Table 1

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **48°** | i | j | <Ai> | <Aj> | <AiAj> |
| Ideal | | | 0.105 | 0.105 | -0.788 |
| Ideal total | | |  | | |
| **Normal**  Sample~  16000 | 1 | 2 | 0.105(0.0095) | 0.104(0.0101) | -0.770(0.0063) |
| 2 | 3 | 0.101(0.0101) | 0.085(0.0099) | -0.783(0.0064) |
| 3 | 4 | 0.111(0.0101) | 0.110(0.0101) | -0.761(0.0065) |
| 4 | 5 | 0.086(0.0100) | 0.111(0.0102) | -0.786(0.0060) |
| 5 | 1 | 0.098(0.0101) | 0.104(0.0100) | -0.785(0.0062) |
| total | |  | | |

Table 2

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **48°** | i | j | <Ai> | <Aj> | <AiAj> |
| Ideal | | | 0.105 | 0.105 | -0.788 |
| Ideal total | | |  | | |
| **Reverse**  Sample~ 10000 | 1 | 5 | 0.101(0.0100) | 0.096(0.0093) | -0.782(0.0061) |
| 2 | 1 | 0.091(0.0100) | 0.114(0.0097) | -0.764(0.0061) |
| 3 | 2 | 0.109(0.0102) | 0.088(0.0100) | -0.759(0.0063) |
| 4 | 3 | 0.105(0.0101) | 0.094(0.0095) | -0.769(0.0067) |
| 5 | 4 | 0.084(0.0098) | 0.099(0.0099) | -0.781(0.0062) |
| total | |  | | |

Table 3

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **46.5 °** | i | j | <Ai> | <Aj> | <AiAj> |
| Ideal | | | 0.052 | 0.139 | -0.804 |
| Ideal total | | |  | | |
| **Normal**  Sample~ 10500 | 1 | 2 | 0.056(0.0098) | 0.149(0.0099) | -0.762(0.0068) |
| 2 | 3 | 0.054(0.0101) | 0.129(0.0099) | -0.769(0.0060) |
| 3 | 4 | 0.053(0.0095) | 0.137(0.0096) | -0.778(0.0062) |
| 4 | 5 | 0.050(0.0100) | 0.122(0.0098) | -0.799(0.0060) |
| 5 | 1 | 0.047(0.0101) | 0.139(0.0102) | -0.789(0.0063) |
| total | |  | | |

Table 4

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **46.5 °** | i | j | <Ai> | <Aj> | <AiAj> |
| Ideal | | | 0.052 | 0.139 | -0.804 |
| Ideal total | | |  | | |
| **Reverse**  Sample~ 10000 | 1 | 5 | 0.047(~) | 0.126(~) | -0.789( ) |
| 2 | 1 | 0.053(~) | 0.140(~) | -0.756( ) |
| 3 | 2 | 0.053(~) | 0.117(~) | -0.764( ) |
| 4 | 3 | 0.033(~) | 0.142(~) | -0.778( ) |
| 5 | 4 | 0.057(~) | 0.115(~) | -0.786( ) |
| total | |  | | |

Table 5

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **45 °** | i | j | <Ai> | <Aj> | <AiAj> |
| Ideal | | | 0 | 0.173 | -0.809 |
| Ideal total | | |  | | |
| **Normal**  Sample ~ 11000 | 1 | 2 | -0.009(0.0099) | 0.188(0.0101) | -0.783(0.0062) |
| 2 | 3 | 0.014(0.0101) | 0.147(0.0098) | -0.785(0.0063) |
| 3 | 4 | -0.002(0.0101) | 0.182(0.0100) | -0.782(0.0065) |
| 4 | 5 | -0.009(0.0098) | 0.169(0.0104) | -0.801(0.0059) |
| 5 | 1 | 0.007(0.0101) | 0.155(0.0098) | -0.787(0.0061) |
| total | |  | | |

