## Converged $10^{4}$ Converged Converged $6 \times 10^{3}$ $4 \times 10^{3}$ $3 \times 10^{3}$ $10^{3}$ time elapsed for this fit --- 48.92400097846985 seconds --- $10^{-3}$ $10^{-3}$ $10^{-2}$ $10^{-4}$ $10^{-2}$ 10<sup>-5</sup> $10^{-4}$ $10^{-1}$ $10^{-1}$ inducer -> S -| Output (GFP) Full circuit with stripe $4 \times 10^3$ $3 \times 10^{3}$ $10^{4}$ $2 \times 10^{3}$ $10^{3}$ $10^{-5}$ 10<sup>-3</sup> 10<sup>-5</sup> 10<sup>-3</sup> $10^{-2}$ $10^{-4}$ $10^{-2}$ $10^{-1}$ $10^{-4}$ $10^{-1}$ Across all four plots: RSS (converged)=0.946 RSS (initial)=1.527 RSS (% reduction)=0.618 epsilon Initial guesses Converged message: Optimization terminated successfully. As -111.601696 650.714912 539.113216 success: True B s -825.014772 16259.979950 15434.965178 status: 0 Cs -110.611845 1296.448889 1185.837044 fun: 0.945661226946576 Νs 0.027826 1.154067 1.181893 x: [5.391e+02 1.543e+04 ... 1.178e+00 6.326e+00] Αr 0.000000 2020.019216 2020.019216 nit: 18213 23688.809187 23688.809187 Βr 0.000000 nfev: 23797 Cr0.000000 0.010358 0.010358 final simplex: (array([[ 5.391e+02, 1.543e+04, ..., 1.178e+00, 0.000000 0.910072 0.910072 Νr 6.326e+001, 143.802212 -140.930947 2.871265 [5.391e+02, 1.543e+04, ..., 1.178e+00, B h 21075.526521 50238.271408 71313.797929 6.326e+00], $C_h$ 0.000984 0.000929 0.001913 [5.391e+02, 1.543e+04, ..., 1.178e+00, 17.644332 1.673894 19.318226 Αо -0.713601 0.895342 0.181741 Во 6.326e+00], C\_o [5.391e+02, 1.543e+04, ..., 1.178e+00, -0.511831 2.657699 2.145868 -0.201917 1.379953 6.326e+00]]), array([ 9.457e-01, 9.457e-01, ..., 9.457e-01, 9.457e-01])) Νo 1.178035 3.964223 6.325507

inducer -> S - IR (GFP output)

**Initial Guess** 

Converged

['SM data type data plots for mutation', 'Regulator10', 'using model:', 'model']

inducer -> sensor (GFP output)

F\_o

2.361284