```
1.91617561e+03, 1.88742408e+04, 9.03017988e-03, 8.20433340e-01,
                                                                                                                1.00795168e+03, 4.05938451e+04, 4.82784925e-04, 1.75636428e+00,
                                                                                                                7.43638263e-01, 1.66493354e+00, 2.94259349e+00, 1.67390744e+00],
                                                                                                               [6.18047086e+02, 1.62788566e+04, 1.30065379e+03, 1.09654125e+00, 1.91617561e+03, 1.88742408e+04, 9.03017988e-03, 8.20433340e-01,
                                                                                                                1.00795168e+03, 4.05938451e+04, 4.82784925e-04, 1.75636429e+00,
                                                                                                                7.43638263e-01, 1.66493354e+00, 2.94259348e+00, 1.67390744e+00],
                                                                                                              [6.18047086e+02, 1.62788566e+04, 1.30065379e+03, 1.09654125e+00,
                                                                                                                1.91617561e+03, 1.88742408e+04, 9.03017988e-03, 8.20433340e-01,
                                                                                                                1.00795168e+03, 4.05938450e+04, 4.82784924e-04, 1.75636429e+00,
                                                                                                                7.43638263e-01, 1.66493353e+00, 2.94259348e+00, 1.67390744e+00],
                                                                                                              [6.18047086e+02, 1.62788566e+04, 1.30065379e+03, 1.09654125e+00,
                                                                                                                1.91617561e+03, 1.88742408e+04, 9.03017988e-03, 8.20433340e-01,
                                                                                                                1.00795168e+03, 4.05938450e+04, 4.82784924e-04, 1.75636430e+00, 7.43638263e-01, 1.66493352e+00, 2.94259348e+00, 1.67390744e+00],
                                                                                                              [6.18047086e+02, 1.62788566e+04, 1.30065379e+03, 1.09654125e+00,
                                                                                                                1.91617561e+03, 1.88742408e+04, 9.03017988e-03, 8.20433340e-01,
                                                                                                                1.00795168e+03, 4.05938450e+04, 4.82784924e-04, 1.75636429e+00,
                                                                                                                7.43638263e-01, 1.66493353e+00, 2.94259348e+00, 1.67390744e+00],
                                                                                                               [6.18047086e+02, 1.62788566e+04, 1.30065379e+03, 1.09654125e+00,
                                                                                                                1.91617561e+03, 1.88742408e+04, 9.03017988e-03, 8.20433340e-01,
                                                                                                                1.00795168e+03, 4.05938450e+04, 4.82784924e-04, 1.75636429e+00,
                                                                                                                7.43638262e-01, 1.66493354e+00, 2.94259348e+00, 1.67390744e+00],
                                                                                                               [6.18047086e+02, 1.62788566e+04, 1.30065379e+03, 1.09654125e+00,
                                                                                                                1.91617561e+03, 1.88742408e+04, 9.03017988e-03, 8.20433340e-01,
             ['SM data type data plots for mutation', 'Output7138e+03, 4.05938450e+04, 5.05784075e-04, 1.75636429e+00, cer -> sensor (GFP output) inducer -> S_{[6][1804708844402], 1.6278856}^{[1804708844402], 1.6278856}^{[1804708844402], 1.6278856}^{[180470884402], 1.6278856}^{[180470884402], 1.6278856}^{[180470884402], 1.6278856}^{[180470884402], 1.6278856}^{[180470884402], 1.6278856}^{[180470884402], 1.6278856}^{[180470884402], 1.6278856}^{[18047088402], 1.6278856}^{[18047088402], 1.6278856}^{[18047088402], 1.6278856}^{[18047088402], 1.6278856}^{[18047088402], 1.6278856}^{[18047088402], 1.6278856}^{[18047088402], 1.6278856}^{[18047088402], 1.6278856}^{[18047088402], 1.6278856}^{[1804708], 1.6278856}^{[1804708], 1.6278856}^{[1804708], 1.6278856}^{[1804708], 1.627885}^{[1804708], 1.627885}^{[1804708], 1.627885}^{[1804708], 1.627885}^{[1804708], 1.627885}^{[1804708], 1.627885}^{[1804708], 1.627885}^{[1804708], 1.627885}^{[1804708], 1.627885}^{[1804708], 1.627885}^{[1804708], 1.627885}^{[1804708], 1.627885}^{[1804708], 1.627885}^{[1804708], 1.627885}^{[1804708], 1.627885}^{[1804708], 1.627885}^{[1804708], 1.627885}^{[1804708], 1.627885}^{[1804708], 1.627885}^{[1804708], 1.627885}^{[1804708], 1.627885}^{[1804708], 1.627885}^{[1804708], 1.627885}^{[1804708], 1.627885}^{[1804708], 1.627885}^{[1804708], 1.627885}^{[1804708], 1.627885}^{[1804708], 1.627885}^{[1804708], 1.627885}^{[1804708], 1.627885}^{[1804708], 1.627885}^{[1804708], 1.627885}^{[1804708], 1.627885}^{[1804708], 1.627885}^{[1804708], 1.627885}^{[1804708], 1.627885}^{[1804708], 1.627885}^{[1804708], 1.627885}^{[1804708], 1.627885}^{[1804708], 1.627885}^{[1804708], 1.627885}^{[1804708], 1.627885}^{[1804708], 1.627885}^{[1804708], 1.627885}^{[1804708], 1.627885}^{[1804708], 1.627885}^{[1804708], 1.627885}^{[1804708], 1.627885}^{[1804708], 1.627885}^{[1804708], 1.627885}^{[1804708], 1.627885}^{[1804708], 1.627885}^{[1804708], 1.627885}^{[1804708], 1.627885}^{[1804708], 1.627885}^{[1804708], 1.627885}^{[1804708], 1.627885}^{[1804708], 1.627885}^{[1804708], 1.627885}^{[
