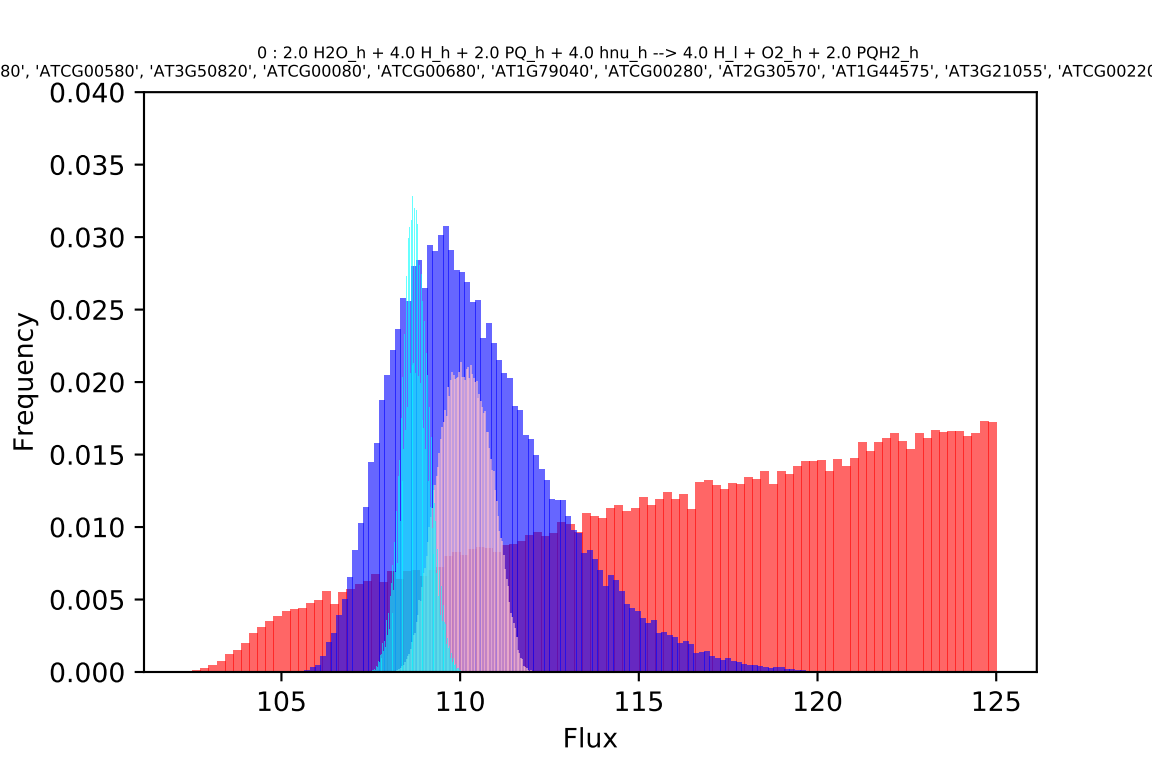
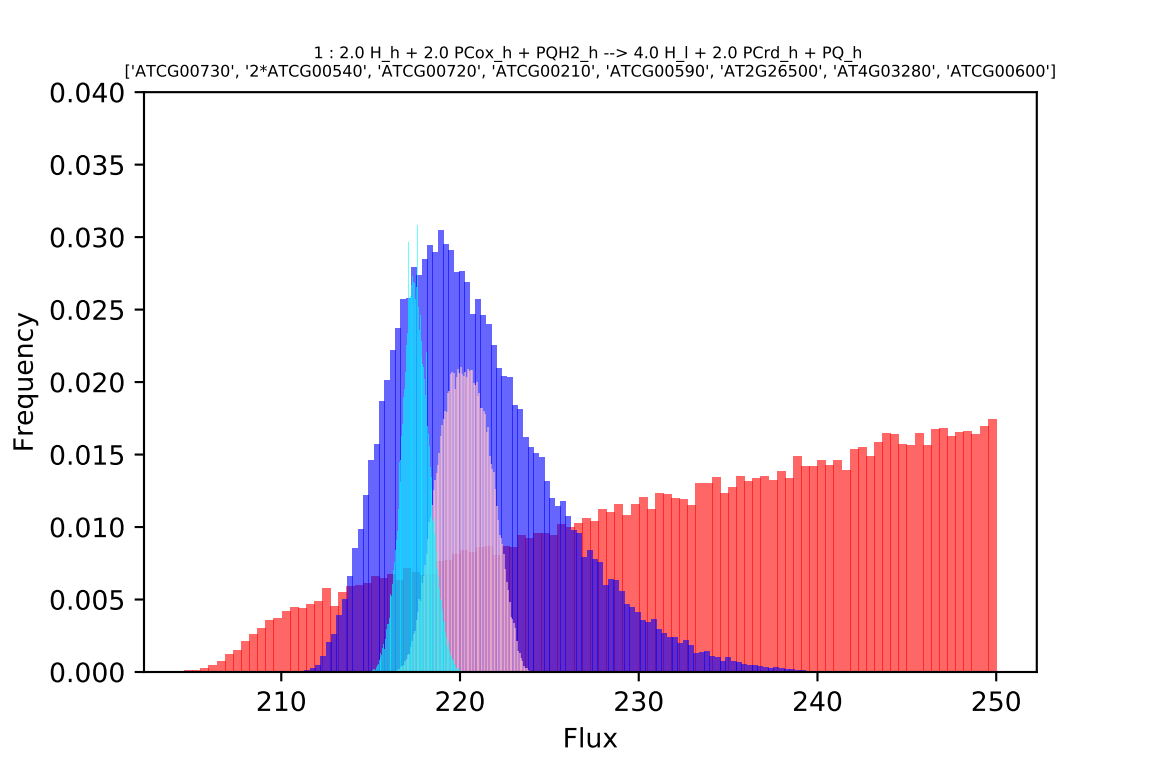
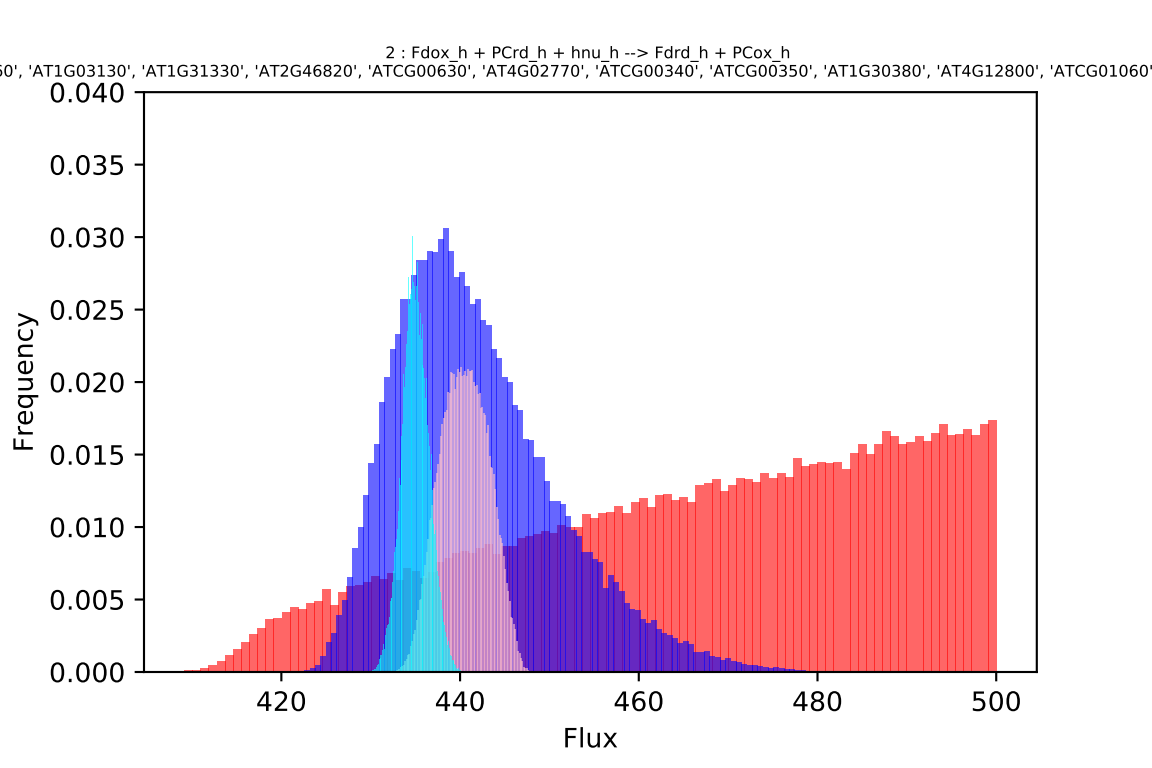
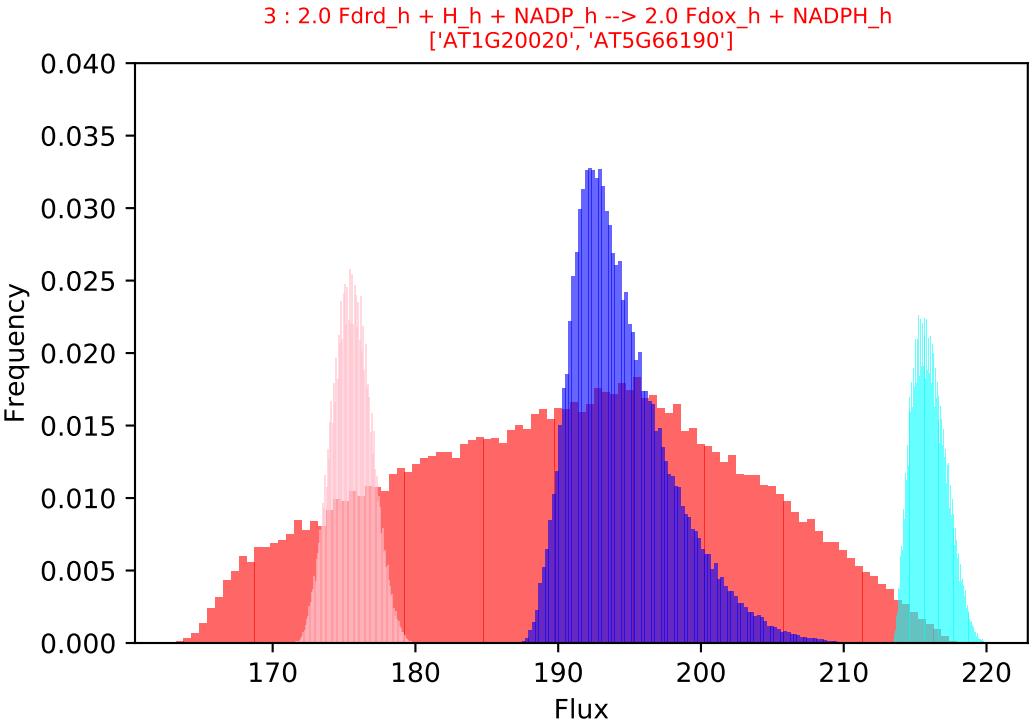
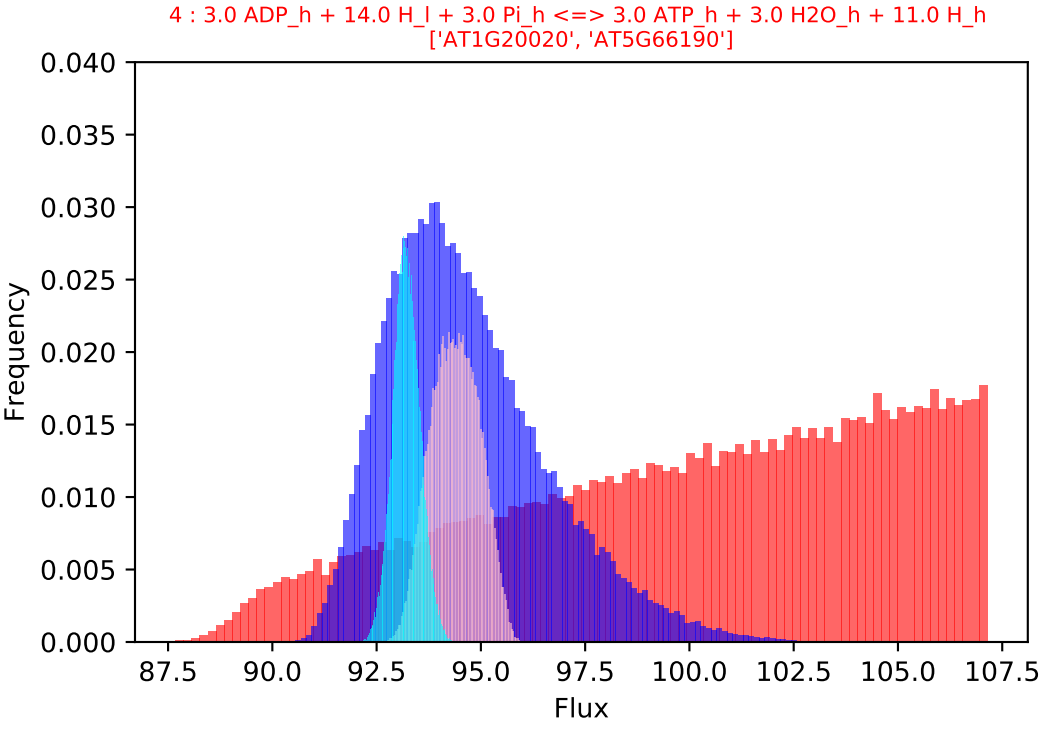
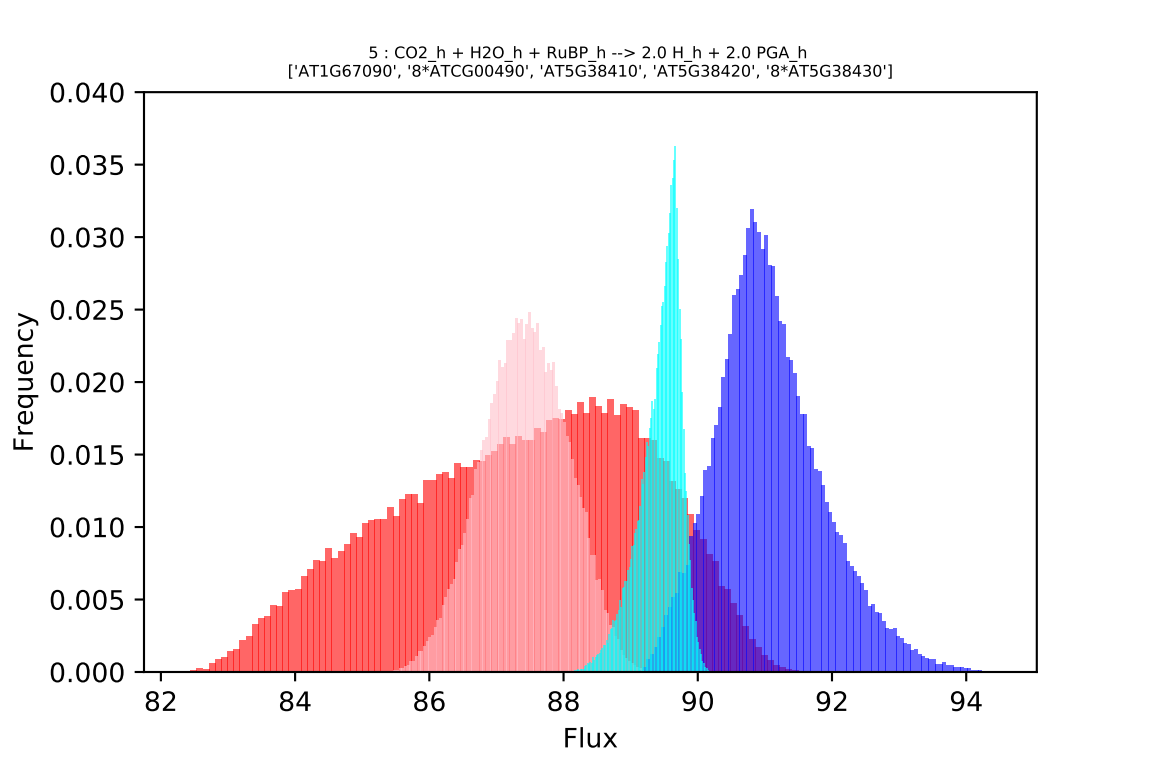

0 : 2.0 H2O_h + 4.0 H_h + 2.0 PQ_h + 4.0 hnu_h --> 4.0 H_l + O2_h + 2.0 PQH2_h
80', 'ATCG00580', 'AT3G50820', 'ATCG00080', 'ATCG00680', 'AT1G79040', 'ATCG00280', 'AT2G30570', 'AT1G44575', 'AT3G21055', 'ATCG0022C
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
105
110
115
120
125
Flux

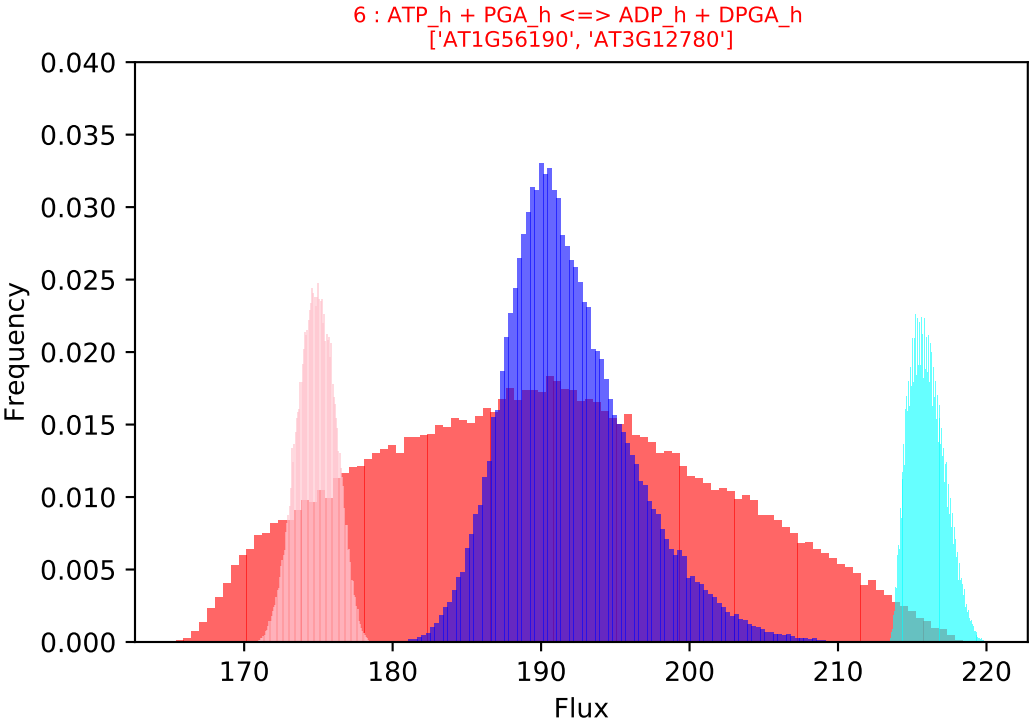

1 : 2.0 H_h + 2.0 PCox_h + PQH2_h --> 4.0 H_l + 2.0 PCrd_h + PQ_h
['ATCG00730', '2*ATCG00540', 'ATCG00720', 'ATCG00210', 'ATCG00590', 'AT2G26500', 'AT4G03280', 'ATCG00600']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
210
220
230
240
250
Flux

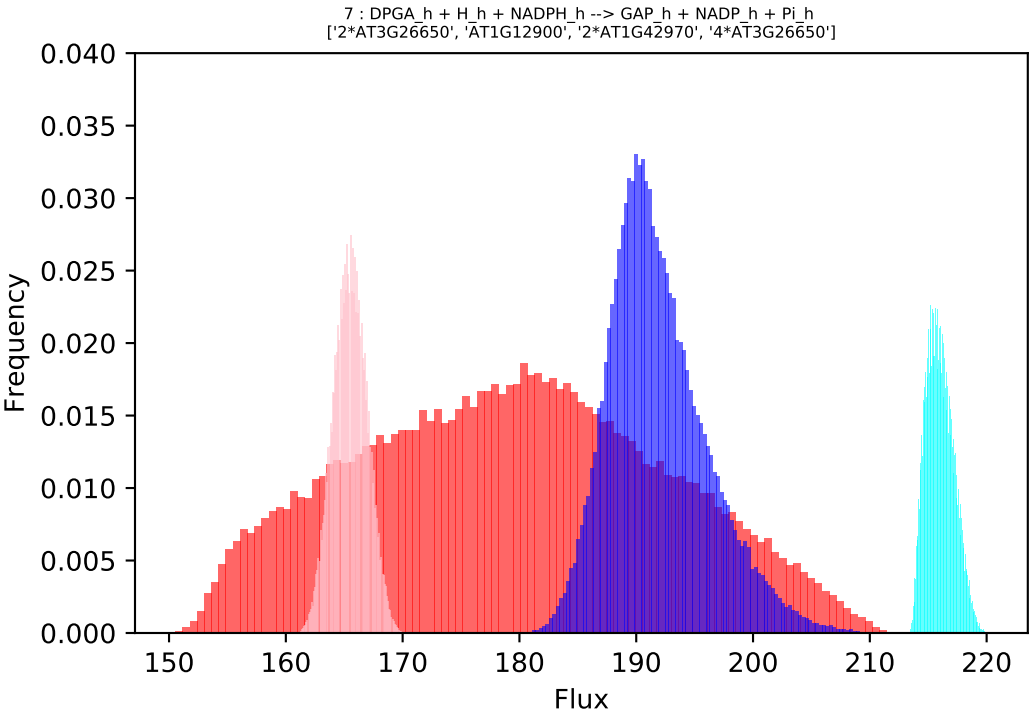

2 : Fdox_h + PCrd_h + hnu_h --> Fdrd_h + PCox_h
60', 'AT1G03130', 'AT1G31330', 'AT2G46820', 'ATCG00630', 'AT4G02770', 'ATCG00340', 'ATCG00350', 'AT1G30380', 'AT4G12800', 'ATCG01060'
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
420
440
460
480
500
Flux

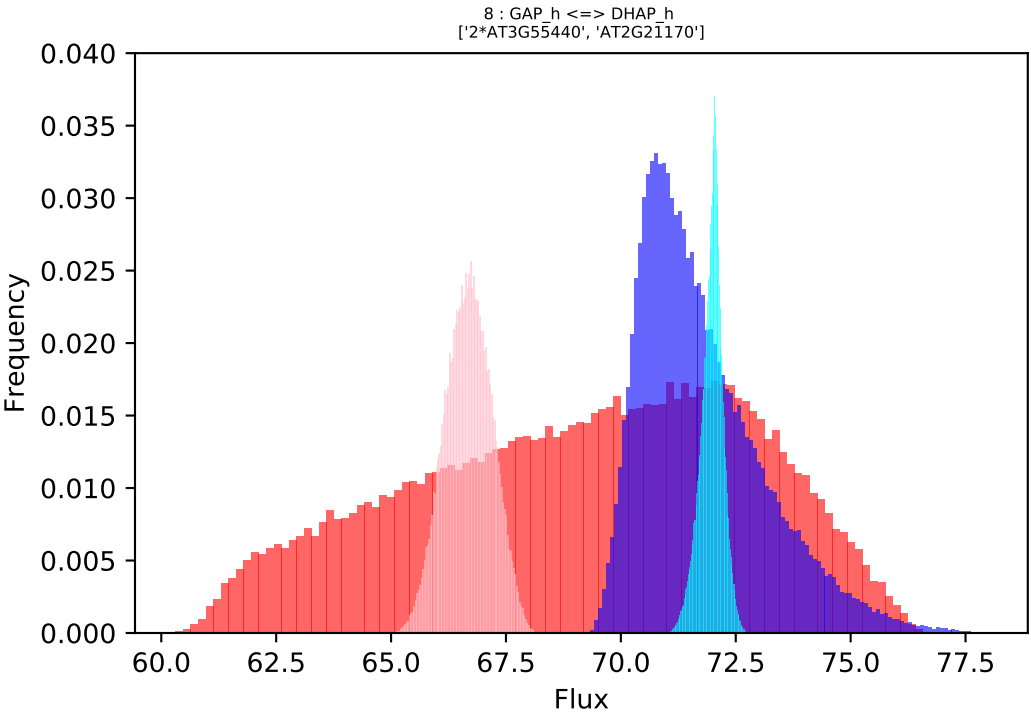

3 : 2.0 Fdrd_h + H_h + NADP_h --> 2.0 Fdox_h + NADPH_h
['AT1G20020', 'AT5G66190']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
170
180
190
200
210
220
Flux

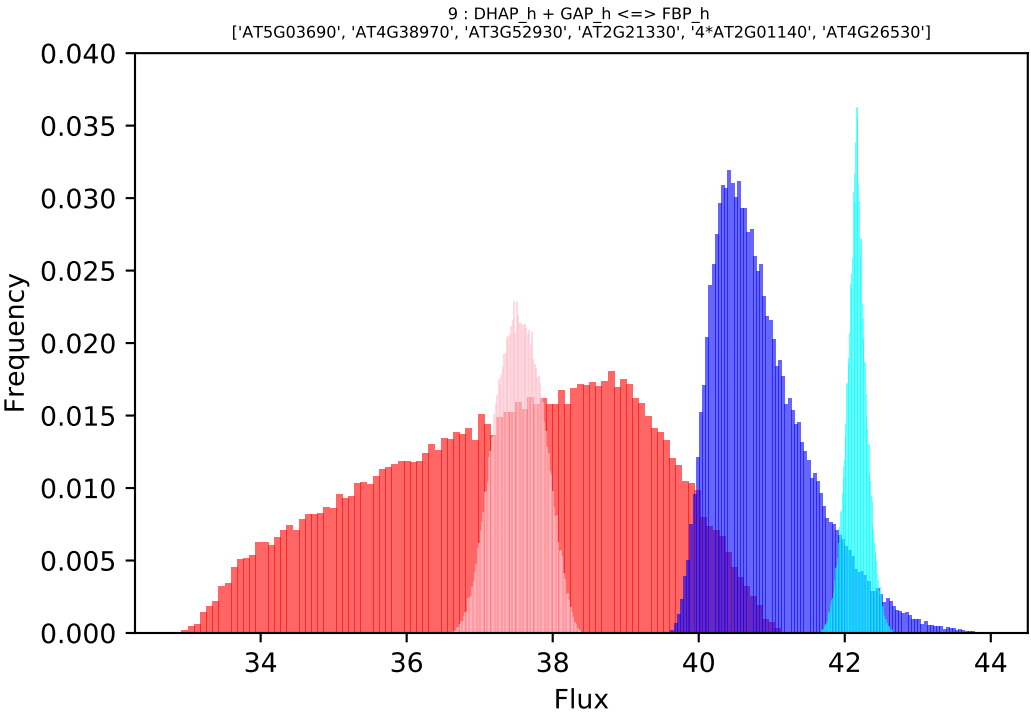

4 : 3.0 ADP_h + 14.0 H_l + 3.0 Pi_h <=> 3.0 ATP_h + 3.0 H2O_h + 11.0 H_h
['AT1G20020', 'AT5G66190']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
87.5
90.0
92.5
95.0
97.5
100.0
102.5
105.0
107.5
Flux

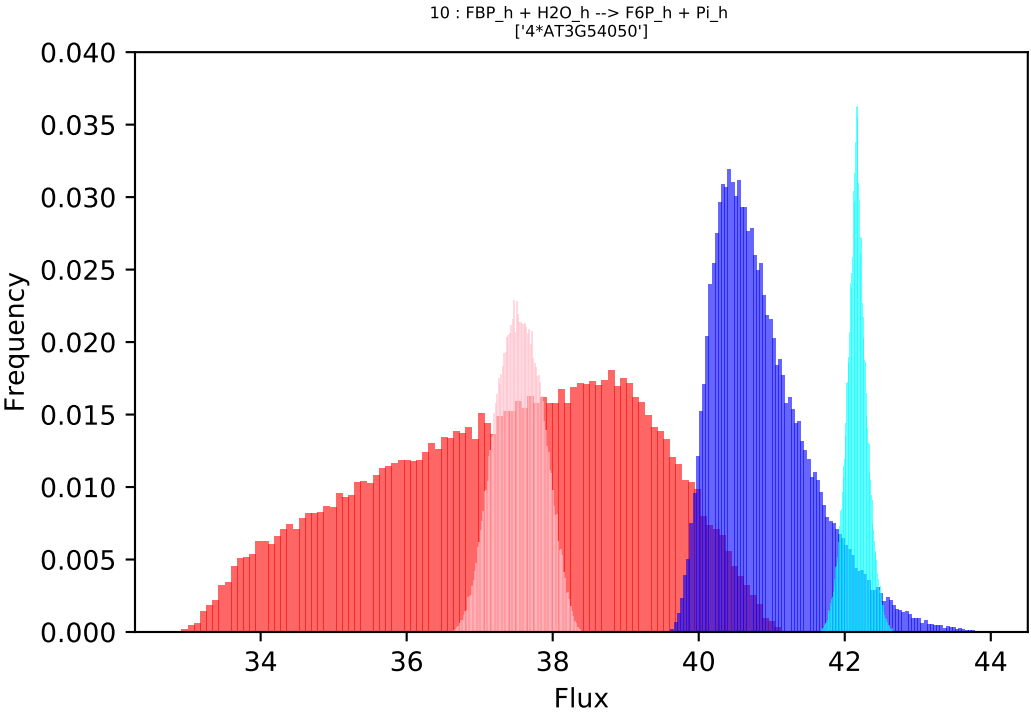

5 : CO2_h + H2O_h + RuBP_h --> 2.0 H_h + 2.0 PGA_h
['AT1G67090', '8*ATCG00490', 'AT5G38410', 'AT5G38420', '8*AT5G38430']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
82
84
86
88
90
92
94
Flux

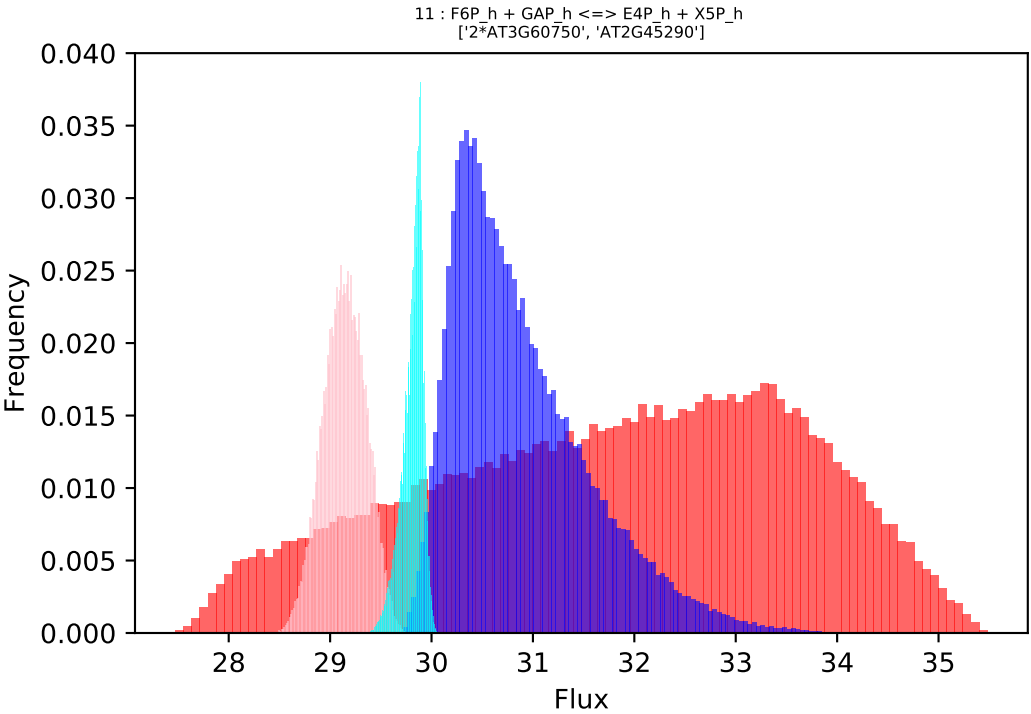

6 : ATP_h + PGA_h <=> ADP_h + DPGA_h
['AT1G56190', 'AT3G12780']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
170
180
190
200
210
220
Flux

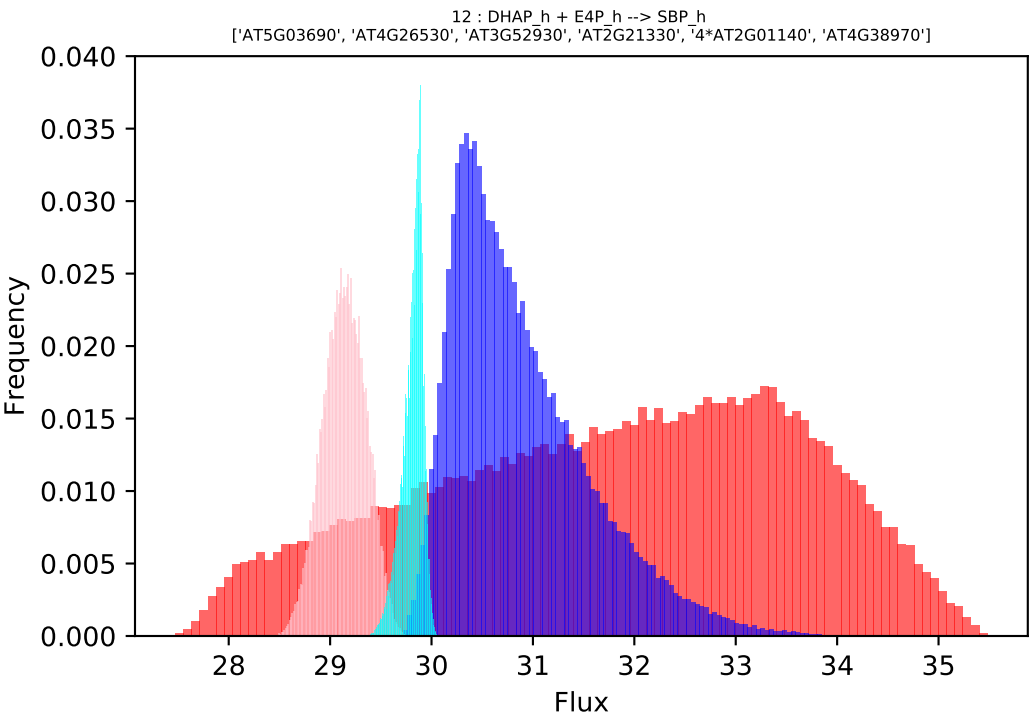

7 : DPGA_h + H_h + NADPH_h --> GAP_h + NADP_h + Pi_h
['2*AT3G26650', 'AT1G12900', '2*AT1G42970', '4*AT3G26650']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
150
160
170
180
190
200
210
220
Flux

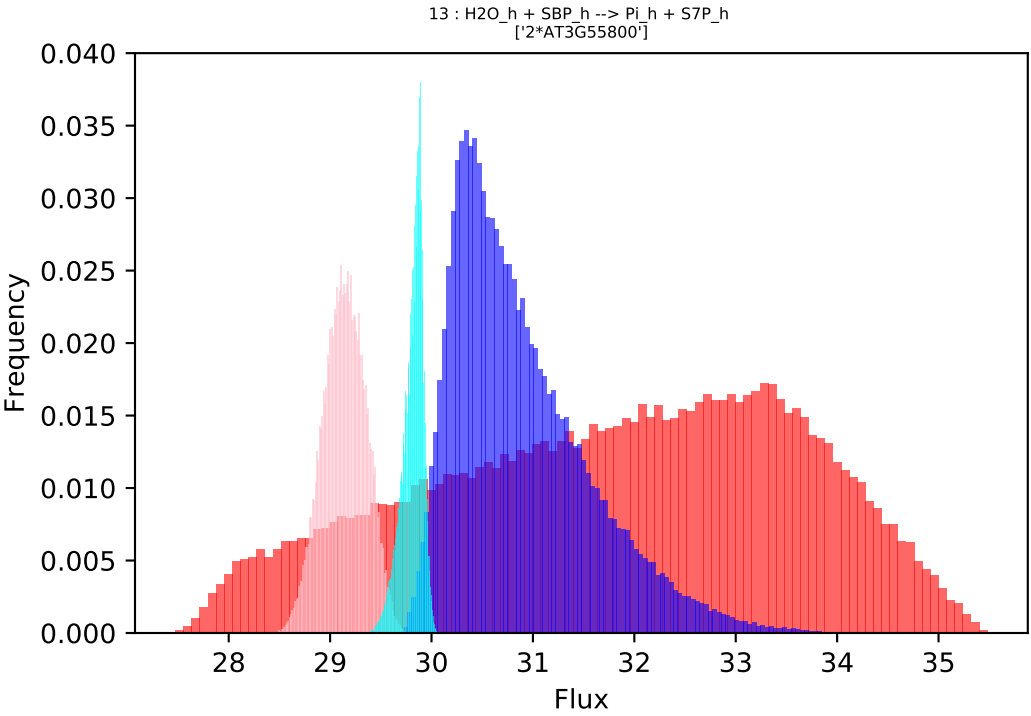

8 : GAP_h <=> DHAP_h
['2*AT3G55440', 'AT2G21170']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
60.0
62.5
65.0
67.5
70.0
72.5
75.0
77.5
Flux

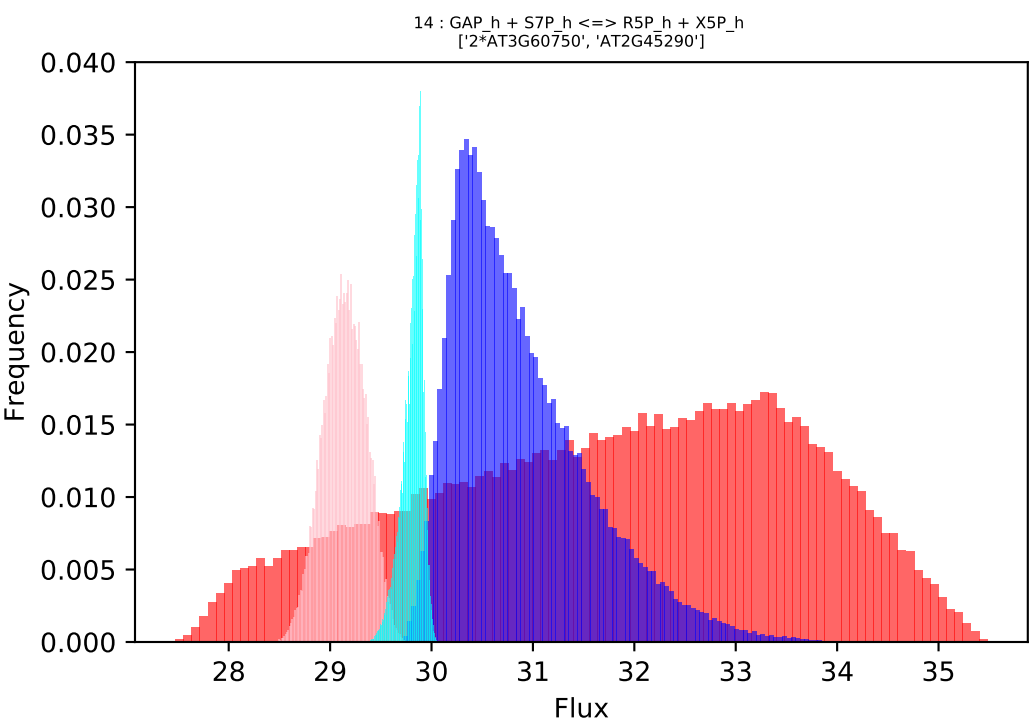

9 : DHAP_h + GAP_h <=> FBP_h
['AT5G03690', 'AT4G38970', 'AT3G52930', 'AT2G21330', '4*AT2G01140', 'AT4G26530']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
34
36
38
40
42
44
Flux

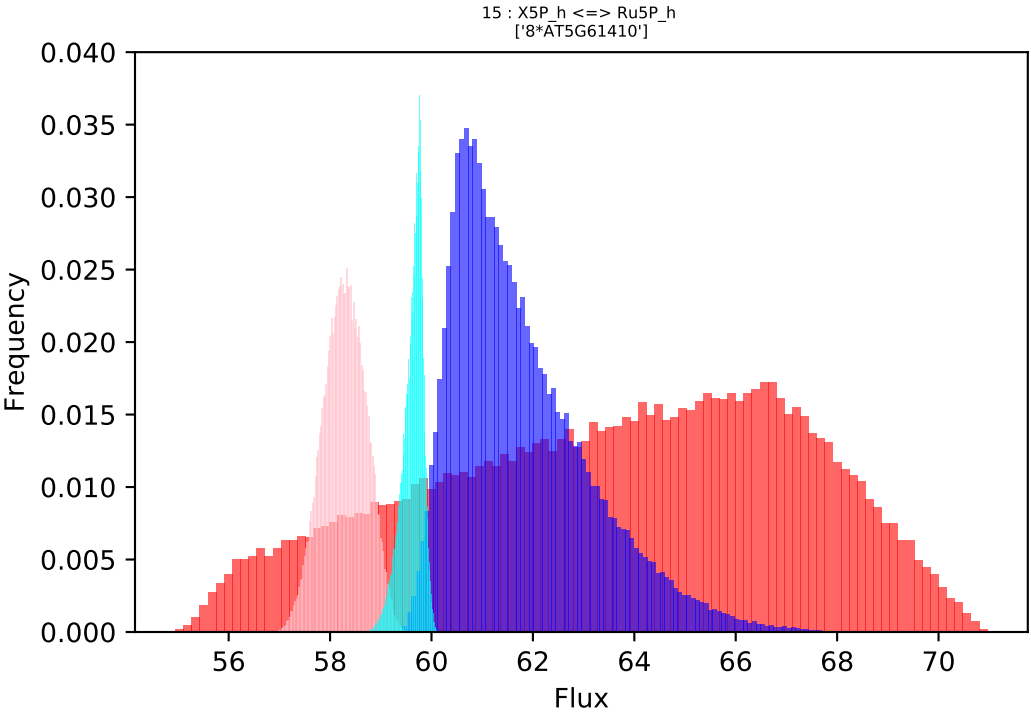

10 : FBP_h + H2O_h --> F6P_h + Pi_h
['4*AT3G54050']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
34
36
38
40
42
44
Flux

