```
final simplex: (array([[6.18047086e+02, 1.62788566e+04, 1.30065379e+03, 1.09654125e+00,
                                                                                                                                        5.92581485e+03, 7.15013696e+04, 7.38043446e-03, 1.19579471e+00,
                                                                                                                                        6.83835638e+02, 3.24643802e+04, 4.73376905e-04, 6.67301823e+00,
                                                                                                                                        6.32148081e-01, 9.72768210e-01, 2.64017386e+00, 1.91933916e+00],
                                                                                                                                      [6.18047086e+02, 1.62788566e+04, 1.30065379e+03, 1.09654125e+00, 5.92581485e+03, 7.15013696e+04, 7.38043447e-03, 1.19579471e+00,
                                                                                                                                        6.83835638e+02, 3.24643802e+04, 4.73376905e-04, 6.67301823e+00,
                                                                                                                                        6.32148081e-01, 9.72768210e-01, 2.64017386e+00, 1.91933916e+00],
                                                                                                                                       [6.18047086e+02, 1.62788566e+04, 1.30065379e+03, 1.09654125e+00,
                                                                                                                                        5.92581485e+03, 7.15013696e+04, 7.38043446e-03, 1.19579471e+00,
                                                                                                                                        6.83835638e+02, 3.24643802e+04, 4.73376905e-04, 6.67301823e+00,
                                                                                                                                        6.32148081e-01, 9.72768210e-01, 2.64017386e+00, 1.91933916e+00],
                                                                                                                                       [6.18047086e+02, 1.62788566e+04, 1.30065379e+03, 1.09654125e+00,
                                                                                                                                        5.92581485e+03, 7.15013696e+04, 7.38043446e-03, 1.19579471e+00,
                                                                                                                                        \begin{array}{l} 6.83835638e+02,\ 3.24643802e+04,\ 4.73376905e-04,\ 6.67301823e+00,\\ 6.32148081e-01,\ 9.72768210e-01,\ 2.64017386e+00,\ 1.91933916e+00], \end{array}
                                                                                                                                      [6.18047086e+02, 1.62788566e+04, 1.30065379e+03, 1.09654125e+00, 1.09654125e+00]
                                                                                                                                        5.92581485e+03, 7.15013696e+04, 7.38043446e-03, 1.19579471e+00,
                                                                                                                                        6.83835638e+02, 3.24643802e+04, 4.73376905e-04, 6.67301823e+00,
                                                                                                                                        6.32148081e-01, 9.72768210e-01, 2.64017386e+00, 1.91933916e+00],
                                                                                                                                       [6.18047086e+02, 1.62788566e+04, 1.30065379e+03, 1.09654125e+00,
                                                                                                                                        5.92581485e+03, 7.15013695e+04, 7.38043446e-03, 1.19579471e+00,
                                                                                                                                        6.83835638e+02, 3.24643802e+04, 4.73376905e-04, 6.67301823e+00,
                                                                                                                                        6.32148081e-01, 9.72768210e-01, 2.64017386e+00, 1.91933916e+00],
                                                                                                                                       [6.18047086e+02, 1.62788566e+04, 1.30065379e+03, 1.09654125e+00,
                                                                                                                                        5.92581485e+03, 7.15013696e+04, 7.38043446e-03, 1.19579471e+00,
           ['SM data type data plots for mutation', 'Regulator98]e+02, 3.24643802_e+04, 7.36474765e-04, 6.67301823e+00, decer -> sensor (GFP output) inducer -> S[6][18047688]e+09, 1.6278856_e+0 Converged 79e+03, 1.09654125e+00, decer -> S[6][1804768]e+09, decer -> S[6][
   inducer -> sensor (GFP output)
                                                                                                                                        5.92581485e+03, 7.1501369 ---- 4Converged 46e-03, 1.19579471e+00,
                                                                                                                                     6.83835638e+02, 3.2464380 e+0 Converged 5e-04, 6.67301823e+00, 6.32148081e-01, 9.72768210 e-01, Converged 79e+03, 1.09654125e+00, 1.09664125e+00, 1.09664125e+
                                                                                            10^{4}
                                                                                                                                        5.92581485e+03, 7.15013696e+04, 7.38043446e-03, 1.19579471e+00,
                                                                                                                                        689895638e+02, 9.24643802e+04, 4.73376905e-04, 6.67301823e+00, 6.32148081e-01, 9.72768210e-01, 2.64017386e+00, 1.91933916e+00],
