```
1.91617561e+03, 1.88742408e+04, 9.03017988e-03, 8.20433340e-01,
                                                                                                              7.38636080e+02, 2.89077831e+04, 4.20083711e-04, 2.44323134e+00,
                                                                                                              1.64985792e-01, 1.33071118e+00, 2.82813735e+00, 1.59374721e+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,
                                                                                                              7.38636082e+02, 2.89077830e+04, 4.20083711e-04, 2.44323134e+00,
                                                                                                              1.64985794e-01, 1.33071118e+00, 2.82813735e+00, 1.59374721e+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,
                                                                                                              7.38636083e+02, 2.89077831e+04, 4.20083710e-04, 2.44323134e+00,
                                                                                                              1.64985795e-01, 1.33071118e+00, 2.82813736e+00, 1.59374721e+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,
                                                                                                              7.38636083e+02, 2.89077830e+04, 4.20083710e-04, 2.44323134e+00, 1.64985791e-01, 1.33071119e+00, 2.82813736e+00, 1.59374721e+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,
                                                                                                              7.38636084e+02, 2.89077830e+04, 4.20083710e-04, 2.44323135e+00,
                                                                                                              1.64985796e-01, 1.33071117e+00, 2.82813735e+00, 1.59374721e+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,
                                                                                                              7.38636087e+02, 2.89077830e+04, 4.20083710e-04, 2.44323135e+00,
                                                                                                              1.64985795e-01, 1.33071118e+00, 2.82813736e+00, 1.59374721e+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,
             inducer -> sensor (GFP output)
                                                                                                              7.38636086e+02, 2.8907783 e+04 Converged De-04, 2.44323134e+00,
                                                                                                             1.64985794e-01, 1.3B071118e+00, 2.5e+00, 1.59374721e+00], [6.18047086e+02, 1.6278856e+0 Converged 79e+03, 1.09654125e+00,
                                                                     4 \times 10^{3}
                                                                                                              1.91617561e+03, 1.$8742408e+04, 9.03017988e-03, 8.20433340e-01,
                                                                                                              7.38636080e+02, 2.89077831e+04, 4.20083711e-04, 2.44323134e+00, 1.64985793e-01, 1.33071118e+00, 2.82813736e+00, 1.59374721e+00],
                                                                     3 \times 10^{3}
                                                                                                              1.043047086e+02, 1.62788566e+04, 1.30065379e+03, 1.09654125e+00, 1.91617361e+03, 1.88742408e+04, 9.03017988e-03, 8.20433340e-01, 7.38636090e+02, 2.89077830e+04, 4.20083710e-04, 2.44323135e+00,
                                                                     2 \times 10^{3}
                                                                                                               1.64985797e-01, 1.3β071118e+00, 2.82813736e+00, 1.59374721e+00],
                                                                                                               6:18047086e+02:1.62788566e+04, 1.30065379e+03, 1.09654125e+00, 1.0966466e+00, 1.096666e+00, 1.096666e+000, 1.096666e+000, 1.0966666e+000, 1.09666666e+0000, 1.
                                           10-2
                                                                                10<sup>-5</sup>
              10^{-4}
                             10-3
                                                          10^{-1}
                                                                                               10^{-4}
                                                                                             Full circu7t38636674602, 2.89077831e+04, 4.20083712e-04, 2.44323133e+00, 1.64985788e-01, 1.33071118e+00, 2.82813736e+00, 1.59374720e+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, 38636094e+02, 2.89077830e+04, 4.20083711e-04, 2.44323135e+00,
                                                                     6 \times 10^{3}
                                                                                                               \mathbf{K}_{64985795\text{e-}01}, 1.3 \beta 071118\text{e+}00, 2.82813736\text{e+}00, 1.59374721\text{e+}00],
                                                                                                              [6.18047086e+02, 1.62788566e+04, 1.30065379e+03, 1.09654125e+00,
                                                                     4 \times 10^3
                                                                                                               1.91617561e+03, 1.$8742408e+04, 9.03017988e-03, 8.20433340e-01,
                                                                                                             1.38636081e+02, 2.89077830e+04, 4.20083711e-04, 2.44323134e+00, 1.64985792e-01, 1.3B071118e+00, 2.82813735e+00, 1.59374721e+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,
                                                                     3 \times 10^{3}
                                                                                                               <del>7.,38636078e+02,..?</del>.$9077831e+04, 4.20083711e-04, 2.44323134e+00,
