['SM data type data plots for mutation', 'Output1', 'using model:', 'model_hill.model'']

inducer -> sensor (GFP output)

inducer ->S -|R (GFP output)

Initial Guess
Converged
Converged
Converged
Converged
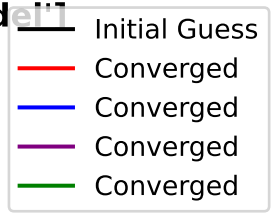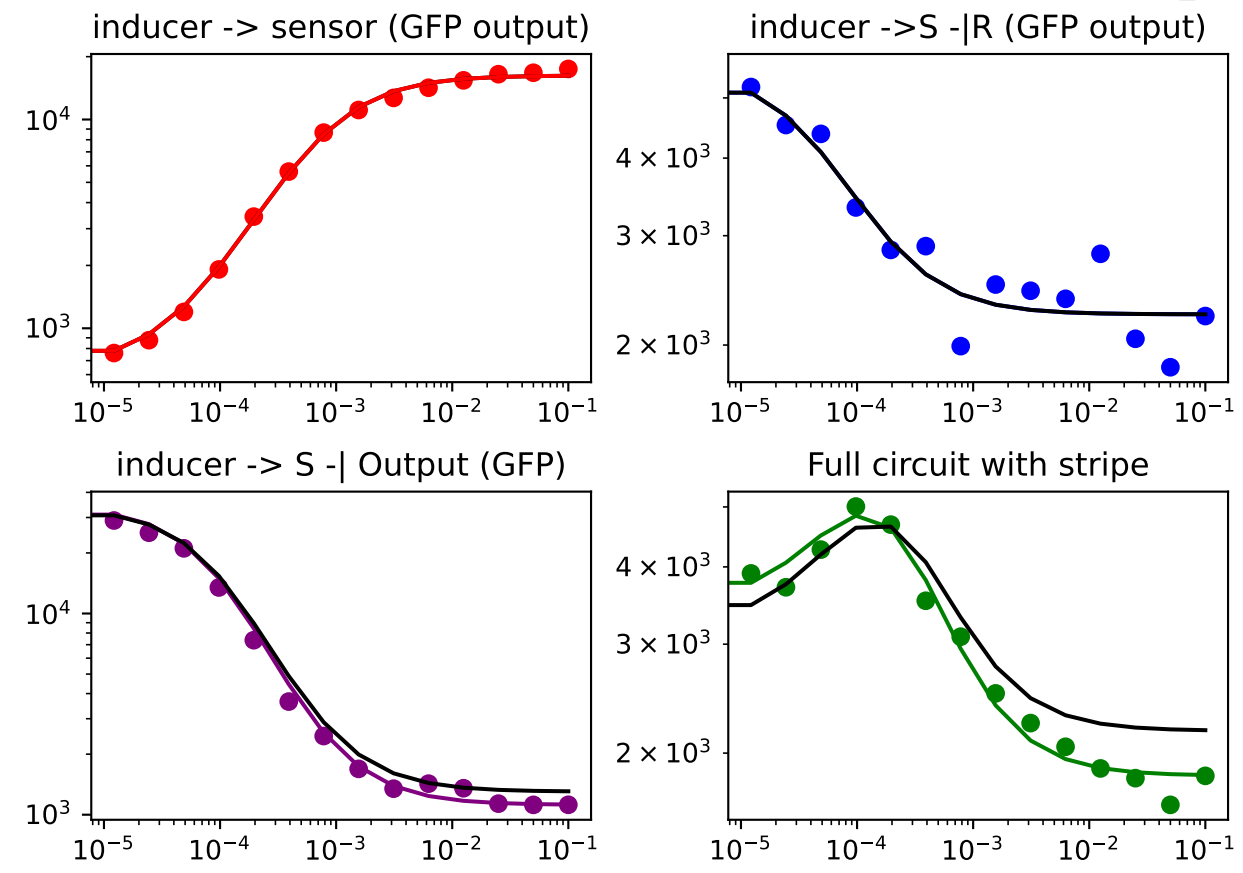
time elapsed for this fit
--- 2.005184173585839844 seconds ---

inducer -> S -| Output (GFP)

Full circuit with stripe

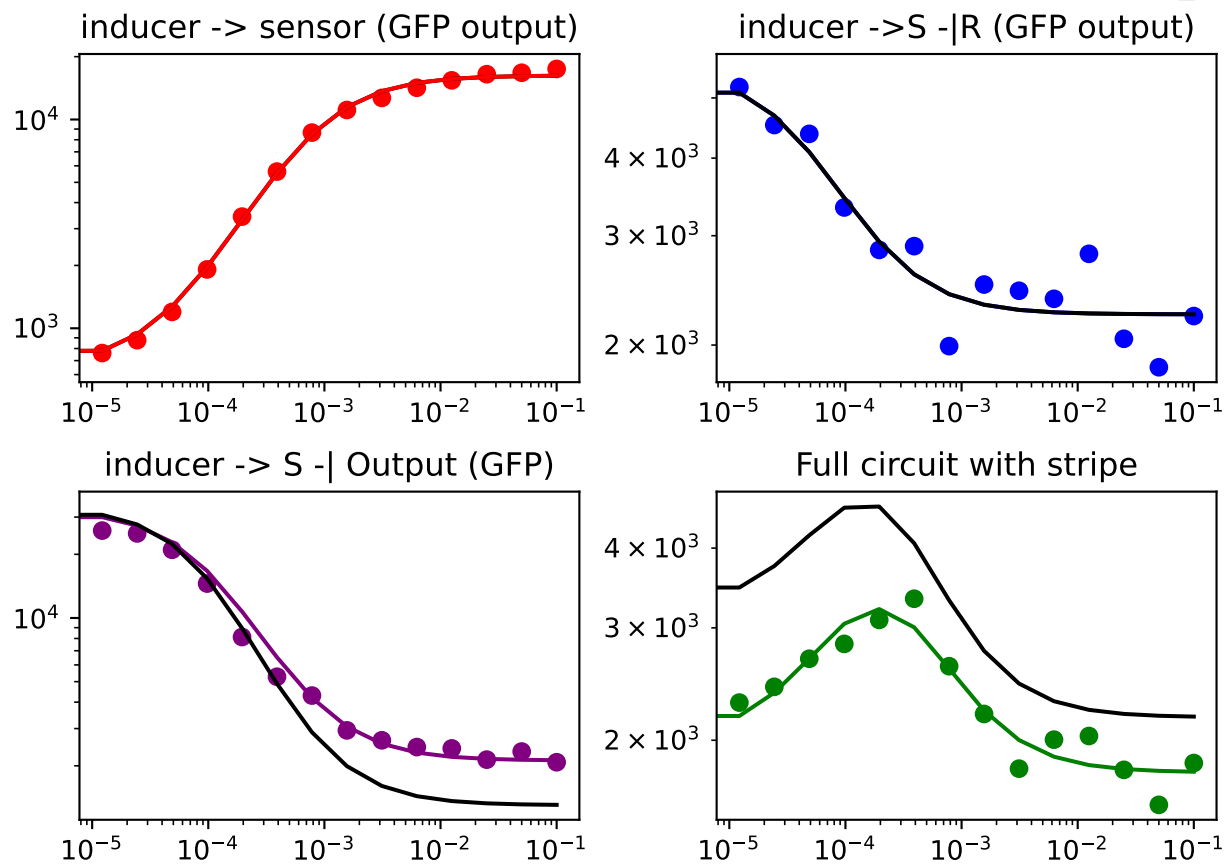Across all four plots:

RSS (converged)=0.075

RSS (initial)=0.152

RSS (% reduction)=0.669

	epsilon	Initial_guesses	Converged
A_s	0.000000	650.714912	650.714912
B_s	0.000000	16259.979950	16259.979950
C_s	0.000000	1296.448889	1296.448889
N_s	0.000000	1.154067	1.154067
A_r	0.000000	2020.019216	2020.019216
B_r	0.000000	23688.809187	23688.809187
C_r	0.000000	0.010358	0.010358
N_r	0.000000	0.910072	0.910072
A_h	0.000000	143.802212	143.802212
B_h	0.000000	50238.271408	50238.271408
C_h	0.000000	0.000929	0.000929
A_o	0.272761	1.673894	1.946656
B_o	-0.012570	0.895342	0.882772
C_o	-0.715392	2.657699	1.942306
N_o	0.064780	1.379953	1.444733
F_o	-0.305293	2.361284	2.055991

message: Optimization terminated successfully.
success: True
 status: 0
    fun: 0.07511155864019757
      x: [6.507e+02 1.626e+04 ... 1.445e+00 2.056e+00]
    nit: 611
   nfev: 923
final_simplex: (array([[6.507e+02, 1.626e+04, ..., 1.445e+00,
          2.056e+00],
              [6.507e+02, 1.626e+04, ..., 1.445e+00,
           2.056e+00],
              ...,
              [6.507e+02, 1.626e+04, ..., 1.445e+00,
           2.056e+00],
              [6.507e+02, 1.626e+04, ..., 1.445e+00,
           2.056e+00]]), array([7.511e-02, 7.511e-02, ..., 7.511e-02, 7.511e-02]))

['SM data type data plots for mutation', 'Output10', 'using model:', 'model_hill.model']

Legend:
- Initial Guess
- Converged
- Converged
- Converged
- Converged

time elapsed for this fit
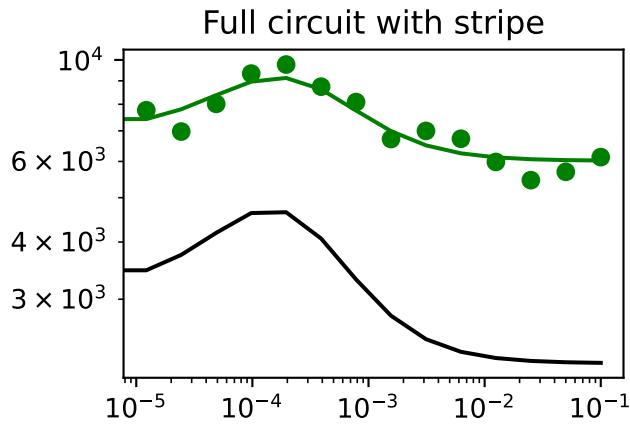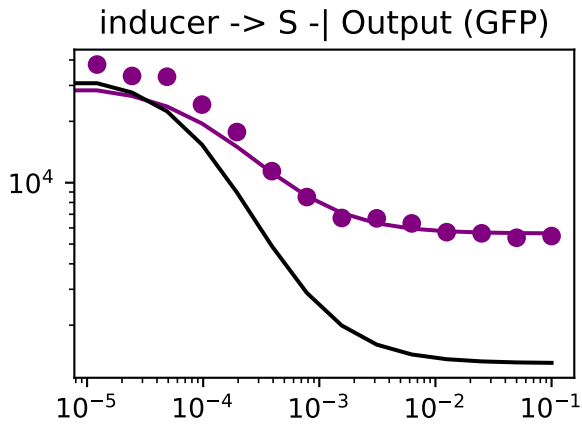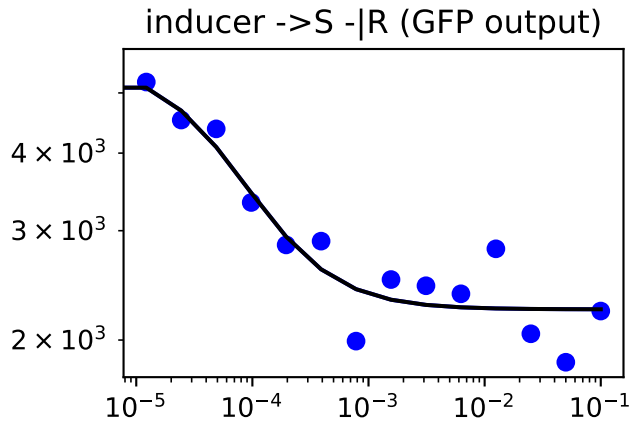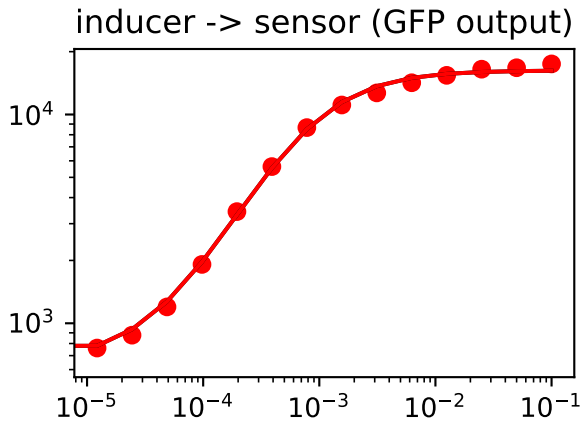--- 3.7211825847625732 seconds ---

Across all four plots:

RSS (converged)=0.091

RSS (initial)=0.735

RSS (% reduction)=0.89

	epsilon	Initial_guesses	Converged
A_s	0.000000	650.714912	650.714912
B_s	0.000000	16259.979950	16259.979950
C_s	0.000000	1296.448889	1296.448889
N_s	0.000000	1.154067	1.154067
A_r	0.000000	2020.019216	2020.019216
B_r	0.000000	23688.809187	23688.809187
C_r	0.000000	0.010358	0.010358
N_r	0.000000	0.910072	0.910072
A_h	0.000000	143.802212	143.802212
B_h	0.000000	50238.271408	50238.271408
C_h	0.000000	0.000929	0.000929
A_o	-1.610495	1.673894	0.063400
B_o	0.707448	0.895342	1.602790
C_o	1.321197	2.657699	3.978896
N_o	-0.202664	1.379953	1.177289
F_o	-1.438708	2.361284	0.922576

message: Optimization terminated successfully.
success: True
status: 0
fun: 0.09107592218659229
x: [6.507e+02 1.626e+04 ... 1.177e+00 9.226e-01]
nit: 960
nfev: 1398
final_simplex: (array([[6.507e+02, 1.626e+04, ..., 1.177e+00,
        9.226e-01],
       [6.507e+02, 1.626e+04, ..., 1.177e+00,
        9.226e-01],
       ...,
       [6.507e+02, 1.626e+04, ..., 1.177e+00,
        9.226e-01],
       [6.507e+02, 1.626e+04, ..., 1.177e+00,
        9.226e-01]]), array([9.108e-02, 9.108e-02, ..., 9.108e-02, 9.108e-02]))

['SM data type data plots for mutation', 'Output2', 'using model:', 'model_hill.model'']

inducer -> sensor (GFP output)

inducer ->S -|R (GFP output)

inducer -> S -| Output (GFP)

Full circuit with stripe

Legend:
- Initial Guess
- Converged
- Converged
- Converged
- Converged

time elapsed for this fit
--- 4.669893980026245 seconds ---

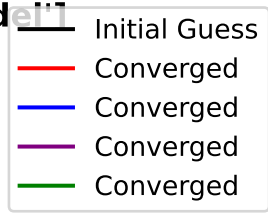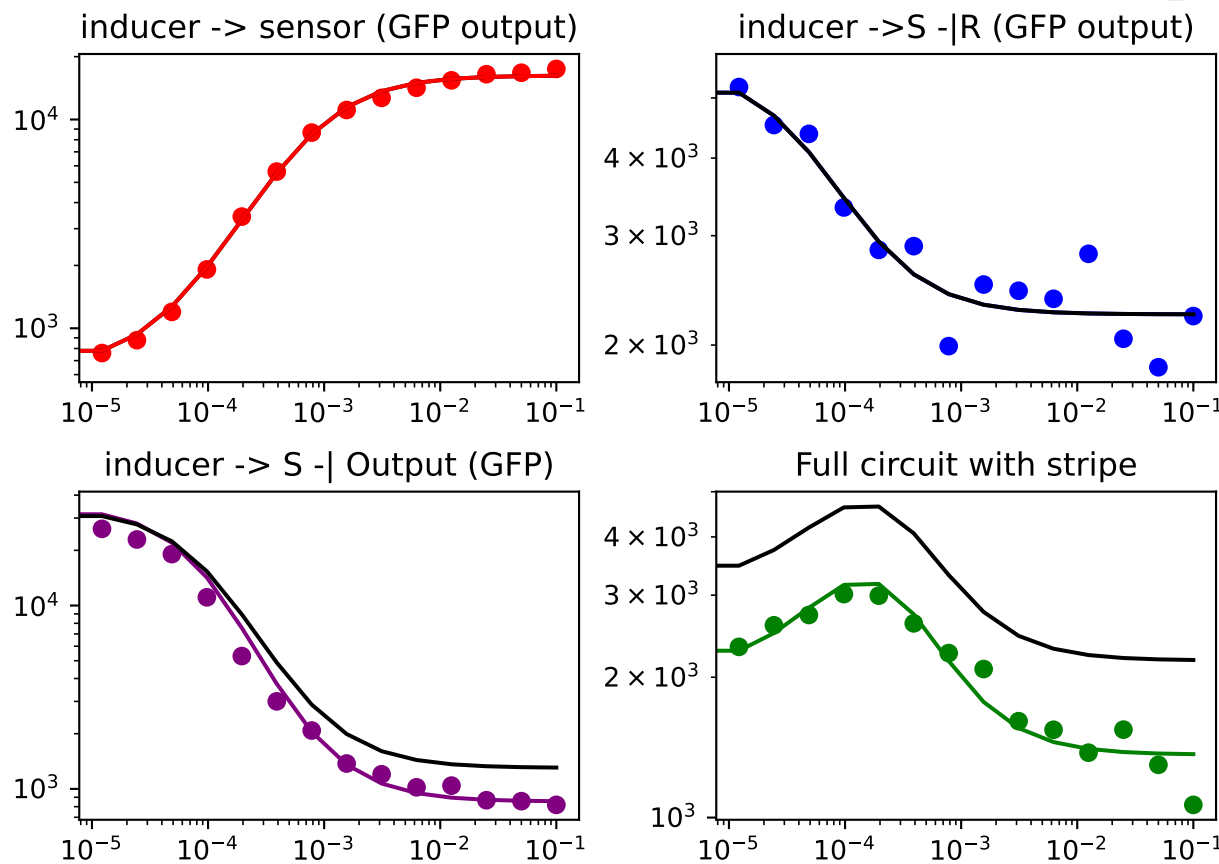Across all four plots:

RSS (converged)=0.122

RSS (initial)=5.327

RSS (% reduction)=0.978

	epsilon	Initial_guesses	Converged
A_s	0.000000	650.714912	6.507149e+02
B_s	0.000000	16259.979950	1.625998e+04
C_s	0.000000	1296.448889	1.296449e+03
N_s	0.000000	1.154067	1.154067e+00
A_r	0.000000	2020.019216	2.020019e+03
B_r	0.000000	23688.809187	2.368881e+04
C_r	0.000000	0.010358	1.035760e-02
N_r	0.000000	0.910072	9.100723e-01
A_h	0.000000	143.802212	1.438022e+02
B_h	0.000000	50238.271408	5.023827e+04
C_h	0.000000	0.000929	9.291293e-04
A_o	-1.673894	1.673894	4.043776e-11
B_o	0.994370	0.895342	1.889712e+00
C_o	0.620345	2.657699	3.278043e+00
N_o	-0.607097	1.379953	7.728556e-01
F_o	-1.608378	2.361284	7.529057e-01

message: Optimization terminated successfully.
success: True
 status: 0
    fun: 0.12155727052073735
      x: [6.507e+02 1.626e+04 ... 7.729e-01 7.529e-01]
    nit: 1596
   nfev: 2230
final_simplex: (array([[6.507e+02, 1.626e+04, ..., 7.729e-01,
         7.529e-01],
       [6.507e+02, 1.626e+04, ..., 7.729e-01,
         7.529e-01],
       ...,
       [6.507e+02, 1.626e+04, ..., 7.729e-01,
         7.529e-01],
       [6.507e+02, 1.626e+04, ..., 7.729e-01,
         7.529e-01]]), array([1.216e-01, 1.216e-01, ..., 1.216e-01, 1.216e-01]))

['SM data type data plots for mutation', 'Output3', 'using model:', 'model_hill.model'']

inducer -> sensor (GFP output)

inducer ->S -|R (GFP output)

inducer -> S -| Output (GFP)

