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# 发明专利证书

发明名称：非线性光子晶体及其双光子频率和路径超纠缠产生方法

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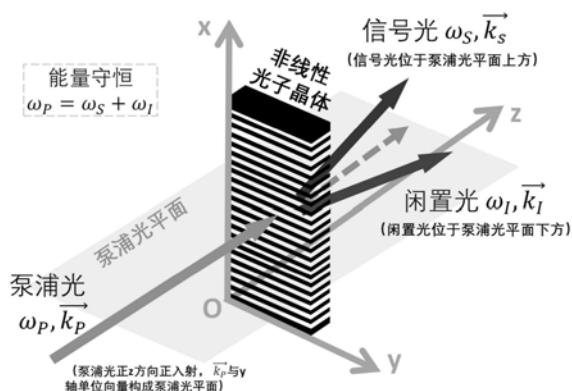
权利要求书2页 说明书18页 附图2页

## (54)发明名称

非线性光子晶体及其双光子频率和路径超纠缠产生方法

## (57)摘要

本发明提供了一种能够直接产生双光子频率和路径超纠缠的非线性光子晶体,该非线性光子晶体选用室温、I类相位匹配(e $\rightarrow$ o+o)条件下的5%MgO掺杂的LiNbO<sub>3</sub>晶体。同时提供了一种基于非线性光子晶体的双光子频率和路径超纠缠产生方法,泵浦光沿着正z方向正入射至非线性光子晶体表面,经过相互作用后生成信号光和闲置光,信号光和闲置光满足频率和路径超纠缠关系。对本发明提供的非线性光子晶体及其双光子频率和路径超纠缠产生方法进行仿真,验证本发明可以产生最大纠缠态且其他参量过程被有效抑制,生成质量较高的超纠缠态。



1. 一种能够直接产生双光子频率和路径超纠缠的非线性光子晶体,其特征在于,所述非线性光子晶体选用室温、I类相位匹配条件下的具有MgO掺杂的LiNbO<sub>3</sub>晶体。

2. 根据权利要求1所述的非线性光子晶体,其特征在于,所述室温为20~25℃。

3. 根据权利要求1所述的非线性光子晶体,其特征在于,所述I类相位匹配条件的偏振性质为 $e \rightarrow o+o$ ,即一个e光光子转变为两个o光光子。

4. 根据权利要求1所述的非线性光子晶体,其特征在于,所述MgO的掺杂量为5%。

5. 根据权利要求1所述的非线性光子晶体,其特征在于,所述非线性光子晶体的准周期晶格结构为:在设定的坐标系中,非线性光子晶体在z方向上的厚度L满足 $L = m\pi / \Delta k_z$ ,其中m为非负整数, $\Delta k_z$ 为z轴方向的相位适配量的模值;非线性光子晶体的二阶非线性极化系数 $x^{(2)}$ 沿x轴方向,并在x轴特定位置反转,实现二阶非线性极化系数 $x^{(2)} = +1$ 的晶畴和二阶非线性极化系数 $x^{(2)} = -1$ 的晶畴以设计的规律交替出现。

6. 一种权利要求1至5中任一项所述的非线性光子晶体的双光子频率和路径超纠缠产生方法,其特征在于,包括:

泵浦光沿着正z方向正入射至非线性光子晶体表面,泵浦光波矢量 $\vec{k}_p$ 和与y轴平行的单位向量构成泵浦光平面, $\vec{k}_p$ 垂直于非线性光子晶体提供的沿x轴方向的相位适配量 $\pm \Delta \vec{k}_{x1}$ 和 $\pm \Delta \vec{k}_{x2}$ ,经过相互作用后生成信号光和闲置光,所述信号光和闲置光满足频率和路径超纠缠关系。

7. 根据权利要求6所述的非线性光子晶体的双光子频率和路径超纠缠产生方法,其特征在于,所述频率和路径超纠缠关系的量子态 $|\psi\rangle$ 表示为:

$$|\psi\rangle = \frac{1}{\sqrt{2}}(|\theta_{1,s}, \theta_{1,I}\rangle + |\theta_{2,s}, \theta_{2,I}\rangle) \otimes \frac{1}{\sqrt{2}}(|\omega_{1,s}, \omega_{2,I}\rangle + |\omega_{2,s}, \omega_{1,I}\rangle)$$

式中,下标S代表信号光,即光子传输路径在泵浦光平面上方,下标I代表闲置光,即光子传输路径在泵浦光平面下方; $\theta_{1,s}$ 表示信号光以角度 $\theta_1$ 出射的情况, $\theta_{1,I}$ 表示闲置光以角度 $\theta_1$ 出射的情况, $\theta_{2,s}$ 表示信号光以角度 $\theta_2$ 出射的情况, $\theta_{2,I}$ 表示信号光以角度 $\theta_2$ 出射的情况, $\omega_{1,s}$ 表示信号光频率为 $\omega_1$ 的情况, $\omega_{2,I}$ 表示闲置光频率为 $\omega_2$ 的情况, $\omega_{2,s}$ 表示信号光频率为 $\omega_2$ 的情况, $\omega_{1,I}$ 表示闲置光频率为 $\omega_1$ 的情况。

8. 根据权利要求6所述的非线性光子晶体的双光子频率和路径超纠缠产生方法,其特征在于,所述非线性光子晶体满足多种准相位匹配条件,能够同时发生多个匹配的自发参量下转换过程。

9. 根据权利要求8所述的非线性光子晶体的双光子频率和路径超纠缠产生方法,其特征在于,所述准相位匹配条件为四种,分别为:

$$(1) \vec{k}_p = \vec{k}_{1,s}(\theta_1) + \vec{k}_{2,I}(\theta_1) - \Delta \vec{k}_{x1} - \Delta \vec{k}_z;$$

$$(2) \vec{k}_p = \vec{k}_{2,s}(\theta_1) + \vec{k}_{1,I}(\theta_1) + \Delta \vec{k}_{x1} - \Delta \vec{k}_z;$$

$$(3) \vec{k}_p = \vec{k}_{1,s}(\theta_2) + \vec{k}_{2,I}(\theta_2) - \Delta \vec{k}_{x2} + \Delta \vec{k}_z;$$

$$(4) \vec{k}_p = \vec{k}_{2,s}(\theta_2) + \vec{k}_{1,I}(\theta_2) + \Delta \vec{k}_{x2} + \Delta \vec{k}_z;$$

式中,  $\vec{k}_p$  为频率为  $\omega_p$  的泵浦光的波矢量,  $\vec{k}_{1,s}(\theta_1)$  为以角度  $\theta_1$  出射的频率为  $\omega_1$  的信号光的波矢量,  $\vec{k}_{2,I}(\theta_1)$  为以角度  $\theta_1$  出射的频率为  $\omega_2$  的闲置光的波矢量,  $\vec{k}_{2,s}(\theta_1)$  为以角度  $\theta_1$  出射的频率为  $\omega_2$  的信号光的波矢量,  $\vec{k}_{1,I}(\theta_1)$  为以角度  $\theta_1$  出射的频率为  $\omega_1$  的闲置光的波矢量,  $\vec{k}_{1,s}(\theta_2)$  为以角度  $\theta_2$  出射的频率为  $\omega_1$  的信号光的波矢量,  $\vec{k}_{2,I}(\theta_2)$  为以角度  $\theta_2$  出射的频率为  $\omega_2$  的闲置光的波矢量,  $\vec{k}_{2,s}(\theta_2)$  为以角度  $\theta_2$  出射的频率为  $\omega_2$  的信号光的波矢量,  $\vec{k}_{1,I}(\theta_2)$  为以角度  $\theta_2$  出射的频率为  $\omega_1$  的闲置光的波矢量,  $\pm\Delta\vec{k}_{x1}$  和  $\pm\Delta\vec{k}_{x2}$  为x轴方向的相位适配量,  $\pm\Delta\vec{k}_z$  为z轴方向的相位适配量;

相应地,四个匹配的自发参量下转换过程为:一个频率为  $\omega_p$  的泵浦光光子被非线性光子晶体转化为一个频率为  $\omega_s$  的信号光光子和一个频率为  $\omega_I$  的闲置光光子,所述转换过程满足能量守恒  $\omega_p = \omega_s + \omega_I$ 。

10. 根据权利要求9所述的非线性光子晶体的双光子频率和路径超纠缠产生方法,其特征在于,四个匹配的自发参量下转换过程中的z轴相位适配量的模值相同且方向相反,使得四个自发参量下转换过程的效率相同,进而产生最大程度的超纠缠。

## 非线性光子晶体及其双光子频率和路径超纠缠产生方法

### 技术领域

[0001] 本发明涉及量子纠缠生成技术领域的非线性光子晶体设计技术,具体地,涉及一种非线性光子晶体及其双光子频率和路径超纠缠产生方法,是一种直接产生双光子频率和路径超纠缠的非线性光子晶体设计方案。

### 背景技术

[0002] 量子纠缠是量子世界的一个重要特征,它描述的是粒子或粒子组之间的、不受距离限制的一种关联特性。量子纠缠对于量子信息处理中的许多应用都是必不可少的量子资源,它被广泛地用于量子密钥分发、量子隐形传态、量子纠缠交换和中继、量子精密计量等方面。

[0003] 超纠缠是一种高维量子纠缠,指的是粒子或粒子组之间在两个及两个以上的维度上的同时量子纠缠。相比于普通的量子纠缠源,超纠缠源的用途更大,它可以实现四种贝尔态的完整区分,实现单光子双量子比特CNOT门,实现双量子比特交换门等。除此之外,超纠缠还可以提高许多量子应用的性能,例如实现更安全的量子密钥分发、实现超密集编码等。

[0004] 2002年,M.Genovese和C.Novero设计了偏振和时间的超纠缠源;2003年,陈增兵教授等人设计了偏振和路径的超纠缠源;2019年浦项科技大学团队实验制备了光子轨道角动量和偏振的超纠缠源。

[0005] 有效产生纠缠的标准技术是在非线性介质的二阶非线性极化系数的作用下产生自发参量下转换(Spontaneous parametric down-conversion,SPDC)过程。自发参量下转换是指二阶非线性光子晶体中泵浦光(频率为 $\omega_p$ )和非线性晶体相互作用生成信号光(频率为 $\omega_s$ )和闲置光(频率为 $\omega_i$ )的非线性参量过程,它在1970年由Burnham和Weinberg两位科学家首次发现。由于非线性光子晶体中二阶非线性极化系数 $\chi^{(2)}$ 非常小,所以为了保证光学自发参量下转换过程的转化效率,输入泵浦光的强度应足够大。在二阶非线性晶体中,泵浦光子按一定的概率和二阶非线性光子晶体发生相互作用,而后泵浦光子湮灭,产生新的信号光子和闲置光子,其中信号光子和闲置光子的能量来自于湮灭的泵浦光子。自发参量下转换过程的实现必须需要满足能量守恒条件( $\omega_p = \omega_s + \omega_i$ ),不是必须满足动量守恒条件( $\vec{k}_p = \vec{k}_s + \vec{k}_i$ );当动量守恒条件不完全满足时,自发参量下转换过程也可以实现,只是效率特别低,只有当动量守恒条件完全满足时,也就是非线性参量过程具有完美相位匹配时,自发参量下转换过程的转换效率才会达到最大。目前光学自发参量下转换过程是制备光子纠缠源的主要方法,主要是因为它稳定,生成的光信号强度高,且生成的光子对具有纠缠特性。

[0006] 准相位匹配(Quasi-phase matching)是一种通用的解决相位匹配条件的方法,可以很好地解决SPDC过程的相位匹配问题。准相位匹配的思想是通过调节非线性光子晶体的结构使其非线性耦合系数周期变化。在一块非线性晶体上,根据晶体的位置周期性反转晶体的光轴,这样晶体的非线性耦合系数也随着晶体位置周期性反转,这个过程也被称作为晶体的周期性极化,周期性极化的晶体可以补偿参量过程非零的波矢量适配量 $\Delta\vec{k}$

$(\Delta \vec{k} = \vec{k}_p - \vec{k}_s - \vec{k}_l)$ , 因此该方法可以有效地增加参量过程的效率。

[0007] 但是, 现有技术不曾设计双光子频率和路径超纠缠源, 更未曾利用非线性光子晶体直接构造出双光子频率和路径超纠缠源。

## 发明内容

[0008] 本发明针对现有技术中存在的上述不足, 提供了一种非线性光子晶体及其双光子频率和路径超纠缠产生方法。

[0009] 本发明是通过以下技术方案实现的。

[0010] 根据本发明的一个方面, 提供了一种能够直接产生双光子频率和路径超纠缠的非线性光子晶体, 所述非线性光子晶体选用室温、I类相位匹配条件下的具有MgO掺杂的LiNbO<sub>3</sub>晶体。

[0011] 优选地, 所述室温为20~25℃。

[0012] 优选地, 所述I类相位匹配条件的偏振性质为e→o+o, 即一个e光光子转变为两个o光光子。

[0013] 优选地, 所述MgO的掺杂量为5%。

[0014] 优选地, 所述非线性光子晶体的准周期晶格结构为: 在设定的坐标系中, 非线性光子晶体在z方向上的厚度L满足 $L = m\pi / \Delta k_z$ , 其中m为非负整数,  $\Delta k_z$ 为z轴方向的相位适配量的模值。非线性光子晶体的二阶非线性极化系数 $\chi^{(2)}$ 沿x轴方向, 并在x轴特定位置反转, 实现二阶非线性极化系数 $\chi^{(2)} = +1$ 的晶畴和二阶非线性极化系数 $\chi^{(2)} = -1$ 的晶畴以设计的规律交替出现。

[0015] 根据本发明的另一个方面, 提供了一种上述任一项所述的非线性光子晶体的双光子频率和路径超纠缠产生方法, 包括:

[0016] 泵浦光沿着正z方向正入射至非线性光子晶体表面, 泵浦光波矢量 $\vec{k}_p$ 和与y轴平行的单位向量构成泵浦光平面,  $\vec{k}_p$ 垂直于非线性光子晶体提供的沿x轴方向的相位适配量 $\pm \Delta \vec{k}_{x1}$ 和 $\pm \Delta \vec{k}_{x2}$ , 经过相互作用后生成信号光和闲置光, 所述信号光和闲置光满足频率和路径超纠缠关系。

[0017] 优选地, 所述频率和路径超纠缠关系的量子态 $|\psi\rangle$ 表示为:

$$[0018] \quad |\psi\rangle = \frac{1}{\sqrt{2}}(|\theta_{1,S}, \theta_{1,I}\rangle + |\theta_{2,S}, \theta_{2,I}\rangle) \otimes \frac{1}{\sqrt{2}}(|\omega_{1,S}, \omega_{2,I}\rangle + |\omega_{2,S}, \omega_{1,I}\rangle)$$

[0019] 式中, 下标S代表信号光, 即光子传输路径在泵浦光平面上方, 下标I代表闲置光, 即光子传输路径在泵浦光平面下方;  $\theta_{1,S}$ 表示信号光以角度 $\theta_1$ 出射的情况,  $\theta_{1,I}$ 表示闲置光以角度 $\theta_1$ 出射的情况,  $\theta_{2,S}$ 表示信号光以角度 $\theta_2$ 出射的情况,  $\theta_{2,I}$ 表示信号光以角度 $\theta_2$ 出射的情况,  $\omega_{1,S}$ 表示信号光频率为 $\omega_1$ 的情况,  $\omega_{2,I}$ 表示闲置光频率为 $\omega_2$ 的情况,  $\omega_{2,S}$ 表示信号光频率为 $\omega_2$ 的情况,  $\omega_{1,I}$ 表示闲置光频率为 $\omega_1$ 的情况。

[0020] 优选地, 所述非线性光子晶体满足多种准相位匹配条件, 能够同时发生多个匹配的自发参量下转换过程。

[0021] 优选地, 所述准相位匹配条件为四种, 分别为:

$$[0022] \quad (1) \quad \vec{k}_p = \vec{k}_{1,s}(\theta_1) + \vec{k}_{2,I}(\theta_1) - \Delta\vec{k}_{x1} - \Delta\vec{k}_z;$$

$$[0023] \quad (2) \quad \vec{k}_p = \vec{k}_{2,s}(\theta_1) + \vec{k}_{1,I}(\theta_1) + \Delta\vec{k}_{x1} - \Delta\vec{k}_z;$$

$$[0024] \quad (3) \quad \vec{k}_p = \vec{k}_{1,s}(\theta_2) + \vec{k}_{2,I}(\theta_2) - \Delta\vec{k}_{x2} + \Delta\vec{k}_z;$$

$$[0025] \quad (4) \quad \vec{k}_p = \vec{k}_{2,s}(\theta_2) + \vec{k}_{1,I}(\theta_2) + \Delta\vec{k}_{x2} + \Delta\vec{k}_z;$$

[0026] 式中,  $\vec{k}_p$  为频率为  $\omega_p$  的泵浦光的波矢量,  $\vec{k}_{1,s}(\theta_1)$  为以角度  $\theta_1$  出射的频率为  $\omega_1$  的信号光的波矢量,  $\vec{k}_{2,I}(\theta_1)$  为以角度  $\theta_1$  出射的频率为  $\omega_2$  的闲置光的波矢量,  $\vec{k}_{2,s}(\theta_1)$  为以角度  $\theta_1$  出射的频率为  $\omega_2$  的信号光的波矢量,  $\vec{k}_{1,I}(\theta_1)$  为以角度  $\theta_1$  出射的频率为  $\omega_1$  的闲置光的波矢量,  $\vec{k}_{1,s}(\theta_2)$  为以角度  $\theta_2$  出射的频率为  $\omega_1$  的信号光的波矢量,  $\vec{k}_{2,I}(\theta_2)$  为以角度  $\theta_2$  出射的频率为  $\omega_2$  的闲置光的波矢量,  $\vec{k}_{2,s}(\theta_2)$  为以角度  $\theta_2$  出射的频率为  $\omega_2$  的信号光的波矢量,  $\vec{k}_{1,I}(\theta_2)$  为以角度  $\theta_2$  出射的频率为  $\omega_1$  的闲置光的波矢量,  $\pm\Delta\vec{k}_{x1}$  和  $\pm\Delta\vec{k}_{x2}$  为 x 轴方向的相位适配量,  $\pm\Delta\vec{k}_z$  为 z 轴方向的相位适配量;

[0027] 相应地,四个匹配的自发参量下转换过程为:一个频率为  $\omega_p$  的泵浦光光子被非线性光子晶体转化为一个频率为  $\omega_s$  的信号光光子和一个频率为  $\omega_I$  的闲置光光子,该转换过程满足能量守恒  $\omega_p = \omega_s + \omega_I$ 。

[0028] 优选地,四个匹配的自发参量下转换过程中的 z 轴相位适配量的模值相同且方向相反,使得四个自发参量下转换过程的效率相同,进而产生最大程度的超纠缠。

[0029] 与现有技术相比,本发明具有如下有益效果:

[0030] 1、本发明提供的非线性光子晶体及其双光子频率和路径超纠缠产生方法,选用室温 (20℃至25℃)、I类相位匹配 (e→o+o) 条件下的 5%MgO 掺杂的 LiNbO<sub>3</sub> 晶体,晶体被设计为在室温下即可同时匹配四个自发参量下转换过程,从而可以在无需加热炉、只将一束泵浦光注入时便可直接产生频率和路径超纠缠的光子对。

[0031] 2、本发明提供的非线性光子晶体及其双光子频率和路径超纠缠产生方法,可以对非线性光子晶体的结构进行自主设计,使其同时满足多个(本发明满足了四个)自发参量下转换过程,这正是设计量子超纠缠源所需要的。

[0032] 3、对本发明提供的非线性光子晶体及其双光子频率和路径超纠缠产生方法进行仿真,可以验证此设计方案可以产生最大纠缠态且其他参量过程被有效抑制,因此能够生成质量较高的超纠缠态。

[0033] 4、本发明提供的非线性光子晶体及其双光子频率和路径超纠缠产生方法,结合量子光学、非线性光学、晶体光学等多个学科,解决了制备双光子频率和路径超纠缠过程中的非线性晶体设计问题。

## 附图说明

[0034] 通过阅读参照以下附图对非限制性实施例所作的详细描述,本发明的其它特征、目的和优点将会变得更明显:

[0035] 图1为本发明一实施例中基于非线性光子晶体的双光子频率和路径超纠缠源设计示意图。

[0036] 图2为本发明一实施例中可产生双光子频率和路径超纠缠的非线性光子晶体所满足的四种准相位匹配条件示意图。

[0037] 图3为本发明一实施例中可产生双光子频率和路径超纠缠的非线性光子晶体的准周期晶格结构的设计方案示意图。

[0038] 图4为本发明一实施例中产生双光子频率和路径超纠缠的非线性光子晶体的准周期晶格的空间傅里叶变换频谱图。

## 具体实施方式

[0039] 下面对本发明的实施例作详细说明:本实施例在以本发明技术方案为前提下进行实施,给出了详细的实施方式和具体的操作过程。应当指出的是,对本领域的普通技术人员来说,在不脱离本发明构思的前提下,还可以做出若干变形和改进,这些都属于本发明的保护范围。

[0040] 本发明实施例提供了一种能够直接产生双光子频率和路径超纠缠的非线性光子晶体,非线性光子晶体选用室温、I类相位匹配条件下的具有MgO掺杂的LiNbO<sub>3</sub>晶体。

[0041] 作为一优选实施例,室温是指非线性光子晶体设计的工作温度,为20~25℃,进一步优选地,室温选择为25℃。

[0042] 作为一优选实施例,I类相位匹配条件的偏振性质为e→o+o,即一个e光光子转变为两个o光光子。

[0043] 作为一优选实施例,MgO的掺杂量为5%。

[0044] 作为一优选实施例,非线性光子晶体的准周期晶格结构,具体为:按图1中规定的坐标系,非线性光子晶体在x方向的长度为3.947cm、在y方向上的宽度为1cm、在z方向上的厚度L满足 $L = m\pi / \Delta k_z$ ,其中m为非负整数, $\Delta k_z$ 为z轴方向的相位适配量的模值, $\Delta k_z = 0.04 \mu\text{m}^{-1}$ 。非线性光子晶体的二阶非线性极化系数 $\chi^{(2)}$ 沿图1中规定的x轴方向、在表1中列出的x轴特定位置反转,实现二阶非线性极化系数 $\chi^{(2)} = +1$ 的晶畴和二阶非线性极化系数 $\chi^{(2)} = -1$ 的晶畴以设计的规律交替出现(图3为示意图)。

[0045] 基于本发明实施例所提供的非线性光子晶体,本发明实施例同时提供了一种上述任一项的非线性光子晶体的双光子频率和路径超纠缠产生方法,包括:

[0046] 如图1所示,泵浦光沿着正z方向正入射至非线性光子晶体表面,泵浦光波矢量 $\vec{k}_p$ 和与y轴平行的单位向量构成泵浦光平面, $\vec{k}_p$ 垂直于非线性光子晶体提供的沿x轴方向的相位适配量 $\pm\Delta\vec{k}_{x1}$ 和 $\pm\Delta\vec{k}_{x2}$ ,经过相互作用后生成信号光和闲置光,信号光和闲置光满足频率和路径超纠缠关系。

[0047] 作为一优选实施例,频率和路径超纠缠关系的量子态 $|\psi\rangle$ 表示为:

$$[0048] \quad |\psi\rangle = \frac{1}{\sqrt{2}}(|\theta_{1,s}, \theta_{1,I}\rangle + |\theta_{2,s}, \theta_{2,I}\rangle) \otimes \frac{1}{\sqrt{2}}(|\omega_{1,s}, \omega_{2,I}\rangle + |\omega_{2,s}, \omega_{1,I}\rangle)$$

[0049] 式中,下标S代表信号光,即光子传输路径在泵浦光平面上方,下标I代表闲置光,即光子传输路径在泵浦光平面下方; $\theta_{1,s}$ 表示信号光以角度 $\theta_1$ 出射的情况, $\theta_{1,I}$ 表示闲置光

以角度 $\theta_1$ 出射的情况, $\theta_{2,S}$ 表示信号光以角度 $\theta_2$ 出射的情况, $\theta_{2,I}$ 表示信号光以角度 $\theta_2$ 出射的情况, $\omega_{1,S}$ 表示信号光频率为 $\omega_1$ 的情况, $\omega_{2,I}$ 表示闲置光频率为 $\omega_2$ 的情况, $\omega_{2,S}$ 表示信号光频率为 $\omega_2$ 的情况, $\omega_{1,I}$ 表示闲置光频率为 $\omega_1$ 的情况。

[0050] 作为一优选实施例,泵浦光波长为775nm。

[0051] 作为一优选实施例,信号光波长为1700nm,闲置光波长为1424.3nm;相应地, $\Delta k_{x1}=0.2801\mu\text{m}^{-1}$ , $\Delta k_{x2}=0.3185\mu\text{m}^{-1}$ ,其中, $\Delta k_{x1}$ 表示图2中x轴方向的相位适配量 $\pm\Delta\overline{k_{x1}}$ 的模值; $\Delta k_{x2}$ 表示图2中x轴方向的相位适配量 $\pm\Delta\overline{k_{x2}}$ 的模值。

[0052] 作为一优选实施例,非线性光子晶体满足多种准相位匹配条件,能够同时发生多个匹配的自发参量下转换过程。

[0053] 作为一优选实施例,如图2所示,准相位匹配条件为四种,分别为:

[0054] (1)  $\overline{k_p} = \overline{k_{1,S}}(\theta_1) + \overline{k_{2,I}}(\theta_1) - \Delta\overline{k_{x1}} - \Delta\overline{k_z}$ ;

[0055] (2)  $\overline{k_p} = \overline{k_{2,S}}(\theta_1) + \overline{k_{1,I}}(\theta_1) + \Delta\overline{k_{x1}} - \Delta\overline{k_z}$ ;

[0056] (3)  $\overline{k_p} = \overline{k_{1,S}}(\theta_2) + \overline{k_{2,I}}(\theta_2) - \Delta\overline{k_{x2}} + \Delta\overline{k_z}$ ;

[0057] (4)  $\overline{k_p} = \overline{k_{2,S}}(\theta_2) + \overline{k_{1,I}}(\theta_2) + \Delta\overline{k_{x2}} + \Delta\overline{k_z}$ ;

