レポート

松浦 健悟（物質基礎科学コース４年、学生証番号:08-183025）

2020 年 1 月 19 日

0.1 はじめに

0.2

0.3

0.4 結果

2020-01-18 19:59:08.482697
path1 = 10
path2 = 10

$$amplitude = \begin{cases} \frac{q}{q^2 z^2 - 1} & \text{for } \left|q^2 z^2\right| < 1 \\ -q \sum_{m=0}^{\infty} q^{2m} z^{2m} & \text{otherwise} \end{cases}$$

2020-01-18 19:59:09.413693
path1 = 10
path2 = 01

$$amplitude = \begin{cases} -\frac{z\left(q^2-1\right)}{q^2 z^4 - q^2 z^2 - z^2 + 1} & \text{for } \left|z^2\right| < 1 \wedge \left|q^2 z^2\right| < 1 \\ z\left(\frac{q^2}{q^2 z^2 - 1} + \sum_{m=0}^{\infty} z^{2m}\right) & \text{for } \left|q^2 z^2\right| < 1 \\ -q^2 z \sum_{m=0}^{\infty} q^{2m} z^{2m} - \frac{z}{z^2-1} & \text{for } \left|z^2\right| < 1 \\ z \sum_{m=0}^{\infty} z^{2m} \left(1 - q^{2m+2}\right) & \text{otherwise} \end{cases}$$

2020-01-18 19:59:08.482697
path1 = 10
path2 = 10

$$amplitude = \begin{cases} \frac{q}{q^2 z^2 - 1} & \text{for } \left|q^2 z^2\right| < 1 \\ -q \sum_{m=0}^{\infty} q^{2m} z^{2m} & \text{otherwise} \end{cases}$$

2020-01-18 19:59:09.413693
path1 = 10
path2 = 01

$$amplitude = \begin{cases} -\frac{z\left(q^2-1\right)}{q^2z^4-q^2z^2-z^2+1} & \text{for } \left|z^2\right| < 1 \wedge \left|q^2z^2\right| < 1 \\ z\left(\frac{q^2}{q^2z^2-1} + \sum_{m=0}^{\infty} z^{2m}\right) & \text{for } \left|q^2z^2\right| < 1 \\ -q^2z\sum_{m=0}^{\infty} q^{2m}z^{2m} - \frac{z}{z^2-1} & \text{for } \left|z^2\right| < 1 \\ z\sum_{m=0}^{\infty} z^{2m}\left(1-q^{2m+2}\right) & \text{otherwise} \end{cases}$$

2020-01-18 20:13:58.039929

path1 = 0000

path2 = 0000

$$amplitude = \begin{cases} -\frac{1}{q^4z^4-1} & \text{for } \left|q^4z^4\right| < 1 \\ \sum_{m=0}^{\infty} q^{4m}z^{4m} & \text{otherwise} \end{cases}$$

2020-01-18 20:13:58.286894

path1 = 1000

path2 = 1000

$$amplitude = \begin{cases} \frac{q}{q^4z^4-1} & \text{for } \left|q^4z^4\right| < 1 \\ -q\sum_{m=0}^{\infty} q^{4m}z^{4m} & \text{otherwise} \end{cases}$$

2020-01-18 20:14:02.173974

path1 = 1000

path2 = 0100

$$amplitude = \begin{cases} -\frac{z\left(q^2-1\right)}{q^6z^8-q^4z^4-q^2z^4+1} & \text{for } \left|q^2z^4\right| < 1 \wedge \left|q^4z^4\right| < 1 \\ z\left(\frac{q^2}{q^4z^4-1} + \sum_{m=0}^{\infty} q^{2m}z^{4m}\right) & \text{for } \left|q^4z^4\right| < 1 \\ -q^2z\sum_{m=0}^{\infty} q^{4m}z^{4m} - \frac{z}{q^2z^4-1} & \text{for } \left|q^2z^4\right| < 1 \\ z\sum_{m=0}^{\infty} q^{2m}z^{4m}\left(1-q^{2m+2}\right) & \text{otherwise} \end{cases}$$

2020-01-18 20:14:06.256172

path1 = 1000

path2 = 0010

$$amplitude = \begin{cases} -\frac{qz^2\left(q^2-1\right)}{q^6z^8-q^4z^4-q^2z^4+1} & \text{for } \left|q^2z^4\right| < 1 \wedge \left|q^4z^4\right| < 1 \\ qz^2\left(\frac{q^2}{q^4z^4-1} + \sum_{m=0}^{\infty} q^{2m}z^{4m}\right) & \text{for } \left|q^4z^4\right| < 1 \\ -qz^2\left(q^2\sum_{m=0}^{\infty} q^{4m}z^{4m} + \frac{1}{q^2z^4-1}\right) & \text{for } \left|q^2z^4\right| < 1 \\ qz^2\sum_{m=0}^{\infty} q^{2m}z^{4m}\left(1-q^{2m+2}\right) & \text{otherwise} \end{cases}$$

2020-01-18 20:14:10.203413

path1 = 1000

path2 = 0001

$$amplitude = \begin{cases} \frac{q^2 z^3 \left(1-q^2\right)}{q^6 z^8 - q^4 z^4 - q^2 z^4 + 1} & \text{for } \left|q^2 z^4\right| < 1 \wedge \left|q^4 z^4\right| < 1 \\ q^2 z^3 \left(\frac{q^2}{q^4 z^4 - 1} + \sum_{m=0}^{\infty} q^{2m} z^{4m}\right) & \text{for } \left|q^4 z^4\right| < 1 \\ -q^2 z^3 \left(q^2 \sum_{m=0}^{\infty} q^{4m} z^{4m} + \frac{1}{q^2 z^4 - 1}\right) & \text{for } \left|q^2 z^4\right| < 1 \\ q^2 z^3 \sum_{m=0}^{\infty} q^{2m} z^{4m} \left(1 - q^{2m+2}\right) & \text{otherwise} \end{cases}$$

2020-01-18 20:14:14.183871

path1 = 0100

path2 = 1000

$$amplitude = \begin{cases} \frac{q^2 z^3 \left(1-q^2\right)}{\left(q^2 z^4 - 1\right)\left(q^4 z^4 - 1\right)} & \text{for } \left|q^2 z^4\right| < 1 \wedge \left|q^4 z^4\right| < 1 \\ \frac{\sum_{m=0}^{\infty} q^{2m} z^{4m} + \frac{1}{q^4 z^4 - 1}}{z} & \text{for } \left|q^4 z^4\right| < 1 \\ \frac{\left(-q^2 z^3 + \frac{1}{z}\right) \sum_{m=0}^{\infty} q^{4m} z^{4m} - \frac{1}{z}}{q^2 z^4 - 1} & \text{for } \left|q^2 z^4\right| < 1 \\ \frac{\sum_{m=0}^{\infty} q^{2m} z^{4m} \left(1 - q^{2m}\right)}{z} & \text{otherwise} \end{cases}$$

2020-01-18 20:14:14.448602

path1 = 0100

path2 = 0100

$$amplitude = \begin{cases} \frac{q}{q^4 z^4 - 1} & \text{for } \left|q^4 z^4\right| < 1 \\ -q \sum_{m=0}^{\infty} q^{4m} z^{4m} & \text{otherwise} \end{cases}$$

2020-01-18 20:14:18.435874

path1 = 0100

path2 = 0010

$$amplitude = \begin{cases} -\frac{z\left(q^2 - 1\right)}{q^6 z^8 - q^4 z^4 - q^2 z^4 + 1} & \text{for } \left|q^2 z^4\right| < 1 \wedge \left|q^4 z^4\right| < 1 \\ z \left(\frac{q^2}{q^4 z^4 - 1} + \sum_{m=0}^{\infty} q^{2m} z^{4m}\right) & \text{for } \left|q^4 z^4\right| < 1 \\ -q^2 z \sum_{m=0}^{\infty} q^{4m} z^{4m} - \frac{z}{q^2 z^4 - 1} & \text{for } \left|q^2 z^4\right| < 1 \\ z \sum_{m=0}^{\infty} q^{2m} z^{4m} \left(1 - q^{2m+2}\right) & \text{otherwise} \end{cases}$$

2020-01-18 20:14:22.104506

path1 = 0100

path2 = 0001

$$amplitude = \begin{cases} -\frac{qz^2\left(q^2-1\right)}{q^6z^8-q^4z^4-q^2z^4+1} & \text{for } \left|q^2z^4\right| < 1 \wedge \left|q^4z^4\right| < 1 \\ qz^2\left(\frac{q^2}{q^4z^4-1}+\sum_{m=0}^{\infty} q^{2m}z^{4m}\right) & \text{for } \left|q^4z^4\right| < 1 \\ -qz^2\left(q^2\sum_{m=0}^{\infty} q^{4m}z^{4m}+\frac{1}{q^2z^4-1}\right) & \text{for } \left|q^2z^4\right| < 1 \\ qz^2\sum_{m=0}^{\infty} q^{2m}z^{4m}\left(1-q^{2m+2}\right) & \text{otherwise} \end{cases}$$