Full circuit with stripe

Initial Guess
Converged
Converged
Converged
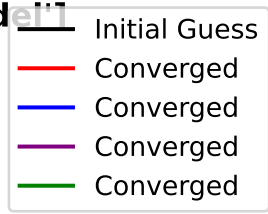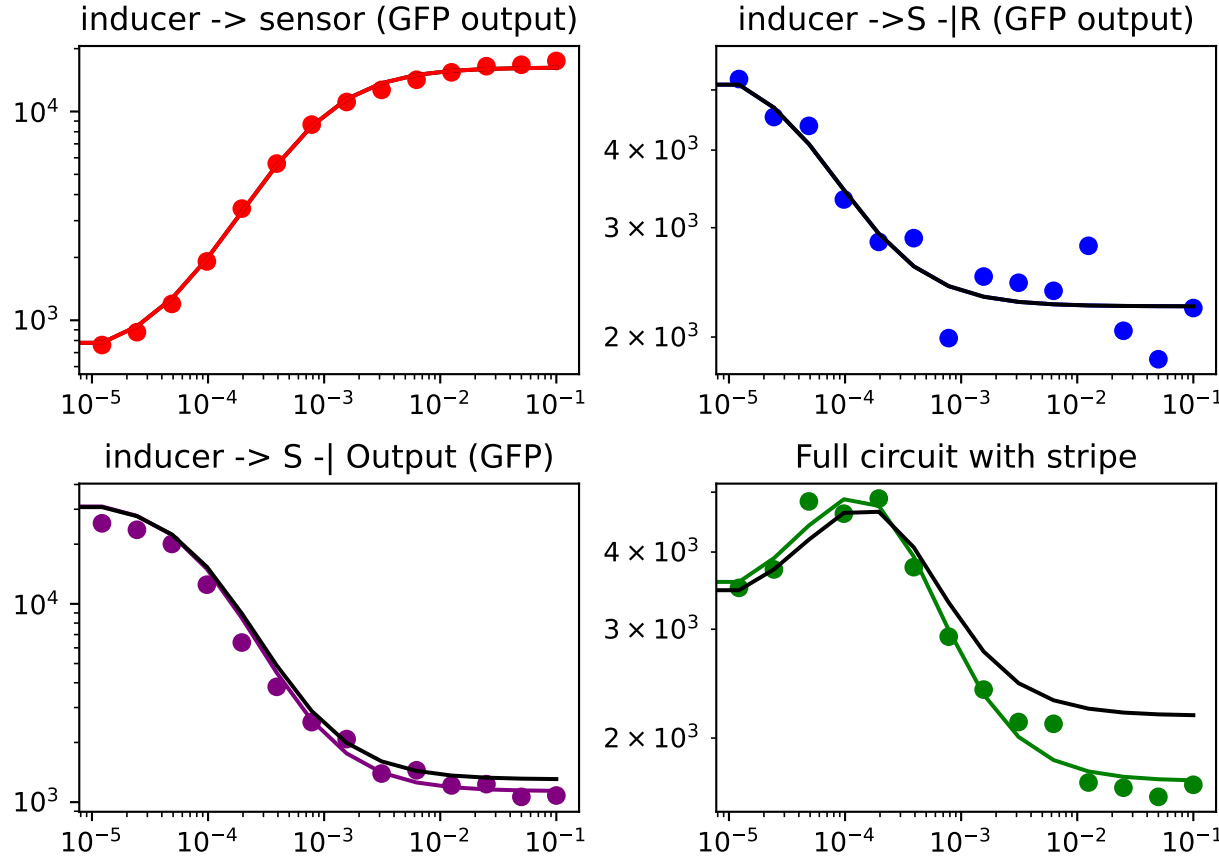Converged

time elapsed for this fit
--- 1.7979230880737305 seconds ---

Across all four plots:

RSS (converged)=0.143

RSS (initial)=0.937

RSS (% reduction)=0.867

	epsilon	Initial_guesses	Converged
A_s	0.000000	650.714912	650.714912
B_s	0.000000	16259.979950	16259.979950
C_s	0.000000	1296.448889	1296.448889
N_s	0.000000	1.154067	1.154067
A_r	0.000000	2020.019216	2020.019216
B_r	0.000000	23688.809187	23688.809187
C_r	0.000000	0.010358	0.010358
N_r	0.000000	0.910072	0.910072
A_h	0.000000	143.802212	143.802212
B_h	0.000000	50238.271408	50238.271408
C_h	0.000000	0.000929	0.000929
A_o	-0.192103	1.673894	1.481791
B_o	0.211231	0.895342	1.106573
C_o	0.002002	2.657699	2.659700
N_o	0.183897	1.379953	1.563850
F_o	-0.404800	2.361284	1.956484

message: Optimization terminated successfully.
success: True
 status: 0
    fun: 0.14318763721646355
      x: [6.507e+02 1.626e+04 ... 1.564e+00 1.956e+00]
    nit: 545
   nfev: 823
final_simplex: (array([[6.507e+02, 1.626e+04, ..., 1.564e+00,
         1.956e+00],
        [6.507e+02, 1.626e+04, ..., 1.564e+00,
          1.957e+00],
        ...,
        [6.507e+02, 1.626e+04, ..., 1.564e+00,
          1.956e+00],
        [6.507e+02, 1.626e+04, ..., 1.564e+00,
          1.956e+00]]), array([1.432e-01, 1.432e-01, ..., 1.432e-01, 1.432e-01]))

['SM data type data plots for mutation', 'Output4', 'using model:', 'model_hill.model'']

inducer -> sensor (GFP output)

inducer ->S -|R (GFP output)

inducer -> S -| Output (GFP)

Full circuit with stripe

Legend: Initial Guess, Converged, Converged, Converged, Converged

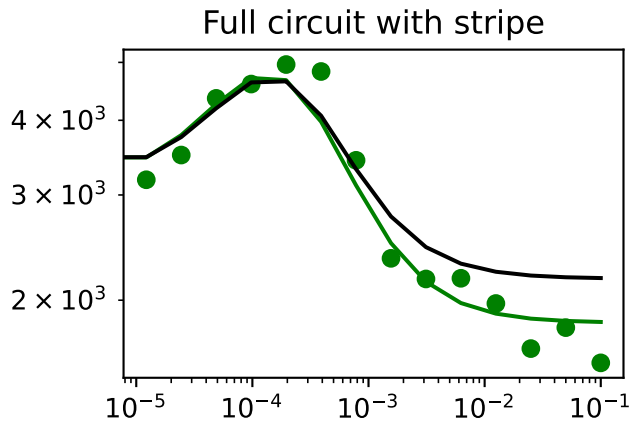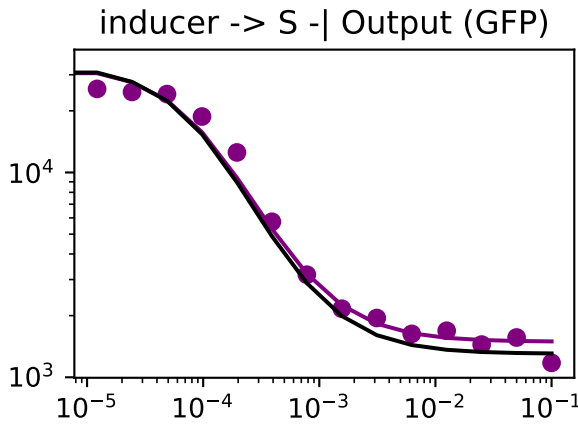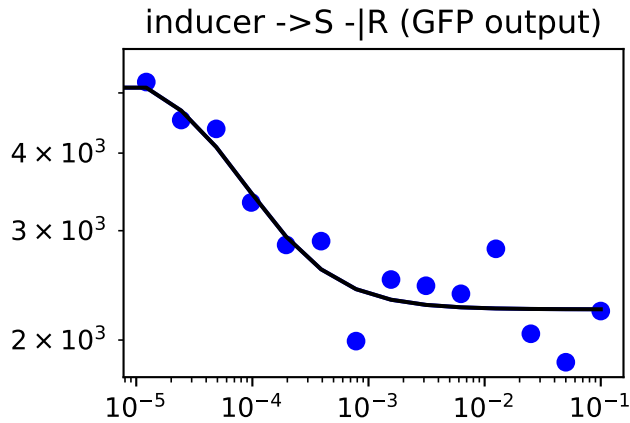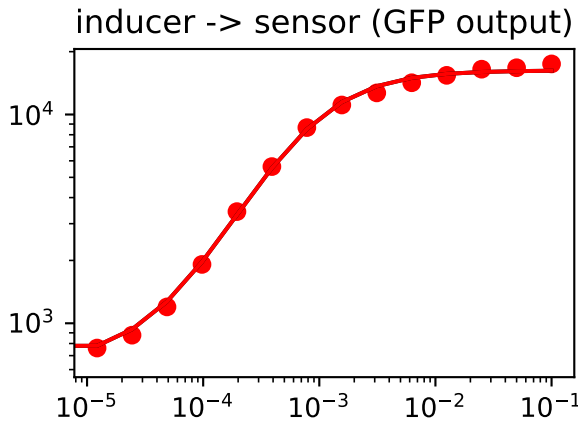time elapsed for this fit
--- 1.900698184967041 seconds ---

Across all four plots:

RSS (converged)=0.114

RSS (initial)=0.21

RSS (% reduction)=0.649

	epsilon	Initial_guesses	Converged
A_s	0.000000	650.714912	650.714912
B_s	0.000000	16259.979950	16259.979950
C_s	0.000000	1296.448889	1296.448889
N_s	0.000000	1.154067	1.154067
A_r	0.000000	2020.019216	2020.019216
B_r	0.000000	23688.809187	23688.809187
C_r	0.000000	0.010358	0.010358
N_r	0.000000	0.910072	0.910072
A_h	0.000000	143.802212	143.802212
B_h	0.000000	50238.271408	50238.271408
C_h	0.000000	0.000929	0.000929
A_o	-1.326101	1.673894	0.347793
B_o	-0.009855	0.895342	0.885487
C_o	-0.422032	2.657699	2.235666
N_o	0.058438	1.379953	1.438390
F_o	0.256824	2.361284	2.618108

message: Optimization terminated successfully.
success: True
status: 0
fun: 0.11397516181218215
x: [6.507e+02 1.626e+04 ... 1.438e+00 2.618e+00]
nit: 594
nfev: 910
final_simplex: (array([[6.507e+02, 1.626e+04, ..., 1.438e+00,
          2.618e+00],
       [6.507e+02, 1.626e+04, ..., 1.438e+00,
          2.618e+00],
       ...,
       [6.507e+02, 1.626e+04, ..., 1.438e+00,
          2.618e+00],
       [6.507e+02, 1.626e+04, ..., 1.438e+00,
          2.618e+00]]), array([1.140e-01, 1.140e-01, ..., 1.140e-01, 1.140e-01]))

['SM data type data plots for mutation', 'Output5', 'using model:', 'model_hill.model'']

inducer -> sensor (GFP output)

inducer ->S -|R (GFP output)

inducer -> S -| Output (GFP)

Full circuit with stripe

Legend:
- Initial Guess
- Converged
- Converged
- Converged
- Converged
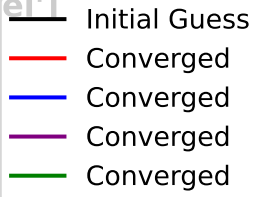
time elapsed for this fit
--- 2.528930187225342 seconds ---

Across all four plots:

RSS (converged)=0.114

RSS (initial)=0.184

RSS (% reduction)=0.617

	epsilon	Initial_guesses	Converged
A_s	0.000000	650.714912	6.507149e+02
B_s	0.000000	16259.979950	1.625998e+04
C_s	0.000000	1296.448889	1.296449e+03
N_s	0.000000	1.154067	1.154067e+00
A_r	0.000000	2020.019216	2.020019e+03
B_r	0.000000	23688.809187	2.368881e+04
C_r	0.000000	0.010358	1.035760e-02
N_r	0.000000	0.910072	9.100723e-01
A_h	0.000000	143.802212	1.438022e+02
B_h	0.000000	50238.271408	5.023827e+04
C_h	0.000000	0.000929	9.291293e-04
A_o	-1.673894	1.673894	2.095938e-11
B_o	1.197827	0.895342	2.093169e+00
C_o	-0.209032	2.657699	2.448666e+00
N_o	-0.057067	1.379953	1.322885e+00
F_o	-1.414144	2.361284	9.471402e-01

message: Optimization terminated successfully.
success: True
 status: 0
    fun: 0.11373412864672598
      x: [6.507e+02 1.626e+04 ... 1.323e+00 9.471e-01]
    nit: 839
   nfev: 1206
final_simplex: (array([[6.507e+02, 1.626e+04, ..., 1.323e+00,
          9.471e-01],
        [6.507e+02, 1.626e+04, ..., 1.323e+00,
          9.471e-01],
        ...,
        [6.507e+02, 1.626e+04, ..., 1.323e+00,
          9.472e-01],
        [6.507e+02, 1.626e+04, ..., 1.323e+00,
          9.472e-01]]), array([1.137e-01, 1.137e-01, ..., 1.137e-01, 1.137e-01]))

['SM data type data plots for mutation', 'Output6', 'using model:', 'model_hill.model'']

inducer -> sensor (GFP output)

inducer ->S -|R (GFP output)

inducer -> S -| Output (GFP)

Full circuit with stripe

Initial Guess
Converged
Converged
Converged
Converged
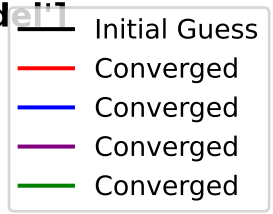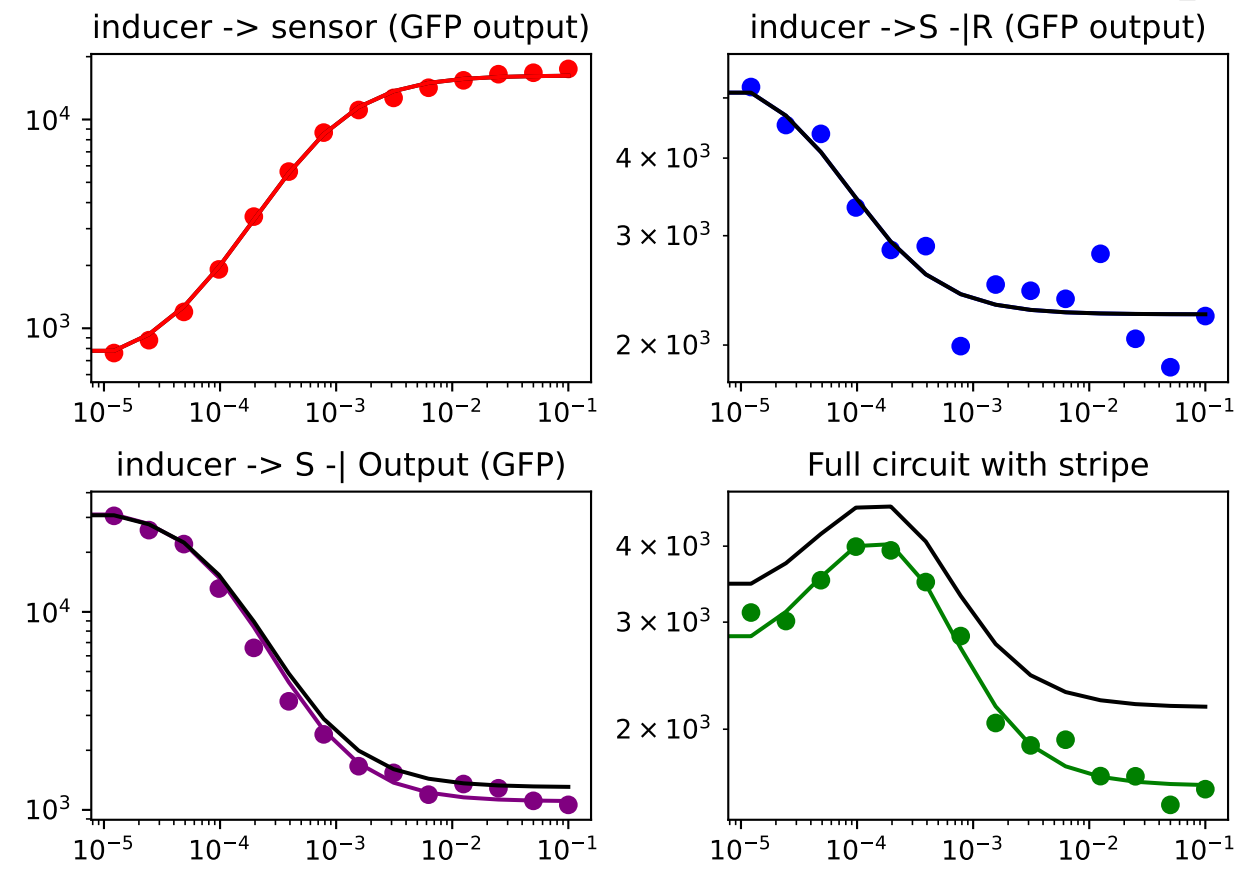
time elapsed for this fit
--- 1.984891653060913 seconds ---

Across all four plots:

RSS (converged)=0.081

RSS (initial)=0.273

RSS (% reduction)=0.77

	epsilon	Initial_guesses	Converged
A_s	0.000000	650.714912	650.714912
B_s	0.000000	16259.979950	16259.979950
C_s	0.000000	1296.448889	1296.448889
N_s	0.000000	1.154067	1.154067
A_r	0.000000	2020.019216	2020.019216
B_r	0.000000	23688.809187	23688.809187
C_r	0.000000	0.010358	0.010358
N_r	0.000000	0.910072	0.910072
A_h	0.000000	143.802212	143.802212
B_h	0.000000	50238.271408	50238.271408
C_h	0.000000	0.000929	0.000929
A_o	-1.041782	1.673894	0.632112
B_o	0.519584	0.895342	1.414926
C_o	0.038903	2.657699	2.696601
N_o	0.070346	1.379953	1.450299
F_o	-0.673726	2.361284	1.687558

message: Optimization terminated successfully.
success: True
 status: 0
   fun: 0.08136500286662311
    x: [6.507e+02 1.626e+04 ... 1.450e+00 1.688e+00]
   nit: 581
  nfev: 891
final_simplex: (array([[6.507e+02, 1.626e+04, ..., 1.450e+00,
         1.688e+00],
       [6.507e+02, 1.626e+04, ..., 1.450e+00,
         1.688e+00],
       ...,
       [6.507e+02, 1.626e+04, ..., 1.450e+00,
         1.688e+00],
       [6.507e+02, 1.626e+04, ..., 1.450e+00,
         1.688e+00]]), array([8.137e-02, 8.137e-02, ..., 8.137e-02, 8.137e-02]))

['SM data type data plots for mutation', 'Output7', 'using model:', 'model_hill.model']

Legend:
- Initial Guess
- Converged
- Converged
- Converged
- Converged
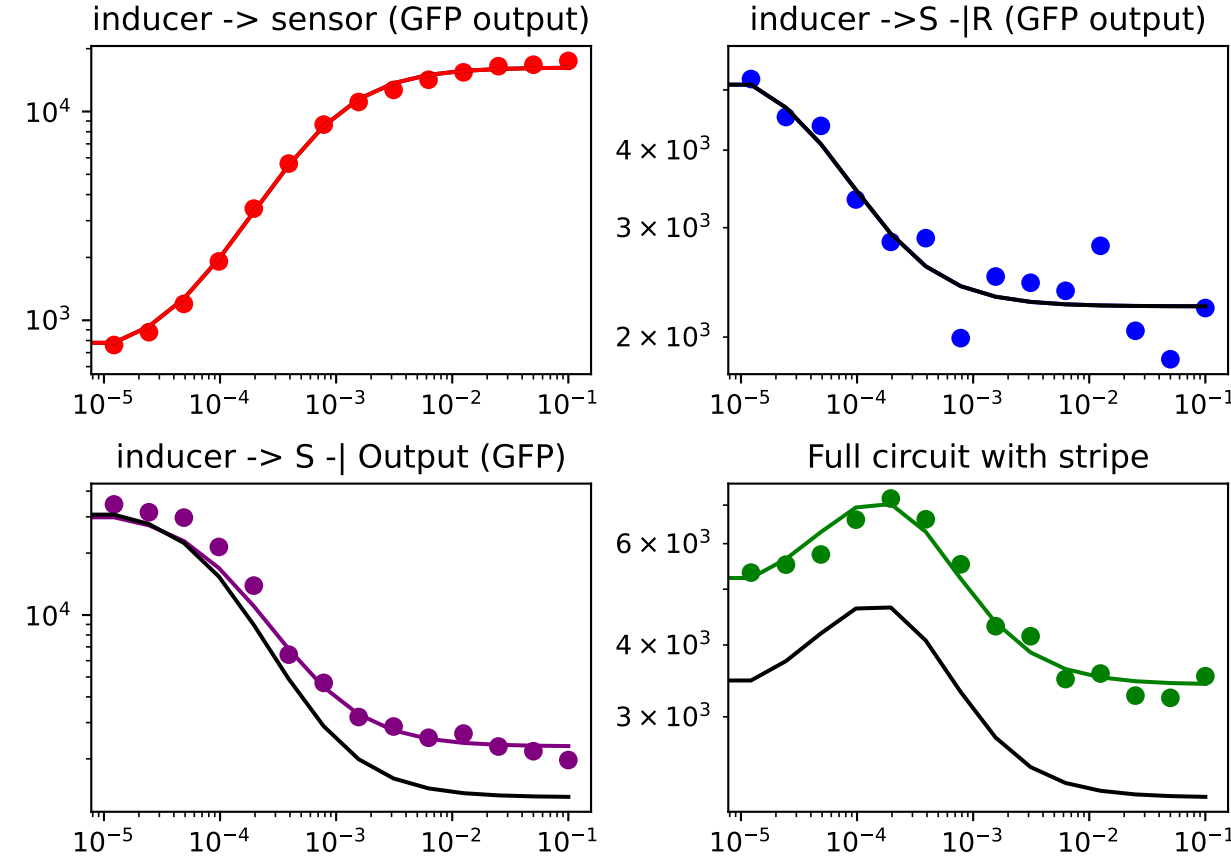
time elapsed for this fit
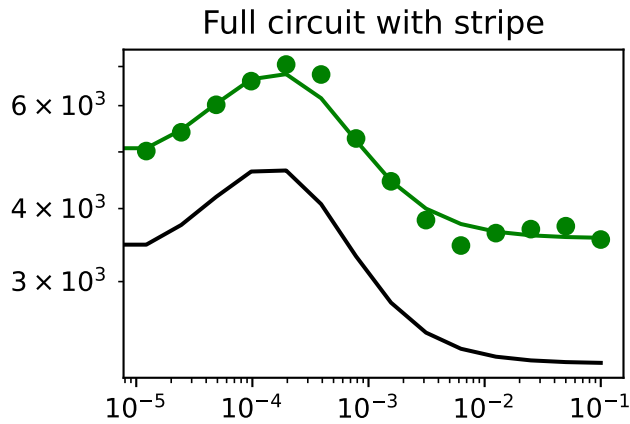--- 2.690615653991699 seconds ---

