fiducials\_image\_27

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1347 | -19285 | 1347 | -19285 | 1347 | -19284 | 1347 | -19285 |
| 19161 | -1470 | 19175 | -1484 | 19160 | -1469 | 19162 | -1470 |
| 1345 | -1471 | 1358 | -1473 | 1345 | -1471 | 1346 | -1472 |
| 19163 | -19283 | 19163 | -19283 | 19167 | -19282 | 19163 | -19283 |
| 843 | -10379 | 849 | -10378 | 842 | -10378 | 843 | -10379 |
| 19666 | -10376 | 19672 | -10391 | 19666 | -10377 | 19666 | -10377 |
| 10254 | -966 | 10267 | -973 | 10253 | -966 | 10254 | -967 |
| 10254 | -19789 | 10255 | -19789 | 10255 | -19789 | 10255 | -19789 |

control\_image\_27

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 9447 | -2295 | 9458 | -2293 | 9448 | -2294 | 9447 | -2296 |
| 10053 | -10883 | 10056 | -10883 | 10048 | -10880 | 10052 | -10883 |
| 11843 | -17255 | 11851 | -17259 | 11848 | -17245 | 11844 | -17251 |
| 17844 | -18028 | 17852 | -18033 | 17862 | -18039 | 17841 | -18027 |
| 11782 | -1172 | 11781 | -1172 | 11781 | -1172 | 11781 | -1174 |
| 14000 | -9752 | 14008 | -9749 | 14007 | -9748 | 13998 | -9754 |
| 9612 | -14506 | 9611 | -14507 | 9612 | -14502 | 9610 | -14505 |
| 14684 | -18207 | 14676 | -18211 | 14685 | -18205 | 14685 | -18205 |

tie\_image\_27

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 9406 | -9117 | 9405 | -9118 | 9407 | -9117 | 9406 | -9117 |
| 18185 | -10723 | 18186 | -10722 | 18187 | -10722 | 18185 | -10723 |
| 9350 | -19175 | 9350 | -19176 | 9350 | -19177 | 9350 | -19176 |
| 17824 | -18055 | 17824 | -18056 | 17825 | -18056 | 17824 | -18056 |
| 9459 | -2291 | 9458 | -2291 | 9458 | -2291 | 9459 | -2291 |
| 17434 | -1693 | 17435 | -1694 | 17435 | -1695 | 17434 | -1694 |

mean\_\_std\_fiducials\_image\_27

|  |  |  |  |
| --- | --- | --- | --- |
| 1347.0 | -19284.75 | 0.0 | 0.5 |
| 19164.5 | -1473.25 | 7.05 | 7.18 |
| 1348.5 | -1471.75 | 6.35 | 0.96 |
| 19164.0 | -19282.75 | 2.0 | 0.5 |
| 844.25 | -10378.5 | 3.2 | 0.58 |
| 19667.5 | -10380.25 | 3.0 | 7.18 |
| 10257.0 | -968.0 | 6.68 | 3.37 |
| 10254.75 | -19789.0 | 0.5 | 0.0 |

mean\_\_std\_control\_image\_27

|  |  |  |  |
| --- | --- | --- | --- |
| 9450.0 | -2294.5 | 5.35 | 1.29 |
| 10052.25 | -10882.25 | 3.3 | 1.5 |
| 11846.5 | -17252.5 | 3.7 | 5.97 |
| 17849.75 | -18031.75 | 9.39 | 5.5 |
| 11781.25 | -1172.5 | 0.5 | 1.0 |
| 14003.25 | -9750.75 | 4.99 | 2.75 |
| 9611.25 | -14505.0 | 0.96 | 2.16 |
| 14682.5 | -18207.0 | 4.36 | 2.83 |

mean\_\_std\_tie\_image\_27

|  |  |  |  |
| --- | --- | --- | --- |
| 9406.0 | -9117.25 | 0.82 | 0.5 |
| 18185.75 | -10722.5 | 0.96 | 0.58 |
| 9350.0 | -19176.0 | 0.0 | 0.82 |
| 17824.25 | -18055.75 | 0.5 | 0.5 |
| 9458.5 | -2291.0 | 0.58 | 0.0 |
| 17434.5 | -1694.0 | 0.58 | 0.82 |