Table 6

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **45 °** | i | j | <Ai> | <Aj> | <AiAj> |
| Ideal | | | 0 | 0.173 | -0.809 |
| Ideal total | | |  | | |
| **Reverse**  Sample ~ 10000 | 1 | 5 | 0.002( ) | 0.157( ) | -0.797() |
| 2 | 1 | -0.009( ) | 0.179( ) | -0.785() |
| 3 | 2 | -0.007( ) | 0.161( ) | -0.784() |
| 4 | 3 | -0.007( ) | 0.168( ) | -0.789() |
| 5 | 4 | -0.016( ) | 0.171( ) | -0.803() |
| total | |  | | |

Table 7

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **48 ° p=0.1** | i | j | <Ai> | <Aj> | <AiAj> |
| Ideal | | | 0.128 | 0.128 | -0.743 |
| Ideal total | | |  | | |
| **Normal**  **Mixed state**  Sample ~ 10600 | 1 | 2 | 0.123(0.0101) | 0.126(0.0101) | -0.722(0.0071) |
| 2 | 3 | 0.118(0.0096) | 0.111(0.0100) | -0.720(0.0067) |
| 3 | 4 | 0.118(0.0101) | 0.129(0.0101) | -0.715(0.0072) |
| 4 | 5 | 0.103(0.0102) | 0.120(0.0096) | -0.742(0.0068) |
| 5 | 1 | 0.124(0.0101) | 0.116(0.0098) | -0.739(0.0065) |
| total | |  | | |

Table 8

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **48°p=0.1** | i | j | <Ai> | <Aj> | <AiAj> |
| Ideal | | | 0.128 | 0.128 | -0.743 |
| Ideal total | | |  | | |
| **Reverse**  Sample~ 10000 | 1 | 5 | 0.120 | 0.122 | -0.729 |
| 2 | 1 | 0.129 | 0.130 | -0.703 |
| 3 | 2 | 0.108 | 0.123 | -0.734 |
| 4 | 3 | 0.114 | 0.129 | -0.724 |
| 5 | 4 | 0.122 | 0.116 | -0.735 |
| total | |  | | |

Table 9

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **48 ° p=0.2** | i | j | <Ai> | <Aj> | <AiAj> |
| Ideal | | | 0.151 | 0.151 | -0.698 |
| Ideal total | | |  | | |
| **Normal**  Mixed state  Sample ~ 11000 | 1 | 2 | 0.150(0.0100) | 0.144(0.0101) | -0.675(0.0074) |
| 2 | 3 | 0.151(0.0096) | 0.135(0.0099) | -0.672(0.0073) |
| 3 | 4 | 0.139(0.0095) | 0.154(0.0096) | -0.676(0.0074) |
| 4 | 5 | 0.146(0.0096) | 0.145(0.0103) | -0.681(0.0076) |
| 5 | 1 | 0.135(0.0099) | 0.135(0.0095) | -0.703(0.0072) |
| total | |  | | |

Table 10

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **48 ° p=0.2** | i | j | <Ai> | <Aj> | <AiAj> |
|  |  |  |  |  |  |
| Ideal | | | 0.151 | 0.151 | -0.698 |
| Ideal total | | |  | | |
| **Reverse**  **Mixed state**  Sample ~ 10000 | 1 | 5 | 0.158 | 0.134 | -0.683 |
| 2 | 1 | 0.142 | 0.150 | -0.683 |
| 3 | 2 | 0.142 | 0.144 | -0.680 |
| 4 | 3 | 0.134 | 0.155 | -0.686 |
| 5 | 4 | 0.134 | 0.142 | -0.699 |
| total | |  | | |

Table 11

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **46 ° p=0.1** | i | j | <Ai> | <Aj> | <AiAj> |
|  |  |  |  |  |  |
| Ideal | | | 0.065 | 0.169 | -0.759 |
| Ideal total | | |  | | |
| **Normal**  **Mixed state**  Sample ~ 10000 | 1 | 2 | 0.065 | 0.161 | -0.724 |
| 2 | 3 | 0.062 | 0.161 | -0.715 |
| 3 | 4 | 0.062 | 0.182 | -0.721 |
| 4 | 5 | 0.054 | 0.161 | -0.752 |
| 5 | 1 | 0.053 | 0.167 | -0.745 |
| total | |  | | |