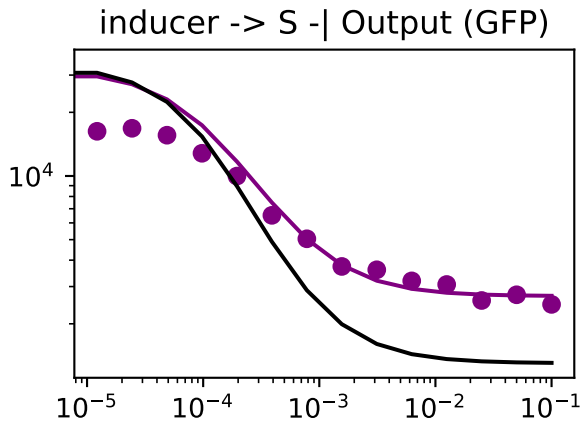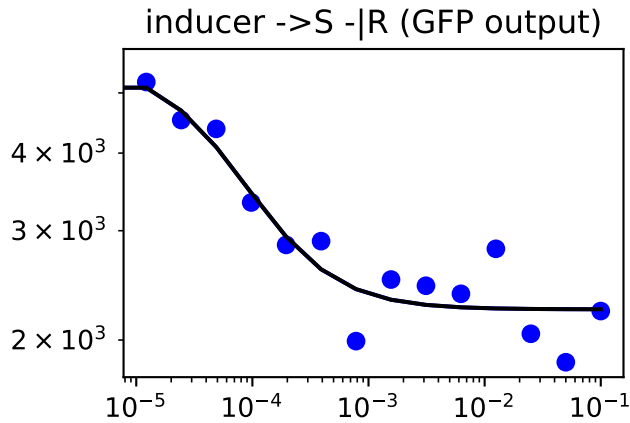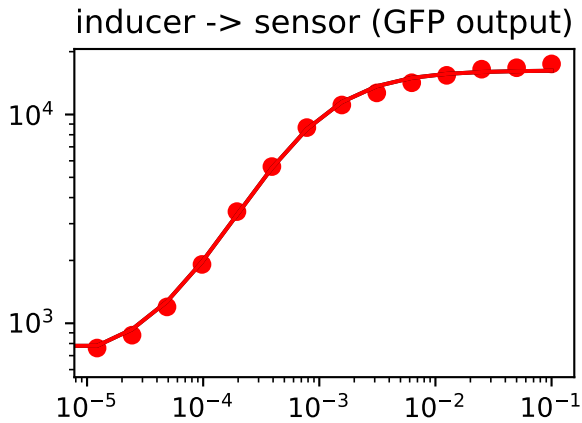Across all four plots:

RSS (converged)=0.099

RSS (initial)=1.108

RSS (% reduction)=0.918

	epsilon	Initial_guesses	Converged
A_s	0.000000	650.714912	6.507149e+02
B_s	0.000000	16259.979950	1.625998e+04
C_s	0.000000	1296.448889	1.296449e+03
N_s	0.000000	1.154067	1.154067e+00
A_r	0.000000	2020.019216	2.020019e+03
B_r	0.000000	23688.809187	2.368881e+04
C_r	0.000000	0.010358	1.035760e-02
N_r	0.000000	0.910072	9.100723e-01
A_h	0.000000	143.802212	1.438022e+02
B_h	0.000000	50238.271408	5.023827e+04
C_h	0.000000	0.000929	9.291293e-04
A_o	-1.673894	1.673894	2.918811e-07
B_o	0.288858	0.895342	1.184200e+00
C_o	0.210986	2.657699	2.868685e+00
N_o	-0.236431	1.379953	1.143521e+00
F_o	-0.430038	2.361284	1.931246e+00

message: Optimization terminated successfully.
success: True
 status: 0
    fun: 0.09893105456449203
      x: [6.507e+02 1.626e+04 ... 1.144e+00 1.931e+00]
    nit: 908
   nfev: 1255
final_simplex: (array([[6.507e+02, 1.626e+04, ..., 1.144e+00,
             1.931e+00],
          [6.507e+02, 1.626e+04, ..., 1.144e+00,
            1.931e+00],
          ...,
          [6.507e+02, 1.626e+04, ..., 1.144e+00,
            1.931e+00],
          [6.507e+02, 1.626e+04, ..., 1.144e+00,
            1.931e+00]]), array([9.893e-02, 9.893e-02, ..., 9.893e-02, 9.893e-02]))

['SM data type data plots for mutation', 'Output8', 'using model:', 'model_hill.model'']

inducer -> sensor (GFP output)

inducer ->S -|R (GFP output)

Initial Guess
Converged
Converged
Converged
Converged

time elapsed for this fit
--- 4.522092819213867 seconds ---

inducer -> S -| Output (GFP)

Full circuit with stripe

Across all four plots:

RSS (converged)=0.293

RSS (initial)=1.614

RSS (% reduction)=0.847

	epsilon	Initial_guesses	Converged
A_s	0.000000	650.714912	6.507149e+02
B_s	0.000000	16259.979950	1.625998e+04
C_s	0.000000	1296.448889	1.296449e+03
N_s	0.000000	1.154067	1.154067e+00
A_r	0.000000	2020.019216	2.020019e+03
B_r	0.000000	23688.809187	2.368881e+04
C_r	0.000000	0.010358	1.035760e-02
N_r	0.000000	0.910072	9.100723e-01
A_h	0.000000	143.802212	1.438022e+02
B_h	0.000000	50238.271408	5.023827e+04
C_h	0.000000	0.000929	9.291293e-04
A_o	-1.673894	1.673894	3.398519e-12
B_o	1.982757	0.895342	2.878099e+00
C_o	0.401899	2.657699	3.059598e+00
N_o	-0.302841	1.379953	1.077112e+00
F_o	-1.667465	2.361284	6.938192e-01

message: Optimization terminated successfully.
success: True
 status: 0
    fun: 0.29266827610948054
      x: [6.507e+02 1.626e+04 ... 1.077e+00 6.938e-01]
    nit: 1516
   nfev: 2150
final_simplex: (array([[6.507e+02, 1.626e+04, ..., 1.077e+00,
        6.938e-01],
       [6.507e+02, 1.626e+04, ..., 1.077e+00,
        6.938e-01],
       ...,
       [6.507e+02, 1.626e+04, ..., 1.077e+00,
        6.938e-01],
       [6.507e+02, 1.626e+04, ..., 1.077e+00,
        6.938e-01]]), array([2.927e-01, 2.927e-01, ..., 2.927e-01, 2.927e-01]))

['SM data type data plots for mutation', 'Output9', 'using model:', 'model_hill.model'']

inducer -> sensor (GFP output)

inducer ->S -|R (GFP output)

inducer -> S -| Output (GFP)

Full circuit with stripe

Legend: Initial Guess, Converged, Converged, Converged, Converged

time elapsed for this fit
--- 3.408193826675415 seconds ---
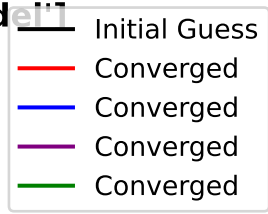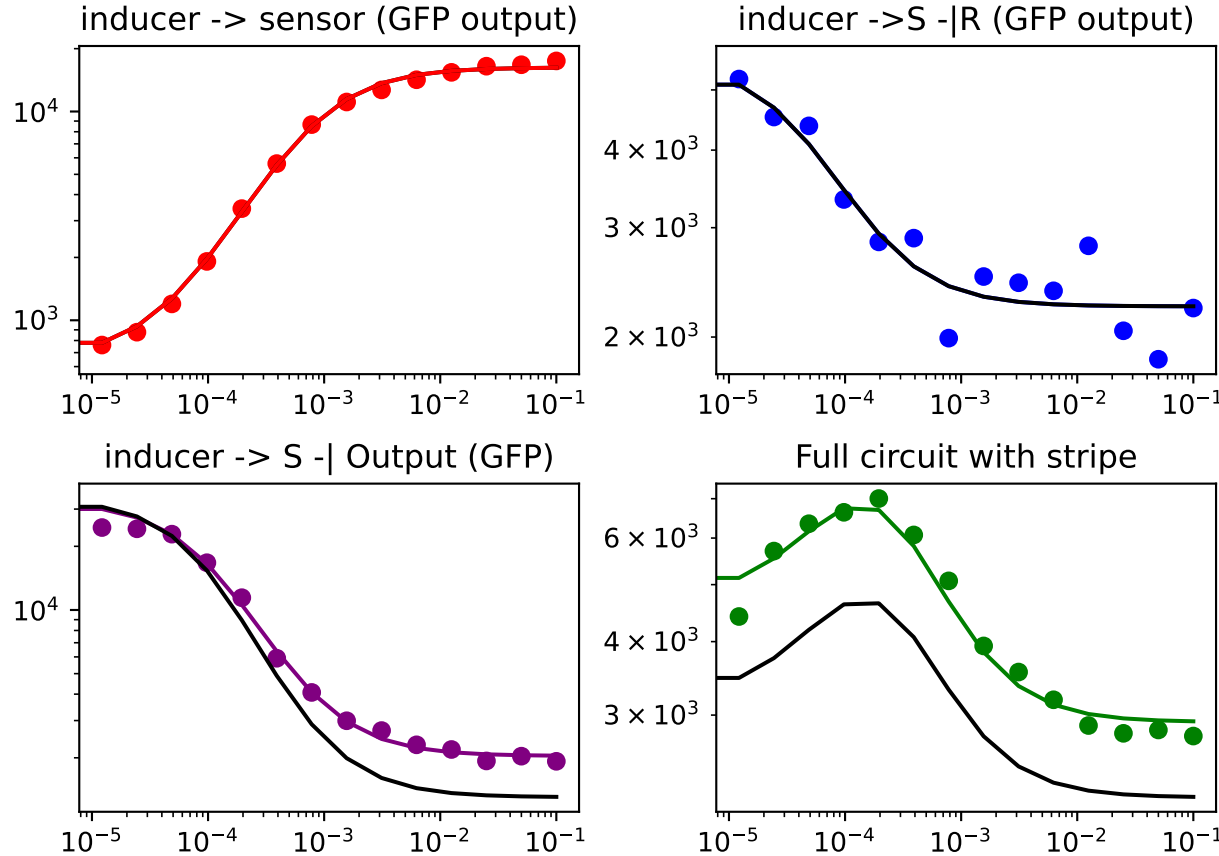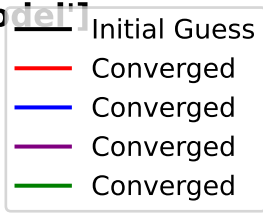
Across all four plots:

RSS (converged)=0.074

RSS (initial)=0.711

RSS (% reduction)=0.906

	epsilon	Initial_guesses	Converged
A_s	0.000000	650.714912	650.714912
B_s	0.000000	16259.979950	16259.979950
C_s	0.000000	1296.448889	1296.448889
N_s	0.000000	1.154067	1.154067
A_r	0.000000	2020.019216	2020.019216
B_r	0.000000	23688.809187	23688.809187
C_r	0.000000	0.010358	0.010358
N_r	0.000000	0.910072	0.910072
A_h	0.000000	143.802212	143.802212
B_h	0.000000	50238.271408	50238.271408
C_h	0.000000	0.000929	0.000929
A_o	-1.673894	1.673894	0.000000
B_o	0.382090	0.895342	1.277432
C_o	-0.196620	2.657699	2.461078
N_o	-0.187165	1.379953	1.192788
F_o	-0.672489	2.361284	1.688795

message: Optimization terminated successfully.
success: True
 status: 0
    fun: 0.07374697772697539
      x: [6.507e+02 1.626e+04 ... 1.193e+00 1.689e+00]
    nit: 1136
   nfev: 1583
final_simplex: (array([[6.507e+02, 1.626e+04, ..., 1.193e+00,
          1.689e+00],
        [6.507e+02, 1.626e+04, ..., 1.193e+00,
          1.689e+00],
        ...,
        [6.507e+02, 1.626e+04, ..., 1.193e+00,
          1.689e+00],
        [6.507e+02, 1.626e+04, ..., 1.193e+00,
          1.689e+00]]), array([7.375e-02, 7.375e-02, ..., 7.375e-02, 7.375e-02]))

['SM data type data plots for mutation', 'Regulator1', 'using model:', 'model_hill.model']

inducer -> sensor (GFP output)

inducer ->S -|R (GFP output)

Legend:
- Initial Guess
- Converged
- Converged
- Converged
- Converged
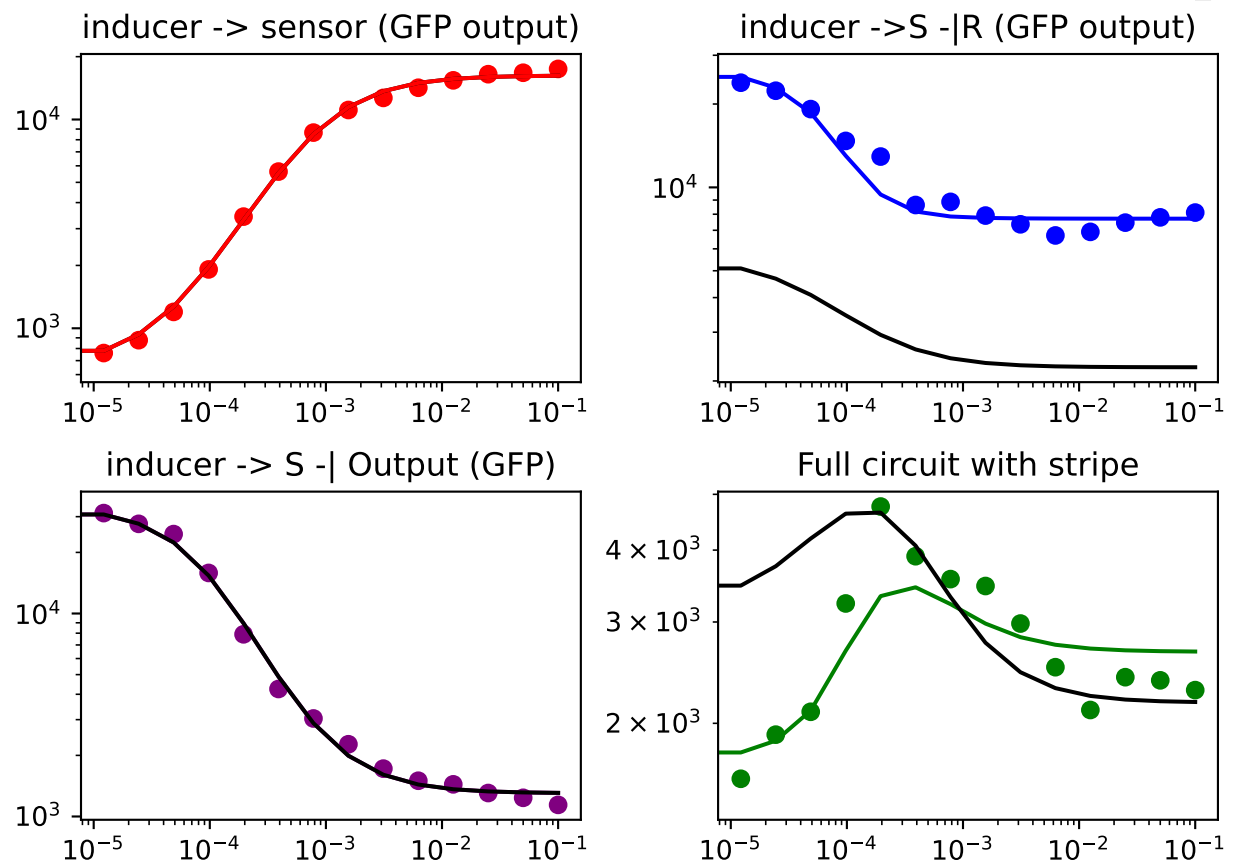
time elapsed for this fit
--- 5.162982225418091 seconds ---
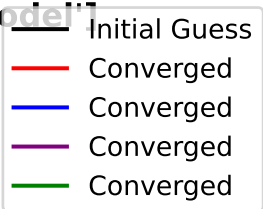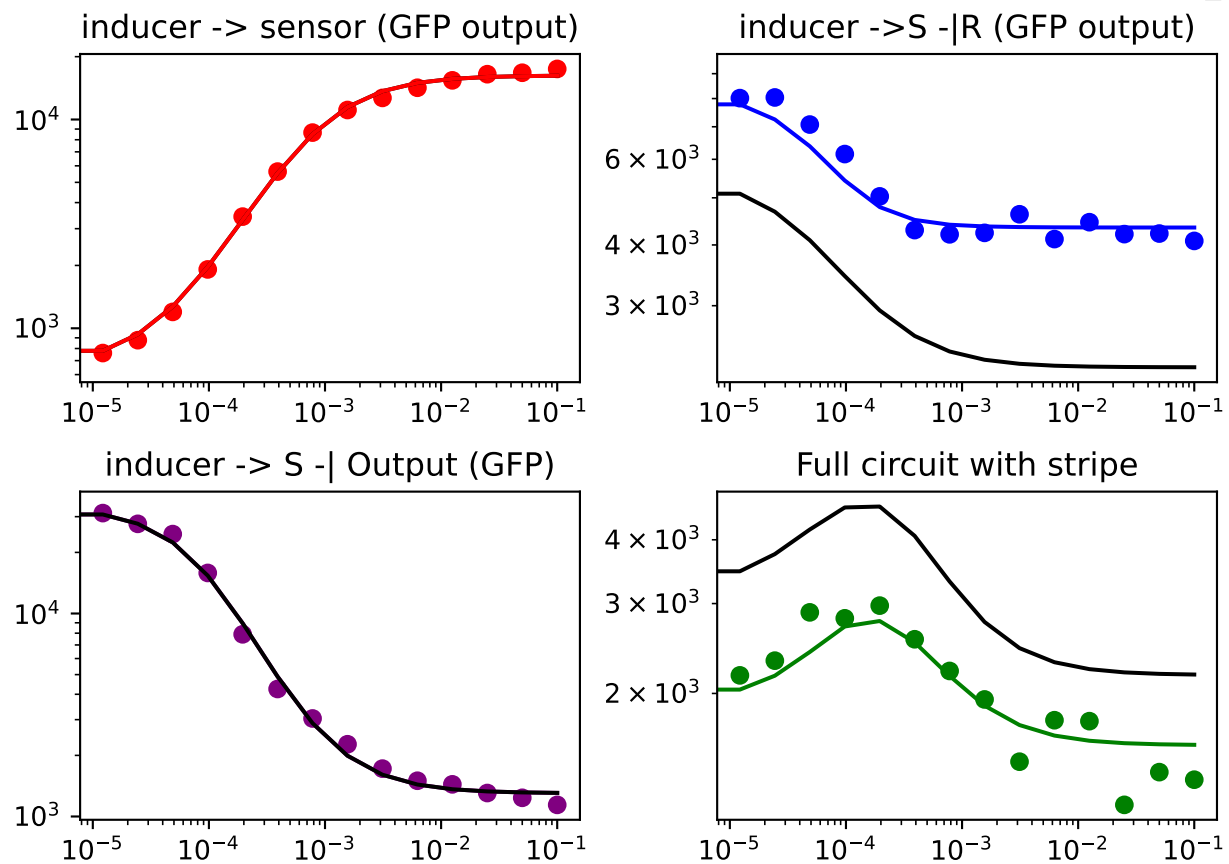
inducer -> S -| Output (GFP)