                                                                                    6 \times 10^{3}
                                                                                                                                       [6.18047086e+02, 1.62788566e+04, 1.30065379e+03, 1.09654125e+00,
                                                                                    4 \times 10^{3}
                                                                                                                                        5.92581485e+03, 7.15013696e+04, 7.38043446e-03, 1.19579471e+00,
                                                                                    3 \times 10^{3}
                                                                                                                                        6.83835638e+02, 3.‡4643802e+04, 4.73376905e-04, 6.67301823e+00,
                                                                                                                                        6<del>.32148081e-01, 9.</del>72768210e-01, 2.64017386e+00, 1.91933916e+00],
                                                                                                                                       <u>[6,18047086e+02,1.6</u>2788566e+04,1.30065379e+03,1.09654125e+00,5052581485e+03,0,15013696e+04,7.38043446e-03,1.19579471e+00,
                                                                                                  10<sup>-5</sup>
                                                     10-2
                 10^{-4}
                                    10-3
                                                                       10^{-1}
                                                                                                                    10^{-4}
                                                                                                                  Full circunt 83035 6780 6.321480816-01, 9.72768210e-01, 2.64017386e+00, 1.91933916e+00],
       inducer -> S -| Output (GFP)
                                                                                                                                       [6.18047086e+02, 1.62788566e+04, 1.30065379e+03, 1.09654125e+00,
                                                                                                                                       5.92581485e+03, 7.15013696e+04, 7.38043447e-03, 1.19579471e+00, 6.83835638e+02, 3.24643802e+04, 4.73376905e-04, 6.67301823e+00,
                                                                                    6 \times 10^{3}
                                                                                                                                           32148081e-01, 9.72768210e-01, 2.64017386e+00, 1.91933916e+00],
                                                                                                                                     [6.18047086e+02, 1.62788566e+04, 1.30065379e+03, 1.09654125e+00, 5.92581485e+03, 7.15013695e+04, 7.38043446e-03, 1.19579471e+00, 6.82148081e-01, 9.72768210e-01, 2.64017386e+00, 1.91933916e+00], [6.18047086e+02, 7.62788566e+04, 1.30065379e+03, 1.09654125e+00, 6.92581485e+02, 7.62788566e+04, 7.38043446e-03, 1.10570471e+00, 6.92581485e+03, 7.15013606e+04, 7.38043446e-03, 7.15013606e+04, 7.38043446e-03, 7.15013606e+04, 7.38043446e-03, 7.15013606e+04, 7.38043446e-03, 7.15013606e+04, 7.3804346e-03, 7.15013606e+04, 7.3804346e-04, 7.380486e-04, 7.380486e
                                                                                    4 \times 10^{3}
                                                                                    3 \times 10^{3}
                                                                                                                                        5.92581485e+03, 7.15013696e+04, 7.38043446e-03, 1.19579471e+00,
                                                                                                                                      \begin{array}{l} 6.83835638e \pm 0.7, 3.24643802e \pm 0.4, 4.73376905e \pm 0.4, 6.67301823e \pm 0.0, \\ 6.632148981e \pm 0.1, 9.72768210e \pm 0.1, 2.64017386e \pm 0.0, 1.91933916e \pm 0.0], \\ [6.18047086e \pm 0.2, 1.62788566e \pm 0.4, 1.30065379e \pm 0.3, 1.09654125e \pm 0.0, \\ \end{array}
                                                                                                   10^{-5}
10^{-5}
                                                     10^{-2}
                                                                        10^{-1}
                                                                                                                     10^{-4}
                  10^{-4}
                                    10^{-3}
              Across all four plots:
                                                                                                                                        5.92581485e+03, 7.15013696e+04, 7.38043446e-03, 1.19579471e+00,
                                                                                                                                        6.83835638e+02, 3.24643802e+04, 4.73376905e-04, 6.67301823e+00,
                  RSS (converged)=0.218
                                                                                                                                        6.32148081e-01, 9.72768210e-01, 2.64017386e+00, 1.91933916e+00],
                                                                                                                                       [6.18047086e+02, 1.62788566e+04, 1.30065379e+03, 1.09654125e+00,
                  RSS (initial)=3.275
                                                                                                                                        5.92581485e+03, 7.15013696e+04, 7.38043446e-03, 1.19579471e+00,
                                                                                                                                        6.83835638e+02, 3.24643802e+04, 4.73376905e-04, 6.67301823e+00,
                 RSS (% reduction)=0.938