[0058] 式中 $\overline{k_p}$ 为频率为 $\omega_p$ 的泵浦光的波矢量, $\overline{k_{1,S}}(\theta_1)$ 为以角度 $\theta_1$ 出射的频率为 $\omega_1$ 的信号光的波矢量, $\overline{k_{2,I}}(\theta_1)$ 为以角度 $\theta_1$ 出射的频率为 $\omega_2$ 的闲置光的波矢量, $\overline{k_{2,S}}(\theta_1)$ 为以角度 $\theta_1$ 出射的频率为 $\omega_2$ 的信号光的波矢量, $\overline{k_{1,I}}(\theta_1)$ 为以角度 $\theta_1$ 出射的频率为 $\omega_1$ 的闲置光的波矢量, $\overline{k_{1,S}}(\theta_2)$ 为以角度 $\theta_2$ 出射的频率为 $\omega_1$ 的信号光的波矢量, $\overline{k_{2,I}}(\theta_2)$ 为以角度 $\theta_2$ 出射的频率为 $\omega_2$ 的闲置光的波矢量, $\overline{k_{2,S}}(\theta_2)$ 为以角度 $\theta_2$ 出射的频率为 $\omega_2$ 的信号光的波矢量, $\overline{k_{1,I}}(\theta_2)$ 为以角度 $\theta_2$ 出射的频率为 $\omega_1$ 的闲置光的波矢量, $\pm\Delta\overline{k_{x1}}$ 和 $\pm\Delta\overline{k_{x2}}$ 为x轴方向的相位适配量, $\pm\Delta\overline{k_z}$ 为z轴方向的相位适配量;

[0059] 相应地,四个匹配的自发参量下转换过程为:一个频率为 $\omega_p$ 的泵浦光光子被非线性光子晶体转化为一个频率为 $\omega_s$ 的信号光光子和一个频率为 $\omega_i$ 的闲置光光子,该过程满足能量守恒 $\omega_p = \omega_s + \omega_i$ 。

[0060] 作为一优选实施例,四个匹配的自发参量下转换过程中的z轴相位适配量的模值相同且方向相反,使得四个自发参量下转换过程的效率相同,进而产生最大程度的超纠缠。

[0061] 作为一优选实施例, $\pm\Delta\overline{k_z}$ 的模值 $\Delta k_z=0.04\mu\text{m}^{-1}$ ; $\theta_1=0.1741\text{rad}$ , $\theta_2=0.1982\text{rad}$ 。

[0062] 下面结合附图,对本发明实施例所提供的技术方案进一步详细描述。

[0063] 本发明实施例所提供的能够直接产生双光子频率和路径超纠缠的非线性光子晶体,选用室温(优选为25℃)、I类相位匹配(e $\rightarrow$ o+o)条件下的5%MgO掺杂的LiNbO<sub>3</sub>晶体。

[0064] 如图1所示,非线性光子晶体的双光子频率和路径超纠缠产生方法为:泵浦光(频率为 $\omega_p$ ,e光)沿着正z方向正入射至非线性光子晶体表面,泵浦光波矢量垂直于非线性光子晶体提供的沿x轴方向的相位适配量 $\pm\Delta\overline{k_{x1}}$ 和 $\pm\Delta\overline{k_{x2}}$ ,经过相互作用后生成信号光(频率

为 $\omega_s, o$ 光)和闲置光(频率为 $\omega_i, o$ 光),信号光和闲置光满足频率和路径超纠缠关系。

[0065] 本发明实施例中,泵浦光波长优选为775nm。

[0066] 如图2所示,非线性光子晶体采用四种准相位匹配产生四个自发参量下转换过程;其中,

[0067] 四种准相位匹配条件分别为:

[0068] (1)  $\vec{k}_p = \vec{k}_{1,s}(\theta_1) + \vec{k}_{2,i}(\theta_1) - \Delta\vec{k}_{x1} - \Delta\vec{k}_z$ ;

[0069] (2)  $\vec{k}_p = \vec{k}_{2,s}(\theta_1) + \vec{k}_{1,i}(\theta_1) + \Delta\vec{k}_{x1} - \Delta\vec{k}_z$ ;

[0070] (3)  $\vec{k}_p = \vec{k}_{1,s}(\theta_2) + \vec{k}_{2,i}(\theta_2) - \Delta\vec{k}_{x2} + \Delta\vec{k}_z$ ;

[0071] (4)  $\vec{k}_p = \vec{k}_{2,s}(\theta_2) + \vec{k}_{1,i}(\theta_2) + \Delta\vec{k}_{x2} + \Delta\vec{k}_z$ ;

[0072] 式中 $\vec{k}_p$ 为频率为 $\omega_p$ 的泵浦光的波矢量, $\vec{k}_{1,s}(\theta_1)$ 为以角度 $\theta_1$ 出射的频率为 $\omega_1$ 的信号光的波矢量, $\vec{k}_{2,i}(\theta_1)$ 为以角度 $\theta_1$ 出射的频率为 $\omega_2$ 的闲置光的波矢量, $\vec{k}_{2,s}(\theta_1)$ 为以角度 $\theta_1$ 出射的频率为 $\omega_2$ 的信号光的波矢量, $\vec{k}_{1,i}(\theta_1)$ 为以角度 $\theta_1$ 出射的频率为 $\omega_1$ 的闲置光的波矢量, $\vec{k}_{1,s}(\theta_2)$ 为以角度 $\theta_2$ 出射的频率为 $\omega_1$ 的信号光的波矢量, $\vec{k}_{2,i}(\theta_2)$ 为以角度 $\theta_2$ 出射的频率为 $\omega_2$ 的闲置光的波矢量, $\vec{k}_{2,s}(\theta_2)$ 为以角度 $\theta_2$ 出射的频率为 $\omega_2$ 的信号光的波矢量, $\vec{k}_{1,i}(\theta_2)$ 为以角度 $\theta_2$ 出射的频率为 $\omega_1$ 的闲置光的波矢量, $\pm\Delta\vec{k}_{x1}$ 和 $\pm\Delta\vec{k}_{x2}$ 为x轴方向的相位适配量, $\pm\Delta\vec{k}_z$ 为z轴方向的相位适配量,其模值 $\Delta k_z = 0.04\mu\text{m}^{-1}$ 。 $\theta_1 = 0.1741\text{rad}$ , $\theta_2 = 0.1982\text{rad}$ 。

[0073] 四个匹配的自发参量下转换过程为:一个频率为 $\omega_p$ 的泵浦光光子被非线性光子晶体转化为一个频率为 $\omega_s$ 的信号光光子和一个频率为 $\omega_i$ 的闲置光光子,该过程满足能量守恒 $\omega_p = \omega_s + \omega_i$ 。

[0074] 非线性光子晶体能够同时匹配上述四个自发参量下转换过程。只要晶体的周期极化可以补偿x方向上的动量不匹配,就会发生非线性过程,而z方向上的不匹配仅仅会影响其转换效率。在图2这种情况下,四个过程在z方向上都具有动量不匹配,因此,非线性过程的效率将低于其他情况。在本发明实施例中,确保沿z轴的不匹配量具有相同的数值而仅是方向相反,此时四个自发参量下转换过程的效率将相同,这意味着最大程度的超纠缠。

[0075] 本发明实施例中,优选信号光波长为1700nm,闲置光频率约为1424.3nm。相应地, $\Delta k_{x1} = 0.2801\mu\text{m}^{-1}$ , $\Delta k_{x2} = 0.3185\mu\text{m}^{-1}$ ,其中, $\Delta k_{x1}$ 表示图2中x轴方向的相位适配量 $\pm\Delta\vec{k}_{x1}$ 的模值; $\Delta k_{x2}$ 表示图2中x轴方向的相位适配量 $\pm\Delta\vec{k}_{x2}$ 的模值。

[0076] 如图3所示,非线性光子晶体的准周期晶格结构,具体为:按图1中规定的坐标系,优选非线性光子晶体在x方向的长度为3.947cm、在y方向上的宽度为1cm、在z方向上的厚度L满足 $L = m\pi / \Delta k_z$ ,其中m为非负整数, $\Delta k_z$ 为z轴方向的相位适配量的模值,优选 $\Delta k_z = 0.04\mu\text{m}^{-1}$ 。非线性光子晶体的二阶非线性极化系数 $x^{(2)}$ 沿图1中规定的x轴方向、在表1中列出的x轴特定位置反转,实现二阶非线性极化系数 $x^{(2)} = +1$ 的晶畴和二阶非线性极化系数 $x^{(2)} = -1$

的晶畴以设计的规律交替出现。

[0077] 如图4所示,是准周期晶格的空间傅里叶变换频谱图,可见准周期晶格的两个主导频率的傅里叶系数非常接近,分别优选为0.398和0.3979。

[0078] 由此得到非线性光子晶体的频率和路径超纠缠的量子态 $|\psi\rangle$ 表示为:

$$[0079] \quad |\psi\rangle = \frac{1}{\sqrt{2}}(|\theta_{1,S}, \theta_{1,I}\rangle + |\theta_{2,S}, \theta_{2,I}\rangle) \otimes \frac{1}{\sqrt{2}}(|\omega_{1,S}, \omega_{2,I}\rangle + |\omega_{2,S}, \omega_{1,I}\rangle)$$

[0080] 式中,下标S代表信号光,即光子传输路径在泵浦光平面上方,下标I代表闲置光,即光子传输路径在泵浦光平面下方; $\theta_{1,S}$ 表示信号光以角度 $\theta_1$ 出射的情况, $\theta_{1,I}$ 表示闲置光以角度 $\theta_1$ 出射的情况, $\theta_{2,S}$ 表示信号光以角度 $\theta_2$ 出射的情况, $\theta_{2,I}$ 表示信号光以角度 $\theta_2$ 出射的情况, $\omega_{1,S}$ 表示信号光频率为 $\omega_1$ 的情况, $\omega_{2,I}$ 表示闲置光频率为 $\omega_2$ 的情况, $\omega_{2,S}$ 表示信号光频率为 $\omega_2$ 的情况, $\omega_{1,I}$ 表示闲置光频率为 $\omega_1$ 的情况。

[0081] 表1为本发明一实施例中产生双光子频率和路径超纠缠的非线性光子晶体的二阶非线性极化系数的反转规律。

表 1

| 序号 | 二阶非线性极<br>化系数反转处<br>的x轴位置坐标<br>(m) | 二阶非线性<br>极化系数反<br>转后的取值 |
|----|------------------------------------|-------------------------|
| 1  | 0                                  | 1                       |
| 2  | 9.78E-06                           | -1                      |
| 3  | 2.09E-05                           | 1                       |
| 4  | 3.07E-05                           | -1                      |
| 5  | 4.18E-05                           | 1                       |
| 6  | 5.16E-05                           | -1                      |
| 7  | 6.27E-05                           | 1                       |
| 8  | 7.25E-05                           | -1                      |
| 9  | 8.36E-05                           | -1                      |
| 10 | 9.48E-05                           | 1                       |
| 11 | 0.00010453                         | -1                      |
| 12 | 0.00011566                         | 1                       |
| 13 | 0.00012544                         | -1                      |
| 14 | 0.00013657                         | 1                       |
| 15 | 0.00014635                         | -1                      |
| 16 | 0.00015747                         | 1                       |
| 17 | 0.00016726                         | -1                      |
| 18 | 0.00017838                         | 1                       |
| 19 | 0.00018816                         | -1                      |
| 20 | 0.00019929                         | 1                       |
| 21 | 0.00020907                         | -1                      |
| 22 | 0.00022019                         | 1                       |
| 23 | 0.00022988                         | -1                      |
| 24 | 0.0002411                          | 1                       |
| 25 | 0.00025222                         | -1                      |
| 26 | 0.00026201                         | -1                      |
| 27 | 0.00027313                         | 1                       |
| 28 | 0.00028291                         | -1                      |
| 29 | 0.00029404                         | 1                       |
| 30 | 0.00030382                         | -1                      |
| 31 | 0.00031494                         | 1                       |
| 32 | 0.00032473                         | -1                      |
| 33 | 0.00033585                         | 1                       |
| 34 | 0.00034563                         | -1                      |
| 35 | 0.00035676                         | 1                       |
| 36 | 0.00036654                         | -1                      |
| 37 | 0.00037767                         | 1                       |
| 38 | 0.00038745                         | -1                      |
| 39 | 0.00039857                         | 1                       |
| 40 | 0.00040836                         | -1                      |
| 41 | 0.00041948                         | -1                      |
| 42 | 0.0004306                          | 1                       |
| 43 | 0.00044039                         | -1                      |
| 44 | 0.00045151                         | 1                       |
| 45 | 0.00046129                         | -1                      |
| 46 | 0.00047242                         | 1                       |
| 47 | 0.0004822                          | -1                      |
| 48 | 0.00049332                         | 1                       |
| 49 | 0.00050311                         | -1                      |
| 50 | 0.00051423                         | 1                       |
| 51 | 0.00052401                         | -1                      |
| 52 | 0.00053514                         | 1                       |
| 53 | 0.00054492                         | -1                      |
| 54 | 0.00055604                         | 1                       |
| 55 | 0.00056583                         | -1                      |
| 56 | 0.00057695                         | -1                      |
| 57 | 0.00058808                         | 1                       |
| 58 | 0.00059786                         | -1                      |
| 59 | 0.00060898                         | 1                       |
| 60 | 0.00061877                         | -1                      |
| 61 | 0.00062989                         | 1                       |
| 62 | 0.00063967                         | -1                      |
| 63 | 0.0006508                          | 1                       |
| 64 | 0.00066058                         | -1                      |
| 65 | 0.00067117                         | 1                       |
| 66 | 0.00068149                         | -1                      |
| 67 | 0.00069261                         | 1                       |
| 68 | 0.00070239                         | -1                      |
| 69 | 0.00071352                         | 1                       |
| 70 | 0.0007233                          | -1                      |
| 71 | 0.00073442                         | -1                      |
| 72 | 0.00074555                         | 1                       |
| 73 | 0.00075533                         | -1                      |
| 74 | 0.00076645                         | 1                       |
| 75 | 0.00077624                         | -1                      |
| 76 | 0.00078736                         | 1                       |
| 77 | 0.00079714                         | -1                      |
| 78 | 0.00080827                         | 1                       |
| 79 | 0.00081805                         | -1                      |
| 80 | 0.00082918                         | 1                       |
| 81 | 0.00083896                         | -1                      |
| 82 | 0.00085098                         | 1                       |
| 83 | 0.00085987                         | -1                      |
| 84 | 0.00087099                         | 1                       |
| 85 | 0.00088077                         | -1                      |
| 86 | 0.0008919                          | 1                       |
| 87 | 0.00090168                         | -1                      |
| 88 | 0.0009128                          | -1                      |
| 89 | 0.00092393                         | 1                       |
| 90 | 0.00093371                         | -1                      |
| 91 | 0.00094483                         | 1                       |
| 92 | 0.00095462                         | -1                      |
| 93 | 0.00096574                         | 1                       |
| 94 | 0.00097552                         | -1                      |
| 95 | 0.00098665                         | 1                       |
| 96 | 0.00099643                         | -1                      |
| 97 | 0.0010076                          | 1                       |
| 98 | 0.0010173                          | -1                      |
| 99 | 0.0010285                          | 1                       |

(续表)

|     |           |    |
|-----|-----------|----|
| 100 | 0.0010382 | -1 |
| 101 | 0.0010494 | 1  |
| 102 | 0.0010592 | -1 |
| 103 | 0.0010703 | -1 |
| 104 | 0.0010814 | 1  |
| 105 | 0.0010912 | -1 |
| 106 | 0.0011023 | 1  |
| 107 | 0.0011121 | -1 |
| 108 | 0.0011232 | 1  |
| 109 | 0.001133  | -1 |
| 110 | 0.0011441 | 1  |
| 111 | 0.0011539 | -1 |
| 112 | 0.001165  | 1  |
| 113 | 0.0011748 | -1 |
| 114 | 0.0011859 | 1  |
| 115 | 0.0011957 | -1 |
| 116 | 0.0012068 | 1  |
| 117 | 0.0012166 | -1 |
| 118 | 0.0012277 | -1 |
| 119 | 0.0012389 | 1  |
| 120 | 0.0012487 | -1 |
| 121 | 0.0012588 | 1  |
| 122 | 0.0012696 | -1 |
| 123 | 0.0012807 | 1  |
| 124 | 0.0012905 | -1 |
| 125 | 0.0013016 | 1  |
| 126 | 0.0013114 | -1 |
| 127 | 0.0013225 | 1  |
| 128 | 0.0013323 | -1 |
| 129 | 0.0013434 | 1  |
| 130 | 0.0013532 | -1 |
| 131 | 0.0013643 | 1  |
| 132 | 0.0013741 | -1 |
| 133 | 0.0013852 | 1  |
| 134 | 0.001395  | -1 |
| 135 | 0.0014061 | -1 |
| 136 | 0.0014173 | 1  |
| 137 | 0.001427  | -1 |
| 138 | 0.0014382 | 1  |
| 139 | 0.0014479 | -1 |
| 140 | 0.0014591 | 1  |
| 141 | 0.0014688 | -1 |
| 142 | 0.00148   | 1  |
| 143 | 0.0014898 | -1 |
| 144 | 0.0015009 | 1  |
| 145 | 0.0015107 | -1 |
| 146 | 0.0015218 | 1  |
| 147 | 0.0015316 | -1 |
| 148 | 0.0015427 | 1  |
| 149 | 0.0015525 | -1 |
| 150 | 0.0015636 | -1 |
| 151 | 0.0015747 | 1  |
| 152 | 0.0015845 | -1 |
| 153 | 0.0015956 | 1  |
| 154 | 0.0016054 | -1 |
| 155 | 0.0016165 | 1  |
| 156 | 0.0016263 | -1 |
| 157 | 0.0016374 | 1  |
| 158 | 0.0016472 | -1 |
| 159 | 0.0016584 | 1  |
| 160 | 0.0016681 | -1 |
| 161 | 0.0016793 | 1  |
| 162 | 0.001689  | -1 |
| 163 | 0.0017002 | 1  |
| 164 | 0.0017099 | -1 |
| 165 | 0.0017211 | -1 |
| 166 | 0.0017322 | 1  |
| 167 | 0.001742  | -1 |
| 168 | 0.0017531 | 1  |
| 169 | 0.0017629 | -1 |
| 170 | 0.001774  | 1  |
| 171 | 0.0017838 | -1 |
| 172 | 0.0017949 | 1  |
| 173 | 0.0018047 | -1 |
| 174 | 0.0018158 | 1  |
| 175 | 0.0018256 | -1 |
| 176 | 0.0018367 | 1  |
| 177 | 0.0018465 | -1 |
| 178 | 0.0018576 | 1  |
| 179 | 0.0018674 | -1 |
| 180 | 0.0018785 | -1 |
| 181 | 0.0018897 | 1  |
| 182 | 0.0018995 | -1 |
| 183 | 0.0019106 | 1  |
| 184 | 0.0019204 | -1 |
| 185 | 0.0019315 | 1  |
| 186 | 0.0019413 | -1 |
| 187 | 0.0019524 | 1  |
| 188 | 0.0019622 | -1 |
| 189 | 0.0019733 | 1  |
| 190 | 0.0019831 | -1 |
| 191 | 0.0019942 | 1  |
| 192 | 0.002004  | -1 |
| 193 | 0.0020151 | 1  |
| 194 | 0.0020249 | -1 |
| 195 | 0.002036  | 1  |
| 196 | 0.0020458 | -1 |
| 197 | 0.0020569 | -1 |
| 198 | 0.002068  | 1  |
| 199 | 0.0020778 | -1 |

(续表)

|     |           |    |
|-----|-----------|----|
| 200 | 0.002089  | 1  |
| 201 | 0.0020987 | -1 |
| 202 | 0.0021099 | 1  |
| 203 | 0.0021196 | -1 |
| 204 | 0.0021308 | 1  |
| 205 | 0.0021406 | -1 |
| 206 | 0.0021517 | 1  |
| 207 | 0.0021615 | -1 |
| 208 | 0.0021726 | 1  |
| 209 | 0.0021824 | -1 |
| 210 | 0.0021935 | 1  |
| 211 | 0.0022033 | -1 |
| 212 | 0.0022144 | -1 |
| 213 | 0.0022255 | 1  |
| 214 | 0.0022353 | -1 |
| 215 | 0.0022464 | 1  |
| 216 | 0.0022562 | -1 |
| 217 | 0.0022673 | 1  |
| 218 | 0.0022771 | -1 |
| 219 | 0.0022882 | 1  |
| 220 | 0.002298  | -1 |
| 221 | 0.0023091 | 1  |
| 222 | 0.0023189 | -1 |
| 223 | 0.0023301 | 1  |
| 224 | 0.0023398 | -1 |
| 225 | 0.002351  | 1  |
| 226 | 0.0023607 | -1 |
| 227 | 0.0023719 | -1 |
| 228 | 0.002383  | 1  |
| 229 | 0.0023928 | -1 |
| 230 | 0.0024039 | 1  |
| 231 | 0.0024137 | -1 |
| 232 | 0.0024248 | 1  |
| 233 | 0.0024346 | -1 |
| 234 | 0.0024457 | 1  |
| 235 | 0.0024555 | -1 |
| 236 | 0.0024666 | 1  |
| 237 | 0.0024764 | -1 |
| 238 | 0.0024875 | 1  |
| 239 | 0.0024973 | -1 |
| 240 | 0.0025084 | 1  |
| 241 | 0.0025182 | -1 |
| 242 | 0.0025293 | 1  |
| 243 | 0.0025391 | -1 |
| 244 | 0.0025502 | -1 |
| 245 | 0.0025614 | 1  |
| 246 | 0.0025712 | -1 |
| 247 | 0.0025823 | 1  |
| 248 | 0.0025921 | -1 |
| 249 | 0.0026032 | 1  |
| 250 | 0.002613  | -1 |
| 251 | 0.0026241 | 1  |
| 252 | 0.0026339 | -1 |
| 253 | 0.002645  | 1  |
| 254 | 0.0026548 | -1 |
| 255 | 0.0026659 | 1  |
| 256 | 0.0026757 | -1 |
| 257 | 0.0026868 | 1  |
| 258 | 0.0026966 | -1 |
| 259 | 0.0027077 | -1 |
| 260 | 0.0027188 | 1  |
| 261 | 0.0027286 | -1 |
| 262 | 0.0027398 | 1  |
| 263 | 0.0027495 | -1 |
| 264 | 0.0027607 | 1  |
| 265 | 0.0027704 | -1 |
| 266 | 0.0027816 | 1  |
| 267 | 0.0027913 | -1 |
| 268 | 0.0028025 | 1  |
| 269 | 0.0028123 | -1 |
| 270 | 0.0028234 | 1  |
| 271 | 0.0028332 | -1 |
| 272 | 0.0028443 | 1  |
| 273 | 0.0028541 | -1 |
| 274 | 0.0028652 | -1 |
| 275 | 0.0028763 | 1  |
| 276 | 0.0028861 | -1 |
| 277 | 0.0028972 | 1  |
| 278 | 0.002907  | -1 |
| 279 | 0.0029181 | 1  |
| 280 | 0.0029279 | -1 |
| 281 | 0.002939  | 1  |
| 282 | 0.0029488 | -1 |
| 283 | 0.0029599 | 1  |
| 284 | 0.0029697 | -1 |
| 285 | 0.0029809 | 1  |
| 286 | 0.0029906 | -1 |
| 287 | 0.0030018 | 1  |
| 288 | 0.0030115 | -1 |
| 289 | 0.0030227 | -1 |
| 290 | 0.0030338 | 1  |
| 291 | 0.0030436 | -1 |
| 292 | 0.0030547 | 1  |
| 293 | 0.0030645 | -1 |
| 294 | 0.0030756 | 1  |
| 295 | 0.0030864 | -1 |
| 296 | 0.0030965 | 1  |
| 297 | 0.0031063 | -1 |
| 298 | 0.0031174 | 1  |
| 299 | 0.0031272 | -1 |

(续表)

|     |           |    |
|-----|-----------|----|
| 300 | 0.0031383 | 1  |
| 301 | 0.0031481 | -1 |
| 302 | 0.0031582 | 1  |
| 303 | 0.003169  | -1 |
| 304 | 0.0031801 | 1  |
| 305 | 0.0031899 | -1 |
| 306 | 0.0032001 | -1 |
| 307 | 0.0032122 | 1  |
| 308 | 0.003222  | -1 |
| 309 | 0.0032331 | 1  |
| 310 | 0.0032429 | -1 |
| 311 | 0.003254  | 1  |
| 312 | 0.0032638 | -1 |
| 313 | 0.0032749 | 1  |
| 314 | 0.0032847 | -1 |
| 315 | 0.0032958 | 1  |
| 316 | 0.0033066 | -1 |
| 317 | 0.0033167 | 1  |
| 318 | 0.0033265 | -1 |
| 319 | 0.0033376 | 1  |
| 320 | 0.0033474 | -1 |
| 321 | 0.0033585 | -1 |
| 322 | 0.0033686 | 1  |
| 323 | 0.0033794 | -1 |
| 324 | 0.0033905 | 1  |
| 325 | 0.0034003 | -1 |
| 326 | 0.0034115 | 1  |
| 327 | 0.0034212 | -1 |
| 328 | 0.0034324 | 1  |
| 329 | 0.0034421 | -1 |
| 330 | 0.0034533 | 1  |
| 331 | 0.0034631 | -1 |
| 332 | 0.0034742 | 1  |
| 333 | 0.0034844 | -1 |
| 334 | 0.0034951 | 1  |
| 335 | 0.0035049 | -1 |
| 336 | 0.003516  | -1 |
| 337 | 0.0035271 | 1  |
| 338 | 0.0035369 | -1 |
| 339 | 0.003548  | 1  |
| 340 | 0.0035578 | -1 |
| 341 | 0.0035689 | 1  |
| 342 | 0.0035787 | -1 |
| 343 | 0.0035898 | 1  |
| 344 | 0.0035996 | -1 |
| 345 | 0.0036107 | 1  |
| 346 | 0.0036205 | -1 |
| 347 | 0.0036316 | 1  |
| 348 | 0.0036414 | -1 |
| 349 | 0.0036526 | 1  |
| 350 | 0.0036623 | -1 |
| 351 | 0.0036735 | 1  |
| 352 | 0.0036832 | -1 |
| 353 | 0.0036944 | -1 |
| 354 | 0.0037055 | 1  |
| 355 | 0.0037153 | -1 |
| 356 | 0.0037264 | 1  |
| 357 | 0.0037362 | -1 |
| 358 | 0.0037473 | 1  |
| 359 | 0.0037571 | -1 |
| 360 | 0.0037682 | 1  |
| 361 | 0.003778  | -1 |
| 362 | 0.0037891 | 1  |
| 363 | 0.0037989 | -1 |
| 364 | 0.00381   | 1  |
| 365 | 0.0038198 | -1 |
| 366 | 0.0038309 | 1  |
| 367 | 0.0038407 | -1 |
| 368 | 0.0038518 | -1 |
| 369 | 0.003863  | 1  |
| 370 | 0.0038727 | -1 |
| 371 | 0.0038839 | 1  |
| 372 | 0.0038937 | -1 |
| 373 | 0.0039048 | 1  |
| 374 | 0.0039146 | -1 |
| 375 | 0.0039257 | 1  |
| 376 | 0.0039355 | -1 |
| 377 | 0.0039466 | 1  |