2020-01-18 20:14:25.180482

path1 = 0010

path2 = 1000

$$amplitude = \begin{cases} \frac{qz^2\left(1-q^2\right)}{\left(q^2z^4-1\right)\left(q^4z^4-1\right)} & \text{for } \left|q^2z^4\right| < 1 \wedge \left|q^4z^4\right| < 1 \\ \frac{q^4z^4\sum_{m=0}^{\infty} q^{2m}z^{4m}-\sum_{m=0}^{\infty} q^{2m}z^{4m}+1}{q^5z^6-qz^2} & \text{for } \left|q^4z^4\right| < 1 \\ -\frac{q^2z^4\sum_{m=0}^{\infty} q^{4m}z^{4m}-\sum_{m=0}^{\infty} q^{4m}z^{4m}+1}{q^3z^6-qz^2} & \text{for } \left|q^2z^4\right| < 1 \\ \frac{\sum_{m=0}^{\infty} q^{2m}z^{4m}\left(1-q^{2m}\right)}{qz^2} & \text{otherwise} \end{cases}$$

2020-01-18 20:14:28.172664

path1 = 0010

path2 = 0100

$$amplitude = \begin{cases} \frac{q^2z^3\left(1-q^2\right)}{\left(q^2z^4-1\right)\left(q^4z^4-1\right)} & \text{for } \left|q^2z^4\right| < 1 \wedge \left|q^4z^4\right| < 1 \\ \frac{\sum_{m=0}^{\infty} q^{2m}z^{4m}+\frac{1}{q^4z^4-1}}{z} & \text{for } \left|q^4z^4\right| < 1 \\ \frac{\left(-q^2z^3+\frac{1}{z}\right)\sum_{m=0}^{\infty} q^{4m}z^{4m}-\frac{1}{z}}{q^2z^4-1} & \text{for } \left|q^2z^4\right| < 1 \\ \frac{\sum_{m=0}^{\infty} q^{2m}z^{4m}\left(1-q^{2m}\right)}{z} & \text{otherwise} \end{cases}$$

2020-01-18 20:14:28.392682

path1 = 0010

path2 = 0010

$$amplitude = \begin{cases} \frac{q}{q^4z^4-1} & \text{for } \left|q^4z^4\right| < 1 \\ -q\sum_{m=0}^{\infty} q^{4m}z^{4m} & \text{otherwise} \end{cases}$$

2020-01-18 20:14:32.022315

path1 = 0010

path2 = 0001

$$amplitude = \begin{cases} -\frac{z\left(q^2-1\right)}{q^6 z^8-q^4 z^4-q^2 z^4+1} & \text{for } \left|q^2 z^4\right|<1 \wedge \left|q^4 z^4\right|<1 \\ z\left(\frac{q^2}{q^4 z^4-1}+\sum_{m=0}^{\infty} q^{2m} z^{4m}\right) & \text{for } \left|q^4 z^4\right|<1 \\ -q^2 z \sum_{m=0}^{\infty} q^{4m} z^{4m}-\frac{z}{q^2 z^4-1} & \text{for } \left|q^2 z^4\right|<1 \\ z \sum_{m=0}^{\infty} q^{2m} z^{4m}\left(1-q^{2m+2}\right) & \text{otherwise} \end{cases}$$

2020-01-18 20:14:35.435881

path1 = 0001

path2 = 1000

$$amplitude = \begin{cases} \frac{z\left(1-q^2\right)}{\left(q^2 z^4-1\right)\left(q^4 z^4-1\right)} & \text{for } \left|q^2 z^4\right|<1 \wedge \left|q^4 z^4\right|<1 \\ \frac{q^4 z^4 \sum_{m=0}^{\infty} q^{2m} z^{4m}-\sum_{m=0}^{\infty} q^{2m} z^{4m}+1}{q^6 z^7-q^2 z^3} & \text{for } \left|q^4 z^4\right|<1 \\ \frac{\left(-z+\frac{1}{q^2 z^3}\right) \sum_{m=0}^{\infty} q^{4m} z^{4m}-\frac{1}{q^2 z^3}}{q^2 z^4-1} & \text{for } \left|q^2 z^4\right|<1 \\ \frac{\sum_{m=0}^{\infty} q^{2m} z^{4m}\left(1-q^{2m}\right)}{q^2 z^3} & \text{otherwise} \end{cases}$$

2020-01-18 20:14:39.641138

path1 = 0001

path2 = 0100

$$amplitude = \begin{cases} \frac{q z^2\left(1-q^2\right)}{\left(q^2 z^4-1\right)\left(q^4 z^4-1\right)} & \text{for } \left|q^2 z^4\right|<1 \wedge \left|q^4 z^4\right|<1 \\ \frac{q^4 z^4 \sum_{m=0}^{\infty} q^{2m} z^{4m}-\sum_{m=0}^{\infty} q^{2m} z^{4m}+1}{q^5 z^6-q z^2} & \text{for } \left|q^4 z^4\right|<1 \\ -\frac{q^2 z^4 \sum_{m=0}^{\infty} q^{4m} z^{4m}-\sum_{m=0}^{\infty} q^{4m} z^{4m}+1}{q^3 z^6-q z^2} & \text{for } \left|q^2 z^4\right|<1 \\ \frac{\sum_{m=0}^{\infty} q^{2m} z^{4m}\left(1-q^{2m}\right)}{q z^2} & \text{otherwise} \end{cases}$$

2020-01-18 20:14:42.909649

path1 = 0001

path2 = 0010

$$amplitude = \begin{cases} \frac{q^2 z^3\left(1-q^2\right)}{\left(q^2 z^4-1\right)\left(q^4 z^4-1\right)} & \text{for } \left|q^2 z^4\right|<1 \wedge \left|q^4 z^4\right|<1 \\ \frac{\sum_{m=0}^{\infty} q^{2m} z^{4m}+\frac{1}{q^4 z^4-1}}{z} & \text{for } \left|q^4 z^4\right|<1 \\ \frac{\left(-q^2 z^3+\frac{1}{z}\right) \sum_{m=0}^{\infty} q^{4m} z^{4m}-\frac{1}{z}}{q^2 z^4-1} & \text{for } \left|q^2 z^4\right|<1 \\ \frac{\sum_{m=0}^{\infty} q^{2m} z^{4m}\left(1-q^{2m}\right)}{z} & \text{otherwise} \end{cases}$$

2020-01-18 20:14:43.146013

path1 = 0001

path2 = 0001

$$amplitude = \begin{cases} \frac{q}{q^4 z^4 - 1} & \text{for } \left|q^4 z^4\right| < 1 \\ -q \sum_{m=0}^{\infty} q^{4m} z^{4m} & \text{otherwise} \end{cases}$$

2020-01-18 20:14:43.418617

path1 = 1100

path2 = 1100

$$amplitude = \begin{cases} -\frac{q^2}{q^4 z^4 - 1} & \text{for } \left|q^4 z^4\right| < 1 \\ q^2 \sum_{m=0}^{\infty} q^{4m} z^{4m} & \text{otherwise} \end{cases}$$

2020-01-18 20:14:45.627930

path1 = 1100

path2 = 1010

$$amplitude = \begin{cases} \frac{qz\left(q^2 - 1\right)}{q^6 z^8 - q^4 z^4 - q^2 z^4 + 1} & \text{for } \left|q^2 z^4\right| < 1 \wedge \left|q^4 z^4\right| < 1 \\ q^3 z \sum_{m=0}^{\infty} q^{4m} z^{4m} + \frac{qz}{q^2 z^4 - 1} & \text{for } \left|q^2 z^4\right| < 1 \\ -qz \left(\frac{q^2}{q^4 z^4 - 1} + \sum_{m=0}^{\infty} q^{2m} z^{4m} \right) & \text{for } \left|q^4 z^4\right| < 1 \\ qz \sum_{m=0}^{\infty} q^{2m} z^{4m} \left(q^{2m+2} - 1\right) & \text{otherwise} \end{cases}$$

2020-01-18 20:14:47.701813

path1 = 1100

path2 = 1001

$$amplitude = \begin{cases} \frac{q^2 z^2 \left(q^2 - 1\right)}{q^6 z^8 - q^4 z^4 - q^2 z^4 + 1} & \text{for } \left|q^2 z^4\right| < 1 \wedge \left|q^4 z^4\right| < 1 \\ q^2 z^2 \left(q^2 \sum_{m=0}^{\infty} q^{4m} z^{4m} + \frac{1}{q^2 z^4 - 1} \right) & \text{for } \left|q^2 z^4\right| < 1 \\ -q^2 z^2 \left(\frac{q^2}{q^4 z^4 - 1} + \sum_{m=0}^{\infty} q^{2m} z^{4m} \right) & \text{for } \left|q^4 z^4\right| < 1 \\ q^2 z^2 \sum_{m=0}^{\infty} q^{2m} z^{4m} \left(q^{2m+2} - 1\right) & \text{otherwise} \end{cases}$$

