Setup.
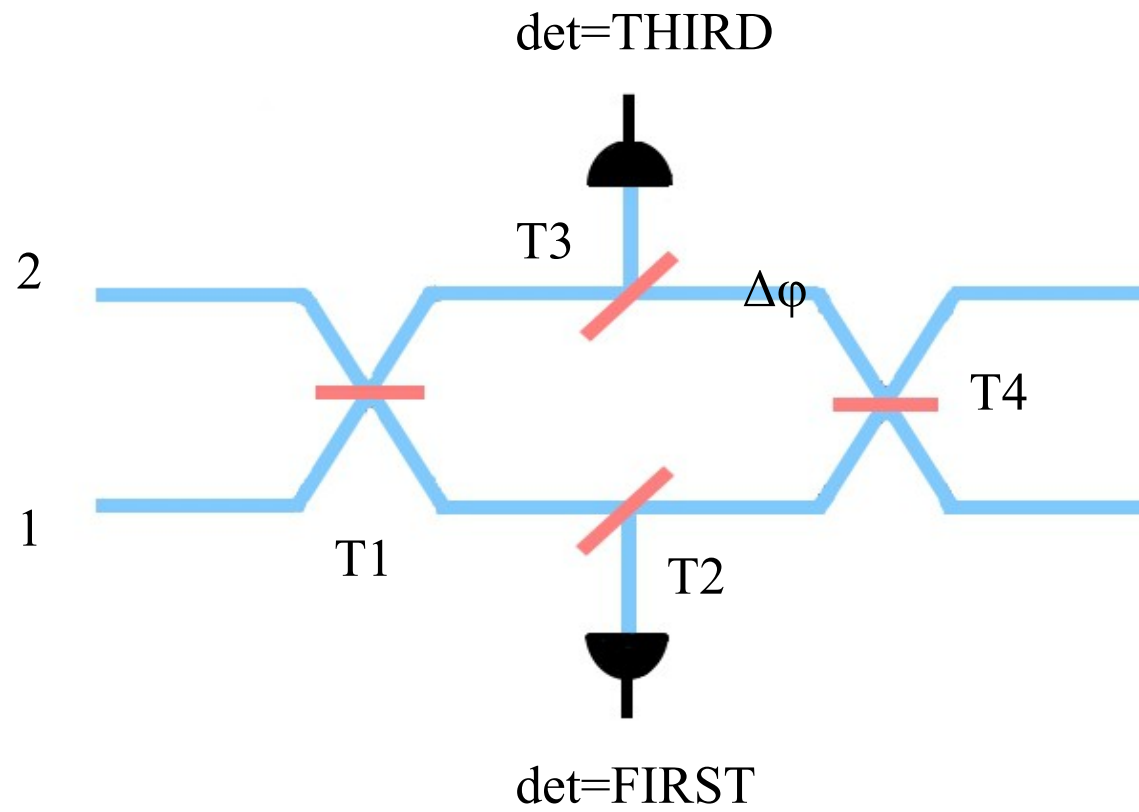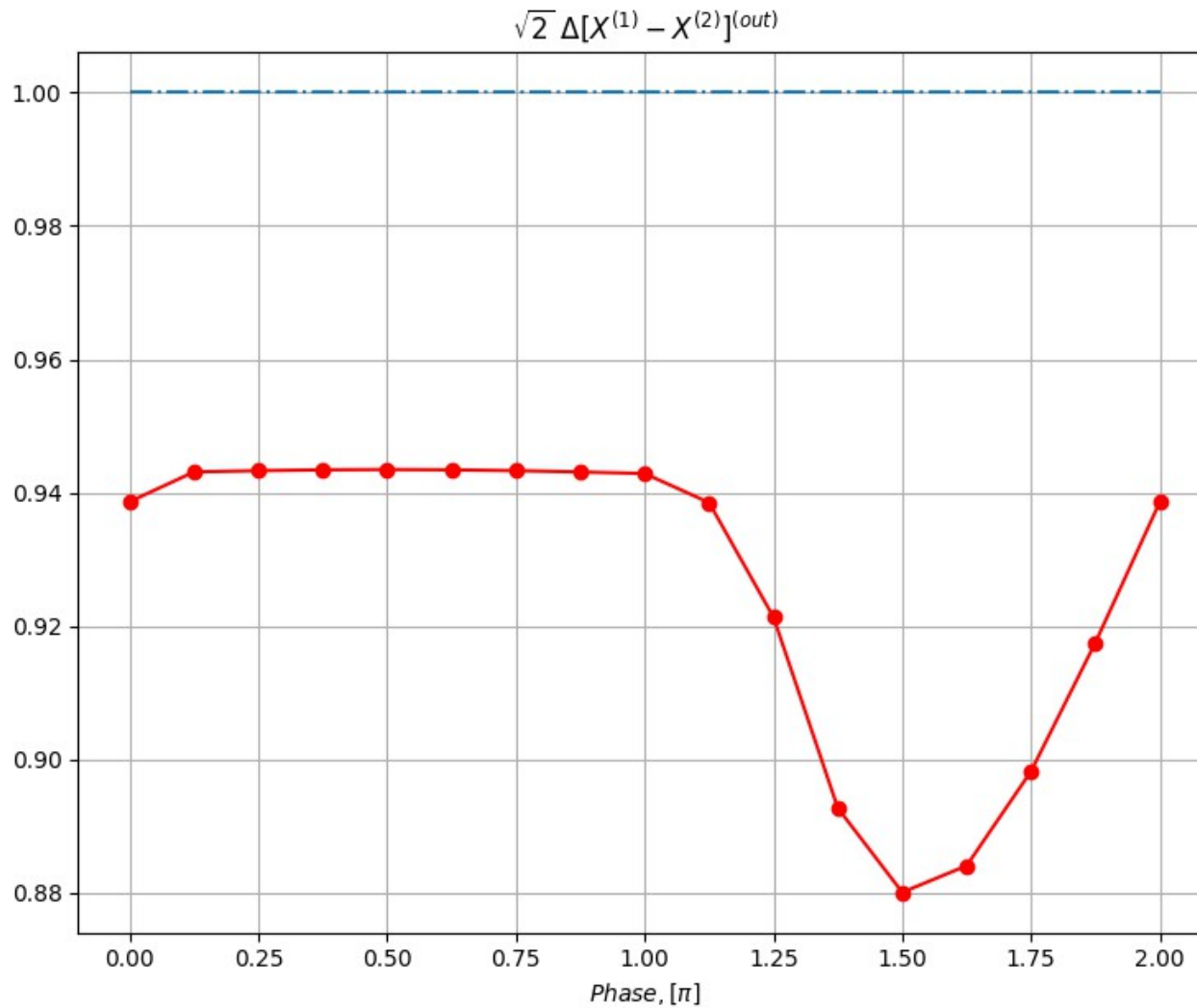
1. Single photon goes to the second(top) channel. Coherent state (alpha=1) goes to the first(bottom) channel. **First and only first** detector clicks.