(续表)

|     |           |    |
|-----|-----------|----|
| 400 | 0.0041877 | -1 |
| 401 | 0.0041988 | 1  |
| 402 | 0.0042066 | -1 |
| 403 | 0.0042197 | 1  |
| 404 | 0.0042295 | -1 |
| 405 | 0.0042406 | 1  |
| 406 | 0.0042504 | -1 |
| 407 | 0.0042615 | 1  |
| 408 | 0.0042713 | -1 |
| 409 | 0.0042824 | 1  |
| 410 | 0.0042922 | -1 |
| 411 | 0.0043033 | 1  |
| 412 | 0.0043131 | -1 |
| 413 | 0.0043243 | 1  |
| 414 | 0.004334  | -1 |
| 415 | 0.0043452 | -1 |
| 416 | 0.0043563 | 1  |
| 417 | 0.0043661 | -1 |
| 418 | 0.0043772 | 1  |
| 419 | 0.004387  | -1 |
| 420 | 0.0043981 | 1  |
| 421 | 0.0044079 | -1 |
| 422 | 0.004419  | 1  |
| 423 | 0.0044288 | -1 |
| 424 | 0.0044399 | 1  |
| 425 | 0.0044497 | -1 |
| 426 | 0.0044608 | 1  |
| 427 | 0.0044706 | -1 |
| 428 | 0.0044817 | 1  |
| 429 | 0.0044915 | -1 |
| 430 | 0.0045026 | -1 |
| 431 | 0.0045138 | 1  |
| 432 | 0.0045235 | -1 |
| 433 | 0.0045347 | 1  |
| 434 | 0.0045444 | -1 |
| 435 | 0.0045556 | 1  |
| 436 | 0.0045654 | -1 |
| 437 | 0.0045765 | 1  |
| 438 | 0.0045863 | -1 |
| 439 | 0.0045974 | 1  |
| 440 | 0.0046072 | -1 |
| 441 | 0.0046183 | 1  |
| 442 | 0.0046281 | -1 |
| 443 | 0.0046392 | 1  |
| 444 | 0.004649  | -1 |
| 445 | 0.0046601 | -1 |
| 446 | 0.0046712 | 1  |
| 447 | 0.004681  | -1 |
| 448 | 0.0046921 | 1  |
| 449 | 0.0047019 | -1 |
| 450 | 0.004713  | 1  |
| 451 | 0.0047228 | -1 |
| 452 | 0.004734  | 1  |
| 453 | 0.0047437 | -1 |
| 454 | 0.0047549 | 1  |
| 455 | 0.0047646 | -1 |
| 456 | 0.0047758 | 1  |
| 457 | 0.0047855 | -1 |
| 458 | 0.0047967 | 1  |
| 459 | 0.0048065 | -1 |
| 460 | 0.0048176 | 1  |
| 461 | 0.0048274 | -1 |
| 462 | 0.0048385 | -1 |
| 463 | 0.0048496 | 1  |
| 464 | 0.0048594 | -1 |
| 465 | 0.0048705 | 1  |
| 466 | 0.0048803 | -1 |
| 467 | 0.0048914 | 1  |
| 468 | 0.0049012 | -1 |
| 469 | 0.0049123 | 1  |
| 470 | 0.0049221 | -1 |
| 471 | 0.0049332 | 1  |
| 472 | 0.004943  | -1 |
| 473 | 0.0049541 | 1  |
| 474 | 0.0049639 | -1 |
| 475 | 0.0049751 | 1  |
| 476 | 0.0049848 | -1 |
| 477 | 0.004996  | -1 |
| 478 | 0.0050071 | 1  |
| 479 | 0.0050169 | -1 |
| 480 | 0.005028  | 1  |
| 481 | 0.0050378 | -1 |
| 482 | 0.0050489 | 1  |
| 483 | 0.0050587 | -1 |
| 484 | 0.0050698 | 1  |
| 485 | 0.0050796 | -1 |
| 486 | 0.0050907 | 1  |
| 487 | 0.0051005 | -1 |
| 488 | 0.0051116 | 1  |
| 489 | 0.0051214 | -1 |
| 490 | 0.0051325 | 1  |
| 491 | 0.0051423 | -1 |
| 492 | 0.0051534 | -1 |
| 493 | 0.0051646 | 1  |
| 494 | 0.0051743 | -1 |
| 495 | 0.0051855 | 1  |
| 496 | 0.0051952 | -1 |
| 497 | 0.0052064 | 1  |
| 498 | 0.0052162 | -1 |
| 499 | 0.0052273 | 1  |

(续表)

|     |           |    |
|-----|-----------|----|
| 500 | 0.0052371 | -1 |
| 501 | 0.0052482 | 1  |
| 502 | 0.005258  | -1 |
| 503 | 0.0052691 | 1  |
| 504 | 0.0052789 | -1 |
| 505 | 0.00529   | 1  |
| 506 | 0.0052998 | -1 |
| 507 | 0.0053109 | 1  |
| 508 | 0.0053207 | -1 |
| 509 | 0.0053318 | -1 |
| 510 | 0.0053429 | 1  |
| 511 | 0.0053527 | -1 |
| 512 | 0.0053638 | 1  |
| 513 | 0.0053736 | -1 |
| 514 | 0.0053847 | 1  |
| 515 | 0.0053945 | -1 |
| 516 | 0.0054057 | 1  |
| 517 | 0.0054154 | -1 |
| 518 | 0.0054266 | 1  |
| 519 | 0.0054363 | -1 |
| 520 | 0.0054475 | 1  |
| 521 | 0.0054573 | -1 |
| 522 | 0.0054684 | 1  |
| 523 | 0.0054782 | -1 |
| 524 | 0.0054893 | 1  |
| 525 | 0.0055004 | 1  |
| 526 | 0.0055102 | -1 |
| 527 | 0.0055213 | 1  |
| 528 | 0.0055311 | -1 |
| 529 | 0.0055422 | 1  |
| 530 | 0.005552  | -1 |
| 531 | 0.0055631 | 1  |
| 532 | 0.0055729 | -1 |
| 533 | 0.005584  | 1  |
| 534 | 0.0055938 | -1 |
| 535 | 0.0056049 | 1  |
| 536 | 0.0056147 | -1 |
| 537 | 0.0056258 | 1  |
| 538 | 0.0056356 | -1 |
| 539 | 0.0056468 | -1 |
| 540 | 0.0056579 | 1  |
| 541 | 0.0056677 | -1 |
| 542 | 0.0056788 | 1  |
| 543 | 0.0056886 | -1 |
| 544 | 0.0056997 | 1  |
| 545 | 0.0057095 | -1 |
| 546 | 0.0057206 | 1  |
| 547 | 0.0057304 | -1 |
| 548 | 0.0057415 | 1  |
| 549 | 0.0057513 | -1 |
| 550 | 0.0057624 | 1  |
| 551 | 0.0057722 | -1 |
| 552 | 0.0057833 | 1  |
| 553 | 0.0057931 | -1 |
| 554 | 0.0058042 | -1 |
| 555 | 0.0058154 | 1  |
| 556 | 0.0058251 | -1 |
| 557 | 0.0058363 | 1  |
| 558 | 0.005846  | -1 |
| 559 | 0.0058572 | 1  |
| 560 | 0.0058669 | -1 |
| 561 | 0.0058781 | 1  |
| 562 | 0.0058879 | -1 |
| 563 | 0.005899  | 1  |
| 564 | 0.0059088 | -1 |
| 565 | 0.0059199 | 1  |
| 566 | 0.0059297 | -1 |
| 567 | 0.0059408 | 1  |
| 568 | 0.0059506 | -1 |
| 569 | 0.0059617 | 1  |
| 570 | 0.0059715 | -1 |
| 571 | 0.0059826 | -1 |
| 572 | 0.0059937 | 1  |
| 573 | 0.0060035 | -1 |
| 574 | 0.0060146 | 1  |
| 575 | 0.0060244 | -1 |
| 576 | 0.0060355 | 1  |
| 577 | 0.0060453 | -1 |
| 578 | 0.0060565 | 1  |
| 579 | 0.0060662 | -1 |
| 580 | 0.0060774 | 1  |
| 581 | 0.0060871 | -1 |
| 582 | 0.0060983 | 1  |
| 583 | 0.006108  | -1 |
| 584 | 0.0061192 | 1  |
| 585 | 0.006129  | -1 |
| 586 | 0.0061401 | -1 |
| 587 | 0.0061512 | 1  |
| 588 | 0.006161  | -1 |
| 589 | 0.0061721 | 1  |
| 590 | 0.0061819 | -1 |
| 591 | 0.006193  | 1  |
| 592 | 0.0062028 | -1 |
| 593 | 0.0062139 | 1  |
| 594 | 0.0062237 | -1 |
| 595 | 0.0062348 | 1  |
| 596 | 0.0062446 | -1 |
| 597 | 0.0062557 | 1  |
| 598 | 0.0062655 | -1 |
| 599 | 0.0062766 | 1  |

(续表)

|     |           |    |
|-----|-----------|----|
| 600 | 0.0062864 | -1 |
| 601 | 0.0062976 | -1 |
| 602 | 0.0063087 | 1  |
| 603 | 0.0063185 | -1 |
| 604 | 0.0063296 | 1  |
| 605 | 0.0063394 | -1 |
| 606 | 0.0063505 | 1  |
| 607 | 0.0063603 | -1 |
| 608 | 0.0063714 | 1  |
| 609 | 0.0063812 | -1 |
| 610 | 0.0063923 | 1  |
| 611 | 0.0064021 | -1 |
| 612 | 0.0064132 | 1  |
| 613 | 0.006423  | -1 |
| 614 | 0.0064341 | 1  |
| 615 | 0.0064439 | -1 |
| 616 | 0.006455  | 1  |
| 617 | 0.0064648 | -1 |
| 618 | 0.0064759 | -1 |
| 619 | 0.0064871 | 1  |
| 620 | 0.0064968 | -1 |
| 621 | 0.006508  | 1  |
| 622 | 0.0065177 | -1 |
| 623 | 0.0065289 | 1  |
| 624 | 0.0065387 | -1 |
| 625 | 0.0065498 | 1  |
| 626 | 0.0065596 | -1 |
| 627 | 0.0065707 | 1  |
| 628 | 0.0065805 | -1 |
| 629 | 0.0065916 | 1  |
| 630 | 0.0066014 | -1 |
| 631 | 0.0066125 | 1  |
| 632 | 0.0066223 | -1 |
| 633 | 0.0066334 | -1 |
| 634 | 0.0066445 | 1  |
| 635 | 0.0066543 | -1 |
| 636 | 0.0066654 | 1  |
| 637 | 0.0066752 | -1 |
| 638 | 0.0066863 | 1  |
| 639 | 0.0066961 | -1 |
| 640 | 0.0067072 | 1  |
| 641 | 0.006717  | -1 |
| 642 | 0.0067282 | 1  |
| 643 | 0.0067379 | -1 |
| 644 | 0.0067491 | 1  |
| 645 | 0.0067588 | -1 |
| 646 | 0.00677   | 1  |
| 647 | 0.0067798 | -1 |
| 648 | 0.0067909 | 1  |
| 649 | 0.006802  | -1 |
| 650 | 0.0068118 | -1 |
| 651 | 0.0068229 | 1  |
| 652 | 0.0068327 | -1 |
| 653 | 0.0068438 | 1  |
| 654 | 0.0068536 | -1 |
| 655 | 0.0068647 | 1  |
| 656 | 0.0068745 | -1 |
| 657 | 0.0068856 | 1  |
| 658 | 0.0068954 | -1 |
| 659 | 0.0069065 | 1  |
| 660 | 0.0069163 | -1 |
| 661 | 0.0069274 | 1  |
| 662 | 0.0069372 | -1 |
| 663 | 0.0069483 | 1  |
| 664 | 0.0069581 | -1 |
| 665 | 0.0069693 | -1 |
| 666 | 0.0069804 | 1  |
| 667 | 0.0069902 | -1 |
| 668 | 0.0070013 | 1  |
| 669 | 0.0070111 | -1 |
| 670 | 0.0070222 | 1  |
| 671 | 0.007032  | -1 |
| 672 | 0.0070431 | 1  |
| 673 | 0.0070529 | -1 |
| 674 | 0.007064  | 1  |
| 675 | 0.0070738 | -1 |
| 676 | 0.0070849 | 1  |
| 677 | 0.0070947 | -1 |
| 678 | 0.0071058 | 1  |
| 679 | 0.0071156 | -1 |
| 680 | 0.0071267 | 1  |
| 681 | 0.0071379 | -1 |
| 682 | 0.0071476 | -1 |
| 683 | 0.0071588 | 1  |
| 684 | 0.0071685 | -1 |
| 685 | 0.0071797 | 1  |
| 686 | 0.0071894 | -1 |
| 687 | 0.0072006 | 1  |
| 688 | 0.0072104 | -1 |
| 689 | 0.0072215 | 1  |
| 690 | 0.0072313 | -1 |
| 691 | 0.0072424 | 1  |
| 692 | 0.0072522 | -1 |
| 693 | 0.0072633 | 1  |
| 694 | 0.0072731 | -1 |
| 695 | 0.0072842 | -1 |
| 696 | 0.0072953 | 1  |
| 697 | 0.0073051 | -1 |
| 698 | 0.0073162 | 1  |
| 699 | 0.007326  | -1 |

(续表)

|     |           |    |
|-----|-----------|----|
| 700 | 0.0073371 | 1  |
| 701 | 0.0073469 | -1 |
| 702 | 0.007358  | 1  |
| 703 | 0.0073678 | -1 |
| 704 | 0.007379  | 1  |
| 705 | 0.0073887 | -1 |
| 706 | 0.0073999 | 1  |
| 707 | 0.0074096 | -1 |
| 708 | 0.0074208 | 1  |
| 709 | 0.0074305 | -1 |
| 710 | 0.0074417 | -1 |
| 711 | 0.0074528 | 1  |
| 712 | 0.0074626 | -1 |
| 713 | 0.0074737 | 1  |
| 714 | 0.0074835 | -1 |
| 715 | 0.0074946 | 1  |
| 716 | 0.0075044 | -1 |
| 717 | 0.0075155 | 1  |
| 718 | 0.0075253 | -1 |
| 719 | 0.0075364 | 1  |
| 720 | 0.0075462 | -1 |
| 721 | 0.0075573 | 1  |
| 722 | 0.0075671 | -1 |
| 723 | 0.0075782 | 1  |
| 724 | 0.007588  | -1 |
| 725 | 0.0075991 | 1  |
| 726 | 0.0076098 | -1 |
| 727 | 0.0076201 | -1 |
| 728 | 0.0076312 | 1  |
| 729 | 0.007641  | -1 |
| 730 | 0.0076521 | 1  |
| 731 | 0.0076619 | -1 |
| 732 | 0.007673  | 1  |
| 733 | 0.0076828 | -1 |
| 734 | 0.0076939 | 1  |
| 735 | 0.0077037 | -1 |
| 736 | 0.0077148 | 1  |
| 737 | 0.0077246 | -1 |
| 738 | 0.0077357 | 1  |
| 739 | 0.0077455 | -1 |
| 740 | 0.0077566 | 1  |
| 741 | 0.0077664 | -1 |
| 742 | 0.0077775 | -1 |
| 743 | 0.0077886 | 1  |
| 744 | 0.0077984 | -1 |
| 745 | 0.0078096 | 1  |
| 746 | 0.0078193 | -1 |
| 747 | 0.0078305 | 1  |
| 748 | 0.0078402 | -1 |
| 749 | 0.0078514 | 1  |
| 750 | 0.0078612 | -1 |
| 751 | 0.0078723 | 1  |
| 752 | 0.0078821 | -1 |
| 753 | 0.0078932 | 1  |
| 754 | 0.007903  | -1 |
| 755 | 0.0079141 | 1  |
| 756 | 0.0079239 | -1 |
| 757 | 0.007935  | -1 |
| 758 | 0.0079461 | 1  |
| 759 | 0.0079559 | -1 |
| 760 | 0.007967  | 1  |
| 761 | 0.0079768 | -1 |
| 762 | 0.0079879 | 1  |
| 763 | 0.0079977 | -1 |
| 764 | 0.0080088 | 1  |
| 765 | 0.0080186 | -1 |
| 766 | 0.0080297 | 1  |
| 767 | 0.0080395 | -1 |
| 768 | 0.0080507 | 1  |
| 769 | 0.0080604 | -1 |
| 770 | 0.0080716 | 1  |
| 771 | 0.0080813 | -1 |
| 772 | 0.0080925 | 1  |
| 773 | 0.0081023 | -1 |
| 774 | 0.0081134 | -1 |
| 775 | 0.0081245 | 1  |
| 776 | 0.0081343 | -1 |
| 777 | 0.0081454 | 1  |
| 778 | 0.0081552 | -1 |
| 779 | 0.0081663 | 1  |
| 780 | 0.0081761 | -1 |
| 781 | 0.0081872 | 1  |
| 782 | 0.008197  | -1 |
| 783 | 0.0082081 | 1  |
| 784 | 0.0082179 | -1 |
| 785 | 0.008229  | 1  |
| 786 | 0.0082388 | -1 |
| 787 | 0.0082499 | 1  |
| 788 | 0.0082597 | -1 |
| 789 | 0.0082708 | 1  |
| 790 | 0.008282  | 1  |
| 791 | 0.0082918 | -1 |
| 792 | 0.0083029 | 1  |
| 793 | 0.0083127 | -1 |
| 794 | 0.0083238 | 1  |
| 795 | 0.0083336 | -1 |
| 796 | 0.0083447 | 1  |
| 797 | 0.0083545 | -1 |
| 798 | 0.0083656 | 1  |
| 799 | 0.0083754 | 1  |

(续表)

|     |           |    |
|-----|-----------|----|
| 800 | 0.0083865 | -1 |
| 801 | 0.0083963 | -1 |
| 802 | 0.0084074 | -1 |
| 803 | 0.0084172 | -1 |
| 804 | 0.0084283 | -1 |
| 805 | 0.0084394 | -1 |
| 806 | 0.0084492 | -1 |
| 807 | 0.0084604 | -1 |
| 808 | 0.0084701 | -1 |
| 809 | 0.0084813 | -1 |
| 810 | 0.008491  | -1 |
| 811 | 0.0085022 | -1 |
| 812 | 0.0085119 | -1 |
| 813 | 0.0085231 | -1 |
| 814 | 0.0085329 | -1 |
| 815 | 0.008544  | -1 |
| 816 | 0.0085538 | -1 |
| 817 | 0.0085649 | -1 |
| 818 | 0.0085747 | -1 |
| 819 | 0.0085858 | -1 |
| 820 | 0.0085969 | -1 |
| 821 | 0.0086067 | -1 |
| 822 | 0.0086178 | -1 |
| 823 | 0.0086276 | -1 |
| 824 | 0.0086387 | -1 |
| 825 | 0.0086485 | -1 |
| 826 | 0.0086596 | -1 |
| 827 | 0.0086694 | -1 |
| 828 | 0.0086805 | -1 |
| 829 | 0.0086903 | -1 |
| 830 | 0.0087015 | -1 |
| 831 | 0.0087112 | -1 |
| 832 | 0.0087224 | -1 |
| 833 | 0.0087321 | -1 |
| 834 | 0.0087433 | -1 |
| 835 | 0.008753  | -1 |
| 836 | 0.0087642 | -1 |
| 837 | 0.0087753 | -1 |
| 838 | 0.0087851 | -1 |
| 839 | 0.0087962 | -1 |
| 840 | 0.008806  | -1 |
| 841 | 0.0088171 | -1 |
| 842 | 0.0088269 | -1 |
| 843 | 0.008838  | -1 |
| 844 | 0.0088478 | -1 |
| 845 | 0.0088589 | -1 |
| 846 | 0.0088687 | -1 |
| 847 | 0.0088798 | -1 |
| 848 | 0.0088896 | -1 |
| 849 | 0.0089007 | -1 |
| 850 | 0.0089105 | -1 |
| 851 | 0.0089216 | -1 |
| 852 | 0.0089328 | -1 |
| 853 | 0.0089426 | -1 |
| 854 | 0.0089537 | -1 |
| 855 | 0.0089635 | -1 |
| 856 | 0.0089746 | -1 |
| 857 | 0.0089844 | -1 |
| 858 | 0.0089955 | -1 |
| 859 | 0.0090053 | -1 |
| 860 | 0.0090164 | -1 |
| 861 | 0.0090262 | -1 |
| 862 | 0.0090373 | -1 |
| 863 | 0.0090471 | -1 |
| 864 | 0.0090582 | -1 |
| 865 | 0.009068  | -1 |
| 866 | 0.0090791 | -1 |
| 867 | 0.0090902 | -1 |
| 868 | 0.0091    | -1 |
| 869 | 0.0091111 | -1 |
| 870 | 0.0091209 | -1 |
| 871 | 0.0091321 | -1 |
| 872 | 0.0091418 | -1 |
| 873 | 0.009153  | -1 |
| 874 | 0.0091627 | -1 |
| 875 | 0.0091739 | -1 |
| 876 | 0.0091837 | -1 |
| 877 | 0.0091948 | -1 |
| 878 | 0.0092046 | -1 |
| 879 | 0.0092157 | -1 |
| 880 | 0.0092255 | -1 |
| 881 | 0.0092366 | -1 |
| 882 | 0.0092464 | -1 |
| 883 | 0.0092575 | -1 |
| 884 | 0.0092686 | -1 |
| 885 | 0.0092784 | -1 |
| 886 | 0.0092895 | -1 |
| 887 | 0.0092993 | -1 |
| 888 | 0.0093104 | -1 |
| 889 | 0.0093202 | -1 |
| 890 | 0.0093313 | -1 |
| 891 | 0.0093411 | -1 |
| 892 | 0.0093522 | -1 |
| 893 | 0.009362  | -1 |
| 894 | 0.0093732 | -1 |
| 895 | 0.0093829 | -1 |
| 896 | 0.0093941 | -1 |
| 897 | 0.0094038 | -1 |
| 898 | 0.009415  | -1 |
| 899 | 0.0094261 | -1 |

(续表)

|     |           |    |
|-----|-----------|----|
| 900 | 0.0094359 | -1 |
| 901 | 0.009447  | -1 |
| 902 | 0.0094568 | -1 |
| 903 | 0.0094679 | -1 |
| 904 | 0.0094777 | -1 |
| 905 | 0.0094888 | -1 |
| 906 | 0.0094986 | -1 |
| 907 | 0.0095097 | -1 |
| 908 | 0.0095195 | -1 |
| 909 | 0.0095306 | -1 |
| 910 | 0.0095404 | -1 |
| 911 | 0.0095515 | -1 |
| 912 | 0.0095613 | -1 |
| 913 | 0.0095724 | -1 |
| 914 | 0.0095836 | -1 |
| 915 | 0.0095933 | -1 |
| 916 | 0.0096045 | -1 |
| 917 | 0.0096143 | -1 |
| 918 | 0.0096254 | -1 |
| 919 | 0.0096352 | -1 |
| 920 | 0.0096463 | -1 |
| 921 | 0.0096561 | -1 |
| 922 | 0.0096672 | -1 |
| 923 | 0.009677  | -1 |
| 924 | 0.0096881 | -1 |
| 925 | 0.0096979 | -1 |
| 926 | 0.009709  | -1 |
| 927 | 0.0097188 | -1 |
| 928 | 0.0097299 | -1 |
| 929 | 0.0097397 | -1 |
| 930 | 0.0097508 | -1 |
| 931 | 0.0097619 | -1 |
| 932 | 0.0097717 | -1 |
| 933 | 0.0097828 | -1 |
| 934 | 0.0097926 | -1 |
| 935 | 0.0098038 | -1 |
| 936 | 0.0098135 | -1 |
| 937 | 0.0098247 | -1 |
| 938 | 0.0098344 | -1 |
| 939 | 0.0098456 | -1 |
| 940 | 0.0098554 | -1 |
| 941 | 0.0098665 | -1 |
| 942 | 0.0098763 | -1 |
| 943 | 0.0098874 | -1 |
| 944 | 0.0098972 | -1 |
| 945 | 0.0099083 | -1 |
| 946 | 0.0099194 | -1 |
| 947 | 0.0099292 | -1 |
| 948 | 0.0099403 | -1 |
| 949 | 0.0099501 | -1 |
| 950 | 0.0099612 | -1 |
| 951 | 0.009971  | -1 |
| 952 | 0.0099821 | -1 |
| 953 | 0.0099919 | -1 |
| 954 | 0.010003  | -1 |
| 955 | 0.010013  | -1 |
| 956 | 0.010024  | -1 |
| 957 | 0.010034  | -1 |
| 958 | 0.010045  | -1 |
| 959 | 0.010055  | -1 |
| 960 | 0.010066  | -1 |
| 961 | 0.010077  | -1 |
| 962 | 0.010087  | -1 |
| 963 | 0.010098  | -1 |
| 964 | 0.010108  | -1 |
| 965 | 0.010119  | -1 |
| 966 | 0.010128  | -1 |
| 967 | 0.01014   | -1 |
| 968 | 0.010149  | -1 |
| 969 | 0.010161  | -1 |
| 970 | 0.01017   | -1 |
| 971 | 0.010181  | -1 |
| 972 | 0.010191  | -1 |
| 973 | 0.010202  | -1 |
| 974 | 0.010212  | -1 |
| 975 | 0.010223  | -1 |
| 976 | 0.010234  | -1 |
| 977 | 0.010244  | -1 |
| 978 | 0.010255  | -1 |
| 979 | 0.010265  | -1 |
| 980 | 0.010276  | -1 |
| 981 | 0.010286  | -1 |
| 982 | 0.010297  | -1 |
| 983 | 0.010307  | -1 |
| 984 | 0.010318  | -1 |
| 985 | 0.010328  | -1 |
| 986 | 0.010339  | -1 |
| 987 | 0.010349  | -1 |
| 988 | 0.01036   | -1 |
| 989 | 0.01037   | -1 |
| 990 | 0.010381  | -1 |
| 991 | 0.01039   | -1 |
| 992 | 0.010402  | -1 |
| 993 | 0.010413  | -1 |
| 994 | 0.010423  | -1 |
| 995 | 0.010434  | -1 |
| 996 | 0.010443  | -1 |
| 997 | 0.010455  | -1 |
| 998 | 0.010464  | -1 |
| 999 | 0.010475  | -1 |