2020-01-18 20:14:49.538656

path1 = 1100

path2 = 0110

$$amplitude = \begin{cases} \frac{q^2 z^2 \left(q^2-1\right)}{q^6 z^8 - q^4 z^4 - q^2 z^4 + 1} & \text{for } \left|q^2 z^4\right| < 1 \wedge \left|q^4 z^4\right| < 1 \\ q^2 z^2 \left(q^2 \sum_{m=0}^{\infty} q^{4m} z^{4m} + \frac{1}{q^2 z^4 - 1}\right) & \text{for } \left|q^2 z^4\right| < 1 \\ -q^2 z^2 \left(\frac{q^2}{q^4 z^4 - 1} + \sum_{m=0}^{\infty} q^{2m} z^{4m}\right) & \text{for } \left|q^4 z^4\right| < 1 \\ q^2 z^2 \sum_{m=0}^{\infty} q^{2m} z^{4m} \left(q^{2m+2} - 1\right) & \text{otherwise} \end{cases}$$

2020-01-18 20:14:51.428655

path1 = 1100

path2 = 0101

$$amplitude = \begin{cases} \frac{q^3 z^3 \left(q^2-1\right)}{q^6 z^8 - q^4 z^4 - q^2 z^4 + 1} & \text{for } \left|q^2 z^4\right| < 1 \wedge \left|q^4 z^4\right| < 1 \\ q^3 z^3 \left(q^2 \sum_{m=0}^{\infty} q^{4m} z^{4m} + \frac{1}{q^2 z^4 - 1}\right) & \text{for } \left|q^2 z^4\right| < 1 \\ -q^3 z^3 \left(\frac{q^2}{q^4 z^4 - 1} + \sum_{m=0}^{\infty} q^{2m} z^{4m}\right) & \text{for } \left|q^4 z^4\right| < 1 \\ q^3 z^3 \sum_{m=0}^{\infty} q^{2m} z^{4m} \left(q^{2m+2} - 1\right) & \text{otherwise} \end{cases}$$

2020-01-18 20:14:57.160564

path1 = 1100

path2 = 0011

$$amplitude = \begin{cases} \frac{z^4 \left(-q^6 + q^4 + q^2 - 1\right)}{q^6 z^{12} - q^6 z^8 - q^4 z^8 + q^4 z^4 - q^2 z^8 + q^2 z^4 + z^4 - 1} & \text{for } \left|z^4\right| < 1 \wedge \left|q^2 z^4\right| < 1 \wedge \left|q^4 z^4\right| < 1 \\ z^4 \left(-\frac{q^6}{q^4 z^4 - 1} + \frac{q^4}{q^2 z^4 - 1} + \frac{q^2}{q^2 z^4 - 1} + \sum_{m=0}^{\infty} z^{4m}\right) & \text{for } \left|q^2 z^4\right| < 1 \wedge \left|q^4 z^4\right| < 1 \\ -z^4 \left(\frac{q^6}{q^4 z^4 - 1} + q^4 \sum_{m=0}^{\infty} q^{2m} z^{4m} + q^2 \sum_{m=0}^{\infty} q^{2m} z^{4m} + \frac{1}{z^4 - 1}\right) & \text{for } \left|z^4\right| < 1 \wedge \left|q^4 z^4\right| < 1 \\ \frac{z^4 \left(-q^6 + \sum_{m=0}^{\infty} z^{4m} \left(q^4 z^4 + q^{2m+2} + q^{2m+4} - q^{2m+6} z^4 - q^{2m+8} z^4 - 1\right)\right)}{q^4 z^4 - 1} & \text{for } \left|q^4 z^4\right| < 1 \\ z^4 \left(q^6 \sum_{m=0}^{\infty} q^{4m} z^{4m} + \frac{q^4}{q^2 z^4 - 1} + \frac{q^2}{q^2 z^4 - 1} - \frac{1}{z^4 - 1}\right) & \text{for } \left|z^4\right| < 1 \wedge \left|q^2 z^4\right| < 1 \\ z^4 \left(\frac{q^4}{q^2 z^4 - 1} + \frac{q^2}{q^2 z^4 - 1} + \sum_{m=0}^{\infty} z^{4m} \left(-\frac{q^{4m+6}}{q^2 z^4 - 1} + \frac{q^{4m+8} z^4}{q^2 z^4 - 1} + 1\right)\right) & \text{for } \left|q^2 z^4\right| < 1 \\ \frac{z^4 \left(q^2 \sum_{m=0}^{\infty} q^{2m} z^{4m} \left(-q^2 z^4 + q^2 + q^{2m+4} z^4 - q^{2m+4} - z^4 + 1\right) - 1\right)}{z^4 - 1} & \text{for } \left|z^4\right| < 1 \\ z^4 \sum_{m=0}^{\infty} z^{4m} \left(-q^{2m+2} - q^{2m+4} + q^{4m+6} + 1\right) & \text{otherwise} \end{cases}$$

2020-01-18 20:14:59.194923

path1 = 1010

path2 = 1100

$$amplitude = \begin{cases} \frac{q^3 z^3 \left(q^2-1\right)}{\left(q^2 z^4 - 1\right)\left(q^4 z^4 - 1\right)} & \text{for } \left|q^2 z^4\right| < 1 \wedge \left|q^4 z^4\right| < 1 \\ \frac{q^3 z^4 \sum_{m=0}^{\infty} q^{4m} z^{4m} - q \sum_{m=0}^{\infty} q^{4m} z^{4m} + q}{q^2 z^5 - z} & \text{for } \left|q^2 z^4\right| < 1 \\ \frac{q\left(\left(-q^4 z^3 + \frac{1}{z}\right) \sum_{m=0}^{\infty} q^{2m} z^{4m} - \frac{1}{z}\right)}{q^4 z^4 - 1} & \text{for } \left|q^4 z^4\right| < 1 \\ \frac{q \sum_{m=0}^{\infty} q^{2m} z^{4m} \left(q^{2m} - 1\right)}{z} & \text{otherwise} \end{cases}$$

2020-01-18 20:14:59.469255

path1 = 1010

path2 = 1010

$$amplitude = \begin{cases} -\frac{q^2}{q^4 z^4 - 1} & \text{for } \left|q^4 z^4\right| < 1 \\ q^2 \sum_{m=0}^{\infty} q^{4m} z^{4m} & \text{otherwise} \end{cases}$$

2020-01-18 20:15:01.465646

path1 = 1010

path2 = 1001

$$amplitude = \begin{cases} \frac{qz\left(q^2-1\right)}{q^6 z^8 - q^4 z^4 - q^2 z^4 + 1} & \text{for } \left|q^2 z^4\right| < 1 \wedge \left|q^4 z^4\right| < 1 \\ q^3 z \sum_{m=0}^{\infty} q^{4m} z^{4m} + \frac{qz}{q^2 z^4 - 1} & \text{for } \left|q^2 z^4\right| < 1 \\ -qz \left(\frac{q^2}{q^4 z^4 - 1} + \sum_{m=0}^{\infty} q^{2m} z^{4m} \right) & \text{for } \left|q^4 z^4\right| < 1 \\ qz \sum_{m=0}^{\infty} q^{2m} z^{4m} \left(q^{2m+2} - 1\right) & \text{otherwise} \end{cases}$$

2020-01-18 20:15:03.362482

path1 = 1010

path2 = 0110

$$amplitude = \begin{cases} \frac{qz\left(q^2-1\right)}{q^6 z^8 - q^4 z^4 - q^2 z^4 + 1} & \text{for } \left|q^2 z^4\right| < 1 \wedge \left|q^4 z^4\right| < 1 \\ q^3 z \sum_{m=0}^{\infty} q^{4m} z^{4m} + \frac{qz}{q^2 z^4 - 1} & \text{for } \left|q^2 z^4\right| < 1 \\ -qz \left(\frac{q^2}{q^4 z^4 - 1} + \sum_{m=0}^{\infty} q^{2m} z^{4m} \right) & \text{for } \left|q^4 z^4\right| < 1 \\ qz \sum_{m=0}^{\infty} q^{2m} z^{4m} \left(q^{2m+2} - 1\right) & \text{otherwise} \end{cases}$$

