## Converged $10^{5}$ $10^{4}$ Converged Converged $10^{4}$ $10^{3}$ time elapsed for this fit --- 38.25314736366272 seconds --- $10^{-3}$ $10^{-2}$ $10^{-3}$ $10^{-1}$ 10<sup>-5</sup> $10^{-4}$ $10^{-2}$ $10^{-4}$ $10^{-1}$ inducer -> S -| Output (GFP) Full circuit with stripe $10^{5}$ $6 \times 10^3$ $4 \times 10^{3}$ $10^{4}$ $3 \times 10^{3}$ 10<sup>-5</sup> $10^{-3}$ $10^{-2}$ 10<sup>-5</sup> $10^{-2}$ $10^{-4}$ $10^{-1}$ $10^{-3}$ $10^{-1}$ $10^{-4}$ Across all four plots: RSS (converged)=1.193 RSS (initial)=1.653RSS (% reduction)=0.581 epsilon Initial guesses Converged message: Optimization terminated successfully. A\_s 0.000000 650.714912 6.507149e+02 success: True 0.000000 16259.979950 1.625998e+04 status: 0 $C_s$ 0.000000 1296.448889 1.296449e+03 fun: 1.1930041459115155 0.000000 1.154067 1.154067e+00 x: [6.507e+02 1.626e+04 ... 3.591e-01 3.834e-01] -666.368490 2020.019216 1.353651e+03 nit: 14862 B r 170558.126363 23688.809187 1.942469e+05 nfev: 19788 C r -0.009813 0.010358 5.442702e-04 final simplex: (array([[ 6.507e+02, 1.626e+04, ..., 3.591e-01, 13.888479 0.910072 1.479855e+01 Νr 3.834e-011, -143.802212 143.802212 1.527035e-12 [6.507e+02, 1.626e+04, ..., 3.591e-01, 50238.271408 2.999328e+05 B h 249694.499786 3.834e-01], Ch 0.012607 0.000929 1.353590e-02 228.575878 1.673894 2.302498e+02 Αо [6.507e+02, 1.626e+04, ..., 3.591e-01, -0.629260 0.895342 2.660818e-01 Во 3.834e-01], C\_0 [6.507e+02, 1.626e+04, ..., 3.591e-01, -2.597338 2.657699 6.036027e-02 1.379953 3.590556e-01 Νo -1.020897 3.834e-01]), array([ 1.193e+00, 1.193e+00, ..., 1.193e+00, 1.193e+00])) -1.977932 2.361284 3.833520e-01

inducer -> S - IR (GFP output)

**Initial Guess** 

Converged

['SM data type data plots for mutation', 'Sensor6', 'using model:', 'model']

inducer -> sensor (GFP output)