$$\sqrt{2}\,\Delta[X^{(1)} - X^{(2)}]^{(out)}$$

Phase, $[\pi]$

EPR[X] min values among all parameters.

Minimizing set of parameters.
Probability of current detection > 0.1

Phase, [pi]	Probab.	T1	T4	T2	T3
0.0	0.1077	0.28	0.72	0.88	0.86
0.125	0.1002	0.7	1.0	0.86	0.0
0.25	0.1002	0.7	1.0	0.86	0.0
0.375	0.1002	0.7	1.0	0.86	0.0
0.5	0.1002	0.7	1.0	0.86	0.0
0.625	0.1002	0.7	1.0	0.86	0.0
0.75	0.1002	0.7	1.0	0.86	0.0
0.875	0.1002	0.7	1.0	0.86	0.0
1.0	0.1002	0.7	1.0	0.86	0.0
1.125	0.1003	0.7	1.0	0.86	0.01
1.25	0.1011	0.7	1.0	0.86	0.08
1.375	0.1094	0.28	1.0	0.88	0.9
1.5	0.1007	0.78	1.0	0.84	0.12
1.625	0.1094	0.28	0.98	0.88	0.9
1.75	0.1022	0.7	0.9	0.86	0.16
1.875	0.1022	0.7	0.82	0.86	0.16
2.0	0.1077	0.28	0.72	0.88	0.86

Phase dependence around the point with the phase = 1.5pi.