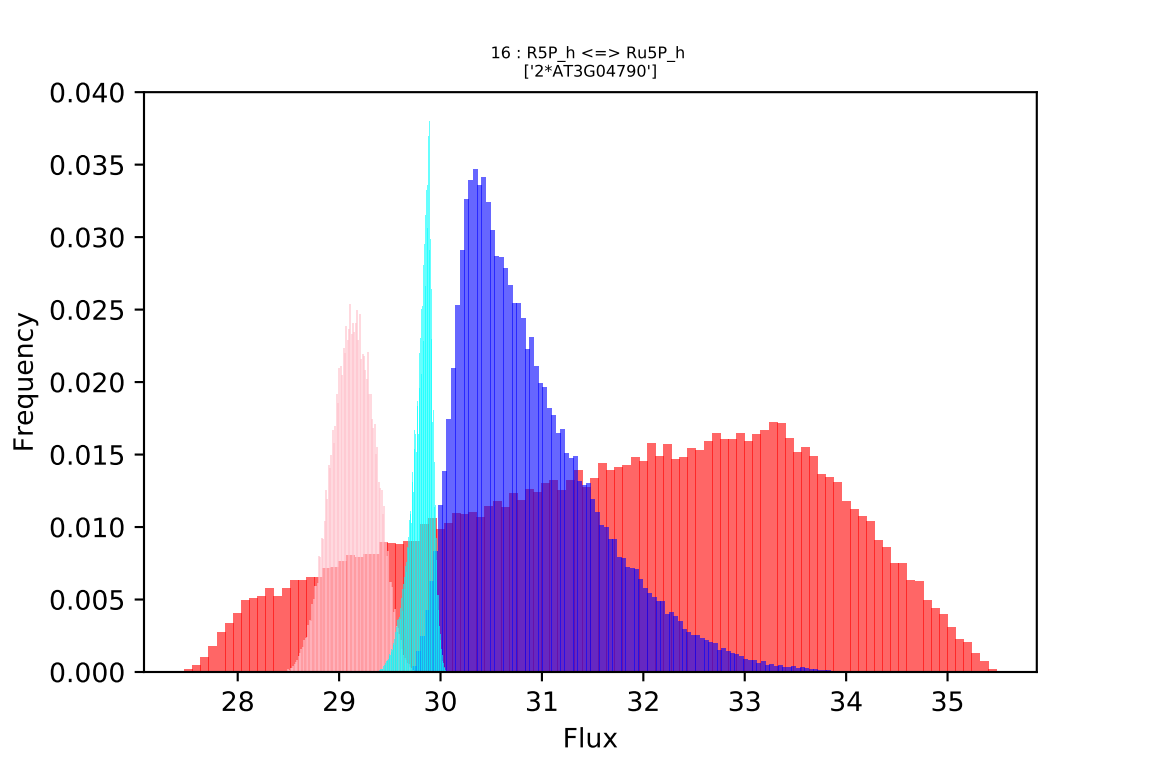

11 : F6P_h + GAP_h <=> E4P_h + X5P_h
['2*AT3G60750', 'AT2G45290']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
28
29
30
31
32
33
34
35
Flux

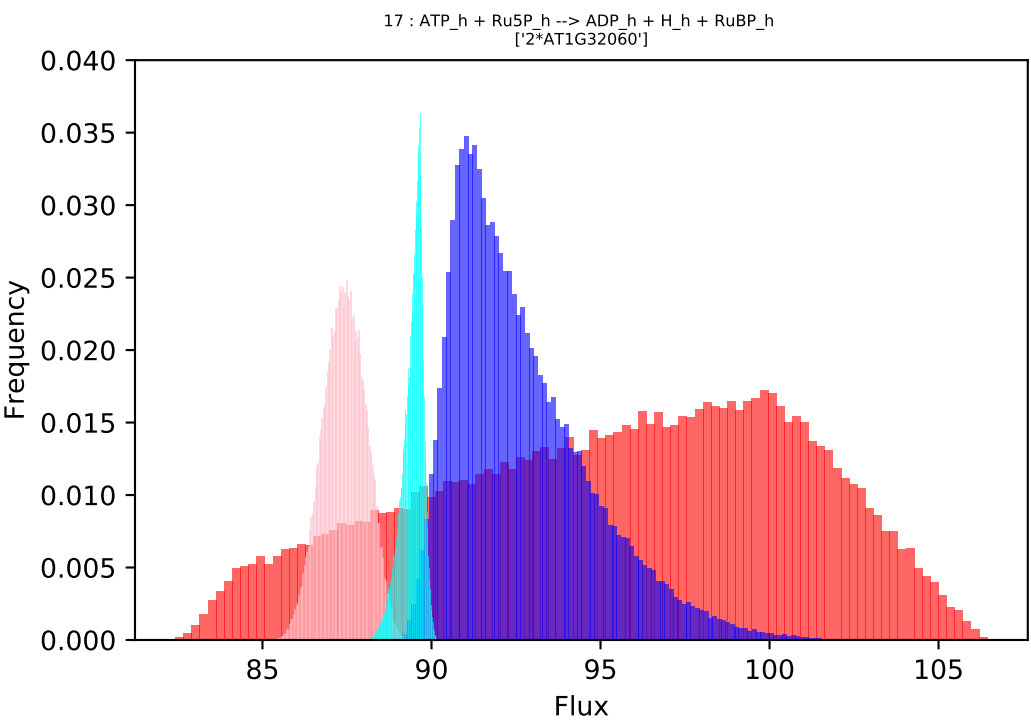

12 : DHAP_h + E4P_h --> SBP_h
['AT5G03690', 'AT4G26530', 'AT3G52930', 'AT2G21330', '4*AT2G01140', 'AT4G38970']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
28
29
30
31
32
33
34
35
Flux

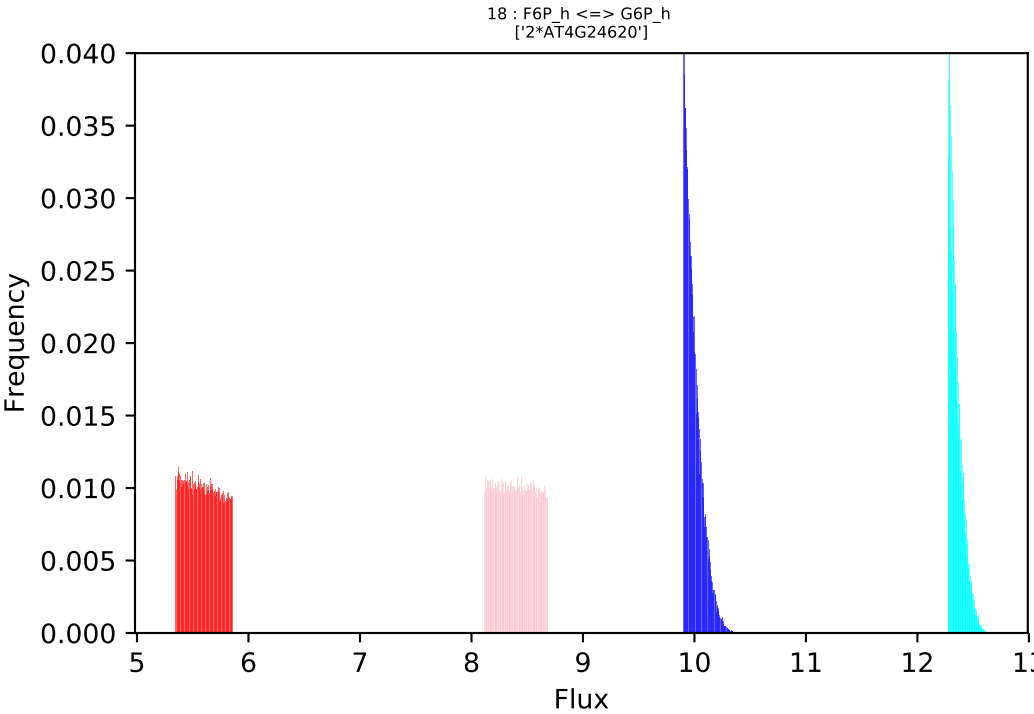

13 : H2O_h + SBP_h --> Pi_h + S7P_h
['2*AT3G55800']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
28
29
30
31
32
33
34
35
Flux

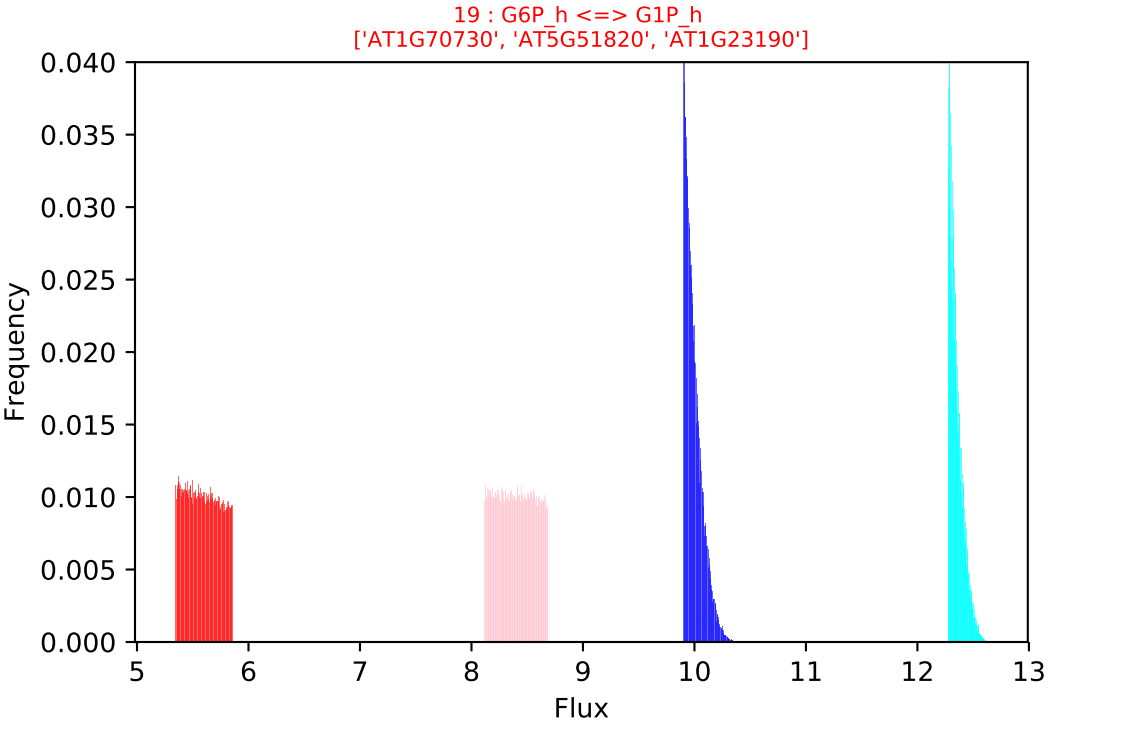

14 : GAP_h + S7P_h <=> R5P_h + X5P_h
['2*AT3G60750', 'AT2G45290']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
28
29
30
31
32
33
34
35
Flux

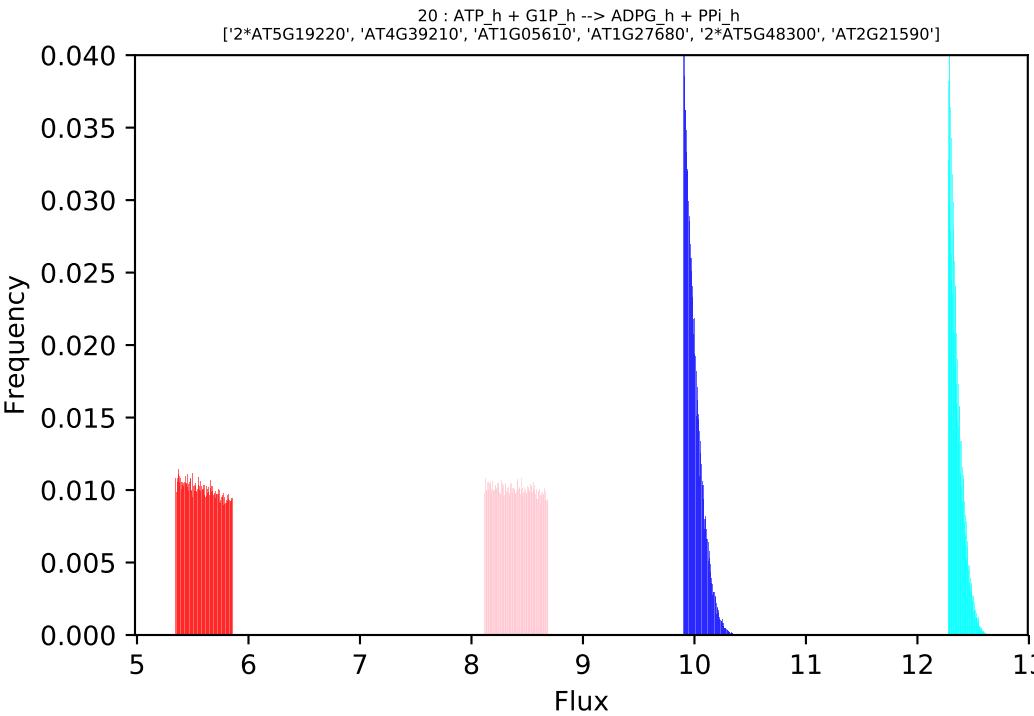

15 : X5P_h <=> Ru5P_h
['8*AT5G61410']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
56
58
60
62
64
66
68
70
Flux

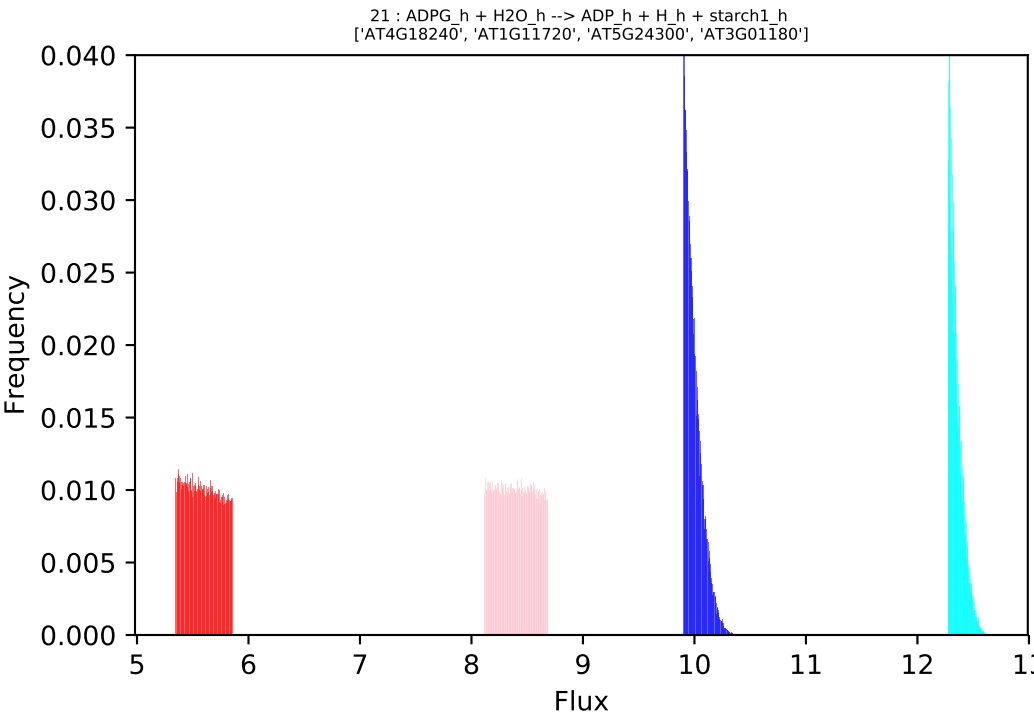

16 : R5P_h <=> Ru5P_h
['2*AT3G04790']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
28
29
30
31
32
33
34
35
Flux

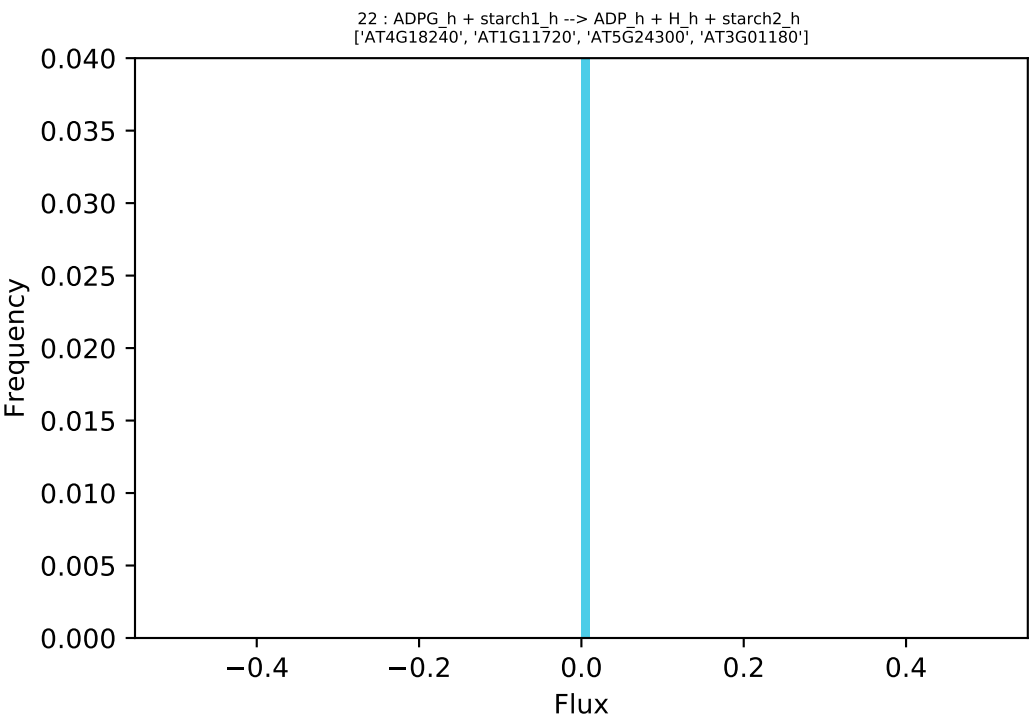

17 : ATP_h + Ru5P_h --> ADP_h + H_h + RuBP_h
['2*AT1G32060']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
85
90
95
100
105
Flux

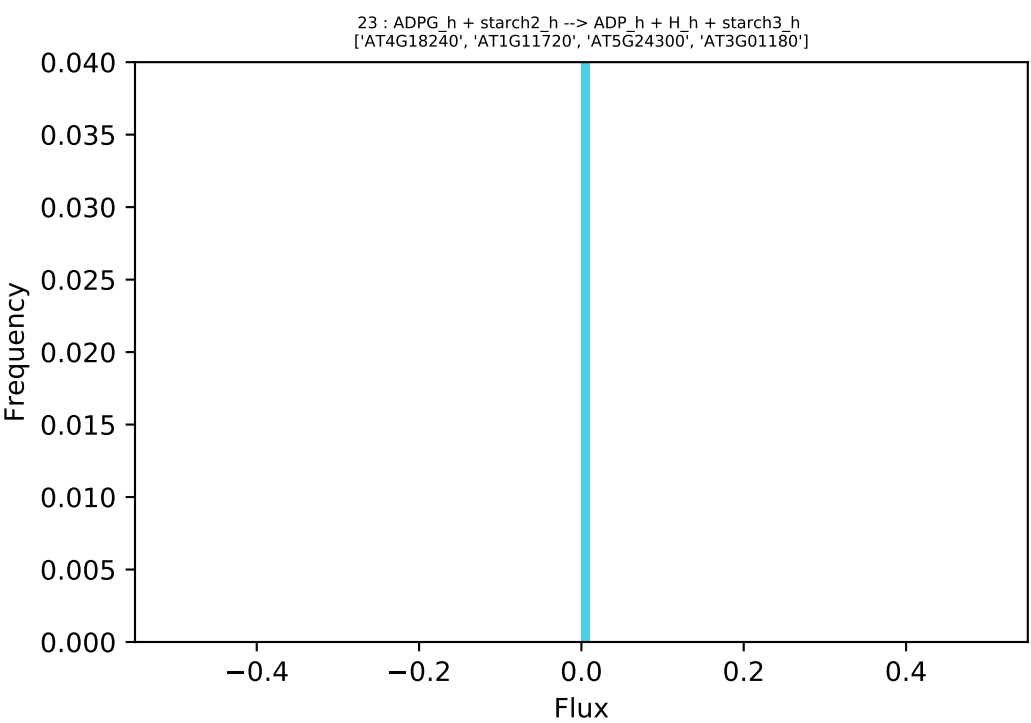

18 : F6P_h <=> G6P_h
['2*AT4G24620']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
5
6
7
8
9
10
11
12
13
Flux

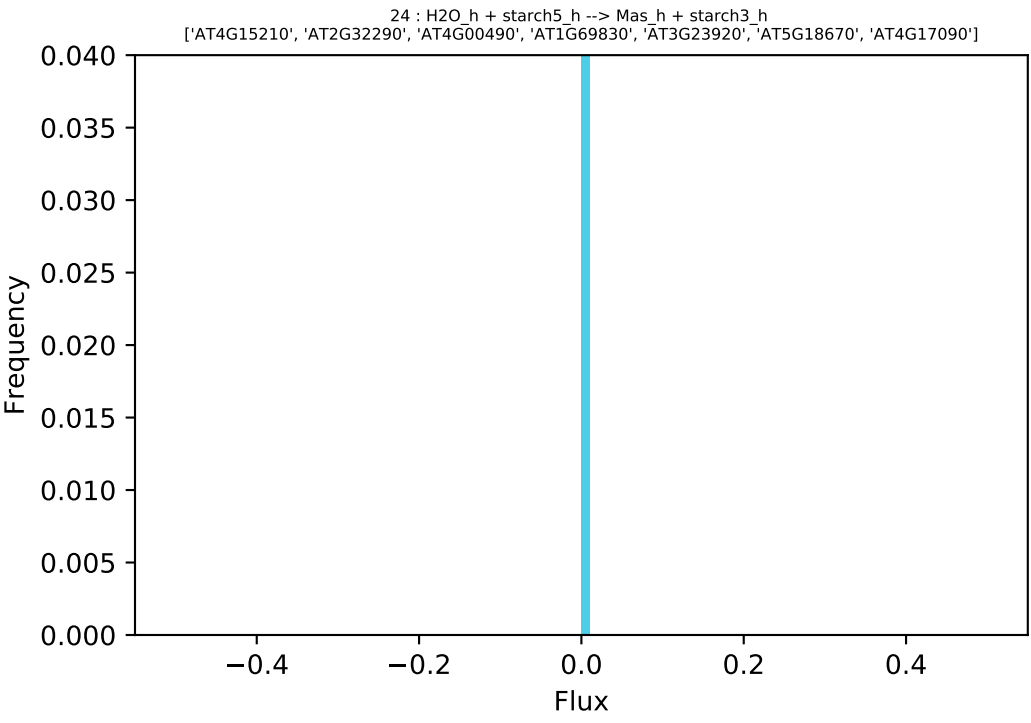

19 : G6P_h <=> G1P_h
['AT1G70730', 'AT5G51820', 'AT1G23190']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
5
6
7
8
9
10
11
12
13
Flux

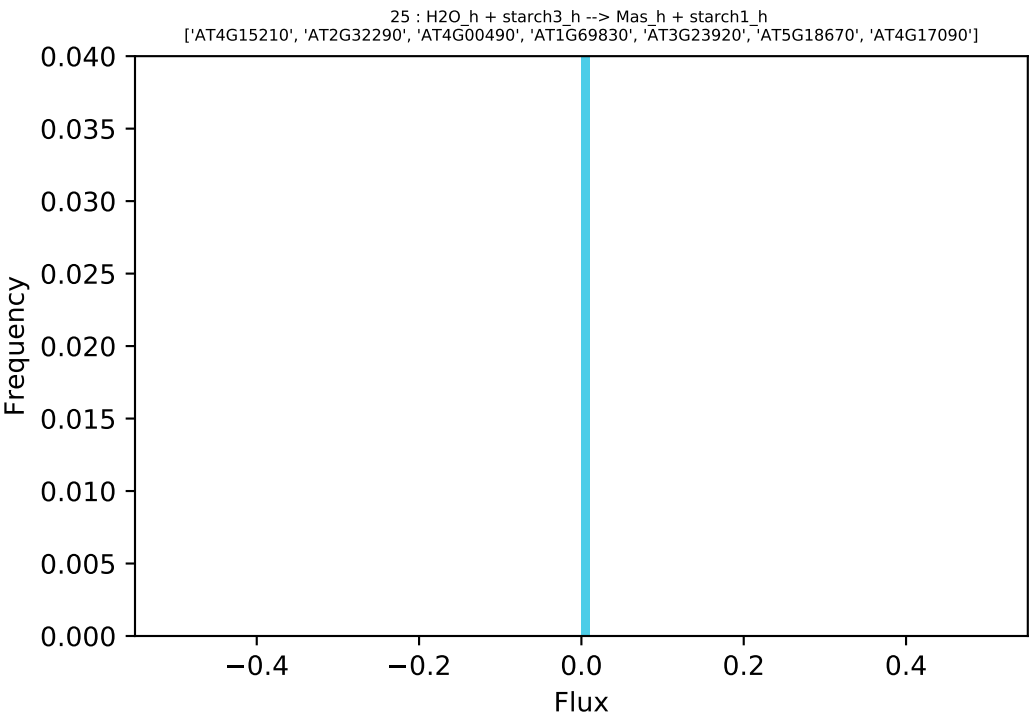

20 : ATP_h + G1P_h --> ADPG_h + PPi_h
['2*AT5G19220', 'AT4G39210', 'AT1G05610', 'AT1G27680', '2*AT5G48300', 'AT2G21590']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
5
6
7
8
9
10
11
12
13
Flux

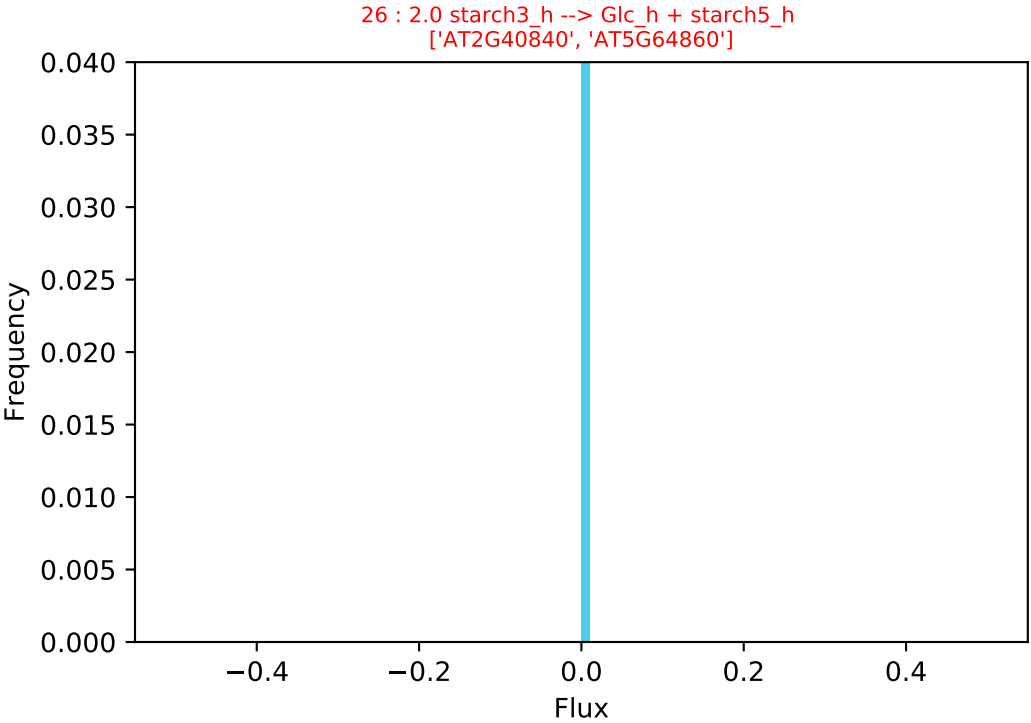

21 : ADPG_h + H2O_h --> ADP_h + H_h + starch1_h
['AT4G18240', 'AT1G11720', 'AT5G24300', 'AT3G01180']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
5
6
7
8
9
10
11
12
13
Flux

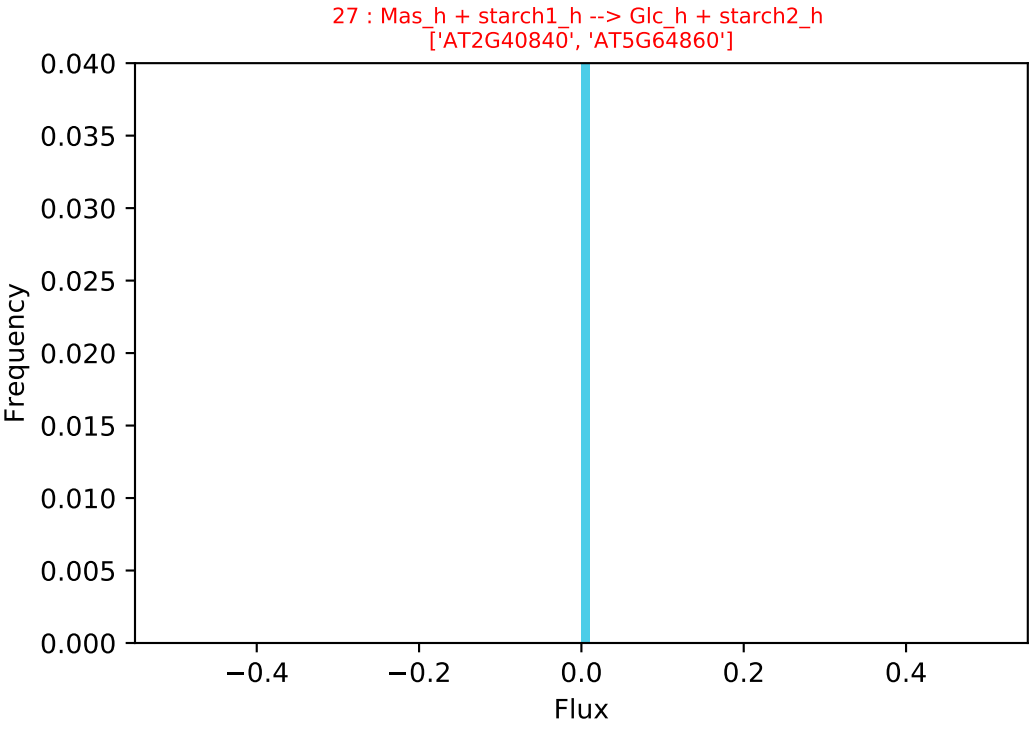

22 : ADPG_h + starch1_h --> ADP_h + H_h + starch2_h
['AT4G18240', 'AT1G11720', 'AT5G24300', 'AT3G01180']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

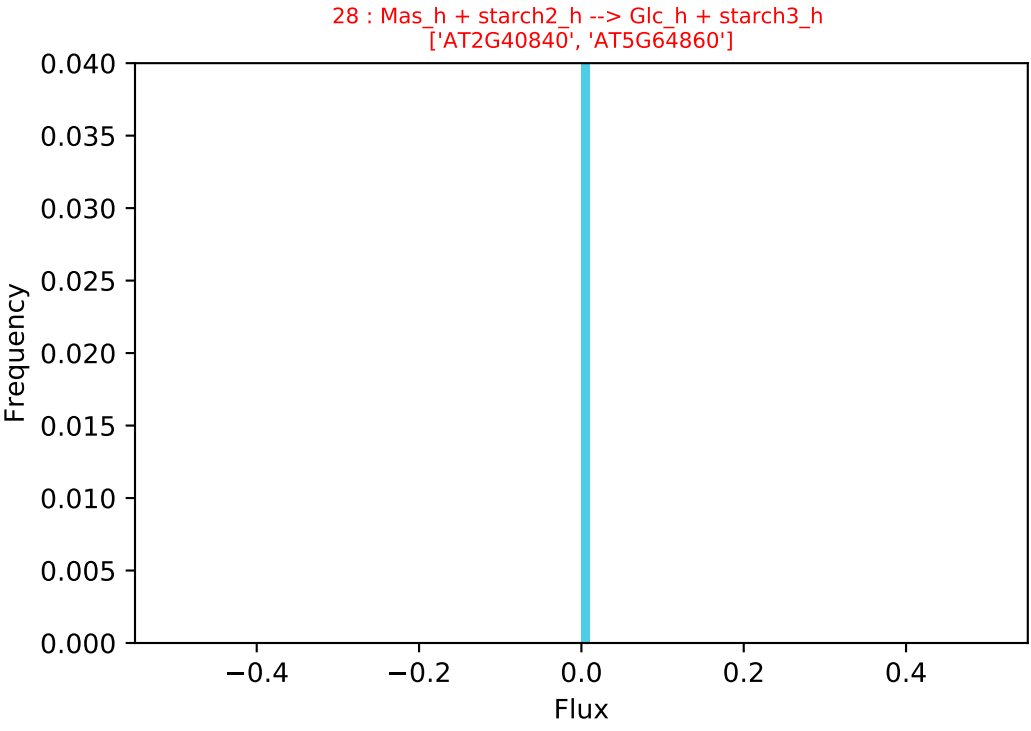

23 : ADPG_h + starch2_h --> ADP_h + H_h + starch3_h
['AT4G18240', 'AT1G11720', 'AT5G24300', 'AT3G01180']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

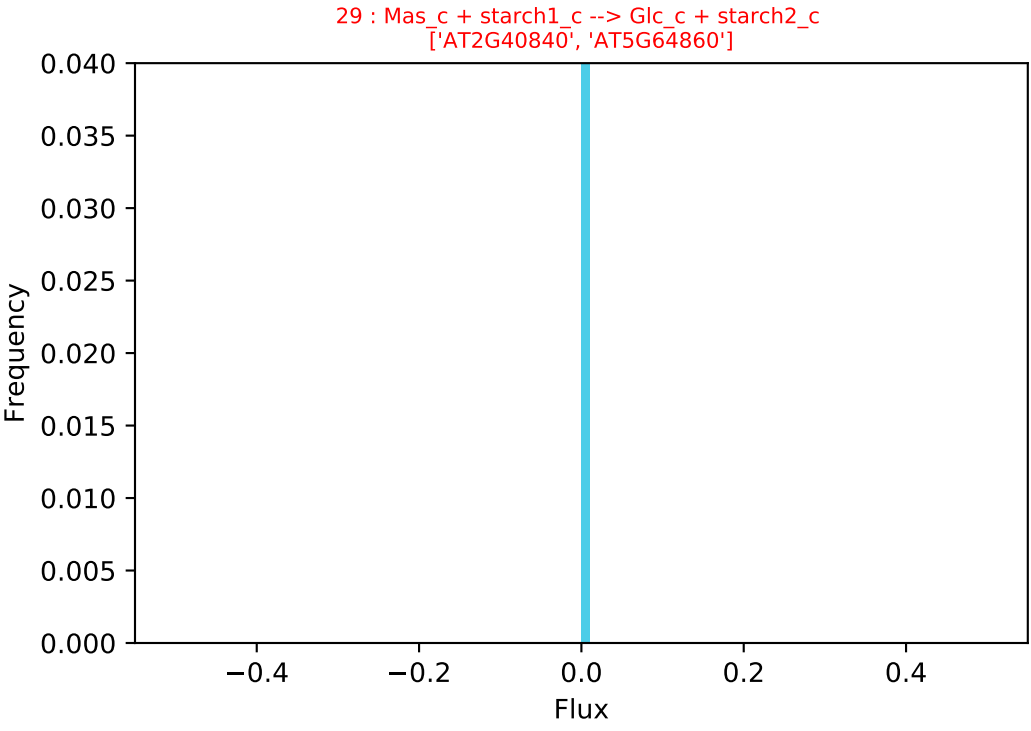

24 : H2O_h + starch5_h --> Mas_h + starch3_h
['AT4G15210', 'AT2G32290', 'AT4G00490', 'AT1G69830', 'AT3G23920', 'AT5G18670', 'AT4G17090']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

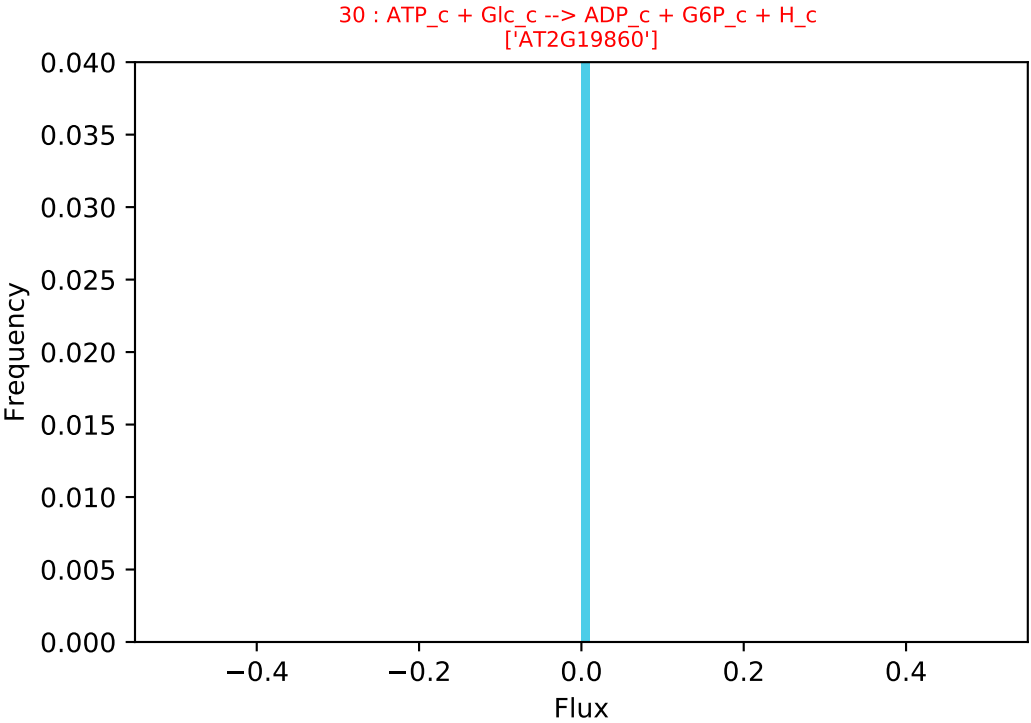

25 : H2O_h + starch3_h --> Mas_h + starch1_h
['AT4G15210', 'AT2G32290', 'AT4G00490', 'AT1G69830', 'AT3G23920', 'AT5G18670', 'AT4G17090']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

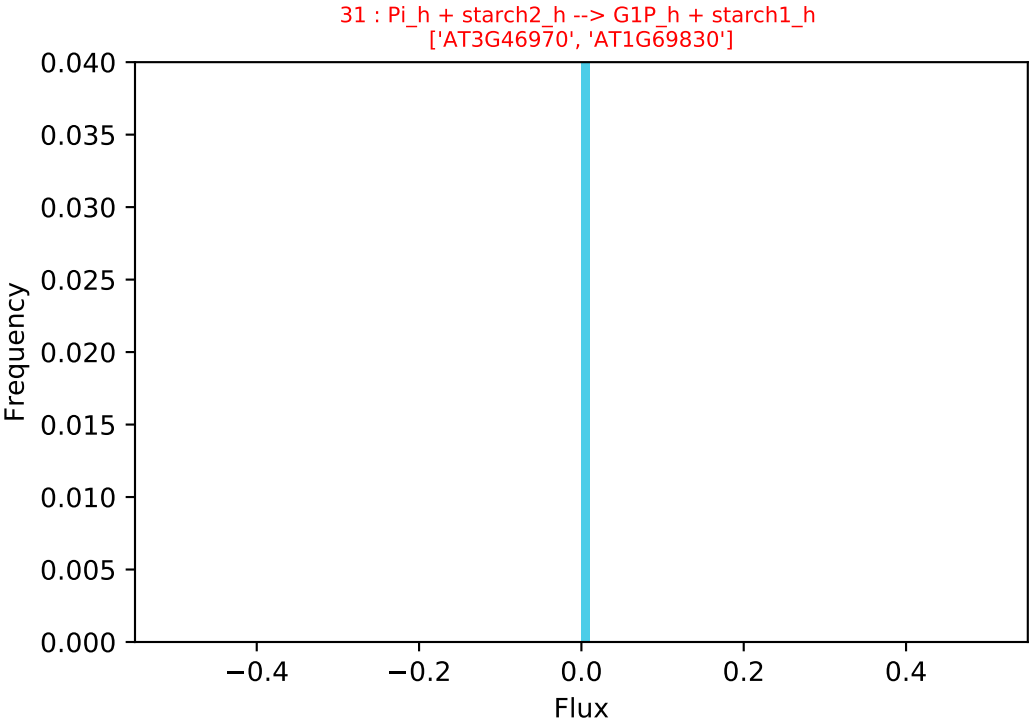

26 : 2.0 starch3_h --> Glc_h + starch5_h
['AT2G40840', 'AT5G64860']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