                                                                                                                                        6.32148081e-01, 9.72768210e-01, 2.64017386e+00, 1.91933916e+00],
                                                                                                                                       [6.18047086e+02, 1.62788566e+04, 1.30065379e+03, 1.09654125e+00,
                               epsilon Initial guesses
                                                                                    Converged
                                                                                                                                        5.92581485e+03, 7.15013696e+04, 7.38043446e-03, 1.19579471e+00,
                           0.000000
                                                        618.047086 618.047086
                                                                                                                                        6.83835638e+02, 3.24643802e+04, 4.73376905e-04, 6.67301823e+00,
             Вs
                           0.000000
                                                      16278.856600 16278.856600
                                                                                                                                        6.32148081e-01, 9.72768210e-01, 2.64017386e+00, 1.91933916e+00]]), array([0.21807181, 0.21807181, 0.21807181, 0.21807181, 0.21807181,
                           0.000000
                                                       1300.653790 1300.653790
             C s
                                                                                                                                       0.21807181, 0.21807181, 0.21807181, 0.21807181, 0.21807181,
                           0.000000
                                                           1.096541
                                                                                    1.096541
             N_s
                                                                                                                                       0.21807181, 0.21807181, 0.21807181, 0.21807181, 0.21807181,
                       4009.639241
                                                           1916.175610 5925.814851
                                                                                                                                      0.21807181, 0.21807181]))
                                                          18874.240800 71501.369570
                      52627.128770
                                                                                                                                           fun: 0.21807180930782133
                                                           0.009030
                          -0.001650
                                                                                      0.007380
             C r
                                                                                                                                       message: 'Optimization terminated successfully.'
                                                           0.820433
             Νr
                           0.375361
                                                                                      1.195795
                                                                                                                                          nfev: 11421
                            0.000000
                                                         683.835638
                                                                                     683.835638
                                                                                                                                           nit: 8432
                                                      32464.380200 32464.380200
                            0.000000
             Βh
                                                                                                                                        status: 0
                                                           0.000473
                                                                                       0.000473
                            0.000000
             Ch
                                                                                                                                       success: True
                            3.851667
                                                           2.821352
                                                                                      6.673018
             Fο
                                                                                                                                              x: array([6.18047086e+02, 1.62788566e+04, 1.30065379e+03, 1.09654125e+00,
                                                           0.632148
                            0.000000
                                                                                      0.632148
                                                                                                                                       5.92581485e+03, 7.15013696e+04, 7.38043446e-03, 1.19579471e+00,
             Во
                            0.000000
                                                           0.972768
                                                                                      0.972768
                                                                                                                                       6.83835638e+02, 3.24643802e+04, 4.73376905e-04, 6.67301823e+00,
                            0.000000
                                                            2.640174
                                                                                       2.640174
                                                                                                                                       6.32148081e-01, 9.72768210e-01, 2.64017386e+00, 1.91933916e+00])
             Со
```

 10^{4}

 10^{3}

 10^{4}

 10^{3}

0.000000

1.919339

1.919339