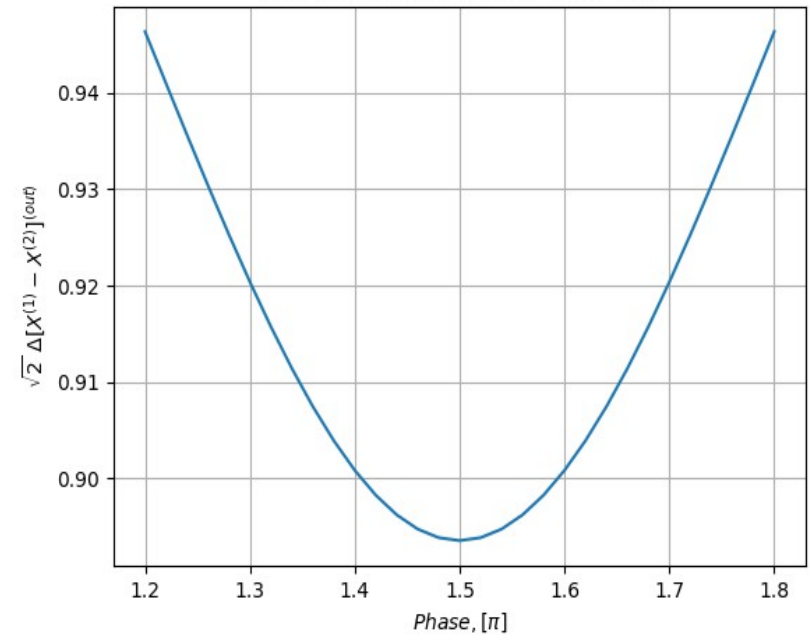## Mean phot. number «alpha» = 1
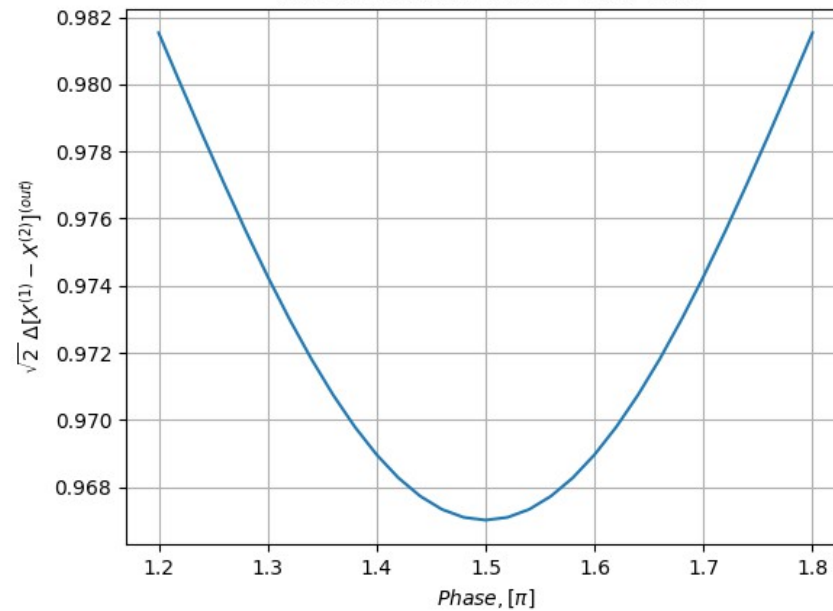
T1: 0.78, T4: 1.0, T2: 0.84, T3: 0.12
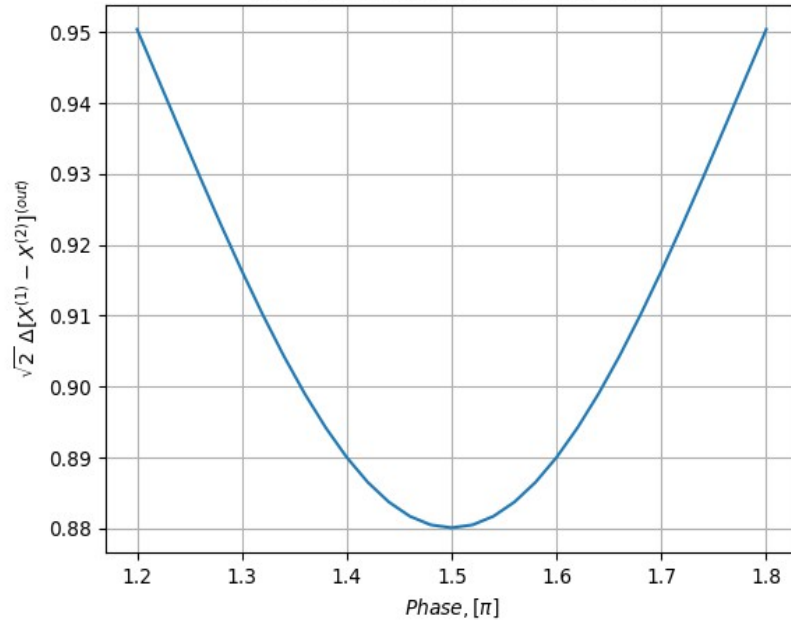
Mean phot. number «alpha» = 0.5
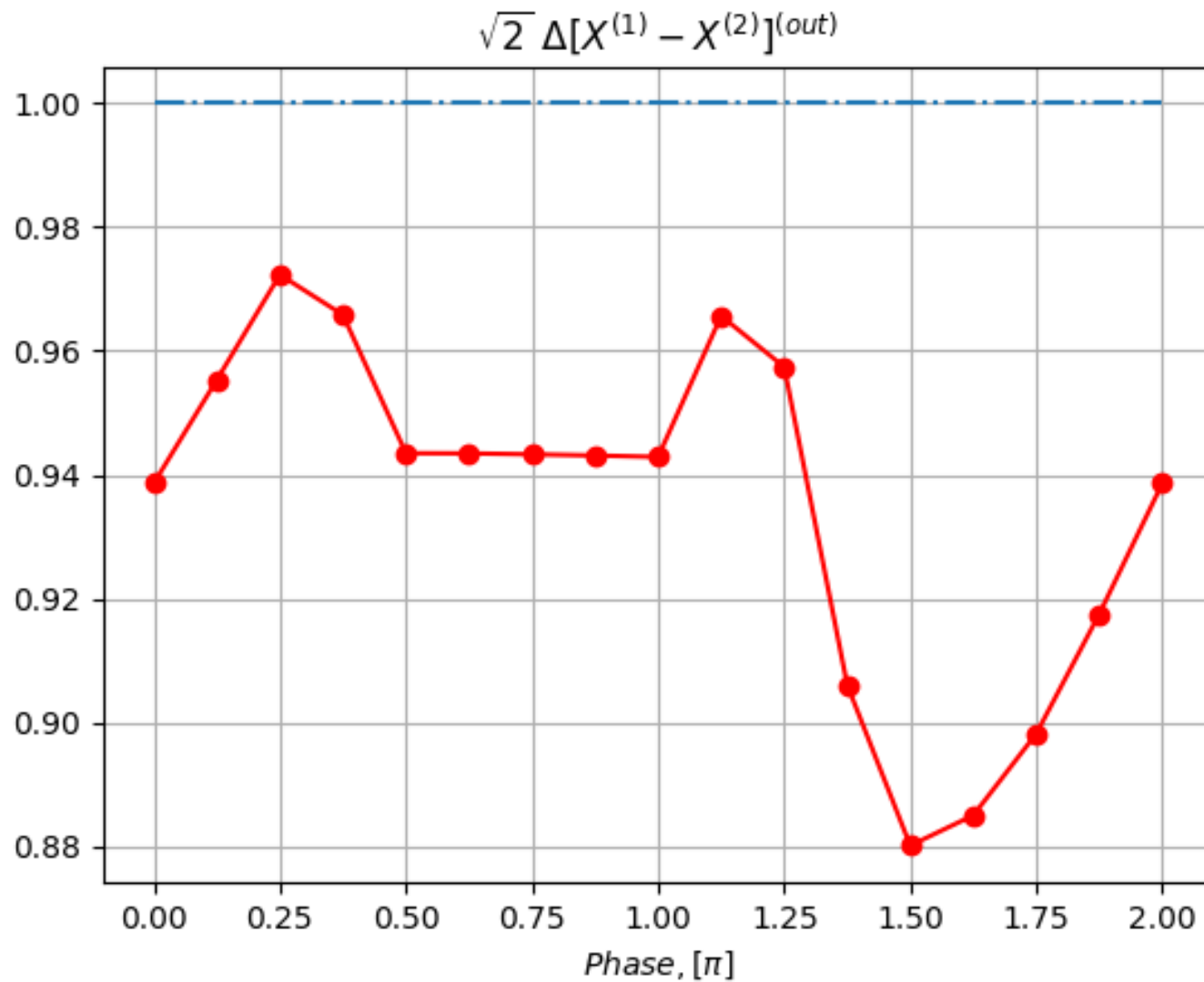
T1: 0.78, T4: 1.0, T2: 0.84, T3: 0.12