Table 12

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **47 ° p=0.05** | i | j | <Ai> | <Aj> | <AiAj> |
|  |  |  |  |  |  |
| Ideal | | | 0.083 | 0.138 | -0.777 |
| Ideal total | | |  | | |
| **Normal**  **Mixed state**  Sample ~ 10000 | 1 | 2 | 0.093 | 0.128 | -0.751 |
| 2 | 3 | 0.071 | 0.131 | -0.749 |
| 3 | 4 | 0.081 | 0.138 | -0.742 |
| 4 | 5 | 0.082 | 0.130 | -0.745 |
| 5 | 1 | 0.080 | 0.125 | -0.762 |
| total | |  | | |

Table 13

|  |  |  |  |
| --- | --- | --- | --- |
| Fdelity of the initial state  (4000 samples for each experimental run) | state | Fidelity to self | Fidelity to |0> |
| |0> | 0.9998 | 0.9998 |
| |1> | 0.9957 | 0.0042 |
| |2> | 0.9928 | 0.0058 |
| Mixed with p=0.05 | 0.9990 | 0.9665 |
| Mixed with p=0.1 | 0.9962 | 0.9348 |
| Mixed with p=0.2 | 0.9924 | 0.8456 |

Table 14

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Sharp measurement | 1 | 2 | 3 | 4 | 5 | total |
| 15000 Samples for each run | 0.9936 | 0.9913 | 0.9900 | 0.9925 | 0.9941 | 0.9923 |

Table 15

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Fdelity of the POVM Operator  4000 samples for each Experimental run | () | order | fidelity | error |
| 48 | 1 | 0.9936 |  |
| 2 | 0.9906 |  |
| 3 | 0.9961 |  |
| 4 | 0.9945 |  |
| 5 | 0.9896 |  |
| 47 | 1 | 0.9921 |  |
| 2 | 0.9862 |  |
| 3 | 0.9924 |  |
| 4 | 0.9890 |  |
| 5 | 0.9958 |  |
| 46.5 | 1 | 0.9889 |  |
| 2 | 0.9966 |  |
| 3 | 0.9980 |  |
| 4 | 0.9920 |  |
| 5 | 0.9883 |  |
| 46 | 1 | 0.9898 |  |
| 2 | 0.9903 |  |
| 3 | 0.9936 |  |
| 4 | 0.9946 |  |
| 5 | 0.9874 |  |
| 45 | 1 | 0.9878 |  |
| 2 | 0.9916 |  |
| 3 | 0.9877 |  |
| 4 | 0.9914 |  |
| 5 | 0.9831 |  |

注：Table 15 的fidelity是按照参考文献的第二种计算方法计算的，与python程序计算结果有所不同，优点是不会出现超过1的保真度。

New from 2021.04-

Table 1

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 150.612244 | Normal | i | j | <Ai> | <Aj> | <AiAj> |
| N~  10000 | ideal | 1 | 2 | 0.158 | 0.158 | -0.683 |
| 2 | 3 | 0.158 | -0.157 | -0.998 |
| 3 | 4 | -0.157 | 0.864 | -0.292 |
| 4 | 5 | 0.864 | -0.157 | -0.292 |
| 5 | 1 | -0.157 | 0.158 | -0.998 |
| total | |  | | |
| experimental | 1 | 2 | 0.174(0.0099) | 0.135(0.0100) | -0.683(0.0074) |
| 2 | 3 | 0.161(0.0097) | -0.138(0.0097) | -0.969(0.0024) |
| 3 | 4 | -0.152(0.0096) | 0.845(0.0054) | -0.295(0.0096) |
| 4 | 5 | 0.853(0.0052) | -0.159(0.0102) | -0.303(0.0101) |
| 5 | 1 | -0.159(0.0098) | 0.163(0.0098) | -0.986(0.0017) |
| total | |  | | |

