## Converged Converged $10^{4}$ Converged $6 \times 10^{3}$ Converged $4 \times 10^{3}$ $3 \times 10^3$ 10<sup>3</sup> time elapsed for this fit --- 73.86659955978394 seconds --- $10^{-4}$ 10<sup>-3</sup> $10^{-2}$ $10^{-2}$ $10^{-1}$ 10<sup>-5</sup> $10^{-4}$ 10<sup>-3</sup> $10^{-1}$ inducer -> S -| Output (GFP) Full circuit with stripe $6 \times 10^{3}$ $10^{4}$ $4 \times 10^{3}$ $3 \times 10^{3}$ $10^{3}$ 10<sup>-3</sup> $10^{-5}$ 10<sup>-3</sup> $10^{-2}$ $10^{-5}$ $10^{-4}$ $10^{-2}$ $10^{-1}$ $10^{-4}$ $10^{-1}$ Across all four plots: RSS (converged)=0.461 RSS (initial)=0.847 RSS (% reduction)=0.647 epsilon Initial guesses Converged message: Optimization terminated successfully. A\_s -71.050035 650.714912 579.664877 success: True -453.275657 16259.979950 15806.704293 status: 0 -102.372436 1296.448889 1194.076452 fun: 0.46139596786181064 0.039965 1.154067 1.194032 x: [5.797e+02 1.581e+04 ... 1.172e+00 1.303e+01] Αr 0.000000 2020.019216 2020.019216 nit: 27554 Βr 0.000000 23688.809187 23688.809187 nfev: 35764 Сr 0.000000 0.010358 0.010358 final simplex: (array([[ 5.797e+02, 1.581e+04, ..., 1.172e+00, 0.000000 0.910072 0.910072 Νr 1.303e + 011, 143.802212 3.578693 A h -140.223519 [5.797e+02, 1.581e+04, ..., 1.172e+00, 50238.271408 77186.634702 B h 26948.363293 1.303e+01], 0.000929 Ch0.001102 0.002031 [5.797e+02, 1.581e+04, ..., 1.172e+00, 0.431628 1.673894 2.105522 Αо 0.895342 -0.621748 0.273594 1.303e+01], C\_o [5.797e+02, 1.581e+04, ..., 1.172e+00, 0.282099 2.657699 2.939798 -0.207918 1.379953 1.172034 1.303e+01]]), array([ 4.614e-01, 4.614e-01, ..., 4.614e-01, 4.614e-01])) Νo 10.669952 2.361284 13.031235

inducer -> S - IR (GFP output)

**Initial Guess** 

['SM data type data plots for mutation', 'Regulator7', 'using model:', 'model']

inducer -> sensor (GFP output)