T1: 0.78, T4: 1.0, T2: 0.84, T3: 0.12

Mean phot. number «alpha» = 0.2

2. Single photon goes to the second(top) channel. Coherent state (alpha=1) goes to the first(bottom) channel. **Third and only third** detector clicks.

$$\sqrt{2}\ \Delta[X^{(1)} - X^{(2)}]^{(out)}$$

EPR[X] min values among all parameters.

Minimizing set of parameters.
Probability of current detection > 0.1

Phase, [pi]	Probab.	T1	T4	T2	T3
0.0	0.1077	0.72	0.28	0.86	0.88
0.125	0.1081	0.4	0.0	0.06	0.86
0.25	0.6096	0.68	1.0	1.0	0.0
0.375	0.1002	0.3	1.0	0.0	0.86
0.5	0.1002	0.3	1.0	0.0	0.86
0.625	0.1002	0.3	0.86	0.0	0.86
0.75	0.1002	0.3	0.5	0.0	0.86
0.875	0.1002	0.3	0.14	0.0	0.86
1.0	0.1002	0.3	0.0	0.0	0.86
1.125	0.1002	0.3	0.0	0.0	0.86
1.25	0.5399	0.72	1.0	1.0	0.24
1.375	0.1007	0.22	1.0	0.12	0.84
1.5	0.1007	0.22	1.0	0.12	0.84
1.625	0.1007	0.22	0.94	0.12	0.84
1.75	0.1022	0.3	0.78	0.16	0.86
1.875	0.1022	0.3	0.56	0.16	0.86
2.0	0.1077	0.72	0.28	0.86	0.88

Phase dependence around the point with the phase = 1.5pi.