2020-01-18 20:15:07.934409

path1 = 1010

path2 = 0101

$$amplitude = \begin{cases} -z^2 \left(\frac{q^4}{q^4 z^4-1} - \frac{2q^2}{q^2 z^4-1} + \frac{1}{z^4-1}\right) & \text{for } \left|z^4\right| < 1 \wedge \left|q^2 z^4\right| < 1 \wedge \left|q^4 z^4\right| < 1 \\ z^2 \left(-\frac{q^4}{q^4 z^4-1} + \frac{2q^2}{q^2 z^4-1} + \sum_{m=0}^{\infty} z^{4m}\right) & \text{for } \left|q^2 z^4\right| < 1 \wedge \left|q^4 z^4\right| < 1 \\ -z^2 \left(\frac{q^4}{q^4 z^4-1} + 2q^2 \sum_{m=0}^{\infty} q^{2m} z^{4m} + \frac{1}{z^4-1}\right) & \text{for } \left|z^4\right| < 1 \wedge \left|q^4 z^4\right| < 1 \\ z^2 \left(-\frac{q^4}{q^4 z^4-1} + \sum_{m=0}^{\infty} z^{4m} \left(\frac{2q^{2m+2}}{q^4 z^4-1} - \frac{2q^{2m+6} z^4}{q^4 z^4-1} + 1\right)\right) & \text{for } \left|q^4 z^4\right| < 1 \\ z^2 \left(q^4 \sum_{m=0}^{\infty} q^{4m} z^{4m} + \frac{2q^2}{q^2 z^4-1} - \frac{1}{z^4-1}\right) & \text{for } \left|z^4\right| < 1 \wedge \left|q^2 z^4\right| < 1 \\ z^2 \left(\frac{2q^2}{q^2 z^4-1} + \sum_{m=0}^{\infty} z^{4m} \left(-\frac{q^{4m+4}}{q^2 z^4-1} + \frac{q^{4m+6} z^4}{q^2 z^4-1} + 1\right)\right) & \text{for } \left|q^2 z^4\right| < 1 \\ \frac{z^2 \left(q^2 \sum_{m=0}^{\infty} q^{2m} z^{4m} \left(q^{2m+2} z^4 - q^{2m+2} - 2z^4 + 2\right) - 1\right)}{z^4-1} & \text{for } \left|z^4\right| < 1 \\ z^2 \sum_{m=0}^{\infty} z^{4m} \left(-2q^{2m+2} + q^{4m+4} + 1\right) & \text{otherwise} \end{cases}$$

2020-01-18 20:15:09.685624

path1 = 1010

path2 = 0011

$$amplitude = \begin{cases} \frac{q^3 z^3 \left(q^2-1\right)}{q^6 z^8 - q^4 z^4 - q^2 z^4 + 1} & \text{for } \left|q^2 z^4\right| < 1 \wedge \left|q^4 z^4\right| < 1 \\ q^3 z^3 \left(q^2 \sum_{m=0}^{\infty} q^{4m} z^{4m} + \frac{1}{q^2 z^4-1}\right) & \text{for } \left|q^2 z^4\right| < 1 \\ -q^3 z^3 \left(\frac{q^2}{q^4 z^4-1} + \sum_{m=0}^{\infty} q^{2m} z^{4m}\right) & \text{for } \left|q^4 z^4\right| < 1 \\ q^3 z^3 \sum_{m=0}^{\infty} q^{2m} z^{4m} \left(q^{2m+2} - 1\right) & \text{otherwise} \end{cases}$$

2020-01-18 20:15:11.358737

path1 = 1001

path2 = 1100

$$amplitude = \begin{cases} \frac{q^2 z^2 \left(q^2-1\right)}{\left(q^2 z^4-1\right)\left(q^4 z^4-1\right)} & \text{for } \left|q^2 z^4\right| < 1 \wedge \left|q^4 z^4\right| < 1 \\ \frac{q^2 z^4 \sum_{m=0}^{\infty} q^{4m} z^{4m} - \sum_{m=0}^{\infty} q^{4m} z^{4m} + 1}{q^2 z^6 - z^2} & \text{for } \left|q^2 z^4\right| < 1 \\ -\frac{q^4 z^4 \sum_{m=0}^{\infty} q^{2m} z^{4m} - \sum_{m=0}^{\infty} q^{2m} z^{4m} + 1}{q^4 z^6 - z^2} & \text{for } \left|q^4 z^4\right| < 1 \\ \frac{\sum_{m=0}^{\infty} q^{2m} z^{4m} \left(q^{2m} - 1\right)}{z^2} & \text{otherwise} \end{cases}$$

2020-01-18 20:15:13.061218

path1 = 1001

path2 = 1010

$$amplitude = \begin{cases} \frac{q^3 z^3 \left(q^2-1\right)}{\left(q^2 z^4-1\right)\left(q^4 z^4-1\right)} & \text{for } \left|q^2 z^4\right| < 1 \wedge \left|q^4 z^4\right| < 1 \\ \frac{q^3 z^4 \sum_{m=0}^{\infty} q^{4m} z^{4m} - q \sum_{m=0}^{\infty} q^{4m} z^{4m} + q}{q^2 z^5 - z} & \text{for } \left|q^2 z^4\right| < 1 \\ \frac{q\left(\left(-q^4 z^3 + \frac{1}{z}\right) \sum_{m=0}^{\infty} q^{2m} z^{4m} - \frac{1}{z}\right)}{q^4 z^4 - 1} & \text{for } \left|q^4 z^4\right| < 1 \\ \frac{q \sum_{m=0}^{\infty} q^{2m} z^{4m} \left(q^{2m} - 1\right)}{z} & \text{otherwise} \end{cases}$$

2020-01-18 20:15:13.314423

path1 = 1001

path2 = 1001

$$amplitude = \begin{cases} -\frac{q^2}{q^4 z^4 - 1} & \text{for } \left|q^4 z^4\right| < 1 \\ q^2 \sum_{m=0}^{\infty} q^{4m} z^{4m} & \text{otherwise} \end{cases}$$

2020-01-18 20:15:17.616254

path1 = 1001

path2 = 0110

$$amplitude = \begin{cases} \frac{z^4\left(-q^6+q^4+q^2-1\right)}{q^6 z^{12}-q^6 z^8-q^4 z^8+q^4 z^4-q^2 z^8+q^2 z^4+z^4-1} & \text{for } \left|z^4\right| < 1 \wedge \left|q^2 z^4\right| < 1 \wedge \left|q^4 z^4\right| < 1 \\ \frac{q^6 z^4}{q^6 z^8-q^4 z^4-q^2 z^4+1} + \sum_{m=0}^{\infty} z^{4m} - \frac{1}{q^6 z^8-q^4 z^4-q^2 z^4+1} & \text{for } \left|q^2 z^4\right| < 1 \wedge \left|q^4 z^4\right| < 1 \\ q^2 \sum_{m=0}^{\infty} q^{4m} z^{4m} - \frac{q^2}{q^2 z^8-q^2 z^4-z^4+1} + \frac{z^4}{q^2 z^8-q^2 z^4-z^4+1} & \text{for } \left|z^4\right| < 1 \wedge \left|q^2 z^4\right| < 1 \\ \frac{q^2}{q^2 z^4-1} + \sum_{m=0}^{\infty} z^{4m}\left(-\frac{q^{4m+2}}{q^2 z^4-1} + \frac{q^{4m+4} z^4}{q^2 z^4-1} + 1\right) + \frac{1}{q^2 z^4-1} & \text{for } \left|q^2 z^4\right| < 1 \\ -(q^2 \sum_{m=0}^{\infty} q^{2m} z^{4m} + \frac{q^2}{q^4 z^4-1} + \sum_{m=0}^{\infty} q^{2m} z^{4m} + \frac{1}{z^4-1}) & \text{for } \left|z^4\right| < 1 \wedge \left|q^4 z^4\right| < 1 \\ \frac{-q^2+\sum_{m=0}^{\infty} z^{4m}\left(q^4 z^4+q^{2m}+q^{2(m+1)}-q^{2m+4} z^4-q^{2m+6} z^4-1\right)}{q^4 z^4-1} & \text{for } \left|q^4 z^4\right| < 1 \\ \frac{\sum_{m=0}^{\infty} q^{2m} z^{4m}\left(-q^2 z^4+q^2+q^{2m+2} z^4-q^{2m+2}-z^4+1\right)-1}{z^4-1} & \text{for } \left|z^4\right| < 1 \\ \sum_{m=0}^{\infty} z^{4m}\left(q^{2m}\left(-q^2+q^{2(m+1)}-1\right)+1\right) & \text{otherwise} \end{cases}$$

2020-01-18 20:15:19.438850

path1 = 1001

path2 = 0101

$$amplitude = \begin{cases} \frac{qz\left(q^2-1\right)}{q^6 z^8-q^4 z^4-q^2 z^4+1} & \text{for } \left|q^2 z^4\right| < 1 \wedge \left|q^4 z^4\right| < 1 \\ q^3 z \sum_{m=0}^{\infty} q^{4m} z^{4m} + \frac{qz}{q^2 z^4-1} & \text{for } \left|q^2 z^4\right| < 1 \\ -qz\left(\frac{q^2}{q^4 z^4-1} + \sum_{m=0}^{\infty} q^{2m} z^{4m}\right) & \text{for } \left|q^4 z^4\right| < 1 \\ qz \sum_{m=0}^{\infty} q^{2m} z^{4m}\left(q^{2m+2}-1\right) & \text{otherwise} \end{cases}$$