fiducials\_image\_28

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1347 | -19285 | 1347 | -19286 | 1348 | -19286 | 1347 | -19285 |
| 19175 | -1483 | 19175 | -1484 | 19175 | -1481 | 19175 | -1483 |
| 1358 | -1472 | 1358 | -1472 | 1358 | -1472 | 1358 | -1472 |
| 19162 | -19297 | 19162 | -19297 | 19161 | -19296 | 19163 | -19297 |
| 849 | -10379 | 849 | -10378 | 848 | -10379 | 849 | -10379 |
| 19672 | -10391 | 19672 | -10391 | 19672 | -10390 | 19672 | -10391 |
| 10267 | -972 | 10268 | -973 | 10268 | -974 | 10268 | -973 |
| 10254 | -19795 | 10254 | -19796 | 10254 | -19796 | 10255 | -19795 |

control\_image\_28

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1404 | -2083 | 1408 | -2080 | 1402 | -2081 | 1398 | -2084 |
| 2269 | -10787 | 2272 | -10787 | 2270 | -10787 | 2268 | -10786 |
| 4158 | -17086 | 4160 | -17080 | 4159 | -17083 | 4159 | -17083 |
| 10140 | -17689 | 10147 | -17696 | 10140 | -17689 | 10136 | -17688 |
| 3727 | -851 | 3726 | -849 | 3727 | -852 | 3727 | -852 |
| 6154 | -9531 | 6163 | -9527 | 6153 | -9532 | 6152 | -9532 |
| 1948 | -14420 | 1958 | -14415 | 1947 | -14419 | 1948 | -14419 |
| 6982 | -17952 | 6982 | -17955 | 6983 | -17950 | 6984 | -17949 |

tie\_image\_28

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1537 | -9029 | 1536 | -9034 | 1535 | -9032 | 1536 | -9029 |
| 10332 | -10387 | 10334 | -10384 | 10333 | -10387 | 10332 | -10387 |
| 1836 | -19046 | 1838 | -19046 | 1836 | -19046 | 1836 | -19046 |
| 10120 | -17716 | 10118 | -17714 | 10121 | -17717 | 10120 | -17717 |
| 1410 | -2080 | 1408 | -2095 | 1409 | -2082 | 1410 | -2081 |
| 9448 | -1199 | 9445 | -1200 | 9450 | -1199 | 9449 | -1199 |

mean\_\_std\_fiducials\_image\_28

|  |  |  |  |
| --- | --- | --- | --- |
| 1347.25 | -19285.5 | 0.5 | 0.58 |
| 19175.0 | -1482.75 | 0.0 | 1.26 |
| 1358.0 | -1472.0 | 0.0 | 0.0 |
| 19162.0 | -19296.75 | 0.82 | 0.5 |
| 848.75 | -10378.75 | 0.5 | 0.5 |
| 19672.0 | -10390.75 | 0.0 | 0.5 |
| 10267.75 | -973.0 | 0.5 | 0.82 |
| 10254.25 | -19795.5 | 0.5 | 0.58 |

mean\_\_std\_control\_image\_28

|  |  |  |  |
| --- | --- | --- | --- |
| 1403.0 | -2082.0 | 4.16 | 1.83 |
| 2269.75 | -10786.75 | 1.71 | 0.5 |
| 4159.0 | -17083.0 | 0.82 | 2.45 |
| 10140.75 | -17690.5 | 4.57 | 3.7 |
| 3726.75 | -851.0 | 0.5 | 1.41 |
| 6155.5 | -9530.5 | 5.07 | 2.38 |
| 1950.25 | -14418.25 | 5.19 | 2.22 |
| 6982.75 | -17951.5 | 0.96 | 2.65 |