Mean phot. number «alpha» = 1

T1: 0.22, T4: 1.0, T2: 0.12, T3: 0.84

Mean phot. number «alpha» = 0.5

T1: 0.22, T4: 1.0, T2: 0.12, T3: 0.84

T1: 0.22, T4: 1.0, T2: 0.12, T3: 0.84
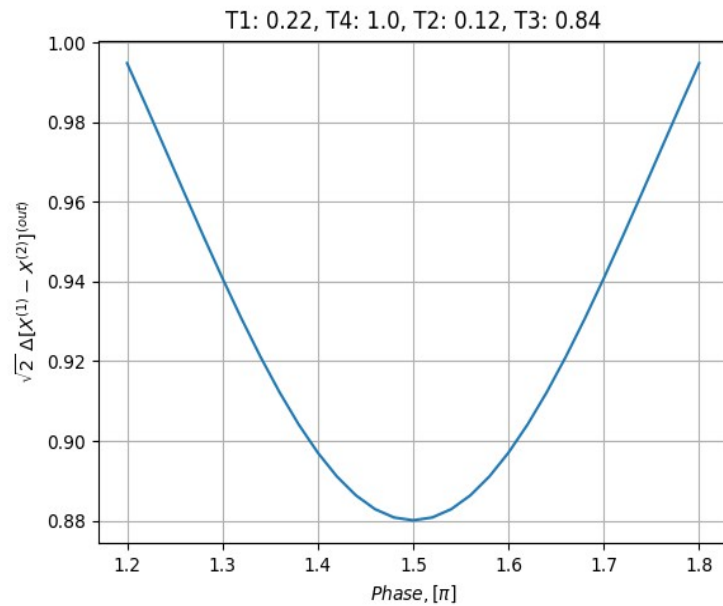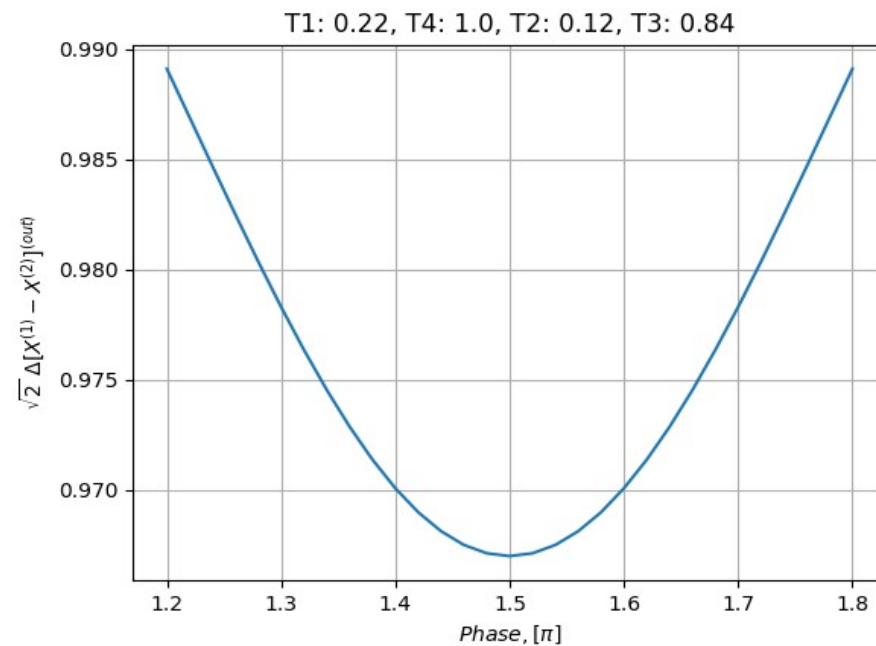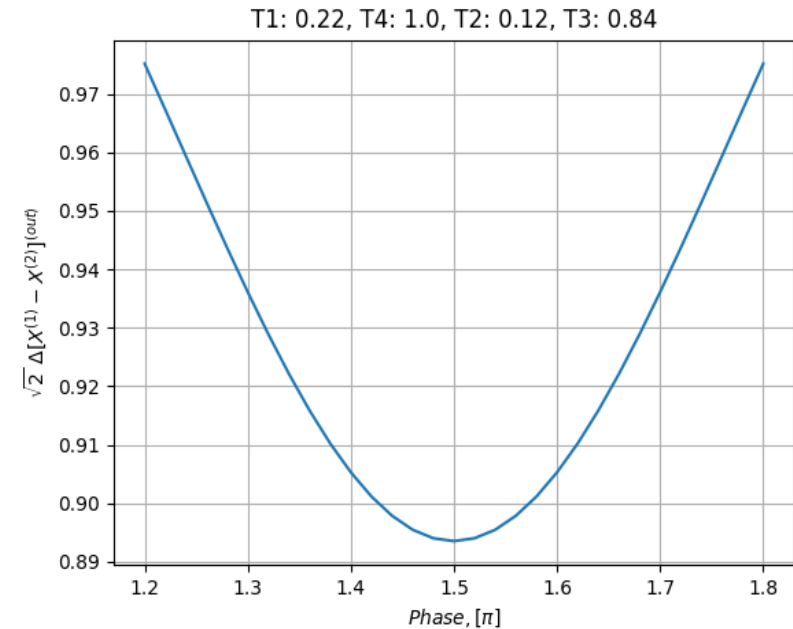
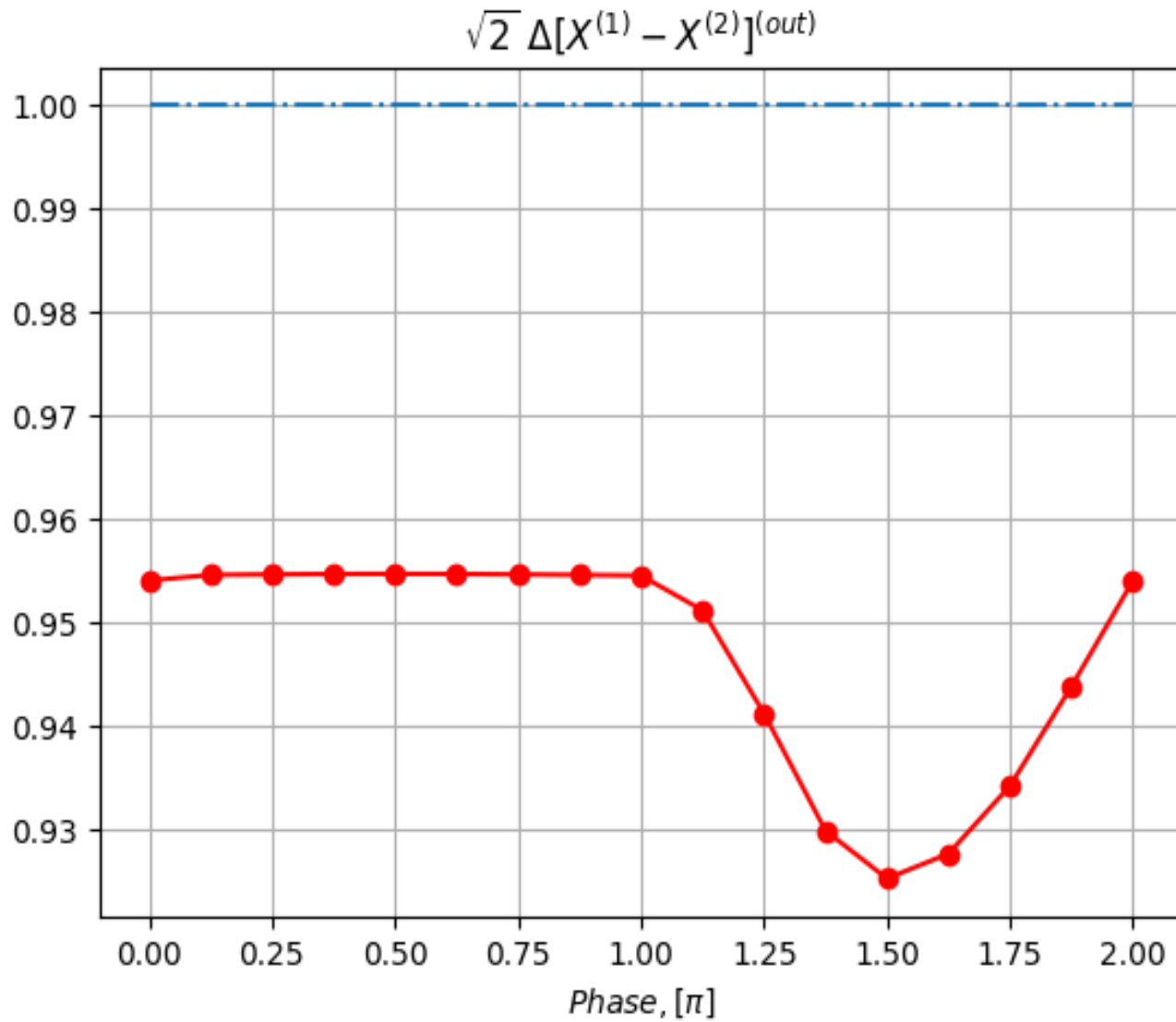## Mean phot. number «alpha» = 0.2

