```
final simplex: (array([[6.18047086e+02, 1.62788566e+04, 1.30065379e+03, 1.09654125e+00,
                                                                                                       1.91617561e+03, 1.88742408e+04, 9.03017988e-03, 8.20433340e-01,
                                                                                                       5.18911096e+02, 3.95178115e+04, 7.49308858e-04, 3.66162241e+00,
                                                                                                       3.86088997e-01, 6.74366441e-01, 2.00674235e+00, 1.63100665e+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,
                                                                                                       5.18911094e+02, 3.95178116e+04, 7.49308860e-04, 3.66162242e+00,
                                                                                                       3.86088996e-01, 6.74366438e-01, 2.00674235e+00, 1.63100665e+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, 5.18911096e+02, 3.95178115e+04, 7.49308859e-04, 3.66162241e+00,
                                                                                                       3.86088996e-01, 6.74366440e-01, 2.00674235e+00, 1.63100665e+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,
                                                                                                       5.18911095e+02, 3.95178115e+04, 7.49308859e-04, 3.66162242e+00, 3.86088996e-01, 6.74366439e-01, 2.00674235e+00, 1.63100665e+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,
                                                                                                       5.18911096e+02, 3.95178115e+04, 7.49308859e-04, 3.66162240e+00,
                                                                                                       3.86088996e-01, 6.74366442e-01, 2.00674235e+00, 1.63100665e+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,
                                                                                                       5.18911096e+02, 3.95178115e+04, 7.49308859e-04, 3.66162241e+00,
                                                                                                       3.86088996e-01, 6.74366441e-01, 2.00674235e+00, 1.63100665e+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,
1.91617561e+03, 1.8874240 ---- 4Converged 8e-03, 8.20433340e-01,
                                                                                                       5.18911095e+02, 3.95178115e+04<sub>Converged</sub>59e-04, 3.66162242e+00,
                                                                                                      3.86088995e-01, 6.74366440e-01, 2.0074235e+00, 1.63100665e+00], [6.18047086e+02, 1.62788566e+0 Converged 79e+03, 1.09654125e+00,
                                                           4 \times 10^{3}
                                                                                                       1.91617561e+03, 1.88742408e+04, 9.03017988e-03, 8.20433340e-01,
                                                                                                       5.18911096e+02, 3.95178115e+04, 7.49308858e-04, 3.66162241e+00, 3.86088996e-01, 6.74366441e-01, 2.00674235e+00, 1.63100665e+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, 5.18911096e+02, 3.95178115e+04, 7.49308859e-04, 3.66162241e+00, 3.86088996e-01.6.74366441e-01, 2.00674235e+00, 1.63100665e+00],
                                                           2 \times 10^{3}
                                                                                                      <u>[6]18047086e+02]1.</u>62788566e+04, 1.30065379e+03, 1.09654125e+00,
1091617581e+03, 1.88742408e+04, 9.03017988e-03, 8.20433340e-01,
                                                                       10-5
                                                                                     Full circunt 18911 695 pt 02, 3.95178115e+04, 7.49308860e-04, 3.66162241e+00,
                                                                                                            3<del>6088996€-01, 6.7</del>4366441e-01, 2.00674235e+00, 1.63100665e+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, 5.18911097e+02, 3.95178115e+04, 7.49308858e-04, 3.66162240e+00,
                                                           4 \times 10^{3}
                                                                                                          .86088997e-01, 6.7\366443e-01, 2.00674235e+00, 1.63100665e+00],
                                                                                                       1.8047086e+02, 1.62788566e+04, 1.30065379e+03, 1.09654125e+00,
                                                           3 \times 10^{3}
                                                                                                       1.91617561e+03, 1.$8742408e+04, 9.03017988e-03, 8.20433340e-01,
                                                                                                       5.19911094e+02, 3.95178116e+04, 7.49308860e-04, 3.66162242e+00, 3.8608995e-01, 6.74366441e-01, 2.00674235e+00, 1.63100665e+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, 5.18911096e+02, 3.95178115e+04, 7.49308859e-04, 3.66162241e+00, 3.66088996e-01, 6.74366440e-01, 2.00674235e+00, 1.63100665e+00], [6.18047086e+02, 1.62788566e+04, 1.30065379e+03, 1.09654125e+00, 1.01617561e+03, 1.88743408e+04, 1.30065379e+03, 2.20433340e-01, 1.01617561e+03, 1.88743408e+04, 1.30065379e+03, 1.09654125e+00, 1.01617561e+03, 1.026841e+04, 1.30065379e+03, 1.09654125e+00, 1.01617561e+03, 1.026841e+04, 1.30065379e+03, 1.09654125e+00, 1.01617561e+03, 1.026841e+04, 1.30065379e+03, 1.09654125e+00, 1.01617561e+03, 1.026841e+04, 1.30065379e+03, 1.026841e+04, 1.026841e+04, 1.30065379e+03, 1.026841e+04, 1