mean\_\_std\_tie\_image\_28

|  |  |  |  |
| --- | --- | --- | --- |
| 1536.0 | -9031.0 | 0.82 | 2.45 |
| 10332.75 | -10386.25 | 0.96 | 1.5 |
| 1836.5 | -19046.0 | 1.0 | 0.0 |
| 10119.75 | -17716.0 | 1.26 | 1.41 |
| 1409.25 | -2084.5 | 0.96 | 7.05 |
| 9448.0 | -1199.25 | 2.16 | 0.5 |

residual\_image\_27

|  |  |
| --- | --- |
| -0.004161 | -0.007042 |
| 0.0007 | -0.004617 |
| -0.002541 | 0.007406 |
| 0.005976 | 0.021594 |
| 0.006588 | -0.00293 |
| -0.006074 | -0.018656 |
| 0.001485 | 0.007684 |
| -0.001972 | -0.00344 |

residual\_image\_28

|  |  |
| --- | --- |
| 0.004864 | 0.002514 |
| 0.008032 | 0.002944 |
| -0.011877 | -0.002244 |
| -0.006998 | 0.000734 |
| 0.001838 | -0.003601 |
| -0.005782 | -0.006828 |
| 0.005771 | 0.004446 |
| 0.004152 | 0.002035 |

residual\_test

|  |  |
| --- | --- |
| -0.007366 | -0.004732 |
| -0.006623 | -0.002921 |
| 0.015168 | -0.009748 |
| 0.012766 | 0.005017 |
| -0.001198 | 0.003946 |
| -0.003939 | 0.002113 |
| -0.003568 | -0.006794 |
| -0.010601 | 0.014421 |
| 0.004003 | 0.002442 |
| 0.001827 | -0.002776 |
| 0.001524 | 0.000136 |
| -0.009814 | 0.009802 |
| -0.009597 | -0.008094 |
| 0.001605 | -0.00577 |
| 0.003748 | 0.00533 |
| 0.012066 | -0.002372 |

radial\_lens

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 149.9089 | 0.0016 | 0.0011 | 0.0011 | 149.8958 | 0.0016 | 0.0011 | 0.0011 |
| 149.9124 | 0.0016 | -0.0011 | -0.0011 | 149.9229 | 0.0016 | -0.0012 | -0.0012 |
| 149.9116 | 0.0016 | 0.0011 | -0.0011 | 149.9113 | 0.0016 | 0.0011 | -0.0011 |
| 149.909 | 0.0016 | -0.0011 | 0.0011 | 149.9146 | 0.0016 | -0.0012 | 0.0012 |
| 111.9874 | -0.0023 | -0.0023 | -0.0 | 111.9922 | -0.0023 | -0.0023 | -0.0 |
| 112.0059 | -0.0023 | 0.0023 | -0.0 | 112.0062 | -0.0023 | 0.0023 | -0.0 |
| 112.0087 | -0.0023 | 0.0 | 0.0023 | 112.0054 | -0.0023 | 0.0 | 0.0023 |
| 112.0074 | -0.0023 | 0.0 | -0.0023 | 112.002 | -0.0023 | 0.0 | -0.0023 |
| 96.6965 | -0.0008 | -0.0001 | 0.0008 | 144.4742 | -0.0002 | -0.0001 | 0.0001 |
| 6.4628 | 0.0006 | 0.0002 | 0.0005 | 95.2023 | -0.0006 | -0.0006 | -0.0 |
| 83.9812 | 0.0006 | -0.0001 | 0.0006 | 107.8204 | -0.0019 | -0.0013 | -0.0014 |
| 128.3218 | -0.0026 | 0.0018 | -0.0019 | 86.9617 | 0.0003 | 0.0 | 0.0003 |
| 111.0682 | -0.0022 | 0.0004 | 0.0022 | 137.5425 | -0.0017 | -0.0009 | 0.0014 |
| 45.2235 | 0.0027 | -0.0027 | -0.0004 | 49.8881 | 0.0027 | 0.0026 | -0.0005 |
| 49.7083 | 0.0027 | 0.0004 | 0.0027 | 109.9184 | -0.0021 | -0.0019 | -0.0009 |
| 107.0444 | -0.0019 | 0.0009 | -0.0016 | 98.1347 | -0.0009 | -0.0004 | -0.0009 |
| 18.0967 | 0.0015 | 0.0008 | -0.0013 | 105.057 | -0.0017 | -0.0016 | 0.0003 |
| 94.4624 | -0.0005 | 0.0005 | -0.0 | 0.8686 | 0.0001 | -0.0001 | 0.0 |
| 105.263 | -0.0017 | -0.0002 | -0.0017 | 143.7777 | -0.0004 | -0.0002 | -0.0003 |
| 128.3116 | -0.0026 | 0.0018 | -0.0019 | 87.2695 | 0.0003 | 0.0 | 0.0003 |
| 96.728 | -0.0008 | -0.0001 | 0.0008 | 144.3996 | -0.0002 | -0.0001 | 0.0001 |
| 134.099 | -0.0021 | 0.0014 | 0.0017 | 109.7395 | -0.0021 | -0.0002 | 0.0021 |