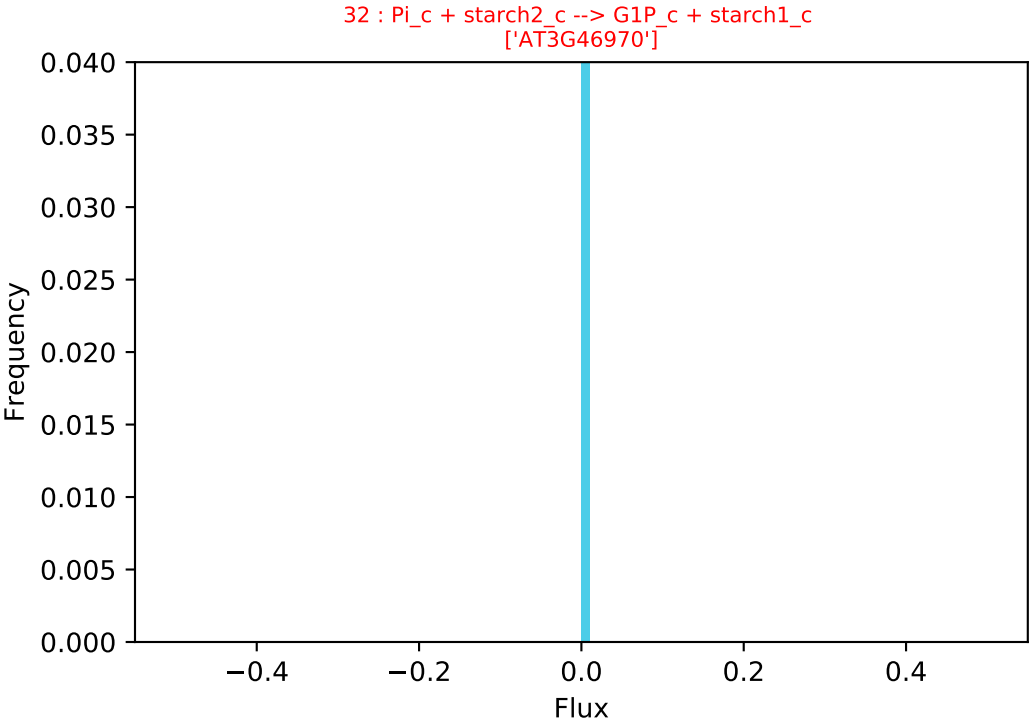

27 : Mas_h + starch1_h --> Glc_h + starch2_h
['AT2G40840', 'AT5G64860']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

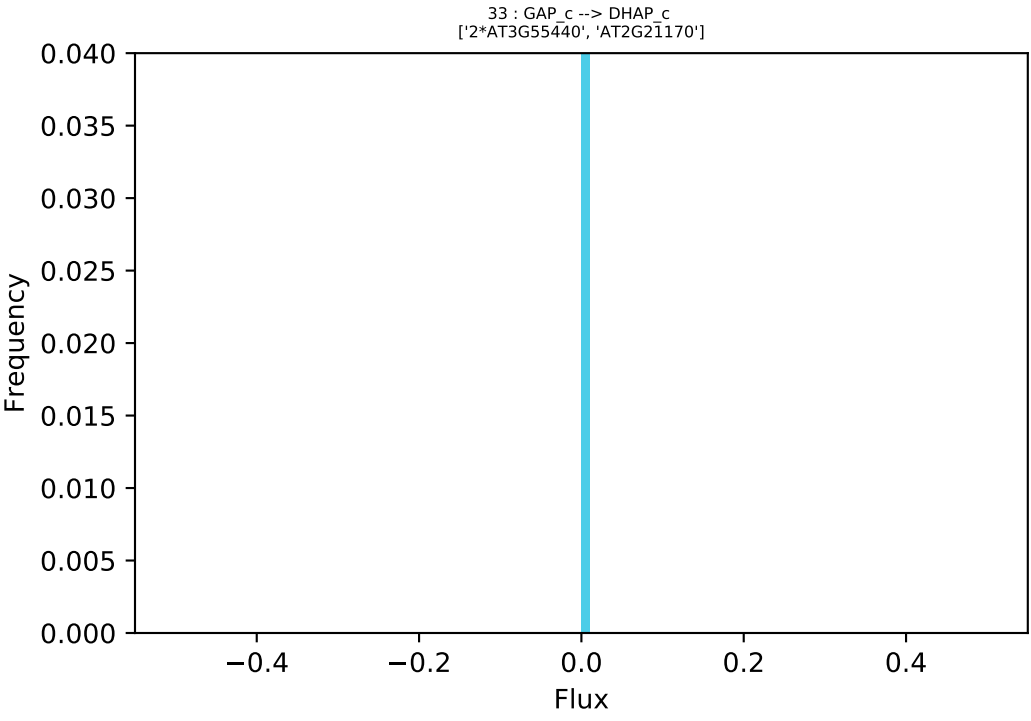

28 : Mas_h + starch2_h --> Glc_h + starch3_h
['AT2G40840', 'AT5G64860']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

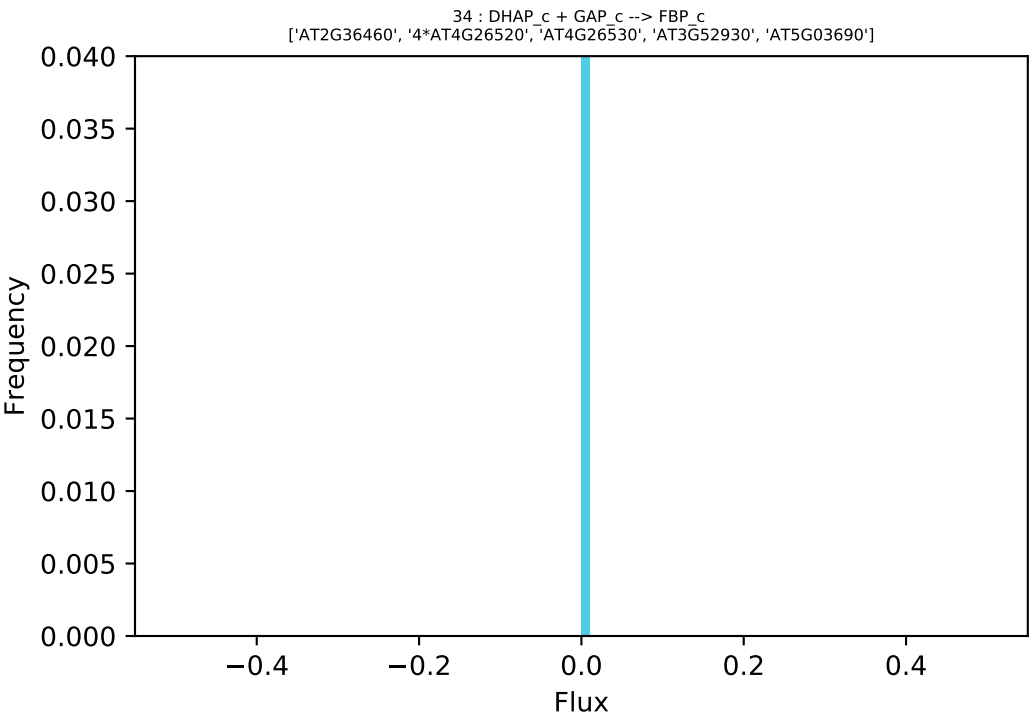

29 : Mas_c + starch1_c --> Glc_c + starch2_c
['AT2G40840', 'AT5G64860']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

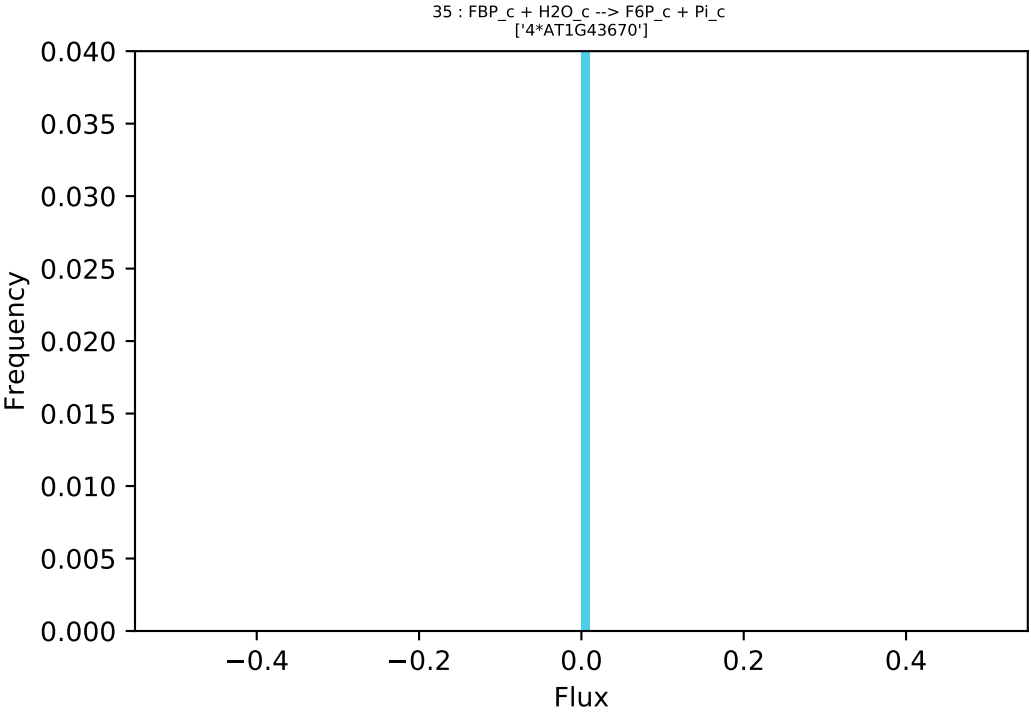

30 : ATP_c + Glc_c --> ADP_c + G6P_c + H_c
['AT2G19860']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

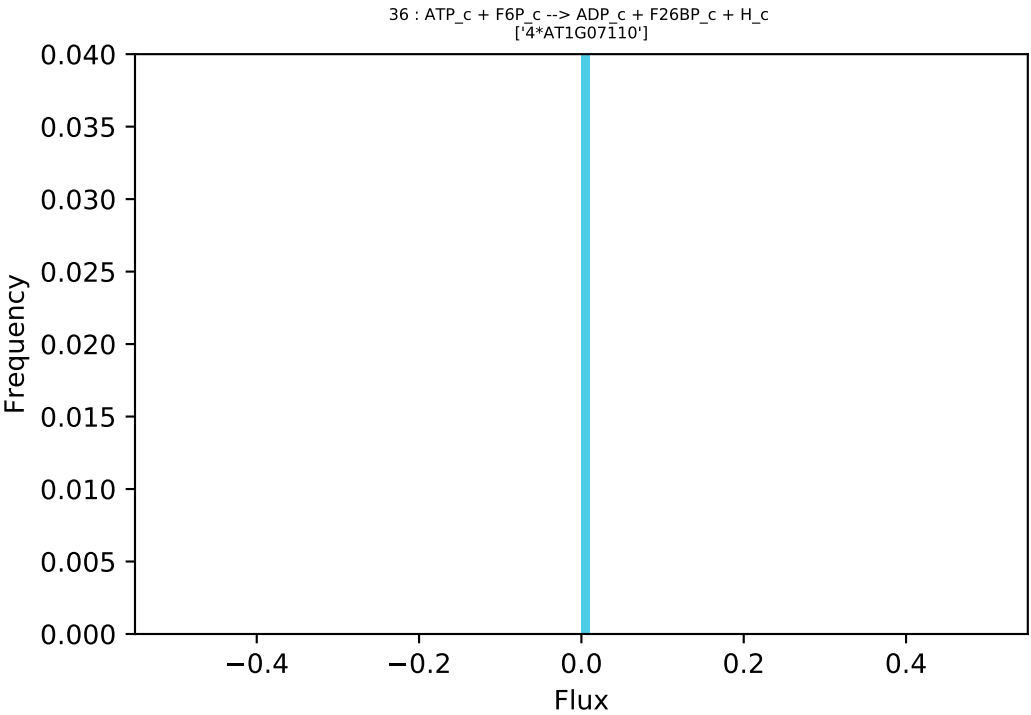

31 : Pi_h + starch2_h --> G1P_h + starch1_h
['AT3G46970', 'AT1G69830']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

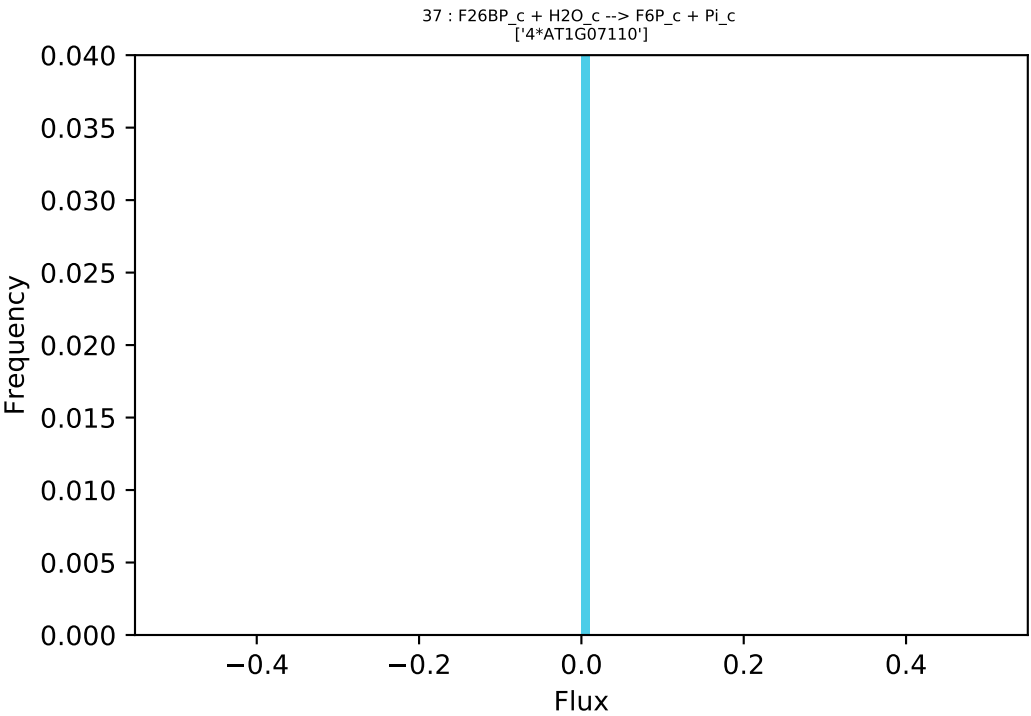

32 : Pi_c + starch2_c --> G1P_c + starch1_c
['AT3G46970']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

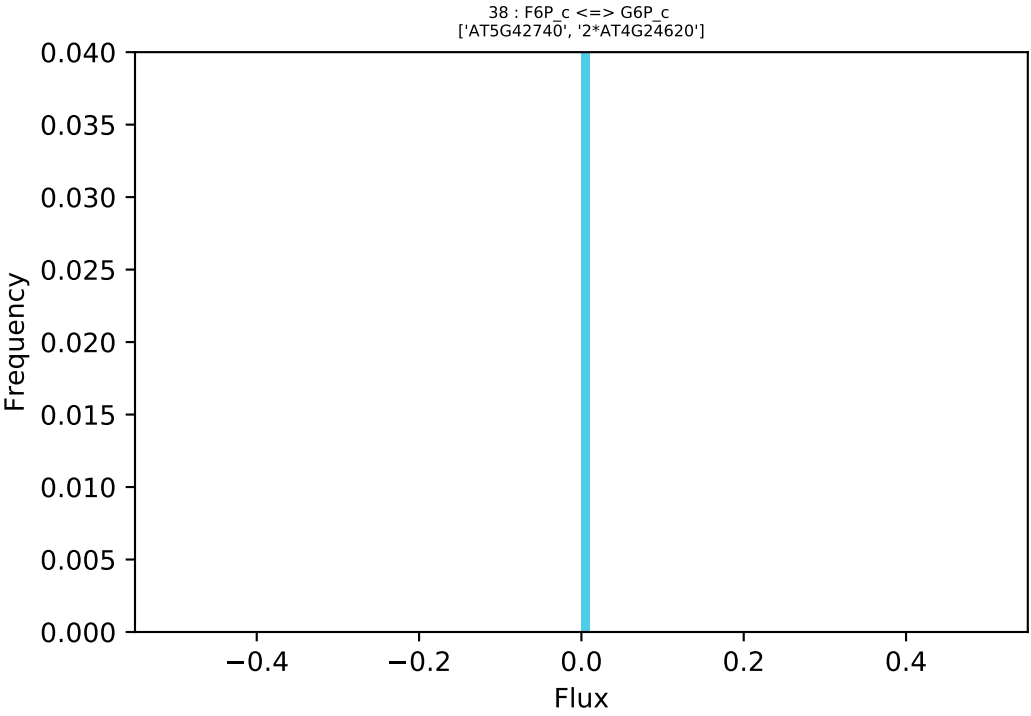

33 : GAP_c --> DHAP_c
['2*AT3G55440', 'AT2G21170']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

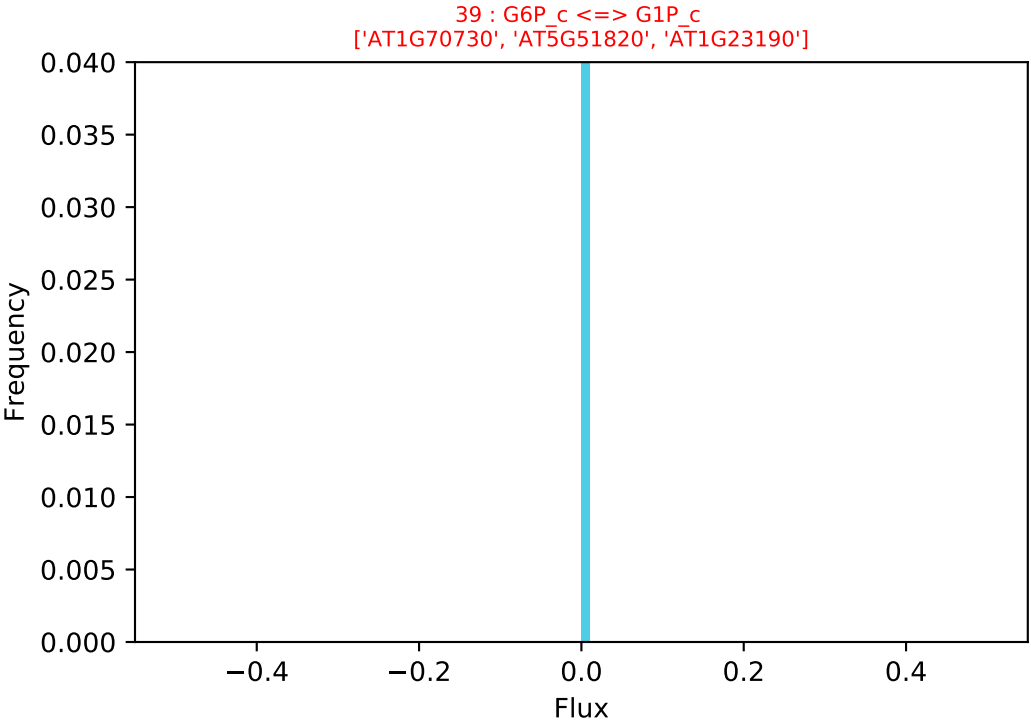

34 : DHAP_c + GAP_c --> FBP_c
['AT2G36460', '4*AT4G26520', 'AT4G26530', 'AT3G52930', 'AT5G03690']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

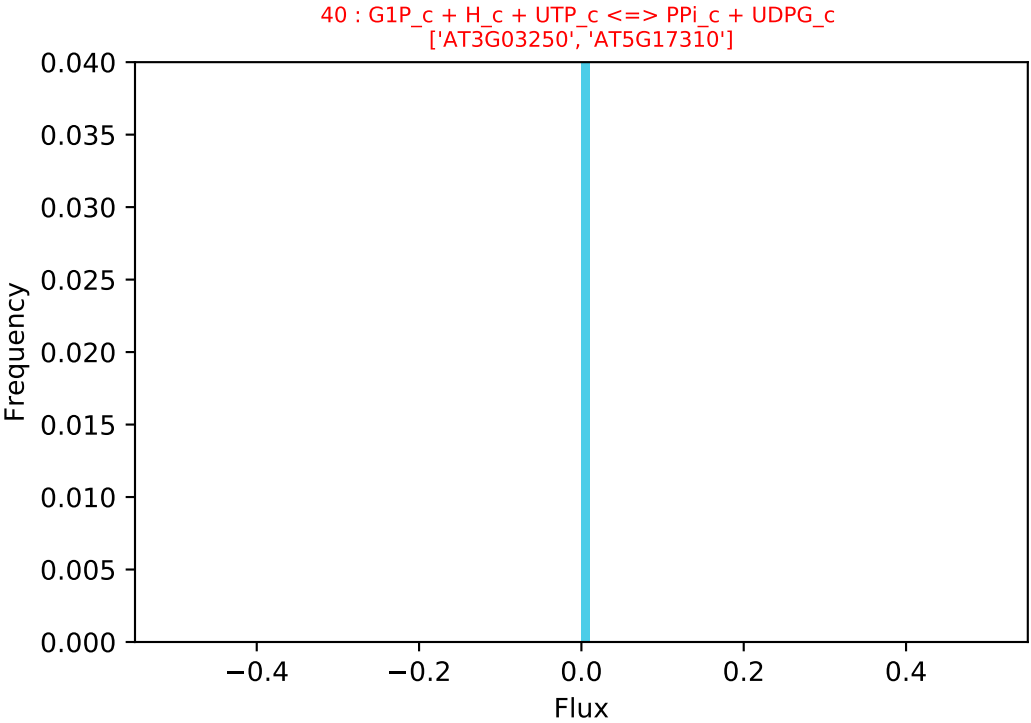

35 : FBP_c + H2O_c --> F6P_c + Pi_c
['4*AT1G43670']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

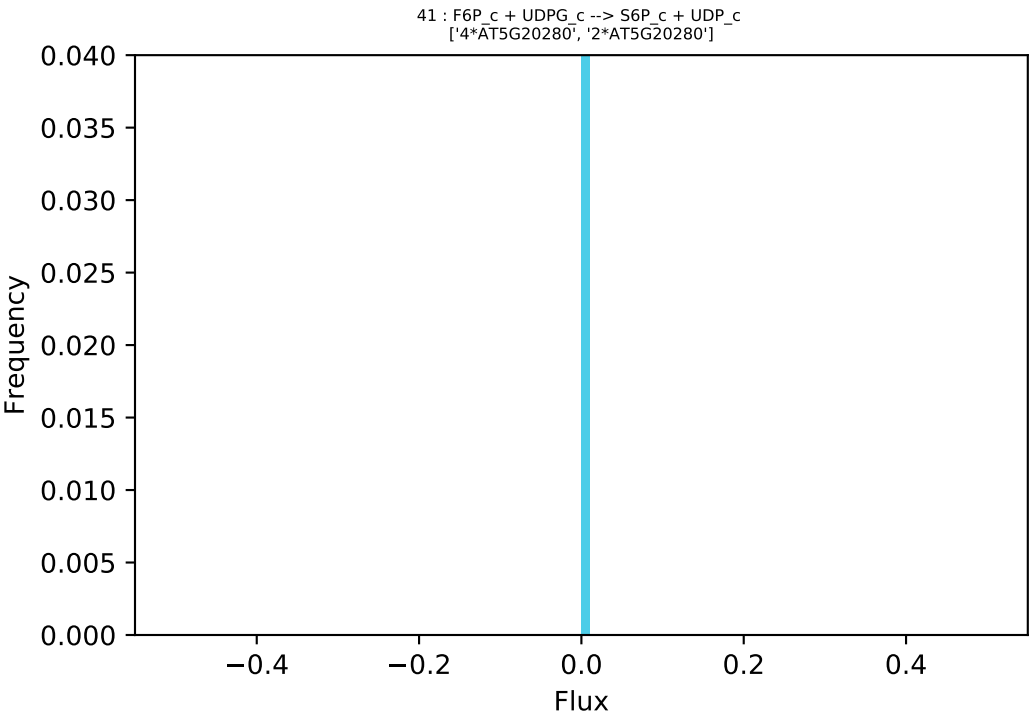

36 : ATP_c + F6P_c --> ADP_c + F26BP_c + H_c
['4*AT1G07110']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

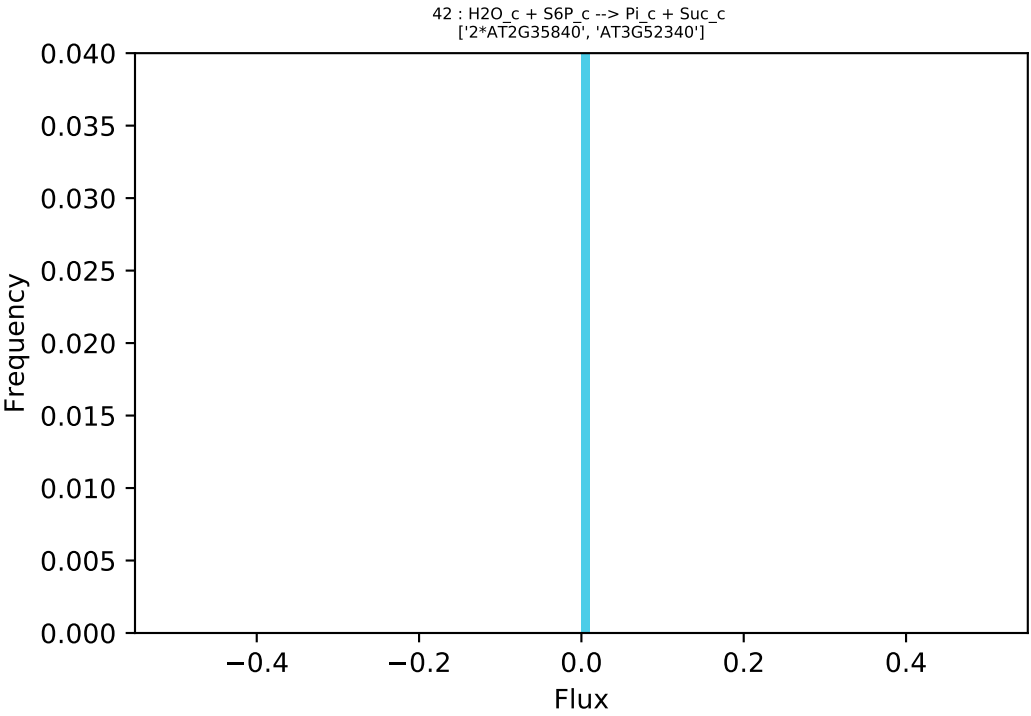

37 : F26BP_c + H2O_c --> F6P_c + Pi_c
['4*AT1G07110']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

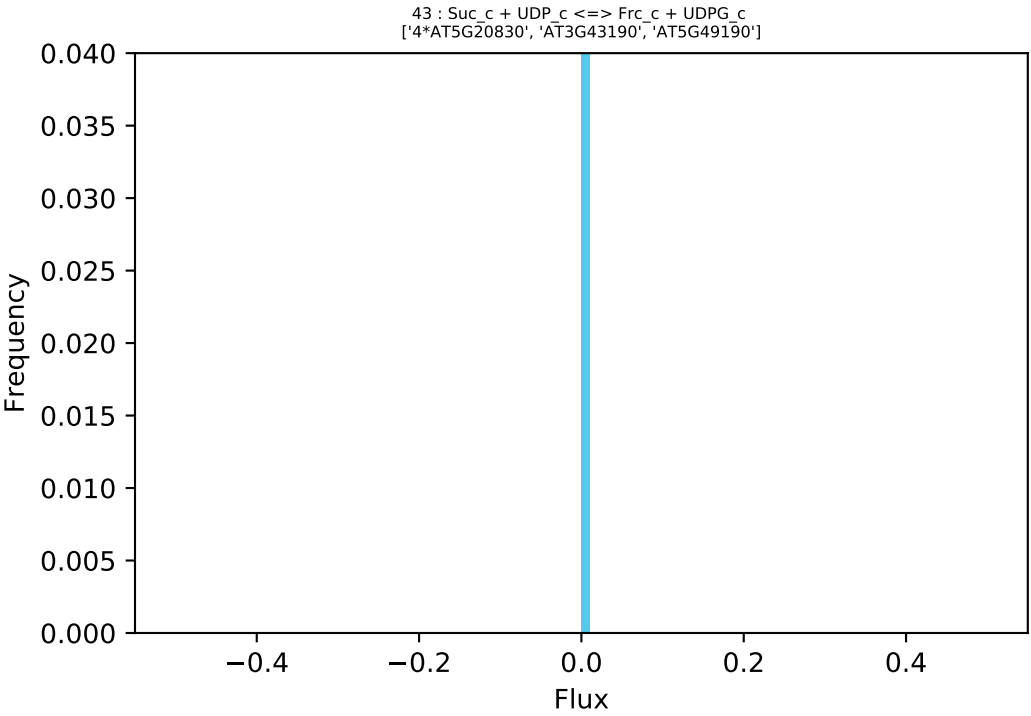

38 : F6P_c <=> G6P_c
['AT5G42740', '2*AT4G24620']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

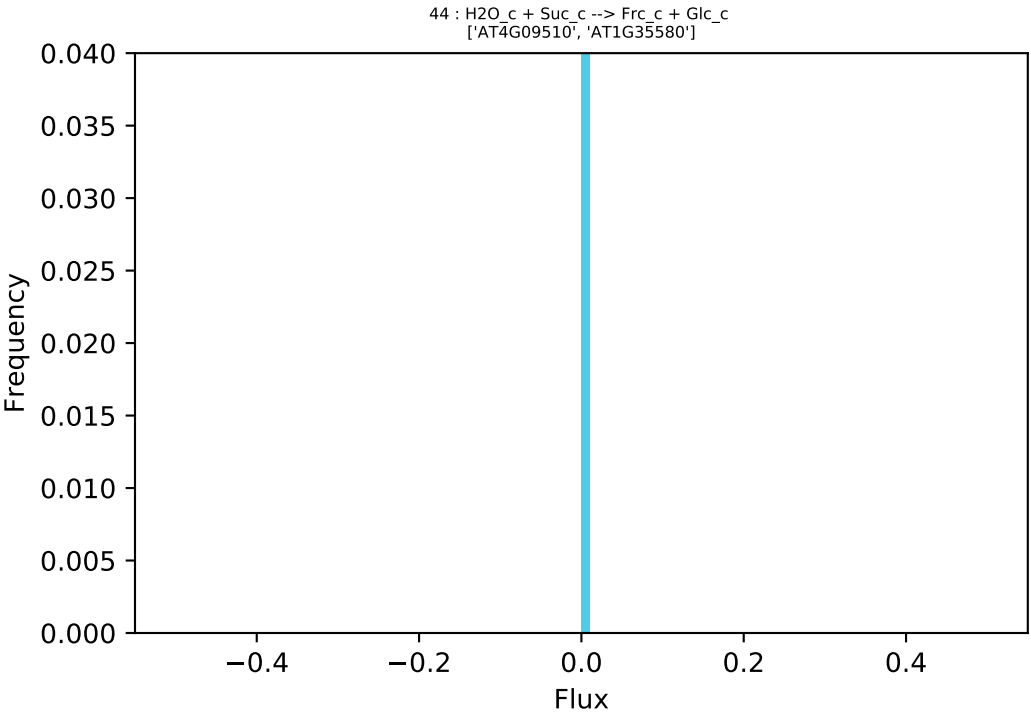

39 : G6P_c <=> G1P_c
['AT1G70730', 'AT5G51820', 'AT1G23190']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

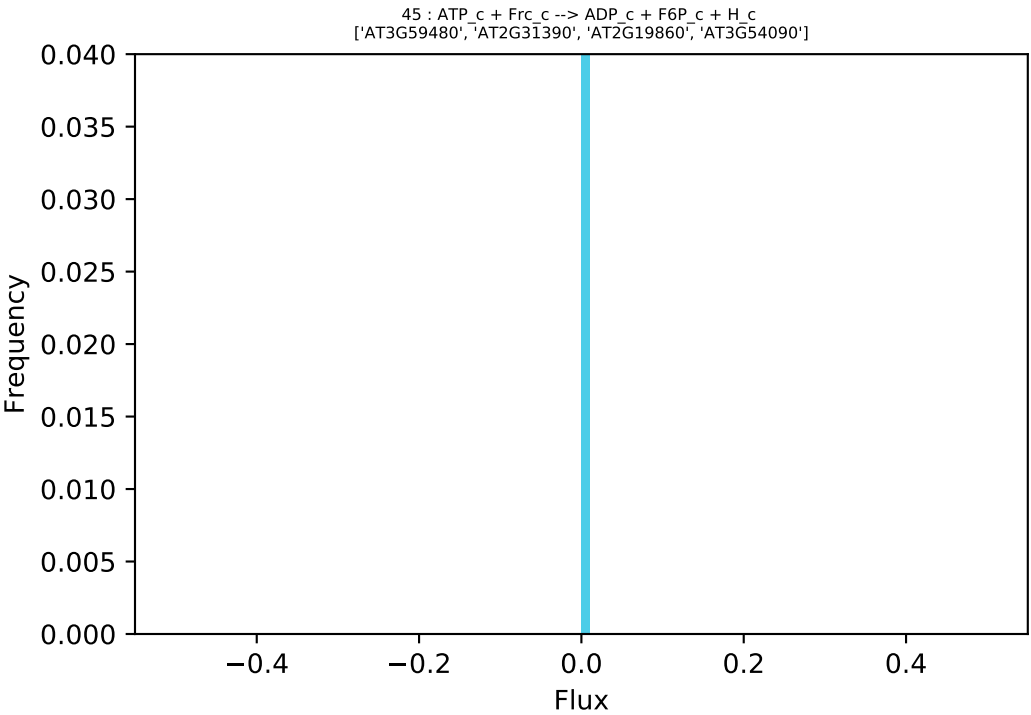

40 : G1P_c + H_c + UTP_c <=> PPi_c + UDPG_c
['AT3G03250', 'AT5G17310']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

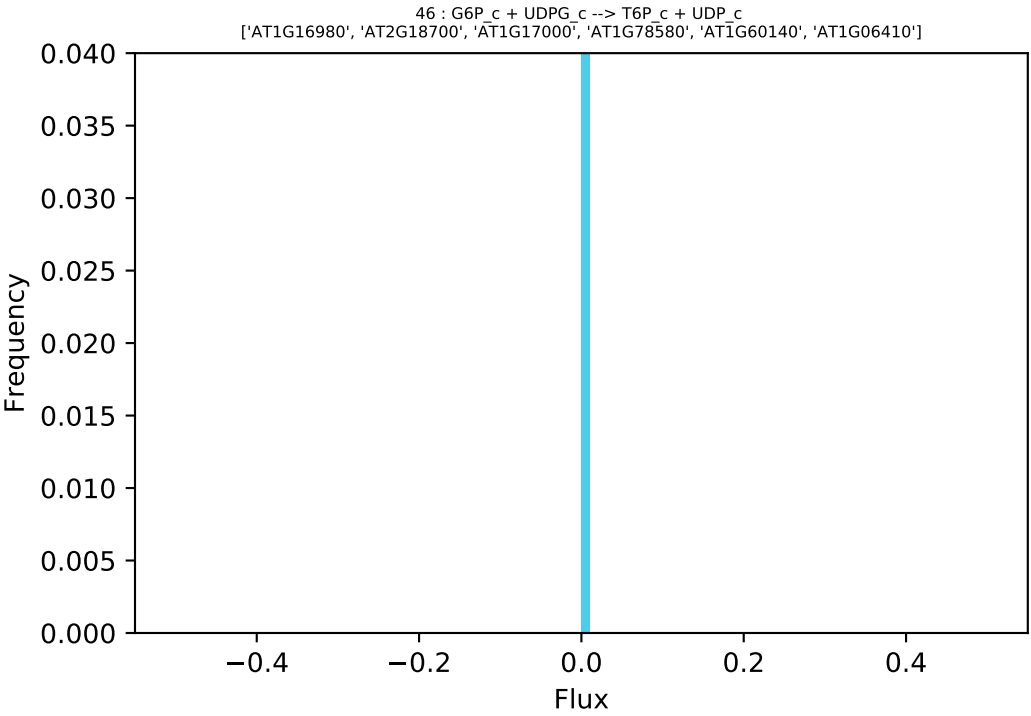

41 : F6P_c + UDPG_c --> S6P_c + UDP_c
['4*AT5G20280', '2*AT5G20280']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

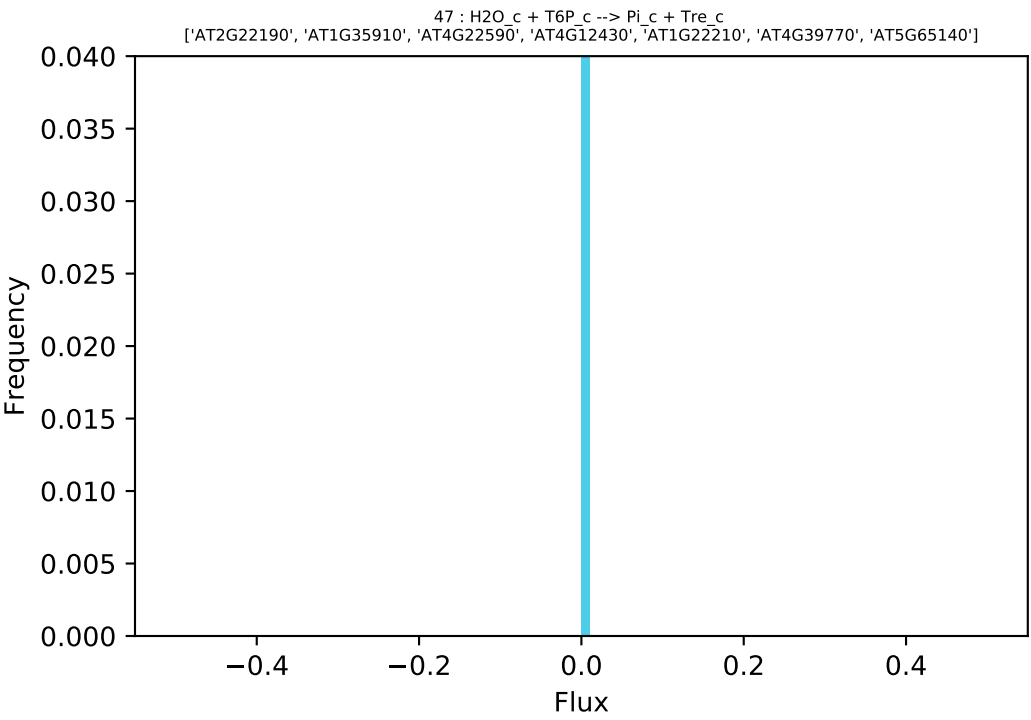

42 : H2O_c + S6P_c --> Pi_c + Suc_c
['2*AT2G35840', 'AT3G52340']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

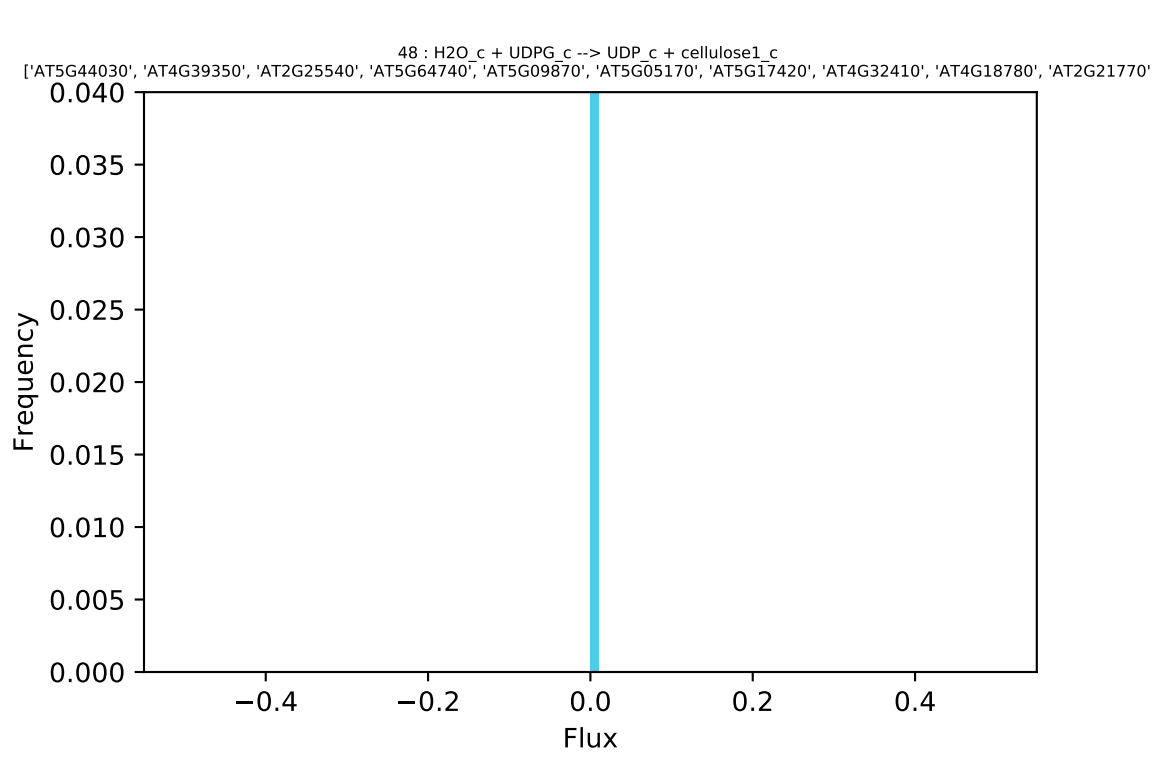

43 : Suc_c + UDP_c <=> Frc_c + UDPG_c
['4*AT5G20830', 'AT3G43190', 'AT5G49190']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

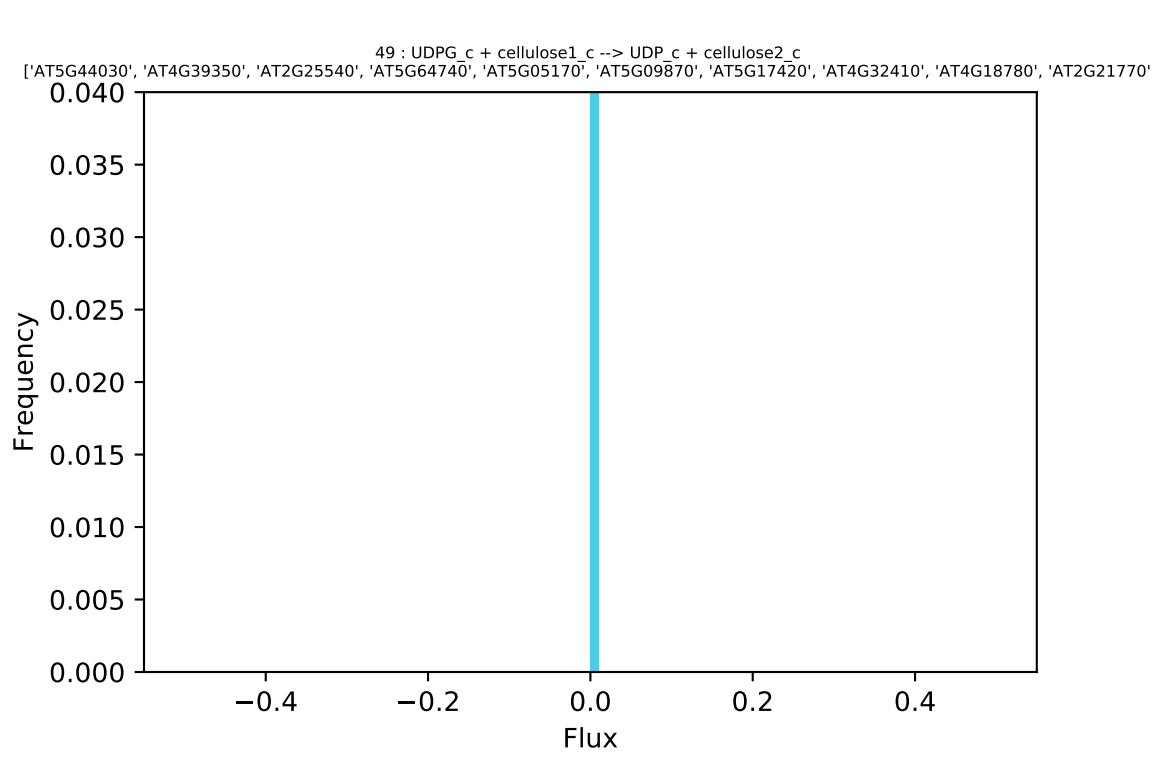

44 : H2O_c + Suc_c --> Frc_c + Glc_c
['AT4G09510', 'AT1G35580']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