Table 2

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 150.612244 | Revere | i | j | <Ai> | <Aj> | <AiAj> |
| N~  10000 | ideal | 1 | 5 | 0.158 | -0.157 | -0.998 |
| 2 | 1 | 0.158 | 0.158 | -0.683 |
| 3 | 2 | -0.157 | 0.158 | -0.998 |
| 4 | 3 | 0.864 | -0.157 | -0.292 |
| 5 | 4 | -0.157 | 0.864 | -0.292 |
| total | |  | | |
| experimental | 1 | 5 | 0.169(0.0102) | -0.154(0.0099) | -0.980(0.0020) |
| 2 | 1 | 0.142(0.0099) | 0.166(0.0102) | -0.684(0.0070) |
| 3 | 2 | -0.132(0.0100) | 0.154(0.0104) | -0.972(0.0024) |
| 4 | 3 | 0.844(0.0053) | -0.141(0.0098) | -0.295(0.0098) |
| 5 | 4 | -0.157(0.0102) | 0.846(0.0055) | -0.295(0.0098) |
| total | |  | | |

Table 3

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 113.877551 | Normal | i | j | <Ai> | <Aj> | <AiAj> |
| N~  10000 | ideal | 1 | 2 | 0.080 | 0.080 | -0.840 |
| 2 | 3 | 0.080 | 0.999 | 0.079 |
| 3 | 4 | 0.999 | -0.999 | -1.000 |
| 4 | 5 | -0.999 | 0.999 | -1.000 |
| 5 | 1 | 0.999 | 0.08 | 0.080 |
| total | |  | | |
| experimental | 1 | 2 | 0.074(0.0103) | 0.077(0.0103) | -0.838(0.0053) |
| 2 | 3 | 0.09(0.0102) | 0.0983(0.0096) | 0.079(0.0099) |
| 3 | 4 | 0.995(0.0010) | -0.973(0.0022) | -0.977(0.0022) |
| 4 | 5 | -0.988(0.0015) | 0.977(0.0022) | -0.977(0.0022) |
| 5 | 1 | 0.981(0.0020) | 0.084(0.0105) | 0.066(0.0103) |
| total | |  | | |

Table 4

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 113.877551 | Revere | i | j | <Ai> | <Aj> | <AiAj> |
| N~  10000 | ideal | 1 | 5 | 0.080 | 0.999 | 0.080 |
| 2 | 1 | 0.080 | 0.080 | -0.840 |
| 3 | 2 | 0.999 | 0.080 | 0.080 |
| 4 | 3 | -0.999 | 0.999 | -1.000 |
| 5 | 4 | 0.999 | -0.999 | -1.000 |
| total | |  | | |
| experimental | 1 | 5 | 0.095(0.0101) | 0.974(0.0022) | 0.073(0.0101) |
| 2 | 1 | 0.082(0.0101) | 0.067(0.0098) | -0.845(0.0053) |
| 3 | 2 | 0.991(0.0013) | 0.087(0.0101) | 0.079(0.0097) |
| 4 | 3 | -0.989(0.0015) | 0.986(0.0017) | -0.982(0.0019) |
| 5 | 4 | 0.993(0.0012) | -0.970(0.0025) | -0.976(0.0021) |
| total | |  | | |