decentering\_lens

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 149.9089 | -0.0058 | 0.0025 | 149.8958 | -0.0058 | 0.0025 |
| 149.9124 | -0.0058 | 0.0025 | 149.9229 | -0.0058 | 0.0025 |
| 149.9116 | -0.0063 | -0.0036 | 149.9113 | -0.0063 | -0.0036 |
| 149.909 | -0.0063 | -0.0036 | 149.9146 | -0.0063 | -0.0036 |
| 111.9874 | -0.0051 | -0.0002 | 111.9922 | -0.0051 | -0.0002 |
| 112.0059 | -0.0051 | -0.0002 | 112.0062 | -0.0051 | -0.0002 |
| 112.0087 | -0.0017 | -0.0005 | 112.0054 | -0.0017 | -0.0005 |
| 112.0074 | -0.0017 | -0.0005 | 112.002 | -0.0017 | -0.0005 |
| 96.6965 | -0.0013 | -0.0006 | 144.4742 | -0.0061 | -0.0033 |
| 6.4628 | -0.0 | 0.0 | 95.2023 | -0.0036 | 0.0 |
| 83.9812 | -0.0011 | -0.0007 | 107.8204 | -0.0028 | 0.0013 |
| 128.3218 | -0.0046 | -0.0026 | 86.9617 | -0.001 | -0.0002 |
| 111.0682 | -0.0017 | 0.0001 | 137.5425 | -0.0044 | -0.0029 |
| 45.2235 | -0.0008 | 0.0001 | 49.8881 | -0.001 | -0.0002 |
| 49.7083 | -0.0003 | 0.0 | 109.9184 | -0.0041 | 0.0011 |
| 107.0444 | -0.0024 | -0.0017 | 98.1347 | -0.0016 | 0.0006 |
| 18.0967 | -0.0001 | -0.0001 | 105.057 | -0.0044 | -0.0006 |
| 94.4624 | -0.0036 | -0.0002 | 0.8686 | -0.0 | -0.0 |
| 105.263 | -0.0015 | -0.0001 | 143.7777 | -0.0052 | 0.0023 |
| 128.3116 | -0.0046 | -0.0026 | 87.2695 | -0.001 | -0.0002 |
| 96.728 | -0.0013 | -0.0006 | 144.3996 | -0.0061 | -0.0033 |
| 134.099 | -0.0042 | 0.0019 | 109.7395 | -0.0017 | -0.0007 |