  inducer -> sensor (GFP output)
                                                                                                                1.00795168e+03, 4.0593845 <u>e+0</u>4 converged 24e-04, 1.75636430e+00,
                                                                                                              7.43638262e-01, 1.66493352e+00, 2594259348e+00, 1.67390744e+00], [6.18047086e+02, 1.62788566e+04Converged 79e+03, 1.09654125e+00,
                                                                      4 \times 10^{3}
                                                                                                                1.91617561e+03, 1.$8742408e+04, 9.03017988e-03, 8.20433340e-01,
                                                                                                               1.91017301e+03, 1.96742406e+04, 9.03017988e-03, 8.20433340e-01, 1.00795167e+03, 4.05938450e+04, 4.82784924e-04, 1.75636430e+00, 7.43638263e-01, 1.66493352e+00, 2.94259348e+00, 1.67390744e+00], 46.18047086e+02, 1.62788566e+04, 1.30065379e+03, 1.09654125e+00, 1.91617561e+03, 1.88742408e+04, 9.03017988e-03, 8.20433340e-01, 1.00795168e+03, 4.05938450e+04, 4.82784924e-04, 1.75636429e+00, 7.436382640, 01e, 1.684932530+00, 2.04359348e+00, 1.67390744e+001, 1.466382640, 01e, 1.684932530+00, 2.04359348e+00, 1.67390744e+001, 1.466382640, 01e, 1.684932530+00, 2.04359348e+00, 1.67390744e+001, 1.6739074e+001, 1.
                                                                      3 \times 10^{3}
                                                                      2 \times 10^{3}
                                                                                                                 7.43638264e-01, 1.66493353e+00, 2.94259348e+00, 1.67390744e+00],
                                                                                                               [6:18047086e+02:1.62788566e+04, 1.30065379e+03, 1.09654125e+00, 1.91617561e+03, 1.88742408e+04, 9.03017988e-03, 8.20433340e-01,
                                            10-2
                                                                                 10<sup>-5</sup>
              10^{-4}
                             10-3
                                                           10^{-1}
                                                                                                10^{-4}
                                                                                              Full circult 007951686+03, 4.05938451e+04, 4.82784925e-04, 1.75636429e+00, 7.43638263e-01, 1.66493353e+00, 2.94259348e+00, 1.67390744e+00],
      inducer -> S -| Output (GFP)
                                                                                                               [6.18047086e+02, 1.62788566e+04, 1.30065379e+03, 1.09654125e+00, 1.91617561e+03, 1.88742408e+04, 9.03017988e-03, 8.20433340e-01, 2.00795168e+03, 4.05938450e+04, 4.82784924e-04, 1.75636429e+00,
                                                                      6 \times 10^3
                                                                                                                7.\(\)43638263e-01, 1.6\(\)6493354e+00, 2.94259348e+00, 1.67390744e+00],
                                                                                                                [6.16047086e+02, 1.62788566e+04, 1.30065379e+03, 1.09654125e+00,
                                                                      4 \times 10^{3}
                                                                                                                1.91617561e+03, 1.88742408e+04, 9.03017988e-03, 8.20433340e-01, 1.00795168e+03, 4.05938450e+04, 4.82784924e-04, 1.75636428e+00, 7.43638263e-01, 1.66493355e+00, 2.94259348e+00, 1.67390744e+00],
                                                                      3 \times 10^{3}
                                                                                                               [6.18047086e+02, 1.62788566e+04, 1.30065379e+03, 1.09654125e+00, 1.91617561e+03, 1.88742408e+04, 9.03017988e-03, 8.20433340e-01,
                                                                                                                 7_043638263e-01,1066493354e+00, 2.94259348e+00, 1.67390744e+00], [6.18047086e+02, 1.62788566e+04, 1.30065379e+03, 1.09654125e+00,
10^{-5}
                             10<sup>-3</sup>
                                            10^{-2}
                                                           10^{-1}
                                                                                 10^{-5}
                                                                                                10^{-4}
               10^{-4}
            Across all four plots:
                                                                                                                1.91617561e+03, 1.88742408e+04, 9.03017988e-03, 8.20433340e-01,
                                                                                                                1.00795168e+03, 4.05938451e+04, 4.82784925e-04, 1.75636429e+00,
               RSS (converged)=0.066
                                                                                                                7.43638263e-01, 1.66493353e+00, 2.94259348e+00, 1.67390744e+00],