2020-01-18 20:15:21.291204

path1 = 1001

path2 = 0011

$$amplitude = \begin{cases} \frac{q^2 z^2 \left(q^2-1\right)}{q^6 z^8 - q^4 z^4 - q^2 z^4 + 1} & \text{for } \left|q^2 z^4\right| < 1 \wedge \left|q^4 z^4\right| < 1 \\ q^2 z^2 \left(q^2 \sum_{m=0}^{\infty} q^{4m} z^{4m} + \frac{1}{q^2 z^4 - 1}\right) & \text{for } \left|q^2 z^4\right| < 1 \\ -q^2 z^2 \left(\frac{q^2}{q^4 z^4 - 1} + \sum_{m=0}^{\infty} q^{2m} z^{4m}\right) & \text{for } \left|q^4 z^4\right| < 1 \\ q^2 z^2 \sum_{m=0}^{\infty} q^{2m} z^{4m} \left(q^{2m+2} - 1\right) & \text{otherwise} \end{cases}$$

2020-01-18 20:15:22.767789

path1 = 0110

path2 = 1100

$$amplitude = \begin{cases} \frac{q^2 z^2 \left(q^2-1\right)}{\left(q^2 z^4 - 1\right)\left(q^4 z^4 - 1\right)} & \text{for } \left|q^2 z^4\right| < 1 \wedge \left|q^4 z^4\right| < 1 \\ \frac{q^2 z^4 \sum_{m=0}^{\infty} q^{4m} z^{4m} - \sum_{m=0}^{\infty} q^{4m} z^{4m} + 1}{q^2 z^6 - z^2} & \text{for } \left|q^2 z^4\right| < 1 \\ -\frac{q^4 z^4 \sum_{m=0}^{\infty} q^{2m} z^{4m} - \sum_{m=0}^{\infty} q^{2m} z^{4m} + 1}{q^4 z^6 - z^2} & \text{for } \left|q^4 z^4\right| < 1 \\ \frac{\sum_{m=0}^{\infty} q^{2m} z^{4m} \left(q^{2m} - 1\right)}{z^2} & \text{otherwise} \end{cases}$$

2020-01-18 20:15:24.459053

path1 = 0110

path2 = 1010

$$amplitude = \begin{cases} \frac{q^3 z^3 \left(q^2-1\right)}{\left(q^2 z^4 - 1\right)\left(q^4 z^4 - 1\right)} & \text{for } \left|q^2 z^4\right| < 1 \wedge \left|q^4 z^4\right| < 1 \\ \frac{q^3 z^4 \sum_{m=0}^{\infty} q^{4m} z^{4m} - q \sum_{m=0}^{\infty} q^{4m} z^{4m} + q}{q^2 z^5 - z} & \text{for } \left|q^2 z^4\right| < 1 \\ \frac{q\left(\left(-q^4 z^3 + \frac{1}{z}\right) \sum_{m=0}^{\infty} q^{2m} z^{4m} - \frac{1}{z}\right)}{q^4 z^4 - 1} & \text{for } \left|q^4 z^4\right| < 1 \\ \frac{q \sum_{m=0}^{\infty} q^{2m} z^{4m} \left(q^{2m} - 1\right)}{z} & \text{otherwise} \end{cases}$$

2020-01-18 20:15:28.009658

path1 = 0110

path2 = 1001

$$amplitude = \begin{cases} \frac{z^4 \left(-q^6 + q^4 + q^2 - 1\right)}{q^6 z^{12} - q^6 z^8 - q^4 z^8 + q^4 z^4 - q^2 z^8 + q^2 z^4 + z^4 - 1} & \text{for } \left|z^4\right| < 1 \wedge \left|q^2 z^4\right| < 1 \wedge \left|q^4 z^4\right| < 1 \\ \frac{q^6 z^4}{q^6 z^8 - q^4 z^4 - q^2 z^4 + 1} + \sum_{m=0}^{\infty} z^{4m} - \frac{1}{q^6 z^8 - q^4 z^4 - q^2 z^4 + 1} & \text{for } \left|q^2 z^4\right| < 1 \wedge \left|q^4 z^4\right| < 1 \\ q^2 \sum_{m=0}^{\infty} q^{4m} z^{4m} - \frac{q^2}{q^2 z^8 - q^2 z^4 - z^4 + 1} + \frac{z^4}{q^2 z^8 - q^2 z^4 - z^4 + 1} & \text{for } \left|z^4\right| < 1 \wedge \left|q^2 z^4\right| < 1 \\ \frac{q^2}{q^2 z^4 - 1} + \sum_{m=0}^{\infty} z^{4m} \left(-\frac{q^{4m+2}}{q^2 z^4 - 1} + \frac{q^{4m+4} z^4}{q^2 z^4 - 1} + 1\right) + \frac{1}{q^2 z^4 - 1} & \text{for } \left|q^2 z^4\right| < 1 \\ -(q^2 \sum_{m=0}^{\infty} q^{2m} z^{4m} + \frac{q^2}{q^4 z^4 - 1} + \sum_{m=0}^{\infty} q^{2m} z^{4m} + \frac{1}{z^4 - 1}) & \text{for } \left|z^4\right| < 1 \wedge \left|q^4 z^4\right| < 1 \\ \frac{-q^2 + \sum_{m=0}^{\infty} z^{4m} \left(q^4 z^4 + q^{2m} + q^{2(m+1)} - q^{2m+4} z^4 - q^{2m+6} z^4 - 1\right)}{q^4 z^4 - 1} & \text{for } \left|q^4 z^4\right| < 1 \\ \frac{\sum_{m=0}^{\infty} q^{2m} z^{4m} \left(-q^2 z^4 + q^2 + q^{2m+2} z^4 - q^{2m+2} - z^4 + 1\right) - 1}{z^4 - 1} & \text{for } \left|z^4\right| < 1 \\ \sum_{m=0}^{\infty} z^{4m} \left(q^{2m} \left(-q^2 + q^{2(m+1)} - 1\right) + 1\right) & \text{otherwise} \end{cases}$$

2020-01-18 20:15:28.243860

path1 = 0110

path2 = 0110

$$amplitude = \begin{cases} -\frac{q^2}{q^4 z^4 - 1} & \text{for } \left|q^4 z^4\right| < 1 \\ q^2 \sum_{m=0}^{\infty} q^{4m} z^{4m} & \text{otherwise} \end{cases}$$

2020-01-18 20:15:29.915651

path1 = 0110

path2 = 0101

$$amplitude = \begin{cases} \frac{qz\left(q^2-1\right)}{q^6 z^8 - q^4 z^4 - q^2 z^4 + 1} & \text{for } \left|q^2 z^4\right| < 1 \wedge \left|q^4 z^4\right| < 1 \\ q^3 z \sum_{m=0}^{\infty} q^{4m} z^{4m} + \frac{qz}{q^2 z^4 - 1} & \text{for } \left|q^2 z^4\right| < 1 \\ -qz \left(\frac{q^2}{q^4 z^4 - 1} + \sum_{m=0}^{\infty} q^{2m} z^{4m}\right) & \text{for } \left|q^4 z^4\right| < 1 \\ qz \sum_{m=0}^{\infty} q^{2m} z^{4m} \left(q^{2m+2} - 1\right) & \text{otherwise} \end{cases}$$

2020-01-18 20:15:31.589580

path1 = 0110

path2 = 0011

$$amplitude = \begin{cases} \frac{q^2 z^2 \left(q^2-1\right)}{q^6 z^8 - q^4 z^4 - q^2 z^4 + 1} & \text{for } \left|q^2 z^4\right| < 1 \wedge \left|q^4 z^4\right| < 1 \\ q^2 z^2 \left(q^2 \sum_{m=0}^{\infty} q^{4m} z^{4m} + \frac{1}{q^2 z^4 - 1}\right) & \text{for } \left|q^2 z^4\right| < 1 \\ -q^2 z^2 \left(\frac{q^2}{q^4 z^4 - 1} + \sum_{m=0}^{\infty} q^{2m} z^{4m}\right) & \text{for } \left|q^4 z^4\right| < 1 \\ q^2 z^2 \sum_{m=0}^{\infty} q^{2m} z^{4m} \left(q^{2m+2} - 1\right) & \text{otherwise} \end{cases}$$

2020-01-18 20:15:33.541624

path1 = 0101

path2 = 1100

$$amplitude = \begin{cases} \frac{qz\left(q^2-1\right)}{\left(q^2 z^4 - 1\right)\left(q^4 z^4 - 1\right)} & \text{for } \left|q^2 z^4\right| < 1 \wedge \left|q^4 z^4\right| < 1 \\ \frac{q^2 z^4 \sum_{m=0}^{\infty} q^{4m} z^{4m} - \sum_{m=0}^{\infty} q^{4m} z^{4m} + 1}{q^3 z^7 - q z^3} & \text{for } \left|q^2 z^4\right| < 1 \\ -\frac{q^4 z^4 \sum_{m=0}^{\infty} q^{2m} z^{4m} - \sum_{m=0}^{\infty} q^{2m} z^{4m} + 1}{q^5 z^7 - q z^3} & \text{for } \left|q^4 z^4\right| < 1 \\ \frac{\sum_{m=0}^{\infty} q^{2m} z^{4m} \left(q^{2m} - 1\right)}{q z^3} & \text{otherwise} \end{cases}$$