Full circuit with stripe

Across all four plots:

RSS (converged)=0.13

RSS (initial)=5.544

RSS (% reduction)=0.977

	epsilon	Initial_guesses	Converged
A_s	0.000000	650.714912	650.714912
B_s	0.000000	16259.979950	16259.979950
C_s	0.000000	1296.448889	1296.448889
N_s	0.000000	1.154067	1.154067
A_r	5654.249528	2020.019216	7674.268744
B_r	-607.592451	23688.809187	23081.216736
C_r	-0.009536	0.010358	0.000821
N_r	1.594141	0.910072	2.504213
A_h	0.000000	143.802212	143.802212
B_h	0.000000	50238.271408	50238.271408
C_h	0.000000	0.000929	0.000929
A_o	0.000000	1.673894	1.673894
B_o	0.000000	0.895342	0.895342
C_o	0.000000	2.657699	2.657699
N_o	0.000000	1.379953	1.379953
F_o	2.208802	2.361284	4.570085

message: Optimization terminated successfully.
success: True
 status: 0
    fun: 0.13037748308160518
      x: [6.507e+02 1.626e+04 ... 1.380e+00 4.570e+00]
    nit: 1651
   nfev: 2456
final_simplex: (array([[6.507e+02, 1.626e+04, ..., 1.380e+00,
          4.570e+00],
        [6.507e+02, 1.626e+04, ..., 1.380e+00,
          4.570e+00],
        ...,
        [6.507e+02, 1.626e+04, ..., 1.380e+00,
          4.570e+00],
        [6.507e+02, 1.626e+04, ..., 1.380e+00,
          4.570e+00]]), array([1.304e-01, 1.304e-01, ..., 1.304e-01, 1.304e-01]))

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

Across all four plots:

RSS (converged)=0.079

RSS (initial)=1.527

RSS (% reduction)=0.951

	epsilon	Initial_guesses	Converged
A_s	0.000000	650.714912	650.714912
B_s	0.000000	16259.979950	16259.979950
C_s	0.000000	1296.448889	1296.448889
N_s	0.000000	1.154067	1.154067
A_r	2298.994065	2020.019216	4319.013280
B_r	-17427.158016	23688.809187	6261.651171
C_r	-0.009212	0.010358	0.001145
N_r	0.982436	0.910072	1.892508
A_h	0.000000	143.802212	143.802212
B_h	0.000000	50238.271408	50238.271408
C_h	0.000000	0.000929	0.000929
A_o	0.000000	1.673894	1.673894
B_o	0.000000	0.895342	0.895342
C_o	0.000000	2.657699	2.657699
N_o	0.000000	1.379953	1.379953
F_o	-0.225140	2.361284	2.136144

time elapsed for this fit
--- 6.076026916503906 seconds ---

message: Optimization terminated successfully.
success: True
 status: 0
    fun: 0.07885574845212528
     x: [6.507e+02 1.626e+04 ... 1.380e+00 2.136e+00]
   nit: 2012
  nfev: 2899
final_simplex: (array([[6.507e+02, 1.626e+04, ..., 1.380e+00,
        2.136e+00],
       [6.507e+02, 1.626e+04, ..., 1.380e+00,
        2.136e+00],
       ...,
       [6.507e+02, 1.626e+04, ..., 1.380e+00,
        2.136e+00],
       [6.507e+02, 1.626e+04, ..., 1.380e+00,
        2.136e+00]]), array([7.886e-02, 7.886e-02, ..., 7.886e-02, 7.886e-02]))

['SM data type data plots for mutation', 'Regulator2', 'using model:', 'model_hill.model']

inducer -> sensor (GFP output)

inducer ->S -|R (GFP output)
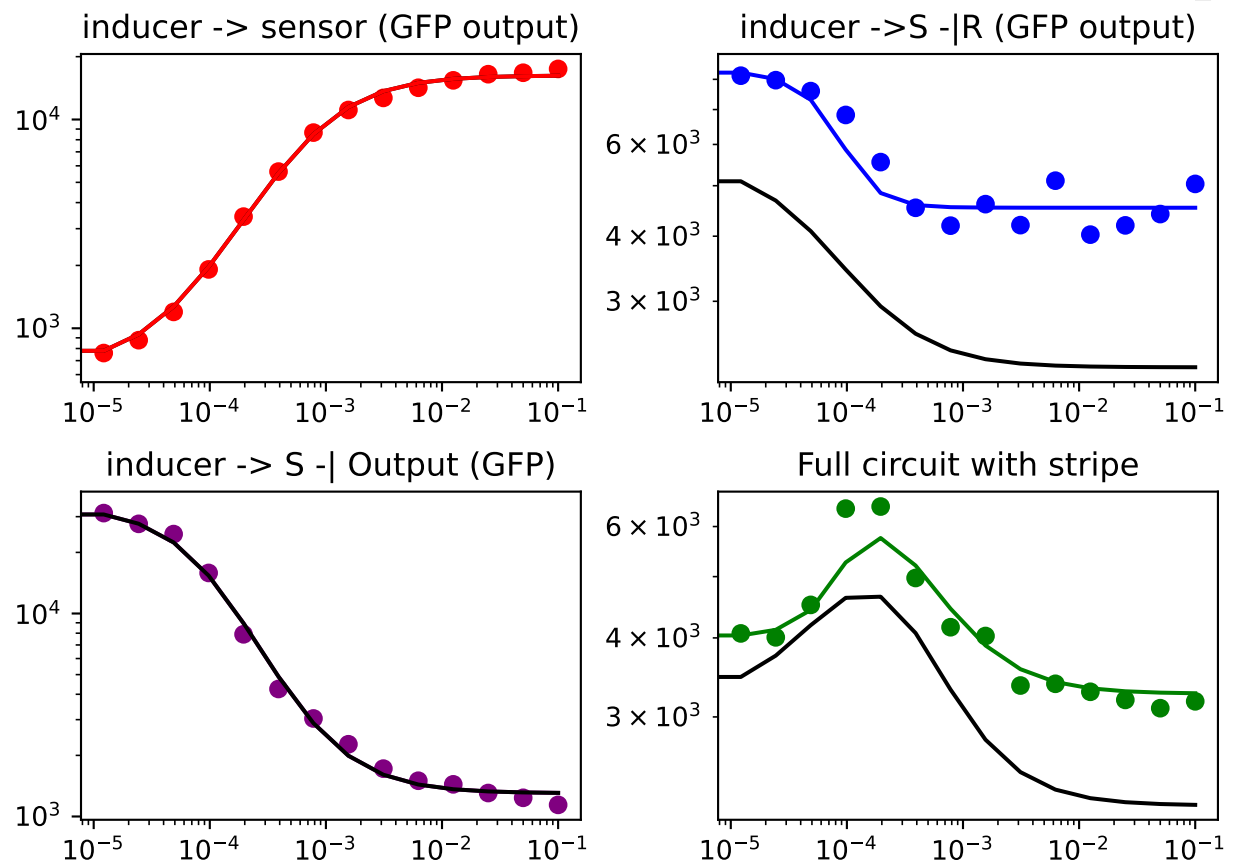
Initial Guess
Converged
Converged
Converged
Converged

time elapsed for this fit
--- 5.856753826141357 seconds ---

inducer -> S -| Output (GFP)

Full circuit with stripe

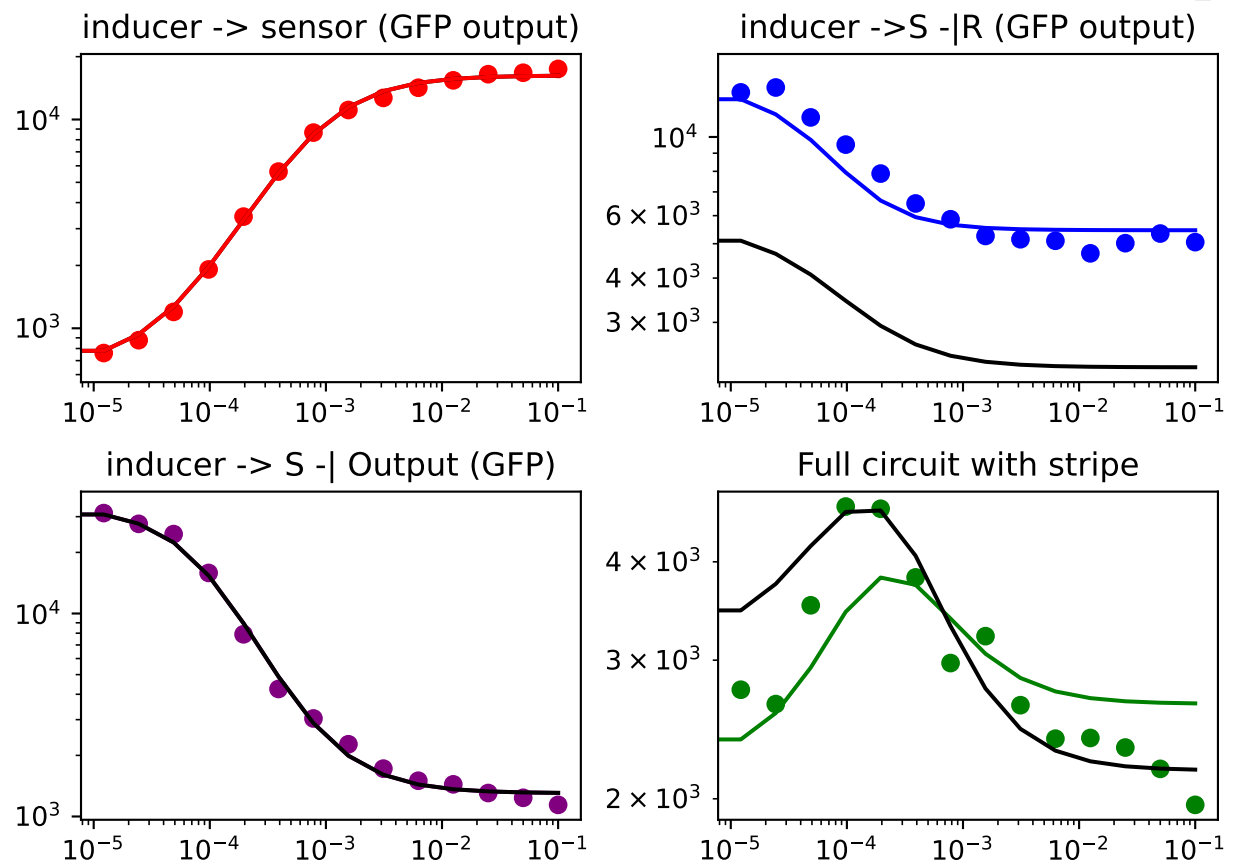Across all four plots:

RSS (converged)=0.058

RSS (initial)=1.38

RSS (% reduction)=0.959

	epsilon	Initial_guesses	Converged
A_s	0.000000	650.714912	650.714912
B_s	0.000000	16259.979950	16259.979950
C_s	0.000000	1296.448889	1296.448889
N_s	0.000000	1.154067	1.154067
A_r	2514.691338	2020.019216	4534.710554
B_r	-19676.123747	23688.809187	4012.685440
C_r	-0.009735	0.010358	0.000623
N_r	2.541487	0.910072	3.451559
A_h	0.000000	143.802212	143.802212
B_h	0.000000	50238.271408	50238.271408
C_h	0.000000	0.000929	0.000929
A_o	0.000000	1.673894	1.673894
B_o	0.000000	0.895342	0.895342
C_o	0.000000	2.657699	2.657699
N_o	0.000000	1.379953	1.379953
F_o	2.116491	2.361284	4.477775

message: Optimization terminated successfully.
success: True
status: 0
fun: 0.05843309386786325
x: [6.507e+02 1.626e+04 ... 1.380e+00 4.478e+00]
nit: 1886
nfev: 2683
final_simplex: (array([[6.507e+02, 1.626e+04, ..., 1.380e+00,
          4.478e+00],
       [6.507e+02, 1.626e+04, ..., 1.380e+00,
          4.478e+00],
       ...,
       [6.507e+02, 1.626e+04, ..., 1.380e+00,
          4.478e+00],
       [6.507e+02, 1.626e+04, ..., 1.380e+00,
          4.478e+00]]), array([5.843e-02, 5.843e-02, ..., 5.843e-02, 5.843e-02]))

['SM data type data plots for mutation', 'Regulator3', 'using model:', 'model_hill.model']

inducer -> sensor (GFP output)

inducer ->S -|R (GFP output)

Initial Guess
Converged
Converged
Converged
Converged

time elapsed for this fit
--- 5.3845109939575195 seconds ---

inducer -> S -| Output (GFP)

Full circuit with stripe

Across all four plots:

RSS (converged)=0.139

RSS (initial)=2.427

RSS (% reduction)=0.946

	epsilon	Initial_guesses	Converged
A_s	0.000000	650.714912	650.714912
B_s	0.000000	16259.979950	16259.979950
C_s	0.000000	1296.448889	1296.448889
N_s	0.000000	1.154067	1.154067
A_r	3315.908874	2020.019216	5335.928090
B_r	-5098.636303	23688.809187	18590.172884
C_r	-0.008686	0.010358	0.001672
N_r	0.613024	0.910072	1.523097
A_h	0.000000	143.802212	143.802212
B_h	0.000000	50238.271408	50238.271408
C_h	0.000000	0.000929	0.000929
A_o	0.000000	1.673894	1.673894
B_o	0.000000	0.895342	0.895342
C_o	0.000000	2.657699	2.657699
N_o	0.000000	1.379953	1.379953
F_o	1.539401	2.361284	3.900684

message: Optimization terminated successfully.
success: True
 status: 0
    fun: 0.13893787423679754
      x: [6.507e+02 1.626e+04 ... 1.380e+00 3.901e+00]
    nit: 1720
   nfev: 2527
final_simplex: (array([[6.507e+02, 1.626e+04, ..., 1.380e+00,
          3.901e+00],
        [6.507e+02, 1.626e+04, ..., 1.380e+00,
          3.901e+00],
        ...,
        [6.507e+02, 1.626e+04, ..., 1.380e+00,
          3.901e+00],
        [6.507e+02, 1.626e+04, ..., 1.380e+00,
          3.901e+00]]), array([1.389e-01, 1.389e-01, ..., 1.389e-01, 1.389e-01]))

['SM data type data plots for mutation', 'Regulator4', 'using model:', 'model_hill.model']

inducer -> sensor (GFP output)

inducer ->S -|R (GFP output)

Legend:
- Initial Guess
- Converged
- Converged
- Converged
- Converged
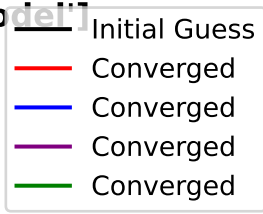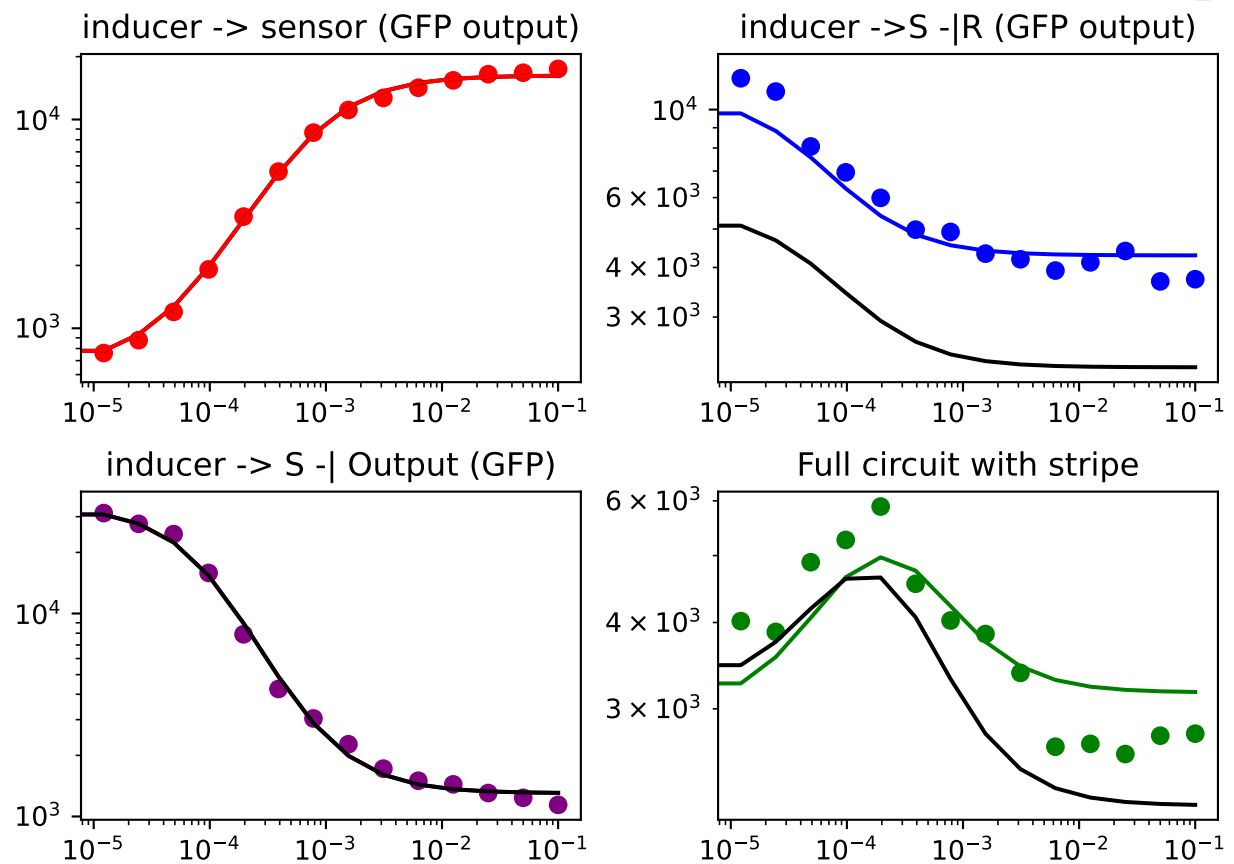
time elapsed for this fit
--- 739.2025649547577 seconds ---

inducer -> S -| Output (GFP)

Full circuit with stripe

Across all four plots:

RSS (converged)=0.131

RSS (initial)=1.446

RSS (% reduction)=0.917

	epsilon	Initial_guesses	Converged
A_s	0.000000e+00	650.714912	6.507149e+02
B_s	0.000000e+00	16259.979950	1.625998e+04
C_s	0.000000e+00	1296.448889	1.296449e+03
N_s	0.000000e+00	1.154067	1.154067e+00
A_r	1.977967e+03	2020.019216	3.997986e+03
B_r	9.439413e+11	23688.809187	9.439413e+11
C_r	2.902249e+05	0.010358	2.902249e+05
N_r	7.292641e-02	0.910072	9.829987e-01
A_h	0.000000e+00	143.802212	1.438022e+02
B_h	0.000000e+00	50238.271408	5.023827e+04
C_h	0.000000e+00	0.000929	9.291293e-04
A_o	0.000000e+00	1.673894	1.673894e+00
B_o	0.000000e+00	0.895342	8.953419e-01
C_o	0.000000e+00	2.657699	2.657699e+00
N_o	0.000000e+00	1.379953	1.379953e+00
F_o	1.891823e+00	2.361284	4.253107e+00

message: Maximum number of iterations has been exceeded.
success: False
 status: 2
    fun: 0.1312547030364287
      x: [6.507e+02 1.626e+04 ... 1.380e+00 4.253e+00]
    nit: 100000
   nfev: 369606
final_simplex: (array([[6.507e+02, 1.626e+04, ..., 1.380e+00,
          4.253e+00],
        [6.507e+02, 1.626e+04, ..., 1.380e+00,
          4.253e+00],
        ...,
        [6.507e+02, 1.626e+04, ..., 1.380e+00,
          4.253e+00],
        [6.507e+02, 1.626e+04, ..., 1.380e+00,
          4.253e+00]]), array([1.313e-01, 1.313e-01, ..., 1.313e-01, 1.313e-01]))