Table 5

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 22.040813 | Normal | i | j | <Ai> | <Aj> | <AiAj> |
| N~  10000 | ideal | 1 | 2 | 0.060 | 0.060 | -0.880 |
| 2 | 3 | 0.060 | -0.058 | -0.998 |
| 3 | 4 | -0.058 | 0.855 | -2.03 |
| 4 | 5 | 0.855 | -0.058 | -2.03 |
| 5 | 1 | -0.058 | 0.060 | -0.998 |
| total | |  | | |
| experimental | 1 | 2 | 0.054(0.0102) | 0.06(0.0099) | -0.877(0.0048) |
| 2 | 3 | 0.068(0.0099) | -0.063(0.0097) | -0.985(0.0017) |
| 3 | 4 | -0.057(0.0103) | 0.833(0.0055) | -0.189(0.0101) |
| 4 | 5 | 0.843(0.0054) | -0.045(0.0100) | -0.199(0.0099) |
| 5 | 1 | -0.064(0.0097) | 0.064(0.0101) | -0.979(0.002) |
| total | |  | | |

Table 6

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 22.040813 | Revere | i | j | <Ai> | <Aj> | <AiAj> |
| N~  10000 | ideal | 1 | 5 | 0.060 | -0.058 | -0.998 |
| 2 | 1 | 0.060 | 0.060 | -0.880 |
| 3 | 2 | -0.058 | 0.060 | -0.998 |
| 4 | 3 | 0.855 | -0.058 | -0.203 |
| 5 | 4 | -0.058 | 0.855 | -0.203 |
| total | |  | | |
| experimental | 1 | 5 | 0.063(0.0100) | -0.061(0.0096) | -0.976(0.0021) |
| 2 | 1 | 0.054(0.0099) | 0.053(0.0101) | -0.875(0.0050) |
| 3 | 2 | -0.057(0.0101) | 0.057(0.0098) | -0.988(0.0015) |
| 4 | 3 | 0.826(0.0056) | -0.046(0.0101) | -0.218(0.0100) |
| 5 | 4 | -0.04(0.0101) | 0.845(0.0053) | -0.189(0.0099) |
| total | |  | | |

Table 7

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 58.775510 | Normal | i | j | <Ai> | <Aj> | <AiAj> |
| N~  10000 | ideal | 1 | 2 | 0.191 | 0.191 | -0.619 |
| 2 | 3 | 0.191 | 0.996 | 0.187 |
| 3 | 4 | 0.996 | -0.996 | -0.999 |
| 4 | 5 | -0.996 | 0.996 | -0.999 |
| 5 | 1 | 0.996 | 0.191 | 0.187 |
| total | |  | | |
| experimental | 1 | 2 | 0.172(0.0095) | 0.198(0.0099) | -0.619(0.0074) |
| 2 | 3 | 0.217(0.0096) | 0.957(0.0029) | 0.180(0.01) |
| 3 | 4 | -0.990(0.0014) | -0.968(0.0025) | -0.976(0.0022) |
| 4 | 5 | -0.977(0.0021) | 0.982(0.0019) | -0.986(0.0016) |
| 5 | 1 | 0.989(0.0015) | 0.190(0.0098) | 0.178(0.0099) |
| total | |  | | |

Table 8

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 58.775510 | Revere | i | j | <Ai> | <Aj> | <AiAj> |
| N~  10000 | ideal | 1 | 5 | 0.191 | 0.996 | 0.187 |
| 2 | 1 | 0.191 | 0.191 | -0.619 |
| 3 | 2 | 0.996 | 0.191 | 0.187 |
| 4 | 3 | -0.996 | 0.996 | -0.999 |
| 5 | 4 | 0.996 | -0.996 | -0.999 |
| total | |  | | |
| experimental | 1 | 5 | 0.204(0.0098) | 0.970(0.0024) | 0.182(0.0098) |
| 2 | 1 | 0.180(0.0099) | 0.197(0.0097) | -0.614(0.0075) |
| 3 | 2 | 0.986(0.0017) | 0.200(0.0099) | 0.187(0.0101) |
| 4 | 3 | -0.992(0.0013) | 0.974(0.0023) | -0.978(0.0021) |
| 5 | 4 | 0.994(0.0011) | -0.969(0.0024) | -0.975(0.0022) |
| total | |  | | |