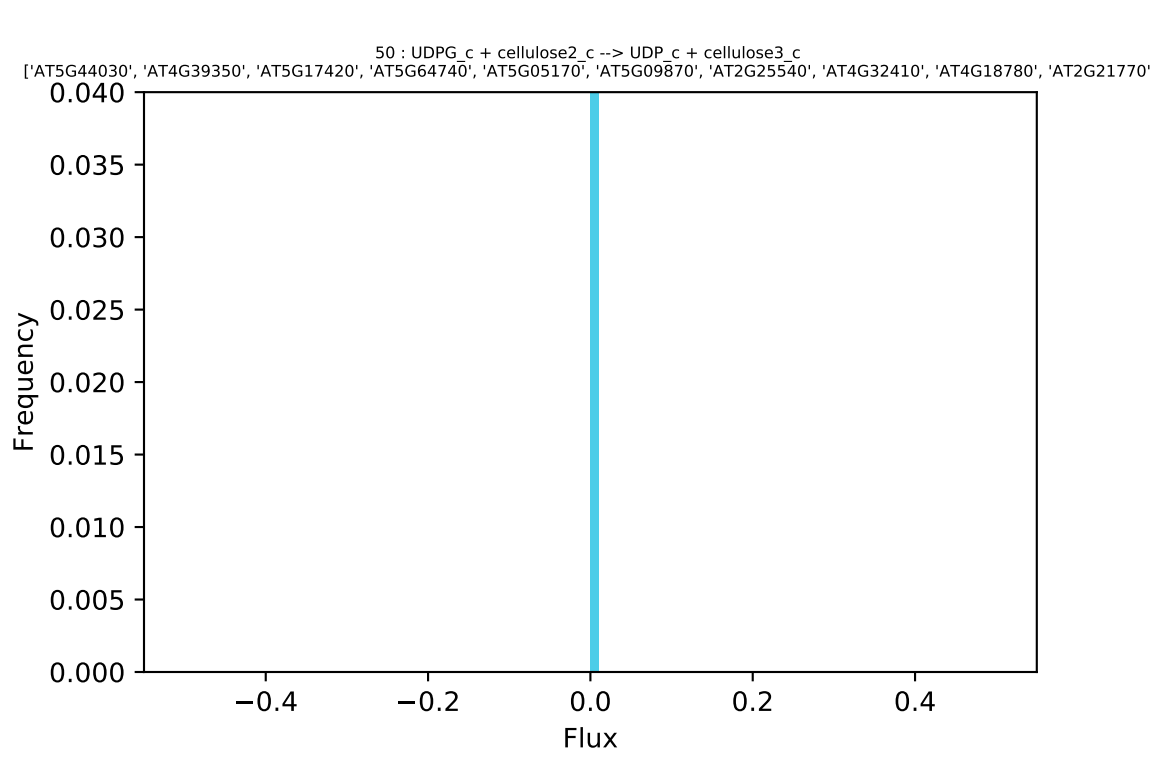

45 : ATP_c + Frc_c --> ADP_c + F6P_c + H_c
['AT3G59480', 'AT2G31390', 'AT2G19860', 'AT3G54090']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

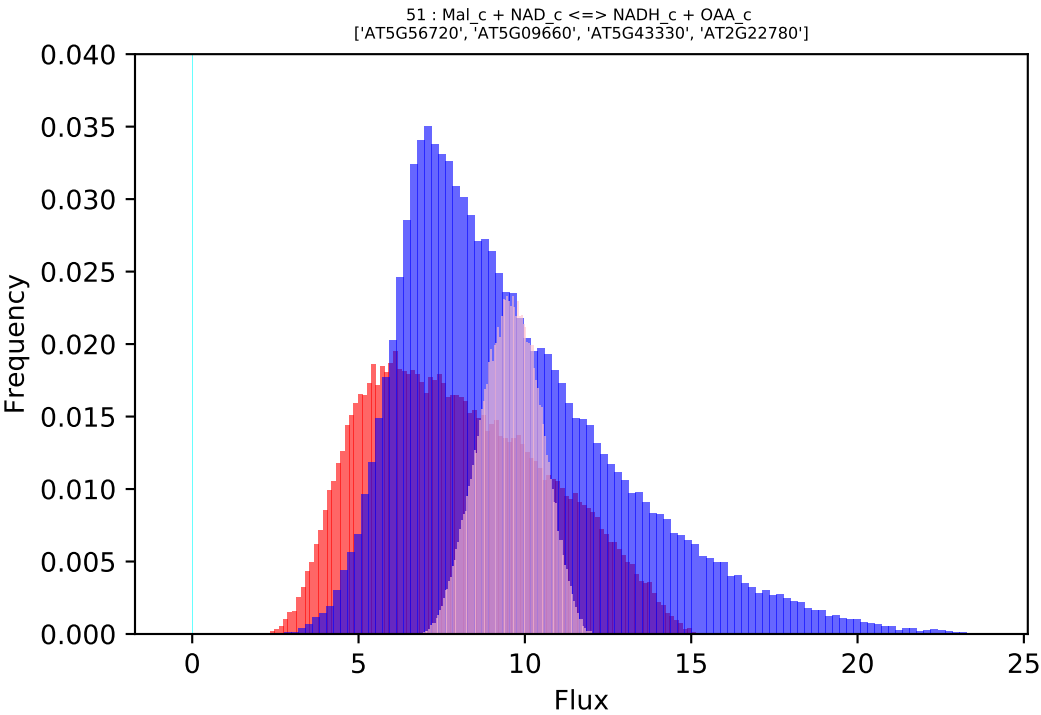

46 : G6P_c + UDPG_c --> T6P_c + UDP_c
['AT1G16980', 'AT2G18700', 'AT1G17000', 'AT1G78580', 'AT1G60140', 'AT1G06410']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

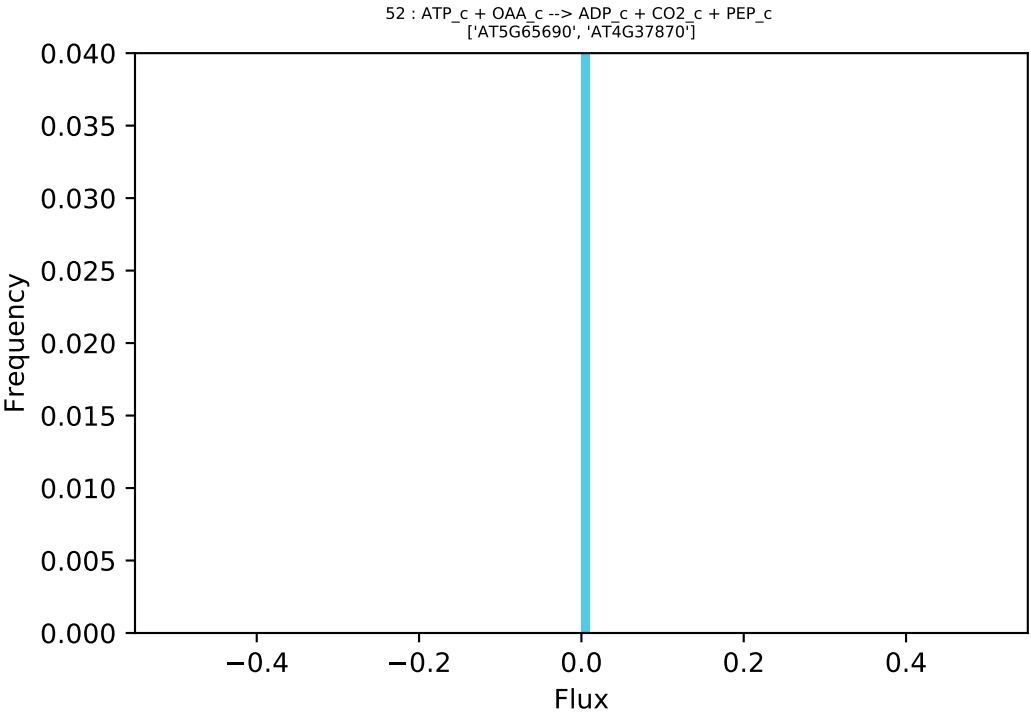

47 : H2O_c + T6P_c --> Pi_c + Tre_c
['AT2G22190', 'AT1G35910', 'AT4G22590', 'AT4G12430', 'AT1G22210', 'AT4G39770', 'AT5G65140']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

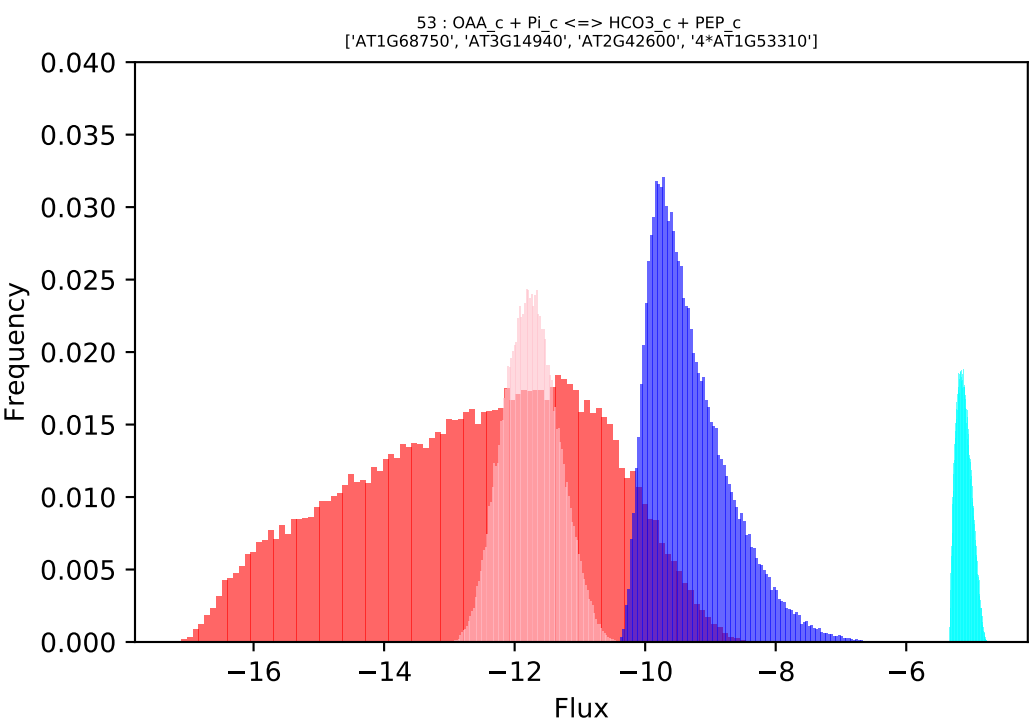

48 : H2O_c + UDPG_c --> UDP_c + cellulose1_c
['AT5G44030', 'AT4G39350', 'AT2G25540', 'AT5G64740', 'AT5G09870', 'AT5G05170', 'AT5G17420', 'AT4G32410', 'AT4G18780', 'AT2G21770'
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

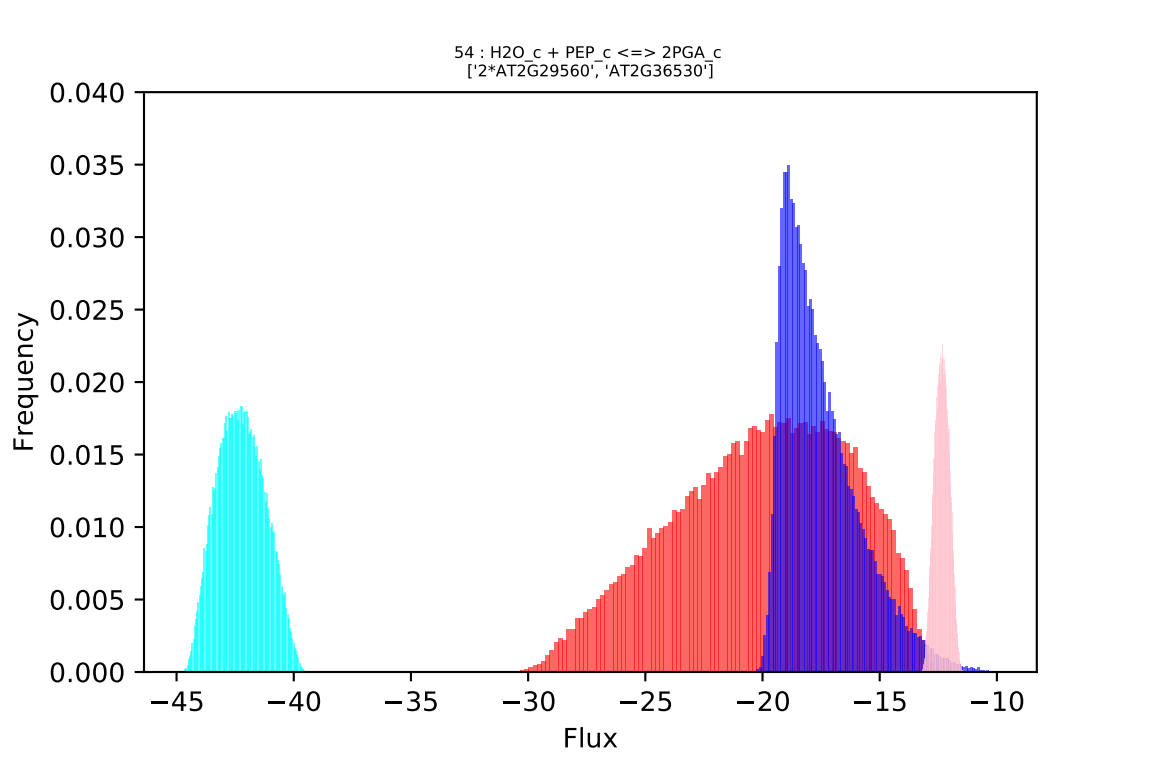

49 : UDPG_c + cellulose1_c --> UDP_c + cellulose2_c
['AT5G44030', 'AT4G39350', 'AT2G25540', 'AT5G64740', 'AT5G05170', 'AT5G09870', 'AT5G17420', 'AT4G32410', 'AT4G18780', 'AT2G21770'
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

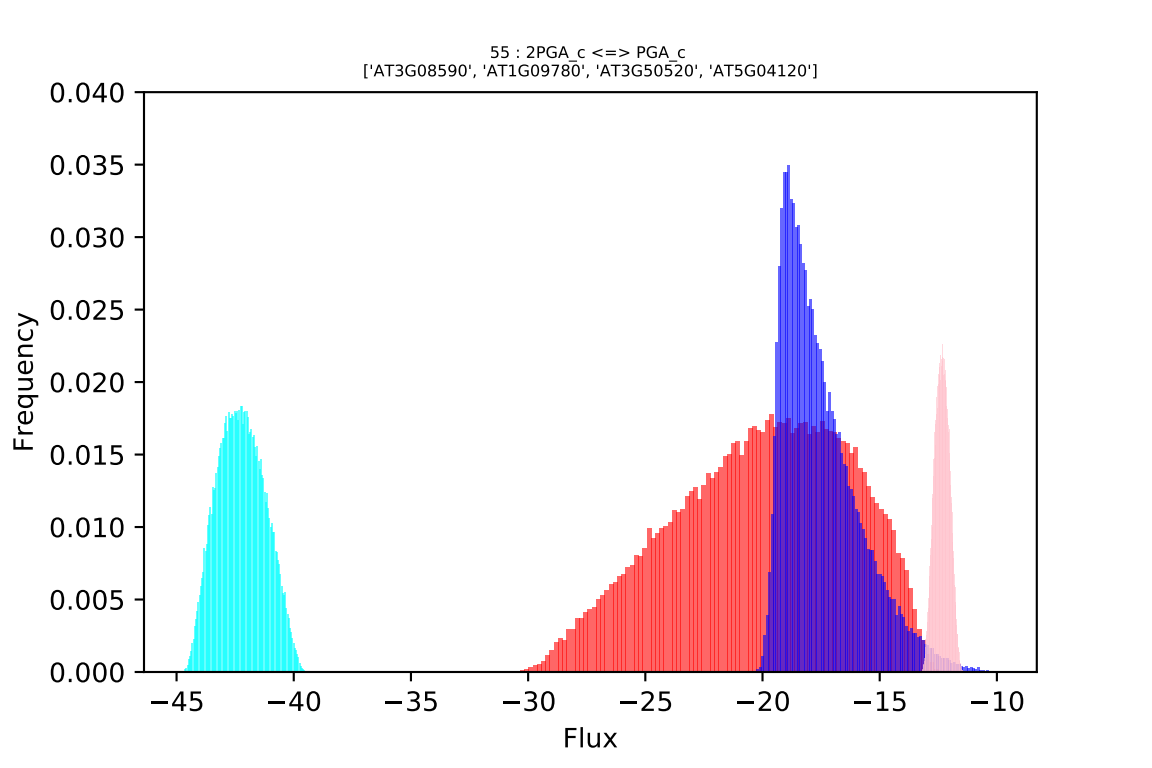

50 : UDPG_c + cellulose2_c --> UDP_c + cellulose3_c
['AT5G44030', 'AT4G39350', 'AT5G17420', 'AT5G64740', 'AT5G05170', 'AT5G09870', 'AT2G25540', 'AT4G32410', 'AT4G18780', 'AT2G21770'
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

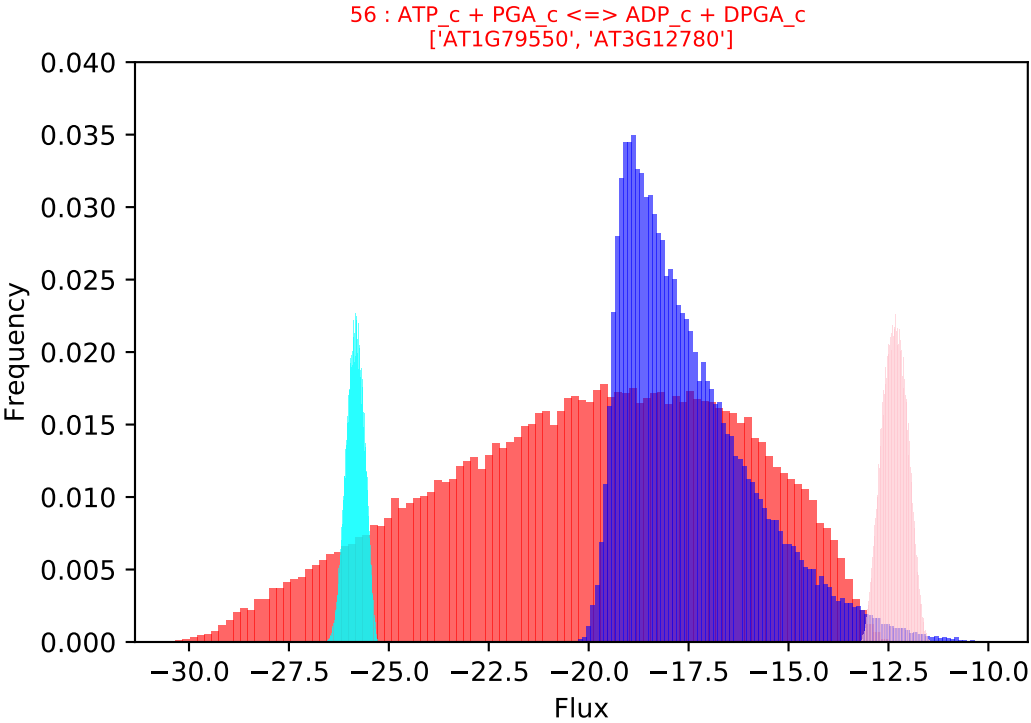

51 : Mal_c + NAD_c <=> NADH_c + OAA_c
['AT5G56720', 'AT5G09660', 'AT5G43330', 'AT2G22780']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0
5
10
15
20
25
Flux

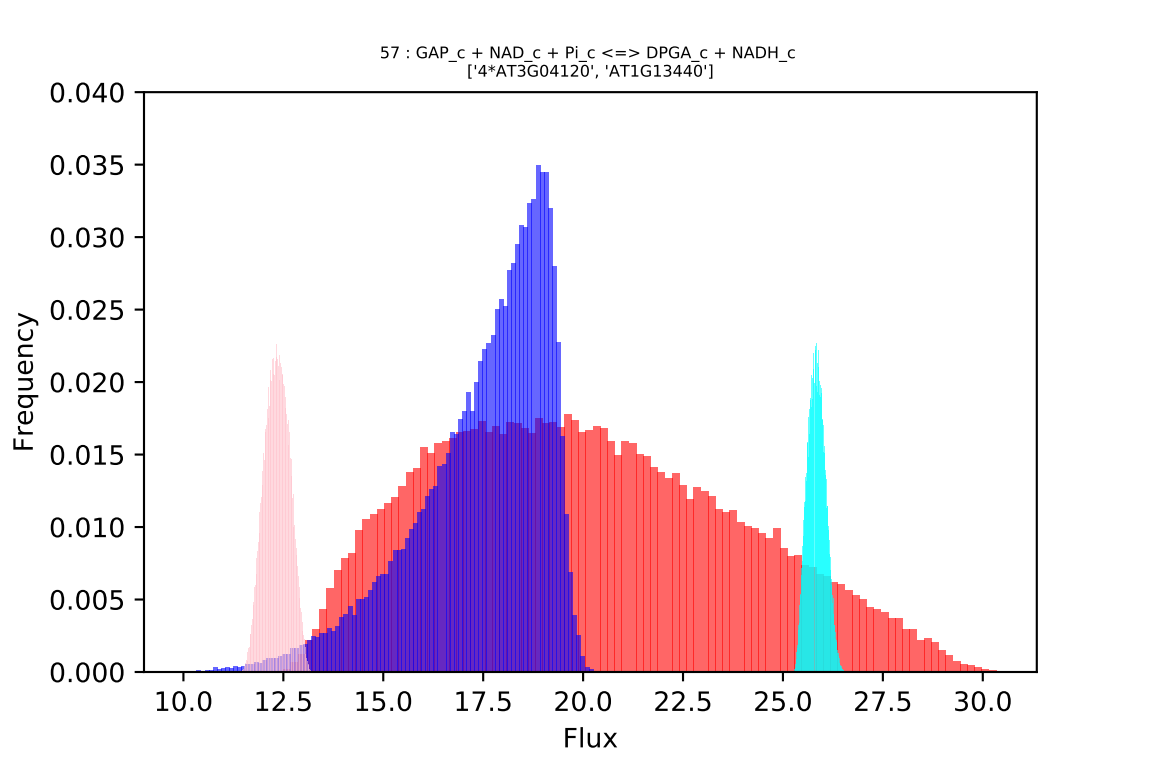

52 : ATP_c + OAA_c --> ADP_c + CO2_c + PEP_c
['AT5G65690', 'AT4G37870']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

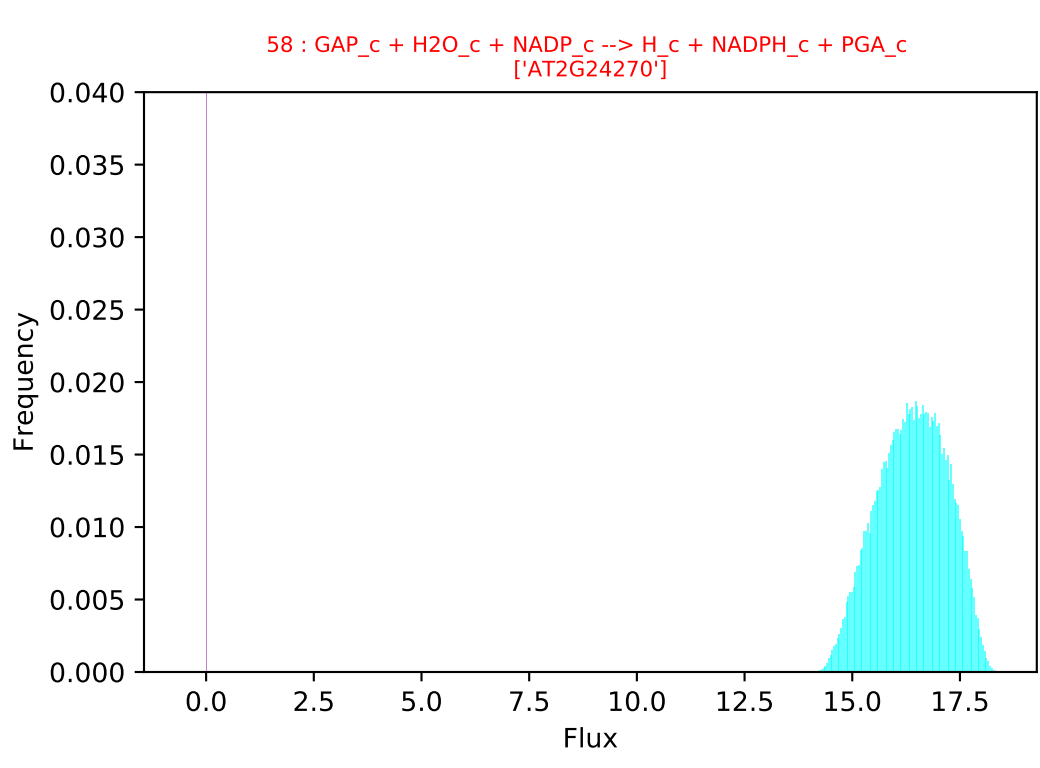

53 : OAA_c + Pi_c <=> HCO3_c + PEP_c
['AT1G68750', 'AT3G14940', 'AT2G42600', '4*AT1G53310']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−16
−14
−12
−10
−8
−6
Flux

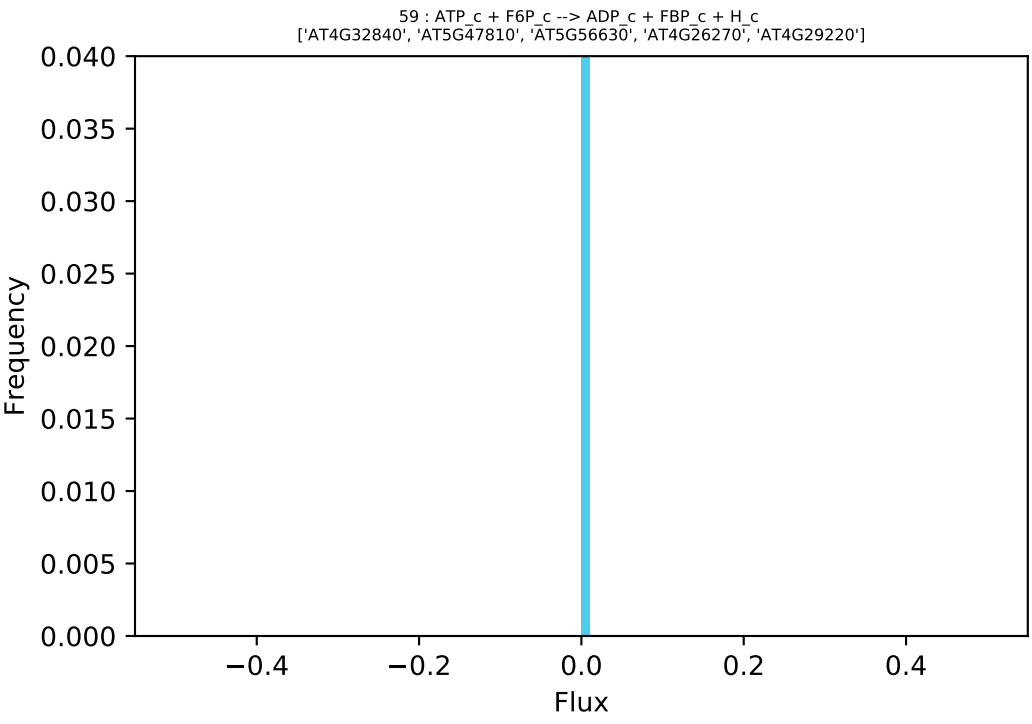

54 : H2O_c + PEP_c <=> 2PGA_c
['2*AT2G29560', 'AT2G36530']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−45
−40
−35
−30
−25
−20
−15
−10
Flux

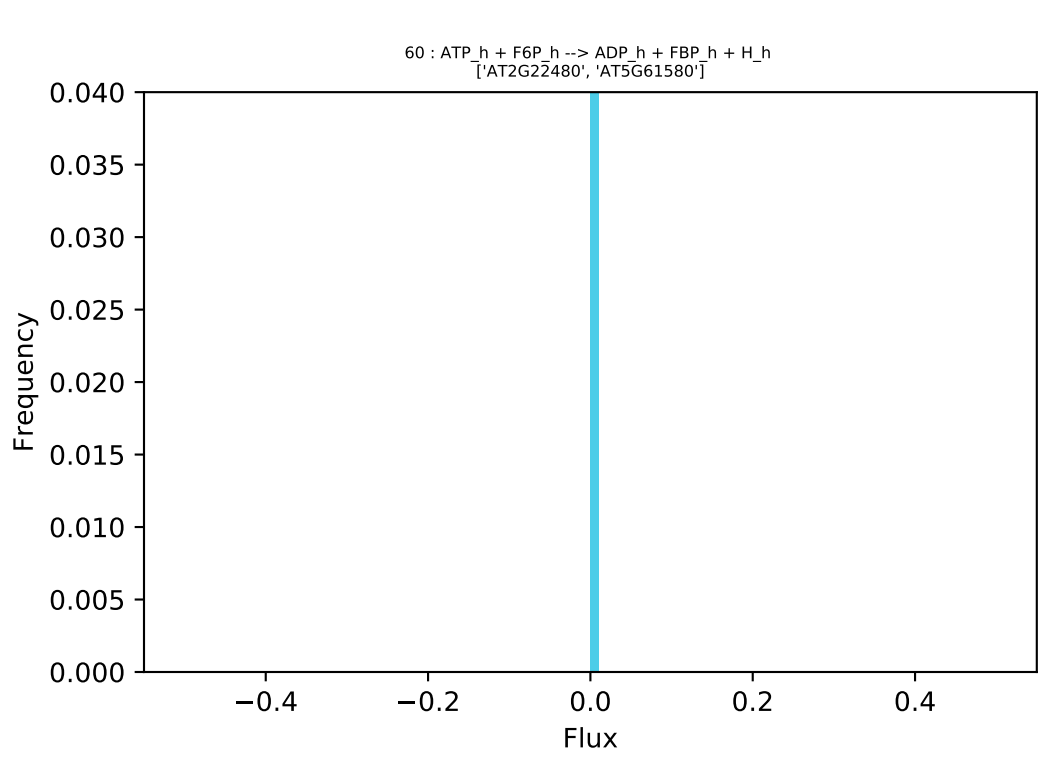

55 : 2PGA_c <=> PGA_c
['AT3G08590', 'AT1G09780', 'AT3G50520', 'AT5G04120']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−45
−40
−35
−30
−25
−20
−15
−10
Flux

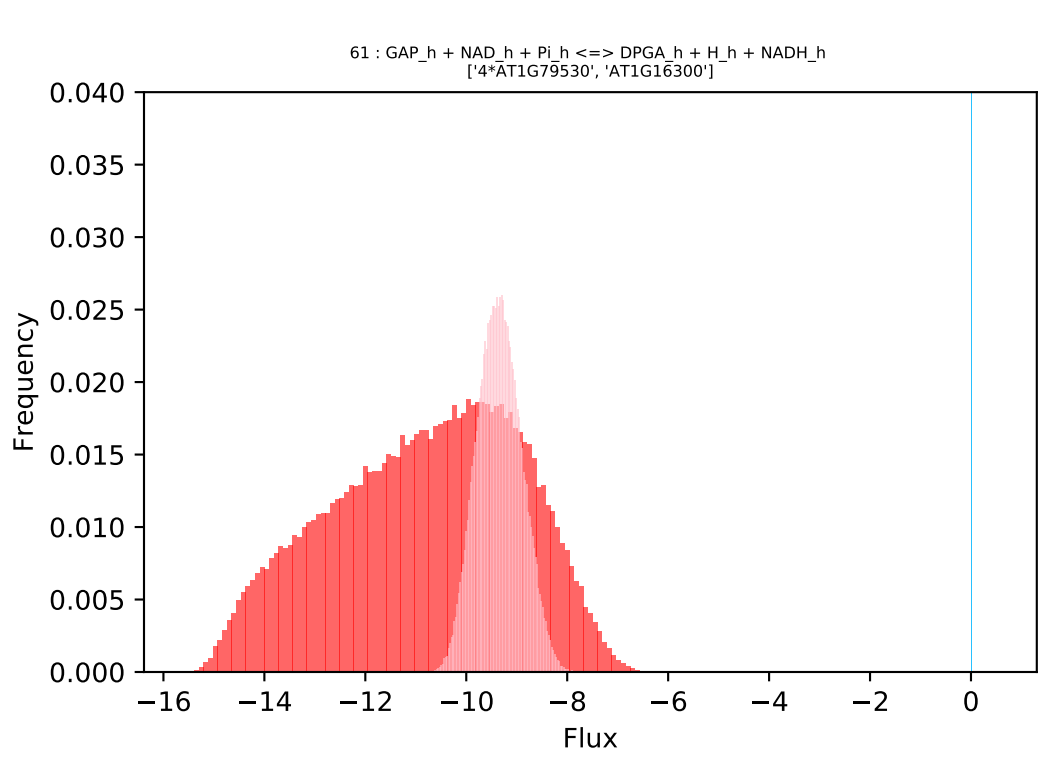

56 : ATP_c + PGA_c <=> ADP_c + DPGA_c
['AT1G79550', 'AT3G12780']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−30.0
−27.5
−25.0
−22.5
−20.0
−17.5
−15.0
−12.5
−10.0
Flux

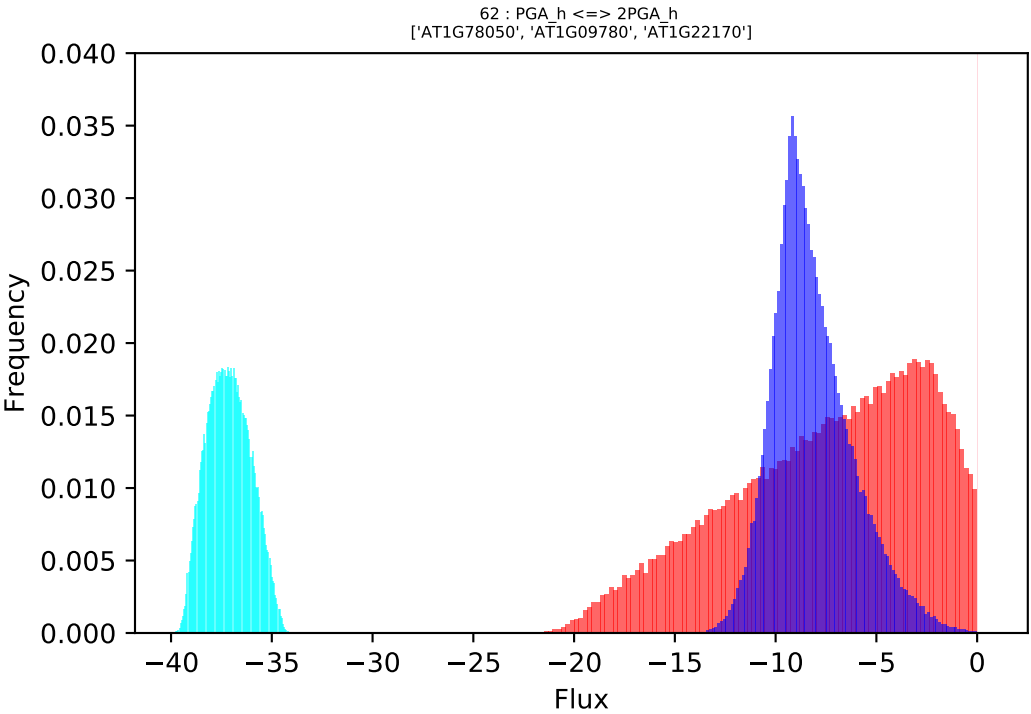

57 : GAP_c + NAD_c + Pi_c <=> DPGA_c + NADH_c
['4*AT3G04120', 'AT1G13440']
Frequency
Flux
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
10.0
12.5
15.0
17.5
20.0
22.5
25.0
27.5
30.0

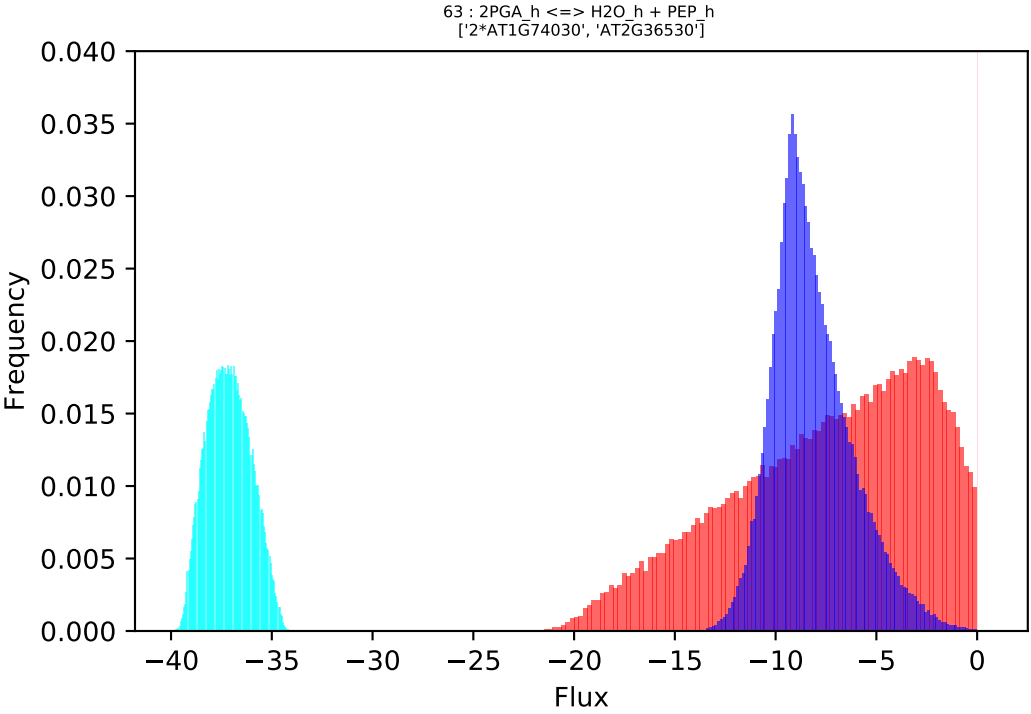

58 : GAP_c + H2O_c + NADP_c --> H_c + NADPH_c + PGA_c
['AT2G24270']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0.0
2.5
5.0
7.5
10.0
12.5
15.0
17.5
Flux

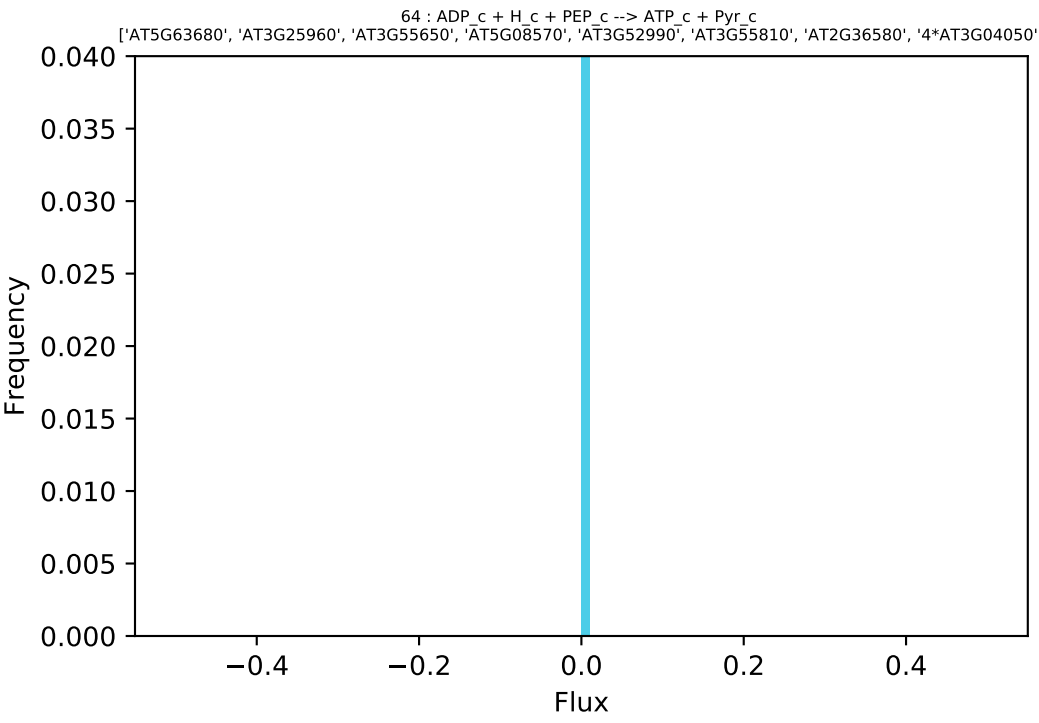

59 : ATP_c + F6P_c --> ADP_c + FBP_c + H_c
['AT4G32840', 'AT5G47810', 'AT5G56630', 'AT4G26270', 'AT4G29220']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