(续表)

|      |          |    |
|------|----------|----|
| 1000 | 0.010485 | -1 |
| 1001 | 0.010496 | -1 |
| 1002 | 0.010506 | -1 |
| 1003 | 0.010517 | -1 |
| 1004 | 0.010527 | -1 |
| 1005 | 0.010538 | -1 |
| 1006 | 0.010548 | -1 |
| 1007 | 0.010559 | -1 |
| 1008 | 0.01057  | -1 |
| 1009 | 0.01058  | -1 |
| 1010 | 0.010591 | -1 |
| 1011 | 0.010601 | -1 |
| 1012 | 0.010612 | -1 |
| 1013 | 0.010622 | -1 |
| 1014 | 0.010633 | -1 |
| 1015 | 0.010643 | -1 |
| 1016 | 0.010654 | -1 |
| 1017 | 0.010664 | -1 |
| 1018 | 0.010675 | -1 |
| 1019 | 0.010685 | -1 |
| 1020 | 0.010696 | -1 |
| 1021 | 0.010705 | -1 |
| 1022 | 0.010717 | -1 |
| 1023 | 0.010728 | -1 |
| 1024 | 0.010737 | -1 |
| 1025 | 0.010749 | -1 |
| 1026 | 0.010758 | -1 |
| 1027 | 0.010769 | -1 |
| 1028 | 0.010779 | -1 |
| 1029 | 0.01079  | -1 |
| 1030 | 0.0108   | -1 |
| 1031 | 0.010811 | -1 |
| 1032 | 0.010821 | -1 |
| 1033 | 0.010832 | -1 |
| 1034 | 0.010842 | -1 |
| 1035 | 0.010853 | -1 |
| 1036 | 0.010863 | -1 |
| 1037 | 0.010874 | -1 |
| 1038 | 0.010884 | -1 |
| 1039 | 0.010895 | -1 |
| 1040 | 0.010906 | -1 |
| 1041 | 0.010916 | -1 |
| 1042 | 0.010927 | -1 |
| 1043 | 0.010937 | -1 |
| 1044 | 0.010948 | -1 |
| 1045 | 0.010958 | -1 |
| 1046 | 0.010969 | -1 |
| 1047 | 0.010979 | -1 |
| 1048 | 0.01099  | -1 |
| 1049 | 0.010999 | -1 |
| 1050 | 0.011011 | -1 |
| 1051 | 0.01102  | -1 |
| 1052 | 0.011032 | -1 |
| 1053 | 0.011041 | -1 |
| 1054 | 0.011052 | -1 |
| 1055 | 0.011064 | -1 |
| 1056 | 0.011073 | -1 |
| 1057 | 0.011084 | -1 |
| 1058 | 0.011094 | -1 |
| 1059 | 0.011105 | -1 |
| 1060 | 0.011115 | -1 |
| 1061 | 0.011126 | -1 |
| 1062 | 0.011136 | -1 |
| 1063 | 0.011147 | -1 |
| 1064 | 0.011157 | -1 |
| 1065 | 0.011168 | -1 |
| 1066 | 0.011178 | -1 |
| 1067 | 0.011189 | -1 |
| 1068 | 0.011199 | -1 |
| 1069 | 0.01121  | -1 |
| 1070 | 0.011221 | -1 |
| 1071 | 0.011231 | -1 |
| 1072 | 0.011242 | -1 |
| 1073 | 0.011252 | -1 |
| 1074 | 0.011263 | -1 |
| 1075 | 0.011273 | -1 |
| 1076 | 0.011284 | -1 |
| 1077 | 0.011294 | -1 |
| 1078 | 0.011305 | -1 |
| 1079 | 0.011314 | -1 |
| 1080 | 0.011326 | -1 |
| 1081 | 0.011335 | -1 |
| 1082 | 0.011346 | -1 |
| 1083 | 0.011356 | -1 |
| 1084 | 0.011367 | -1 |
| 1085 | 0.011378 | -1 |
| 1086 | 0.011388 | -1 |
| 1087 | 0.011399 | -1 |
| 1088 | 0.011409 | -1 |
| 1089 | 0.01142  | -1 |
| 1090 | 0.01143  | -1 |
| 1091 | 0.011441 | -1 |
| 1092 | 0.011451 | -1 |
| 1093 | 0.011462 | -1 |
| 1094 | 0.011472 | -1 |
| 1095 | 0.011483 | -1 |
| 1096 | 0.011493 | -1 |
| 1097 | 0.011504 | -1 |
| 1098 | 0.011514 | -1 |
| 1099 | 0.011525 | -1 |

(续表)

|      |          |    |
|------|----------|----|
| 1100 | 0.011535 | -1 |
| 1101 | 0.011546 | -1 |
| 1102 | 0.011557 | -1 |
| 1103 | 0.011567 | -1 |
| 1104 | 0.011578 | -1 |
| 1105 | 0.011588 | -1 |
| 1106 | 0.011599 | -1 |
| 1107 | 0.011608 | -1 |
| 1108 | 0.01162  | -1 |
| 1109 | 0.011629 | -1 |
| 1110 | 0.01164  | -1 |
| 1111 | 0.01165  | -1 |
| 1112 | 0.011661 | -1 |
| 1113 | 0.011671 | -1 |
| 1114 | 0.011682 | -1 |
| 1115 | 0.011692 | -1 |
| 1116 | 0.011703 | -1 |
| 1117 | 0.011714 | -1 |
| 1118 | 0.011724 | -1 |
| 1119 | 0.011735 | -1 |
| 1120 | 0.011745 | -1 |
| 1121 | 0.011756 | -1 |
| 1122 | 0.011766 | -1 |
| 1123 | 0.011777 | -1 |
| 1124 | 0.011787 | -1 |
| 1125 | 0.011798 | -1 |
| 1126 | 0.011808 | -1 |
| 1127 | 0.011819 | -1 |
| 1128 | 0.011829 | -1 |
| 1129 | 0.01184  | -1 |
| 1130 | 0.01185  | -1 |
| 1131 | 0.011861 | -1 |
| 1132 | 0.011872 | -1 |
| 1133 | 0.011882 | -1 |
| 1134 | 0.011893 | -1 |
| 1135 | 0.011902 | -1 |
| 1136 | 0.011914 | -1 |
| 1137 | 0.011923 | -1 |
| 1138 | 0.011935 | -1 |
| 1139 | 0.011944 | -1 |
| 1140 | 0.011955 | -1 |
| 1141 | 0.011965 | -1 |
| 1142 | 0.011976 | -1 |
| 1143 | 0.011986 | -1 |
| 1144 | 0.011997 | -1 |
| 1145 | 0.012007 | -1 |
| 1146 | 0.012018 | -1 |
| 1147 | 0.012028 | -1 |
| 1148 | 0.012039 | -1 |
| 1149 | 0.01205  | -1 |
| 1150 | 0.01206  | -1 |
| 1151 | 0.012071 | -1 |
| 1152 | 0.012081 | -1 |
| 1153 | 0.012092 | -1 |
| 1154 | 0.012102 | -1 |
| 1155 | 0.012113 | -1 |
| 1156 | 0.012123 | -1 |
| 1157 | 0.012134 | -1 |
| 1158 | 0.012144 | -1 |
| 1159 | 0.012155 | -1 |
| 1160 | 0.012165 | -1 |
| 1161 | 0.012176 | -1 |
| 1162 | 0.012185 | -1 |
| 1163 | 0.012197 | -1 |
| 1164 | 0.012208 | -1 |
| 1165 | 0.012217 | -1 |
| 1166 | 0.012229 | -1 |
| 1167 | 0.012238 | -1 |
| 1168 | 0.012249 | -1 |
| 1169 | 0.012259 | -1 |
| 1170 | 0.01227  | -1 |
| 1171 | 0.01228  | -1 |
| 1172 | 0.012291 | -1 |
| 1173 | 0.012301 | -1 |
| 1174 | 0.012312 | -1 |
| 1175 | 0.012322 | -1 |
| 1176 | 0.012333 | -1 |
| 1177 | 0.012343 | -1 |
| 1178 | 0.012354 | -1 |

(续表)

|      |          |    |
|------|----------|----|
| 1200 | 0.012585 | 1  |
| 1201 | 0.012595 | -1 |
| 1202 | 0.012606 | 1  |
| 1203 | 0.012616 | -1 |
| 1204 | 0.012627 | 1  |
| 1205 | 0.012637 | -1 |
| 1206 | 0.012648 | 1  |
| 1207 | 0.012658 | -1 |
| 1208 | 0.012669 | 1  |
| 1209 | 0.012679 | -1 |
| 1210 | 0.012689 | 1  |
| 1211 | 0.012701 | 1  |
| 1212 | 0.012711 | -1 |
| 1213 | 0.012722 | 1  |
| 1214 | 0.012732 | -1 |
| 1215 | 0.012743 | 1  |
| 1216 | 0.012753 | -1 |
| 1217 | 0.012764 | 1  |
| 1218 | 0.012773 | -1 |
| 1219 | 0.012785 | 1  |
| 1220 | 0.012794 | -1 |
| 1221 | 0.012806 | 1  |
| 1222 | 0.012815 | -1 |
| 1223 | 0.012826 | 1  |
| 1224 | 0.012836 | -1 |
| 1225 | 0.012847 | -1 |
| 1226 | 0.012858 | 1  |
| 1227 | 0.012868 | -1 |
| 1228 | 0.012879 | 1  |
| 1229 | 0.012889 | -1 |
| 1230 | 0.0129   | 1  |
| 1231 | 0.01291  | -1 |
| 1232 | 0.012921 | 1  |
| 1233 | 0.012931 | -1 |
| 1234 | 0.012942 | 1  |
| 1235 | 0.012952 | -1 |
| 1236 | 0.012963 | 1  |
| 1237 | 0.012973 | -1 |
| 1238 | 0.012984 | 1  |
| 1239 | 0.012994 | -1 |
| 1240 | 0.013005 | -1 |
| 1241 | 0.013016 | 1  |
| 1242 | 0.013026 | -1 |
| 1243 | 0.013037 | 1  |
| 1244 | 0.013047 | -1 |
| 1245 | 0.013058 | 1  |
| 1246 | 0.013068 | -1 |
| 1247 | 0.013079 | 1  |
| 1248 | 0.013088 | -1 |
| 1249 | 0.0131   | 1  |
| 1250 | 0.013109 | -1 |
| 1251 | 0.01312  | 1  |
| 1252 | 0.01313  | -1 |
| 1253 | 0.013141 | 1  |
| 1254 | 0.013151 | -1 |
| 1255 | 0.013162 | 1  |
| 1256 | 0.013172 | -1 |
| 1257 | 0.013183 | -1 |
| 1258 | 0.013194 | 1  |
| 1259 | 0.013204 | -1 |
| 1260 | 0.013215 | 1  |
| 1261 | 0.013225 | -1 |
| 1262 | 0.013236 | 1  |
| 1263 | 0.013246 | -1 |
| 1264 | 0.013257 | 1  |
| 1265 | 0.013267 | -1 |
| 1266 | 0.013278 | 1  |
| 1267 | 0.013288 | -1 |
| 1268 | 0.013299 | 1  |
| 1269 | 0.013309 | -1 |
| 1270 | 0.01332  | 1  |
| 1271 | 0.01333  | -1 |
| 1272 | 0.013341 | -1 |
| 1273 | 0.013352 | 1  |
| 1274 | 0.013362 | -1 |
| 1275 | 0.013373 | 1  |
| 1276 | 0.013382 | -1 |
| 1277 | 0.013394 | 1  |
| 1278 | 0.013403 | -1 |
| 1279 | 0.013414 | 1  |
| 1280 | 0.013424 | -1 |
| 1281 | 0.013435 | 1  |
| 1282 | 0.013445 | -1 |
| 1283 | 0.013456 | 1  |
| 1284 | 0.013466 | -1 |
| 1285 | 0.013477 | 1  |
| 1286 | 0.013487 | -1 |
| 1287 | 0.013498 | -1 |
| 1288 | 0.013509 | 1  |
| 1289 | 0.013519 | -1 |
| 1290 | 0.01353  | 1  |
| 1291 | 0.01354  | -1 |
| 1292 | 0.013551 | 1  |
| 1293 | 0.013561 | -1 |
| 1294 | 0.013572 | 1  |
| 1295 | 0.013582 | -1 |
| 1296 | 0.013593 | 1  |
| 1297 | 0.013603 | -1 |
| 1298 | 0.013614 | 1  |
| 1299 | 0.013624 | -1 |

(续表)

|      |          |    |
|------|----------|----|
| 1300 | 0.013635 | 1  |
| 1301 | 0.013644 | -1 |
| 1302 | 0.013656 | 1  |
| 1303 | 0.013665 | -1 |
| 1304 | 0.013677 | -1 |
| 1305 | 0.013688 | 1  |
| 1306 | 0.013697 | -1 |
| 1307 | 0.013709 | 1  |
| 1308 | 0.013718 | -1 |
| 1309 | 0.013729 | 1  |
| 1310 | 0.013739 | -1 |
| 1311 | 0.01375  | 1  |
| 1312 | 0.01376  | -1 |
| 1313 | 0.013771 | 1  |
| 1314 | 0.013781 | -1 |
| 1315 | 0.013792 | 1  |
| 1316 | 0.013802 | -1 |
| 1317 | 0.013813 | 1  |
| 1318 | 0.013823 | -1 |
| 1319 | 0.013834 | -1 |
| 1320 | 0.013845 | 1  |
| 1321 | 0.013855 | -1 |
| 1322 | 0.013866 | 1  |
| 1323 | 0.013876 | -1 |
| 1324 | 0.013887 | 1  |
| 1325 | 0.013897 | -1 |
| 1326 | 0.013908 | 1  |
| 1327 | 0.013918 | -1 |
| 1328 | 0.013929 | 1  |
| 1329 | 0.013939 | -1 |
| 1330 | 0.01395  | 1  |
| 1331 | 0.013959 | -1 |
| 1332 | 0.013971 | 1  |
| 1333 | 0.01398  | -1 |
| 1334 | 0.013991 | -1 |
| 1335 | 0.014003 | 1  |
| 1336 | 0.014012 | -1 |
| 1337 | 0.014023 | 1  |
| 1338 | 0.014033 | -1 |
| 1339 | 0.014044 | 1  |
| 1340 | 0.014054 | -1 |
| 1341 | 0.014065 | 1  |
| 1342 | 0.014075 | -1 |
| 1343 | 0.014086 | 1  |
| 1344 | 0.014096 | -1 |
| 1345 | 0.014107 | 1  |
| 1346 | 0.014117 | -1 |
| 1347 | 0.014128 | 1  |
| 1348 | 0.014138 | -1 |
| 1349 | 0.014149 | -1 |
| 1350 | 0.01416  | 1  |
| 1351 | 0.01417  | -1 |
| 1352 | 0.014181 | 1  |
| 1353 | 0.014191 | -1 |
| 1354 | 0.014202 | 1  |
| 1355 | 0.014212 | -1 |
| 1356 | 0.014223 | 1  |
| 1357 | 0.014233 | -1 |
| 1358 | 0.014244 | 1  |
| 1359 | 0.014253 | -1 |
| 1360 | 0.014265 | 1  |
| 1361 | 0.014274 | -1 |
| 1362 | 0.014285 | 1  |
| 1363 | 0.014295 | -1 |
| 1364 | 0.014306 | 1  |
| 1365 | 0.014316 | -1 |
| 1366 | 0.014327 | -1 |
| 1367 | 0.014338 | 1  |
| 1368 | 0.014348 | -1 |
| 1369 | 0.014359 | 1  |
| 1370 | 0.014369 | -1 |
| 1371 | 0.01438  | 1  |
| 1372 | 0.01439  | -1 |
| 1373 | 0.014401 | 1  |
| 1374 | 0.014411 | -1 |
| 1375 | 0.014422 | 1  |
| 1376 | 0.014432 | -1 |
| 1377 | 0.014443 | 1  |
| 1378 | 0.014453 | -1 |
| 1379 | 0.014464 | 1  |
| 1380 | 0.014474 | -1 |
| 1381 | 0.014485 | -1 |
| 1382 | 0.014496 | 1  |
| 1383 | 0.014506 | -1 |
| 1384 | 0.014517 | 1  |
| 1385 | 0.014527 | -1 |
| 1386 | 0.014538 | 1  |
| 1387 | 0.014547 | -1 |
| 1388 | 0.014559 | 1  |
| 1389 | 0.014568 | -1 |
| 1390 | 0.01458  | 1  |
| 1391 | 0.014589 | -1 |
| 1392 | 0.0146   | 1  |
| 1393 | 0.01461  | -1 |
| 1394 | 0.014621 | 1  |
| 1395 | 0.014631 | -1 |
| 1396 | 0.014642 | -1 |
| 1397 | 0.014653 | 1  |
| 1398 | 0.014663 | -1 |
| 1399 | 0.014674 | 1  |

(续表)

|      |          |    |
|------|----------|----|
| 1400 | 0.014684 | -1 |
| 1401 | 0.014695 | 1  |
| 1402 | 0.014705 | -1 |
| 1403 | 0.014716 | 1  |
| 1404 | 0.014726 | -1 |
| 1405 | 0.014737 | 1  |
| 1406 | 0.014747 | -1 |
| 1407 | 0.014758 | 1  |
| 1408 | 0.014768 | -1 |
| 1409 | 0.014779 | 1  |
| 1410 | 0.014789 | -1 |
| 1411 | 0.0148   | 1  |
| 1412 | 0.014809 | -1 |
| 1413 | 0.014821 | -1 |
| 1414 | 0.014832 | 1  |
| 1415 | 0.014842 | -1 |
| 1416 | 0.014853 | 1  |
| 1417 | 0.014862 | -1 |
| 1418 | 0.014874 | 1  |
| 1419 | 0.014883 | -1 |
| 1420 | 0.014894 | 1  |
| 1421 | 0.014904 | -1 |
| 1422 | 0.014915 | 1  |
| 1423 | 0.014925 | -1 |
| 1424 | 0.014936 | 1  |
| 1425 | 0.014946 | -1 |
| 1426 | 0.014957 | 1  |
| 1427 | 0.014967 | -1 |
| 1428 | 0.014978 | -1 |
| 1429 | 0.014989 | 1  |
| 1430 | 0.014999 | -1 |
| 1431 | 0.01501  | 1  |
| 1432 | 0.01502  | -1 |
| 1433 | 0.015031 | 1  |
| 1434 | 0.015041 | -1 |
| 1435 | 0.015052 | 1  |
| 1436 | 0.015062 | -1 |
| 1437 | 0.015073 | 1  |
| 1438 | 0.015083 | -1 |
| 1439 | 0.015094 | 1  |
| 1440 | 0.015104 | -1 |
| 1441 | 0.015115 | 1  |
| 1442 | 0.015124 | -1 |
| 1443 | 0.015136 | -1 |
| 1444 | 0.015147 | 1  |
| 1445 | 0.015156 | -1 |
| 1446 | 0.015168 | 1  |
| 1447 | 0.015177 | -1 |
| 1448 | 0.015189 | 1  |
| 1449 | 0.015198 | -1 |
| 1450 | 0.015209 | 1  |
| 1451 | 0.015219 | -1 |
| 1452 | 0.01523  | 1  |
| 1453 | 0.01524  | -1 |
| 1454 | 0.015251 | 1  |
| 1455 | 0.015261 | -1 |
| 1456 | 0.015272 | 1  |
| 1457 | 0.015282 | -1 |
| 1458 | 0.015293 | 1  |
| 1459 | 0.015303 | -1 |
| 1460 | 0.015314 | -1 |
| 1461 | 0.015325 | 1  |
| 1462 | 0.015335 | -1 |
| 1463 | 0.015346 | 1  |
| 1464 | 0.015356 | -1 |
| 1465 | 0.015367 | 1  |
| 1466 | 0.015377 | -1 |
| 1467 | 0.015388 | 1  |
| 1468 | 0.015398 | -1 |
| 1469 | 0.015409 | 1  |
| 1470 | 0.015418 | -1 |
| 1471 | 0.01543  | 1  |
| 1472 | 0.015439 | -1 |
| 1473 | 0.015451 | 1  |
| 1474 | 0.01546  | -1 |
| 1475 | 0.015471 | -1 |
| 1476 | 0.015483 | 1  |
| 1477 | 0.015492 | -1 |
| 1478 | 0.015503 | 1  |
| 1479 | 0.015513 | -1 |
| 1480 | 0.015524 | 1  |
| 1481 | 0.015534 | -1 |
| 1482 | 0.015545 | 1  |
| 1483 | 0.015555 | -1 |
| 1484 | 0.015566 | 1  |
| 1485 | 0.015576 | -1 |
| 1486 | 0.015587 | 1  |
| 1487 | 0.015597 | -1 |
| 1488 | 0.015608 | 1  |
| 1489 | 0.015618 | -1 |
| 1490 | 0.015629 | -1 |
| 1491 | 0.01564  | 1  |
| 1492 | 0.015655 | -1 |
| 1493 | 0.015661 | 1  |
| 1494 | 0.015671 | -1 |
| 1495 | 0.015682 | 1  |
| 1496 | 0.015692 | -1 |
| 1497 | 0.015703 | 1  |
| 1498 | 0.015713 | -1 |
| 1499 | 0.015724 | 1  |

(续表)

|      |          |    |
|------|----------|----|
| 1500 | 0.015733 | -1 |
| 1501 | 0.015745 | 1  |
| 1502 | 0.015754 | -1 |
| 1503 | 0.015765 | 1  |
| 1504 | 0.015775 | -1 |
| 1505 | 0.015786 | -1 |
| 1506 | 0.015797 | 1  |
| 1507 | 0.015807 | -1 |
| 1508 | 0.015818 | 1  |
| 1509 | 0.015828 | -1 |
| 1510 | 0.015839 | 1  |
| 1511 | 0.015849 | -1 |
| 1512 | 0.01586  | 1  |
| 1513 | 0.01587  | -1 |
| 1514 | 0.015881 | 1  |
| 1515 | 0.015891 | -1 |
| 1516 | 0.015902 | 1  |
| 1517 | 0.015912 | -1 |
| 1518 | 0.015923 | 1  |
| 1519 | 0.015933 | -1 |
| 1520 | 0.015944 | 1  |
| 1521 | 0.015954 | -1 |
| 1522 | 0.015965 | -1 |
| 1523 | 0.015976 | 1  |
| 1524 | 0.015986 | -1 |
| 1525 | 0.015997 | 1  |
| 1526 | 0.016007 | -1 |
| 1527 | 0.016018 | 1  |
| 1528 | 0.016027 | -1 |
| 1529 | 0.016039 | 1  |
| 1530 | 0.016048 | -1 |
| 1531 | 0.016059 | 1  |
| 1532 | 0.016069 | -1 |
| 1533 | 0.01608  | 1  |
| 1534 | 0.01609  | -1 |
| 1535 | 0.016101 | 1  |
| 1536 | 0.016111 | -1 |
| 1537 | 0.016122 | -1 |
| 1538 | 0.016133 | 1  |
| 1539 | 0.016143 | -1 |
| 1540 | 0.016154 | 1  |
| 1541 | 0.016164 | -1 |
| 1542 | 0.016175 | 1  |
| 1543 | 0.016185 | -1 |
| 1544 | 0.016196 | 1  |
| 1545 | 0.016206 | -1 |
| 1546 | 0.016217 | 1  |
| 1547 | 0.016227 | -1 |
| 1548 | 0.016238 | 1  |
| 1549 | 0.016248 | -1 |
| 1550 | 0.016259 | 1  |
| 1551 | 0.016269 | -1 |
| 1552 | 0.01628  | -1 |
| 1553 | 0.016291 | 1  |
| 1554 | 0.016301 | -1 |
| 1555 | 0.016312 | 1  |
| 1556 | 0.016322 | -1 |
| 1557 | 0.016333 | 1  |
| 1558 | 0.016342 | -1 |
| 1559 | 0.016354 | 1  |
| 1560 | 0.016363 | -1 |
| 1561 | 0.016374 | 1  |
| 1562 | 0.016384 | -1 |
| 1563 | 0.016395 | 1  |
| 1564 | 0.016405 | -1 |
| 1565 | 0.016416 | 1  |
| 1566 | 0.016426 | -1 |
| 1567 | 0.016437 | 1  |
| 1568 | 0.016447 | -1 |
| 1569 | 0.016458 | -1 |
| 1570 | 0.016469 | 1  |
| 1571 | 0.016479 | -1 |
| 1572 | 0.01649  | 1  |
| 1573 | 0.0165   | -1 |
| 1574 | 0.016511 | 1  |
| 1575 | 0.016521 | -1 |
| 1576 | 0.016532 | 1  |
| 1577 | 0.016542 | -1 |
| 1578 | 0.016553 | 1  |
| 1579 | 0.016563 | -1 |
| 1580 | 0.016574 | 1  |
| 1581 | 0.016584 | -1 |
| 1582 | 0.016595 | 1  |
| 1583 | 0.016604 | -1 |
| 1584 | 0.016616 | 1  |
| 1585 | 0.016627 | -1 |
| 1586 | 0.016636 | -1 |
| 1587 | 0.016648 | 1  |
| 1588 | 0.016657 | -1 |
| 1589 | 0.016668 | 1  |
| 1590 | 0.016678 | -1 |
| 1591 | 0.016689 | 1  |
| 1592 | 0.016699 | -1 |
| 1593 | 0.01671  | 1  |
| 1594 | 0.01672  | -1 |
| 1595 | 0.016731 | 1  |
| 1596 | 0.016741 | -1 |
| 1597 | 0.016752 | 1  |
| 1598 | 0.016762 | -1 |
| 1599 | 0.016773 | 1  |