2020-01-18 20:15:37.065303

path1 = 0101

path2 = 1010

$$amplitude = \begin{cases} -\frac{\frac{1}{q^4z^4-1}-\frac{2}{q^2z^4-1}+\frac{1}{z^4-1}}{z^2} & \text{for } \left|z^4\right|<1 \wedge \left|q^2z^4\right|<1 \wedge \left|q^4z^4\right|<1 \\ \frac{\sum_{m=0}^{\infty} q^{4m}z^{4m}+\frac{2}{q^2z^4-1}-\frac{1}{z^4-1}}{z^2} & \text{for } \left|z^4\right|<1 \wedge \left|q^2z^4\right|<1 \\ \frac{\sum_{m=0}^{\infty} z^{4m}-\frac{1}{q^4z^4-1}+\frac{2}{q^2z^4-1}}{z^2} & \text{for } \left|q^2z^4\right|<1 \wedge \left|q^4z^4\right|<1 \\ \frac{\sum_{m=0}^{\infty} z^{4m}\left(q^2z^2+q^{4m+2}z^2-\frac{q^{4m}+1}{z^2}\right)+\frac{2}{z^2}}{q^2z^4-1} & \text{for } \left|q^2z^4\right|<1 \\ -\frac{2\sum_{m=0}^{\infty} q^{2m}z^{4m}+\frac{1}{q^4z^4-1}+\frac{1}{z^4-1}}{z^2} & \text{for } \left|z^4\right|<1 \wedge \left|q^4z^4\right|<1 \\ \frac{\sum_{m=0}^{\infty} q^{2m}z^{4m}\left(q^{2m}z^2-2z^2+\frac{2-q^{2m}}{z^2}\right)-\frac{1}{z^2}}{z^4-1} & \text{for } \left|z^4\right|<1 \\ \frac{\sum_{m=0}^{\infty} z^{4m}\left(q^4z^2-2q^{2m+4}z^2+\frac{2q^{2m}-1}{z^2}\right)-\frac{1}{z^2}}{q^4z^4-1} & \text{for } \left|q^4z^4\right|<1 \\ \frac{\sum_{m=0}^{\infty} z^{4m}\left(q^{4m}-2q^{2m}+1\right)}{z^2} & \text{otherwise} \end{cases}$$

2020-01-18 20:15:38.608827

path1 = 0101

path2 = 1001

$$amplitude = \begin{cases} \frac{q^3z^3\left(q^2-1\right)}{\left(q^2z^4-1\right)\left(q^4z^4-1\right)} & \text{for } \left|q^2z^4\right|<1 \wedge \left|q^4z^4\right|<1 \\ \frac{q^3z^4\sum_{m=0}^{\infty} q^{4m}z^{4m}-q\sum_{m=0}^{\infty} q^{4m}z^{4m}+q}{q^2z^5-z} & \text{for } \left|q^2z^4\right|<1 \\ \frac{q\left(\left(-q^4z^3+\frac{1}{z}\right)\sum_{m=0}^{\infty} q^{2m}z^{4m}-\frac{1}{z}\right)}{q^4z^4-1} & \text{for } \left|q^4z^4\right|<1 \\ \frac{q\sum_{m=0}^{\infty} q^{2m}z^{4m}\left(q^{2m}-1\right)}{z} & \text{otherwise} \end{cases}$$

2020-01-18 20:15:40.088707

path1 = 0101

path2 = 0110

$$amplitude = \begin{cases} \frac{q^3z^3\left(q^2-1\right)}{\left(q^2z^4-1\right)\left(q^4z^4-1\right)} & \text{for } \left|q^2z^4\right|<1 \wedge \left|q^4z^4\right|<1 \\ \frac{q^3z^4\sum_{m=0}^{\infty} q^{4m}z^{4m}-q\sum_{m=0}^{\infty} q^{4m}z^{4m}+q}{q^2z^5-z} & \text{for } \left|q^2z^4\right|<1 \\ \frac{q\left(\left(-q^4z^3+\frac{1}{z}\right)\sum_{m=0}^{\infty} q^{2m}z^{4m}-\frac{1}{z}\right)}{q^4z^4-1} & \text{for } \left|q^4z^4\right|<1 \\ \frac{q\sum_{m=0}^{\infty} q^{2m}z^{4m}\left(q^{2m}-1\right)}{z} & \text{otherwise} \end{cases}$$

2020-01-18 20:15:40.319528

path1 = 0101

path2 = 0101

$$amplitude = \begin{cases} -\frac{q^2}{q^4 z^4 - 1} & \text{for } \left|q^4 z^4\right| < 1 \\ q^2 \sum_{m=0}^{\infty} q^{4m} z^{4m} & \text{otherwise} \end{cases}$$

2020-01-18 20:15:41.979534

path1 = 0101

path2 = 0011

$$amplitude = \begin{cases} \frac{qz\left(q^2-1\right)}{q^6 z^8 - q^4 z^4 - q^2 z^4 + 1} & \text{for } \left|q^2 z^4\right| < 1 \wedge \left|q^4 z^4\right| < 1 \\ q^3 z \sum_{m=0}^{\infty} q^{4m} z^{4m} + \frac{qz}{q^2 z^4 - 1} & \text{for } \left|q^2 z^4\right| < 1 \\ -qz\left(\frac{q^2}{q^4 z^4 - 1} + \sum_{m=0}^{\infty} q^{2m} z^{4m}\right) & \text{for } \left|q^4 z^4\right| < 1 \\ qz \sum_{m=0}^{\infty} q^{2m} z^{4m}\left(q^{2m+2} - 1\right) & \text{otherwise} \end{cases}$$

2020-01-18 20:15:46.511149

path1 = 0011

path2 = 1100

$$amplitude = \begin{cases} \frac{z^4\left(-q^6+q^4+q^2-1\right)}{q^6 z^{12} - q^6 z^8 - q^4 z^8 + q^4 z^4 - q^2 z^8 + q^2 z^4 + z^4 - 1} & \text{for } \left|z^4\right| < 1 \wedge \left|q^2 z^4\right| < 1 \wedge \left|q^4 z^4\right| < 1 \\ \frac{q^2\left(\frac{1}{q^2 z^4 - 1} - \frac{1}{z^4 - 1}\right) + \sum_{m=0}^{\infty} q^{4m} z^{4m} + \frac{1}{q^2 z^4 - 1}}{q^2 z^4} & \text{for } \left|z^4\right| < 1 \wedge \left|q^2 z^4\right| < 1 \\ \frac{q^2\left(\sum_{m=0}^{\infty} z^{4m} + \frac{1}{q^2 z^4 - 1}\right) - \frac{1}{q^4 z^4 - 1} + \frac{1}{q^2 z^4 - 1}}{q^2 z^4} & \text{for } \left|q^2 z^4\right| < 1 \wedge \left|q^4 z^4\right| < 1 \\ \frac{\sum_{m=0}^{\infty} z^{4m}\left(q^2 + q^{4m} - \frac{q^{4m-2}+1}{z^4}\right) + \frac{1}{z^4} + \frac{1}{q^2 z^4}}{q^2 z^4 - 1} & \text{for } \left|q^2 z^4\right| < 1 \\ -\frac{q^2\left(\sum_{m=0}^{\infty} q^{2m} z^{4m} + \frac{1}{z^4 - 1}\right) + \sum_{m=0}^{\infty} q^{2m} z^{4m} + \frac{1}{q^4 z^4 - 1}}{q^2 z^4} & \text{for } \left|z^4\right| < 1 \wedge \left|q^4 z^4\right| < 1 \\ \frac{\sum_{m=0}^{\infty} q^{2m} z^{4m}\left(q^{2m-2} - 1 + \frac{1 + \frac{1-q^{2m}}{q^2}}{z^4} - \frac{1}{q^2}\right) - \frac{1}{z^4}}{z^4 - 1} & \text{for } \left|z^4\right| < 1 \\ \frac{\sum_{m=0}^{\infty} z^{4m}\left(q^4 - q^{2m+2} - q^{2m+4} + \frac{q^{2m} + q^{2m-2} - 1}{z^4}\right) - \frac{1}{q^2 z^4}}{q^4 z^4 - 1} & \text{for } \left|q^4 z^4\right| < 1 \\ \frac{\sum_{m=0}^{\infty} z^{4m}\left(-q^{2m} - q^{2m-2} + q^{4m-2} + 1\right)}{z^4} & \text{otherwise} \end{cases}$$

2020-01-18 20:15:48.206738

path1 = 0011

path2 = 1010

$$amplitude = \begin{cases} \frac{qz\left(q^2-1\right)}{\left(q^2 z^4 - 1\right)\left(q^4 z^4 - 1\right)} & \text{for } \left|q^2 z^4\right| < 1 \wedge \left|q^4 z^4\right| < 1 \\ \frac{q^2 z^4 \sum_{m=0}^{\infty} q^{4m} z^{4m} - \sum_{m=0}^{\infty} q^{4m} z^{4m} + 1}{q^3 z^7 - q z^3} & \text{for } \left|q^2 z^4\right| < 1 \\ -\frac{q^4 z^4 \sum_{m=0}^{\infty} q^{2m} z^{4m} - \sum_{m=0}^{\infty} q^{2m} z^{4m} + 1}{q^5 z^7 - q z^3} & \text{for } \left|q^4 z^4\right| < 1 \\ \frac{\sum_{m=0}^{\infty} q^{2m} z^{4m}\left(q^{2m} - 1\right)}{q z^3} & \text{otherwise} \end{cases}$$