                                                                                                               [6.18047086e+02, 1.62788566e+04, 1.30065379e+03, 1.09654125e+00,
               RSS (initial)=1.108
                                                                                                                1.91617561e+03, 1.88742408e+04, 9.03017988e-03, 8.20433340e-01,
                                                                                                                1.00795167e+03, 4.05938451e+04, 4.82784925e-04, 1.75636429e+00,
               RSS (% reduction)=0.944
                                                                                                                7.43638263e-01, 1.66493353e+00, 2.94259348e+00, 1.67390743e+00],
                                                                                                              [6.18047086e+02, 1.62788566e+04, 1.30065379e+03, 1.09654125e+00, 1.09654125e+00]
                         epsilon Initial guesses
                                                                     Converged
                                                                                                                1.91617561e+03, 1.88742408e+04, 9.03017988e-03, 8.20433340e-01,
                                             618.047086 618.047086
                     0.000000
                                                                                                                1.00795169e+03, 4.05938450e+04, 4.82784924e-04, 1.75636429e+00
          Вs
                     0.000000
                                           16278.856600 16278.856600
                                                                                                                0.000000
                                            1300.653790 1300.653790
                                                                                                              0.06622787, 0.06622787, 0.06622787, 0.06622787, 0.06622787,
          N_s
                     0.000000
                                               1.096541
                                                                      1.096541
                                                                                                              0.06622787, 0.06622787, 0.06622787, 0.06622787, 0.06622787,
                     0.000000
                                            1916.175610 1916.175610
                                                                                                              0.06622787, 0.06622787]))
                                          18874.240800 18874.240800
                     0.000000
                                                                                                                   fun: 0.06622786767839223
                                               0.009030
                     0.000000
                                                                      0.009030
                                                                                                               message: 'Optimization terminated successfully.'
                                               0.820433
                                                                      0.820433
          Νr
                     0.000000
                                                                                                                  nfev: 2365
                                                683.835638 1007.951677
                   324.116039
                                                                                                                   nit: 1636
                                               32464.380200 40593.845071
          B h 8129.464871
                                                                                                                status: 0
                                                0.000473
                     0.000009
                                                                      0.000483
          Ch
                                                                                                              success: True
                    -1.064987
                                               2.821352
                                                                      1.756364
          Fο
                                                                                                                     x: array([6.18047086e+02, 1.62788566e+04, 1.30065379e+03, 1.09654125e+00,
                                                                      0.743638
                     0.111490
                                                0.632148
                                                                                                              1.91617561e+03, 1.88742408e+04, 9.03017988e-03, 8.20433340e-01,
                                                                      1.664934
                                                                                                              1.00795168e+03, 4.05938451e+04, 4.82784925e-04, 1.75636428e+00,
                     0.692165
                                                0.972768
          Во
                      0.302420
                                                2.640174
                                                                       2.942593
                                                                                                              7.43638263e-01, 1.66493354e+00, 2.94259349e+00, 1.67390744e+00]
           Со
```

 10^{4}

 10^{3}

 10^{4}

Νo

-0.245432

1.919339

1.673907