(续表)

|      |          |    |
|------|----------|----|
| 1600 | 0.016784 | 1  |
| 1601 | 0.016794 | -1 |
| 1602 | 0.016805 | 1  |
| 1603 | 0.016815 | -1 |
| 1604 | 0.016826 | 1  |
| 1605 | 0.016836 | -1 |
| 1606 | 0.016847 | 1  |
| 1607 | 0.016857 | -1 |
| 1608 | 0.016868 | 1  |
| 1609 | 0.016878 | -1 |
| 1610 | 0.016889 | 1  |
| 1611 | 0.016898 | -1 |
| 1612 | 0.01691  | 1  |
| 1613 | 0.016919 | -1 |
| 1614 | 0.01693  | 1  |
| 1615 | 0.016942 | 1  |
| 1616 | 0.016951 | -1 |
| 1617 | 0.016963 | 1  |
| 1618 | 0.016972 | -1 |
| 1619 | 0.016983 | 1  |
| 1620 | 0.016993 | -1 |
| 1621 | 0.017004 | 1  |
| 1622 | 0.017014 | -1 |
| 1623 | 0.017025 | 1  |
| 1624 | 0.017035 | -1 |
| 1625 | 0.017046 | 1  |
| 1626 | 0.017056 | -1 |
| 1627 | 0.017067 | 1  |
| 1628 | 0.017077 | -1 |
| 1629 | 0.017088 | 1  |
| 1630 | 0.017098 | -1 |
| 1631 | 0.017109 | -1 |
| 1632 | 0.01712  | 1  |
| 1633 | 0.01713  | -1 |
| 1634 | 0.017141 | 1  |
| 1635 | 0.017151 | -1 |
| 1636 | 0.017162 | 1  |
| 1637 | 0.017172 | -1 |
| 1638 | 0.017183 | 1  |
| 1639 | 0.017192 | -1 |
| 1640 | 0.017204 | 1  |
| 1641 | 0.017213 | -1 |
| 1642 | 0.017225 | 1  |
| 1643 | 0.017234 | -1 |
| 1644 | 0.017245 | 1  |
| 1645 | 0.017255 | -1 |
| 1646 | 0.017266 | -1 |
| 1647 | 0.017277 | 1  |
| 1648 | 0.017287 | -1 |
| 1649 | 0.017298 | 1  |
| 1650 | 0.017308 | -1 |
| 1651 | 0.017319 | 1  |
| 1652 | 0.017329 | -1 |
| 1653 | 0.01734  | 1  |
| 1654 | 0.01735  | -1 |
| 1655 | 0.017361 | 1  |
| 1656 | 0.017371 | -1 |
| 1657 | 0.017382 | 1  |
| 1658 | 0.017392 | -1 |
| 1659 | 0.017403 | 1  |
| 1660 | 0.017413 | -1 |
| 1661 | 0.017424 | -1 |
| 1662 | 0.017435 | 1  |
| 1663 | 0.017445 | -1 |
| 1664 | 0.017456 | 1  |
| 1665 | 0.017466 | -1 |
| 1666 | 0.017477 | 1  |
| 1667 | 0.017487 | -1 |
| 1668 | 0.017498 | 1  |
| 1669 | 0.017507 | -1 |
| 1670 | 0.017519 | 1  |
| 1671 | 0.017528 | -1 |
| 1672 | 0.017539 | 1  |
| 1673 | 0.017549 | -1 |
| 1674 | 0.01756  | 1  |
| 1675 | 0.01757  | -1 |
| 1676 | 0.017581 | 1  |
| 1677 | 0.017591 | -1 |
| 1678 | 0.017602 | -1 |
| 1679 | 0.017613 | 1  |
| 1680 | 0.017623 | -1 |
| 1681 | 0.017634 | 1  |
| 1682 | 0.017644 | -1 |
| 1683 | 0.017655 | 1  |
| 1684 | 0.017665 | -1 |
| 1685 | 0.017676 | 1  |
| 1686 | 0.017686 | -1 |
| 1687 | 0.017697 | 1  |
| 1688 | 0.017707 | -1 |
| 1689 | 0.017718 | 1  |
| 1690 | 0.017728 | -1 |
| 1691 | 0.017739 | 1  |
| 1692 | 0.017749 | -1 |
| 1693 | 0.01776  | -1 |
| 1694 | 0.017771 | 1  |
| 1695 | 0.017781 | -1 |
| 1696 | 0.017792 | 1  |
| 1697 | 0.017801 | -1 |
| 1698 | 0.017813 | 1  |
| 1699 | 0.017822 | -1 |

(续表)

|      |          |    |
|------|----------|----|
| 1700 | 0.017834 | 1  |
| 1701 | 0.017843 | -1 |
| 1702 | 0.017854 | 1  |
| 1703 | 0.017864 | -1 |
| 1704 | 0.017875 | 1  |
| 1705 | 0.017885 | -1 |
| 1706 | 0.017896 | 1  |
| 1707 | 0.017906 | -1 |
| 1708 | 0.017917 | -1 |
| 1709 | 0.017928 | 1  |
| 1710 | 0.017938 | -1 |
| 1711 | 0.017949 | 1  |
| 1712 | 0.017959 | -1 |
| 1713 | 0.01797  | 1  |
| 1714 | 0.01798  | -1 |
| 1715 | 0.017991 | 1  |
| 1716 | 0.018001 | -1 |
| 1717 | 0.018012 | 1  |
| 1718 | 0.018022 | -1 |
| 1719 | 0.018033 | 1  |
| 1720 | 0.018043 | -1 |
| 1721 | 0.018054 | 1  |
| 1722 | 0.018063 | -1 |
| 1723 | 0.018075 | 1  |
| 1724 | 0.018084 | -1 |
| 1725 | 0.018096 | -1 |
| 1726 | 0.018107 | 1  |
| 1727 | 0.018116 | -1 |
| 1728 | 0.018128 | 1  |
| 1729 | 0.018137 | -1 |
| 1730 | 0.018148 | 1  |
| 1731 | 0.018158 | -1 |
| 1732 | 0.018169 | 1  |
| 1733 | 0.018179 | -1 |
| 1734 | 0.01819  | 1  |
| 1735 | 0.0182   | -1 |
| 1736 | 0.018211 | 1  |
| 1737 | 0.018221 | -1 |
| 1738 | 0.018232 | 1  |
| 1739 | 0.018242 | -1 |
| 1740 | 0.018253 | -1 |
| 1741 | 0.018264 | 1  |
| 1742 | 0.018274 | -1 |
| 1743 | 0.018285 | 1  |
| 1744 | 0.018295 | -1 |
| 1745 | 0.018306 | 1  |
| 1746 | 0.018316 | -1 |
| 1747 | 0.018327 | 1  |
| 1748 | 0.018337 | -1 |
| 1749 | 0.018348 | 1  |
| 1750 | 0.018358 | -1 |
| 1751 | 0.018369 | 1  |
| 1752 | 0.018378 | -1 |
| 1753 | 0.01839  | 1  |
| 1754 | 0.018399 | -1 |
| 1755 | 0.01841  | -1 |
| 1756 | 0.018422 | 1  |
| 1757 | 0.018431 | -1 |
| 1758 | 0.018442 | 1  |
| 1759 | 0.018452 | -1 |
| 1760 | 0.018463 | 1  |
| 1761 | 0.018473 | -1 |
| 1762 | 0.018484 | 1  |
| 1763 | 0.018494 | -1 |
| 1764 | 0.018505 | 1  |
| 1765 | 0.018515 | -1 |
| 1766 | 0.018526 | 1  |
| 1767 | 0.018536 | -1 |
| 1768 | 0.018547 | 1  |
| 1769 | 0.018557 | -1 |
| 1770 | 0.018568 | -1 |
| 1771 | 0.018579 | 1  |
| 1772 | 0.018589 | -1 |
| 1773 | 0.0186   | 1  |
| 1774 | 0.01861  | -1 |
| 1775 | 0.018621 | 1  |
| 1776 | 0.018631 | -1 |
| 1777 | 0.018642 | 1  |
| 1778 | 0.018652 | -1 |
| 1779 | 0.018663 | 1  |
| 1780 | 0.018672 | -1 |
| 1781 | 0.018684 | 1  |
| 1782 | 0.018693 | -1 |
| 1783 | 0.018704 | 1  |
| 1784 | 0.018714 | -1 |
| 1785 | 0.018725 | 1  |
| 1786 | 0.018735 | -1 |
| 1787 | 0.018746 | -1 |
| 1788 | 0.018757 | 1  |
| 1789 | 0.018767 | -1 |
| 1790 | 0.018778 | 1  |
| 1791 | 0.018788 | -1 |
| 1792 | 0.018799 | 1  |
| 1793 | 0.018809 | -1 |
| 1794 | 0.01882  | 1  |
| 1795 | 0.01883  | -1 |
| 1796 | 0.018841 | 1  |
| 1797 | 0.018851 | -1 |
| 1798 | 0.018862 | 1  |
| 1799 | 0.018872 | -1 |

(续表)

|      |          |    |
|------|----------|----|
| 1800 | 0.018883 | 1  |
| 1801 | 0.018893 | -1 |
| 1802 | 0.018904 | -1 |
| 1803 | 0.018915 | 1  |
| 1804 | 0.018925 | -1 |
| 1805 | 0.018936 | 1  |
| 1806 | 0.018946 | -1 |
| 1807 | 0.018957 | 1  |
| 1808 | 0.018967 | -1 |
| 1809 | 0.018978 | 1  |
| 1810 | 0.018987 | -1 |
| 1811 | 0.018999 | 1  |
| 1812 | 0.019008 | -1 |
| 1813 | 0.019019 | 1  |
| 1814 | 0.019029 | -1 |
| 1815 | 0.01904  | 1  |
| 1816 | 0.01905  | -1 |
| 1817 | 0.019061 | -1 |
| 1818 | 0.019072 | 1  |
| 1819 | 0.019082 | -1 |
| 1820 | 0.019093 | 1  |
| 1821 | 0.019103 | -1 |
| 1822 | 0.019114 | 1  |
| 1823 | 0.019124 | -1 |
| 1824 | 0.019135 | 1  |
| 1825 | 0.019145 | -1 |
| 1826 | 0.019156 | 1  |
| 1827 | 0.019166 | -1 |
| 1828 | 0.019177 | 1  |
| 1829 | 0.019187 | -1 |
| 1830 | 0.019198 | 1  |
| 1831 | 0.019208 | -1 |
| 1832 | 0.019219 | 1  |
| 1833 | 0.019229 | -1 |
| 1834 | 0.01924  | -1 |
| 1835 | 0.019251 | 1  |
| 1836 | 0.019261 | -1 |
| 1837 | 0.019272 | 1  |
| 1838 | 0.019281 | -1 |
| 1839 | 0.019293 | 1  |
| 1840 | 0.019302 | -1 |
| 1841 | 0.019313 | 1  |
| 1842 | 0.019323 | -1 |
| 1843 | 0.019334 | 1  |
| 1844 | 0.019344 | -1 |
| 1845 | 0.019355 | 1  |
| 1846 | 0.019365 | -1 |
| 1847 | 0.019376 | 1  |
| 1848 | 0.019386 | -1 |
| 1849 | 0.019397 | -1 |
| 1850 | 0.019408 | 1  |
| 1851 | 0.019418 | -1 |
| 1852 | 0.019429 | 1  |
| 1853 | 0.019439 | -1 |
| 1854 | 0.01945  | 1  |
| 1855 | 0.01946  | -1 |
| 1856 | 0.019471 | 1  |
| 1857 | 0.019481 | -1 |
| 1858 | 0.019492 | 1  |
| 1859 | 0.019502 | -1 |
| 1860 | 0.019513 | 1  |
| 1861 | 0.019523 | -1 |
| 1862 | 0.019534 | 1  |
| 1863 | 0.019543 | -1 |
| 1864 | 0.019555 | -1 |
| 1865 | 0.019566 | 1  |
| 1866 | 0.019575 | -1 |
| 1867 | 0.019587 | 1  |
| 1868 | 0.019596 | -1 |
| 1869 | 0.019608 | 1  |
| 1870 | 0.019617 | -1 |
| 1871 | 0.019628 | 1  |
| 1872 | 0.019638 | -1 |
| 1873 | 0.019649 | 1  |
| 1874 | 0.019659 | -1 |
| 1875 | 0.01967  | 1  |
| 1876 | 0.01968  | -1 |
| 1877 | 0.019691 | 1  |
| 1878 | 0.019701 | -1 |
| 1879 | 0.019712 | -1 |
| 1880 | 0.019723 | 1  |
| 1881 | 0.019733 | -1 |
| 1882 | 0.019744 | 1  |
| 1883 | 0.019754 | -1 |
| 1884 | 0.019765 | 1  |
| 1885 | 0.019775 | -1 |
| 1886 | 0.019786 | 1  |
| 1887 | 0.019796 | -1 |
| 1888 | 0.019807 | 1  |
| 1889 | 0.019817 | -1 |
| 1890 | 0.019828 | 1  |
| 1891 | 0.019837 | -1 |
| 1892 | 0.019849 | 1  |
| 1893 | 0.019858 | -1 |
| 1894 | 0.01987  | 1  |
| 1895 | 0.019879 | -1 |
| 1896 | 0.01989  | -1 |
| 1897 | 0.019902 | 1  |
| 1898 | 0.019911 | -1 |
| 1899 | 0.019922 | 1  |

(续表)

|      |          |    |
|------|----------|----|
| 1900 | 0.019932 | -1 |
| 1901 | 0.019943 | 1  |
| 1902 | 0.019953 | -1 |
| 1903 | 0.019964 | 1  |
| 1904 | 0.019974 | -1 |
| 1905 | 0.019985 | 1  |
| 1906 | 0.019995 | -1 |
| 1907 | 0.020006 | 1  |
| 1908 | 0.020016 | -1 |
| 1909 | 0.020027 | 1  |
| 1910 | 0.020037 | -1 |
| 1911 | 0.020048 | 1  |
| 1912 | 0.020059 | -1 |
| 1913 | 0.020069 | 1  |
| 1914 | 0.02008  | -1 |
| 1915 | 0.02009  | 1  |
| 1916 | 0.020101 | -1 |
| 1917 | 0.020111 | 1  |
| 1918 | 0.020122 | -1 |
| 1919 | 0.020132 | 1  |
| 1920 | 0.020143 | -1 |
| 1921 | 0.020152 | 1  |
| 1922 | 0.020164 | -1 |
| 1923 | 0.020173 | 1  |
| 1924 | 0.020184 | -1 |
| 1925 | 0.020194 | 1  |
| 1926 | 0.020205 | -1 |
| 1927 | 0.020216 | 1  |
| 1928 | 0.020226 | -1 |
| 1929 | 0.020237 | 1  |
| 1930 | 0.020247 | -1 |
| 1931 | 0.020258 | 1  |
| 1932 | 0.020268 | -1 |
| 1933 | 0.020279 | 1  |
| 1934 | 0.020289 | -1 |
| 1935 | 0.0203   | 1  |
| 1936 | 0.02031  | -1 |
| 1937 | 0.020321 | 1  |
| 1938 | 0.020331 | -1 |
| 1939 | 0.020342 | 1  |
| 1940 | 0.020352 | -1 |
| 1941 | 0.020363 | 1  |
| 1942 | 0.020373 | -1 |
| 1943 | 0.020384 | 1  |
| 1944 | 0.020395 | -1 |
| 1945 | 0.020405 | 1  |
| 1946 | 0.020416 | -1 |
| 1947 | 0.020426 | 1  |
| 1948 | 0.020437 | -1 |
| 1949 | 0.020446 | 1  |
| 1950 | 0.020458 | -1 |
| 1951 | 0.020467 | 1  |
| 1952 | 0.020479 | -1 |
| 1953 | 0.020488 | 1  |
| 1954 | 0.020499 | -1 |
| 1955 | 0.020509 | 1  |
| 1956 | 0.02052  | -1 |
| 1957 | 0.02053  | 1  |
| 1958 | 0.020541 | -1 |
| 1959 | 0.020552 | 1  |
| 1960 | 0.020562 | -1 |
| 1961 | 0.020573 | 1  |
| 1962 | 0.020583 | -1 |
| 1963 | 0.020594 | 1  |
| 1964 | 0.020604 | -1 |
| 1965 | 0.020615 | 1  |
| 1966 | 0.020625 | -1 |
| 1967 | 0.020636 | 1  |
| 1968 | 0.020646 | -1 |
| 1969 | 0.020657 | 1  |
| 1970 | 0.020667 | -1 |
| 1971 | 0.020678 | 1  |
| 1972 | 0.020688 | -1 |
| 1973 | 0.020699 | 1  |
| 1974 | 0.02071  | -1 |
| 1975 | 0.02072  | 1  |
| 1976 | 0.020731 | -1 |
| 1977 | 0.020741 | 1  |
| 1978 | 0.020752 | -1 |
| 1979 | 0.020761 | 1  |
| 1980 | 0.020773 | -1 |
| 1981 | 0.020782 | 1  |
| 1982 | 0.020793 | -1 |
| 1983 | 0.020803 | 1  |
| 1984 | 0.020814 | -1 |
| 1985 | 0.020824 | 1  |
| 1986 | 0.020835 | -1 |
| 1987 | 0.020845 | 1  |
| 1988 | 0.020856 | -1 |
| 1989 | 0.020866 | 1  |
| 1990 | 0.020877 | -1 |
| 1991 | 0.020888 | 1  |
| 1992 | 0.020898 | -1 |
| 1993 | 0.020909 | 1  |
| 1994 | 0.020919 | -1 |
| 1995 | 0.02093  | 1  |
| 1996 | 0.02094  | -1 |
| 1997 | 0.020951 | 1  |
| 1998 | 0.020961 | -1 |
| 1999 | 0.020972 | 1  |

(续表)

|      |          |    |
|------|----------|----|
| 2000 | 0.020982 | -1 |
| 2001 | 0.020993 | 1  |
| 2002 | 0.021003 | -1 |
| 2003 | 0.021014 | 1  |
| 2004 | 0.021023 | -1 |
| 2005 | 0.021035 | -1 |
| 2006 | 0.021046 | 1  |
| 2007 | 0.021055 | -1 |
| 2008 | 0.021067 | 1  |
| 2009 | 0.021076 | -1 |
| 2010 | 0.021087 | 1  |
| 2011 | 0.021097 | -1 |
| 2012 | 0.021108 | 1  |
| 2013 | 0.021118 | -1 |
| 2014 | 0.021129 | 1  |
| 2015 | 0.021139 | -1 |
| 2016 | 0.02115  | 1  |
| 2017 | 0.02116  | -1 |
| 2018 | 0.021171 | 1  |
| 2019 | 0.021181 | -1 |
| 2020 | 0.021192 | -1 |
| 2021 | 0.021203 | 1  |
| 2022 | 0.021213 | -1 |
| 2023 | 0.021224 | 1  |
| 2024 | 0.021234 | -1 |
| 2025 | 0.021245 | 1  |
| 2026 | 0.021255 | -1 |
| 2027 | 0.021266 | 1  |
| 2028 | 0.021276 | -1 |
| 2029 | 0.021287 | 1  |
| 2030 | 0.021297 | -1 |
| 2031 | 0.021308 | 1  |
| 2032 | 0.021317 | -1 |
| 2033 | 0.021329 | 1  |
| 2034 | 0.021338 | -1 |
| 2035 | 0.021349 | -1 |
| 2036 | 0.021361 | 1  |
| 2037 | 0.02137  | -1 |
| 2038 | 0.021382 | 1  |
| 2039 | 0.021391 | -1 |
| 2040 | 0.021402 | 1  |
| 2041 | 0.021412 | -1 |
| 2042 | 0.021423 | 1  |
| 2043 | 0.021433 | -1 |
| 2044 | 0.021444 | 1  |
| 2045 | 0.021454 | -1 |
| 2046 | 0.021465 | 1  |
| 2047 | 0.021475 | -1 |
| 2048 | 0.021486 | 1  |
| 2049 | 0.021496 | -1 |
| 2050 | 0.021507 | 1  |
| 2051 | 0.021517 | -1 |
| 2052 | 0.021528 | -1 |
| 2053 | 0.021539 | 1  |
| 2054 | 0.021549 | -1 |
| 2055 | 0.02156  | 1  |
| 2056 | 0.02157  | -1 |
| 2057 | 0.021581 | 1  |
| 2058 | 0.021591 | -1 |
| 2059 | 0.021602 | 1  |
| 2060 | 0.021611 | -1 |
| 2061 | 0.021623 | 1  |
| 2062 | 0.021632 | -1 |
| 2063 | 0.021644 | 1  |
| 2064 | 0.021653 | -1 |
| 2065 | 0.021664 | 1  |
| 2066 | 0.021674 | -1 |
| 2067 | 0.021685 | -1 |
| 2068 | 0.021696 | 1  |
| 2069 | 0.021706 | -1 |
| 2070 | 0.021717 | 1  |
| 2071 | 0.021727 | -1 |
| 2072 | 0.021738 | 1  |
| 2073 | 0.021748 | -1 |
| 2074 | 0.021759 | 1  |
| 2075 | 0.021769 | -1 |
| 2076 | 0.02178  | 1  |
| 2077 | 0.02179  | -1 |
| 2078 | 0.021801 | 1  |
| 2079 | 0.021811 | -1 |
| 2080 | 0.021822 | 1  |
| 2081 | 0.021832 | -1 |
| 2082 | 0.021843 | -1 |
| 2083 | 0.021854 | 1  |
| 2084 | 0.021864 | -1 |
| 2085 | 0.021875 | 1  |
| 2086 | 0.021885 | -1 |
| 2087 | 0.021896 | 1  |
| 2088 | 0.021906 | -1 |
| 2089 | 0.021917 | 1  |
| 2090 | 0.021926 | -1 |
| 2091 | 0.021938 | 1  |
| 2092 | 0.021947 | -1 |
| 2093 | 0.021958 | 1  |
| 2094 | 0.021968 | -1 |
| 2095 | 0.021979 | 1  |
| 2096 | 0.021989 | -1 |
| 2097 | 0.022    | 1  |
| 2098 | 0.02201  | -1 |
| 2099 | 0.022021 | -1 |

(续表)

|      |          |    |
|------|----------|----|
| 2100 | 0.022032 | 1  |
| 2101 | 0.022042 | -1 |
| 2102 | 0.022053 | 1  |
| 2103 | 0.022063 | -1 |
| 2104 | 0.022074 | 1  |
| 2105 | 0.022084 | -1 |
| 2106 | 0.022095 | 1  |
| 2107 | 0.022105 | -1 |
| 2108 | 0.022116 | 1  |
| 2109 | 0.022126 | -1 |
| 2110 | 0.022137 | 1  |
| 2111 | 0.022147 | -1 |
| 2112 | 0.022158 | 1  |
| 2113 | 0.022168 | -1 |
| 2114 | 0.022179 | -1 |
| 2115 | 0.02219  | 1  |
| 2116 | 0.0222   | -1 |
| 2117 | 0.022211 | 1  |
| 2118 | 0.02222  | -1 |
| 2119 | 0.022232 | 1  |
| 2120 | 0.022241 | -1 |
| 2121 | 0.022253 | 1  |
| 2122 | 0.022262 | -1 |
| 2123 | 0.022273 | 1  |
| 2124 | 0.022283 | -1 |
| 2125 | 0.022294 | 1  |
| 2126 | 0.022304 | -1 |
| 2127 | 0.022315 | 1  |
| 2128 | 0.022325 | -1 |
| 2129 | 0.022336 | -1 |
| 2130 | 0.022347 | 1  |
| 2131 | 0.022357 | -1 |
| 2132 | 0.022368 | 1  |
| 2133 | 0.022378 | -1 |
| 2134 | 0.022389 | 1  |
| 2135 | 0.022399 | -1 |
| 2136 | 0.02241  | 1  |
| 2137 | 0.02242  | -1 |
| 2138 | 0.022431 | 1  |
| 2139 | 0.022441 | -1 |
| 2140 | 0.022452 | 1  |
| 2141 | 0.022462 | -1 |
| 2142 | 0.022473 | 1  |
| 2143 | 0.022482 | -1 |
| 2144 | 0.022494 | -1 |
| 2145 | 0.022505 | 1  |
| 2146 | 0.022515 | -1 |
| 2147 | 0.022526 | 1  |
| 2148 | 0.022535 | -1 |
| 2149 | 0.022547 | 1  |
| 2150 | 0.022556 | -1 |
| 2151 | 0.022567 | 1  |
| 2152 | 0.022577 | -1 |
| 2153 | 0.022588 | 1  |
| 2154 | 0.022598 | -1 |
| 2155 | 0.022609 | 1  |
| 2156 | 0.022619 | -1 |
| 2157 | 0.02263  | 1  |
| 2158 | 0.02264  | -1 |
| 2159 | 0.022651 | 1  |
| 2160 | 0.022661 | -1 |
| 2161 | 0.022672 | -1 |
| 2162 | 0.022683 | 1  |
| 2163 | 0.022693 | -1 |
| 2164 | 0.022704 | 1  |
| 2165 | 0.022714 | -1 |
| 2166 | 0.022725 | 1  |
| 2167 | 0.022735 | -1 |
| 2168 | 0.022746 | 1  |
| 2169 | 0.022756 | -1 |
| 2170 | 0.022767 | 1  |
| 2171 | 0.022777 | -1 |
| 2172 | 0.022788 | 1  |
| 2173 | 0.022797 | -1 |
| 2174 | 0.022809 | 1  |
| 2175 | 0.022818 | -1 |
| 2176 | 0.022829 | -1 |
| 2177 | 0.022841 | 1  |
| 2178 | 0.02285  | -1 |
| 2179 | 0.022861 | 1  |
| 2180 | 0.022871 | -1 |
| 2181 | 0.022882 | 1  |
| 2182 | 0.022892 | -1 |
| 2183 | 0.022903 | 1  |
| 2184 | 0.022913 | -1 |
| 2185 | 0.022924 | 1  |
| 2186 | 0.022934 | -1 |
| 2187 | 0.022945 | 1  |
| 2188 | 0.022955 | -1 |
| 2189 | 0.022966 | 1  |
| 2190 | 0.022976 | -1 |
| 2191 | 0.022987 | -1 |
| 2192 | 0.022998 | 1  |
| 2193 | 0.023008 | -1 |
| 2194 | 0.023019 | 1  |
| 2195 | 0.023029 | -1 |
| 2196 | 0.02304  | 1  |
| 2197 | 0.02305  | -1 |
| 2198 | 0.023061 | 1  |
| 2199 | 0.023071 | -1 |