3. Single photon goes to the second(top) channel. Coherent state (alpha=1) goes to the first(bottom) channel. **Both** detectors click.
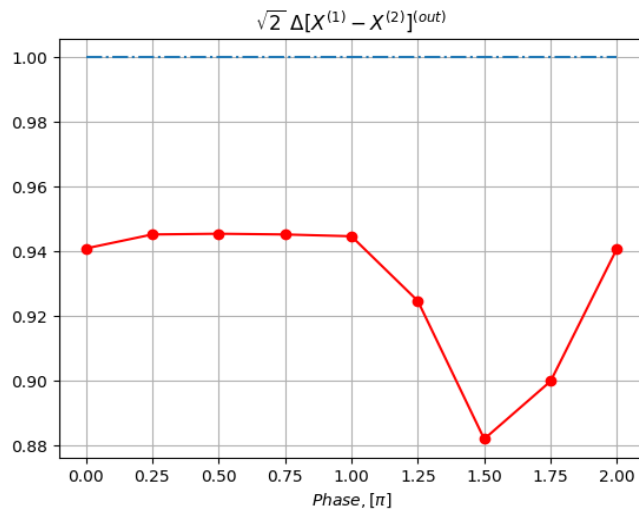

$$\sqrt{2} \, \Delta[X^{(1)} - X^{(2)}]^{(out)}$$

Minimizing set of parameters.
Probability of current detection > 0.1

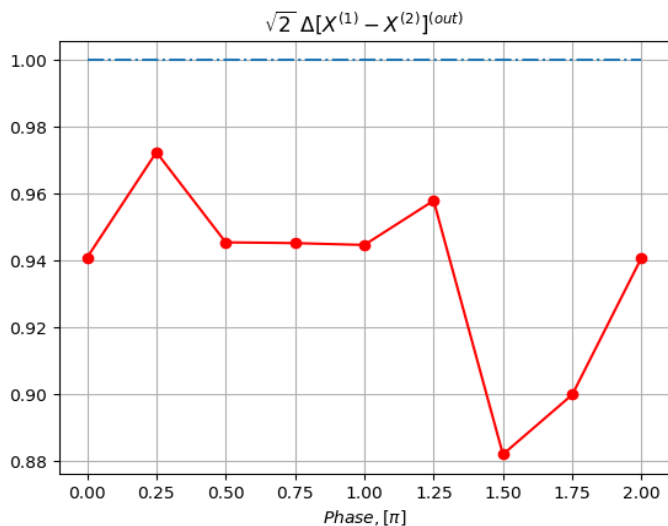| Phase, [pi]	Probab.	T1	T4	T2	T3
0.0	0.101	0.18	0.97	0.72	0.1
0.125	0.1025	0.18	1.0	0.74	0.0
0.25	0.1025	0.18	1.0	0.74	0.0
0.375	0.1025	0.18	1.0	0.74	0.0
0.5	0.1025	0.18	1.0	0.74	0.0
0.625	0.1025	0.18	1.0	0.74	0.0
0.75	0.1025	0.18	1.0	0.74	0.0
0.875	0.1025	0.18	1.0	0.74	0.0
1.0	0.1025	0.18	1.0	0.74	0.0
1.125	0.101	0.18	1.0	0.72	0.1
1.25	0.1003	0.18	1.0	0.66	0.28
1.375	0.1002	0.18	1.0	0.62	0.36
1.5	0.1013	0.8	1.0	0.36	0.58
1.625	0.1013	0.8	0.92	0.36	0.58
1.75	0.1002	0.82	0.7	0.36	0.62
1.875	0.1002	0.82	0.4	0.36	0.62
2.0	0.101	0.18	0.97	0.72	0.1

Changing input channels. EPR_X.

1. Single photon goes to the second(top) channel. Coherent state (alpha=1) goes to the first(bottom) channel. **First and only first** detector clicks.

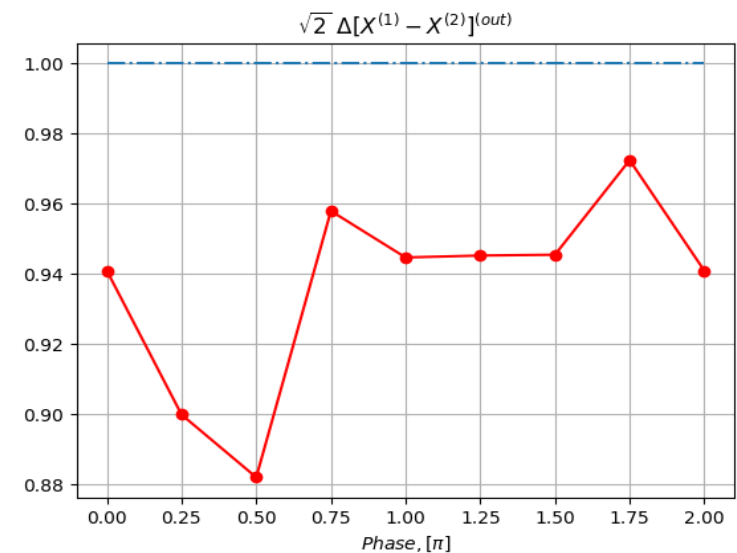$$\sqrt{2}\,\Delta[X^{(1)} - X^{(2)}]^{(out)}$$