Table 9

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 69.795918 | Normal | i | j | <Ai> | <Aj> | <AiAj> |
| N~  10000 | ideal | 1 | 2 | 0.044 | 0.044 | -0.913 |
| 2 | 3 | 0.044 | 0.996 | 0.040 |
| 3 | 4 | 0.996 | -0.996 | -1.000 |
| 4 | 5 | -0.996 | 0.996 | -1.000 |
| 5 | 1 | 0.996 | 0.044 | 0.040 |
| total | |  | | |
| experimental | 1 | 2 | 0.049(0.0101) | 0.034(0.0101) | -0.909(0.0042) |
| 2 | 3 | 0.053(0.0095) | 0.976(0.0022) | 0.042(0.0099) |
| 3 | 4 | 0.989(0.0015) | -0.970(0.0023) | -0.980(0.0020) |
| 4 | 5 | -0.985(0.0017) | 0.982(0.0019) | -0.986(0.0017) |
| 5 | 1 | 0.983(0.0019) | 0.059(0.0102) | 0.043(0.0098) |
| total | |  | | |

Table 10

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 69.795918 | Revere | i | j | <Ai> | <Aj> | <AiAj> |
| N~  10000 | ideal | 1 | 5 | 0.044 | 0.996 | 0.040 |
| 2 | 1 | 0.044 | 0.044 | -0.913 |
| 3 | 2 | 0.996 | 0.044 | 0.040 |
| 4 | 3 | -0.996 | 0.996 | -1.000 |
| 5 | 4 | 0.996 | -0.996 | -1.000 |
| total | |  | | |
| experimental | 1 | 5 | 0.044(0.0099) | 0.985(0.0017) | 0.039(0.0108) |
| 2 | 1 | 0.033(0.0097) | 0.049(0.0097) | -0.907(0.0042) |
| 3 | 2 | 0.969(0.0024) | 0.063(0.0101) | 0.034(0.0097) |
| 4 | 3 | -0.991(0.0014) | 0.971(0.0024) | -0.976(0.0022) |
| 5 | 4 | 0.995(0.0010) | -0.974(0.0023) | -0.979(0.0020) |
| total | |  | | |

Table 11 sharp measurement (15000 samples)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| \\Ai | 1 | 2 | 3 | 4 | 5 | Mean |
| 48 | 0.9936(13) | 0.9913(15) | 0.9900(16) | 0.9925(14) | 0.9941(12) | 0.9923(14) |
| 22.040813 | 0.9987(6) | 0.9962(10) | 0.9987(6) | 0.9923(15) | 0.9944(12) | 0.9958(11) |
| 58.775510 | 0.9995(4) | 0.9967(9) | 0.9980(7) | 0.991915() | 0.9912(16) | 0.9943(13) |
| 150.612244 | 0.9999(2) | 0.9953(11) | 0.9960(11) | 0.9923(14) | 0.9921(15) | 0.9951(11) |
| 69.795918 | 0.9998(2) | 0.9948(11) | 0.9963(1) | 0.9909(16) | 0.9958(11) | 0.9950(12) |
| 113.877551 | 0.9996(3) | 0.9953(11) | 0.9963(1) | 0.9941(13) | 0.9935(13) | 0.9958(10) |

Table 12 Non-disturbance of compatible measurements

()

|  |  |  |
| --- | --- | --- |
| (150.612244) Order | Probability | Error |
|  | 0.587 | 0.0098 |
|  | 0.582 | 0.0098 |
|  | 0.583 | 0.0098 |
|  | 0.584 | 0.0100 |
|  |  |  |
|  | 0.568 | 0.0097 |
|  | 0.580 | 0.0100 |
|  | 0.571 | 0.0099 |
|  | 0.577 | 0.0097 |
|  |  |  |
|  | 0.431 | 0.0098 |
|  | 0.424 | 0.0101 |
|  | 0.434 | 0.0098 |
|  | 0.429 | 0.0106 |
|  |  |  |
|  | 0.922 | 0.0054 |
|  | 0.927 | 0.0051 |
|  | 0.922 | 0.0052 |
|  | 0.923 | 0.0051 |
|  |  |  |
|  | 0.420 | 0.0097 |
|  | 0.420 | 0.0100 |
|  | 0.421 | 0.0102 |
|  | 0.423 | 0.0098 |
|  |  |  |