(续表)

|      |          |    |
|------|----------|----|
| 2200 | 0.023082 | 1  |
| 2201 | 0.023091 | -1 |
| 2202 | 0.023103 | 1  |
| 2203 | 0.023112 | -1 |
| 2204 | 0.023124 | 1  |
| 2205 | 0.023133 | -1 |
| 2206 | 0.023144 | 1  |
| 2207 | 0.023154 | -1 |
| 2208 | 0.023165 | -1 |
| 2209 | 0.023176 | 1  |
| 2210 | 0.023186 | -1 |
| 2211 | 0.023197 | 1  |
| 2212 | 0.023207 | -1 |
| 2213 | 0.023218 | 1  |
| 2214 | 0.023228 | -1 |
| 2215 | 0.023239 | 1  |
| 2216 | 0.023249 | -1 |
| 2217 | 0.02326  | 1  |
| 2218 | 0.02327  | -1 |
| 2219 | 0.023281 | 1  |
| 2220 | 0.023291 | -1 |
| 2221 | 0.023302 | 1  |
| 2222 | 0.023312 | -1 |
| 2223 | 0.023323 | -1 |
| 2224 | 0.023334 | 1  |
| 2225 | 0.023344 | -1 |
| 2226 | 0.023355 | 1  |
| 2227 | 0.023365 | -1 |
| 2228 | 0.023376 | 1  |
| 2229 | 0.023386 | -1 |
| 2230 | 0.023397 | 1  |
| 2231 | 0.023406 | -1 |
| 2232 | 0.023418 | 1  |
| 2233 | 0.023427 | -1 |
| 2234 | 0.023438 | 1  |
| 2235 | 0.023448 | -1 |
| 2236 | 0.023459 | 1  |
| 2237 | 0.023469 | -1 |
| 2238 | 0.02348  | -1 |
| 2239 | 0.023491 | 1  |
| 2240 | 0.023501 | -1 |
| 2241 | 0.023512 | 1  |
| 2242 | 0.023522 | -1 |
| 2243 | 0.023533 | 1  |
| 2244 | 0.023543 | -1 |
| 2245 | 0.023554 | 1  |
| 2246 | 0.023564 | -1 |
| 2247 | 0.023575 | 1  |
| 2248 | 0.023585 | -1 |
| 2249 | 0.023596 | 1  |
| 2250 | 0.023606 | -1 |
| 2251 | 0.023617 | 1  |
| 2252 | 0.023627 | -1 |
| 2253 | 0.023638 | 1  |
| 2254 | 0.023648 | -1 |
| 2255 | 0.023659 | -1 |
| 2256 | 0.02367  | 1  |
| 2257 | 0.02368  | -1 |
| 2258 | 0.023691 | 1  |
| 2259 | 0.0237   | -1 |
| 2260 | 0.023712 | 1  |
| 2261 | 0.023721 | -1 |
| 2262 | 0.023732 | 1  |
| 2263 | 0.023742 | -1 |
| 2264 | 0.023753 | 1  |
| 2265 | 0.023763 | -1 |
| 2266 | 0.023774 | 1  |
| 2267 | 0.023784 | -1 |
| 2268 | 0.023795 | 1  |
| 2269 | 0.023805 | -1 |
| 2270 | 0.023816 | -1 |
| 2271 | 0.023827 | 1  |
| 2272 | 0.023837 | -1 |
| 2273 | 0.023848 | 1  |
| 2274 | 0.023858 | -1 |
| 2275 | 0.023869 | 1  |
| 2276 | 0.023879 | -1 |
| 2277 | 0.02389  | 1  |
| 2278 | 0.0239   | -1 |
| 2279 | 0.023911 | 1  |
| 2280 | 0.023921 | -1 |
| 2281 | 0.023932 | 1  |
| 2282 | 0.023942 | -1 |
| 2283 | 0.023953 | 1  |
| 2284 | 0.023962 | -1 |
| 2285 | 0.023974 | -1 |
| 2286 | 0.023985 | 1  |
| 2287 | 0.023994 | -1 |
| 2288 | 0.024006 | 1  |
| 2289 | 0.024015 | -1 |
| 2290 | 0.024027 | 1  |
| 2291 | 0.024036 | -1 |
| 2292 | 0.024047 | 1  |
| 2293 | 0.024057 | -1 |
| 2294 | 0.024068 | 1  |
| 2295 | 0.024078 | -1 |
| 2296 | 0.024089 | 1  |
| 2297 | 0.024099 | -1 |
| 2298 | 0.02411  | 1  |
| 2299 | 0.02412  | -1 |

(续表)

|      |          |    |
|------|----------|----|
| 2300 | 0.024131 | -1 |
| 2301 | 0.024142 | 1  |
| 2302 | 0.024152 | -1 |
| 2303 | 0.024163 | 1  |
| 2304 | 0.024173 | -1 |
| 2305 | 0.024184 | 1  |
| 2306 | 0.024194 | -1 |
| 2307 | 0.024205 | 1  |
| 2308 | 0.024215 | -1 |
| 2309 | 0.024226 | 1  |
| 2310 | 0.024236 | -1 |
| 2311 | 0.024247 | 1  |
| 2312 | 0.024256 | -1 |
| 2313 | 0.024268 | 1  |
| 2314 | 0.024277 | -1 |
| 2315 | 0.024289 | 1  |
| 2316 | 0.024298 | -1 |
| 2317 | 0.024309 | 1  |
| 2318 | 0.024321 | -1 |
| 2319 | 0.02433  | 1  |
| 2320 | 0.024341 | -1 |
| 2321 | 0.024351 | 1  |
| 2322 | 0.024362 | -1 |
| 2323 | 0.024372 | 1  |
| 2324 | 0.024383 | -1 |
| 2325 | 0.024393 | 1  |
| 2326 | 0.024404 | -1 |
| 2327 | 0.024414 | 1  |
| 2328 | 0.024425 | -1 |
| 2329 | 0.024435 | 1  |
| 2330 | 0.024446 | -1 |
| 2331 | 0.024456 | 1  |
| 2332 | 0.024467 | -1 |
| 2333 | 0.024478 | 1  |
| 2334 | 0.024488 | -1 |
| 2335 | 0.024499 | 1  |
| 2336 | 0.024509 | -1 |
| 2337 | 0.02452  | 1  |
| 2338 | 0.02453  | -1 |
| 2339 | 0.024541 | 1  |
| 2340 | 0.024551 | -1 |
| 2341 | 0.024562 | 1  |
| 2342 | 0.024571 | -1 |
| 2343 | 0.024583 | 1  |
| 2344 | 0.024592 | -1 |
| 2345 | 0.024603 | 1  |
| 2346 | 0.024613 | -1 |
| 2347 | 0.024624 | 1  |
| 2348 | 0.024636 | -1 |
| 2349 | 0.024645 | 1  |
| 2350 | 0.024656 | -1 |
| 2351 | 0.024666 | 1  |
| 2352 | 0.024677 | -1 |
| 2353 | 0.024687 | 1  |
| 2354 | 0.024698 | -1 |
| 2355 | 0.024708 | 1  |
| 2356 | 0.024719 | -1 |
| 2357 | 0.024729 | 1  |
| 2358 | 0.02474  | -1 |
| 2359 | 0.02475  | 1  |
| 2360 | 0.024761 | -1 |
| 2361 | 0.024771 | 1  |
| 2362 | 0.024782 | -1 |
| 2363 | 0.024792 | 1  |
| 2364 | 0.024803 | -1 |
| 2365 | 0.024814 | 1  |
| 2366 | 0.024824 | -1 |
| 2367 | 0.024835 | 1  |
| 2368 | 0.024845 | -1 |
| 2369 | 0.024856 | 1  |
| 2370 | 0.024865 | -1 |
| 2371 | 0.024877 | 1  |
| 2372 | 0.024886 | -1 |
| 2373 | 0.024898 | 1  |
| 2374 | 0.024907 | -1 |
| 2375 | 0.024918 | 1  |
| 2376 | 0.024928 | -1 |
| 2377 | 0.024939 | 1  |
| 2378 | 0.024949 | -1 |
| 2379 | 0.02496  | 1  |
| 2380 | 0.024971 | -1 |
| 2381 | 0.024981 | 1  |
| 2382 | 0.024992 | -1 |
| 2383 | 0.025002 | 1  |
| 2384 | 0.025013 | -1 |
| 2385 | 0.025023 | 1  |
| 2386 | 0.025034 | -1 |
| 2387 | 0.025044 | 1  |
| 2388 | 0.025055 | -1 |
| 2389 | 0.025065 | 1  |
| 2390 | 0.025076 | -1 |
| 2391 | 0.025086 | 1  |
| 2392 | 0.025097 | -1 |
| 2393 | 0.025107 | 1  |
| 2394 | 0.025118 | -1 |
| 2395 | 0.025129 | 1  |
| 2396 | 0.025139 | -1 |
| 2397 | 0.02515  | 1  |
| 2398 | 0.02516  | -1 |
| 2399 | 0.025171 | 1  |

(续表)

|      |          |    |
|------|----------|----|
| 2400 | 0.02518  | -1 |
| 2401 | 0.025192 | -1 |
| 2402 | 0.025201 | -1 |
| 2403 | 0.025212 | -1 |
| 2404 | 0.025222 | -1 |
| 2405 | 0.025233 | -1 |
| 2406 | 0.025243 | -1 |
| 2407 | 0.025254 | -1 |
| 2408 | 0.025264 | -1 |
| 2409 | 0.025275 | -1 |
| 2410 | 0.025286 | -1 |
| 2411 | 0.025296 | -1 |
| 2412 | 0.025307 | -1 |
| 2413 | 0.025317 | -1 |
| 2414 | 0.025328 | -1 |
| 2415 | 0.025338 | -1 |
| 2416 | 0.025349 | -1 |
| 2417 | 0.025359 | -1 |
| 2418 | 0.02537  | -1 |
| 2419 | 0.02538  | -1 |
| 2420 | 0.025391 | -1 |
| 2421 | 0.025401 | -1 |
| 2422 | 0.025412 | -1 |
| 2423 | 0.025422 | -1 |
| 2424 | 0.025433 | -1 |
| 2425 | 0.025442 | -1 |
| 2426 | 0.025454 | -1 |
| 2427 | 0.025465 | -1 |
| 2428 | 0.025474 | -1 |
| 2429 | 0.025486 | -1 |
| 2430 | 0.025495 | -1 |
| 2431 | 0.025506 | -1 |
| 2432 | 0.025516 | -1 |
| 2433 | 0.025527 | -1 |
| 2434 | 0.025537 | -1 |
| 2435 | 0.025548 | -1 |
| 2436 | 0.025558 | -1 |
| 2437 | 0.025569 | -1 |
| 2438 | 0.025579 | -1 |
| 2439 | 0.02559  | -1 |
| 2440 | 0.0256   | -1 |
| 2441 | 0.025611 | -1 |
| 2442 | 0.025622 | -1 |
| 2443 | 0.025632 | -1 |
| 2444 | 0.025643 | -1 |
| 2445 | 0.025653 | -1 |
| 2446 | 0.025664 | -1 |
| 2447 | 0.025674 | -1 |
| 2448 | 0.025685 | -1 |
| 2449 | 0.025695 | -1 |
| 2450 | 0.025706 | -1 |
| 2451 | 0.025716 | -1 |
| 2452 | 0.025727 | -1 |
| 2453 | 0.025736 | -1 |
| 2454 | 0.025748 | -1 |
| 2455 | 0.025757 | -1 |
| 2456 | 0.025769 | -1 |
| 2457 | 0.02578  | -1 |
| 2458 | 0.025789 | -1 |
| 2459 | 0.025801 | -1 |
| 2460 | 0.02581  | -1 |
| 2461 | 0.025821 | -1 |
| 2462 | 0.025831 | -1 |
| 2463 | 0.025842 | -1 |
| 2464 | 0.025852 | -1 |
| 2465 | 0.025863 | -1 |
| 2466 | 0.025873 | -1 |
| 2467 | 0.025884 | -1 |
| 2468 | 0.025894 | -1 |
| 2469 | 0.025905 | -1 |
| 2470 | 0.025915 | -1 |
| 2471 | 0.025926 | -1 |
| 2472 | 0.025936 | -1 |
| 2473 | 0.025947 | -1 |
| 2474 | 0.025958 | -1 |
| 2475 | 0.025968 | -1 |
| 2476 | 0.025979 | -1 |
| 2477 | 0.025989 | -1 |
| 2478 | 0.026    | -1 |
| 2479 | 0.02601  | -1 |
| 2480 | 0.026021 | -1 |
| 2481 | 0.026031 | -1 |
| 2482 | 0.026042 | -1 |
| 2483 | 0.026051 | -1 |
| 2484 | 0.026063 | -1 |
| 2485 | 0.026072 | -1 |
| 2486 | 0.026083 | -1 |
| 2487 | 0.026093 | -1 |
| 2488 | 0.026104 | -1 |
| 2489 | 0.026115 | -1 |
| 2490 | 0.026125 | -1 |
| 2491 | 0.026136 | -1 |
| 2492 | 0.026146 | -1 |
| 2493 | 0.026157 | -1 |
| 2494 | 0.026167 | -1 |
| 2495 | 0.026178 | -1 |
| 2496 | 0.026188 | -1 |
| 2497 | 0.026199 | -1 |
| 2498 | 0.026209 | -1 |
| 2499 | 0.02622  | -1 |

(续表)

|      |          |    |
|------|----------|----|
| 2500 | 0.02623  | -1 |
| 2501 | 0.026241 | -1 |
| 2502 | 0.026251 | -1 |
| 2503 | 0.026262 | -1 |
| 2504 | 0.026273 | -1 |
| 2505 | 0.026283 | -1 |
| 2506 | 0.026294 | -1 |
| 2507 | 0.026304 | -1 |
| 2508 | 0.026315 | -1 |
| 2509 | 0.026325 | -1 |
| 2510 | 0.026336 | -1 |
| 2511 | 0.026345 | -1 |
| 2512 | 0.026357 | -1 |
| 2513 | 0.026366 | -1 |
| 2514 | 0.026377 | -1 |
| 2515 | 0.026387 | -1 |
| 2516 | 0.026398 | -1 |
| 2517 | 0.026408 | -1 |
| 2518 | 0.026419 | -1 |
| 2519 | 0.026429 | -1 |
| 2520 | 0.02644  | -1 |
| 2521 | 0.026451 | -1 |
| 2522 | 0.026461 | -1 |
| 2523 | 0.026472 | -1 |
| 2524 | 0.026482 | -1 |
| 2525 | 0.026493 | -1 |
| 2526 | 0.026503 | -1 |
| 2527 | 0.026514 | -1 |
| 2528 | 0.026524 | -1 |
| 2529 | 0.026535 | -1 |
| 2530 | 0.026545 | -1 |
| 2531 | 0.026556 | -1 |
| 2532 | 0.026566 | -1 |
| 2533 | 0.026577 | -1 |
| 2534 | 0.026587 | -1 |
| 2535 | 0.026598 | -1 |
| 2536 | 0.026609 | -1 |
| 2537 | 0.026619 | -1 |
| 2538 | 0.02663  | -1 |
| 2539 | 0.026639 | -1 |
| 2540 | 0.026651 | -1 |
| 2541 | 0.02666  | -1 |
| 2542 | 0.026672 | -1 |
| 2543 | 0.026681 | -1 |
| 2544 | 0.026692 | -1 |
| 2545 | 0.026702 | -1 |
| 2546 | 0.026713 | -1 |
| 2547 | 0.026723 | -1 |
| 2548 | 0.026734 | -1 |
| 2549 | 0.026744 | -1 |
| 2550 | 0.026755 | -1 |
| 2551 | 0.026766 | -1 |
| 2552 | 0.026776 | -1 |
| 2553 | 0.026787 | -1 |
| 2554 | 0.026797 | -1 |
| 2555 | 0.026808 | -1 |
| 2556 | 0.026818 | -1 |
| 2557 | 0.026829 | -1 |
| 2558 | 0.026839 | -1 |
| 2559 | 0.02685  | -1 |
| 2560 | 0.02686  | -1 |
| 2561 | 0.026871 | -1 |
| 2562 | 0.026881 | -1 |
| 2563 | 0.026892 | -1 |
| 2564 | 0.026901 | -1 |
| 2565 | 0.026913 | -1 |
| 2566 | 0.026924 | -1 |
| 2567 | 0.026934 | -1 |
| 2568 | 0.026945 | -1 |
| 2569 | 0.026954 | -1 |
| 2570 | 0.026966 | -1 |
| 2571 | 0.026975 | -1 |
| 2572 | 0.026986 | -1 |
| 2573 | 0.026996 | -1 |
| 2574 | 0.027007 | -1 |
| 2575 | 0.027017 | -1 |
| 2576 | 0.027028 | -1 |
| 2577 | 0.027038 | -1 |
| 2578 | 0.027049 | -1 |
| 2579 | 0.027059 | -1 |
| 2580 | 0.02707  | -1 |
| 2581 | 0.02708  | -1 |
| 2582 | 0.027091 | -1 |
| 2583 | 0.027102 | -1 |
| 2584 | 0.027112 | -1 |
| 2585 | 0.027123 | -1 |
| 2586 | 0.027133 | -1 |
| 2587 | 0.027144 | -1 |
| 2588 | 0.027154 | -1 |
| 2589 | 0.027165 | -1 |
| 2590 | 0.027175 | -1 |
| 2591 | 0.027186 | -1 |
| 2592 | 0.027196 | -1 |
| 2593 | 0.027207 | -1 |
| 2594 | 0.027216 | -1 |
| 2595 | 0.027228 | -1 |
| 2596 | 0.027237 | -1 |
| 2597 | 0.027248 | -1 |
| 2598 | 0.02726  | -1 |
| 2599 | 0.027269 | -1 |

(续表)

|      |          |    |
|------|----------|----|
| 2600 | 0.027281 | -1 |
| 2601 | 0.02729  | -1 |
| 2602 | 0.027301 | -1 |
| 2603 | 0.027311 | -1 |
| 2604 | 0.027322 | -1 |
| 2605 | 0.027332 | -1 |
| 2606 | 0.027343 | -1 |
| 2607 | 0.027353 | -1 |
| 2608 | 0.027364 | -1 |
| 2609 | 0.027374 | -1 |
| 2610 | 0.027385 | -1 |
| 2611 | 0.027395 | -1 |
| 2612 | 0.027406 | -1 |
| 2613 | 0.027417 | -1 |
| 2614 | 0.027427 | -1 |
| 2615 | 0.027438 | -1 |
| 2616 | 0.027448 | -1 |
| 2617 | 0.027459 | -1 |
| 2618 | 0.027469 | -1 |
| 2619 | 0.02748  | -1 |
| 2620 | 0.02749  | -1 |
| 2621 | 0.027501 | -1 |
| 2622 | 0.02751  | -1 |
| 2623 | 0.027522 | -1 |
| 2624 | 0.027531 | -1 |
| 2625 | 0.027543 | -1 |
| 2626 | 0.027552 | -1 |
| 2627 | 0.027563 | -1 |
| 2628 | 0.027573 | -1 |
| 2629 | 0.027584 | -1 |
| 2630 | 0.027595 | -1 |
| 2631 | 0.027605 | -1 |
| 2632 | 0.027616 | -1 |
| 2633 | 0.027626 | -1 |
| 2634 | 0.027637 | -1 |
| 2635 | 0.027647 | -1 |
| 2636 | 0.027658 | -1 |
| 2637 | 0.027668 | -1 |
| 2638 | 0.027679 | -1 |
| 2639 | 0.027689 | -1 |
| 2640 | 0.0277   | -1 |
| 2641 | 0.02771  | -1 |
| 2642 | 0.027721 | -1 |
| 2643 | 0.027731 | -1 |
| 2644 | 0.027742 | -1 |
| 2645 | 0.027753 | -1 |
| 2646 | 0.027763 | -1 |
| 2647 | 0.027774 | -1 |
| 2648 | 0.027784 | -1 |
| 2649 | 0.027795 | -1 |
| 2650 | 0.027805 | -1 |
| 2651 | 0.027816 | -1 |
| 2652 | 0.027825 | -1 |
| 2653 | 0.027837 | -1 |
| 2654 | 0.027846 | -1 |
| 2655 | 0.027857 | -1 |
| 2656 | 0.027867 | -1 |
| 2657 | 0.027878 | -1 |
| 2658 | 0.027888 | -1 |
| 2659 | 0.027899 | -1 |
| 2660 | 0.02791  | -1 |
| 2661 | 0.02792  | -1 |
| 2662 | 0.027931 | -1 |
| 2663 | 0.027941 | -1 |
| 2664 | 0.027952 | -1 |
| 2665 | 0.027962 | -1 |
| 2666 | 0.027973 | -1 |
| 2667 | 0.027983 | -1 |
| 2668 | 0.027994 | -1 |
| 2669 | 0.028004 | -1 |
| 2670 | 0.028015 | -1 |
| 2671 | 0.028025 | -1 |
| 2672 | 0.028036 | -1 |
| 2673 | 0.028046 | -1 |
| 2674 | 0.028057 | -1 |
| 2675 | 0.028068 | -1 |
| 2676 | 0.028078 | -1 |
| 2677 | 0.028089 | -1 |
| 2678 | 0.028099 | -1 |
| 2679 | 0.02811  | -1 |
| 2680 | 0.028119 | -1 |
| 2681 | 0.028131 | -1 |
| 2682 | 0.02814  | -1 |
| 2683 | 0.028151 | -1 |
| 2684 | 0.028161 | -1 |
| 2685 | 0.028172 | -1 |
| 2686 | 0.028182 | -1 |
| 2687 | 0.028193 | -1 |
| 2688 | 0.028203 | -1 |
| 2689 | 0.028214 | -1 |
| 2690 | 0.028224 | -1 |
| 2691 | 0.028235 | -1 |
| 2692 | 0.028246 | -1 |
| 2693 | 0.028256 | -1 |
| 2694 | 0.028267 | -1 |
| 2695 | 0.028277 | -1 |
| 2696 | 0.028288 | -1 |
| 2697 | 0.028298 | -1 |
| 2698 | 0.028309 | -1 |
| 2699 | 0.028319 | -1 |

(续表)

|      |          |    |
|------|----------|----|
| 2700 | 0.02833  | -1 |
| 2701 | 0.02834  | -1 |
| 2702 | 0.028351 | -1 |
| 2703 | 0.028361 | -1 |
| 2704 | 0.028372 | -1 |
| 2705 | 0.028381 | -1 |
| 2706 | 0.028393 | -1 |
| 2707 | 0.028404 | -1 |
| 2708 | 0.028413 | -1 |
| 2709 | 0.028425 | -1 |
| 2710 | 0.028434 | -1 |
| 2711 | 0.028446 | -1 |
| 2712 | 0.028455 | -1 |
| 2713 | 0.028466 | -1 |
| 2714 | 0.028476 | -1 |
| 2715 | 0.028487 | -1 |
| 2716 | 0.028497 | -1 |
| 2717 | 0.028508 | -1 |
| 2718 | 0.028518 | -1 |
| 2719 | 0.028529 | -1 |
| 2720 | 0.028539 | -1 |
| 2721 | 0.02855  | -1 |
| 2722 | 0.028561 | -1 |
| 2723 | 0.028571 | -1 |
| 2724 | 0.028582 | -1 |
| 2725 | 0.028592 | -1 |
| 2726 | 0.028603 | -1 |
| 2727 | 0.028613 | -1 |
| 2728 | 0.028624 | -1 |
| 2729 | 0.028634 | -1 |
| 2730 | 0.028645 | -1 |
| 2731 | 0.028655 | -1 |
| 2732 | 0.028666 | -1 |
| 2733 | 0.028676 | -1 |
| 2734 | 0.028687 | -1 |
| 2735 | 0.028696 | -1 |
| 2736 | 0.028708 | -1 |
| 2737 | 0.028717 | -1 |
| 2738 | 0.028728 | -1 |
| 2739 | 0.02874  | -1 |
| 2740 | 0.028749 | -1 |
| 2741 | 0.02876  | -1 |
| 2742 | 0.02877  | -1 |
| 2743 | 0.028781 | -1 |
| 2744 | 0.028791 | -1 |
| 2745 | 0.028802 | -1 |
| 2746 | 0.028812 | -1 |
| 2747 | 0.028823 | -1 |
| 2748 | 0.028833 | -1 |
| 2749 | 0.028844 | -1 |
| 2750 | 0.028854 | -1 |
| 2751 | 0.028865 | -1 |
| 2752 | 0.028875 | -1 |
| 2753 | 0.028886 | -1 |
| 2754 | 0.028897 | -1 |
| 2755 | 0.028907 | -1 |
| 2756 | 0.028918 | -1 |
| 2757 | 0.028928 | -1 |
| 2758 | 0.028939 | -1 |
| 2759 | 0.028949 | -1 |
| 2760 | 0.02896  | -1 |
| 2761 | 0.02897  | -1 |
| 2762 | 0.028981 | -1 |
| 2763 | 0.02899  | -1 |
| 2764 | 0.029002 | -1 |
| 2765 | 0.029011 | -1 |
| 2766 | 0.029022 | -1 |
| 2767 | 0.029032 | -1 |
| 2768 | 0.029043 | -1 |
| 2769 | 0.029055 | -1 |
| 2770 | 0.029064 | -1 |
| 2771 | 0.029075 | -1 |
| 2772 | 0.029085 | -1 |
| 2773 | 0.029096 | -1 |
| 2774 | 0.029106 | -1 |
| 2775 | 0.029117 | -1 |
| 2776 | 0.029127 | -1 |
| 2777 | 0.029138 | -1 |
| 2778 | 0.029148 | -1 |
| 2779 | 0.029159 | -1 |
| 2780 | 0.029169 | -1 |
| 2781 | 0.02918  | -1 |
| 2782 | 0.02919  | -1 |
| 2783 | 0.029201 | -1 |
| 2784 | 0.029211 | -1 |
| 2785 | 0.029222 | -1 |
| 2786 | 0.029233 | -1 |
| 2787 | 0.029243 | -1 |
| 2788 | 0.029254 | -1 |
| 2789 | 0.029264 | -1 |
| 2790 | 0.029275 | -1 |
| 2791 | 0.029284 | -1 |
| 2792 | 0.029296 | -1 |
| 2793 | 0.029305 | -1 |
| 2794 | 0.029317 | -1 |
| 2795 | 0.029326 | -1 |
| 2796 | 0.029337 | -1 |
| 2797 | 0.029347 | -1 |
| 2798 | 0.029358 | -1 |
| 2799 | 0.029368 | -1 |