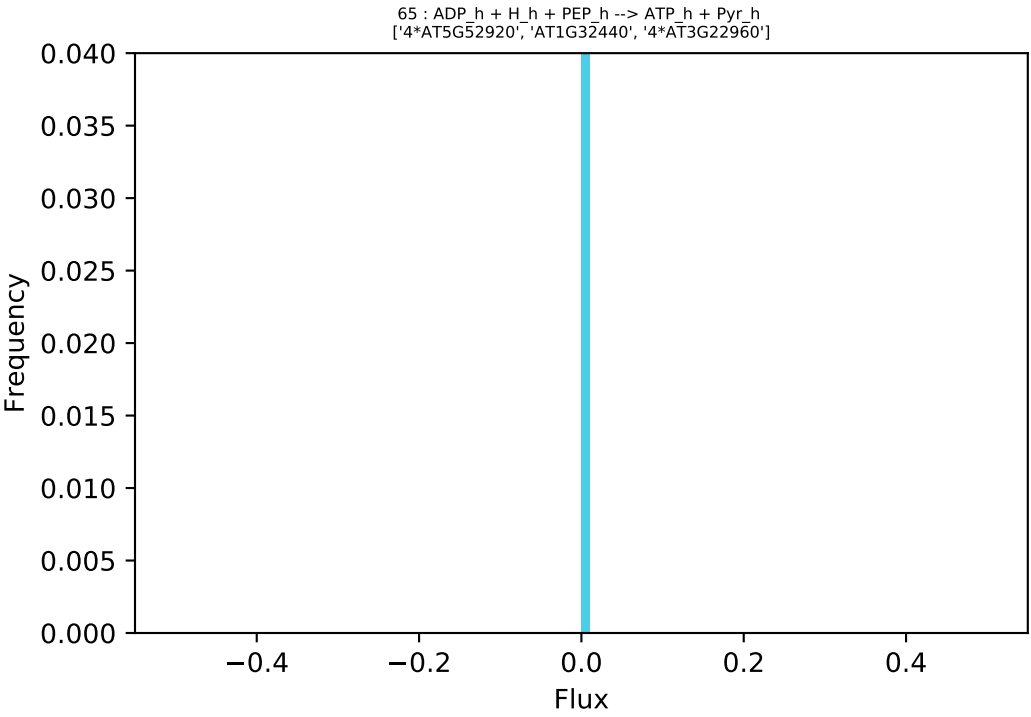

60 : ATP_h + F6P_h --> ADP_h + FBP_h + H_h
['AT2G22480', 'AT5G61580']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

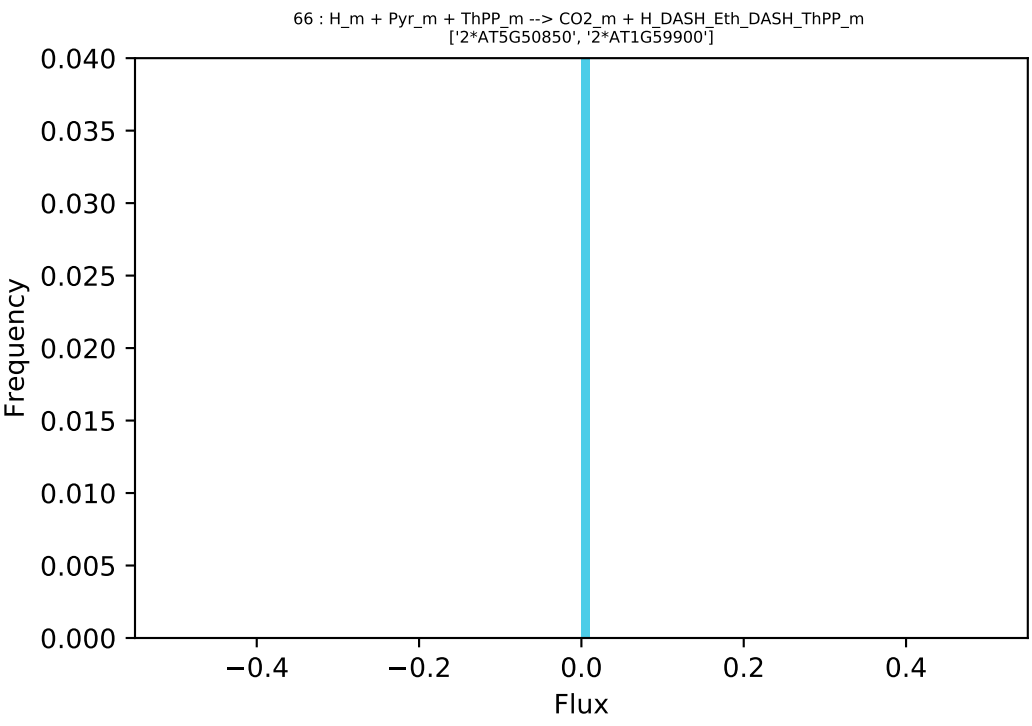

61 : GAP_h + NAD_h + Pi_h <=> DPGA_h + H_h + NADH_h
['4*AT1G79530', 'AT1G16300']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−16
−14
−12
−10
−8
−6
−4
−2
0
Flux

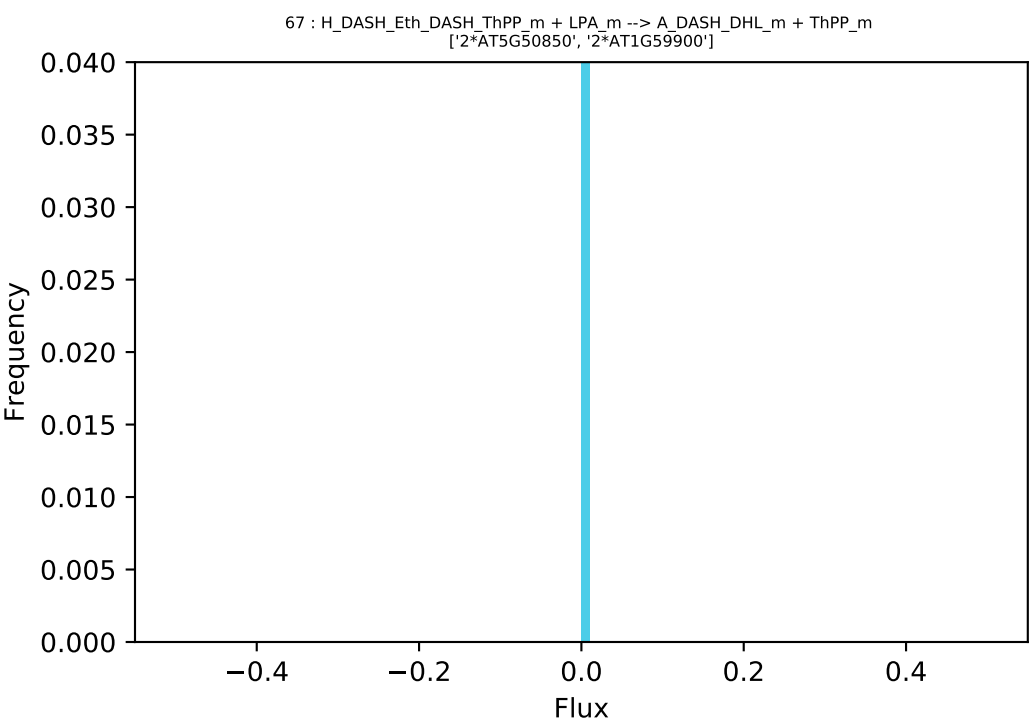

62 : PGA_h <=> 2PGA_h
['AT1G78050', 'AT1G09780', 'AT1G22170']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−40
−35
−30
−25
−20
−15
−10
−5
0
Flux

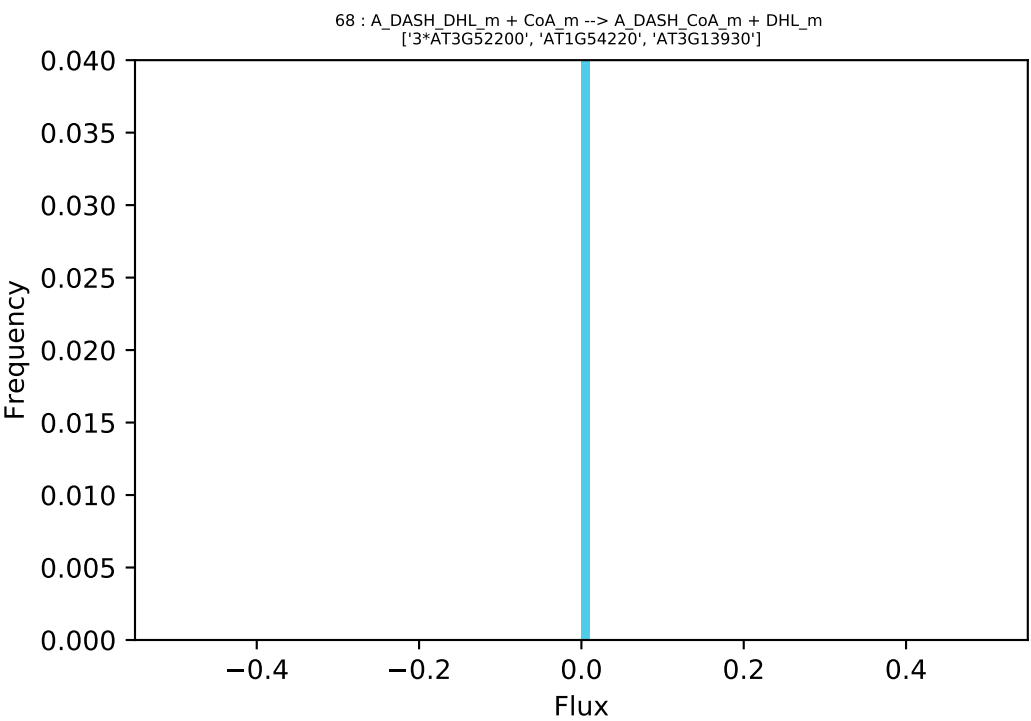

63 : 2PGA_h <=> H2O_h + PEP_h
['2*AT1G74030', 'AT2G36530']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−40
−35
−30
−25
−20
−15
−10
−5
0
Flux

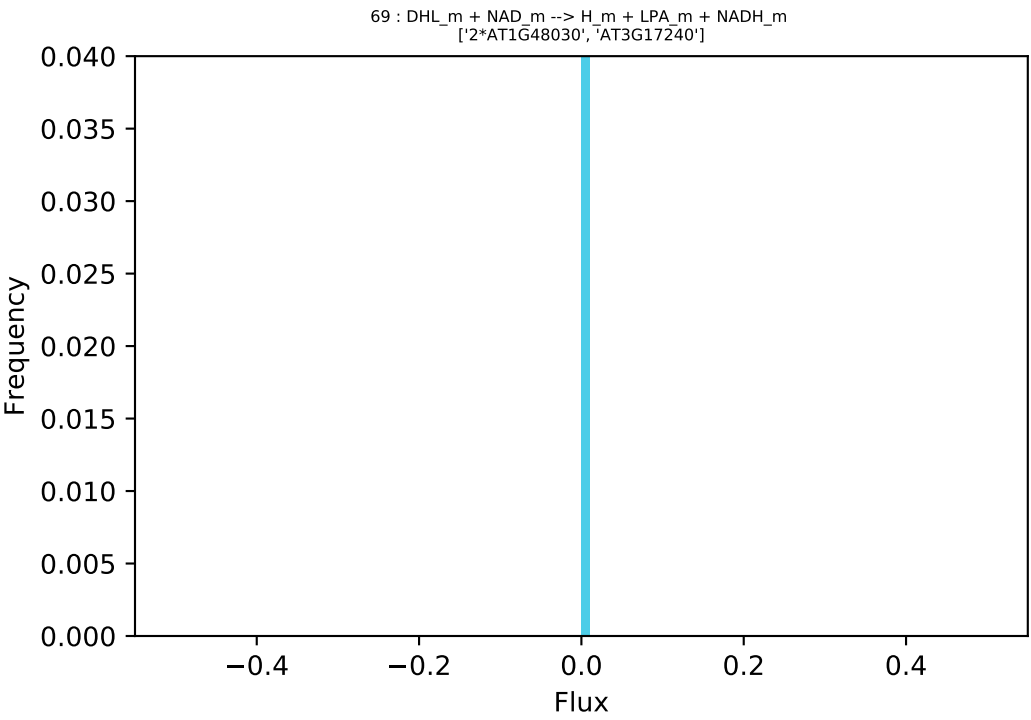

64 : ADP_c + H_c + PEP_c --> ATP_c + Pyr_c
['AT5G63680', 'AT3G25960', 'AT3G55650', 'AT5G08570', 'AT3G52990', 'AT3G55810', 'AT2G36580', '4*AT3G04050']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

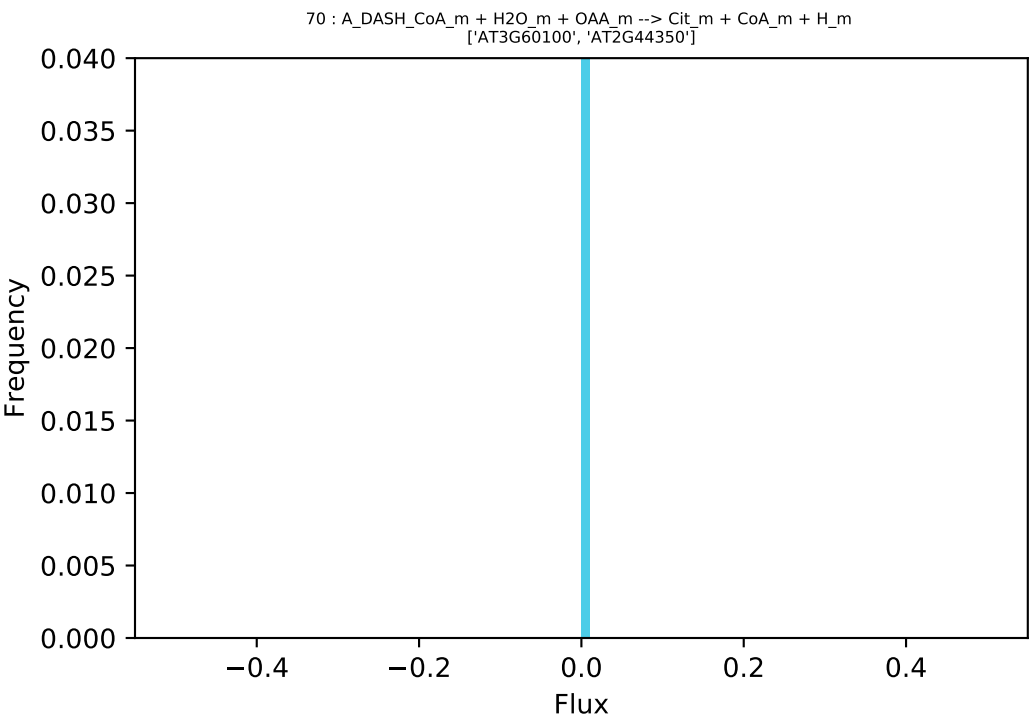

65 : ADP_h + H_h + PEP_h --> ATP_h + Pyr_h
['4*AT5G52920', 'AT1G32440', '4*AT3G22960']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

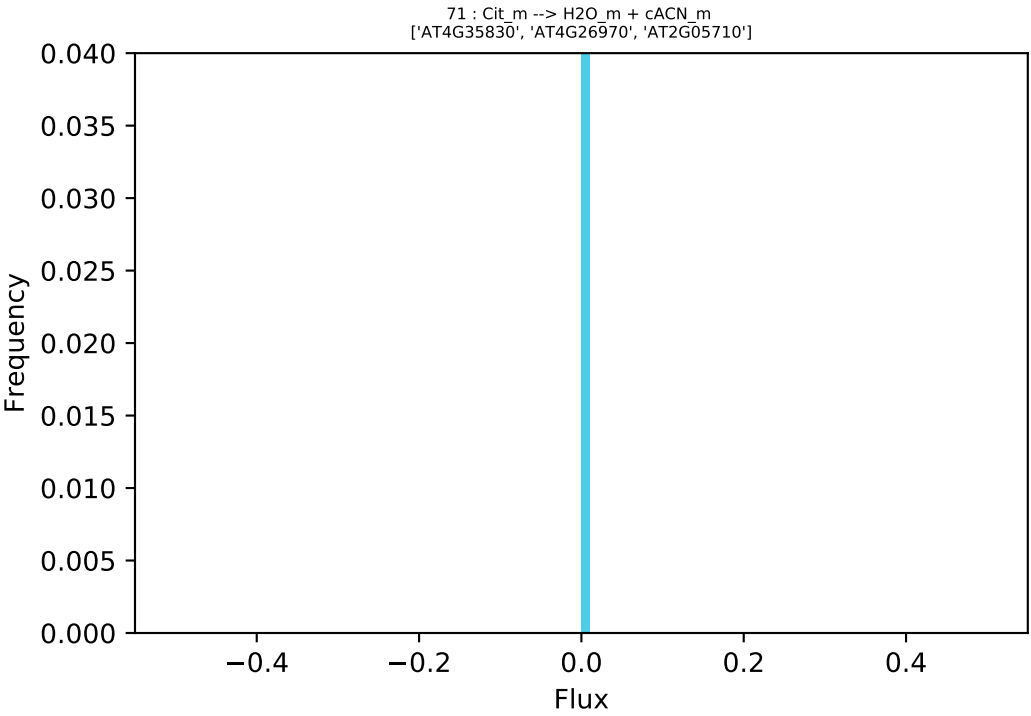

66 : H_m + Pyr_m + ThPP_m --> CO2_m + H_DASH_Eth_DASH_ThPP_m
['2*AT5G50850', '2*AT1G59900']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

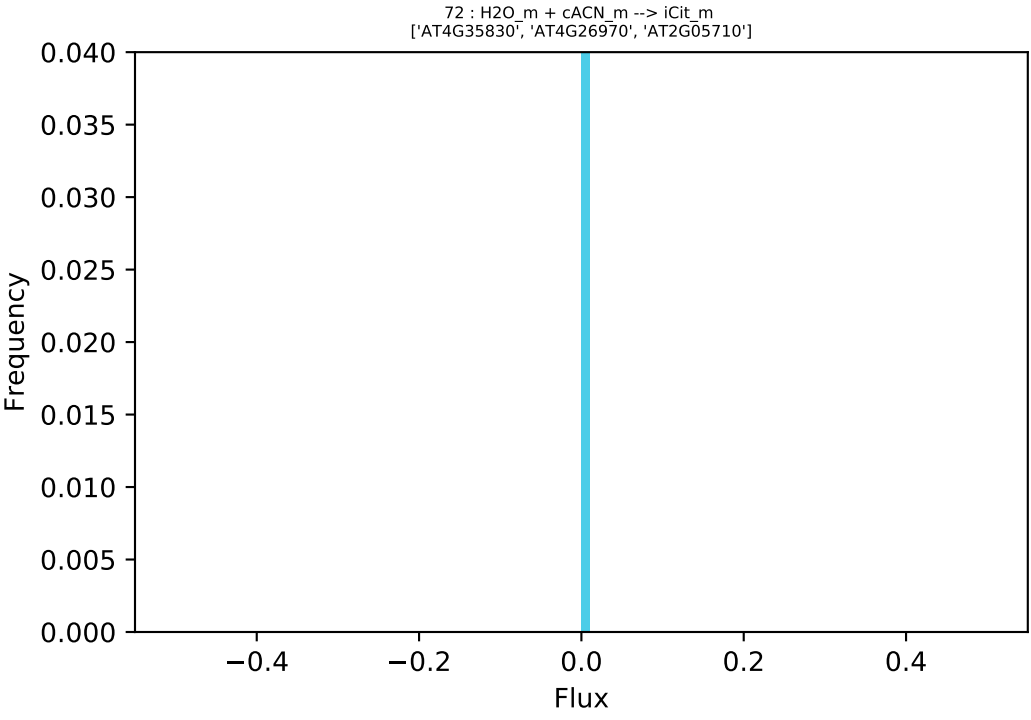

67 : H_DASH_Eth_DASH_ThPP_m + LPA_m --> A_DASH_DHL_m + ThPP_m
['2*AT5G50850', '2*AT1G59900']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

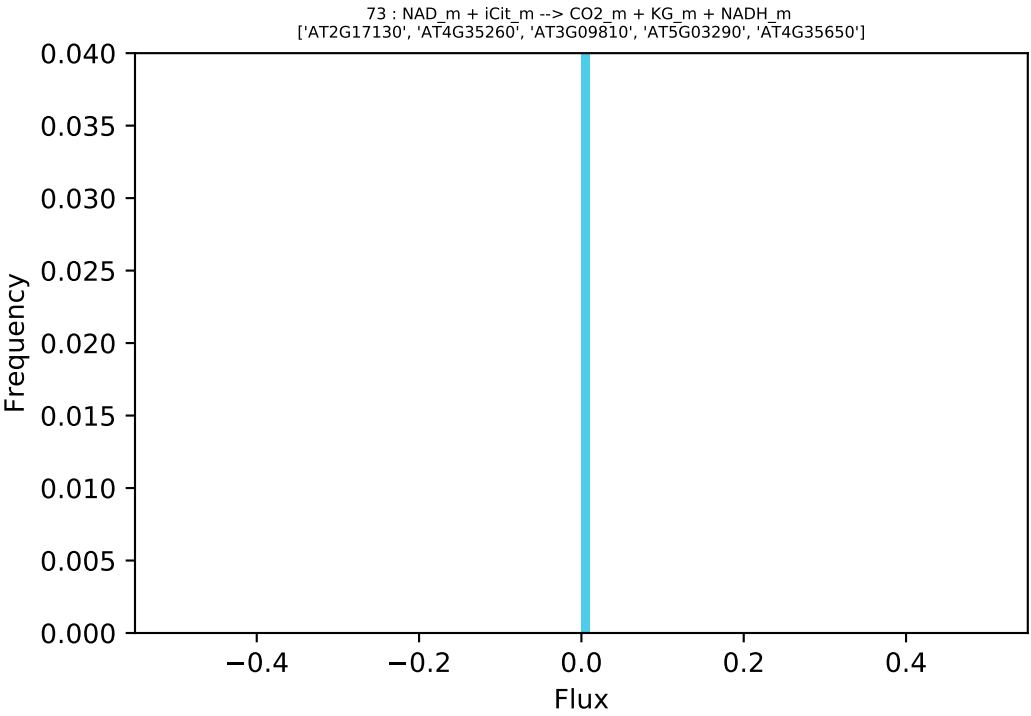

68 : A_DASH_DHL_m + CoA_m --> A_DASH_CoA_m + DHL_m
['3*AT3G52200', 'AT1G54220', 'AT3G13930']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

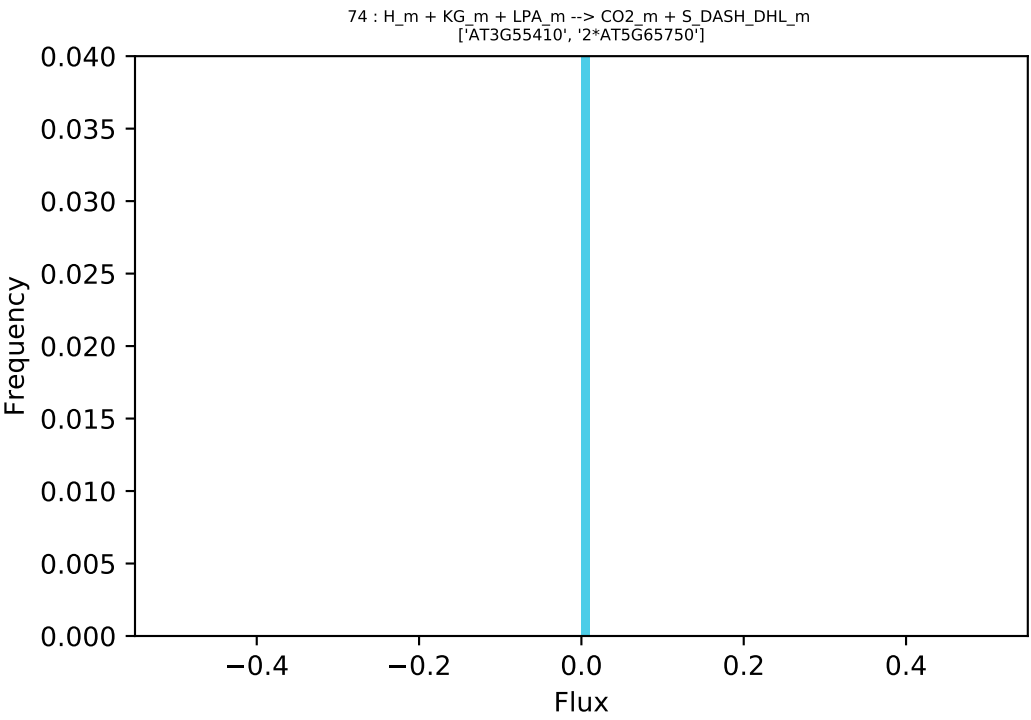

69 : DHL_m + NAD_m --> H_m + LPA_m + NADH_m
['2*AT1G48030', 'AT3G17240']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

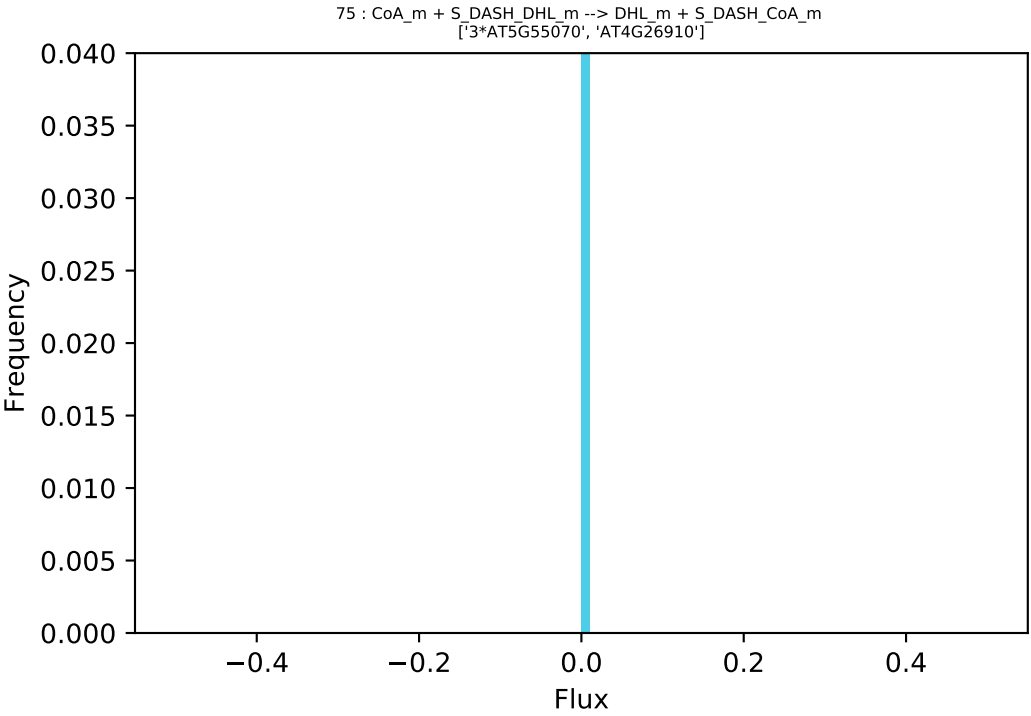

70 : A_DASH_CoA_m + H2O_m + OAA_m --> Cit_m + CoA_m + H_m
['AT3G60100', 'AT2G44350']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

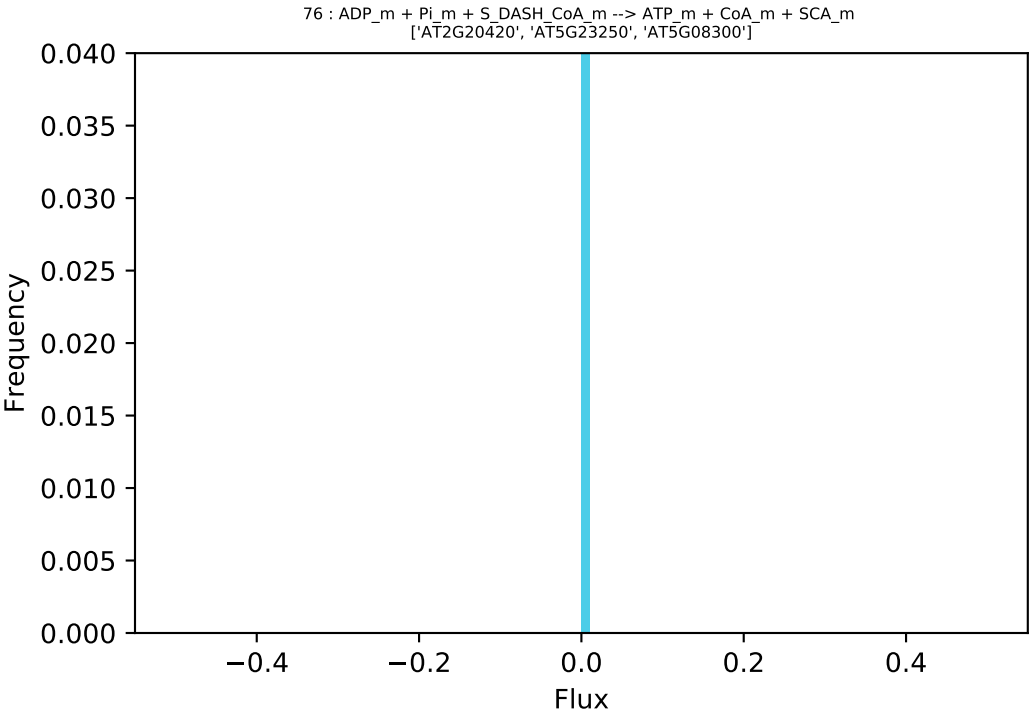

71 : Cit_m --> H2O_m + cACN_m
['AT4G35830', 'AT4G26970', 'AT2G05710']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

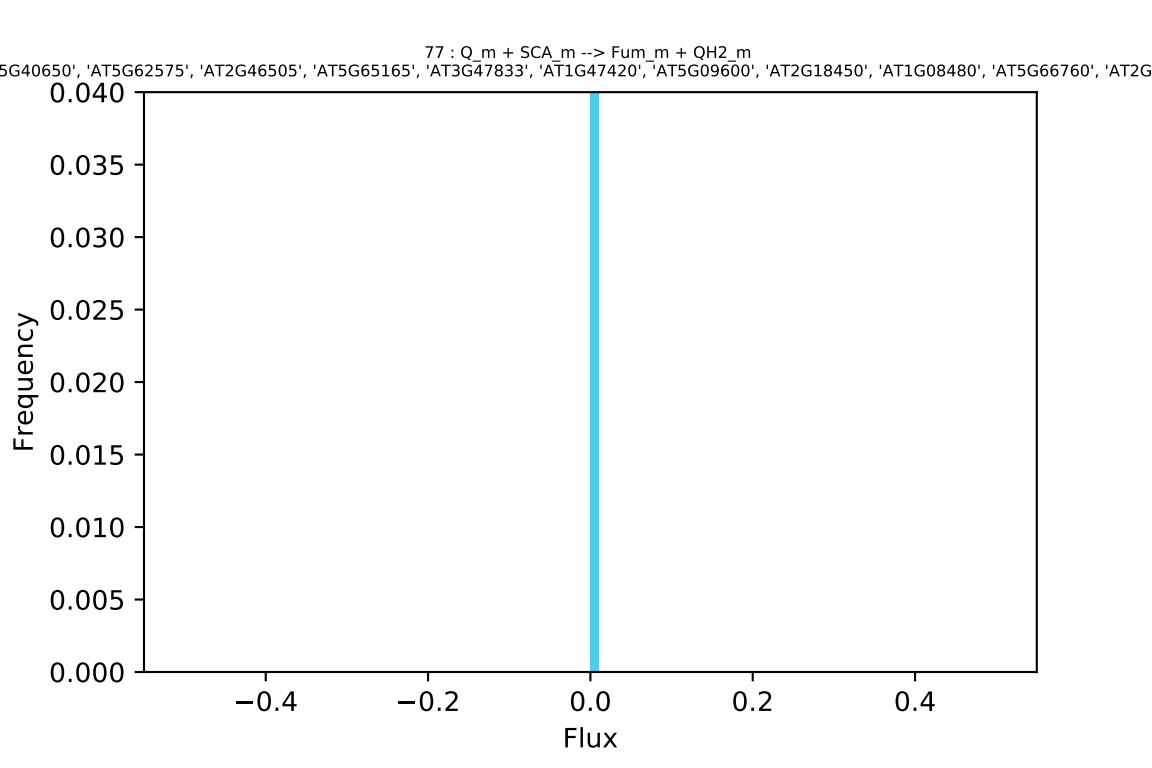

72 : H2O_m + cACN_m --> iCit_m
['AT4G35830', 'AT4G26970', 'AT2G05710']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

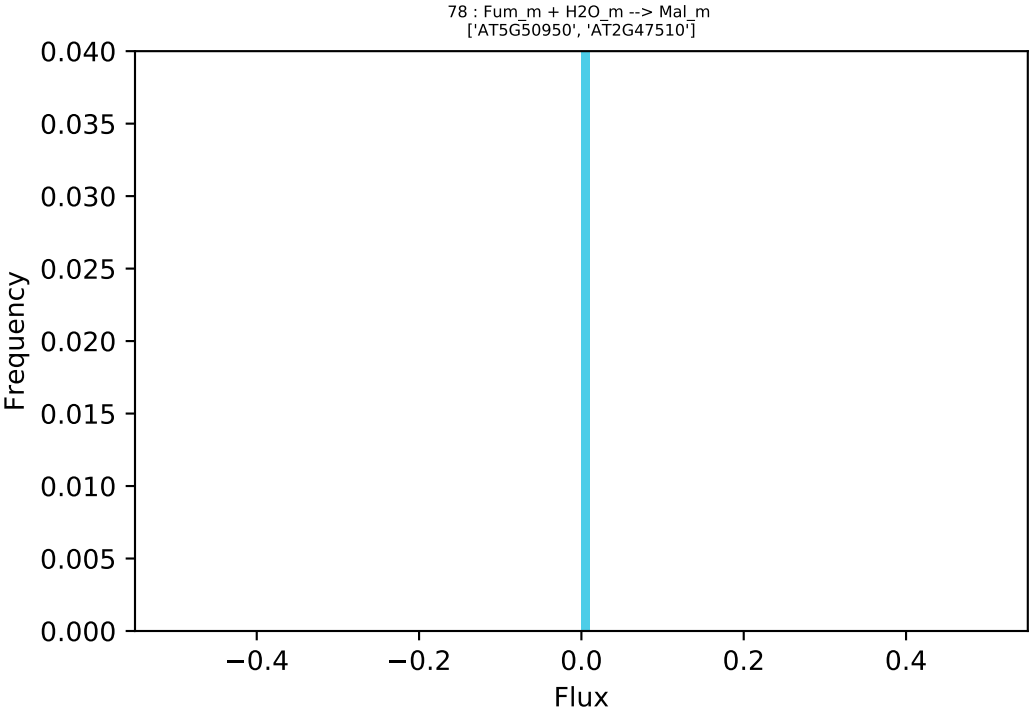

73 : NAD_m + iCit_m --> CO2_m + KG_m + NADH_m
['AT2G17130', 'AT4G35260', 'AT3G09810', 'AT5G03290', 'AT4G35650']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux


74 : H_m + KG_m + LPA_m --> CO2_m + S_DASH_DHL_m
['AT3G55410', '2*AT5G65750']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux


75 : CoA_m + S_DASH_DHL_m --> DHL_m + S_DASH_CoA_m
['3*AT5G55070', 'AT4G26910']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux


76 : ADP_m + Pi_m + S_DASH_CoA_m --> ATP_m + CoA_m + SCA_m
['AT2G20420', 'AT5G23250', 'AT5G08300']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux


77 : Q_m + SCA_m --> Fum_m + QH2_m
5G40650', 'AT5G62575', 'AT2G46505', 'AT5G65165', 'AT3G47833', 'AT1G47420', 'AT5G09600', 'AT2G18450', 'AT1G08480', 'AT5G66760', 'AT2G
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux


78 : Fum_m + H2O_m --> Mal_m
['AT5G50950', 'AT2G47510']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
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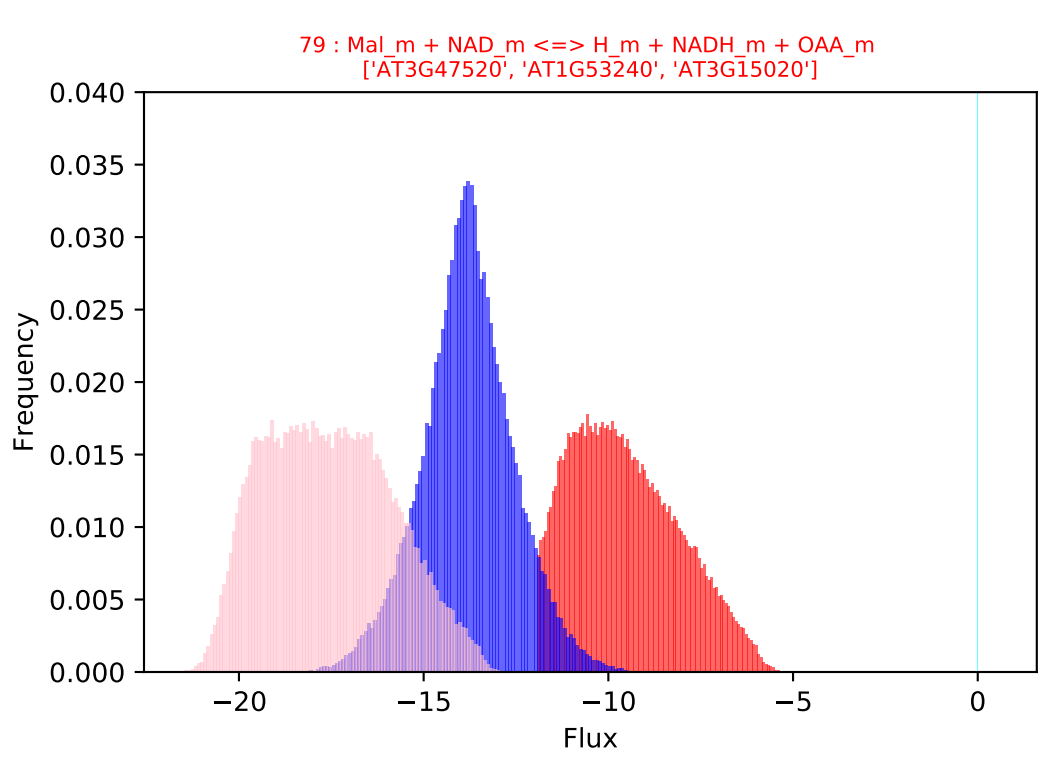
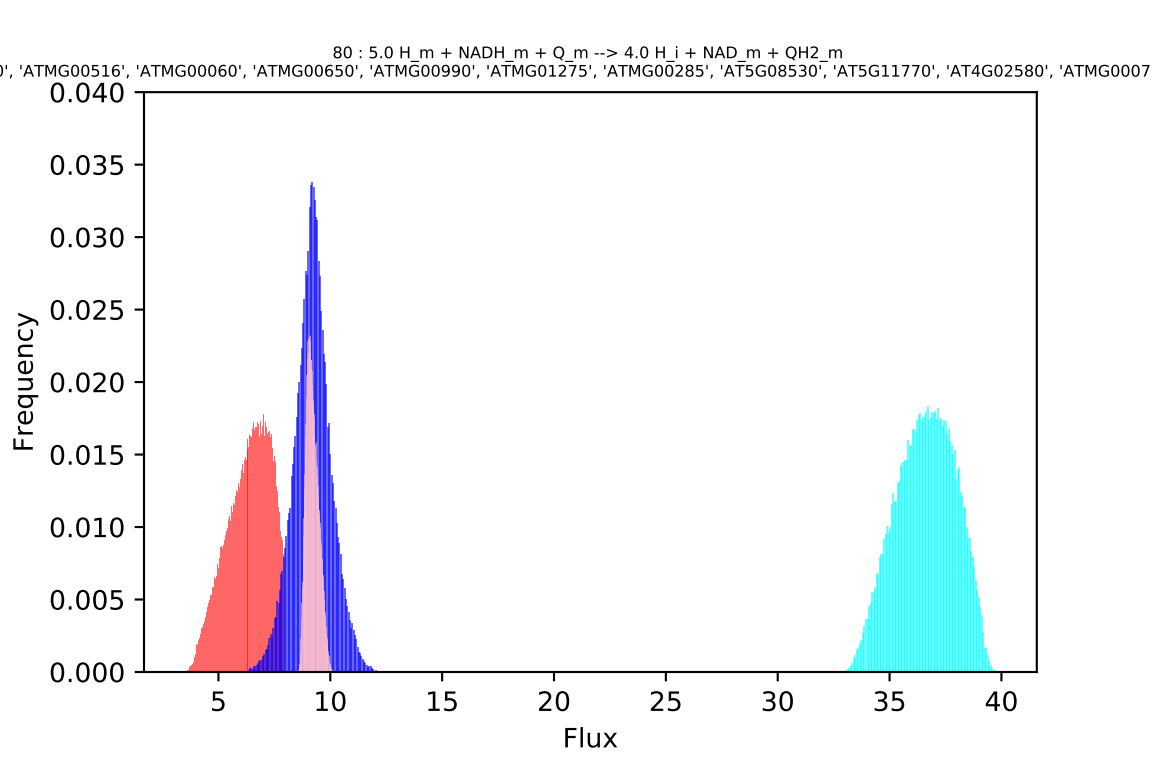
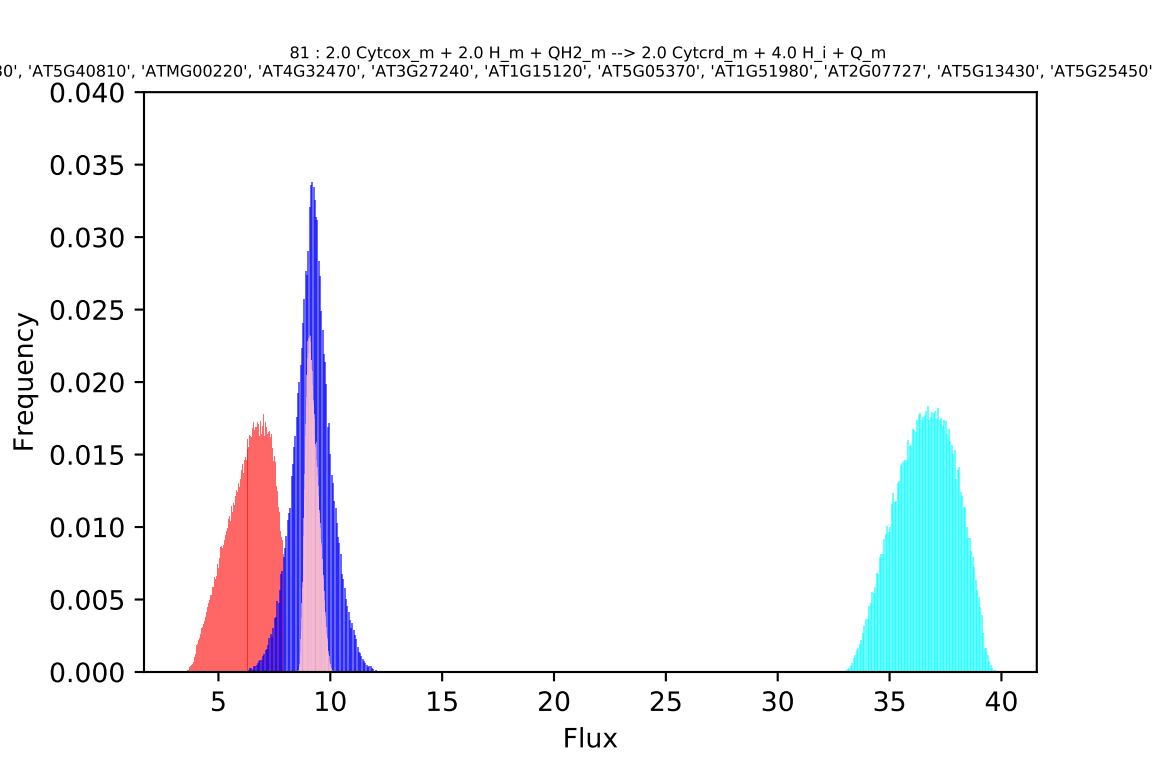
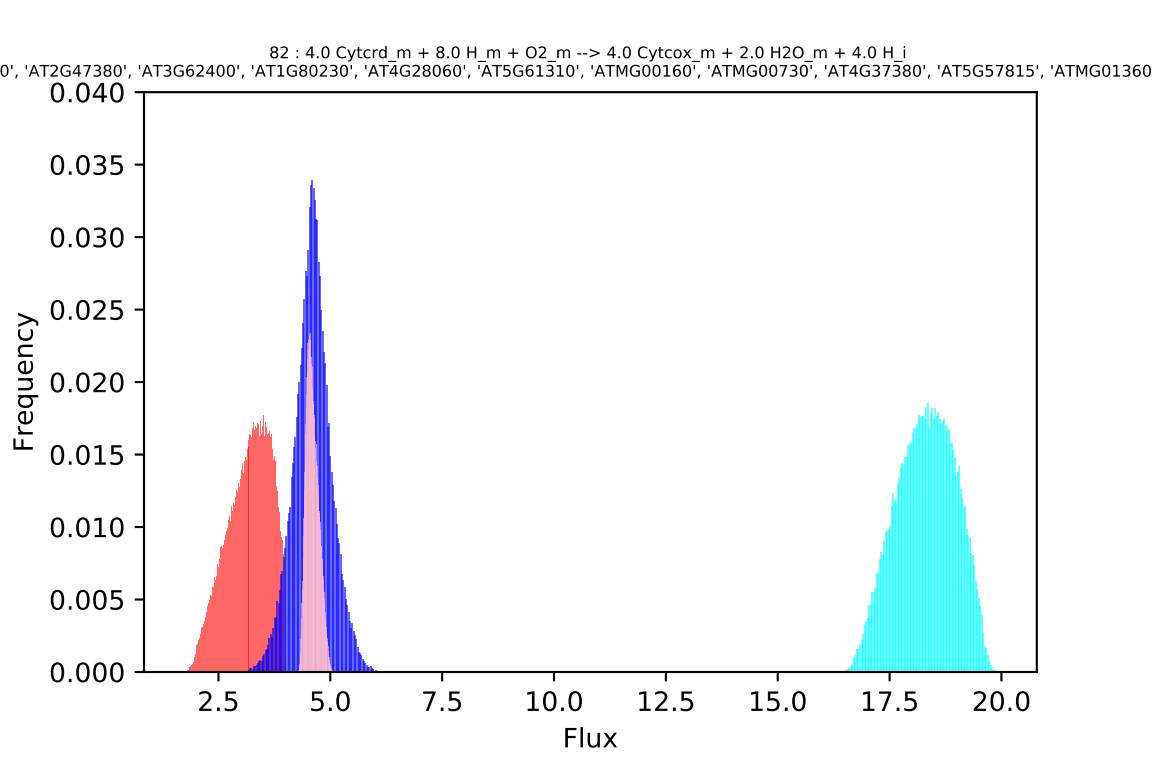
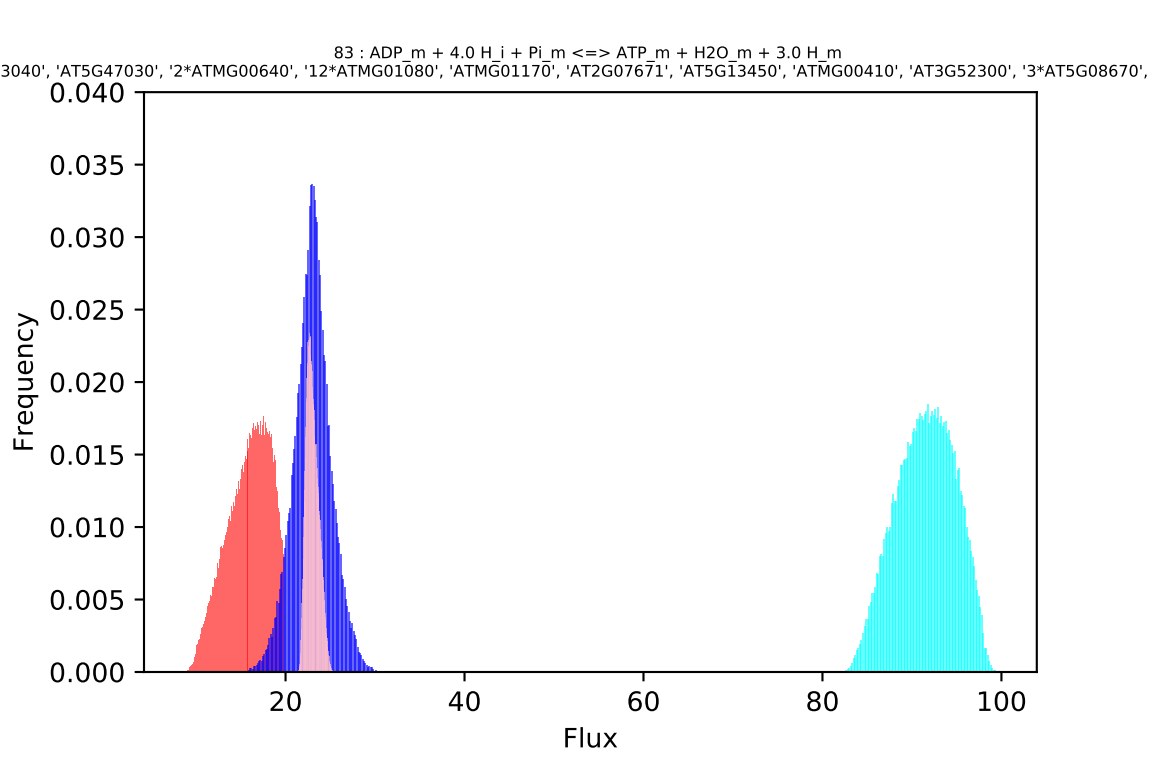
0.2
0.4
Flux

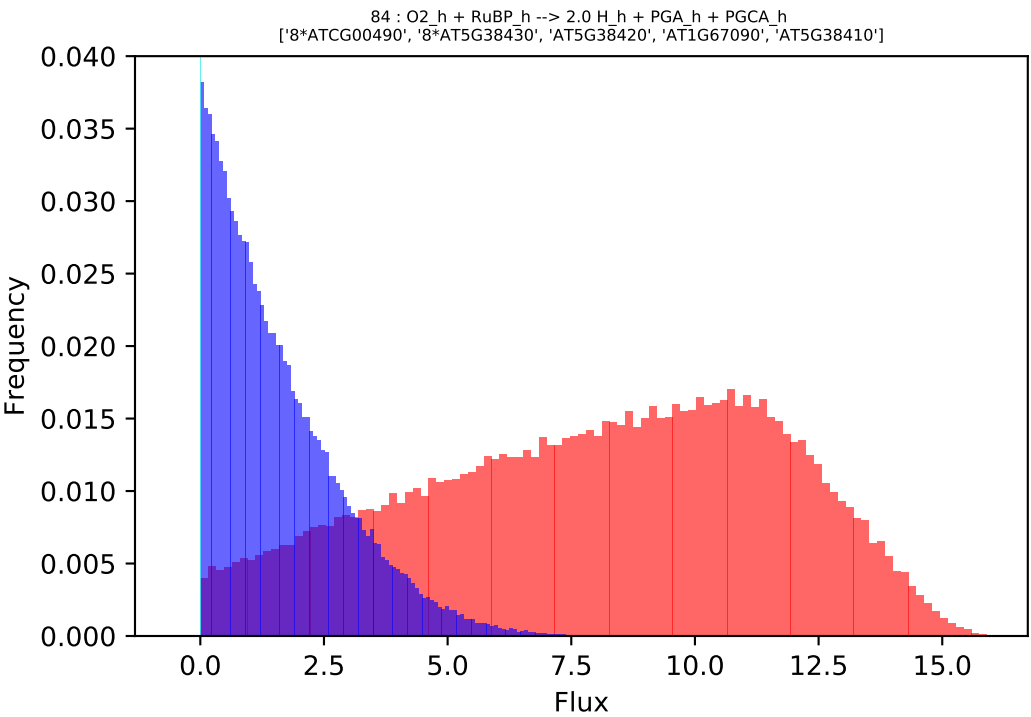

79 : Mal_m + NAD_m <=> H_m + NADH_m + OAA_m
['AT3G47520', 'AT1G53240', 'AT3G15020']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−20
−15
−10
−5
0
Flux

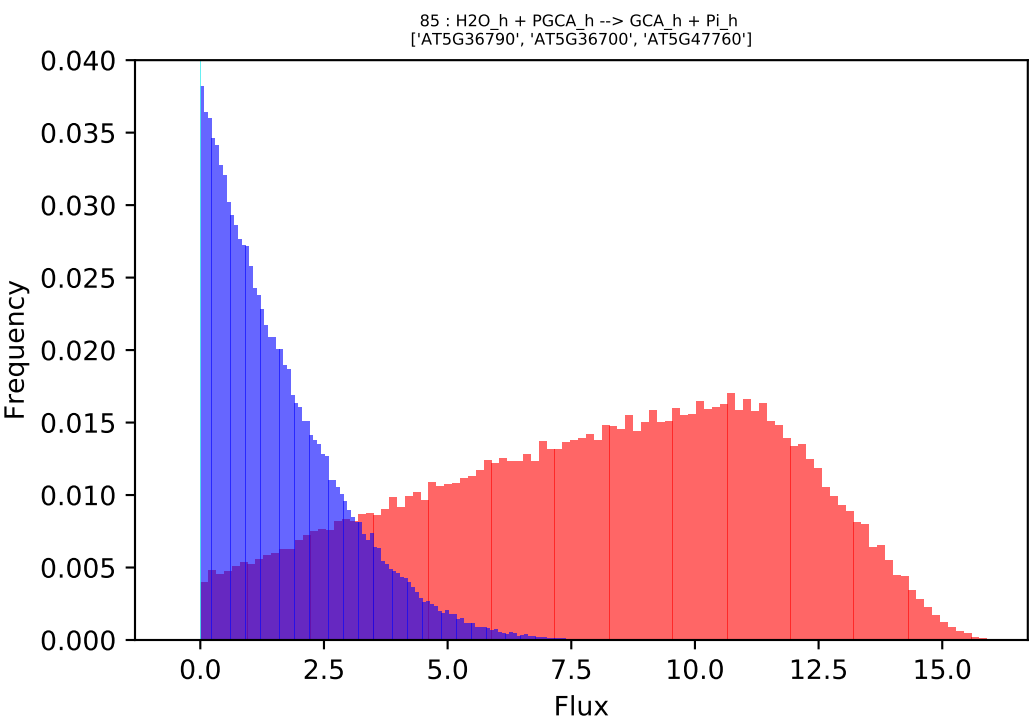

80 : 5.0 H_m + NADH_m + Q_m --> 4.0 H_i + NAD_m + QH2_m
', 'ATMG00516', 'ATMG00060', 'ATMG00650', 'ATMG00990', 'ATMG01275', 'ATMG00285', 'AT5G08530', 'AT5G11770', 'AT4G02580', 'ATMG0007
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
5
10
15
20
25
30
35
40
Flux

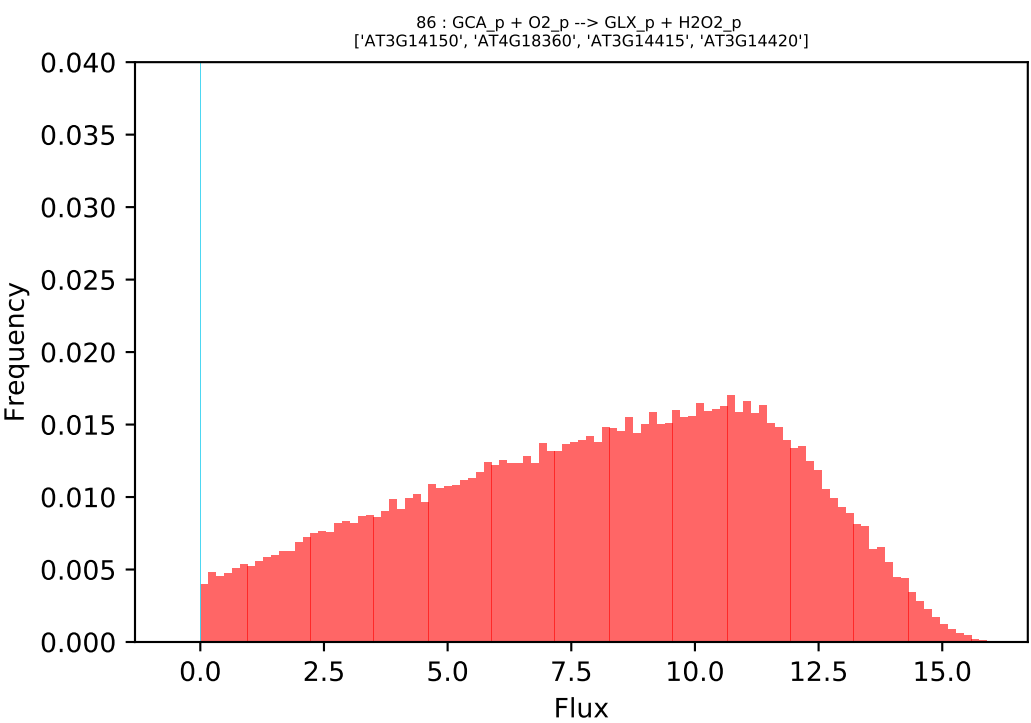

81 : 2.0 Cytcox_m + 2.0 H_m + QH2_m --> 2.0 Cytcrd_m + 4.0 H_i + Q_m
30', 'AT5G40810', 'ATMG00220', 'AT4G32470', 'AT3G27240', 'AT1G15120', 'AT5G05370', 'AT1G51980', 'AT2G07727', 'AT5G13430', 'AT5G25450'
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
5
10
15
20
25
30
35
40
Flux

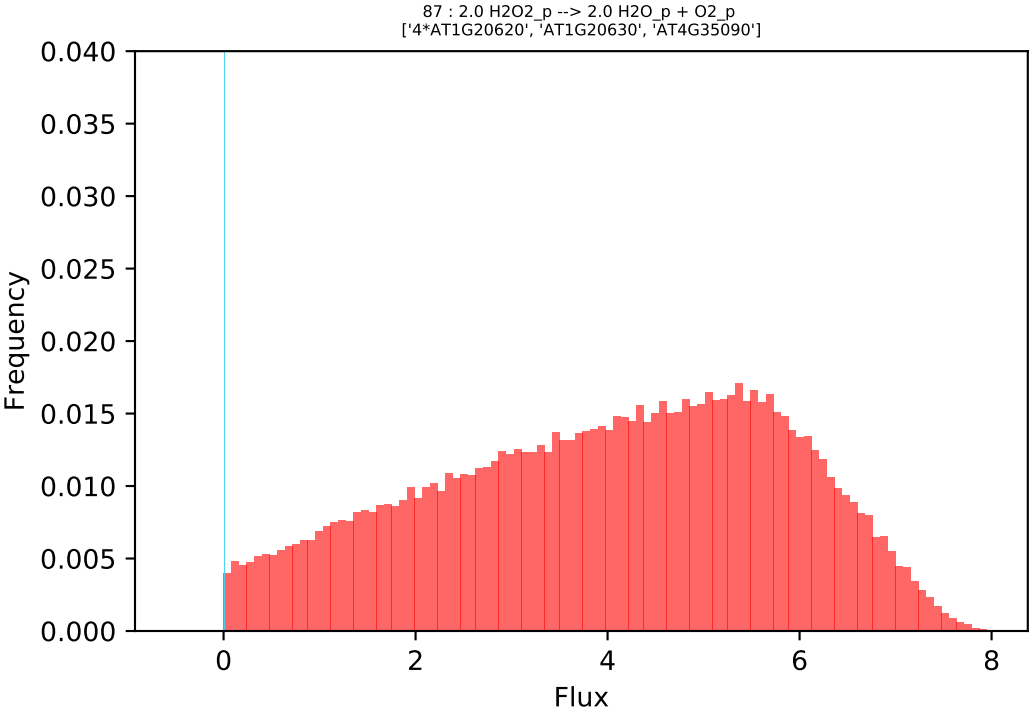

82 : 4.0 Cytcrd_m + 8.0 H_m + O2_m --> 4.0 Cytcox_m + 2.0 H2O_m + 4.0 H_i
0', 'AT2G47380', 'AT3G62400', 'AT1G80230', 'AT4G28060', 'AT5G61310', 'ATMG00160', 'ATMG00730', 'AT4G37380', 'AT5G57815', 'ATMG01360
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
2.5
5.0
7.5
10.0
12.5
15.0
17.5
20.0
Flux

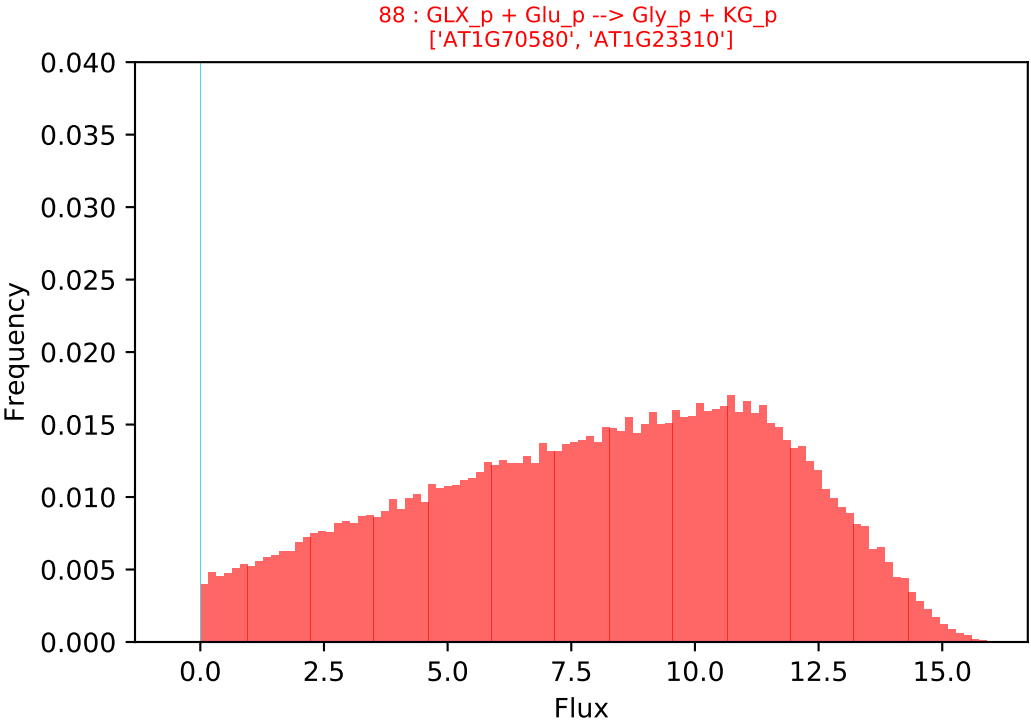

83 : ADP_m + 4.0 H_i + Pi_m <=> ATP_m + H2O_m + 3.0 H_m
3040', 'AT5G47030', '2*ATMG00640', '12*ATMG01080', 'ATMG01170', 'AT2G07671', 'AT5G13450', 'ATMG00410', 'AT3G52300', '3*AT5G08670',
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
20
40
60
80
100
Flux

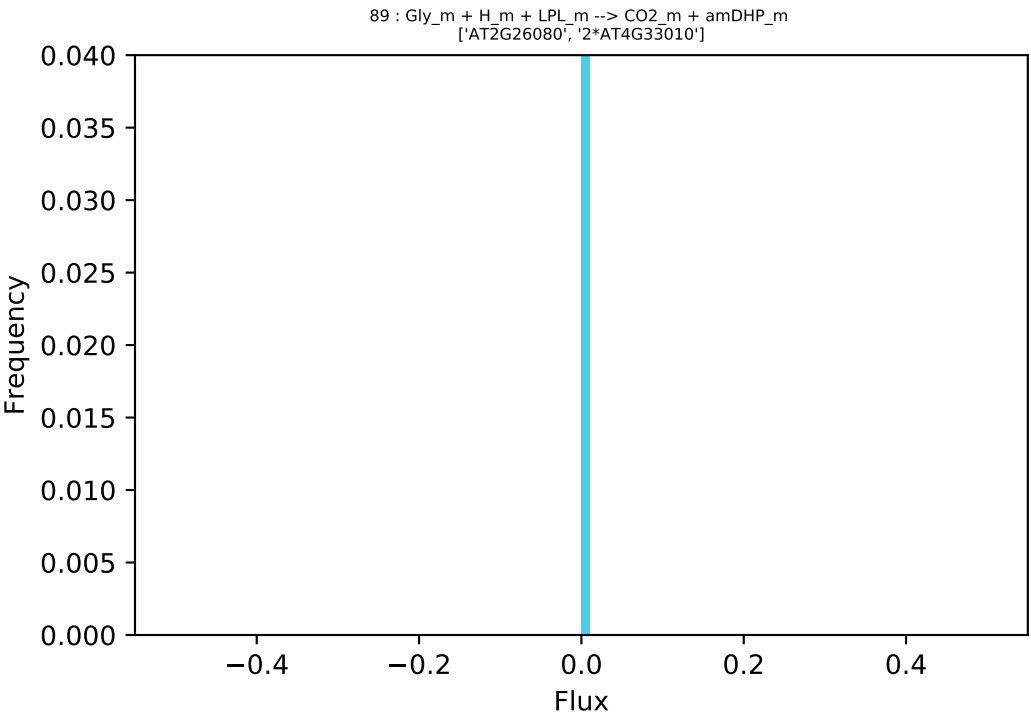

84 : O2_h + RuBP_h --> 2.0 H_h + PGA_h + PGCA_h
['8*ATCG00490', '8*AT5G38430', 'AT5G38420', 'AT1G67090', 'AT5G38410']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
2.5
5.0
7.5
10.0
12.5
15.0
Flux

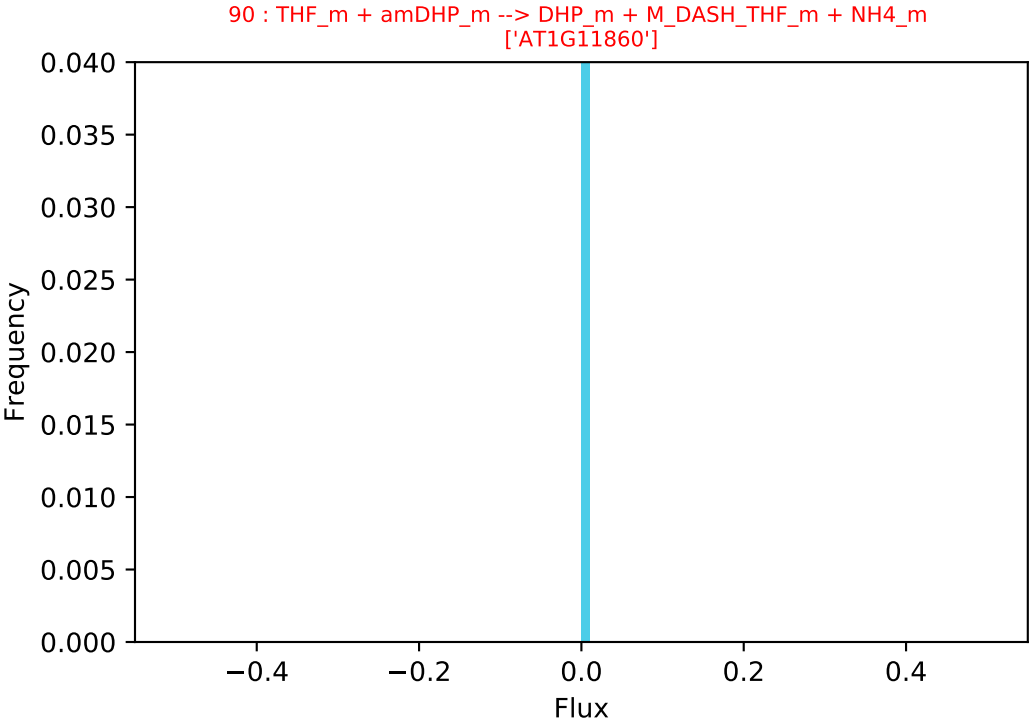

85 : H2O_h + PGCA_h --> GCA_h + Pi_h
['AT5G36790', 'AT5G36700', 'AT5G47760']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
2.5
5.0
7.5
10.0
12.5
15.0
Flux


86 : GCA_p + O2_p --> GLX_p + H2O2_p
['AT3G14150', 'AT4G18360', 'AT3G14415', 'AT3G14420']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
2.5
5.0
7.5
10.0
12.5
15.0
Flux


87 : 2.0 H2O2_p --> 2.0 H2O_p + O2_p
['4*AT1G20620', 'AT1G20630', 'AT4G35090']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0
2
4
6
8
Flux


88 : GLX_p + Glu_p --> Gly_p + KG_p
['AT1G70580', 'AT1G23310']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0.0
2.5
5.0
7.5
10.0
12.5
15.0
Flux


89 : Gly_m + H_m + LPL_m --> CO2_m + amDHP_m
['AT2G26080', '2*AT4G33010']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux


90 : THF_m + amDHP_m --> DHP_m + M_DASH_THF_m + NH4_m
['AT1G11860']
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0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
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−0.2
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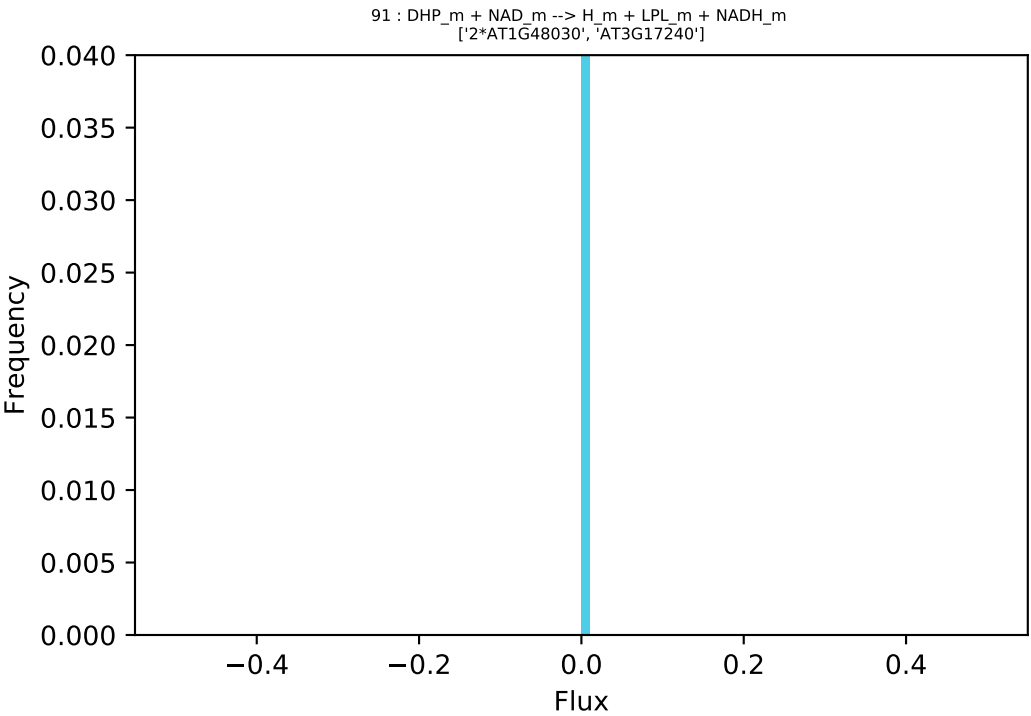
0.2
0.4
Flux


91 : DHP_m + NAD_m --> H_m + LPL_m + NADH_m
['2*AT1G48030', 'AT3G17240']
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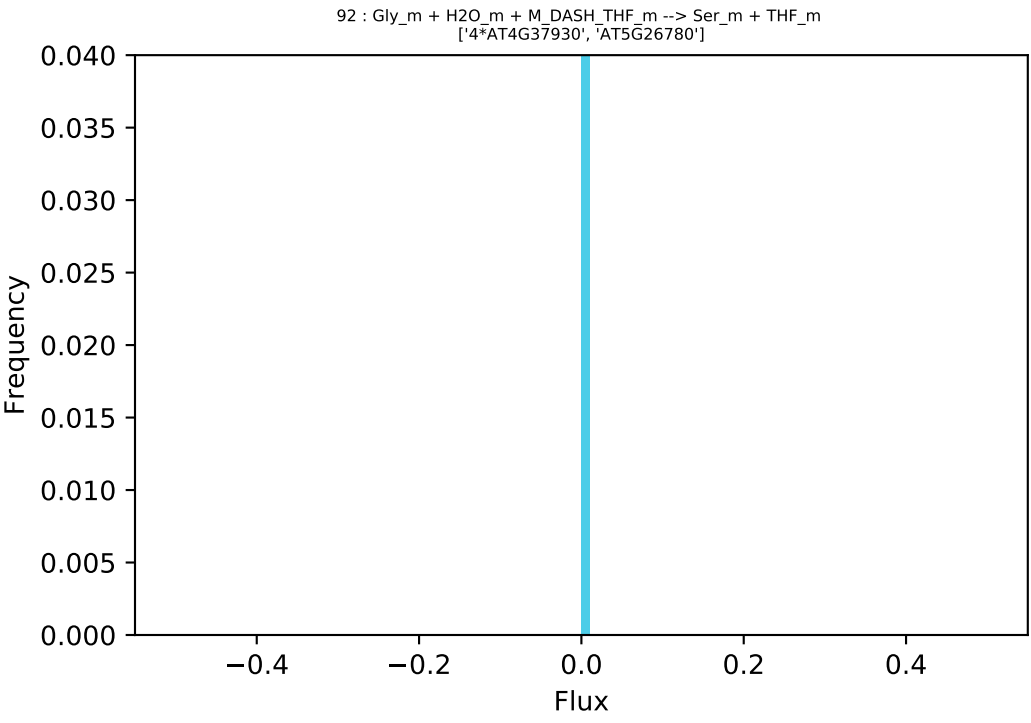
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux


92 : Gly_m + H2O_m + M_DASH_THF_m --> Ser_m + THF_m
['4*AT4G37930', 'AT5G26780']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
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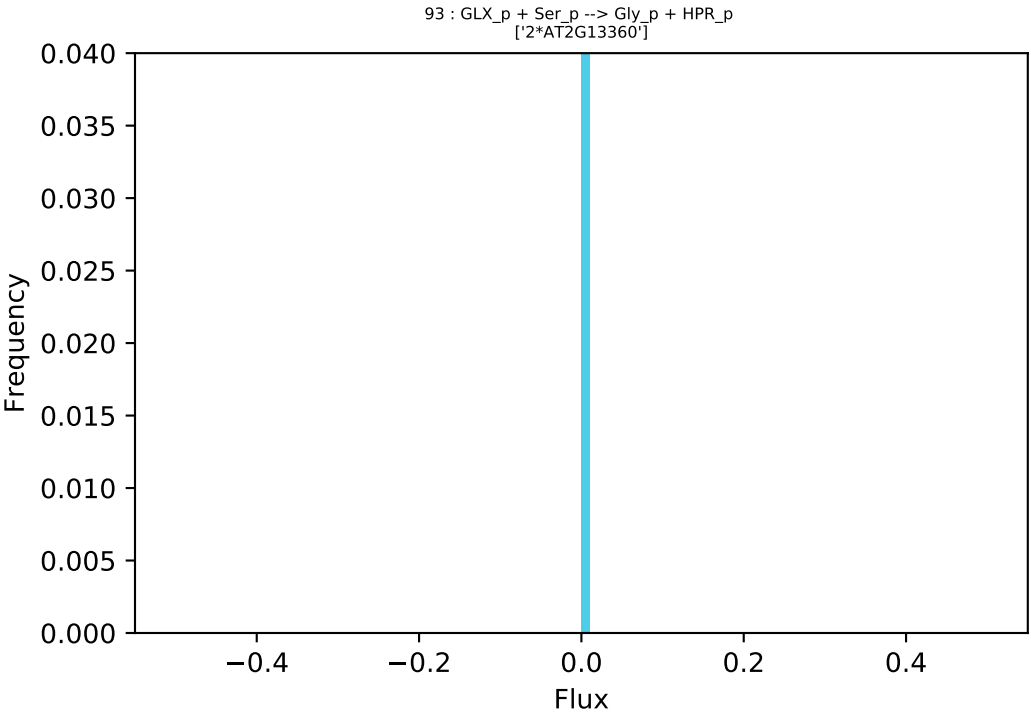
−0.2
0.0
0.2
0.4
Flux


93 : GLX_p + Ser_p --> Gly_p + HPR_p
['2*AT2G13360']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
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−0.2
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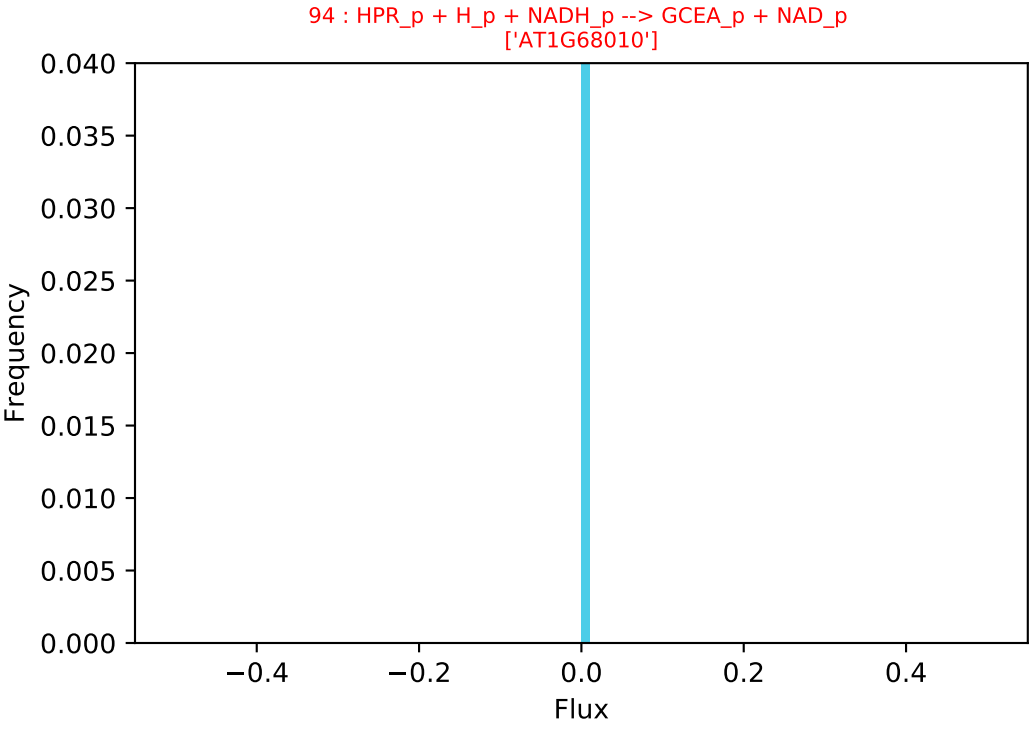
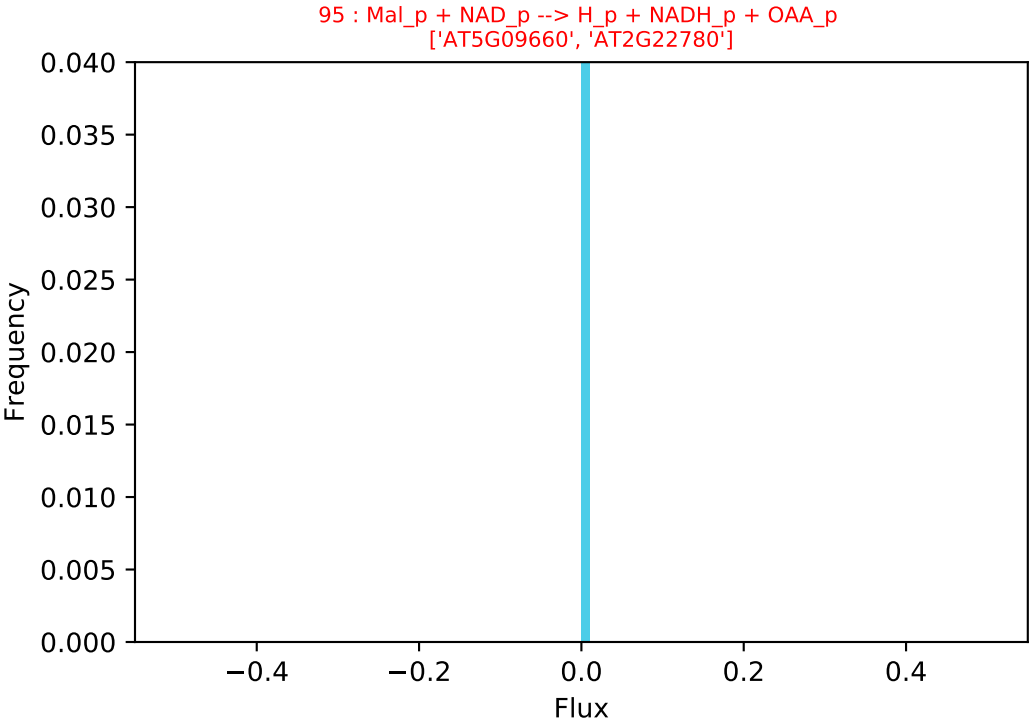
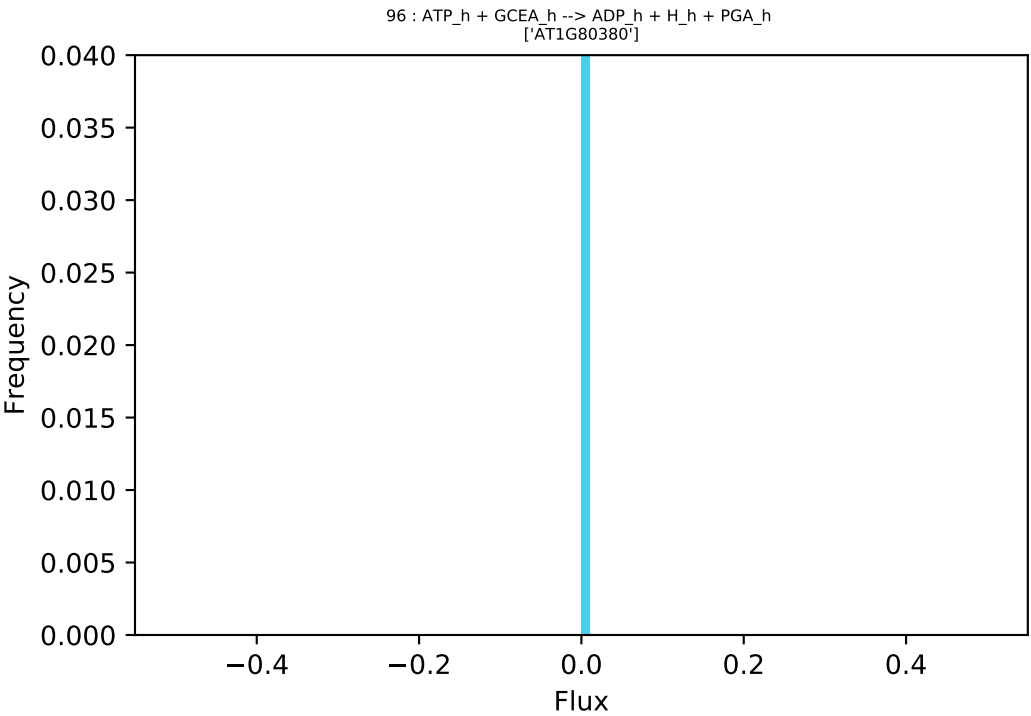
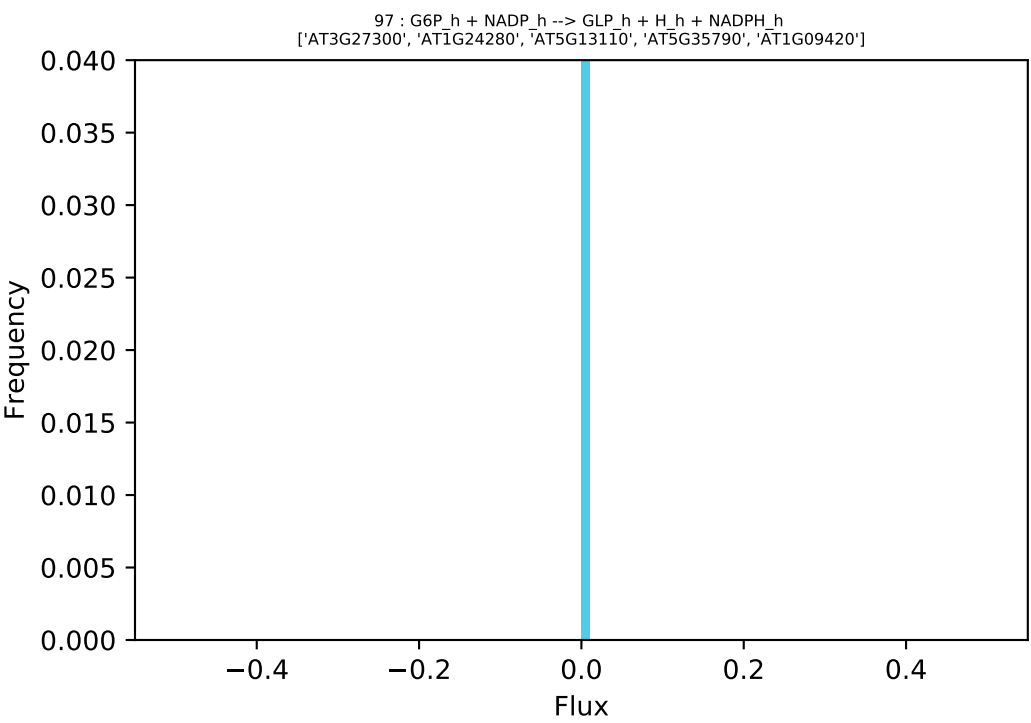
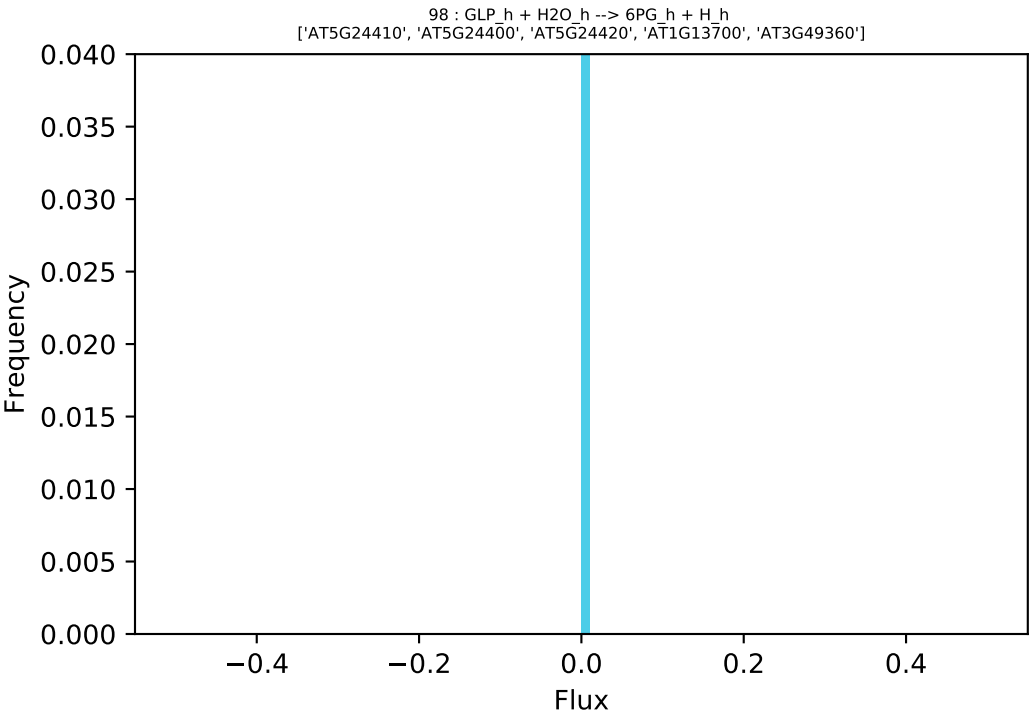
0.2
0.4
Flux