                                                           2 \times 10^{3}
                                                                       10^{-5}
                                                                                       10^{-4}
                                                                                                       1.91617561e+03, 1.88742408e+04, 9.03017988e-03, 8.20433340e-01,
                                                                                                       5.18911097e+02, 3.95178115e+04, 7.49308858e-04, 3.66162240e+00,
                                                                                                       3.86088997e-01, 6.74366443e-01, 2.00674235e+00, 1.63100665e+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,
                                                                                                       5.18911097e+02, 3.95178115e+04, 7.49308858e-04, 3.66162240e+00,
                                                                                                       3.86088998e-01, 6.74366441e-01, 2.00674235e+00, 1.63100665e+00],
                                                                                                      [6.18047086e+02, 1.62788566e+04, 1.30065379e+03, 1.09654125e+00,
                                                          Converged
                                                                                                       1.91617561e+03, 1.88742408e+04, 9.03017988e-03, 8.20433340e-01,
                                 618.047086 618.047086
                                                                                                       5.18911096e+02, 3.95178115e+04, 7.49308858e-04, 3.66162241e+00
                               16278.856600 16278.856600
                                                                                                       3.86088995e-01, 6.74366441e-01, 2.00674235e+00, 1.63100665e+00]]), array([0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.
                                1300.653790 1300.653790
                                                                                                      0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018,
                                                           1.096541
                                                                                                      0.06278018, 0.06278018, 0.06278018, 0.06278018, 0.06278018,
                                1916.175610 1916.175610
                                                                                                      0.06278018, 0.06278018]))
                               18874.240800 18874.240800
                                                                                                          fun: 0.06278017594184845
                                                           0.009030
                                                                                                      message: 'Optimization terminated successfully.'
                                                           0.820433
                                                                                                         nfev: 1842
                                     683.835638 518.911096
                                                                                                          nit: 1195
                                   32464.380200 39517.811482
                                                                                                       status: 0
                                                            0.000749
                                                                                                      success: True
                                                            3.661622
                                                                                                             x: array([6.18047086e+02, 1.62788566e+04, 1.30065379e+03, 1.09654125e+00,
                                                            0.386089
                                                                                                      1.91617561e+03, 1.88742408e+04, 9.03017988e-03, 8.20433340e-01,
                                                            0.674366
                                                                                                      5.18911096e+02, 3.95178115e+04, 7.49308858e-04, 3.66162241e+00,
                                                            2.006742
                                                                                                      3.86088997e-01, 6.74366441e-01, 2.00674235e+00, 1.63100665e+00])
```

inducer -> sensor (GFP output)

10-3

inducer -> S -| Output (GFP)

 10^{-3}

RSS (converged)=0.063

RSS (% reduction)=0.731

Across all four plots:

RSS (initial)=0.17

0.000000

0.000000

0.000000

0.000000

0.000000

0.000000

0.000000

0.000000

-164.924542

0.000276

0.840271

-0.246059

-0.298402

-0.633432

-0.288333

B h 7053.431282

10-2

 10^{-2}

epsilon Initial_guesses

1.096541

0.009030

0.820433

0.000473

2.821352

0.632148

0.972768

2.640174

1.919339

1.631007

 10^{-1}

 10^{-1}

 10^{4}

 10^{3}

 10^{4}

 10^{3}

 10^{-5}

 10^{-4}

 10^{-4}

Вs

 N_s

 C_{r}

Νr

Αh

C h

Fο

Αо B_o

Со Νo