(续表)

|      |          |    |
|------|----------|----|
| 2800 | 0.029379 | -1 |
| 2801 | 0.02939  | 1  |
| 2802 | 0.0294   | -1 |
| 2803 | 0.029411 | 1  |
| 2804 | 0.029421 | -1 |
| 2805 | 0.029432 | 1  |
| 2806 | 0.029442 | -1 |
| 2807 | 0.029453 | 1  |
| 2808 | 0.029463 | -1 |
| 2809 | 0.029474 | 1  |
| 2810 | 0.029484 | -1 |
| 2811 | 0.029495 | 1  |
| 2812 | 0.029505 | -1 |
| 2813 | 0.029516 | 1  |
| 2814 | 0.029526 | -1 |
| 2815 | 0.029537 | -1 |
| 2816 | 0.029548 | 1  |
| 2817 | 0.029558 | -1 |
| 2818 | 0.029569 | 1  |
| 2819 | 0.029579 | -1 |
| 2820 | 0.02959  | 1  |
| 2821 | 0.029599 | -1 |
| 2822 | 0.029611 | 1  |
| 2823 | 0.02962  | -1 |
| 2824 | 0.029631 | 1  |
| 2825 | 0.029641 | -1 |
| 2826 | 0.029652 | 1  |
| 2827 | 0.029662 | -1 |
| 2828 | 0.029673 | 1  |
| 2829 | 0.029683 | -1 |
| 2830 | 0.029694 | -1 |
| 2831 | 0.029705 | 1  |
| 2832 | 0.029715 | -1 |
| 2833 | 0.029726 | 1  |
| 2834 | 0.029736 | -1 |
| 2835 | 0.029747 | 1  |
| 2836 | 0.029757 | -1 |
| 2837 | 0.029768 | 1  |
| 2838 | 0.029778 | -1 |
| 2839 | 0.029789 | 1  |
| 2840 | 0.029799 | -1 |
| 2841 | 0.02981  | 1  |
| 2842 | 0.02982  | -1 |
| 2843 | 0.029831 | 1  |
| 2844 | 0.029841 | -1 |
| 2845 | 0.029852 | 1  |
| 2846 | 0.029861 | -1 |
| 2847 | 0.029873 | -1 |
| 2848 | 0.029884 | 1  |
| 2849 | 0.029893 | -1 |
| 2850 | 0.029905 | 1  |
| 2851 | 0.029914 | -1 |
| 2852 | 0.029926 | 1  |
| 2853 | 0.029935 | -1 |
| 2854 | 0.029946 | 1  |
| 2855 | 0.029956 | -1 |
| 2856 | 0.029967 | 1  |
| 2857 | 0.029977 | -1 |
| 2858 | 0.029988 | 1  |
| 2859 | 0.029998 | -1 |
| 2860 | 0.030009 | 1  |
| 2861 | 0.030019 | -1 |
| 2862 | 0.03003  | -1 |
| 2863 | 0.030041 | 1  |
| 2864 | 0.030051 | -1 |
| 2865 | 0.030062 | 1  |
| 2866 | 0.030072 | -1 |
| 2867 | 0.030083 | 1  |
| 2868 | 0.030093 | -1 |
| 2869 | 0.030104 | 1  |
| 2870 | 0.030114 | -1 |
| 2871 | 0.030125 | 1  |
| 2872 | 0.030135 | -1 |
| 2873 | 0.030146 | 1  |
| 2874 | 0.030155 | -1 |
| 2875 | 0.030167 | 1  |
| 2876 | 0.030176 | -1 |
| 2877 | 0.030188 | -1 |
| 2878 | 0.030199 | 1  |
| 2879 | 0.030208 | -1 |
| 2880 | 0.03022  | 1  |
| 2881 | 0.030229 | -1 |
| 2882 | 0.03024  | 1  |
| 2883 | 0.03025  | -1 |
| 2884 | 0.030261 | 1  |
| 2885 | 0.030271 | -1 |
| 2886 | 0.030282 | 1  |
| 2887 | 0.030292 | -1 |
| 2888 | 0.030303 | 1  |
| 2889 | 0.030313 | -1 |
| 2890 | 0.030324 | 1  |
| 2891 | 0.030334 | -1 |
| 2892 | 0.030345 | 1  |
| 2893 | 0.030355 | -1 |
| 2894 | 0.030366 | -1 |
| 2895 | 0.030377 | 1  |
| 2896 | 0.030387 | -1 |
| 2897 | 0.030398 | 1  |
| 2898 | 0.030408 | -1 |
| 2899 | 0.030419 | 1  |

(续表)

|      |          |    |
|------|----------|----|
| 2900 | 0.030429 | -1 |
| 2901 | 0.03044  | 1  |
| 2902 | 0.03045  | -1 |
| 2903 | 0.030461 | 1  |
| 2904 | 0.03047  | -1 |
| 2905 | 0.030482 | 1  |
| 2906 | 0.030491 | -1 |
| 2907 | 0.030502 | 1  |
| 2908 | 0.030512 | -1 |
| 2909 | 0.030523 | -1 |
| 2910 | 0.030534 | 1  |
| 2911 | 0.030544 | -1 |
| 2912 | 0.030555 | 1  |
| 2913 | 0.030565 | -1 |
| 2914 | 0.030576 | 1  |
| 2915 | 0.030586 | -1 |
| 2916 | 0.030597 | 1  |
| 2917 | 0.030607 | -1 |
| 2918 | 0.030618 | 1  |
| 2919 | 0.030628 | -1 |
| 2920 | 0.030639 | 1  |
| 2921 | 0.030649 | -1 |
| 2922 | 0.03066  | 1  |
| 2923 | 0.03067  | -1 |
| 2924 | 0.030681 | -1 |
| 2925 | 0.030692 | 1  |
| 2926 | 0.030702 | -1 |
| 2927 | 0.030713 | 1  |
| 2928 | 0.030723 | -1 |
| 2929 | 0.030734 | 1  |
| 2930 | 0.030744 | -1 |
| 2931 | 0.030755 | 1  |
| 2932 | 0.030764 | -1 |
| 2933 | 0.030776 | 1  |
| 2934 | 0.030785 | -1 |
| 2935 | 0.030796 | 1  |
| 2936 | 0.030806 | -1 |
| 2937 | 0.030817 | 1  |
| 2938 | 0.030827 | -1 |
| 2939 | 0.030838 | -1 |
| 2940 | 0.030849 | 1  |
| 2941 | 0.030859 | -1 |
| 2942 | 0.03087  | 1  |
| 2943 | 0.03088  | -1 |
| 2944 | 0.030891 | 1  |
| 2945 | 0.030901 | -1 |
| 2946 | 0.030912 | 1  |
| 2947 | 0.030922 | -1 |
| 2948 | 0.030933 | 1  |
| 2949 | 0.030943 | -1 |
| 2950 | 0.030954 | 1  |
| 2951 | 0.030964 | -1 |
| 2952 | 0.030975 | 1  |
| 2953 | 0.030985 | -1 |
| 2954 | 0.030996 | 1  |
| 2955 | 0.031006 | -1 |
| 2956 | 0.031017 | -1 |
| 2957 | 0.031028 | 1  |
| 2958 | 0.031038 | -1 |
| 2959 | 0.031049 | 1  |
| 2960 | 0.031058 | -1 |
| 2961 | 0.03107  | 1  |
| 2962 | 0.031079 | -1 |
| 2963 | 0.031091 | 1  |
| 2964 | 0.0311   | -1 |
| 2965 | 0.031111 | 1  |
| 2966 | 0.031121 | -1 |
| 2967 | 0.031132 | 1  |
| 2968 | 0.031142 | -1 |
| 2969 | 0.031153 | 1  |
| 2970 | 0.031163 | -1 |
| 2971 | 0.031174 | -1 |
| 2972 | 0.031185 | 1  |
| 2973 | 0.031195 | -1 |
| 2974 | 0.031206 | 1  |
| 2975 | 0.031216 | -1 |
| 2976 | 0.031227 | 1  |
| 2977 | 0.031237 | -1 |
| 2978 | 0.031248 | 1  |
| 2979 | 0.031258 | -1 |
| 2980 | 0.031269 | 1  |
| 2981 | 0.031279 | -1 |
| 2982 | 0.03129  | 1  |
| 2983 | 0.0313   | -1 |
| 2984 | 0.031311 | 1  |
| 2985 | 0.031321 | -1 |
| 2986 | 0.031332 | -1 |
| 2987 | 0.031343 | 1  |
| 2988 | 0.031353 | -1 |
| 2989 | 0.031364 | 1  |
| 2990 | 0.031373 | -1 |
| 2991 | 0.031385 | 1  |
| 2992 | 0.031394 | -1 |
| 2993 | 0.031405 | 1  |
| 2994 | 0.031415 | -1 |
| 2995 | 0.031426 | 1  |
| 2996 | 0.031436 | -1 |
| 2997 | 0.031447 | 1  |
| 2998 | 0.031457 | -1 |
| 2999 | 0.031468 | 1  |

(续表)

|      |          |    |
|------|----------|----|
| 3000 | 0.031478 | -1 |
| 3001 | 0.031489 | 1  |
| 3002 | 0.031499 | -1 |
| 3003 | 0.03151  | -1 |
| 3004 | 0.031521 | 1  |
| 3005 | 0.031531 | -1 |
| 3006 | 0.031542 | 1  |
| 3007 | 0.031552 | -1 |
| 3008 | 0.031563 | 1  |
| 3009 | 0.031573 | -1 |
| 3010 | 0.031584 | 1  |
| 3011 | 0.031594 | -1 |
| 3012 | 0.031605 | 1  |
| 3013 | 0.031615 | -1 |
| 3014 | 0.031626 | 1  |
| 3015 | 0.031635 | -1 |
| 3016 | 0.031647 | 1  |
| 3017 | 0.031656 | -1 |
| 3018 | 0.031667 | -1 |
| 3019 | 0.031679 | 1  |
| 3020 | 0.031688 | -1 |
| 3021 | 0.0317   | 1  |
| 3022 | 0.031709 | -1 |
| 3023 | 0.03172  | 1  |
| 3024 | 0.03173  | -1 |
| 3025 | 0.031741 | 1  |
| 3026 | 0.031751 | -1 |
| 3027 | 0.031762 | 1  |
| 3028 | 0.031772 | -1 |
| 3029 | 0.031783 | 1  |
| 3030 | 0.031793 | -1 |
| 3031 | 0.031804 | 1  |
| 3032 | 0.031814 | -1 |
| 3033 | 0.031825 | -1 |
| 3034 | 0.031836 | 1  |
| 3035 | 0.031846 | -1 |
| 3036 | 0.031857 | 1  |
| 3037 | 0.031867 | -1 |
| 3038 | 0.031878 | 1  |
| 3039 | 0.031888 | -1 |
| 3040 | 0.031899 | 1  |
| 3041 | 0.031909 | -1 |
| 3042 | 0.03192  | 1  |
| 3043 | 0.031929 | -1 |
| 3044 | 0.031941 | 1  |
| 3045 | 0.03195  | -1 |
| 3046 | 0.031962 | 1  |
| 3047 | 0.031971 | -1 |
| 3048 | 0.031982 | 1  |
| 3049 | 0.031992 | -1 |
| 3050 | 0.032003 | -1 |
| 3051 | 0.032014 | 1  |
| 3052 | 0.032024 | -1 |
| 3053 | 0.032035 | 1  |
| 3054 | 0.032045 | -1 |
| 3055 | 0.032056 | 1  |
| 3056 | 0.032066 | -1 |
| 3057 | 0.032077 | 1  |
| 3058 | 0.032087 | -1 |
| 3059 | 0.032098 | 1  |
| 3060 | 0.032108 | -1 |
| 3061 | 0.032119 | 1  |
| 3062 | 0.032129 | -1 |
| 3063 | 0.03214  | 1  |
| 3064 | 0.03215  | -1 |
| 3065 | 0.032161 | -1 |
| 3066 | 0.032172 | 1  |
| 3067 | 0.032182 | -1 |
| 3068 | 0.032193 | 1  |
| 3069 | 0.032203 | -1 |
| 3070 | 0.032214 | 1  |
| 3071 | 0.032224 | -1 |
| 3072 | 0.032235 | 1  |
| 3073 | 0.032244 | -1 |
| 3074 | 0.032256 | 1  |
| 3075 | 0.032265 | -1 |
| 3076 | 0.032276 | 1  |
| 3077 | 0.032286 | -1 |
| 3078 | 0.032297 | 1  |
| 3079 | 0.032307 | -1 |
| 3080 | 0.032318 | -1 |
| 3081 | 0.032329 | 1  |
| 3082 | 0.032339 | -1 |
| 3083 | 0.03235  | 1  |
| 3084 | 0.03236  | -1 |
| 3085 | 0.032371 | 1  |
| 3086 | 0.032381 | -1 |
| 3087 | 0.032392 | 1  |
| 3088 | 0.032402 | -1 |
| 3089 | 0.032413 | 1  |
| 3090 | 0.032423 | -1 |
| 3091 | 0.032434 | 1  |
| 3092 | 0.032444 | -1 |
| 3093 | 0.032455 | 1  |
| 3094 | 0.032465 | -1 |
| 3095 | 0.032476 | -1 |
| 3096 | 0.032487 | 1  |
| 3097 | 0.032497 | -1 |
| 3098 | 0.032508 | 1  |
| 3099 | 0.032518 | -1 |

(续表)

|      |          |    |
|------|----------|----|
| 3100 | 0.032529 | 1  |
| 3101 | 0.032538 | -1 |
| 3102 | 0.03255  | 1  |
| 3103 | 0.032559 | -1 |
| 3104 | 0.032571 | 1  |
| 3105 | 0.03258  | -1 |
| 3106 | 0.032591 | 1  |
| 3107 | 0.032601 | -1 |
| 3108 | 0.032612 | 1  |
| 3109 | 0.032622 | -1 |
| 3110 | 0.032633 | 1  |
| 3111 | 0.032643 | -1 |
| 3112 | 0.032654 | -1 |
| 3113 | 0.032665 | 1  |
| 3114 | 0.032675 | -1 |
| 3115 | 0.032686 | 1  |
| 3116 | 0.032696 | -1 |
| 3117 | 0.032707 | 1  |
| 3118 | 0.032717 | -1 |
| 3119 | 0.032728 | 1  |
| 3120 | 0.032738 | -1 |
| 3121 | 0.032749 | 1  |
| 3122 | 0.032759 | -1 |
| 3123 | 0.03277  | 1  |
| 3124 | 0.03278  | -1 |
| 3125 | 0.032791 | 1  |
| 3126 | 0.0328   | -1 |
| 3127 | 0.032812 | -1 |
| 3128 | 0.032823 | 1  |
| 3129 | 0.032833 | -1 |
| 3130 | 0.032844 | 1  |
| 3131 | 0.032853 | -1 |
| 3132 | 0.032865 | 1  |
| 3133 | 0.032874 | -1 |
| 3134 | 0.032885 | 1  |
| 3135 | 0.032895 | -1 |
| 3136 | 0.032906 | 1  |
| 3137 | 0.032916 | -1 |
| 3138 | 0.032927 | 1  |
| 3139 | 0.032937 | -1 |
| 3140 | 0.032948 | 1  |
| 3141 | 0.032958 | -1 |
| 3142 | 0.032969 | -1 |
| 3143 | 0.03298  | 1  |
| 3144 | 0.03299  | -1 |
| 3145 | 0.033001 | 1  |
| 3146 | 0.033011 | -1 |
| 3147 | 0.033022 | 1  |
| 3148 | 0.033032 | -1 |
| 3149 | 0.033043 | 1  |
| 3150 | 0.033053 | -1 |
| 3151 | 0.033064 | 1  |
| 3152 | 0.033074 | -1 |
| 3153 | 0.033085 | 1  |
| 3154 | 0.033095 | -1 |
| 3155 | 0.033106 | 1  |
| 3156 | 0.033115 | -1 |
| 3157 | 0.033127 | 1  |
| 3158 | 0.033136 | -1 |
| 3159 | 0.033147 | -1 |
| 3160 | 0.033159 | 1  |
| 3161 | 0.033168 | -1 |
| 3162 | 0.033179 | 1  |
| 3163 | 0.033189 | -1 |
| 3164 | 0.0332   | 1  |
| 3165 | 0.03321  | -1 |
| 3166 | 0.033221 | 1  |
| 3167 | 0.033231 | -1 |
| 3168 | 0.033242 | 1  |
| 3169 | 0.033252 | -1 |
| 3170 | 0.033263 | 1  |
| 3171 | 0.033273 | -1 |
| 3172 | 0.033284 | 1  |
| 3173 | 0.033294 | -1 |
| 3174 | 0.033305 | -1 |
| 3175 | 0.033316 | 1  |
| 3176 | 0.033326 | -1 |
| 3177 | 0.033337 | 1  |
| 3178 | 0.033347 | -1 |
| 3179 | 0.033358 | 1  |
| 3180 | 0.033368 | -1 |
| 3181 | 0.033379 | 1  |
| 3182 | 0.033389 | -1 |
| 3183 | 0.0334   | 1  |
| 3184 | 0.033409 | -1 |
| 3185 | 0.033421 | 1  |
| 3186 | 0.03343  | -1 |
| 3187 | 0.033441 | 1  |
| 3188 | 0.033451 | -1 |
| 3189 | 0.033462 | 1  |
| 3190 | 0.033474 | 1  |
| 3191 | 0.033483 | -1 |
| 3192 | 0.033494 | 1  |
| 3193 | 0.033504 | -1 |
| 3194 | 0.033515 | 1  |
| 3195 | 0.033525 | -1 |
| 3196 | 0.033536 | 1  |
| 3197 | 0.033546 | -1 |
| 3198 | 0.033557 | 1  |
| 3199 | 0.033567 | -1 |

(续表)

|      |          |    |
|------|----------|----|
| 3200 | 0.033578 | -1 |
| 3201 | 0.033588 | -1 |
| 3202 | 0.033599 | -1 |
| 3203 | 0.033609 | -1 |
| 3204 | 0.03362  | -1 |
| 3205 | 0.033631 | -1 |
| 3206 | 0.033641 | -1 |
| 3207 | 0.033652 | -1 |
| 3208 | 0.033662 | -1 |
| 3209 | 0.033673 | -1 |
| 3210 | 0.033683 | -1 |
| 3211 | 0.033694 | -1 |
| 3212 | 0.033703 | -1 |
| 3213 | 0.033715 | -1 |
| 3214 | 0.033724 | -1 |
| 3215 | 0.033736 | -1 |
| 3216 | 0.033745 | -1 |
| 3217 | 0.033756 | -1 |
| 3218 | 0.033766 | -1 |
| 3219 | 0.033777 | -1 |
| 3220 | 0.033787 | -1 |
| 3221 | 0.033798 | -1 |
| 3222 | 0.033809 | -1 |
| 3223 | 0.033819 | -1 |
| 3224 | 0.03383  | -1 |
| 3225 | 0.03384  | -1 |
| 3226 | 0.033851 | -1 |
| 3227 | 0.033861 | -1 |
| 3228 | 0.033872 | -1 |
| 3229 | 0.033882 | -1 |
| 3230 | 0.033893 | -1 |
| 3231 | 0.033903 | -1 |
| 3232 | 0.033914 | -1 |
| 3233 | 0.033924 | -1 |
| 3234 | 0.033935 | -1 |
| 3235 | 0.033945 | -1 |
| 3236 | 0.033956 | -1 |
| 3237 | 0.033967 | -1 |
| 3238 | 0.033977 | -1 |
| 3239 | 0.033988 | -1 |
| 3240 | 0.033998 | -1 |
| 3241 | 0.034009 | -1 |
| 3242 | 0.034018 | -1 |
| 3243 | 0.03403  | -1 |
| 3244 | 0.034039 | -1 |
| 3245 | 0.03405  | -1 |
| 3246 | 0.03406  | -1 |
| 3247 | 0.034071 | -1 |
| 3248 | 0.034081 | -1 |
| 3249 | 0.034092 | -1 |
| 3250 | 0.034102 | -1 |
| 3251 | 0.034113 | -1 |
| 3252 | 0.034124 | -1 |
| 3253 | 0.034134 | -1 |
| 3254 | 0.034145 | -1 |
| 3255 | 0.034155 | -1 |
| 3256 | 0.034166 | -1 |
| 3257 | 0.034176 | -1 |
| 3258 | 0.034187 | -1 |
| 3259 | 0.034197 | -1 |
| 3260 | 0.034208 | -1 |
| 3261 | 0.034218 | -1 |
| 3262 | 0.034229 | -1 |
| 3263 | 0.034239 | -1 |
| 3264 | 0.03425  | -1 |
| 3265 | 0.03426  | -1 |
| 3266 | 0.034271 | -1 |
| 3267 | 0.03428  | -1 |
| 3268 | 0.034292 | -1 |
| 3269 | 0.034303 | -1 |
| 3270 | 0.034312 | -1 |
| 3271 | 0.034324 | -1 |
| 3272 | 0.034333 | -1 |
| 3273 | 0.034345 | -1 |
| 3274 | 0.034354 | -1 |
| 3275 | 0.034365 | -1 |
| 3276 | 0.034375 | -1 |
| 3277 | 0.034386 | -1 |
| 3278 | 0.034396 | -1 |
| 3279 | 0.034407 | -1 |
| 3280 | 0.034417 | -1 |
| 3281 | 0.034428 | -1 |
| 3282 | 0.034438 | -1 |
| 3283 | 0.034449 | -1 |
| 3284 | 0.03446  | -1 |
| 3285 | 0.03447  | -1 |
| 3286 | 0.034481 | -1 |
| 3287 | 0.034491 | -1 |
| 3288 | 0.034502 | -1 |
| 3289 | 0.034512 | -1 |
| 3290 | 0.034523 | -1 |
| 3291 | 0.034533 | -1 |
| 3292 | 0.034544 | -1 |
| 3293 | 0.034554 | -1 |
| 3294 | 0.034565 | -1 |
| 3295 | 0.034574 | -1 |
| 3296 | 0.034586 | -1 |
| 3297 | 0.034595 | -1 |
| 3298 | 0.034607 | -1 |
| 3299 | 0.034618 | -1 |

(续表)

|      |          |    |
|------|----------|----|
| 3300 | 0.034627 | -1 |
| 3301 | 0.034639 | -1 |
| 3302 | 0.034648 | -1 |
| 3303 | 0.034659 | -1 |
| 3304 | 0.034669 | -1 |
| 3305 | 0.03468  | -1 |
| 3306 | 0.03469  | -1 |
| 3307 | 0.034701 | -1 |
| 3308 | 0.034711 | -1 |
| 3309 | 0.034722 | -1 |
| 3310 | 0.034732 | -1 |
| 3311 | 0.034743 | -1 |
| 3312 | 0.034753 | -1 |
| 3313 | 0.034764 | -1 |
| 3314 | 0.034774 | -1 |
| 3315 | 0.034785 | -1 |
| 3316 | 0.034796 | -1 |
| 3317 | 0.034806 | -1 |
| 3318 | 0.034817 | -1 |
| 3319 | 0.034827 | -1 |
| 3320 | 0.034838 | -1 |
| 3321 | 0.034848 | -1 |
| 3322 | 0.034859 | -1 |
| 3323 | 0.034869 | -1 |
| 3324 | 0.03488  | -1 |
| 3325 | 0.034889 | -1 |
| 3326 | 0.034901 | -1 |
| 3327 | 0.03491  | -1 |
| 3328 | 0.034921 | -1 |
| 3329 | 0.034931 | -1 |
| 3330 | 0.034942 | -1 |
| 3331 | 0.034953 | -1 |
| 3332 | 0.034963 | -1 |
| 3333 | 0.034974 | -1 |
| 3334 | 0.034984 | -1 |
| 3335 | 0.034995 | -1 |
| 3336 | 0.035005 | -1 |
| 3337 | 0.035016 | -1 |
| 3338 | 0.035026 | -1 |
| 3339 | 0.035037 | -1 |
| 3340 | 0.035047 | -1 |
| 3341 | 0.035058 | -1 |
| 3342 | 0.035068 | -1 |
| 3343 | 0.035079 | -1 |
| 3344 | 0.035089 | -1 |
| 3345 | 0.0351   | -1 |
| 3346 | 0.035111 | -1 |
| 3347 | 0.035121 | -1 |
| 3348 | 0.035132 | -1 |
| 3349 | 0.035142 | -1 |
| 3350 | 0.035153 | -1 |
| 3351 | 0.035163 | -1 |
| 3352 | 0.035174 | -1 |
| 3353 | 0.035183 | -1 |
| 3354 | 0.035195 | -1 |
| 3355 | 0.035204 | -1 |
| 3356 | 0.035215 | -1 |
| 3357 | 0.035225 | -1 |
| 3358 | 0.035236 | -1 |
| 3359 | 0.035246 | -1 |
| 3360 | 0.035257 | -1 |
| 3361 | 0.035268 | -1 |
| 3362 | 0.035278 | -1 |
| 3363 | 0.035289 | -1 |
| 3364 | 0.035299 | -1 |
| 3365 | 0.03531  | -1 |
| 3366 | 0.03532  | -1 |
| 3367 | 0.035331 | -1 |
| 3368 | 0.035341 | -1 |
| 3369 | 0.035352 | -1 |
| 3370 | 0.035362 | -1 |
| 3371 | 0.035373 | -1 |
| 3372 | 0.035383 | -1 |
| 3373 | 0.035394 | -1 |
| 3374 | 0.035404 | -1 |
| 3375 | 0.035415 | -1 |
| 3376 | 0.035425 | -1 |
| 3377 | 0.035436 | -1 |
| 3378 | 0.035447 | -1 |
| 3379 | 0.035457 | -1 |
| 3380 | 0.035468 | -1 |
| 3381 | 0.035478 | -1 |
| 3382 | 0.035489 | -1 |
| 3383 | 0.035498 | -1 |
| 3384 | 0.03551  | -1 |
| 3385 | 0.035519 | -1 |
| 3386 | 0.03553  | -1 |
| 3387 | 0.03554  | -1 |
| 3388 | 0.035551 | -1 |
| 3389 | 0.035561 | -1 |
| 3390 | 0.035572 | -1 |
| 3391 | 0.035582 | -1 |
| 3392 | 0.035593 | -1 |
| 3393 | 0.035604 | -1 |
| 3394 | 0.035614 | -1 |
| 3395 | 0.035625 | -1 |
| 3396 | 0.035635 | -1 |
| 3397 | 0.035646 | -1 |
| 3398 | 0.035656 | -1 |
| 3399 | 0.035667 | -1 |