atmospheric\_refraction

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 96.6965 | 0.0016 | 0.0002 | -0.0016 | 144.4742 | 0.0033 | 0.0024 | -0.0022 |
| 6.4628 | 0.0001 | 0.0 | 0.0001 | 95.2023 | 0.0016 | 0.0016 | 0.0001 |
| 83.9812 | 0.0013 | -0.0003 | 0.0013 | 107.8204 | 0.0019 | 0.0013 | 0.0014 |
| 128.3218 | 0.0026 | -0.0018 | 0.0019 | 86.9617 | 0.0014 | 0.0 | 0.0014 |
| 111.0682 | 0.002 | -0.0003 | -0.002 | 137.5425 | 0.003 | 0.0017 | -0.0024 |
| 45.2235 | 0.0006 | -0.0006 | -0.0001 | 49.8881 | 0.0007 | 0.0006 | -0.0001 |
| 49.7083 | 0.0007 | 0.0001 | 0.0006 | 109.9184 | 0.002 | 0.0018 | 0.0009 |
| 107.0444 | 0.0019 | -0.0009 | 0.0017 | 98.1347 | 0.0017 | 0.0007 | 0.0015 |
| 18.0967 | 0.0002 | 0.0001 | -0.0002 | 105.057 | 0.0018 | 0.0018 | -0.0003 |
| 94.4624 | 0.0016 | -0.0016 | 0.0001 | 0.8686 | 0.0 | -0.0 | 0.0 |
| 105.263 | 0.0019 | 0.0002 | 0.0018 | 143.7777 | 0.0032 | 0.0023 | 0.0023 |
| 128.3116 | 0.0026 | -0.0018 | 0.0019 | 87.2695 | 0.0014 | 0.0 | 0.0014 |
| 96.728 | 0.0016 | 0.0002 | -0.0016 | 144.3996 | 0.0033 | 0.0024 | -0.0022 |
| 134.099 | 0.0028 | -0.0018 | -0.0022 | 109.7395 | 0.002 | 0.0002 | -0.002 |