['SM data type data plots for mutation', 'Regulator5', 'using model:', 'model_hill.model']

inducer -> sensor (GFP output)

inducer ->S -|R (GFP output)

Initial Guess
Converged
Converged
Converged
Converged
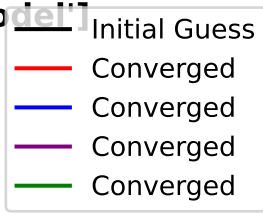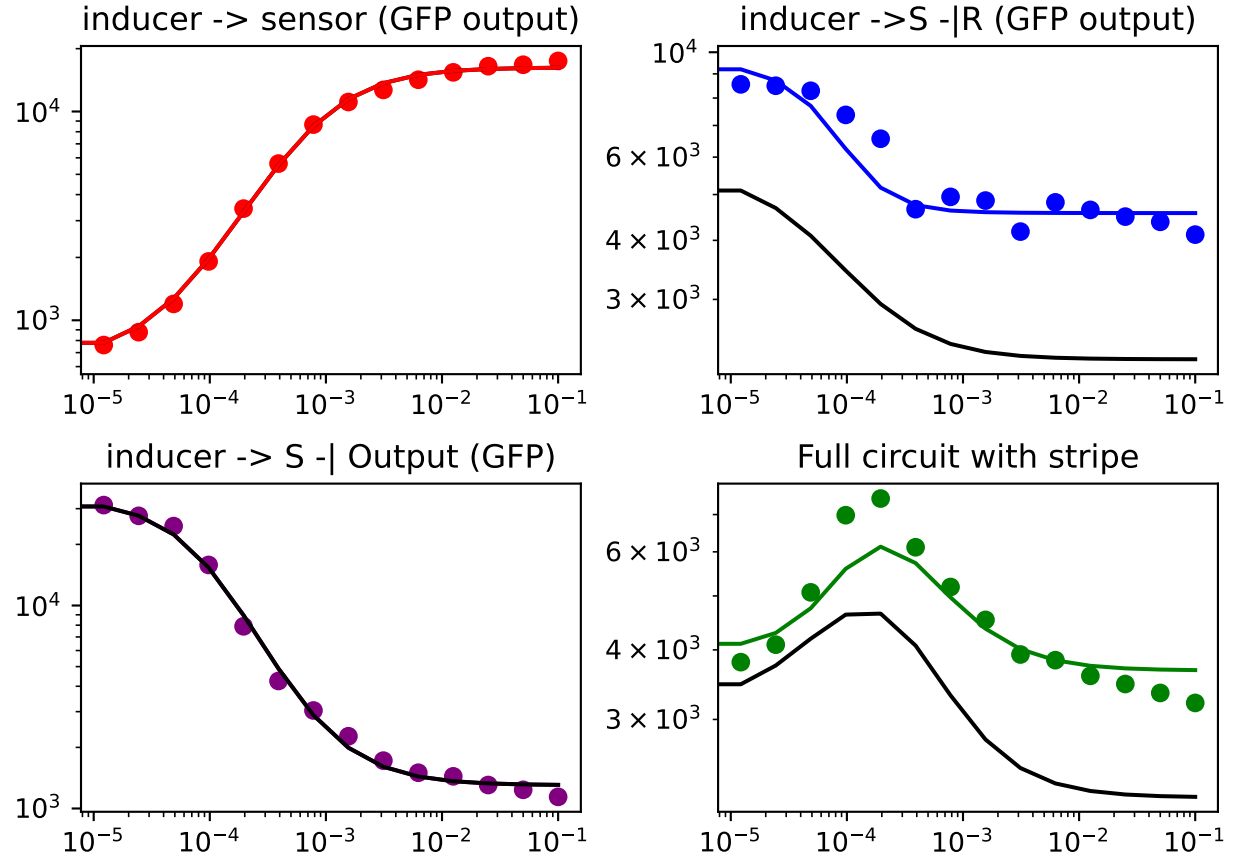
time elapsed for this fit
--- 4.801693439483643 seconds ---

inducer -> S -| Output (GFP)

Full circuit with stripe

Across all four plots:

RSS (converged)=0.085

RSS (initial)=1.717

RSS (% reduction)=0.953

	epsilon	Initial_guesses	Converged
A_s	0.000000	650.714912	650.714912
B_s	0.000000	16259.979950	16259.979950
C_s	0.000000	1296.448889	1296.448889
N_s	0.000000	1.154067	1.154067
A_r	2532.613176	2020.019216	4552.632392
B_r	-17742.650664	23688.809187	5946.158523
C_r	-0.009609	0.010358	0.000749
N_r	1.465656	0.910072	2.375728
A_h	0.000000	143.802212	143.802212
B_h	0.000000	50238.271408	50238.271408
C_h	0.000000	0.000929	0.000929
A_o	0.000000	1.673894	1.673894
B_o	0.000000	0.895342	0.895342
C_o	0.000000	2.657699	2.657699
N_o	0.000000	1.379953	1.379953
F_o	2.690704	2.361284	5.051988

message: Optimization terminated successfully.
success: True
 status: 0
    fun: 0.08467137962573197
      x: [6.507e+02 1.626e+04 ... 1.380e+00 5.052e+00]
    nit: 1574
   nfev: 2300
final_simplex: (array([[6.507e+02, 1.626e+04, ..., 1.380e+00,
           5.052e+00],
         [6.507e+02, 1.626e+04, ..., 1.380e+00,
           5.052e+00],
         ...,
         [6.507e+02, 1.626e+04, ..., 1.380e+00,
           5.052e+00],
         [6.507e+02, 1.626e+04, ..., 1.380e+00,
           5.052e+00]]), array([8.467e-02, 8.467e-02, ..., 8.467e-02, 8.467e-02]))

['SM data type data plots for mutation', 'Regulator6', 'using model:', 'model_hill.model']
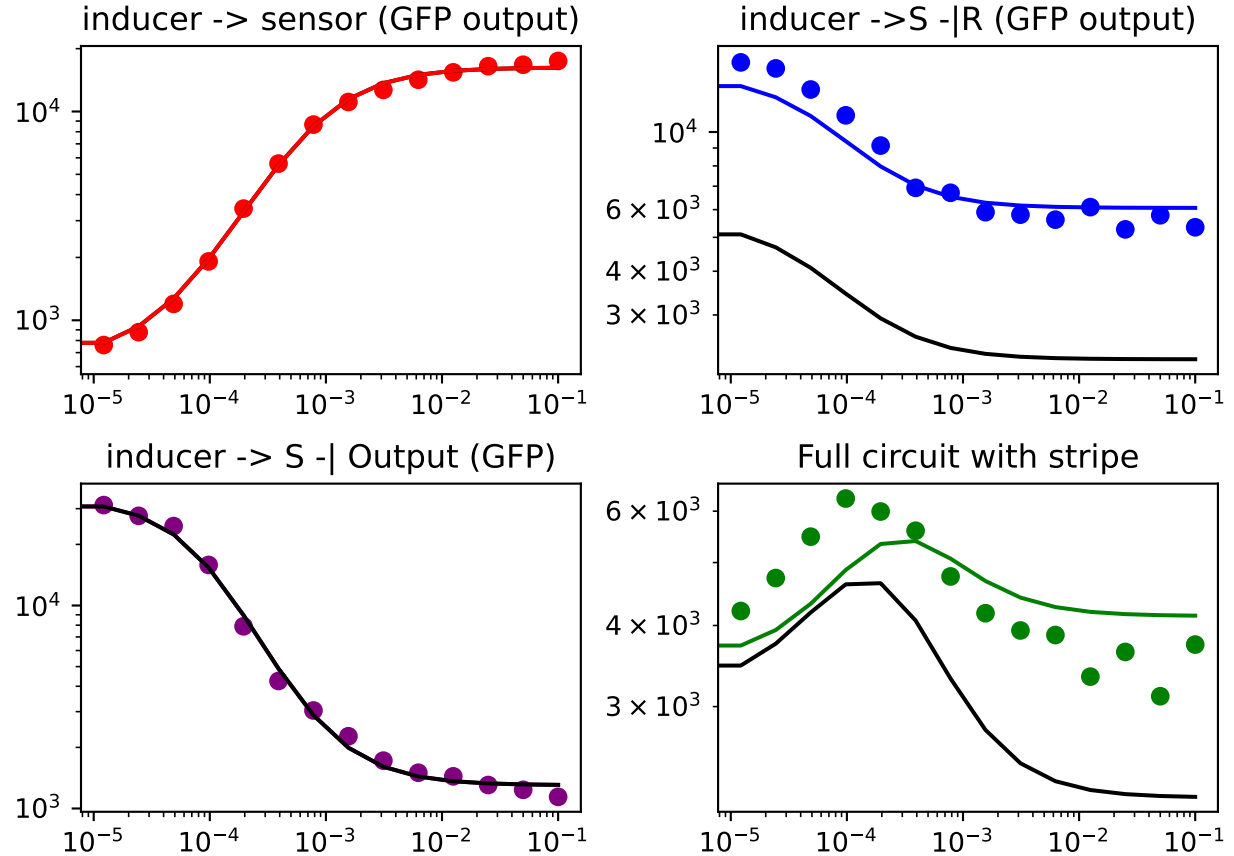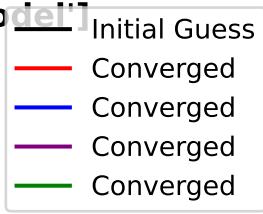

Across all four plots:

RSS (converged)=0.144

RSS (initial)=3.404

RSS (% reduction)=0.959

	epsilon	Initial_guesses	Converged
A_s	0.000000	650.714912	650.714912
B_s	0.000000	16259.979950	16259.979950
C_s	0.000000	1296.448889	1296.448889
N_s	0.000000	1.154067	1.154067
A_r	3554.227434	2020.019216	5574.246650
B_r	-789.838238	23688.809187	22898.970949
C_r	-0.008017	0.010358	0.002340
N_r	0.138585	0.910072	1.048657
A_h	0.000000	143.802212	143.802212
B_h	0.000000	50238.271408	50238.271408
C_h	0.000000	0.000929	0.000929
A_o	0.000000	1.673894	1.673894
B_o	0.000000	0.895342	0.895342
C_o	0.000000	2.657699	2.657699
N_o	0.000000	1.379953	1.379953
F_o	4.030643	2.361284	6.391927

message: Optimization terminated successfully.
success: True
status: 0
fun: 0.14410987576836226
x: [6.507e+02 1.626e+04 ... 1.380e+00 6.392e+00]
nit: 2481
nfev: 3551
final_simplex: (array([[6.507e+02, 1.626e+04, ..., 1.380e+00,
                6.392e+00],
               [6.507e+02, 1.626e+04, ..., 1.380e+00,
                6.392e+00],
               ...,
               [6.507e+02, 1.626e+04, ..., 1.380e+00,
                6.392e+00],
               [6.507e+02, 1.626e+04, ..., 1.380e+00,
                6.392e+00]]), array([1.441e-01, 1.441e-01, ..., 1.441e-01, 1.441e-01]))

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

inducer -> sensor (GFP output)

inducer ->S -|R (GFP output)

Legend:
- Initial Guess (black)
- Converged (red)
- Converged (blue)
- Converged (purple)
- Converged (green)
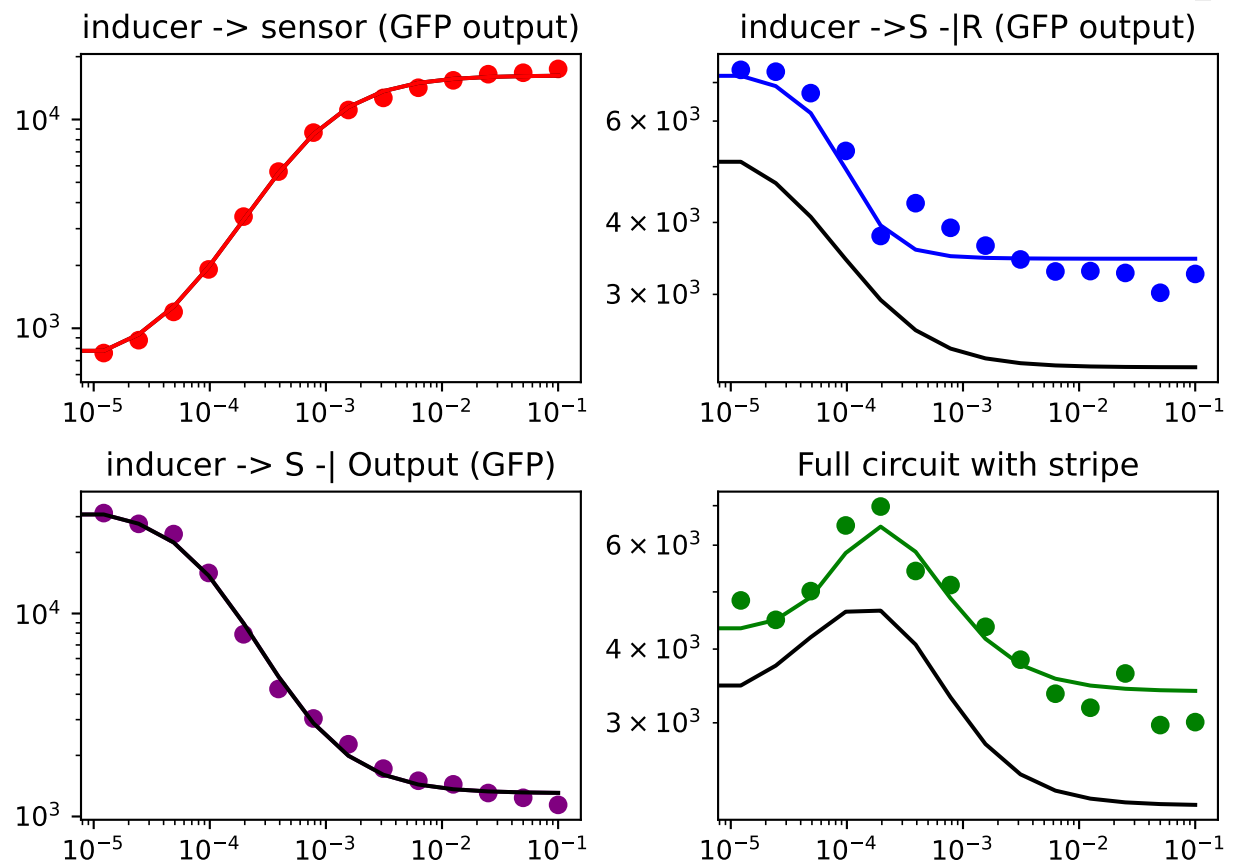
time elapsed for this fit
--- 5.208226680755615 seconds ---

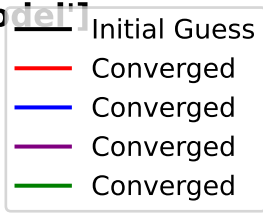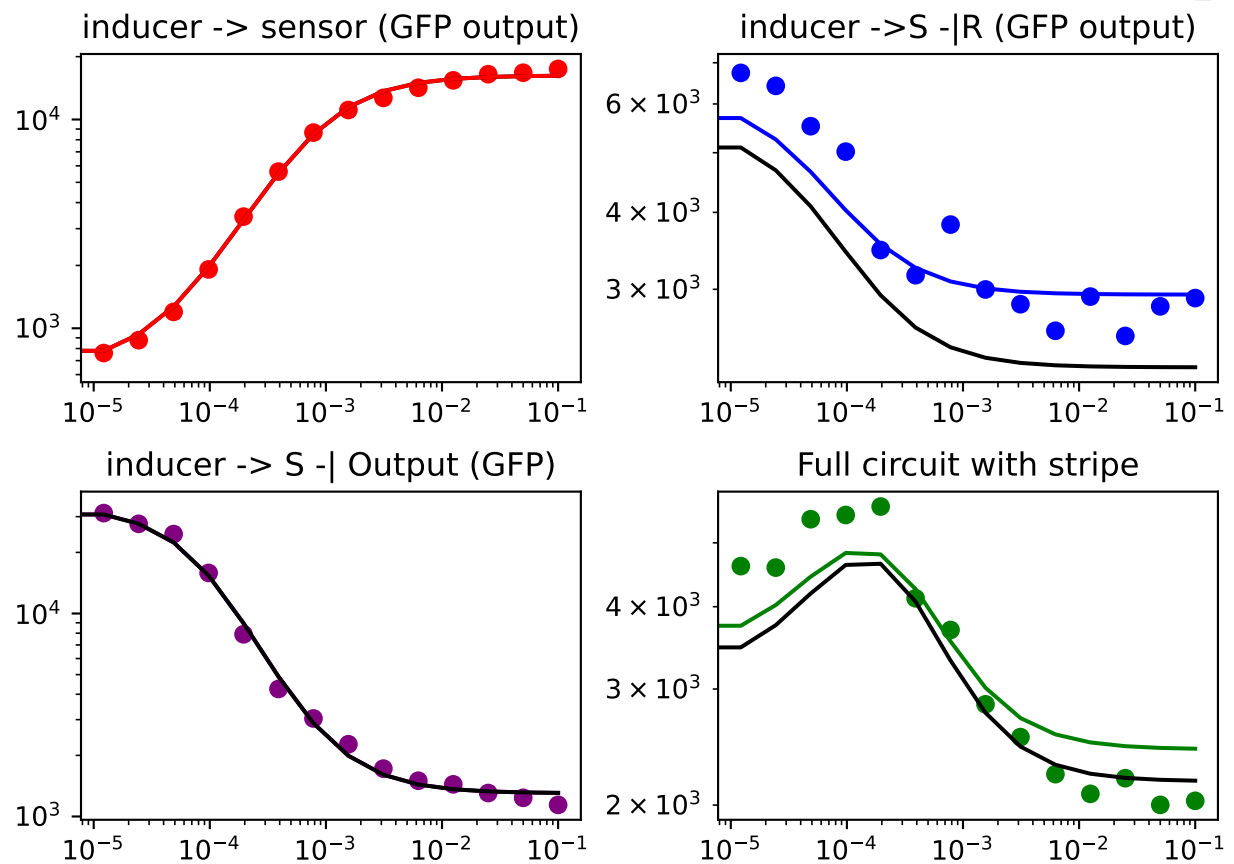## inducer -> S -| Output (GFP)

Full circuit with stripe

Across all four plots:

RSS (converged)=0.061

RSS (initial)=0.847

RSS (% reduction)=0.933

	epsilon	Initial_guesses	Converged
A_s	0.000000	650.714912	650.714912
B_s	0.000000	16259.979950	16259.979950
C_s	0.000000	1296.448889	1296.448889
N_s	0.000000	1.154067	1.154067
A_r	1432.150592	2020.019216	3452.169808
B_r	-19382.952142	23688.809187	4305.857045
C_r	-0.009718	0.010358	0.000640
N_r	1.799175	0.910072	2.709247
A_h	0.000000	143.802212	143.802212
B_h	0.000000	50238.271408	50238.271408
C_h	0.000000	0.000929	0.000929
A_o	0.000000	1.673894	1.673894
B_o	0.000000	0.895342	0.895342
C_o	0.000000	2.657699	2.657699
N_o	0.000000	1.379953	1.379953
F_o	1.849434	2.361284	4.210718

message: Optimization terminated successfully.
success: True
 status: 0
    fun: 0.06063399434405816
      x: [6.507e+02 1.626e+04 ... 1.380e+00 4.211e+00]
    nit: 1726
   nfev: 2487
final_simplex: (array([[6.507e+02, 1.626e+04, ..., 1.380e+00,
         4.211e+00],
       [6.507e+02, 1.626e+04, ..., 1.380e+00,
         4.211e+00],
       ...,
       [6.507e+02, 1.626e+04, ..., 1.380e+00,
         4.211e+00],
       [6.507e+02, 1.626e+04, ..., 1.380e+00,
         4.211e+00]]), array([6.063e-02, 6.063e-02, ..., 6.063e-02, 6.063e-02]))

['SM data type data plots for mutation', 'Regulator8', 'using model:', 'model_hill.model']


inducer -> sensor (GFP output)

inducer ->S -|R (GFP output)

Legend:
- Initial Guess
- Converged
- Converged
- Converged
- Converged

time elapsed for this fit
--- 7.053142309188843 seconds ---

inducer -> S -| Output (GFP)

Full circuit with stripe

Across all four plots:

RSS (converged)=0.129

RSS (initial)=0.285

RSS (% reduction)=0.688

	epsilon	Initial_guesses	Converged
A_s	0.000000	650.714912	650.714912
B_s	0.000000	16259.979950	16259.979950
C_s	0.000000	1296.448889	1296.448889
N_s	0.000000	1.154067	1.154067
A_r	743.836049	2020.019216	2763.855265
B_r	25288.132194	23688.809187	48976.941381
C_r	0.013522	0.010358	0.023880
N_r	0.032085	0.910072	0.942158
A_h	0.000000	143.802212	143.802212
B_h	0.000000	50238.271408	50238.271408
C_h	0.000000	0.000929	0.000929
A_o	0.000000	1.673894	1.673894
B_o	0.000000	0.895342	0.895342
C_o	0.000000	2.657699	2.657699
N_o	0.000000	1.379953	1.379953
F_o	0.498649	2.361284	2.859933

message: Optimization terminated successfully.
success: True
 status: 0
   fun: 0.12937672004405387
     x: [6.507e+02 1.626e+04 ... 1.380e+00 2.860e+00]
   nit: 2313
  nfev: 3393
final_simplex: (array([[6.507e+02, 1.626e+04, ..., 1.380e+00,
             2.860e+00],
          [6.507e+02, 1.626e+04, ..., 1.380e+00,
             2.860e+00],
          ...,
          [6.507e+02, 1.626e+04, ..., 1.380e+00,
             2.860e+00],
          [6.507e+02, 1.626e+04, ..., 1.380e+00,
             2.860e+00]]), array([1.294e-01, 1.294e-01, ..., 1.294e-01, 1.294e-01]))

['SM data type data plots for mutation', 'Regulator9', 'using model:', 'model_hill.model']

inducer -> sensor (GFP output)

inducer ->S -|R (GFP output)
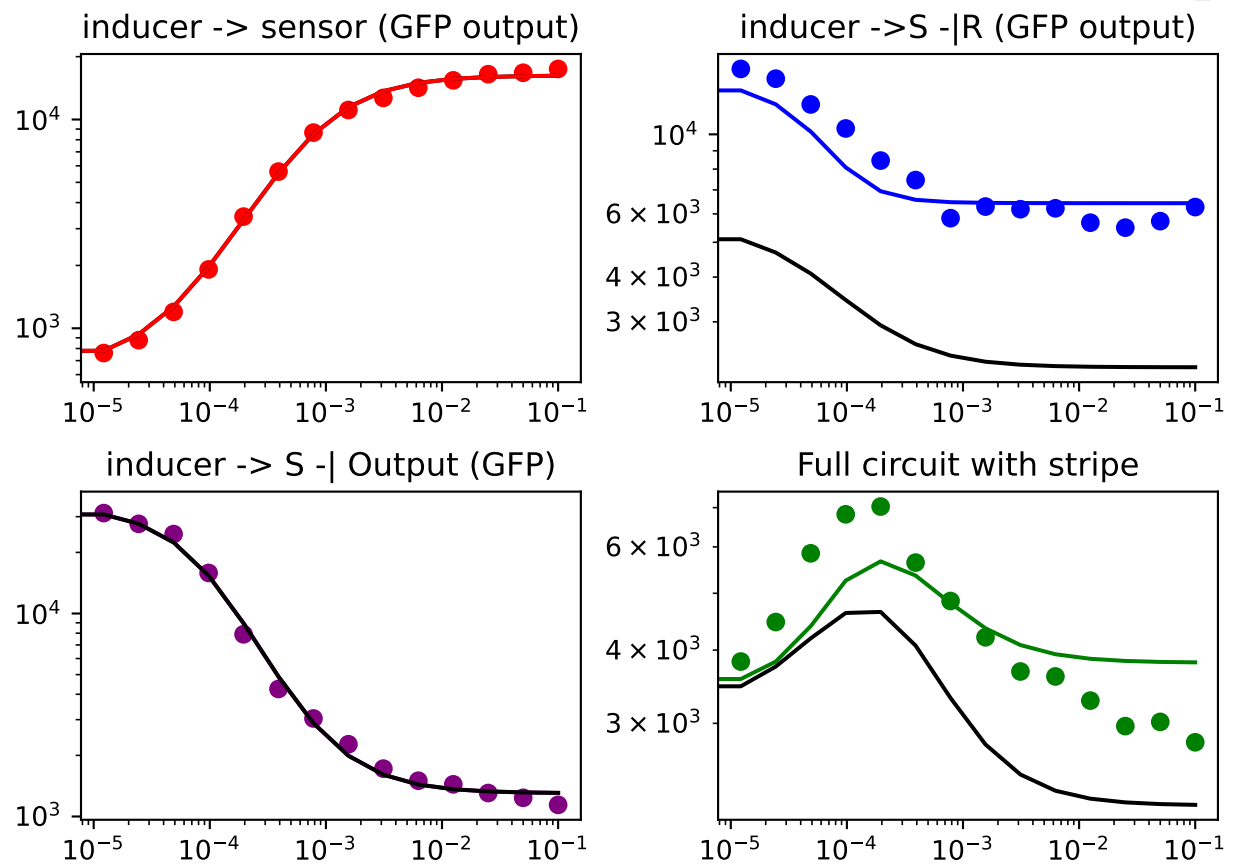
time elapsed for this fit
--- 5.53923487663269 seconds ---

inducer -> S -| Output (GFP)

Full circuit with stripe

Across all four plots:

RSS (converged)=0.173

RSS (initial)=3.258

RSS (% reduction)=0.95

	epsilon	Initial_guesses	Converged
A_s	0.000000	650.714912	650.714912
B_s	0.000000	16259.979950	16259.979950
C_s	0.000000	1296.448889	1296.448889
N_s	0.000000	1.154067	1.154067
A_r	4396.298948	2020.019216	6416.318164
B_r	-13187.061616	23688.809187	10501.747571
C_r	-0.009362	0.010358	0.000996
N_r	1.564791	0.910072	2.474863
A_h	0.000000	143.802212	143.802212
B_h	0.000000	50238.271408	50238.271408
C_h	0.000000	0.000929	0.000929
A_o	0.000000	1.673894	1.673894
B_o	0.000000	0.895342	0.895342
C_o	0.000000	2.657699	2.657699
N_o	0.000000	1.379953	1.379953
F_o	3.669055	2.361284	6.030338

message: Optimization terminated successfully.
success: True
 status: 0
    fun: 0.1726577105804
      x: [6.507e+02 1.626e+04 ... 1.380e+00 6.030e+00]
    nit: 1831
   nfev: 2647
final_simplex: (array([[6.507e+02, 1.626e+04, ..., 1.380e+00,
         6.030e+00],
       [6.507e+02, 1.626e+04, ..., 1.380e+00,
         6.030e+00],
       ...,
       [6.507e+02, 1.626e+04, ..., 1.380e+00,
         6.030e+00],
       [6.507e+02, 1.626e+04, ..., 1.380e+00,
         6.030e+00]]), array([1.727e-01, 1.727e-01, ..., 1.727e-01, 1.727e-01]))

['SM data type data plots for mutation', 'Sensor1', 'using model:', 'model_hill.model']
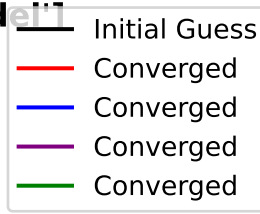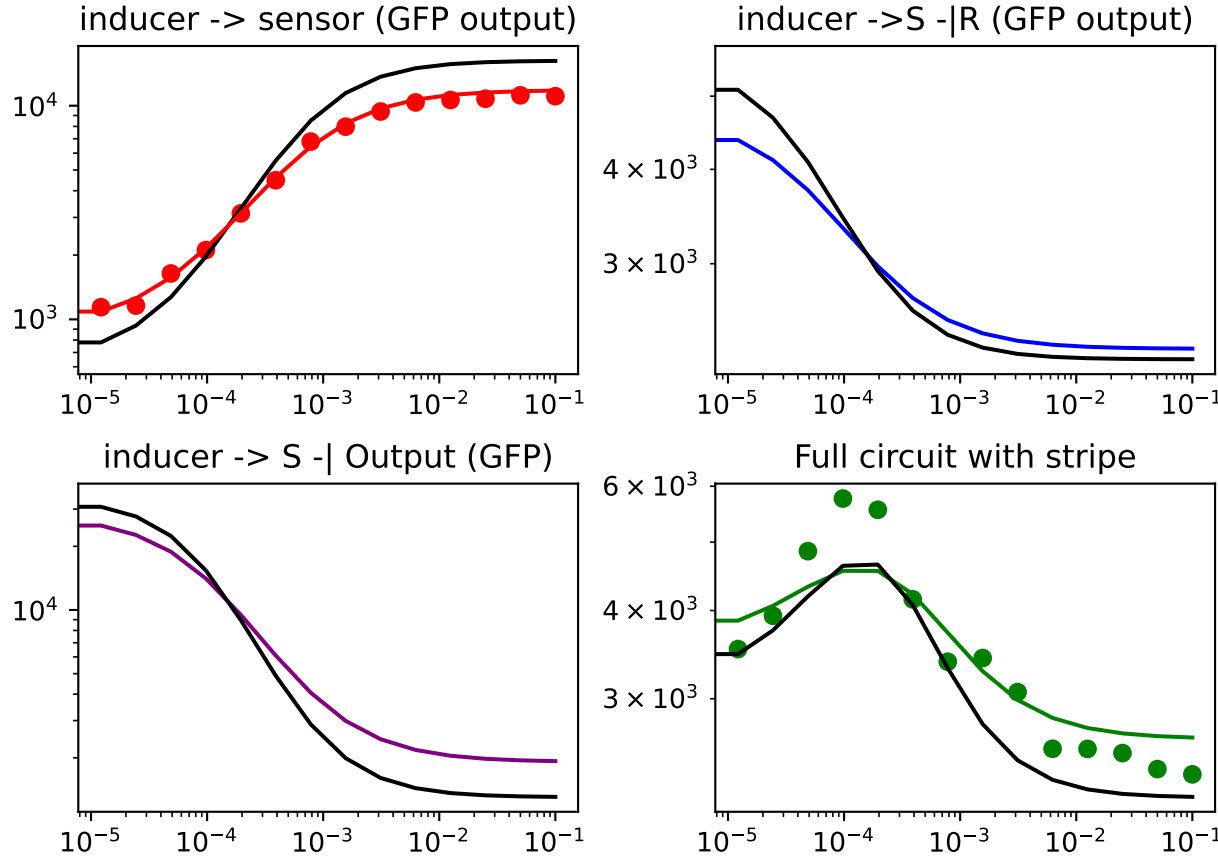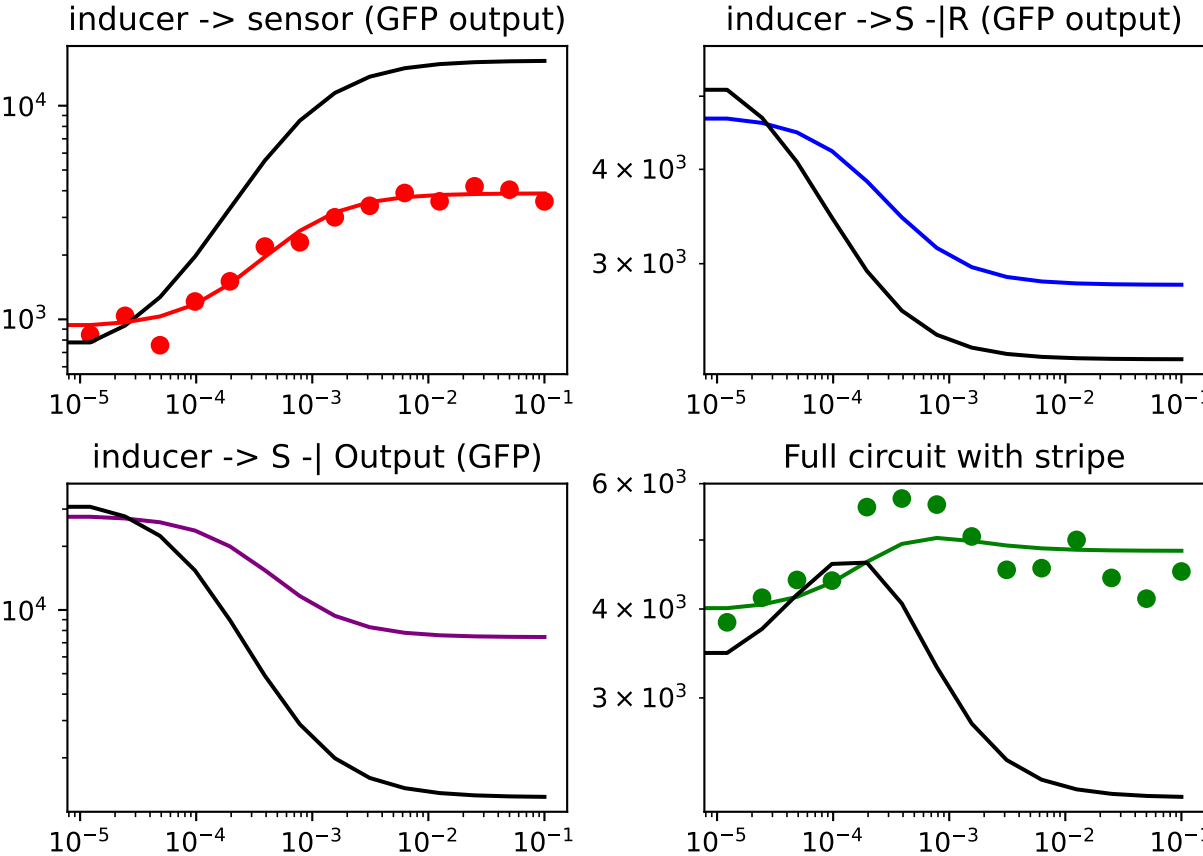

Across all four plots:

RSS (converged)=0.04

RSS (initial)=0.332

RSS (% reduction)=0.893

	epsilon	Initial_guesses	Converged
A_s	266.318365	650.714912	917.033277
B_s	-4405.156074	16259.979950	11854.823876
C_s	11.153743	1296.448889	1307.602632
N_s	-0.152645	1.154067	1.001422
A_r	0.000000	2020.019216	2020.019216
B_r	0.000000	23688.809187	23688.809187
C_r	0.000000	0.010358	0.010358
N_r	0.000000	0.910072	0.910072
A_h	0.000000	143.802212	143.802212
B_h	0.000000	50238.271408	50238.271408
C_h	0.000000	0.000929	0.000929
A_o	0.000000	1.673894	1.673894
B_o	0.000000	0.895342	0.895342
C_o	0.000000	2.657699	2.657699
N_o	0.000000	1.379953	1.379953
F_o	-0.061924	2.361284	2.299360

message: Optimization terminated successfully.
success: True
status: 0
fun: 0.039943777162104864
x: [9.170e+02 1.185e+04 ... 1.380e+00 2.299e+00]
nit: 705
nfev: 1132
final_simplex: (array([[9.170e+02, 1.185e+04, ..., 1.380e+00,
       2.299e+00],
     [9.170e+02, 1.185e+04, ..., 1.380e+00,
       2.299e+00],
     ...,
     [9.170e+02, 1.185e+04, ..., 1.380e+00,
       2.299e+00],
     [9.170e+02, 1.185e+04, ..., 1.380e+00,
       2.299e+00]]), array([3.994e-02, 3.994e-02, ..., 3.994e-02, 3.994e-02]))

['SM data type data plots for mutation', 'Sensor10', 'using model:', 'model_hill.model']

Legend:
- Initial Guess (black)
- Converged (red)
- Converged (blue)
- Converged (purple)
- Converged (green)

inducer -> sensor (GFP output)

inducer ->S -|R (GFP output)

inducer -> S -| Output (GFP)

Full circuit with stripe

time elapsed for this fit
--- 2.775315761566162 seconds ---

Across all four plots:

RSS (converged)=0.066

RSS (initial)=4.065

RSS (% reduction)=0.984

	epsilon	Initial_guesses	Converged
A_s	270.014670	650.714912	920.729581
B_s	-12371.527201	16259.979950	3888.452749
C_s	276.812907	1296.448889	1573.261796
N_s	0.109178	1.154067	1.263245
A_r	0.000000	2020.019216	2020.019216
B_r	0.000000	23688.809187	23688.809187
C_r	0.000000	0.010358	0.010358
N_r	0.000000	0.910072	0.910072
A_h	0.000000	143.802212	143.802212
B_h	0.000000	50238.271408	50238.271408
C_h	0.000000	0.000929	0.000929
A_o	0.000000	1.673894	1.673894
B_o	0.000000	0.895342	0.895342
C_o	0.000000	2.657699	2.657699
N_o	0.000000	1.379953	1.379953
F_o	0.158821	2.361284	2.520104

message: Optimization terminated successfully.
success: True
 status: 0
    fun: 0.06590621462933711
      x: [9.207e+02 3.888e+03 ... 1.380e+00 2.520e+00]
    nit: 898
   nfev: 1398
final_simplex: (array([[9.207e+02, 3.888e+03, ..., 1.380e+00,
            2.520e+00],
           [9.207e+02, 3.888e+03, ..., 1.380e+00,
            2.520e+00],
           ...,
           [9.207e+02, 3.888e+03, ..., 1.380e+00,
            2.520e+00],
           [9.207e+02, 3.888e+03, ..., 1.380e+00,
            2.520e+00]]), array([6.591e-02, 6.591e-02, ..., 6.591e-02, 6.591e-02]))

['SM data type data plots for mutation', 'Sensor2', 'using model:', 'model_hill.model']

inducer -> sensor (GFP output)

inducer ->S -|R (GFP output)

Legend:
- Initial Guess (black)
- Converged (red)
- Converged (blue)
- Converged (purple)
- Converged (green)
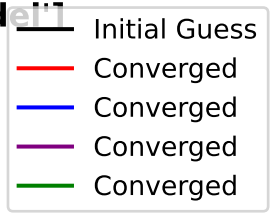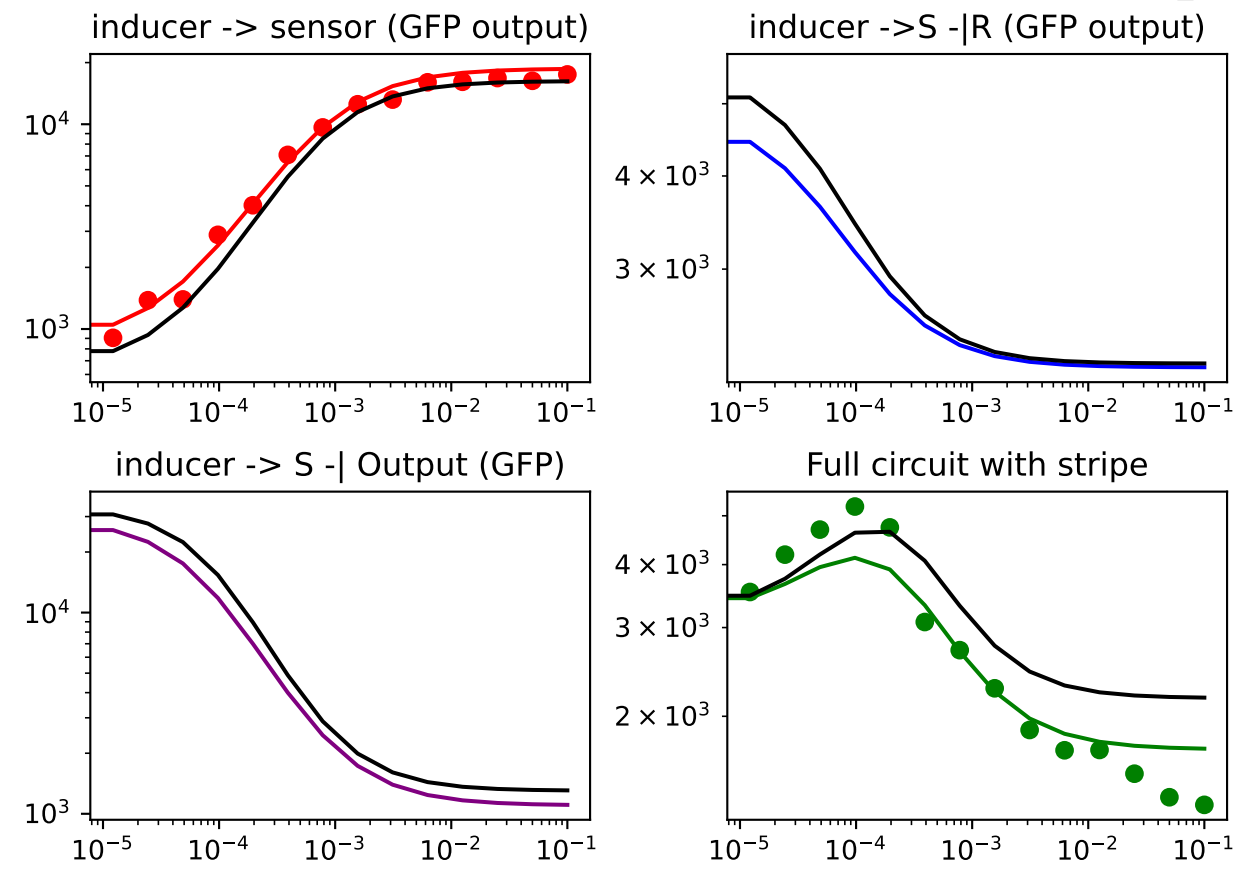
time elapsed for this fit
--- 2.211468458175659 seconds ---

inducer -> S -| Output (GFP)