(续表)

|      |          |    |
|------|----------|----|
| 3400 | 0.035677 | -1 |
| 3401 | 0.035688 | -1 |
| 3402 | 0.035698 | -1 |
| 3403 | 0.035709 | -1 |
| 3404 | 0.035719 | -1 |
| 3405 | 0.03573  | -1 |
| 3406 | 0.03574  | -1 |
| 3407 | 0.035751 | -1 |
| 3408 | 0.035762 | -1 |
| 3409 | 0.035772 | -1 |
| 3410 | 0.035783 | -1 |
| 3411 | 0.035792 | -1 |
| 3412 | 0.035804 | -1 |
| 3413 | 0.035813 | -1 |
| 3414 | 0.035824 | -1 |
| 3415 | 0.035834 | -1 |
| 3416 | 0.035845 | -1 |
| 3417 | 0.035855 | -1 |
| 3418 | 0.035866 | -1 |
| 3419 | 0.035876 | -1 |
| 3420 | 0.035887 | -1 |
| 3421 | 0.035897 | -1 |
| 3422 | 0.035908 | -1 |
| 3423 | 0.035918 | -1 |
| 3424 | 0.035929 | -1 |
| 3425 | 0.03594  | -1 |
| 3426 | 0.03595  | -1 |
| 3427 | 0.035961 | -1 |
| 3428 | 0.035971 | -1 |
| 3429 | 0.035982 | -1 |
| 3430 | 0.035992 | -1 |
| 3431 | 0.036003 | -1 |
| 3432 | 0.036013 | -1 |
| 3433 | 0.036024 | -1 |
| 3434 | 0.036034 | -1 |
| 3435 | 0.036045 | -1 |
| 3436 | 0.036054 | -1 |
| 3437 | 0.036066 | -1 |
| 3438 | 0.036075 | -1 |
| 3439 | 0.036086 | -1 |
| 3440 | 0.036098 | -1 |
| 3441 | 0.036107 | -1 |
| 3442 | 0.036119 | -1 |
| 3443 | 0.036128 | -1 |
| 3444 | 0.036139 | -1 |
| 3445 | 0.036149 | -1 |
| 3446 | 0.03616  | -1 |
| 3447 | 0.03617  | -1 |
| 3448 | 0.036181 | -1 |
| 3449 | 0.036191 | -1 |
| 3450 | 0.036202 | -1 |
| 3451 | 0.036212 | -1 |
| 3452 | 0.036223 | -1 |
| 3453 | 0.036233 | -1 |
| 3454 | 0.036244 | -1 |
| 3455 | 0.036255 | -1 |
| 3456 | 0.036265 | -1 |
| 3457 | 0.036276 | -1 |
| 3458 | 0.036286 | -1 |
| 3459 | 0.036297 | -1 |
| 3460 | 0.036307 | -1 |
| 3461 | 0.036318 | -1 |
| 3462 | 0.036328 | -1 |
| 3463 | 0.036339 | -1 |
| 3464 | 0.036348 | -1 |
| 3465 | 0.03636  | -1 |
| 3466 | 0.036369 | -1 |
| 3467 | 0.036381 | -1 |
| 3468 | 0.03639  | -1 |
| 3469 | 0.036401 | -1 |
| 3470 | 0.036413 | -1 |
| 3471 | 0.036422 | -1 |
| 3472 | 0.036433 | -1 |
| 3473 | 0.036443 | -1 |
| 3474 | 0.036454 | -1 |
| 3475 | 0.036464 | -1 |
| 3476 | 0.036475 | -1 |
| 3477 | 0.036485 | -1 |
| 3478 | 0.036496 | -1 |
| 3479 | 0.036506 | -1 |
| 3480 | 0.036517 | -1 |
| 3481 | 0.036527 | -1 |
| 3482 | 0.036538 | -1 |
| 3483 | 0.036548 | -1 |
| 3484 | 0.036559 | -1 |
| 3485 | 0.036569 | -1 |
| 3486 | 0.03658  | -1 |
| 3487 | 0.036591 | -1 |
| 3488 | 0.036601 | -1 |
| 3489 | 0.036612 | -1 |
| 3490 | 0.036622 | -1 |
| 3491 | 0.036633 | -1 |
| 3492 | 0.036643 | -1 |
| 3493 | 0.036654 | -1 |
| 3494 | 0.036663 | -1 |
| 3495 | 0.036675 | -1 |
| 3496 | 0.036684 | -1 |
| 3497 | 0.036695 | -1 |
| 3498 | 0.036705 | -1 |
| 3499 | 0.036716 | -1 |

(续表)

|      |          |    |
|------|----------|----|
| 3500 | 0.036726 | -1 |
| 3501 | 0.036737 | -1 |
| 3502 | 0.036748 | -1 |
| 3503 | 0.036758 | -1 |
| 3504 | 0.036769 | -1 |
| 3505 | 0.036779 | -1 |
| 3506 | 0.03679  | -1 |
| 3507 | 0.0368   | -1 |
| 3508 | 0.036811 | -1 |
| 3509 | 0.036821 | -1 |
| 3510 | 0.036832 | -1 |
| 3511 | 0.036842 | -1 |
| 3512 | 0.036853 | -1 |
| 3513 | 0.036863 | -1 |
| 3514 | 0.036874 | -1 |
| 3515 | 0.036884 | -1 |
| 3516 | 0.036895 | -1 |
| 3517 | 0.036906 | -1 |
| 3518 | 0.036916 | -1 |
| 3519 | 0.036927 | -1 |
| 3520 | 0.036937 | -1 |
| 3521 | 0.036948 | -1 |
| 3522 | 0.036957 | -1 |
| 3523 | 0.036969 | -1 |
| 3524 | 0.036978 | -1 |
| 3525 | 0.03699  | -1 |
| 3526 | 0.036999 | -1 |
| 3527 | 0.03701  | -1 |
| 3528 | 0.03702  | -1 |
| 3529 | 0.037031 | -1 |
| 3530 | 0.037041 | -1 |
| 3531 | 0.037052 | -1 |
| 3532 | 0.037062 | -1 |
| 3533 | 0.037073 | -1 |
| 3534 | 0.037084 | -1 |
| 3535 | 0.037094 | -1 |
| 3536 | 0.037105 | -1 |
| 3537 | 0.037115 | -1 |
| 3538 | 0.037126 | -1 |
| 3539 | 0.037136 | -1 |
| 3540 | 0.037147 | -1 |
| 3541 | 0.037157 | -1 |
| 3542 | 0.037168 | -1 |
| 3543 | 0.037178 | -1 |
| 3544 | 0.037189 | -1 |
| 3545 | 0.037199 | -1 |
| 3546 | 0.03721  | -1 |
| 3547 | 0.037219 | -1 |
| 3548 | 0.037231 | -1 |
| 3549 | 0.037242 | -1 |
| 3550 | 0.037252 | -1 |
| 3551 | 0.037263 | -1 |
| 3552 | 0.037272 | -1 |
| 3553 | 0.037284 | -1 |
| 3554 | 0.037293 | -1 |
| 3555 | 0.037304 | -1 |
| 3556 | 0.037314 | -1 |
| 3557 | 0.037325 | -1 |
| 3558 | 0.037335 | -1 |
| 3559 | 0.037346 | -1 |
| 3560 | 0.037356 | -1 |
| 3561 | 0.037367 | -1 |
| 3562 | 0.037377 | -1 |
| 3563 | 0.037388 | -1 |
| 3564 | 0.037399 | -1 |
| 3565 | 0.037409 | -1 |
| 3566 | 0.03742  | -1 |
| 3567 | 0.03743  | -1 |
| 3568 | 0.037441 | -1 |
| 3569 | 0.037451 | -1 |
| 3570 | 0.037462 | -1 |
| 3571 | 0.037472 | -1 |
| 3572 | 0.037483 | -1 |
| 3573 | 0.037493 | -1 |
| 3574 | 0.037504 | -1 |
| 3575 | 0.037514 | -1 |
| 3576 | 0.037525 | -1 |
| 3577 | 0.037534 | -1 |
| 3578 | 0.037546 | -1 |
| 3579 | 0.037555 | -1 |
| 3580 | 0.037566 | -1 |
| 3581 | 0.037578 | -1 |
| 3582 | 0.037587 | -1 |
| 3583 | 0.037598 | -1 |
| 3584 | 0.037608 | -1 |
| 3585 | 0.037619 | -1 |
| 3586 | 0.037629 | -1 |
| 3587 | 0.03764  | -1 |
| 3588 | 0.03765  | -1 |
| 3589 | 0.037661 | -1 |
| 3590 | 0.037671 | -1 |
| 3591 | 0.037682 | -1 |
| 3592 | 0.037692 | -1 |
| 3593 | 0.037703 | -1 |
| 3594 | 0.037713 | -1 |
| 3595 | 0.037724 | -1 |
| 3596 | 0.037735 | -1 |
| 3597 | 0.037745 | -1 |
| 3598 | 0.037756 | -1 |
| 3599 | 0.037766 | -1 |

(续表)

|      |          |    |
|------|----------|----|
| 3600 | 0.037777 | 1  |
| 3601 | 0.037787 | -1 |
| 3602 | 0.037798 | 1  |
| 3603 | 0.037806 | -1 |
| 3604 | 0.037819 | 1  |
| 3605 | 0.037828 | -1 |
| 3606 | 0.03784  | 1  |
| 3607 | 0.037849 | -1 |
| 3608 | 0.03786  | 1  |
| 3609 | 0.03787  | -1 |
| 3610 | 0.037881 | -1 |
| 3611 | 0.037893 | 1  |
| 3612 | 0.037902 | -1 |
| 3613 | 0.037913 | 1  |
| 3614 | 0.037923 | -1 |
| 3615 | 0.037934 | 1  |
| 3616 | 0.037944 | -1 |
| 3617 | 0.037955 | 1  |
| 3618 | 0.037965 | -1 |
| 3619 | 0.037976 | 1  |
| 3620 | 0.037986 | -1 |
| 3621 | 0.037997 | 1  |
| 3622 | 0.038007 | -1 |
| 3623 | 0.038018 | 1  |
| 3624 | 0.038028 | -1 |
| 3625 | 0.038039 | -1 |
| 3626 | 0.03805  | 1  |
| 3627 | 0.03806  | -1 |
| 3628 | 0.038071 | 1  |
| 3629 | 0.038081 | -1 |
| 3630 | 0.038092 | 1  |
| 3631 | 0.038102 | -1 |
| 3632 | 0.038113 | 1  |
| 3633 | 0.038123 | -1 |
| 3634 | 0.038134 | 1  |
| 3635 | 0.038143 | -1 |
| 3636 | 0.038155 | 1  |
| 3637 | 0.038164 | -1 |
| 3638 | 0.038175 | 1  |
| 3639 | 0.038185 | -1 |
| 3640 | 0.038196 | 1  |
| 3641 | 0.038206 | -1 |
| 3642 | 0.038217 | -1 |
| 3643 | 0.038228 | 1  |
| 3644 | 0.038238 | -1 |
| 3645 | 0.038249 | 1  |
| 3646 | 0.038259 | -1 |
| 3647 | 0.03827  | 1  |
| 3648 | 0.03828  | -1 |
| 3649 | 0.038291 | 1  |
| 3650 | 0.038301 | -1 |
| 3651 | 0.038312 | 1  |
| 3652 | 0.038322 | -1 |
| 3653 | 0.038333 | 1  |
| 3654 | 0.038343 | -1 |
| 3655 | 0.038354 | 1  |
| 3656 | 0.038364 | -1 |
| 3657 | 0.038375 | -1 |
| 3658 | 0.038386 | 1  |
| 3659 | 0.038396 | -1 |
| 3660 | 0.038407 | 1  |
| 3661 | 0.038417 | -1 |
| 3662 | 0.038428 | 1  |
| 3663 | 0.038437 | -1 |
| 3664 | 0.038449 | 1  |
| 3665 | 0.038458 | -1 |
| 3666 | 0.038469 | 1  |
| 3667 | 0.038479 | -1 |
| 3668 | 0.03849  | 1  |
| 3669 | 0.0385   | -1 |
| 3670 | 0.038511 | 1  |
| 3671 | 0.038521 | -1 |
| 3672 | 0.038532 | -1 |
| 3673 | 0.038543 | 1  |
| 3674 | 0.038553 | -1 |
| 3675 | 0.038564 | 1  |
| 3676 | 0.038574 | -1 |
| 3677 | 0.038585 | 1  |
| 3678 | 0.038595 | -1 |
| 3679 | 0.038606 | 1  |
| 3680 | 0.038616 | -1 |
| 3681 | 0.038627 | 1  |
| 3682 | 0.038637 | -1 |
| 3683 | 0.038648 | 1  |
| 3684 | 0.038658 | -1 |
| 3685 | 0.038669 | 1  |
| 3686 | 0.038679 | -1 |
| 3687 | 0.03869  | 1  |
| 3688 | 0.038699 | -1 |
| 3689 | 0.038711 | -1 |
| 3690 | 0.038722 | 1  |
| 3691 | 0.038731 | -1 |
| 3692 | 0.038743 | 1  |
| 3693 | 0.038752 | -1 |
| 3694 | 0.038764 | 1  |
| 3695 | 0.038773 | -1 |
| 3696 | 0.038784 | 1  |
| 3697 | 0.038794 | -1 |
| 3698 | 0.038805 | 1  |
| 3699 | 0.038815 | -1 |

(续表)

|      |          |    |
|------|----------|----|
| 3700 | 0.038826 | 1  |
| 3701 | 0.038836 | -1 |
| 3702 | 0.038847 | 1  |
| 3703 | 0.038857 | -1 |
| 3704 | 0.038868 | -1 |
| 3705 | 0.038879 | 1  |
| 3706 | 0.038889 | -1 |
| 3707 | 0.0389   | 1  |
| 3708 | 0.03891  | -1 |
| 3709 | 0.038921 | 1  |
| 3710 | 0.038931 | -1 |
| 3711 | 0.038942 | 1  |
| 3712 | 0.038952 | -1 |
| 3713 | 0.038963 | 1  |
| 3714 | 0.038973 | -1 |
| 3715 | 0.038984 | 1  |
| 3716 | 0.038993 | -1 |
| 3717 | 0.039005 | 1  |
| 3718 | 0.039014 | -1 |
| 3719 | 0.039026 | -1 |
| 3720 | 0.039037 | 1  |
| 3721 | 0.039046 | -1 |
| 3722 | 0.039058 | 1  |
| 3723 | 0.039067 | -1 |
| 3724 | 0.039078 | 1  |
| 3725 | 0.039088 | -1 |
| 3726 | 0.039099 | 1  |
| 3727 | 0.039109 | -1 |
| 3728 | 0.03912  | 1  |
| 3729 | 0.03913  | -1 |
| 3730 | 0.039141 | 1  |
| 3731 | 0.039151 | -1 |
| 3732 | 0.039162 | 1  |
| 3733 | 0.039172 | -1 |
| 3734 | 0.039183 | -1 |
| 3735 | 0.039194 | 1  |
| 3736 | 0.039204 | -1 |
| 3737 | 0.039215 | 1  |
| 3738 | 0.039225 | -1 |
| 3739 | 0.039236 | 1  |
| 3740 | 0.039246 | -1 |
| 3741 | 0.039257 | 1  |
| 3742 | 0.039267 | -1 |
| 3743 | 0.039278 | 1  |
| 3744 | 0.039288 | -1 |
| 3745 | 0.039299 | 1  |
| 3746 | 0.039306 | -1 |
| 3747 | 0.03932  | 1  |
| 3748 | 0.039329 | -1 |
| 3749 | 0.03934  | 1  |
| 3750 | 0.03935  | -1 |
| 3751 | 0.039361 | -1 |
| 3752 | 0.039372 | 1  |
| 3753 | 0.039382 | -1 |
| 3754 | 0.039393 | 1  |
| 3755 | 0.039403 | -1 |
| 3756 | 0.039414 | 1  |
| 3757 | 0.039424 | -1 |
| 3758 | 0.039435 | 1  |
| 3759 | 0.039445 | -1 |
| 3760 | 0.039456 | 1  |
| 3761 | 0.039466 | -1 |
| 3762 | 0.039477 | 1  |
| 3763 | 0.039487 | -1 |
| 3764 | 0.039498 | 1  |
| 3765 | 0.039508 | -1 |
| 3766 | 0.039519 | -1 |
| 3767 | 0.03953  | 1  |
| 3768 | 0.03954  | -1 |
| 3769 | 0.039551 | 1  |
| 3770 | 0.039561 | -1 |
| 3771 | 0.039572 | 1  |
| 3772 | 0.039582 | -1 |
| 3773 | 0.039593 | 1  |
| 3774 | 0.039602 | -1 |
| 3775 | 0.039614 | 1  |
| 3776 | 0.039623 | -1 |
| 3777 | 0.039635 | 1  |
| 3778 | 0.039644 | -1 |
| 3779 | 0.039655 | 1  |
| 3780 | 0.039665 | -1 |
| 3781 | 0.039676 | -1 |
| 3782 | 0.039687 | 1  |
| 3783 | 0.039697 | -1 |
| 3784 | 0.039708 | 1  |
| 3785 | 0.039718 | -1 |
| 3786 | 0.039729 | 1  |
| 3787 | 0.039739 | -1 |
| 3788 | 0.03975  | 1  |
| 3789 | 0.03976  | -1 |
| 3790 | 0.039771 | 1  |
| 3791 | 0.039781 | -1 |
| 3792 | 0.039792 | 1  |
| 3793 | 0.039802 | -1 |
| 3794 | 0.039813 | 1  |
| 3795 | 0.039823 | -1 |
| 3796 | 0.039834 | 1  |
| 3797 | 0.039844 | -1 |
| 3798 | 0.039855 | -1 |
| 3799 | 0.039866 | 1  |

(续表)

|      |          |    |
|------|----------|----|
| 3800 | 0.039876 | -1 |
| 3801 | 0.039887 | 1  |
| 3802 | 0.039897 | -1 |
| 3803 | 0.039908 | 1  |
| 3804 | 0.039917 | -1 |
| 3805 | 0.039929 | 1  |
| 3806 | 0.039938 | -1 |
| 3807 | 0.039949 | 1  |
| 3808 | 0.039959 | -1 |
| 3809 | 0.03997  | 1  |
| 3810 | 0.03998  | -1 |
| 3811 | 0.039991 | 1  |

[0091]

[0092] 本发明上述实施例所提供了一种非线性光子晶体及其双光子频率和路径超纠缠产生方法,其中,非线性光子晶体选用室温、I类相位匹配( $e \rightarrow o+o$ )条件下的5%MgO掺杂的LiNbO<sub>3</sub>晶体。双光子频率和路径超纠缠产生方法中,泵浦光波长为775nm。泵浦光(频率为

$\omega_P, e$ 光) 沿着正 $z$ 方向正入射至非线性光子晶体表面, 经过相互作用后生成信号光(频率为 $\omega_S, o$ 光) 和闲置光(频率为 $\omega_I, o$ 光), 信号光和闲置光满足频率和路径超纠缠关系。

[0093] 对本发明上述实施例所提供的非线性光子晶体及其双光子频率和路径超纠缠产生方法进行仿真, 可以验证本发明上述实施例所提供的技术方案可以产生最大纠缠态且其他参量过程被有效抑制, 能够生成质量较高的超纠缠态。

[0094] 以上对本发明的具体实施例进行了描述。需要理解的是, 本发明并不局限于上述特定实施方式, 本领域技术人员可以在权利要求的范围内做出各种变形或修改, 这并不影响本发明的实质内容。

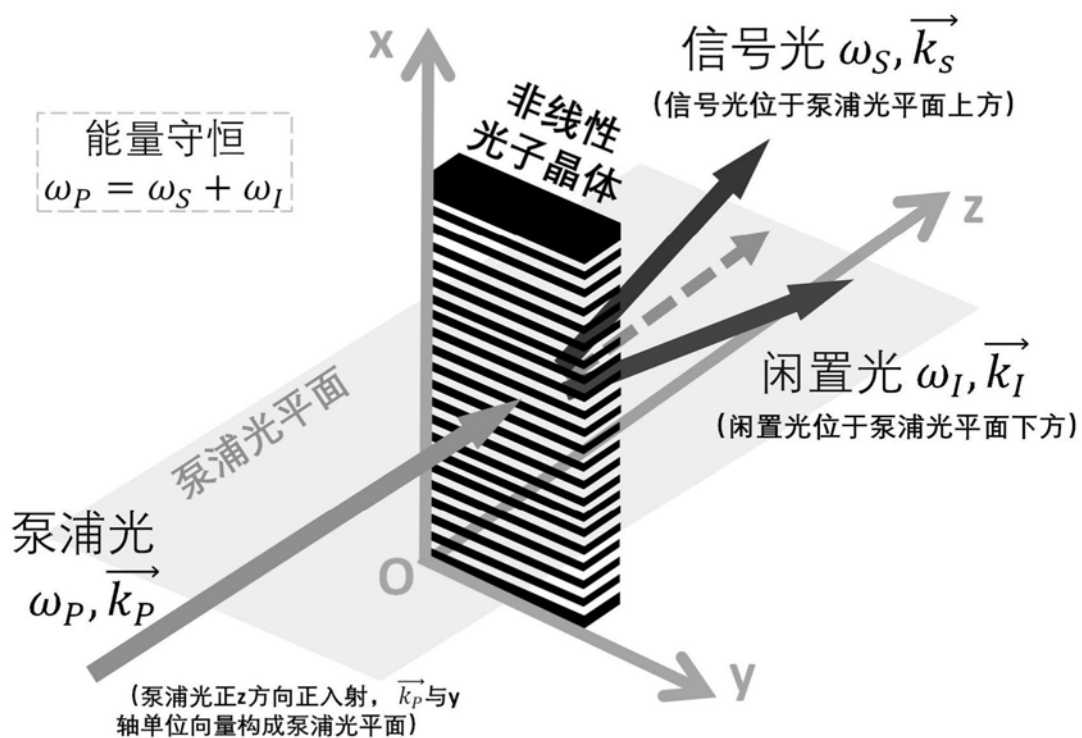


图1

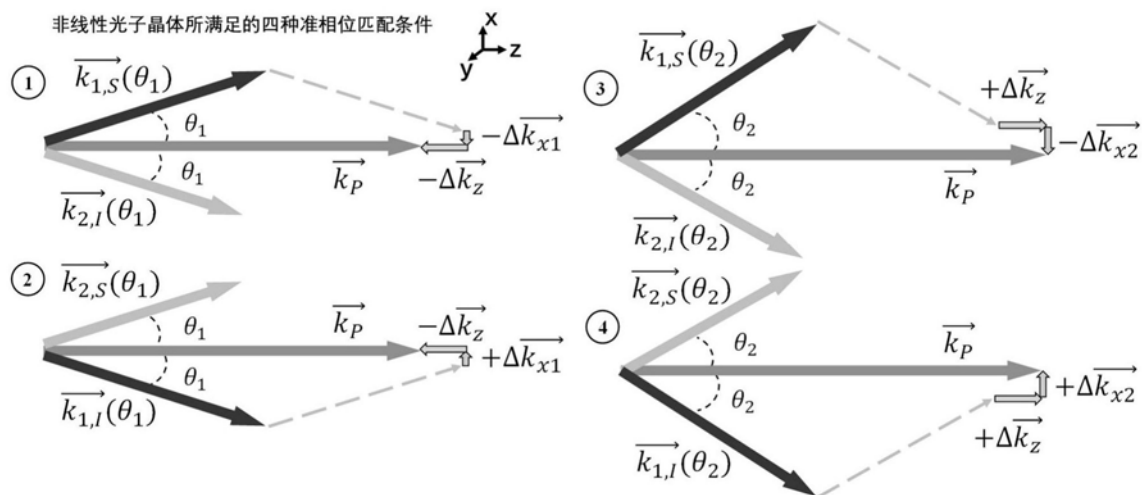


图2

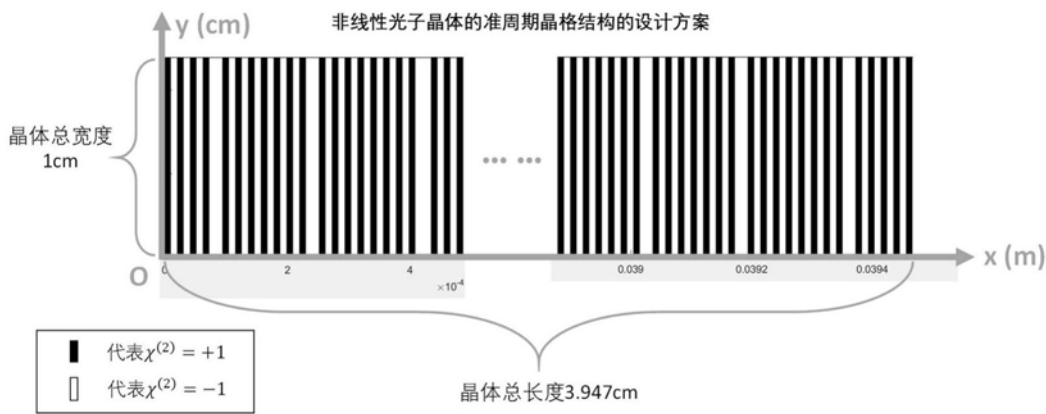


图3

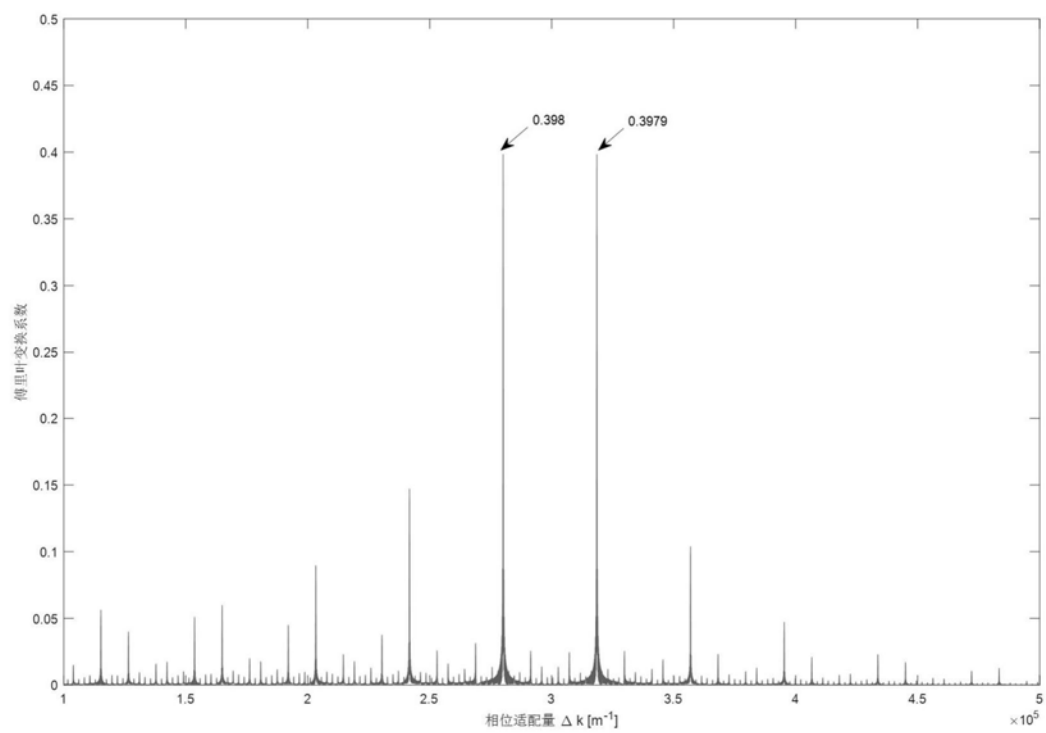


图4