measurements

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| -106.001 | -106.002 | -105.992 | -105.992 | -105.995 | -106.008 | -105.986 | -105.998 | -105.994 | -106.007 | -105.985 | -105.997 | -106.0 | -106.004 | -105.991 | -105.995 | -106.0 | -106.004 | -105.991 | -105.995 |
| 106.005 | 106.003 | 106.012 | 106.011 | 106.011 | 105.997 | 106.018 | 106.005 | 106.01 | 105.996 | 106.017 | 106.004 | 106.004 | 105.999 | 106.011 | 106.006 | 106.004 | 105.999 | 106.011 | 106.006 |
| -106.003 | 106.016 | -106.012 | 106.007 | -105.997 | 106.01 | -106.006 | 106.001 | -105.995 | 106.009 | -106.005 | 106.0 | -106.002 | 106.006 | -106.011 | 105.996 | -106.002 | 106.006 | -106.011 | 105.996 |
| 106.018 | -105.973 | 106.005 | -105.994 | 106.024 | -105.979 | 106.011 | -106.0 | 106.023 | -105.978 | 106.01 | -105.999 | 106.017 | -105.982 | 106.004 | -106.003 | 106.017 | -105.982 | 106.004 | -106.003 |
| -111.993 | 0.004 | -111.998 | 0.003 | -111.987 | -0.002 | -111.992 | -0.003 | -111.99 | -0.002 | -111.994 | -0.003 | -111.995 | -0.002 | -111.999 | -0.003 | -111.995 | -0.002 | -111.999 | -0.003 |
| 112.0 | -0.012 | 112.0 | 0.0 | 112.006 | -0.018 | 112.006 | -0.006 | 112.008 | -0.018 | 112.008 | -0.006 | 112.003 | -0.018 | 112.003 | -0.006 | 112.003 | -0.018 | 112.003 | -0.006 |
| 0.006 | 112.015 | 0.011 | 112.011 | 0.012 | 112.009 | 0.017 | 112.005 | 0.012 | 112.011 | 0.017 | 112.008 | 0.011 | 112.01 | 0.015 | 112.007 | 0.011 | 112.01 | 0.015 | 112.007 |
| 0.0 | -112.001 | 0.006 | -111.996 | 0.006 | -112.007 | 0.012 | -112.002 | 0.006 | -112.01 | 0.012 | -112.004 | 0.004 | -112.01 | 0.01 | -112.005 | 0.004 | -112.01 | 0.01 | -112.005 |
| -9.595 | 96.226 | -105.471 | 98.747 | -9.589 | 96.22 | -105.465 | 98.741 | -9.589 | 96.221 | -105.465 | 98.742 | -9.591 | 96.22 | -105.471 | 98.738 | -9.59 | 96.218 | -105.469 | 98.736 |
| -2.419 | -5.989 | -95.085 | -4.842 | -2.413 | -5.995 | -95.079 | -4.848 | -2.413 | -5.995 | -95.079 | -4.848 | -2.413 | -5.995 | -95.083 | -4.848 | -2.413 | -5.995 | -95.081 | -4.848 |
| 18.939 | -81.81 | -72.55 | -79.76 | 18.945 | -81.816 | -72.544 | -79.766 | 18.945 | -81.816 | -72.546 | -79.767 | 18.944 | -81.817 | -72.548 | -79.766 | 18.943 | -81.815 | -72.547 | -79.764 |
| 90.377 | -91.084 | -1.362 | -86.945 | 90.383 | -91.09 | -1.356 | -86.951 | 90.385 | -91.092 | -1.356 | -86.951 | 90.381 | -91.094 | -1.357 | -86.951 | 90.379 | -91.092 | -1.357 | -86.95 |
| 18.145 | 109.581 | -77.829 | 113.415 | 18.151 | 109.575 | -77.823 | 113.409 | 18.151 | 109.577 | -77.824 | 113.41 | 18.15 | 109.577 | -77.828 | 113.407 | 18.149 | 109.575 | -77.826 | 113.405 |
| 44.596 | 7.479 | -48.854 | 10.138 | 44.602 | 7.473 | -48.848 | 10.132 | 44.599 | 7.473 | -48.846 | 10.131 | 44.598 | 7.473 | -48.847 | 10.131 | 44.598 | 7.473 | -48.846 | 10.131 |
| -7.663 | -49.109 | -98.857 | -48.063 | -7.657 | -49.115 | -98.851 | -48.069 | -7.657 | -49.112 | -98.853 | -48.07 | -7.657 | -49.112 | -98.857 | -48.069 | -7.657 | -49.112 | -98.855 | -48.068 |
| 52.688 | -93.171 | -38.94 | -90.075 | 52.694 | -93.177 | -38.934 | -90.081 | 52.695 | -93.178 | -38.935 | -90.082 | 52.692 | -93.18 | -38.936 | -90.081 | 52.691 | -93.178 | -38.936 | -90.079 |
| -10.111 | 15.018 | -103.831 | 16.048 | -10.105 | 15.012 | -103.825 | 16.042 | -10.105 | 15.011 | -103.827 | 16.042 | -10.105 | 15.011 | -103.831 | 16.042 | -10.105 | 15.011 | -103.829 | 16.042 |
| 94.368 | -4.086 | 0.862 | -0.016 | 94.374 | -4.092 | 0.868 | -0.022 | 94.374 | -4.092 | 0.868 | -0.022 | 94.371 | -4.092 | 0.868 | -0.022 | 94.369 | -4.092 | 0.868 | -0.022 |
| -10.767 | -104.705 | -100.172 | -103.139 | -10.761 | -104.711 | -100.166 | -103.145 | -10.761 | -104.713 | -100.166 | -103.145 | -10.763 | -104.713 | -100.171 | -103.143 | -10.762 | -104.711 | -100.169 | -103.14 |
| 90.074 | -91.369 | -1.612 | -87.249 | 90.08 | -91.375 | -1.606 | -87.255 | 90.082 | -91.377 | -1.606 | -87.254 | 90.077 | -91.38 | -1.607 | -87.255 | 90.075 | -91.378 | -1.607 | -87.253 |
| -9.494 | 96.268 | -105.397 | 98.718 | -9.488 | 96.262 | -105.391 | 98.712 | -9.488 | 96.262 | -105.391 | 98.712 | -9.489 | 96.262 | -105.397 | 98.709 | -9.489 | 96.26 | -105.395 | 98.706 |
| 85.418 | 103.375 | -9.742 | 109.313 | 85.424 | 103.369 | -9.736 | 109.307 | 85.426 | 103.371 | -9.737 | 109.309 | 85.421 | 103.373 | -9.738 | 109.308 | 85.42 | 103.371 | -9.738 | 109.306 |