Phase, $[\pi]$

2. Single photon goes to the first(bottom) channel. Coherent state (alpha=1) goes to the second(top) channel. **First and only first** detector clicks.

$$\sqrt{2}\,\Delta[X^{(1)} - X^{(2)}]^{(out)}$$

Phase, $[\pi]$

3. Single photon goes to the second(top) channel. Coherent state (alpha=1) goes to the first(bottom) channel. **Third and only third** detector clicks.

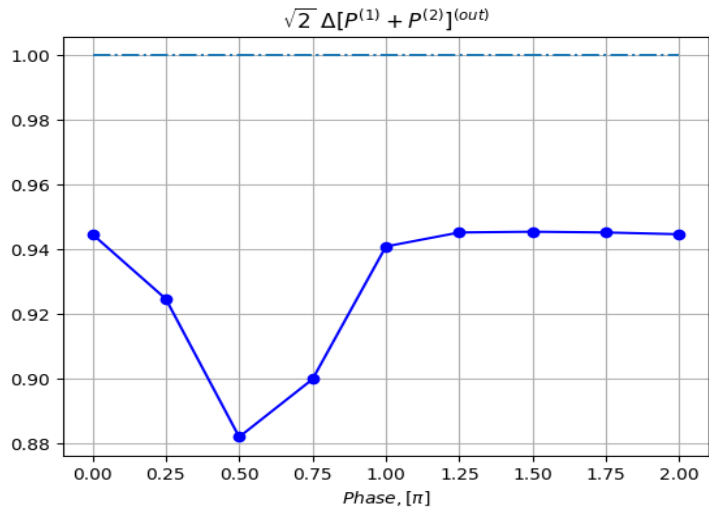$$\sqrt{2}\,\Delta[X^{(1)} - X^{(2)}]^{(out)}$$

Phase, $[\pi]$

4. Single photon goes to the first(bottom) channel. Coherent state (alpha=1) goes to the second(top) channel. **Third and only third** detector clicks.

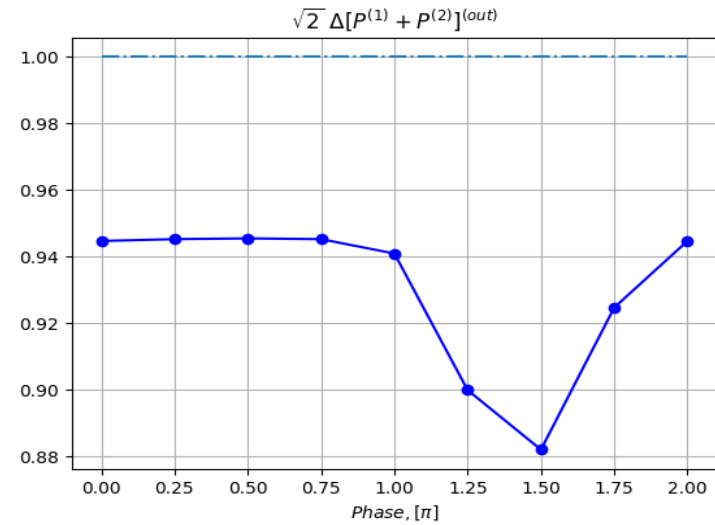$$\sqrt{2}\,\Delta[X^{(1)} - X^{(2)}]^{(out)}$$
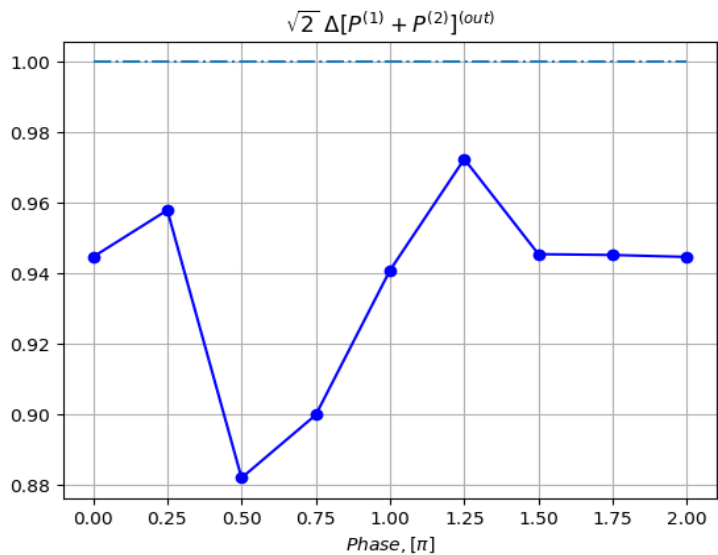
Phase, $[\pi]$
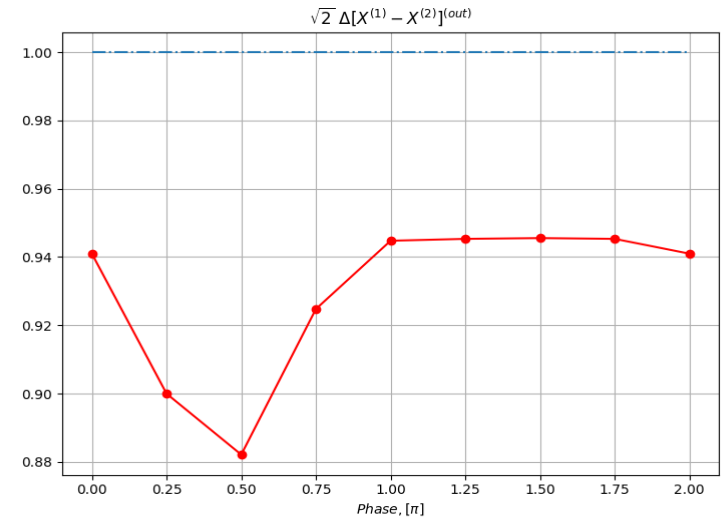
Changing input channels. EPR_P.