2020-01-18 20:15:49.750038

path1 = 0011

path2 = 1001

$$amplitude = \begin{cases} \frac{q^2 z^2 \left(q^2-1\right)}{\left(q^2 z^4-1\right)\left(q^4 z^4-1\right)} & \text{for } \left|q^2 z^4\right| < 1 \wedge \left|q^4 z^4\right| < 1 \\ \frac{q^2 z^4 \sum_{m=0}^{\infty} q^{4m} z^{4m} - \sum_{m=0}^{\infty} q^{4m} z^{4m} + 1}{q^2 z^6 - z^2} & \text{for } \left|q^2 z^4\right| < 1 \\ -\frac{q^4 z^4 \sum_{m=0}^{\infty} q^{2m} z^{4m} - \sum_{m=0}^{\infty} q^{2m} z^{4m} + 1}{q^4 z^6 - z^2} & \text{for } \left|q^4 z^4\right| < 1 \\ \frac{\sum_{m=0}^{\infty} q^{2m} z^{4m} \left(q^{2m}-1\right)}{z^2} & \text{otherwise} \end{cases}$$

2020-01-18 20:15:51.328302

path1 = 0011

path2 = 0110

$$amplitude = \begin{cases} \frac{q^2 z^2 \left(q^2-1\right)}{\left(q^2 z^4-1\right)\left(q^4 z^4-1\right)} & \text{for } \left|q^2 z^4\right| < 1 \wedge \left|q^4 z^4\right| < 1 \\ \frac{q^2 z^4 \sum_{m=0}^{\infty} q^{4m} z^{4m} - \sum_{m=0}^{\infty} q^{4m} z^{4m} + 1}{q^2 z^6 - z^2} & \text{for } \left|q^2 z^4\right| < 1 \\ -\frac{q^4 z^4 \sum_{m=0}^{\infty} q^{2m} z^{4m} - \sum_{m=0}^{\infty} q^{2m} z^{4m} + 1}{q^4 z^6 - z^2} & \text{for } \left|q^4 z^4\right| < 1 \\ \frac{\sum_{m=0}^{\infty} q^{2m} z^{4m} \left(q^{2m}-1\right)}{z^2} & \text{otherwise} \end{cases}$$

2020-01-18 20:15:52.897250

path1 = 0011

path2 = 0101

$$amplitude = \begin{cases} \frac{q^3 z^3 \left(q^2-1\right)}{\left(q^2 z^4-1\right)\left(q^4 z^4-1\right)} & \text{for } \left|q^2 z^4\right| < 1 \wedge \left|q^4 z^4\right| < 1 \\ \frac{q^3 z^4 \sum_{m=0}^{\infty} q^{4m} z^{4m} - q \sum_{m=0}^{\infty} q^{4m} z^{4m} + q}{q^2 z^5 - z} & \text{for } \left|q^2 z^4\right| < 1 \\ \frac{q\left(\left(-q^4 z^3 + \frac{1}{z}\right) \sum_{m=0}^{\infty} q^{2m} z^{4m} - \frac{1}{z}\right)}{q^4 z^4 - 1} & \text{for } \left|q^4 z^4\right| < 1 \\ \frac{q \sum_{m=0}^{\infty} q^{2m} z^{4m} \left(q^{2m}-1\right)}{z} & \text{otherwise} \end{cases}$$

2020-01-18 20:15:53.120394

path1 = 0011

path2 = 0011

$$amplitude = \begin{cases} -\frac{q^2}{q^4 z^4 - 1} & \text{for } \left|q^4 z^4\right| < 1 \\ q^2 \sum_{m=0}^{\infty} q^{4m} z^{4m} & \text{otherwise} \end{cases}$$

2020-01-18 20:15:53.358179

path1 = 1110

path2 = 1110

$$amplitude = \begin{cases} \frac{q^3}{q^4 z^4 - 1} & \text{for } \left|q^4 z^4\right| < 1 \\ -q^3 \sum_{m=0}^{\infty} q^{4m} z^{4m} & \text{otherwise} \end{cases}$$

2020-01-18 20:15:57.042495

path1 = 1110

path2 = 1101

$$amplitude = \begin{cases} -\frac{q^2 z \left(q^2 - 1\right)}{q^6 z^8 - q^4 z^4 - q^2 z^4 + 1} & \text{for } \left|q^2 z^4\right| < 1 \wedge \left|q^4 z^4\right| < 1 \\ q^2 z \left(\frac{q^2}{q^4 z^4 - 1} + \sum_{m=0}^{\infty} q^{2m} z^{4m}\right) & \text{for } \left|q^4 z^4\right| < 1 \\ -q^4 z \sum_{m=0}^{\infty} q^{4m} z^{4m} - \frac{q^2 z}{q^2 z^4 - 1} & \text{for } \left|q^2 z^4\right| < 1 \\ q^2 z \sum_{m=0}^{\infty} q^{2m} z^{4m} \left(1 - q^{2m+2}\right) & \text{otherwise} \end{cases}$$

2020-01-18 20:16:01.131874

path1 = 1110

path2 = 1011

$$amplitude = \begin{cases} \frac{q^3 z^2 \left(1 - q^2\right)}{q^6 z^8 - q^4 z^4 - q^2 z^4 + 1} & \text{for } \left|q^2 z^4\right| < 1 \wedge \left|q^4 z^4\right| < 1 \\ q^3 z^2 \left(\frac{q^2}{q^4 z^4 - 1} + \sum_{m=0}^{\infty} q^{2m} z^{4m}\right) & \text{for } \left|q^4 z^4\right| < 1 \\ -q^3 z^2 \left(q^2 \sum_{m=0}^{\infty} q^{4m} z^{4m} + \frac{1}{q^2 z^4 - 1}\right) & \text{for } \left|q^2 z^4\right| < 1 \\ q^3 z^2 \sum_{m=0}^{\infty} q^{2m} z^{4m} \left(1 - q^{2m+2}\right) & \text{otherwise} \end{cases}$$

2020-01-18 20:16:05.343237

path1 = 1110

path2 = 0111

$$amplitude = \begin{cases} \frac{q^4 z^3 \left(1 - q^2\right)}{q^6 z^8 - q^4 z^4 - q^2 z^4 + 1} & \text{for } \left|q^2 z^4\right| < 1 \wedge \left|q^4 z^4\right| < 1 \\ q^4 z^3 \left(\frac{q^2}{q^4 z^4 - 1} + \sum_{m=0}^{\infty} q^{2m} z^{4m}\right) & \text{for } \left|q^4 z^4\right| < 1 \\ -q^4 z^3 \left(q^2 \sum_{m=0}^{\infty} q^{4m} z^{4m} + \frac{1}{q^2 z^4 - 1}\right) & \text{for } \left|q^2 z^4\right| < 1 \\ q^4 z^3 \sum_{m=0}^{\infty} q^{2m} z^{4m} \left(1 - q^{2m+2}\right) & \text{otherwise} \end{cases}$$

2020-01-18 20:16:08.821836

path1 = 1101

path2 = 1110

$$amplitude = \begin{cases} \frac{q^4 z^3 \left(1-q^2\right)}{\left(q^2 z^4-1\right)\left(q^4 z^4-1\right)} & \text{for } \left|q^2 z^4\right| < 1 \wedge \left|q^4 z^4\right| < 1 \\ \frac{q^2 \left(\sum_{m=0}^{\infty} q^{2m} z^{4m} + \frac{1}{q^4 z^4-1}\right)}{z} & \text{for } \left|q^4 z^4\right| < 1 \\ \frac{q^2 \left(\left(-q^2 z^3 + \frac{1}{z}\right) \sum_{m=0}^{\infty} q^{4m} z^{4m} - \frac{1}{z}\right)}{q^2 z^4-1} & \text{for } \left|q^2 z^4\right| < 1 \\ \frac{q^2 \sum_{m=0}^{\infty} q^{2m} z^{4m} \left(1-q^{2m}\right)}{z} & \text{otherwise} \end{cases}$$

2020-01-18 20:16:09.074198

path1 = 1101

path2 = 1101

$$amplitude = \begin{cases} \frac{q^3}{q^4 z^4-1} & \text{for } \left|q^4 z^4\right| < 1 \\ -q^3 \sum_{m=0}^{\infty} q^{4m} z^{4m} & \text{otherwise} \end{cases}$$