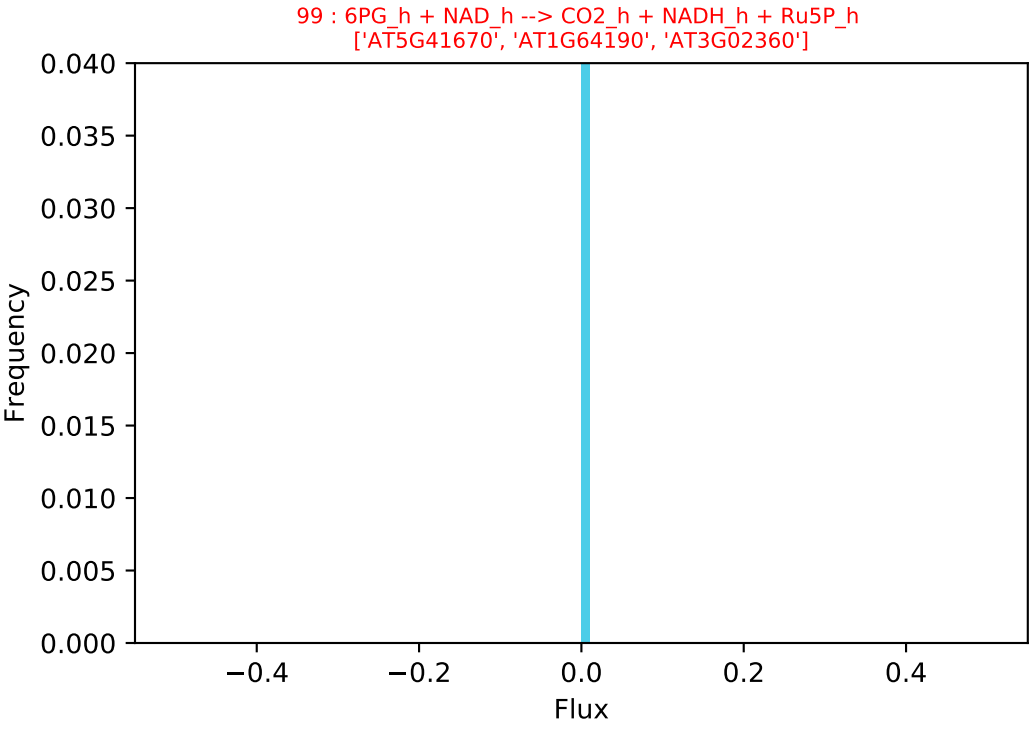

94 : HPR_p + H_p + NADH_p --> GCEA_p + NAD_p
['AT1G68010']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

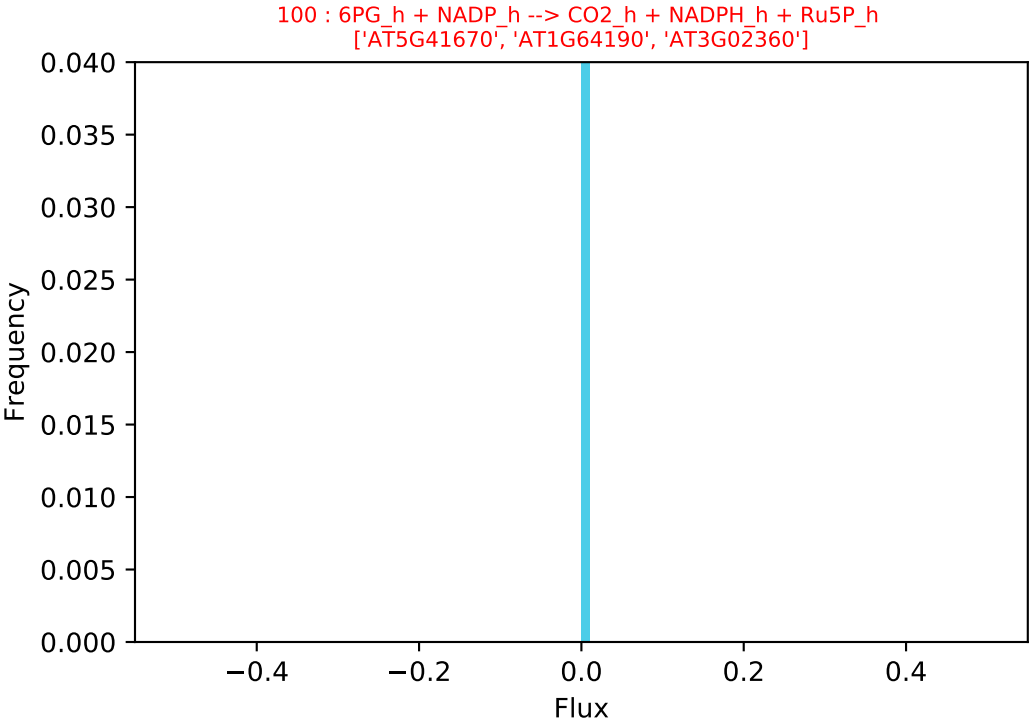

95 : Mal_p + NAD_p --> H_p + NADH_p + OAA_p
['AT5G09660', 'AT2G22780']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

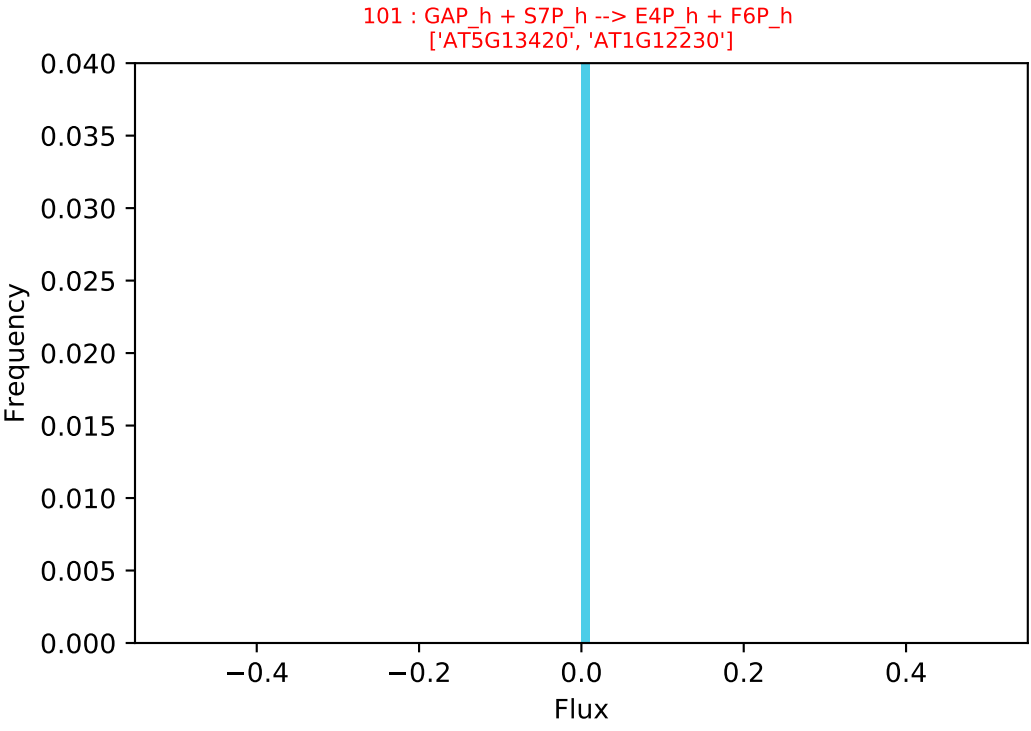

96 : ATP_h + GCEA_h --> ADP_h + H_h + PGA_h
['AT1G80380']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

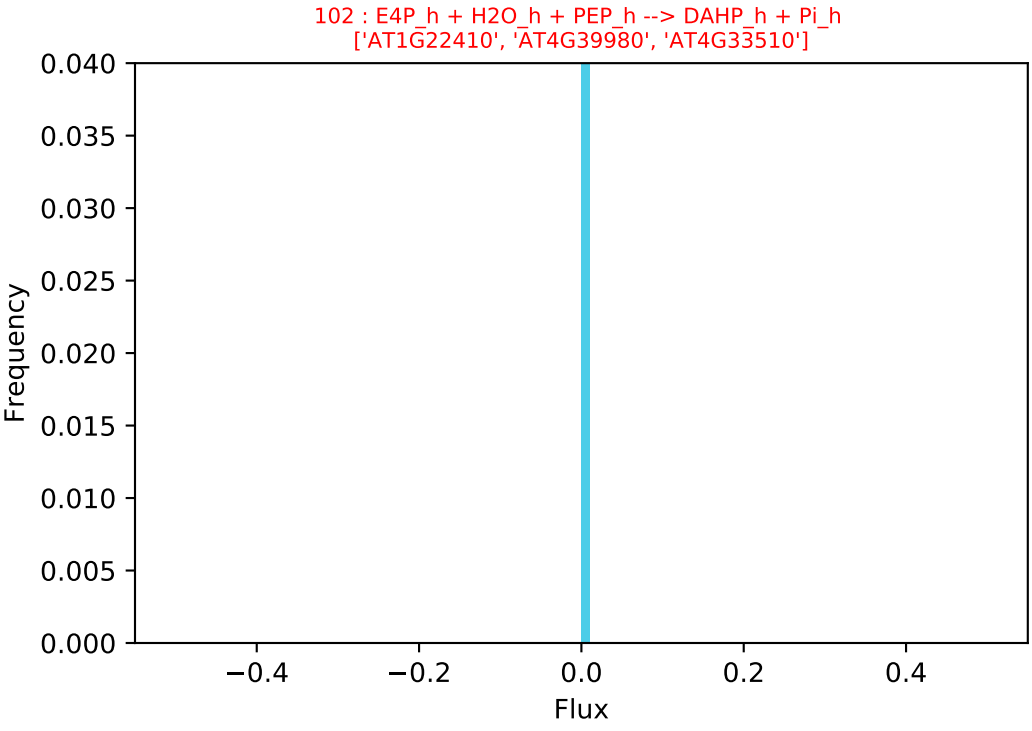

97 : G6P_h + NADP_h --> GLP_h + H_h + NADPH_h
['AT3G27300', 'AT1G24280', 'AT5G13110', 'AT5G35790', 'AT1G09420']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

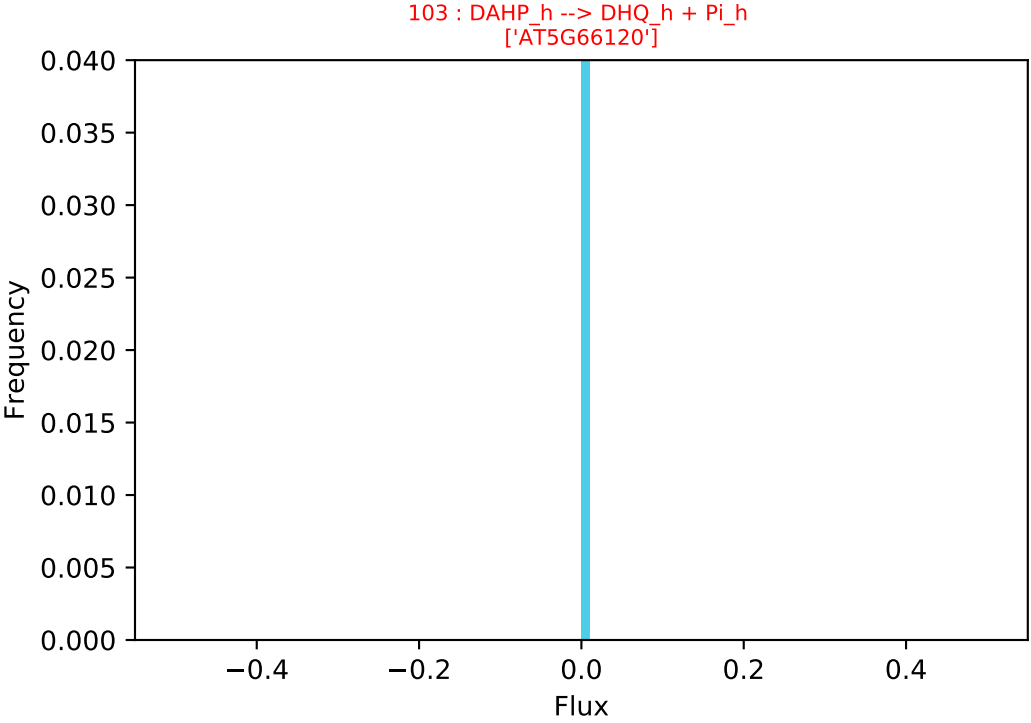

98 : GLP_h + H2O_h --> 6PG_h + H_h
['AT5G24410', 'AT5G24400', 'AT5G24420', 'AT1G13700', 'AT3G49360']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

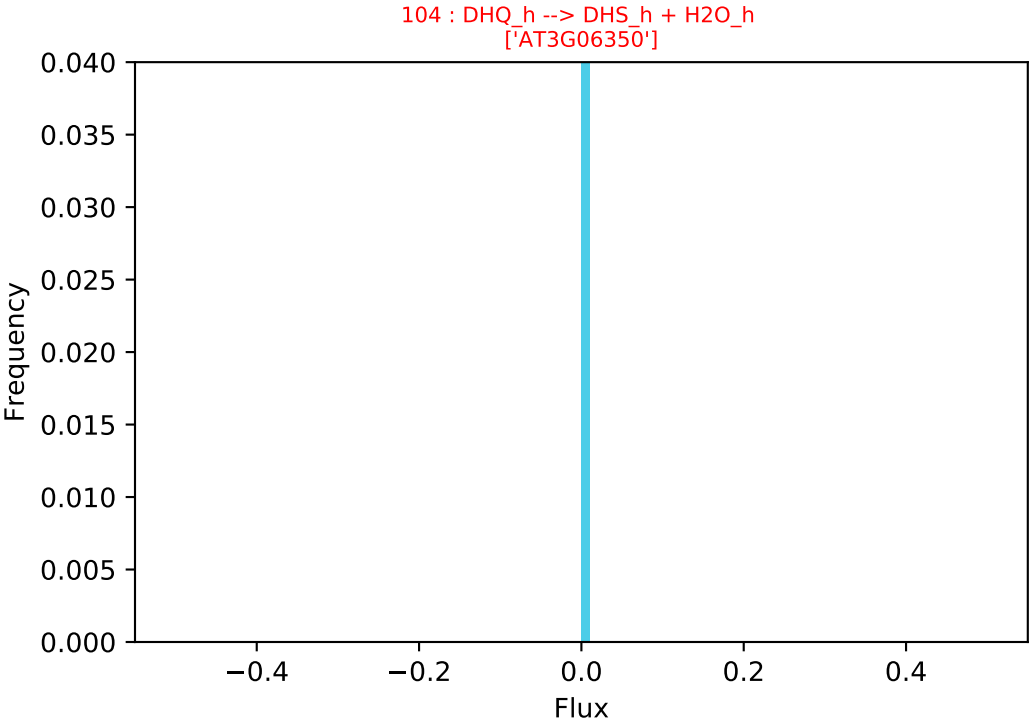

99 : 6PG_h + NAD_h --> CO2_h + NADH_h + Ru5P_h
['AT5G41670', 'AT1G64190', 'AT3G02360']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

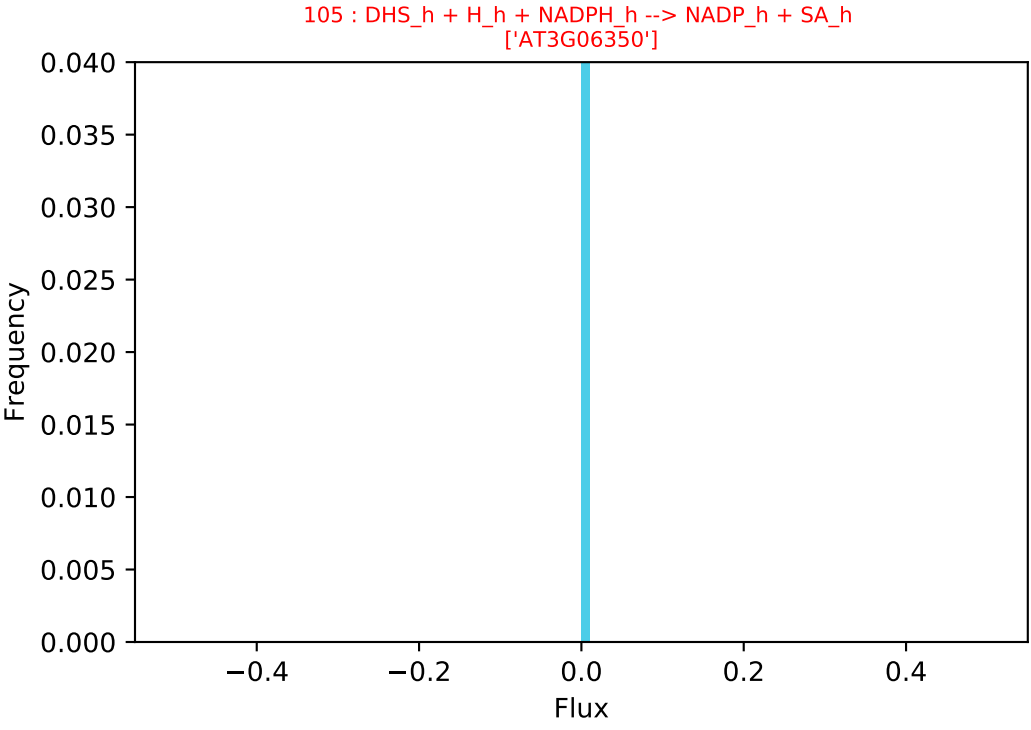

100 : 6PG_h + NADP_h --> CO2_h + NADPH_h + Ru5P_h
['AT5G41670', 'AT1G64190', 'AT3G02360']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

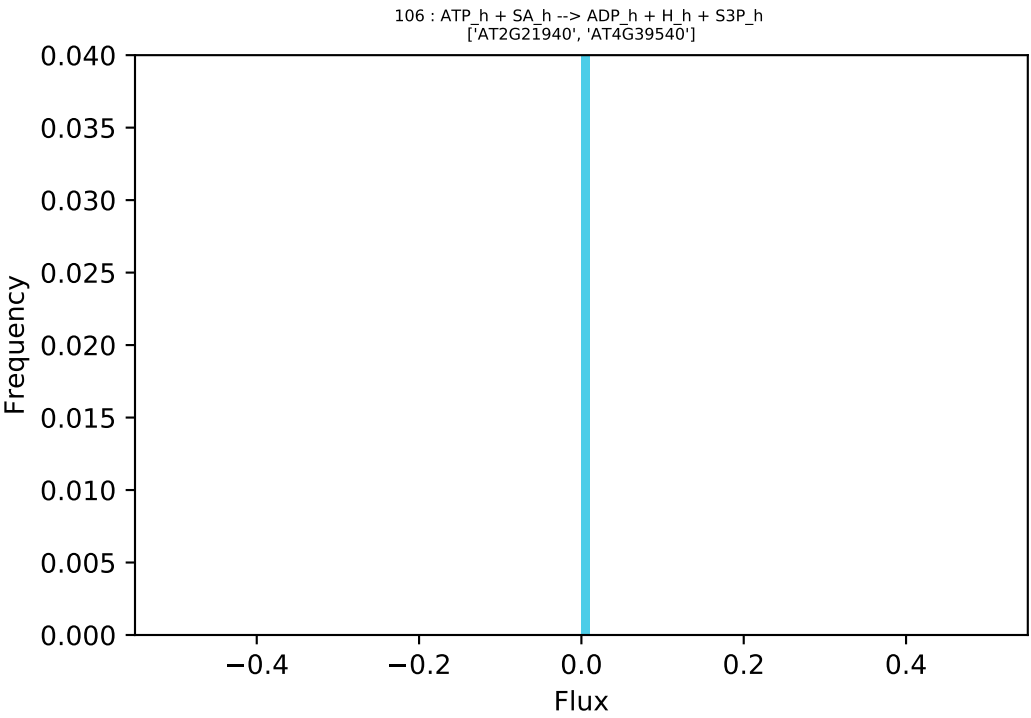

101 : GAP_h + S7P_h --> E4P_h + F6P_h
['AT5G13420', 'AT1G12230']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

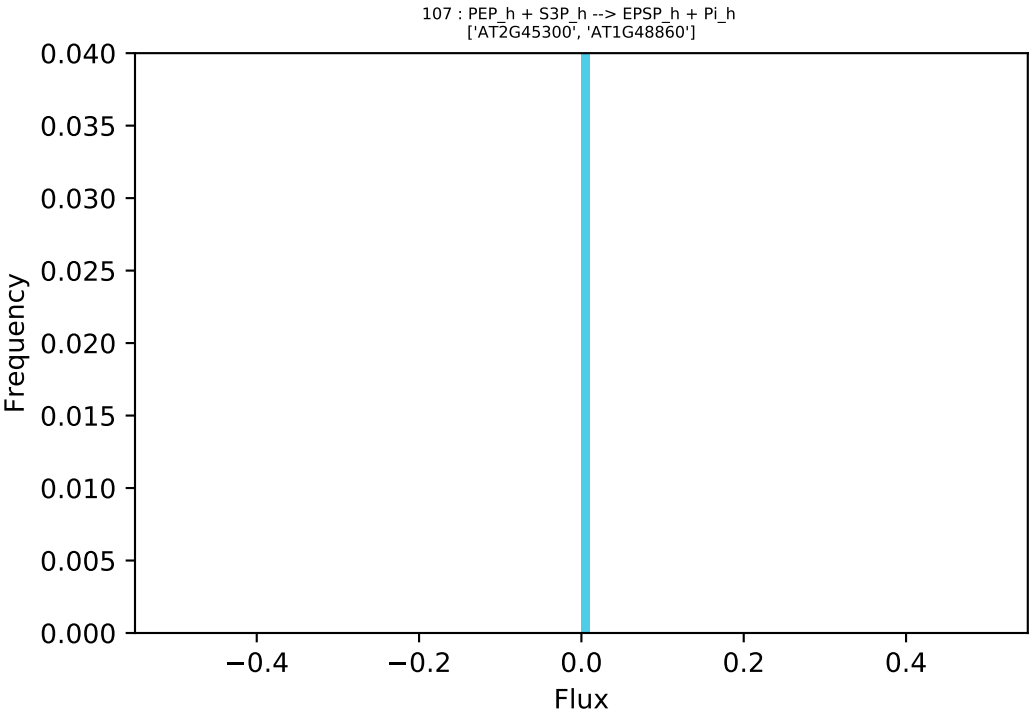

102 : E4P_h + H2O_h + PEP_h --> DAHP_h + Pi_h
['AT1G22410', 'AT4G39980', 'AT4G33510']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

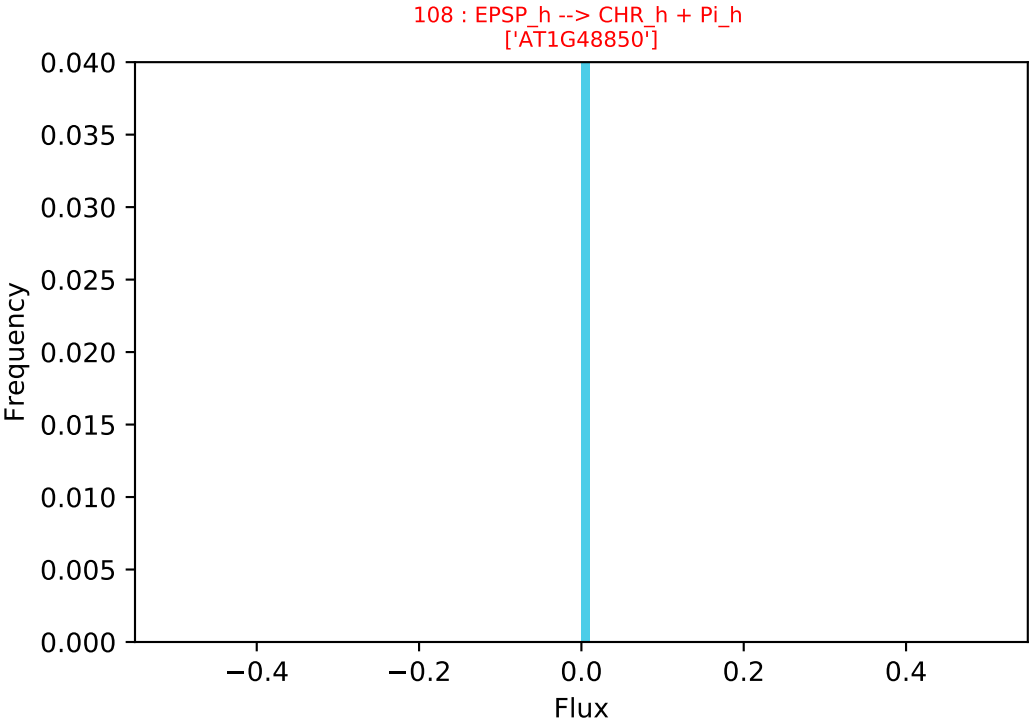

103 : DAHP_h --> DHQ_h + Pi_h
['AT5G66120']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux


104 : DHQ_h --> DHS_h + H2O_h
['AT3G06350']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux


105 : DHS_h + H_h + NADPH_h --> NADP_h + SA_h
['AT3G06350']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux


106 : ATP_h + SA_h --> ADP_h + H_h + S3P_h
['AT2G21940', 'AT4G39540']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux


107 : PEP_h + S3P_h --> EPSP_h + Pi_h
['AT2G45300', 'AT1G48860']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux


108 : EPSP_h --> CHR_h + Pi_h
['AT1G48850']
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0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
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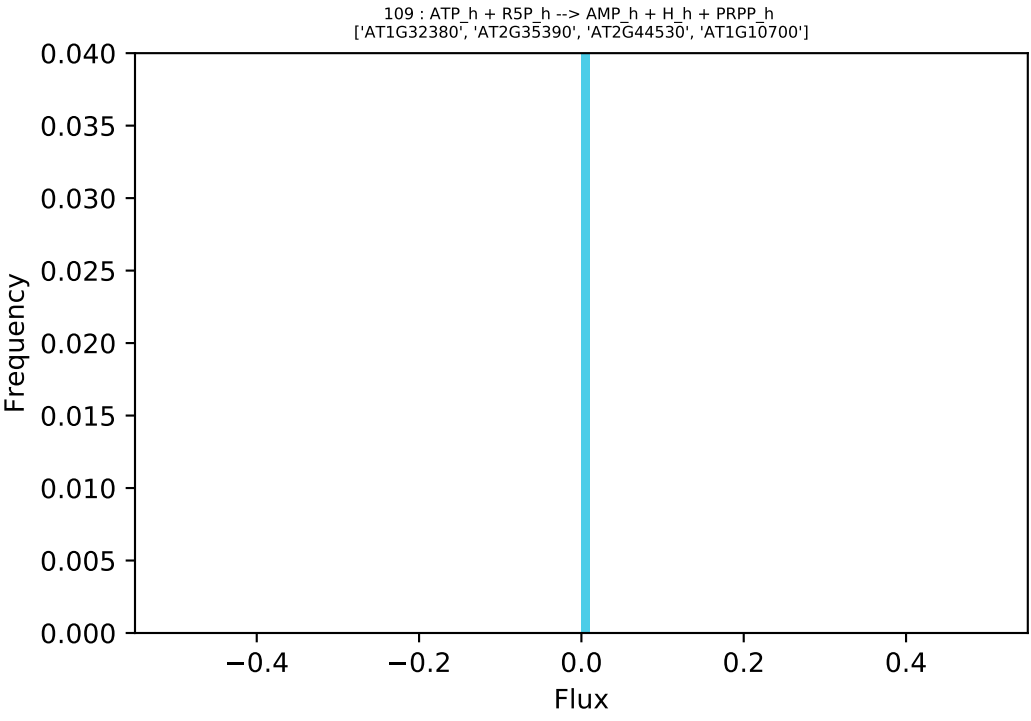
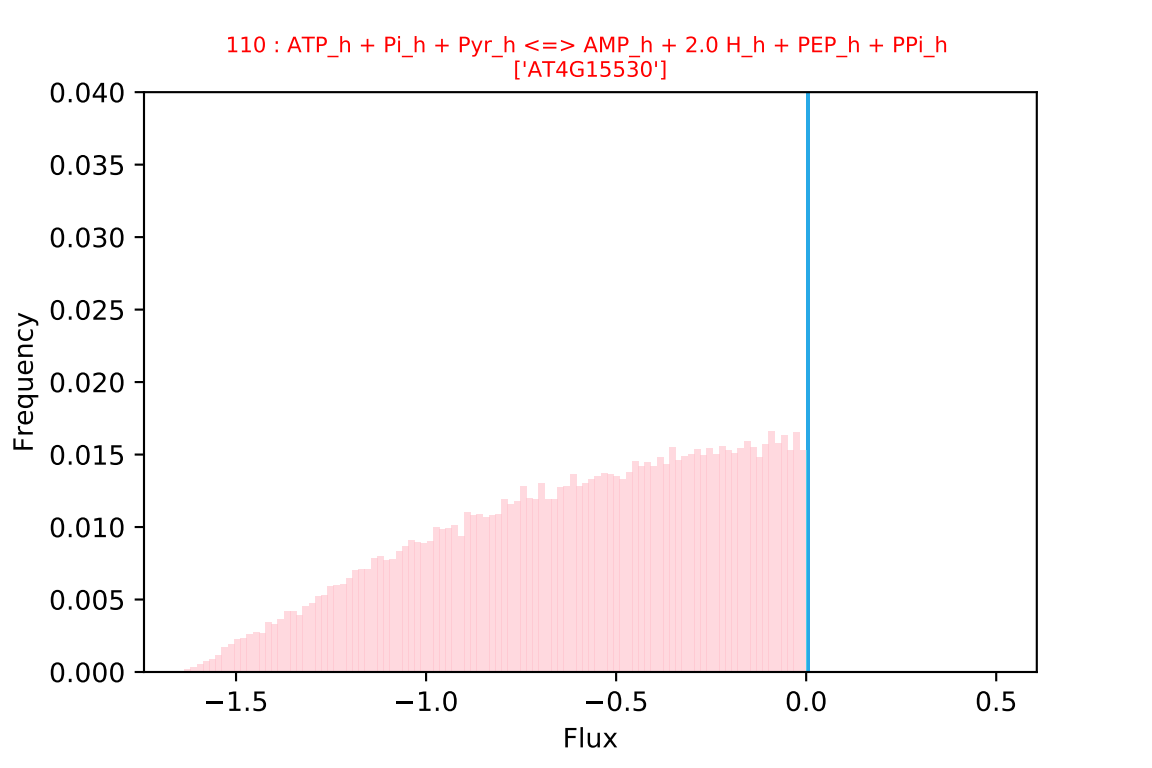
0.2
0.4
Flux


109 : ATP_h + R5P_h --> AMP_h + H_h + PRPP_h
['AT1G32380', 'AT2G35390', 'AT2G44530', 'AT1G10700']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux


110 : ATP_h + Pi_h + Pyr_h <=> AMP_h + 2.0 H_h + PEP_h + PPi_h
['AT4G15530']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
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−1.0
−0.5
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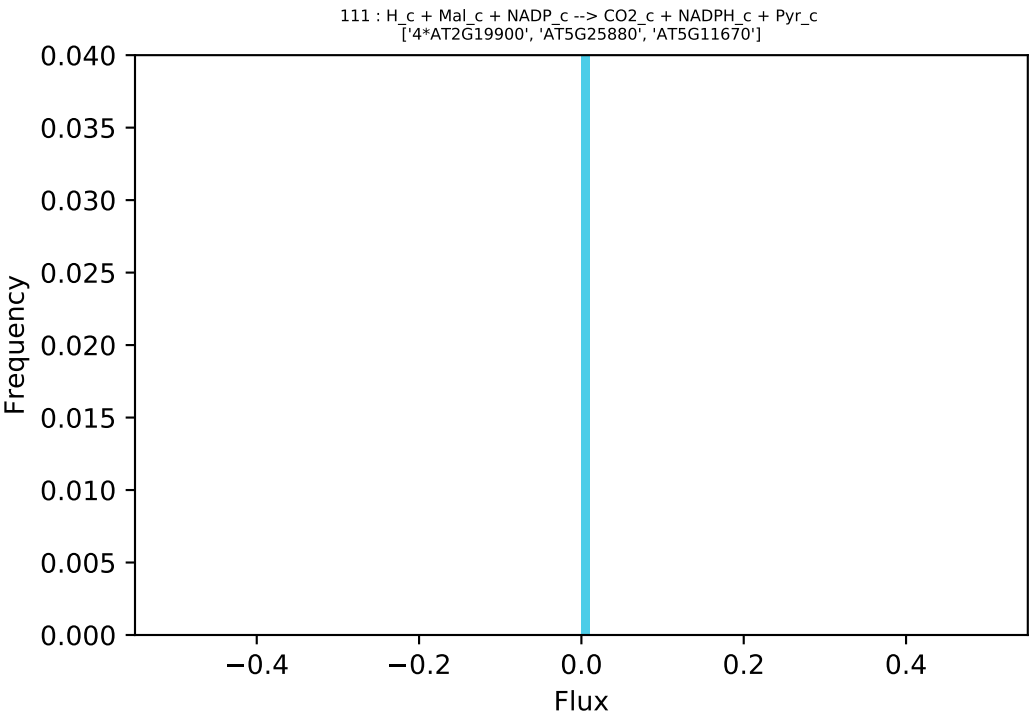
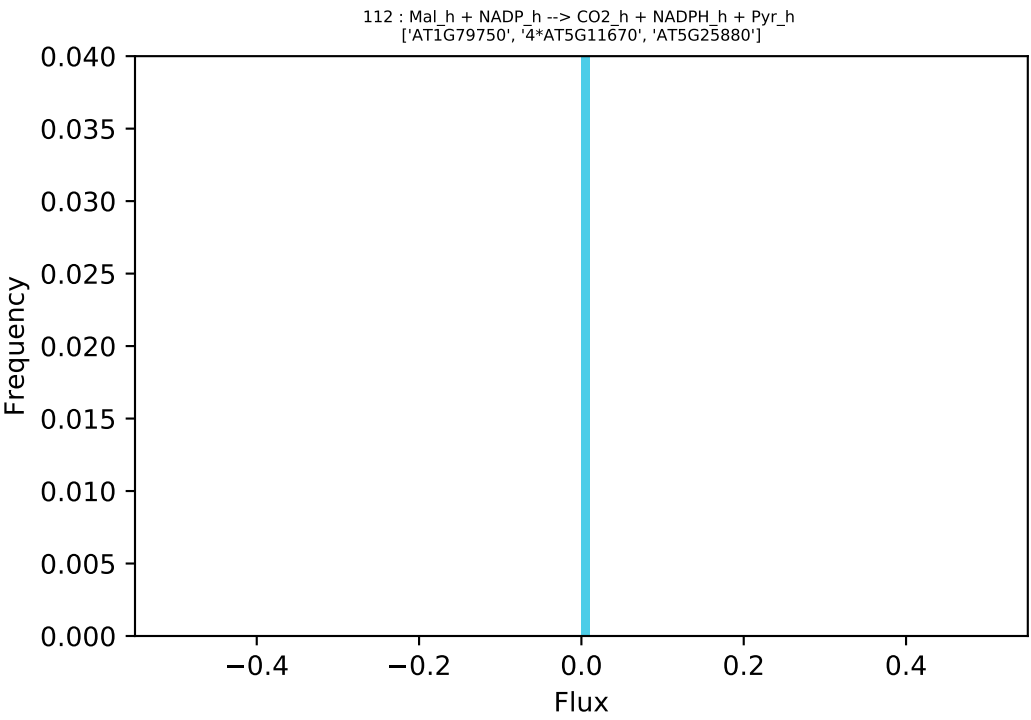
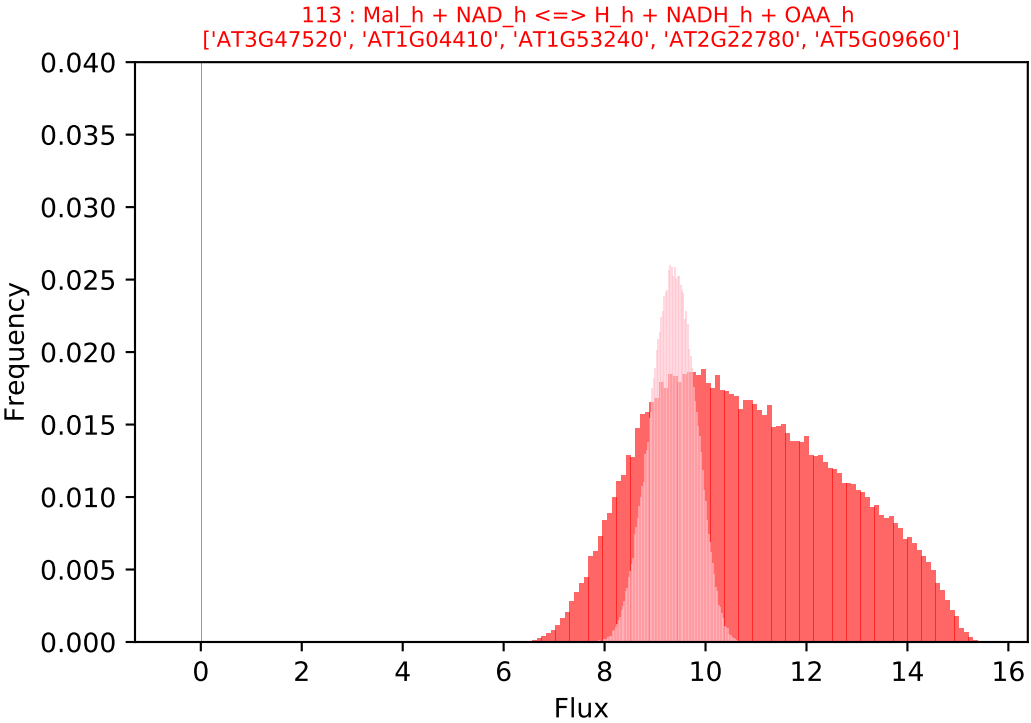
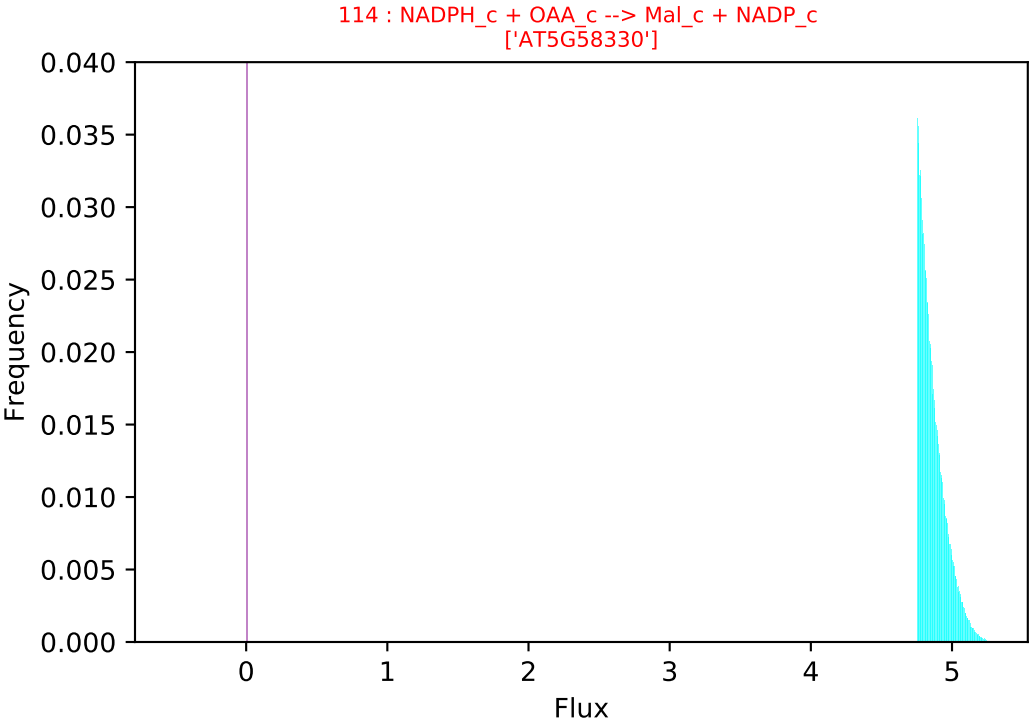
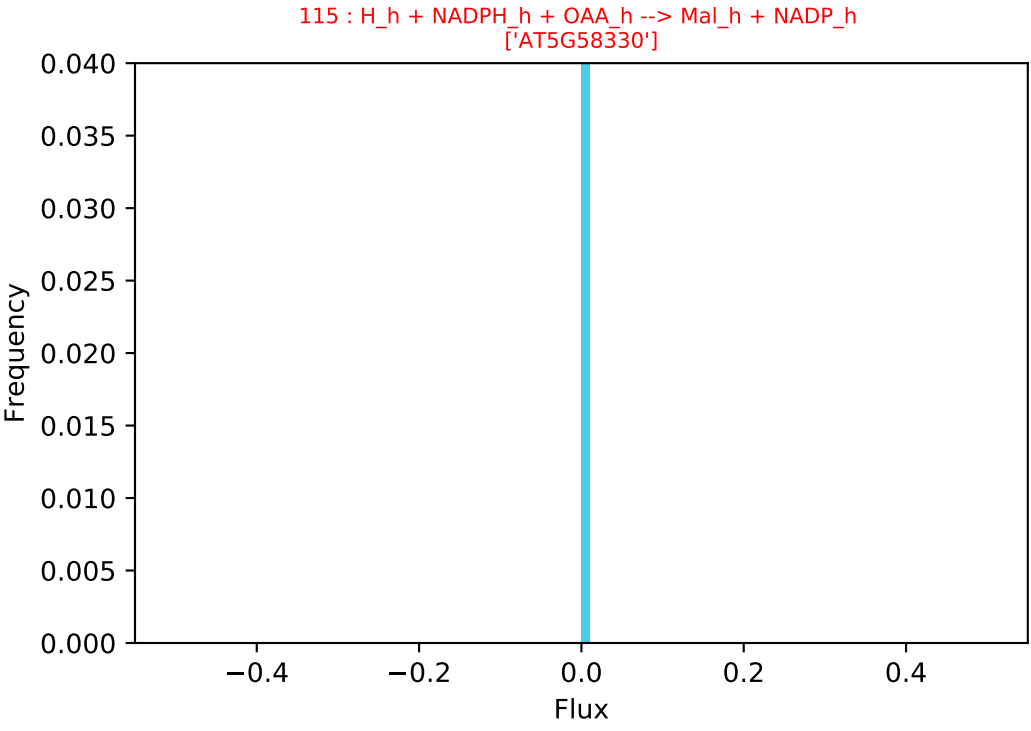
0.5
Flux