1. Single photon goes to the second(top) channel. Coherent state (alpha=1) goes to the first(bottom) channel. **First and only first** detector clicks.
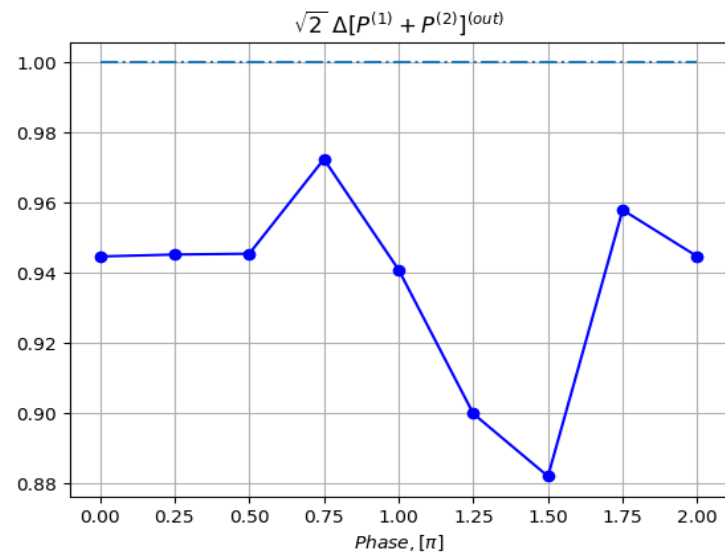

$$\sqrt{2}\ \Delta[P^{(1)} + P^{(2)}]^{(out)}$$

2. Single photon goes to the first(bottom) channel. Coherent state (alpha=1) goes to the second(top) channel. **First and only first** detector clicks.

$$\sqrt{2}\ \Delta[P^{(1)} + P^{(2)}]^{(out)}$$

3. Single photon goes to the second(top) channel. Coherent state (alpha=1) goes to the first(bottom) channel. **Third and only third** detector clicks.
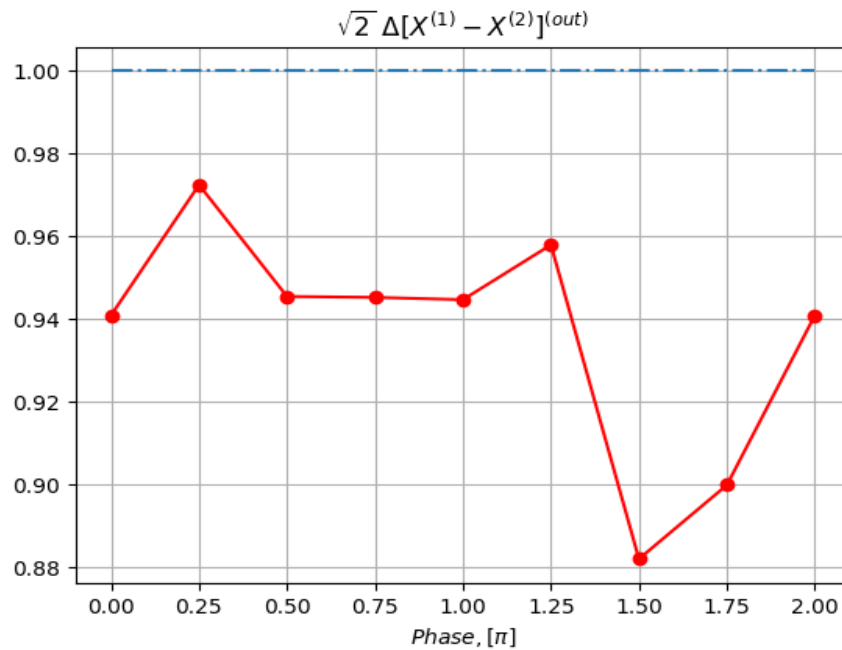

$$\sqrt{2}\ \Delta[P^{(1)} + P^{(2)}]^{(out)}$$

4. Single photon goes to the first(bottom) channel. Coherent state (alpha=1) goes to the second(top) channel. **Third and only third** detector clicks.

$$\sqrt{2}\ \Delta[P^{(1)} + P^{(2)}]^{(out)}$$

Changing input channels and **phase modulation channel**. EPR_X.

1. Single photon goes to the second(top) channel. Coherent state (alpha=1) goes to the first(bottom) channel. **Third and only third** detector clicks. Phase modulation in the **top(2nd) channel.**

2. Single photon goes to the first(bottom)channel. Coherent state (alpha=1) goes to the second(top) channel. **First and only first** detector clicks. Phase modulation in the **bottom(1st) channel.**

$\sqrt{2}\ \Delta[X^{(1)} - X^{(2)}]^{(out)}$

$\sqrt{2}\ \Delta[X^{(1)} - X^{(2)}]^{(out)}$