2020-01-18 20:16:13.015367

path1 = 1101

path2 = 1011

$$amplitude = \begin{cases} -\frac{q^2 z \left(q^2-1\right)}{q^6 z^8 - q^4 z^4 - q^2 z^4 + 1} & \text{for } \left|q^2 z^4\right| < 1 \wedge \left|q^4 z^4\right| < 1 \\ q^2 z \left(\frac{q^2}{q^4 z^4-1} + \sum_{m=0}^{\infty} q^{2m} z^{4m}\right) & \text{for } \left|q^4 z^4\right| < 1 \\ -q^4 z \sum_{m=0}^{\infty} q^{4m} z^{4m} - \frac{q^2 z}{q^2 z^4-1} & \text{for } \left|q^2 z^4\right| < 1 \\ q^2 z \sum_{m=0}^{\infty} q^{2m} z^{4m} \left(1 - q^{2m+2}\right) & \text{otherwise} \end{cases}$$

2020-01-18 20:16:17.039479

path1 = 1101

path2 = 0111

$$amplitude = \begin{cases} \frac{q^3 z^2 \left(1-q^2\right)}{q^6 z^8 - q^4 z^4 - q^2 z^4 + 1} & \text{for } \left|q^2 z^4\right| < 1 \wedge \left|q^4 z^4\right| < 1 \\ q^3 z^2 \left(\frac{q^2}{q^4 z^4-1} + \sum_{m=0}^{\infty} q^{2m} z^{4m}\right) & \text{for } \left|q^4 z^4\right| < 1 \\ -q^3 z^2 \left(q^2 \sum_{m=0}^{\infty} q^{4m} z^{4m} + \frac{1}{q^2 z^4-1}\right) & \text{for } \left|q^2 z^4\right| < 1 \\ q^3 z^2 \sum_{m=0}^{\infty} q^{2m} z^{4m} \left(1 - q^{2m+2}\right) & \text{otherwise} \end{cases}$$

2020-01-18 20:16:21.259468

path1 = 1011

path2 = 1110

$$amplitude = \begin{cases} \frac{q^3 z^2 \left(1-q^2\right)}{\left(q^2 z^4-1\right)\left(q^4 z^4-1\right)} & \text{for } \left|q^2 z^4\right| < 1 \wedge \left|q^4 z^4\right| < 1 \\ \frac{q^5 z^4 \sum_{m=0}^{\infty} q^{2m} z^{4m} - q \sum_{m=0}^{\infty} q^{2m} z^{4m} + q}{q^4 z^6 - z^2} & \text{for } \left|q^4 z^4\right| < 1 \\ -\frac{q^3 z^4 \sum_{m=0}^{\infty} q^{4m} z^{4m} - q \sum_{m=0}^{\infty} q^{4m} z^{4m} + q}{q^2 z^6 - z^2} & \text{for } \left|q^2 z^4\right| < 1 \\ \frac{q \sum_{m=0}^{\infty} q^{2m} z^{4m} \left(1-q^{2m}\right)}{z^2} & \text{otherwise} \end{cases}$$

2020-01-18 20:16:26.658049

path1 = 1011

path2 = 1101

$$amplitude = \begin{cases} \frac{q^4 z^3 \left(1-q^2\right)}{\left(q^2 z^4-1\right)\left(q^4 z^4-1\right)} & \text{for } \left|q^2 z^4\right| < 1 \wedge \left|q^4 z^4\right| < 1 \\ \frac{q^2 \left(\sum_{m=0}^{\infty} q^{2m} z^{4m} + \frac{1}{q^4 z^4-1}\right)}{z} & \text{for } \left|q^4 z^4\right| < 1 \\ \frac{q^2 \left(\left(-q^2 z^3 + \frac{1}{z}\right) \sum_{m=0}^{\infty} q^{4m} z^{4m} - \frac{1}{z}\right)}{q^2 z^4 - 1} & \text{for } \left|q^2 z^4\right| < 1 \\ \frac{q^2 \sum_{m=0}^{\infty} q^{2m} z^{4m} \left(1-q^{2m}\right)}{z} & \text{otherwise} \end{cases}$$

2020-01-18 20:16:26.982020

path1 = 1011

path2 = 1011

$$amplitude = \begin{cases} \frac{q^3}{q^4 z^4-1} & \text{for } \left|q^4 z^4\right| < 1 \\ -q^3 \sum_{m=0}^{\infty} q^{4m} z^{4m} & \text{otherwise} \end{cases}$$

2020-01-18 20:16:32.102358

path1 = 1011

path2 = 0111

$$amplitude = \begin{cases} -\frac{q^2 z \left(q^2-1\right)}{q^6 z^8 - q^4 z^4 - q^2 z^4 + 1} & \text{for } \left|q^2 z^4\right| < 1 \wedge \left|q^4 z^4\right| < 1 \\ q^2 z \left(\frac{q^2}{q^4 z^4-1} + \sum_{m=0}^{\infty} q^{2m} z^{4m}\right) & \text{for } \left|q^4 z^4\right| < 1 \\ -q^4 z \sum_{m=0}^{\infty} q^{4m} z^{4m} - \frac{q^2 z}{q^2 z^4-1} & \text{for } \left|q^2 z^4\right| < 1 \\ q^2 z \sum_{m=0}^{\infty} q^{2m} z^{4m} \left(1 - q^{2m+2}\right) & \text{otherwise} \end{cases}$$

2020-01-18 20:16:36.033754

path1 = 0111

path2 = 1110

$$amplitude = \begin{cases} \frac{q^2 z\left(1-q^2\right)}{\left(q^2 z^4-1\right)\left(q^4 z^4-1\right)} & \text{for } \left|q^2 z^4\right| < 1 \wedge \left|q^4 z^4\right| < 1 \\ \frac{q^4 z^4 \sum_{m=0}^{\infty} q^{2m} z^{4m} - \sum_{m=0}^{\infty} q^{2m} z^{4m} + 1}{q^4 z^7 - z^3} & \text{for } \left|q^4 z^4\right| < 1 \\ \frac{\left(-q^2 z + \frac{1}{z^3}\right) \sum_{m=0}^{\infty} q^{4m} z^{4m} - \frac{1}{z^3}}{q^2 z^4 - 1} & \text{for } \left|q^2 z^4\right| < 1 \\ \frac{\sum_{m=0}^{\infty} q^{2m} z^{4m}\left(1-q^{2m}\right)}{z^3} & \text{otherwise} \end{cases}$$

2020-01-18 20:16:40.112868

path1 = 0111

path2 = 1101

$$amplitude = \begin{cases} \frac{q^3 z^2\left(1-q^2\right)}{\left(q^2 z^4-1\right)\left(q^4 z^4-1\right)} & \text{for } \left|q^2 z^4\right| < 1 \wedge \left|q^4 z^4\right| < 1 \\ \frac{q^5 z^4 \sum_{m=0}^{\infty} q^{2m} z^{4m} - q \sum_{m=0}^{\infty} q^{2m} z^{4m} + q}{q^4 z^6 - z^2} & \text{for } \left|q^4 z^4\right| < 1 \\ -\frac{q^3 z^4 \sum_{m=0}^{\infty} q^{4m} z^{4m} - q \sum_{m=0}^{\infty} q^{4m} z^{4m} + q}{q^2 z^6 - z^2} & \text{for } \left|q^2 z^4\right| < 1 \\ \frac{q \sum_{m=0}^{\infty} q^{2m} z^{4m}\left(1-q^{2m}\right)}{z^2} & \text{otherwise} \end{cases}$$

2020-01-18 20:16:44.306272

path1 = 0111

path2 = 1011

$$amplitude = \begin{cases} \frac{q^4 z^3\left(1-q^2\right)}{\left(q^2 z^4-1\right)\left(q^4 z^4-1\right)} & \text{for } \left|q^2 z^4\right| < 1 \wedge \left|q^4 z^4\right| < 1 \\ \frac{q^2\left(\sum_{m=0}^{\infty} q^{2m} z^{4m} + \frac{1}{q^4 z^4-1}\right)}{z} & \text{for } \left|q^4 z^4\right| < 1 \\ \frac{q^2\left(\left(-q^2 z^3 + \frac{1}{z}\right) \sum_{m=0}^{\infty} q^{4m} z^{4m} - \frac{1}{z}\right)}{q^2 z^4 - 1} & \text{for } \left|q^2 z^4\right| < 1 \\ \frac{q^2 \sum_{m=0}^{\infty} q^{2m} z^{4m}\left(1-q^{2m}\right)}{z} & \text{otherwise} \end{cases}$$

2020-01-18 20:16:44.589911

path1 = 0111

path2 = 0111

$$amplitude = \begin{cases} \frac{q^3}{q^4 z^4-1} & \text{for } \left|q^4 z^4\right| < 1 \\ -q^3 \sum_{m=0}^{\infty} q^{4m} z^{4m} & \text{otherwise} \end{cases}$$

2020-01-18 20:16:44.833911

path1 = 1111

path2 = 1111

$$amplitude = \begin{cases} -\frac{q^4}{q^4 z^4 - 1} & \text{for } \left|q^4 z^4\right| < 1 \\ q^4 \sum_{m=0}^{\infty} q^{4m} z^{4m} & \text{otherwise} \end{cases}$$

0.5 考察・結論

0.6 参考文献