                                                                                                              \frac{1}{10}64985794e-01,_{10}38071118e+00, 2.82813736e+00, 1.59374721e+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,
                                                                                                              7.38636087e+02, 2.89077830e+04, 4.20083710e-04, 2.44323135e+00,
              RSS (converged)=0.059
                                                                                                              1.64985797e-01, 1.33071117e+00, 2.82813735e+00, 1.59374721e+00],
                                                                                                              [6.18047086e+02, 1.62788566e+04, 1.30065379e+03, 1.09654125e+00,
              RSS (initial)=0.706
                                                                                                              1.91617561e+03, 1.88742408e+04, 9.03017988e-03, 8.20433340e-01,
                                                                                                              7.38636083e+02, 2.89077831e+04, 4.20083711e-04, 2.44323134e+00,
              RSS (% reduction)=0.923
                                                                                                              1.64985794e-01, 1.33071117e+00, 2.82813735e+00, 1.59374721e+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,
                     0.000000
                                            618.047086 618.047086
                                                                                                              7.38636086e+02, 2.89077830e+04, 4.20083710e-04, 2.44323134e+00
          Вs
                     0.000000
                                           16278.856600 16278.856600
                                                                                                              1.64985797e-01, 1.33071117e+00, 2.82813735e+00, 1.59374721e+00]), array([0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648448, 0.05881648448, 0.05881648448, 0.05881648448, 0.05881648448, 0.05881648448, 0.05881648, 0
                                           1300.653790 1300.653790
                     0.000000
                                                                                                             0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648,
          N_s
                     0.000000
                                               1.096541
                                                                     1.096541
                                                                                                             0.05881648, 0.05881648, 0.05881648, 0.05881648, 0.05881648,
                     0.000000
                                           1916.175610 1916.175610
                                                                                                             0.05881648, 0.05881648]))
                                          18874.240800 18874.240800
                     0.000000
                                                                                                                 fun: 0.058816480555229464
                                               0.009030
                     0.000000
                                                                     0.009030
          Cr
                                                                                                              message: 'Optimization terminated successfully.'
          Νr
                     0.000000
                                               0.820433
                                                                     0.820433
                                                                                                                 nfev: 2625
                                              683.835638 738.636080
                    54.800442
                                                                                                                 nit: 1834
                                              32464.380200 28907.783066
          B h -3556.597134
                                                                                                              status: 0
                                               0.000473
          Ch
                     -0.000053
                                                                      0.000420
                                                                                                             success: True
                    -0.378120
                                               2.821352
                                                                     2.443231
          Fο
                                                                                                                    x: array([6.18047086e+02, 1.62788566e+04, 1.30065379e+03, 1.09654125e+00,
                     -0.467162
                                               0.632148
                                                                     0.164986
                                                                                                              1.91617561e+03, 1.88742408e+04, 9.03017988e-03, 8.20433340e-01,
                                                                                                             7.38636080e+02, 2.89077831e+04, 4.20083711e-04, 2.44323134e+00,
                     0.357943
                                               0.972768
                                                                     1.330711
          Во
                     0.187963
                                               2.640174
                                                                      2.828137
                                                                                                             1.64985792e-01, 1.33071118e+00, 2.82813735e+00, 1.59374721e+00])
           Со
```

 10^{4}

 10^{3}

 10^{4}

-0.325592

1.919339

1.593747