Table 13 Non-disturbance of compatible measurements

()

|  |  |  |
| --- | --- | --- |
| (113.877551) Order | Probability | Error |
|  | 0.537 | 0.0102 |
|  | 0.542 | 0.0098 |
|  | 0.534 | 0.0095 |
|  | 0.548 | 0.0096 |
|  |  |  |
|  | 0.539 | 0.0100 |
|  | 0.545 | 0.0100 |
|  | 0.541 | 0.0102 |
|  | 0.544 | 0.0093 |
|  |  |  |
|  | 0.991 | 0.0018 |
|  | 0.998 | 0.0009 |
|  | 0.996 | 0.0013 |
|  | 0.993 | 0.0017 |
|  |  |  |
|  | 0.014 | 0.0024 |
|  | 0.006 | 0.0015 |
|  | 0.006 | 0.0015 |
|  | 0.015 | 0.0023 |
|  |  |  |
|  | 0.989 | 0.0020 |
|  | 0.991 | 0.0019 |
|  | 0.996 | 0.0012 |
|  | 0.987 | 0.0022 |
|  |  |  |

Table 14 Non-disturbance of compatible measurements

()

|  |  |  |
| --- | --- | --- |
| (22.040813) Order | Probability | Error |
|  | 0.527 | 0.0100 |
|  | 0.532 | 0.0098 |
|  | 0.526 | 0.0102 |
|  | 0.531 | 0.0097 |
|  |  |  |
|  | 0.530 | 0.0102 |
|  | 0.534 | 0.0100 |
|  | 0.527 | 0.0099 |
|  | 0.529 | 0.0099 |
|  |  |  |
|  | 0.469 | 0.0099 |
|  | 0.472 | 0.0101 |
|  | 0.472 | 0.0099 |
|  | 0.477 | 0.0102 |
|  |  |  |
|  | 0.916 | 0.0057 |
|  | 0.921 | 0.0055 |
|  | 0.913 | 0.0057 |
|  | 0.923 | 0.0053 |
|  |  |  |
|  | 0.478 | 0.0098 |
|  | 0.468 | 0.0099 |
|  | 0.480 | 0.0102 |
|  | 0.469 | 0.0095 |
|  |  |  |

Table 15 Non-disturbance of compatible measurements

()

|  |  |  |
| --- | --- | --- |
| (58.775510) Order | Probability | Error |
|  | 0.586 | 0.0102 |
|  | 0.595 | 0.0096 |
|  | 0.598 | 0.0094 |
|  | 0.602 | 0.0098 |
|  |  |  |
|  | 0.599 | 0.0098 |
|  | 0.608 | 0.0101 |
|  | 0.590 | 0.0097 |
|  | 0.600 | 0.0097 |
|  |  |  |
|  | 0.979 | 0.0029 |
|  | 0.995 | 0.0014 |
|  | 0.993 | 0.0017 |
|  | 0.987 | 0.0022 |
|  |  |  |
|  | 0.016 | 0.0025 |
|  | 0.012 | 0.0022 |
|  | 0.004 | 0.0013 |
|  | 0.016 | 0.0024 |
|  |  |  |
|  | 0.991 | 0.0019 |
|  | 0.994 | 0.0016 |
|  | 0.997 | 0.0011 |
|  | 0.985 | 0.0024 |
|  |  |  |