Full circuit with stripe

Across all four plots:

RSS (converged)=0.085

RSS (initial)=0.295

RSS (% reduction)=0.776

	epsilon	Initial_guesses	Converged
A_s	195.737635	650.714912	846.452547
B_s	2467.965901	16259.979950	18727.945851
C_s	-44.726839	1296.448889	1251.722050
N_s	-0.085685	1.154067	1.068382
A_r	0.000000	2020.019216	2020.019216
B_r	0.000000	23688.809187	23688.809187
C_r	0.000000	0.010358	0.010358
N_r	0.000000	0.910072	0.910072
A_h	0.000000	143.802212	143.802212
B_h	0.000000	50238.271408	50238.271408
C_h	0.000000	0.000929	0.000929
A_o	0.000000	1.673894	1.673894
B_o	0.000000	0.895342	0.895342
C_o	0.000000	2.657699	2.657699
N_o	0.000000	1.379953	1.379953
F_o	-0.295405	2.361284	2.065879

```
message: Optimization terminated successfully.
success: True
 status: 0
    fun: 0.0850879602838029
      x: [ 8.465e+02  1.873e+04 ... 1.380e+00  2.066e+00]
    nit: 650
   nfev: 1084
final_simplex: (array([[ 8.465e+02, 1.873e+04, ..., 1.380e+00,
          2.066e+00],
        [ 8.465e+02, 1.873e+04, ..., 1.380e+00,
          2.066e+00],
        ...,
        [ 8.465e+02, 1.873e+04, ..., 1.380e+00,
          2.066e+00],
        [ 8.465e+02, 1.873e+04, ..., 1.380e+00,
          2.066e+00]]), array([ 8.509e-02, 8.509e-02, ..., 8.509e-02, 8.509e-02]))
```

['SM data type data plots for mutation', 'Sensor3', 'using model:', 'model_hill.model']

inducer -> sensor (GFP output)

inducer ->S -|R (GFP output)

inducer -> S -| Output (GFP)

Full circuit with stripe

Legend:
- Initial Guess
- Converged
- Converged
- Converged
- Converged
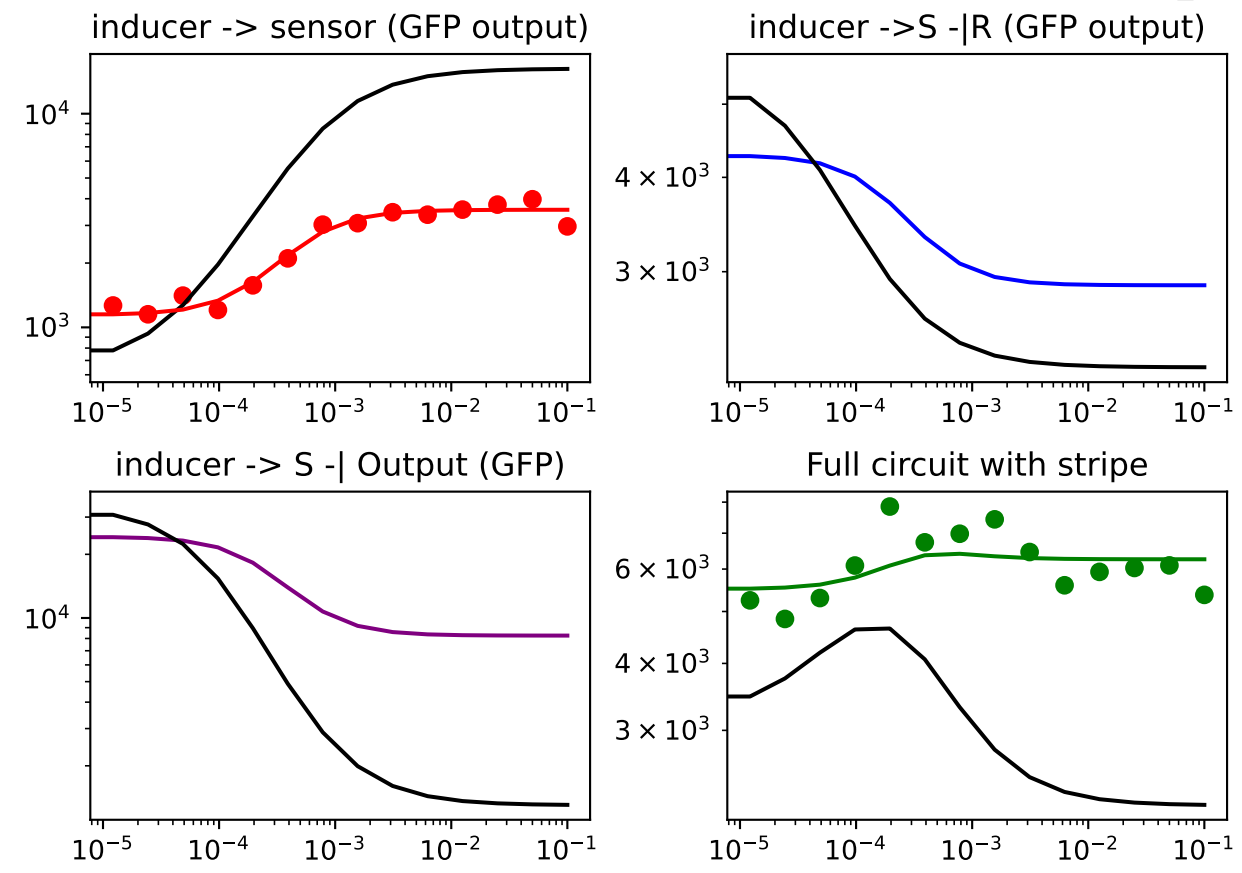
time elapsed for this fit
--- 3.1540346145629883 seconds ---
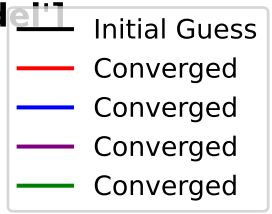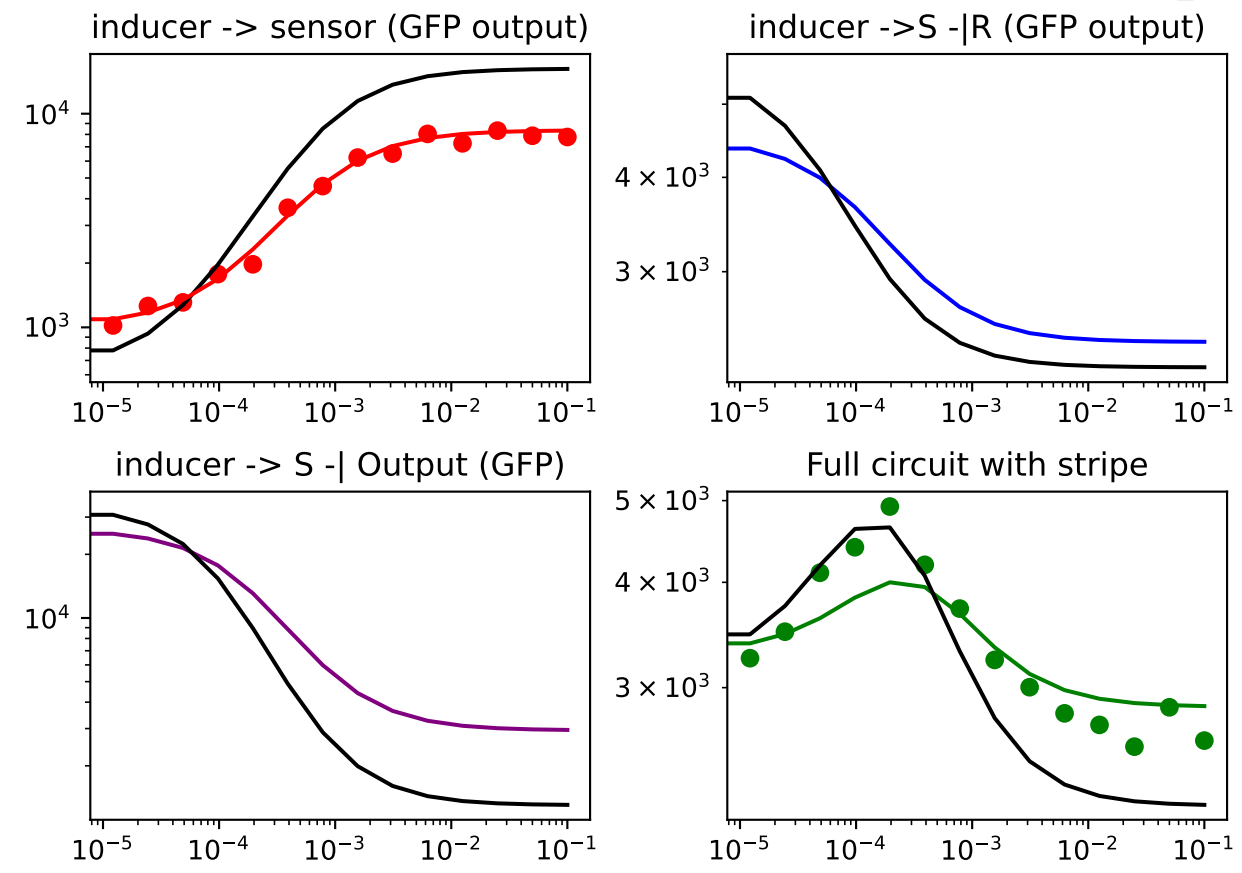
Across all four plots:

RSS (converged)=0.052

RSS (initial)=5.015

RSS (% reduction)=0.99

	epsilon	Initial_guesses	Converged
A_s	492.182474	650.714912	1142.897386
B_s	-12708.227698	16259.979950	3551.752252
C_s	832.659836	1296.448889	2129.108725
N_s	0.409504	1.154067	1.563571
A_r	0.000000	2020.019216	2020.019216
B_r	0.000000	23688.809187	23688.809187
C_r	0.000000	0.010358	0.010358
N_r	0.000000	0.910072	0.910072
A_h	0.000000	143.802212	143.802212
B_h	0.000000	50238.271408	50238.271408
C_h	0.000000	0.000929	0.000929
A_o	0.000000	1.673894	1.673894
B_o	0.000000	0.895342	0.895342
C_o	0.000000	2.657699	2.657699
N_o	0.000000	1.379953	1.379953
F_o	0.850921	2.361284	3.212204

message: Optimization terminated successfully.
success: True
 status: 0
    fun: 0.052474883457784845
      x: [1.143e+03 3.552e+03 ... 1.380e+00 3.212e+00]
    nit: 910
   nfev: 1420
final_simplex: (array([[1.143e+03, 3.552e+03, ..., 1.380e+00,
            3.212e+00],
           [1.143e+03, 3.552e+03, ..., 1.380e+00,
             3.212e+00],
           ...,
           [1.143e+03, 3.552e+03, ..., 1.380e+00,
             3.212e+00],
           [1.143e+03, 3.552e+03, ..., 1.380e+00,
            3.212e+00]]), array([5.247e-02, 5.247e-02, ..., 5.247e-02, 5.247e-02]))

['SM data type data plots for mutation', 'Sensor4', 'using model:', 'model_hill.model']
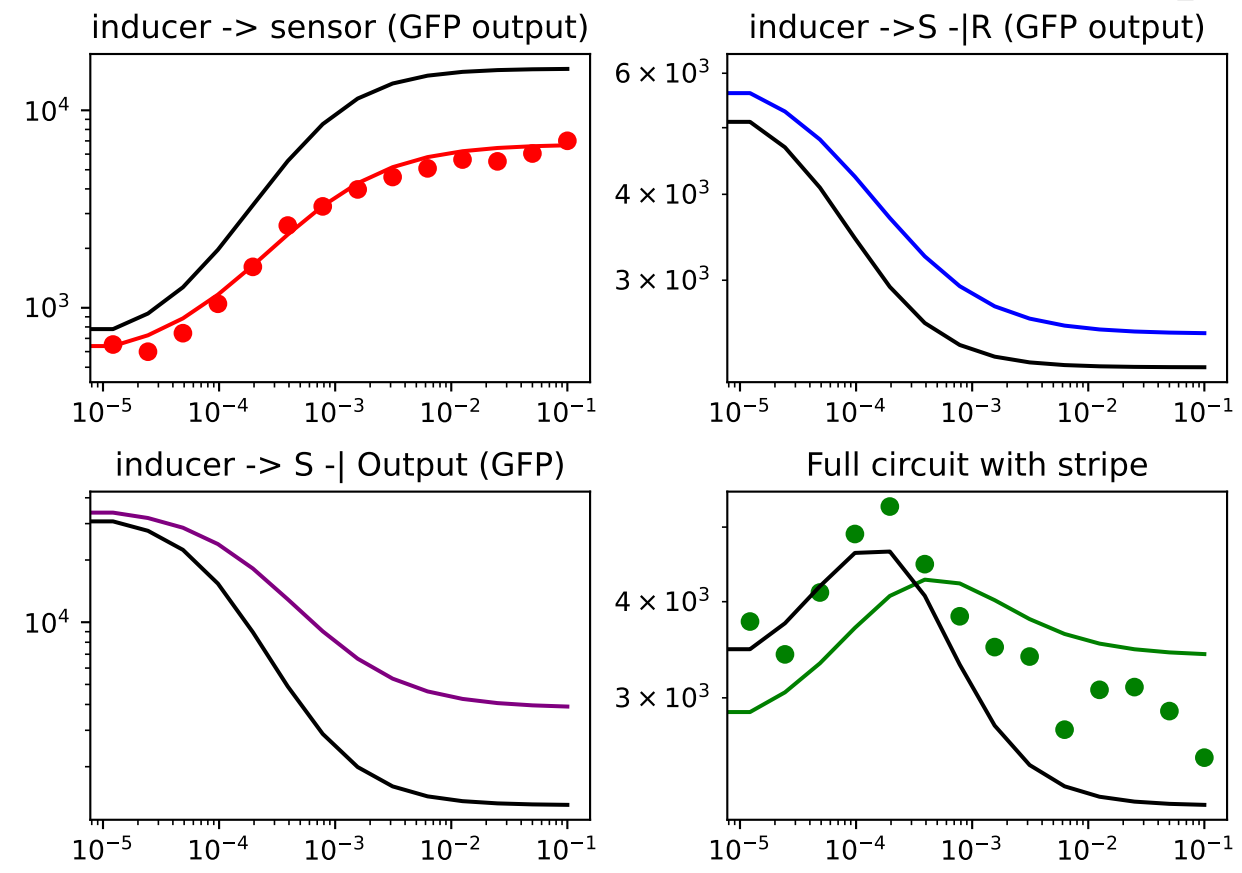

Across all four plots:

RSS (converged)=0.038

RSS (initial)=0.925

RSS (% reduction)=0.961

	epsilon	Initial_guesses	Converged
A_s	367.570465	650.714912	1018.285377
B_s	-7886.632382	16259.979950	8373.347568
C_s	-26.996933	1296.448889	1269.451956
N_s	-0.050362	1.154067	1.103705
A_r	0.000000	2020.019216	2020.019216
B_r	0.000000	23688.809187	23688.809187
C_r	0.000000	0.010358	0.010358
N_r	0.000000	0.910072	0.910072
A_h	0.000000	143.802212	143.802212
B_h	0.000000	50238.271408	50238.271408
C_h	0.000000	0.000929	0.000929
A_o	0.000000	1.673894	1.673894
B_o	0.000000	0.895342	0.895342
C_o	0.000000	2.657699	2.657699
N_o	0.000000	1.379953	1.379953
F_o	-0.352262	2.361284	2.009021

message: Optimization terminated successfully.
success: True
 status: 0
    fun: 0.037630811246989235
      x: [1.018e+03 8.373e+03 ... 1.380e+00 2.009e+00]
    nit: 857
   nfev: 1331
final_simplex: (array([[1.018e+03, 8.373e+03, ..., 1.380e+00,
          2.009e+00],
        [1.018e+03, 8.373e+03, ..., 1.380e+00,
          2.009e+00],
        ...,
        [1.018e+03, 8.373e+03, ..., 1.380e+00,
          2.009e+00],
        [1.018e+03, 8.373e+03, ..., 1.380e+00,
          2.009e+00]]), array([3.763e-02, 3.763e-02, ..., 3.763e-02, 3.763e-02]))

['SM data type data plots for mutation', 'Sensor5', 'using model:', 'model_hill.model']

inducer -> sensor (GFP output)

inducer ->S -|R (GFP output)

Initial Guess
Converged
Converged
Converged
Converged

time elapsed for this fit
--- 2.4705450534820557 seconds ---

inducer -> S -| Output (GFP)

Full circuit with stripe
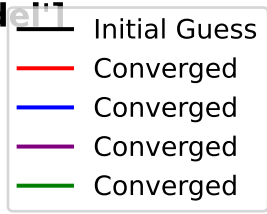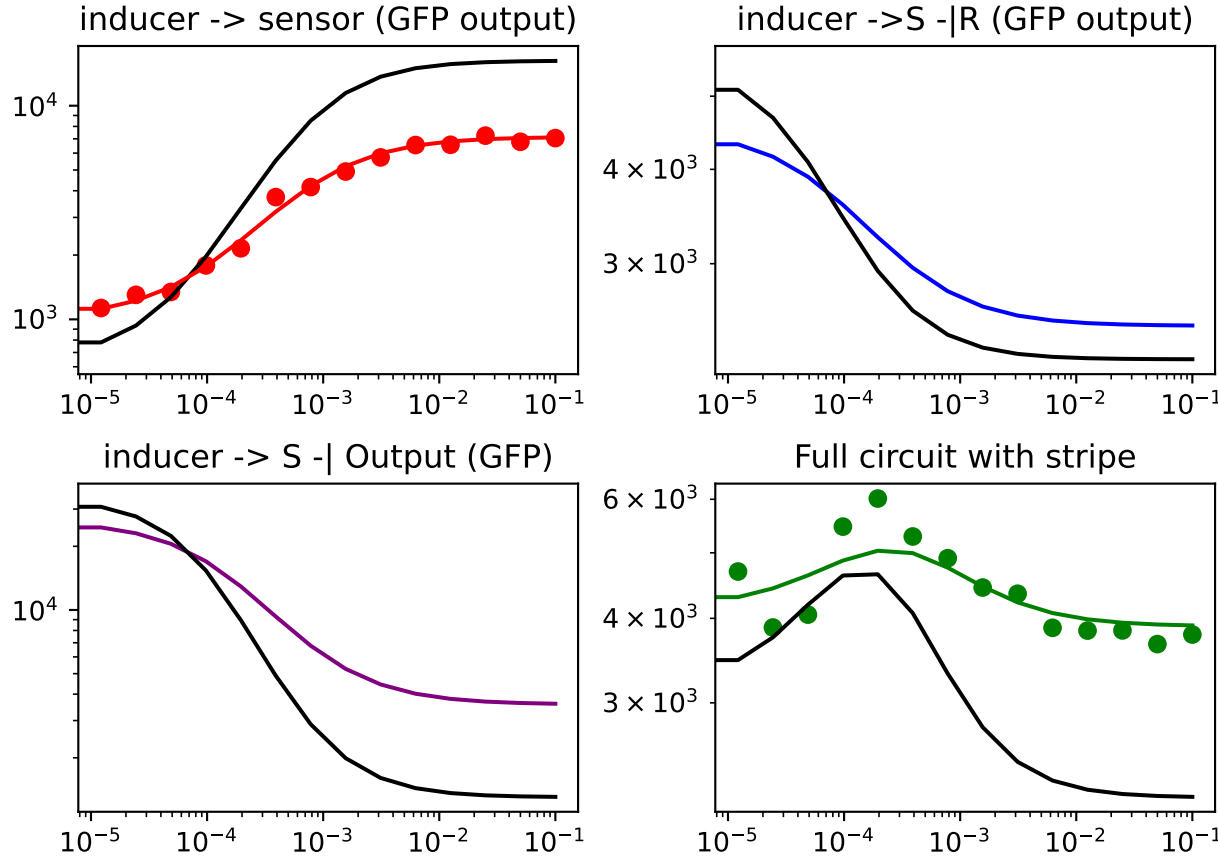
Across all four plots:

RSS (converged)=0.146

RSS (initial)=2.053

RSS (% reduction)=0.933

	epsilon	Initial_guesses	Converged
A_s	-106.627390	650.714912	544.087522
B_s	-9528.569520	16259.979950	6731.410429
C_s	-297.989261	1296.448889	998.459628
N_s	-0.212369	1.154067	0.941698
A_r	0.000000	2020.019216	2020.019216
B_r	0.000000	23688.809187	23688.809187
C_r	0.000000	0.010358	0.010358
N_r	0.000000	0.910072	0.910072
A_h	0.000000	143.802212	143.802212
B_h	0.000000	50238.271408	50238.271408
C_h	0.000000	0.000929	0.000929
A_o	0.000000	1.673894	1.673894
B_o	0.000000	0.895342	0.895342
C_o	0.000000	2.657699	2.657699
N_o	0.000000	1.379953	1.379953
F_o	-0.217011	2.361284	2.144273

message: Optimization terminated successfully.
success: True
 status: 0
    fun: 0.14635373535248491
      x: [5.441e+02 6.731e+03 ... 1.380e+00 2.144e+00]
    nit: 777
   nfev: 1237
final_simplex: (array([[5.441e+02, 6.731e+03, ..., 1.380e+00,
         2.144e+00],
       [5.441e+02, 6.731e+03, ..., 1.380e+00,
         2.144e+00],
       ...,
       [5.441e+02, 6.731e+03, ..., 1.380e+00,
         2.144e+00],
       [5.441e+02, 6.731e+03, ..., 1.380e+00,
         2.144e+00]]), array([1.464e-01, 1.464e-01, ..., 1.464e-01, 1.464e-01]))

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

inducer -> sensor (GFP output)

inducer ->S -|R (GFP output)

inducer -> S -| Output (GFP)

Full circuit with stripe

Legend:
- Initial Guess
- Converged
- Converged
- Converged
- Converged
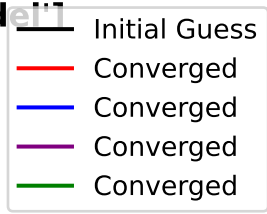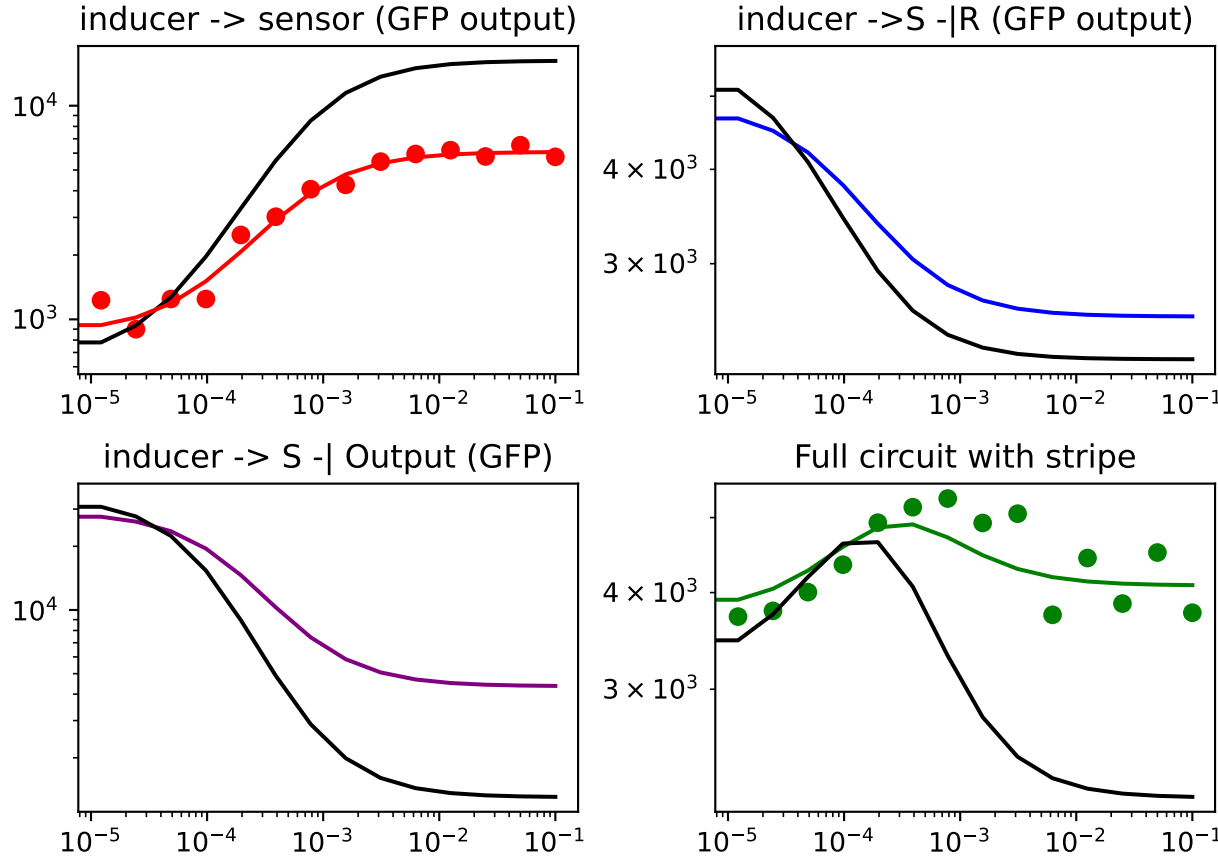
time elapsed for this fit
--- 2.741396427154541 seconds ---

Across all four plots:

RSS (converged)=0.029

RSS (initial)=1.653

RSS (% reduction)=0.983

	epsilon	Initial_guesses	Converged
A_s	361.188174	650.714912	1011.903086
B_s	-9109.172258	16259.979950	7150.807692
C_s	100.702884	1296.448889	1397.151773
N_s	-0.167294	1.154067	0.986773
A_r	0.000000	2020.019216	2020.019216
B_r	0.000000	23688.809187	23688.809187
C_r	0.000000	0.010358	0.010358
N_r	0.000000	0.910072	0.910072
A_h	0.000000	143.802212	143.802212
B_h	0.000000	50238.271408	50238.271408
C_h	0.000000	0.000929	0.000929
A_o	0.000000	1.673894	1.673894
B_o	0.000000	0.895342	0.895342
C_o	0.000000	2.657699	2.657699
N_o	0.000000	1.379953	1.379953
F_o	0.166145	2.361284	2.527429

message: Optimization terminated successfully.
success: True
 status: 0
    fun: 0.028820987967442948
      x: [1.012e+03 7.151e+03 ... 1.380e+00 2.527e+00]
    nit: 888
   nfev: 1359
final_simplex: (array([[1.012e+03, 7.151e+03, ..., 1.380e+00,
          2.527e+00],
        [1.012e+03, 7.151e+03, ..., 1.380e+00,
          2.527e+00],
        ...,
        [1.012e+03, 7.151e+03, ..., 1.380e+00,
          2.527e+00],
        [1.012e+03, 7.151e+03, ..., 1.380e+00,
          2.527e+00]]), array([2.882e-02, 2.882e-02, ..., 2.882e-02, 2.882e-02]))

['SM data type data plots for mutation', 'Sensor7', 'using model:', 'model_hill.model']
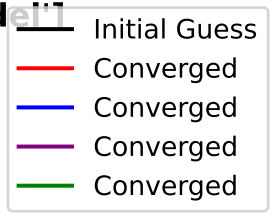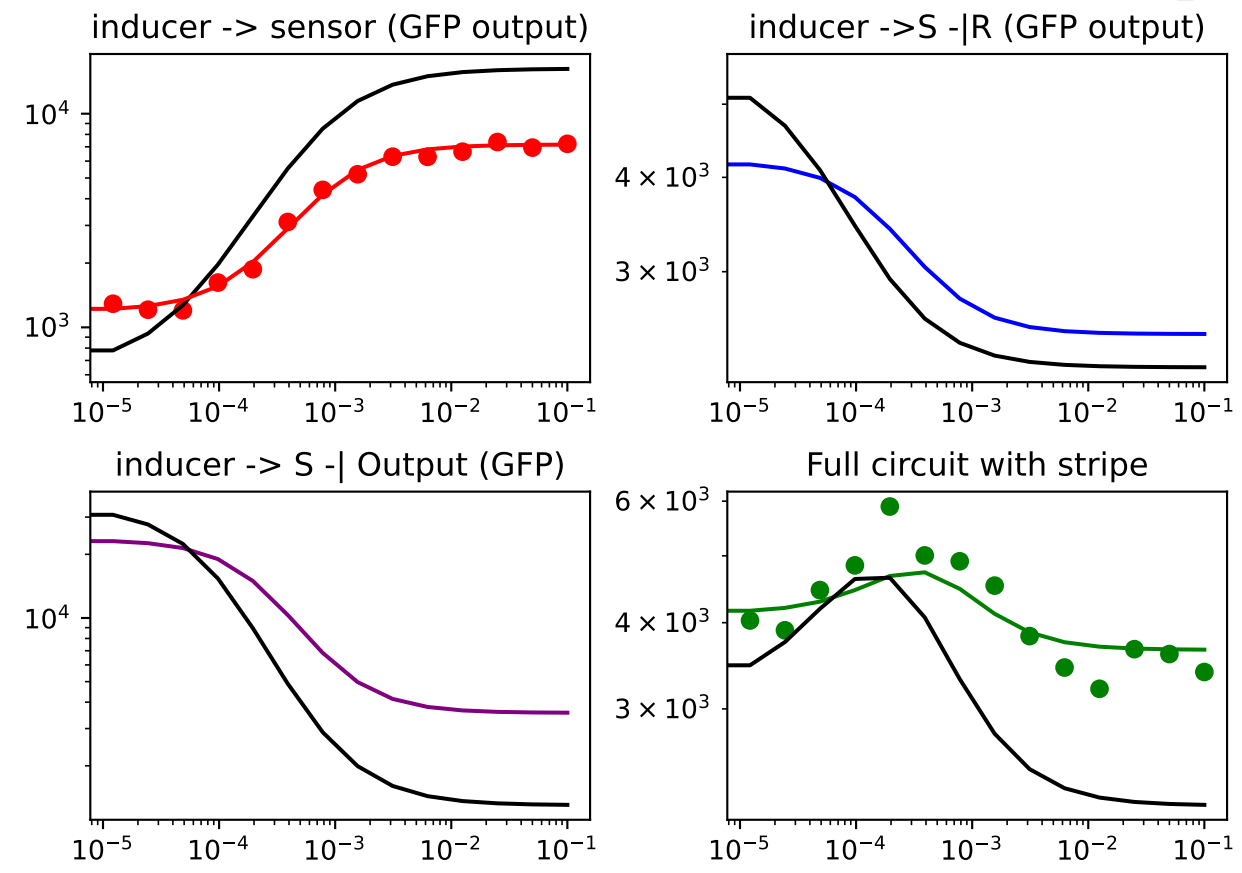

inducer -> sensor (GFP output)

inducer ->S -|R (GFP output)

Initial Guess
Converged
Converged
Converged
Converged

time elapsed for this fit
--- 2.69138050793457 seconds ---

inducer -> S -| Output (GFP)

Full circuit with stripe

Across all four plots:

RSS (converged)=0.058

RSS (initial)=2.062

RSS (% reduction)=0.973

	epsilon	Initial_guesses	Converged
A_s	216.174552	650.714912	866.889464
B_s	-10175.928911	16259.979950	6084.051038
C_s	423.224612	1296.448889	1719.673501
N_s	-0.052814	1.154067	1.101254
A_r	0.000000	2020.019216	2020.019216
B_r	0.000000	23688.809187	23688.809187
C_r	0.000000	0.010358	0.010358
N_r	0.000000	0.910072	0.910072
A_h	0.000000	143.802212	143.802212
B_h	0.000000	50238.271408	50238.271408
C_h	0.000000	0.000929	0.000929
A_o	0.000000	1.673894	1.673894
B_o	0.000000	0.895342	0.895342
C_o	0.000000	2.657699	2.657699
N_o	0.000000	1.379953	1.379953
F_o	0.099575	2.361284	2.460859

message: Optimization terminated successfully.
success: True
 status: 0
    fun: 0.05800566072455375
      x: [8.669e+02 6.084e+03 ... 1.380e+00 2.461e+00]
    nit: 862
   nfev: 1345
final_simplex: (array([[8.669e+02, 6.084e+03, ..., 1.380e+00,
            2.461e+00],
           [8.669e+02, 6.084e+03, ..., 1.380e+00,
            2.461e+00],
           ...,
           [8.669e+02, 6.084e+03, ..., 1.380e+00,
            2.461e+00],
           [8.669e+02, 6.084e+03, ..., 1.380e+00,
            2.461e+00]]), array([5.801e-02, 5.801e-02, ..., 5.801e-02, 5.801e-02]))

['SM data type data plots for mutation', 'Sensor8', 'using model:', 'model_hill.model']

Across all four plots:

RSS (converged)=0.039

RSS (initial)=1.584

RSS (% reduction)=0.976

	epsilon	Initial_guesses	Converged
A_s	545.308759	650.714912	1196.023671
B_s	-9085.247939	16259.979950	7174.732011
C_s	-19.298046	1296.448889	1277.150843
N_s	0.163868	1.154067	1.317935
A_r	0.000000	2020.019216	2020.019216
B_r	0.000000	23688.809187	23688.809187
C_r	0.000000	0.010358	0.010358
N_r	0.000000	0.910072	0.910072
A_h	0.000000	143.802212	143.802212
B_h	0.000000	50238.271408	50238.271408
C_h	0.000000	0.000929	0.000929
A_o	0.000000	1.673894	1.673894
B_o	0.000000	0.895342	0.895342
C_o	0.000000	2.657699	2.657699
N_o	0.000000	1.379953	1.379953
F_o	0.015123	2.361284	2.376407

message: Optimization terminated successfully.
success: True
 status: 0
   fun: 0.039341546953022624
     x: [1.196e+03 7.175e+03 ... 1.380e+00 2.376e+00]
   nit: 826
  nfev: 1301
final_simplex: (array([[1.196e+03, 7.175e+03, ..., 1.380e+00,
        2.376e+00],
       [1.196e+03, 7.175e+03, ..., 1.380e+00,
         2.376e+00],
       ...,
       [1.196e+03, 7.175e+03, ..., 1.380e+00,
         2.376e+00],
       [1.196e+03, 7.175e+03, ..., 1.380e+00,
        2.376e+00]]), array([3.934e-02, 3.934e-02, ..., 3.934e-02, 3.934e-02]))

time elapsed for this fit
--- 2.5973265171051025 seconds ---

['SM data type data plots for mutation', 'Sensor9', 'using model:', 'model_hill.model']

inducer -> sensor (GFP output)

inducer ->S -|R (GFP output)

inducer -> S -| Output (GFP)

Full circuit with stripe

Legend:
- Initial Guess
- Converged
- Converged
- Converged
- Converged
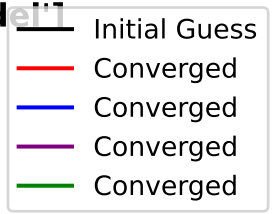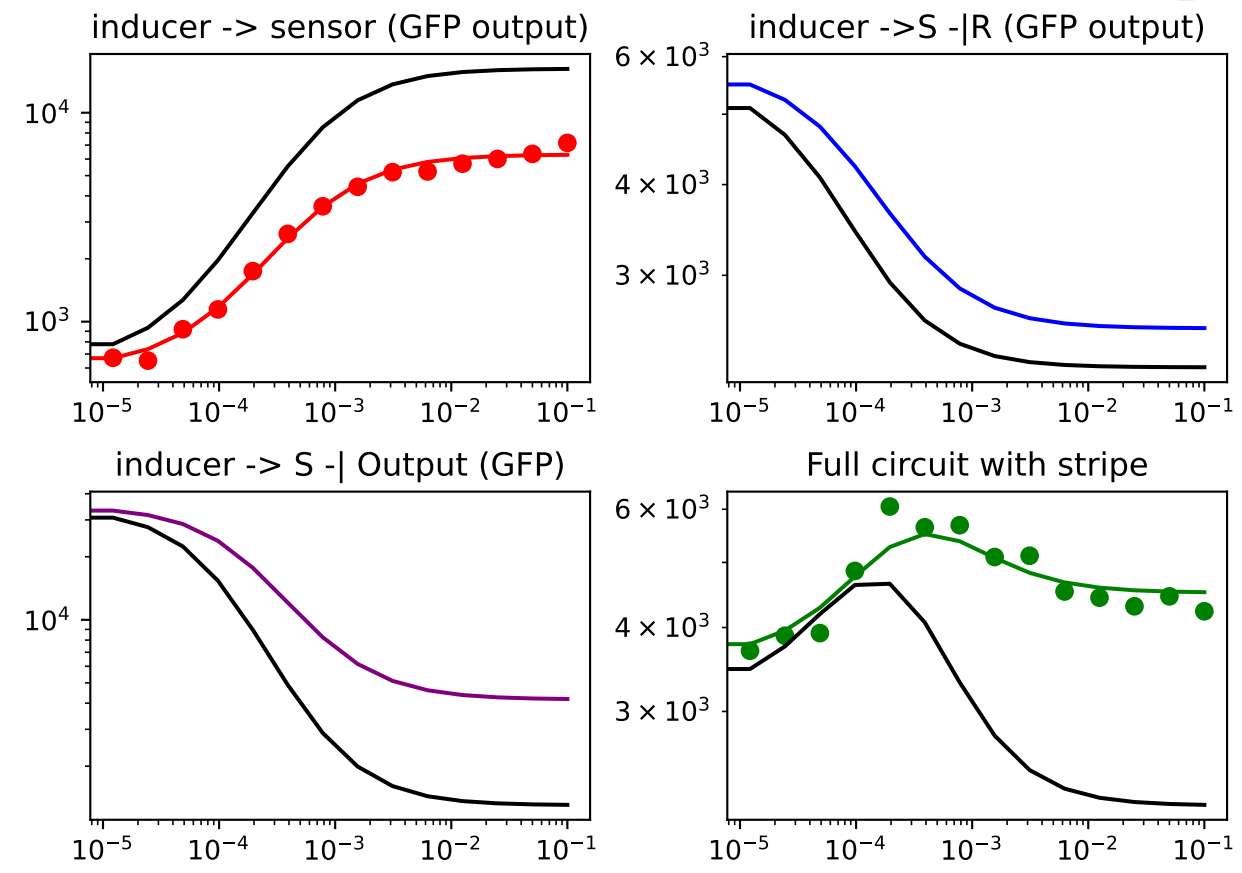
time elapsed for this fit
--- 2.48978853225708 seconds ---

Across all four plots:

RSS (converged)=0.021

RSS (initial)=2.353

RSS (% reduction)=0.991

	epsilon	Initial_guesses	Converged
A_s	-45.595872	650.714912	605.119040
B_s	-9944.435731	16259.979950	6315.544218
C_s	60.539180	1296.448889	1356.988069
N_s	-0.059701	1.154067	1.094366
A_r	0.000000	2020.019216	2020.019216
B_r	0.000000	23688.809187	23688.809187
C_r	0.000000	0.010358	0.010358
N_r	0.000000	0.910072	0.910072
A_h	0.000000	143.802212	143.802212
B_h	0.000000	50238.271408	50238.271408
C_h	0.000000	0.000929	0.000929
A_o	0.000000	1.673894	1.673894
B_o	0.000000	0.895342	0.895342
C_o	0.000000	2.657699	2.657699
N_o	0.000000	1.379953	1.379953
F_o	0.398717	2.361284	2.760001

message: Optimization terminated successfully.
success: True
 status: 0
   fun: 0.020578229549676905
    x: [6.051e+02 6.316e+03 ... 1.380e+00 2.760e+00]
  nit: 795
 nfev: 1247
final_simplex: (array([[6.051e+02, 6.316e+03, ..., 1.380e+00,
          2.760e+00],
        [6.051e+02, 6.316e+03, ..., 1.380e+00,
          2.760e+00],
        ...,
        [6.051e+02, 6.316e+03, ..., 1.380e+00,
          2.760e+00],
        [6.051e+02, 6.316e+03, ..., 1.380e+00,
          2.760e+00]]), array([2.058e-02, 2.058e-02, ..., 2.058e-02, 2.058e-02]))