Table 16 Non-disturbance of compatible measurements

()

|  |  |  |
| --- | --- | --- |
| (69.612244) Order | Probability | Error |
|  | 0.524 | 0.0101 |
|  | 0.530 | 0.0095 |
|  | 0.524 | 0.0101 |
|  | 0.522 | 0.0097 |
|  |  |  |
|  | 0.517 | 0.0101 |
|  | 0.526 | 0.0106 |
|  | 0.516 | 0.0097 |
|  | 0.532 | 0.0103 |
|  |  |  |
|  | 0.988 | 0.0022 |
|  | 0.995 | 0.0014 |
|  | 0.985 | 0.0024 |
|  | 0.985 | 0.0023 |
|  |  |  |
|  | 0.015 | 0.0025 |
|  | 0.008 | 0.0018 |
|  | 0.005 | 0.0014 |
|  | 0.013 | 0.0022 |
|  |  |  |
|  | 0.991 | 0.0019 |
|  | 0.991 | 0.0019 |
|  | 0.997 | 0.0011 |
|  | 0.993 | 0.0017 |
|  |  |  |

Table 17 Non-disturbance of compatible measurements

()

|  |  |  |
| --- | --- | --- |
| (48°) Order | Probability | Error |
|  | 0.552 | 0.005 |
|  | 0.552 | 0.005 |
|  | 0.557 | 0.005 |
|  | 0.548 | 0.005 |
|  |  |  |
|  | 0.552 | 0.005 |
|  | 0.551 | 0.005 |
|  | 0.546 | 0.005 |
|  | 0.544 | 0.005 |
|  |  |  |
|  | 0.542 | 0.005 |
|  | 0.556 | 0.005 |
|  | 0.554 | 0.005 |
|  | 0.547 | 0.005 |
|  |  |  |
|  | 0.555 | 0.005 |
|  | 0.543 | 0.005 |
|  | 0.552 | 0.005 |
|  | 0.549 | 0.005 |
|  |  |  |
|  | 0.556 | 0.005 |
|  | 0.549 | 0.005 |
|  | 0.542 | 0.005 |
|  | 0.548 | 0.005 |
|  |  |  |

Table 18 state tomography

|  |  |  |  |
| --- | --- | --- | --- |
| Fdelity of the initial state  (4000 samples for each experimental run) | state | Fidelity | error |
| 22 | 0.9944 | 0.0082 |
| 58 | 0.9944 | 0.0119 |
| 69 | 0.9923 | 0.0111 |
| 113 | 0.9965 | 0.0115 |
| 150 | 0.9946 | 0.0085 |

Table 19 POVM tomography

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Fdelity of the POVM Operator  4000 samples for each Experimental run | () | order | fidelity | error |
| 48 | 1 | 0.9936 | 0.0055 |
| 2 | 0.9906 | 0.0063 |
| 3 | 0.9961 | 0.0038 |
| 4 | 0.9945 | 0.0056 |
| 5 | 0.9896 | 0.0087 |
| 22 | 1 | 0.9970 | 0.0042 |
| 2 | 0.9977 | 0.0046 |
| 3 | 0.9967 | 0.0045 |
| 4 | 1.0000 | 0.0074 |
| 5 | 0.9969 | 0.0064 |
| 58 | 1 | 0.9973 | 0.0039 |
| 2 | 0.9976 | 0.0037 |
| 3 | 1.0000 | 0.0045 |
| 4 | 0.9940 | 0.0083 |
| 5 | 0.9923 | 0.0065 |
| 69 | 1 | 0.9960 | 0.0044 |
| 2 | 0.9967 | 0.0039 |
| 3 | 0.9992 | 0.0053 |
| 4 | 0.9930 | 0.0045 |
| 5 | 0.9914 | 0.0030 |
| 113 | 1 | 0.9957 | 0.0044 |
| 2 | 0.9965 | 0.0043 |
| 3 | 0.9966 | 0.0064 |
| 4 | 0.9954 | 0.0081 |
| 5 | 0.9938 | 0.0047 |
| 150 | 1 | 0.9949 | 0.0043 |
| 2 | 0.9949 | 0.0067 |
| 3 | 0.9941 | 0.0054 |
| 4 | 0.9955 | 0.0054 |
| 5 | 0.9929 | 0.0047 |