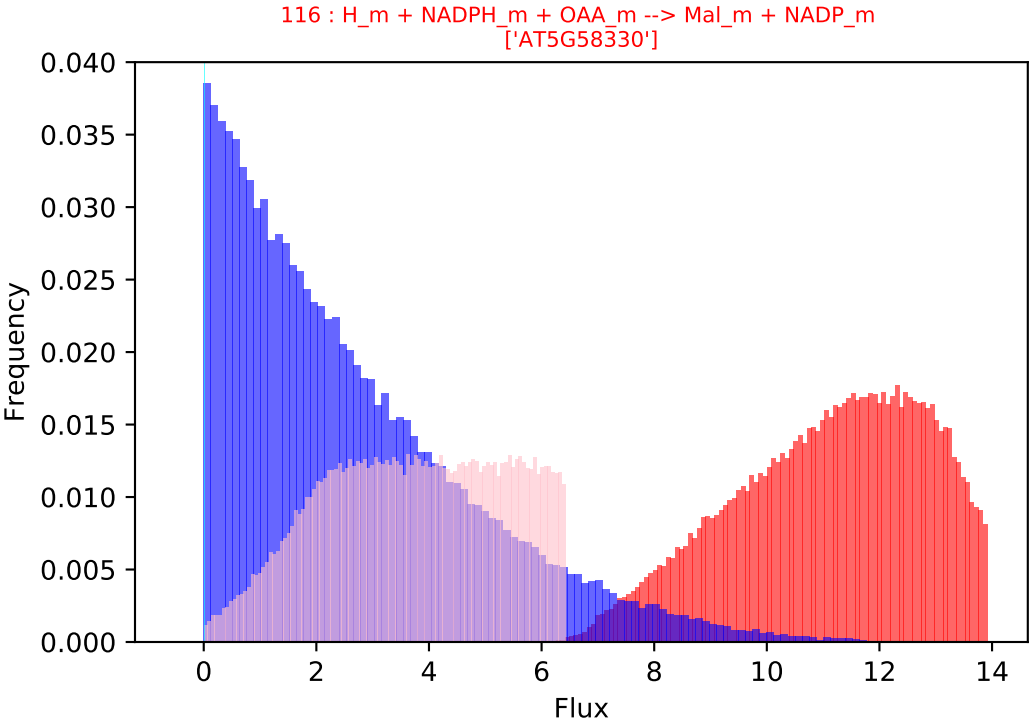

111 : H_c + Mal_c + NADP_c --> CO2_c + NADPH_c + Pyr_c
['4*AT2G19900', 'AT5G25880', 'AT5G11670']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

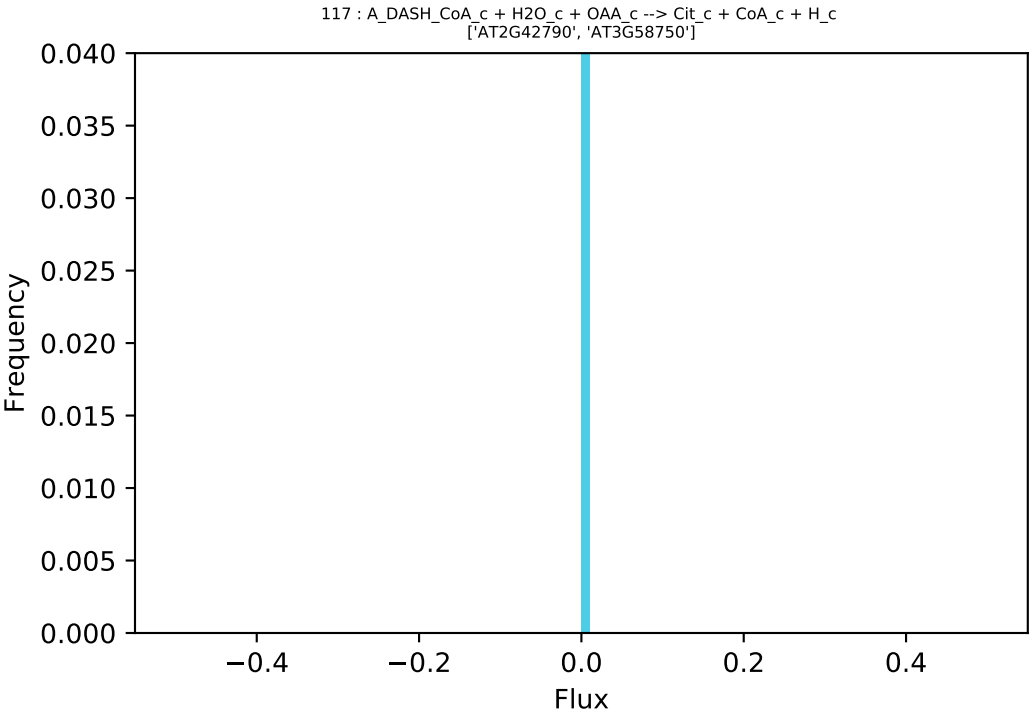

112 : Mal_h + NADP_h --> CO2_h + NADPH_h + Pyr_h
['AT1G79750', '4*AT5G11670', 'AT5G25880']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

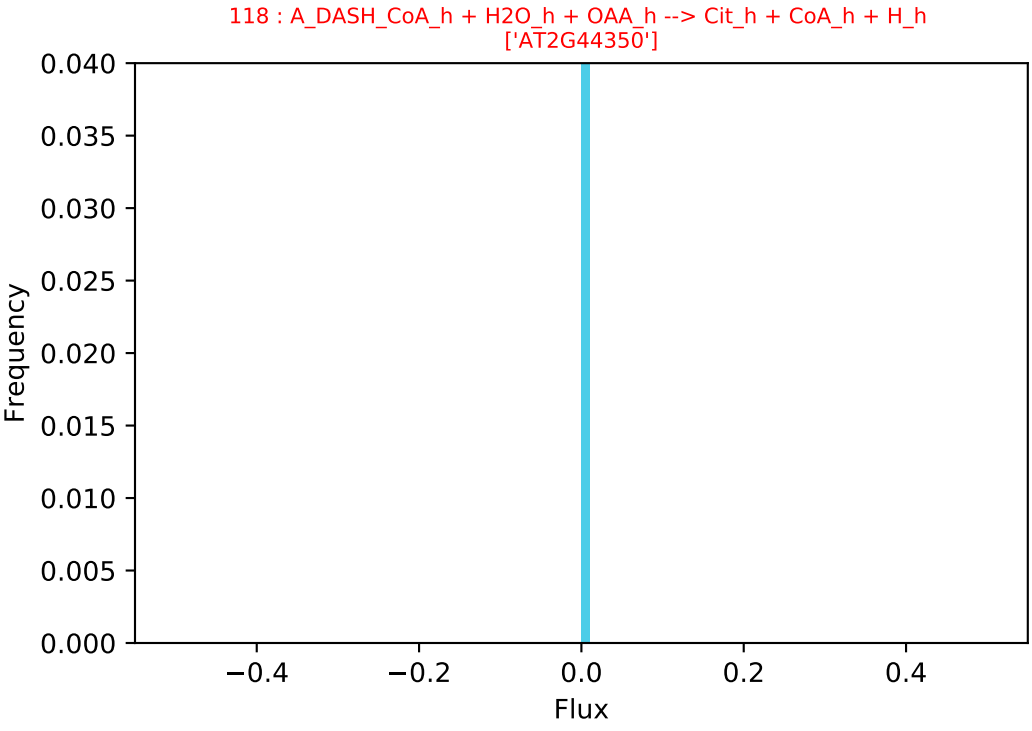

113 : Mal_h + NAD_h <=> H_h + NADH_h + OAA_h
['AT3G47520', 'AT1G04410', 'AT1G53240', 'AT2G22780', 'AT5G09660']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0
2
4
6
8
10
12
14
16
Flux


114 : NADPH_c + OAA_c --> Mal_c + NADP_c
['AT5G58330']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0
1
2
3
4
5
Flux


115 : H_h + NADPH_h + OAA_h --> Mal_h + NADP_h
['AT5G58330']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux


116 : H_m + NADPH_m + OAA_m --> Mal_m + NADP_m
['AT5G58330']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0
2
4
6
8
10
12
14
Flux


117 : A_DASH_CoA_c + H2O_c + OAA_c --> Cit_c + CoA_c + H_c
['AT2G42790', 'AT3G58750']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux


118 : A_DASH_CoA_h + H2O_h + OAA_h --> Cit_h + CoA_h + H_h
['AT2G44350']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
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−0.2
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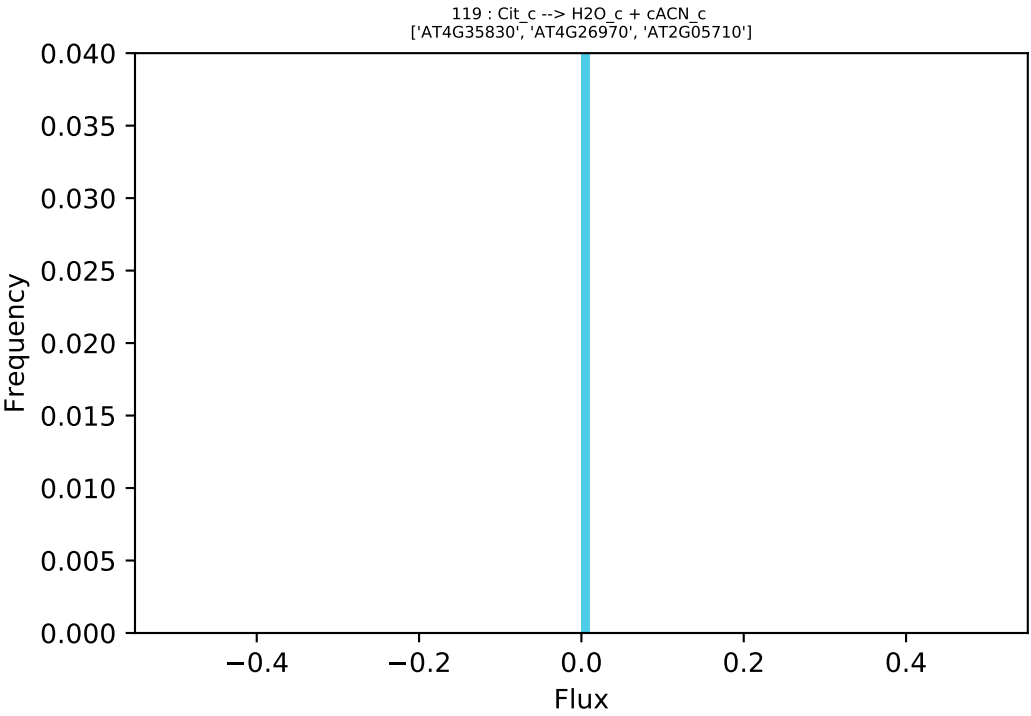
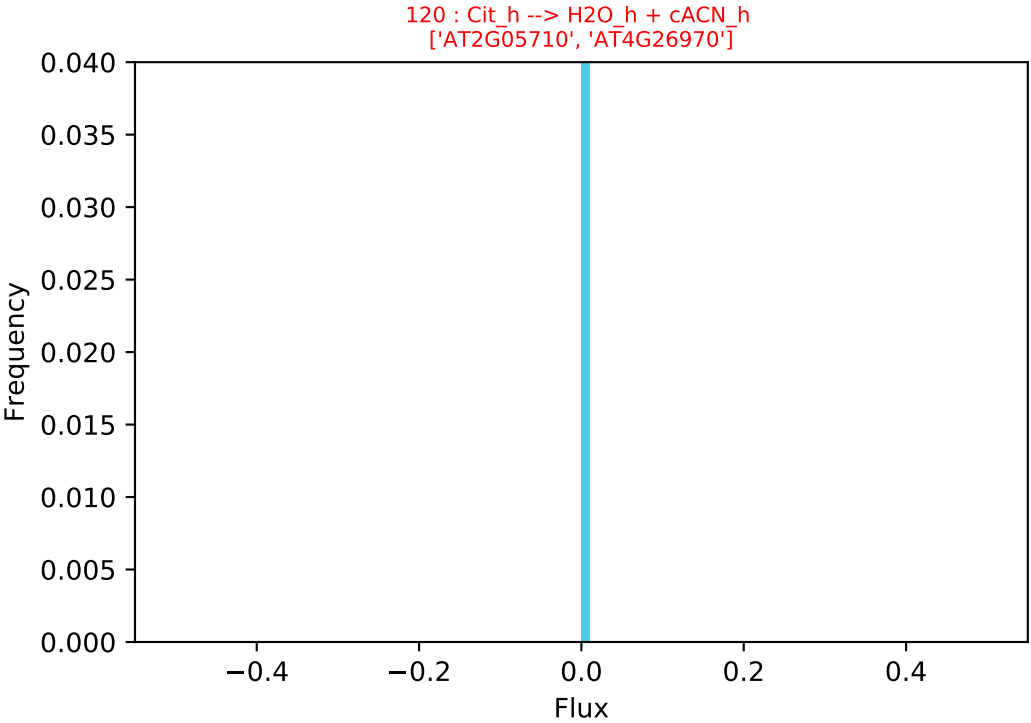
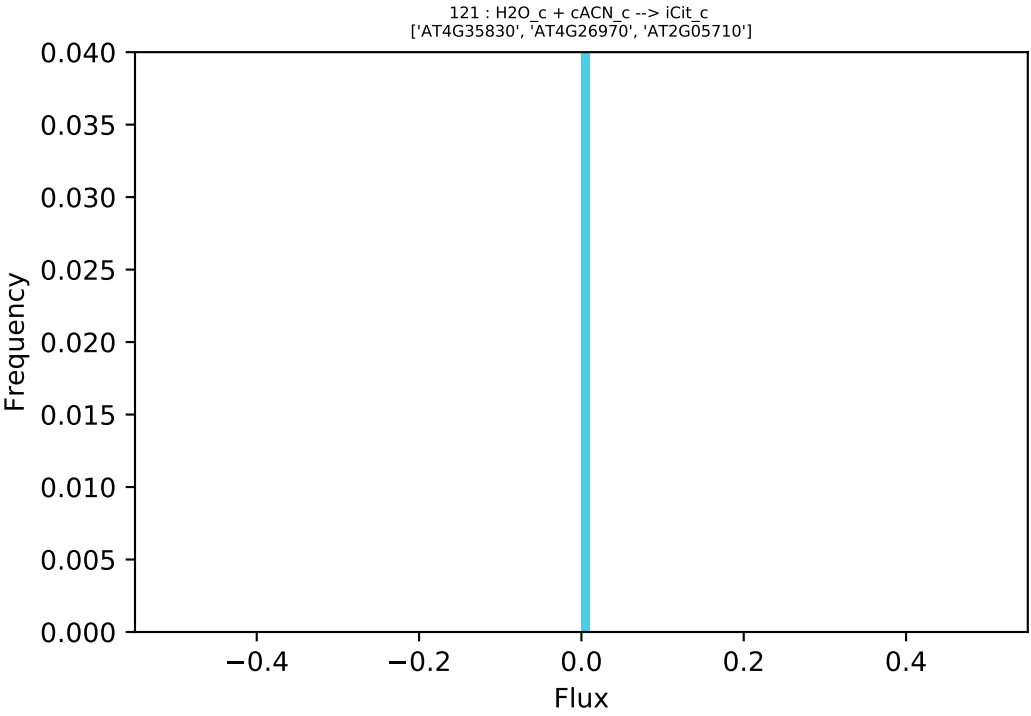
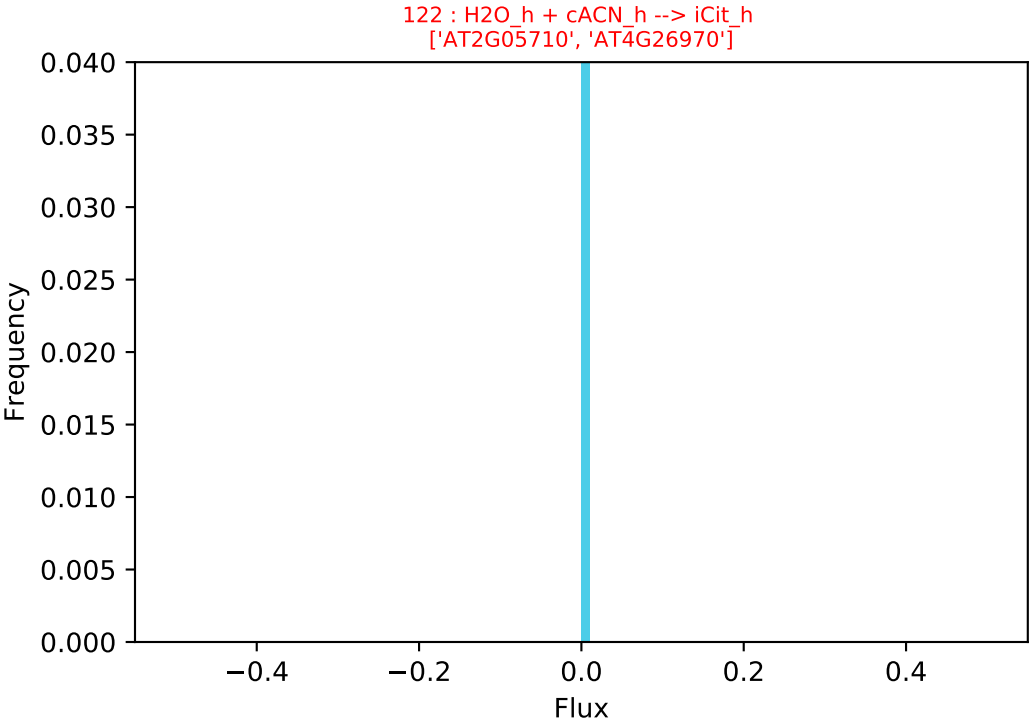
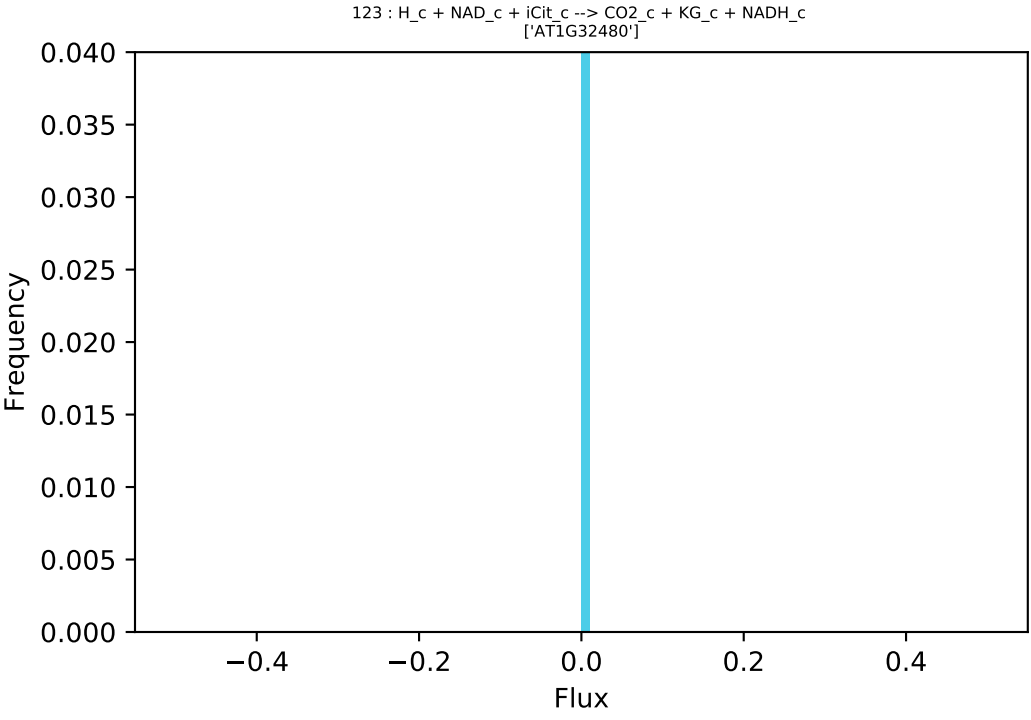
0.2
0.4
Flux

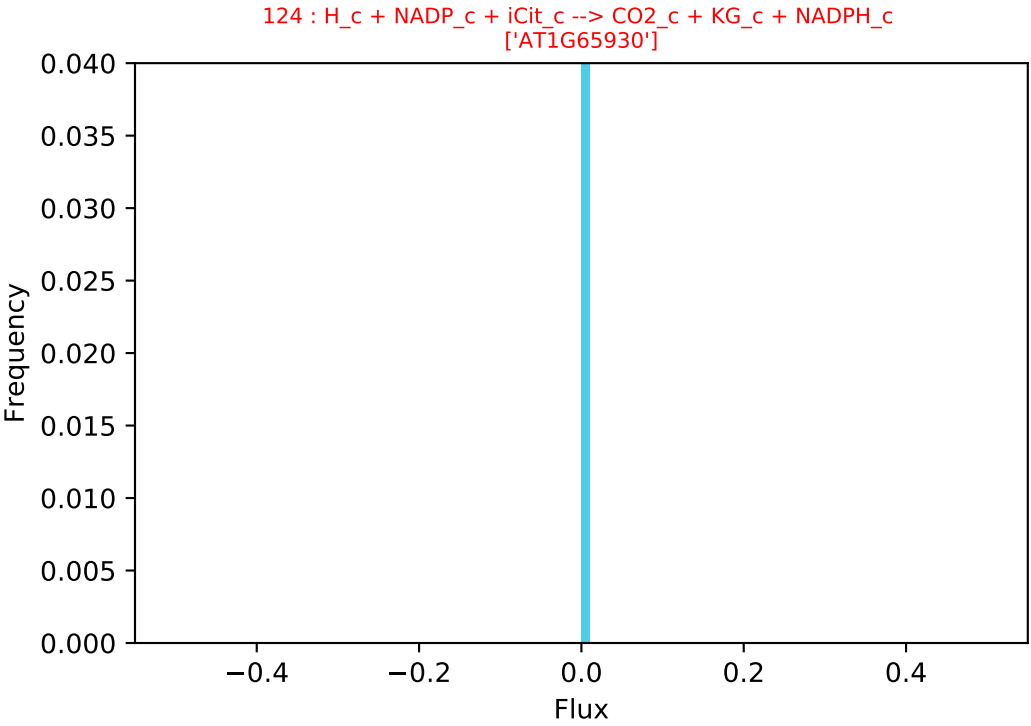

119 : Cit_c --> H2O_c + cACN_c
['AT4G35830', 'AT4G26970', 'AT2G05710']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

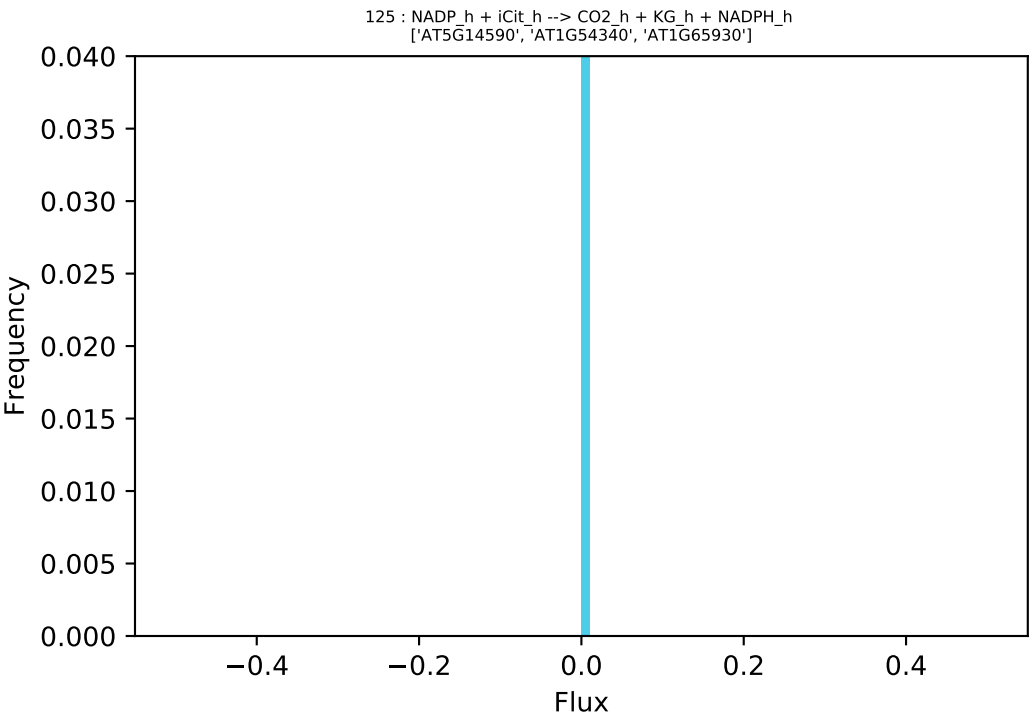

120 : Cit_h --> H2O_h + cACN_h
['AT2G05710', 'AT4G26970']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

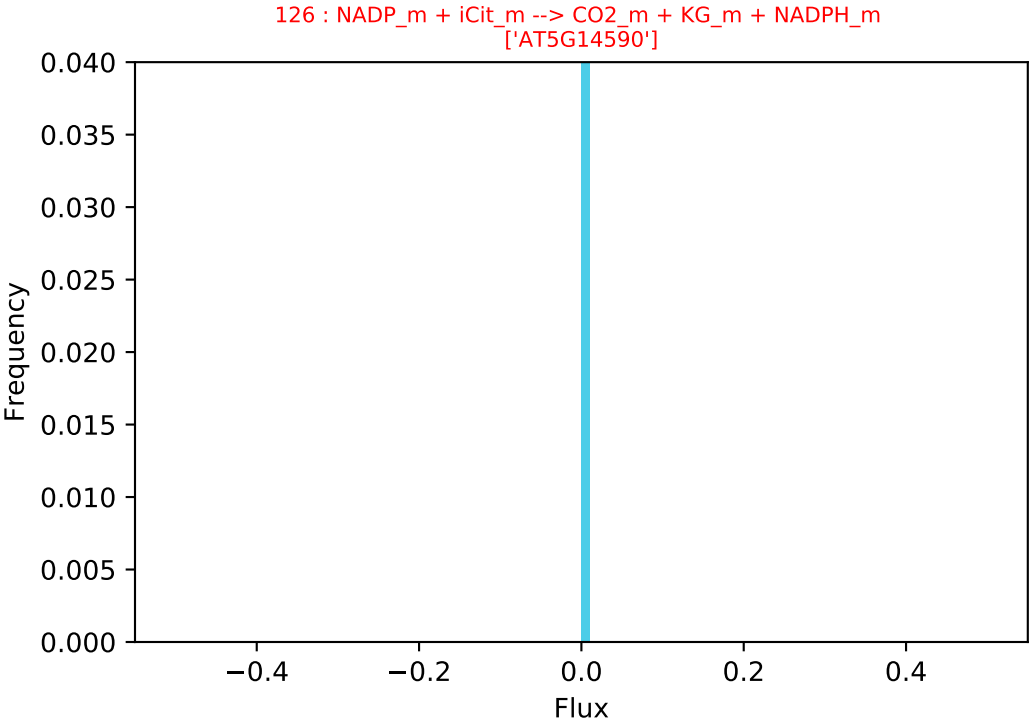

121 : H2O_c + cACN_c --> iCit_c
['AT4G35830', 'AT4G26970', 'AT2G05710']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

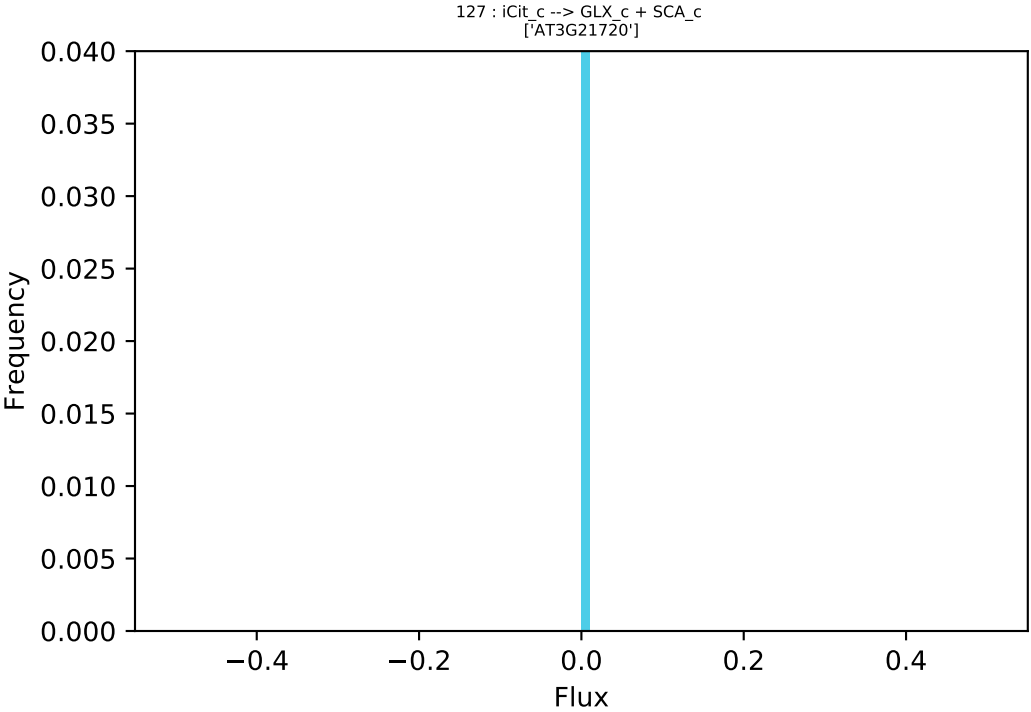

122 : H2O_h + cACN_h --> iCit_h
['AT2G05710', 'AT4G26970']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

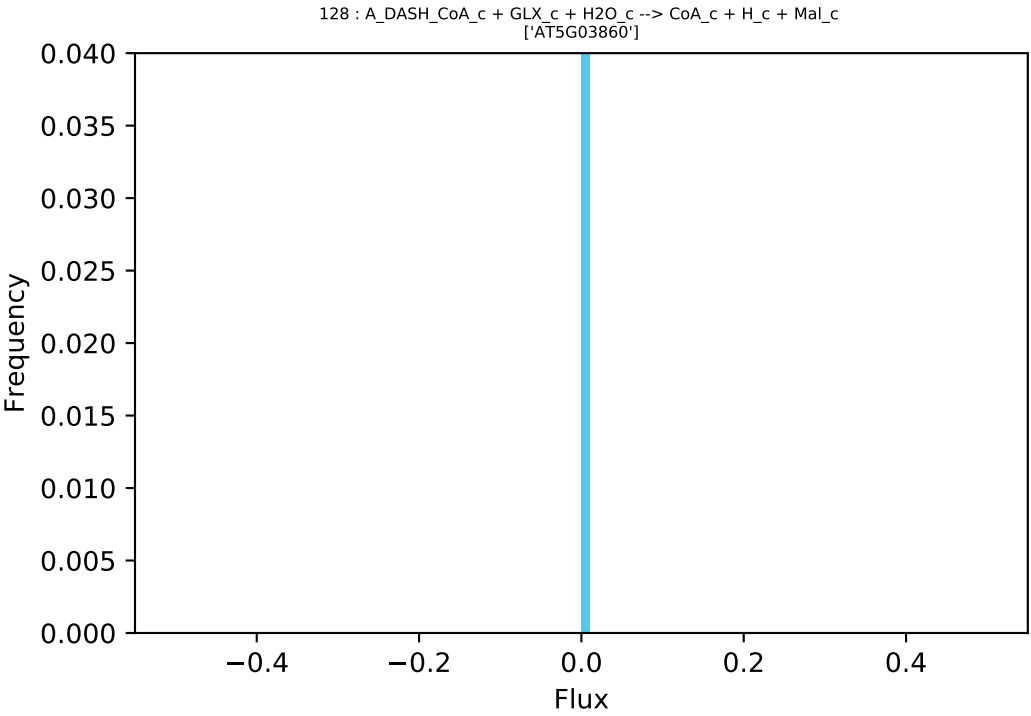

123 : H_c + NAD_c + iCit_c --> CO2_c + KG_c + NADH_c
['AT1G32480']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

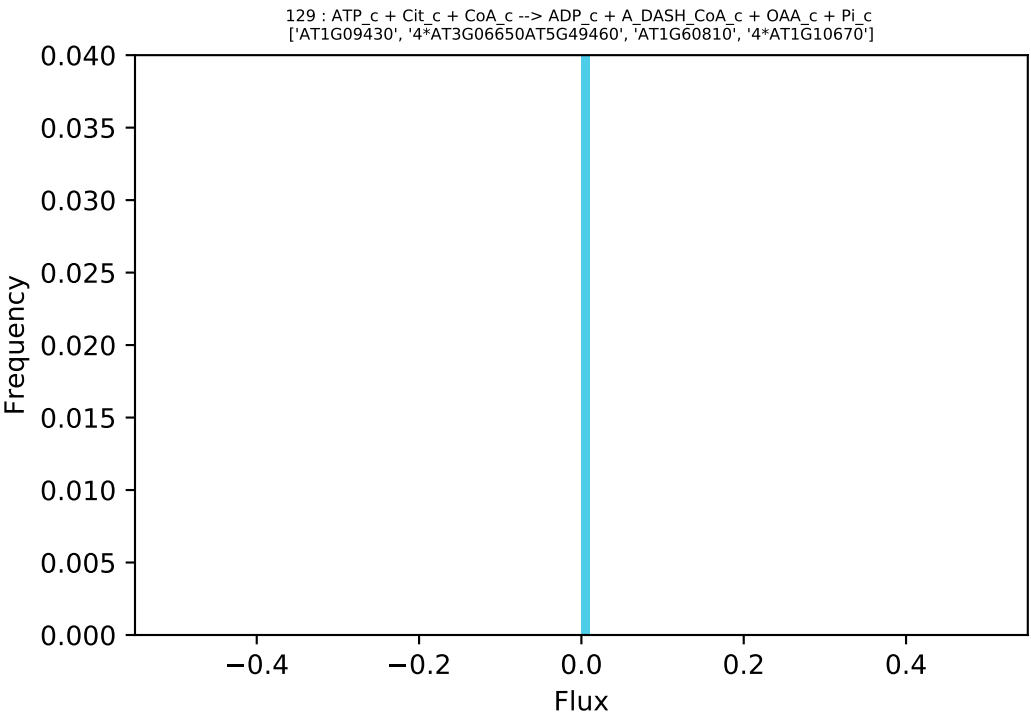

124 : H_c + NADP_c + iCit_c --> CO2_c + KG_c + NADPH_c
['AT1G65930']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

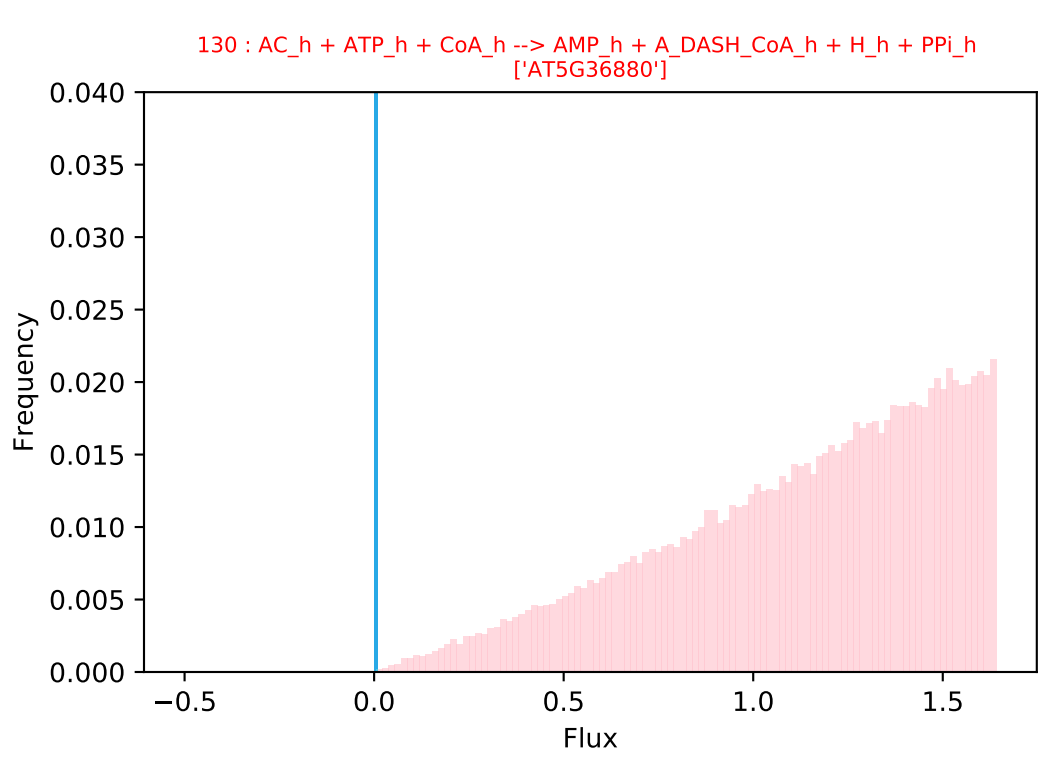

125 : NADP_h + iCit_h --> CO2_h + KG_h + NADPH_h
['AT5G14590', 'AT1G54340', 'AT1G65930']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

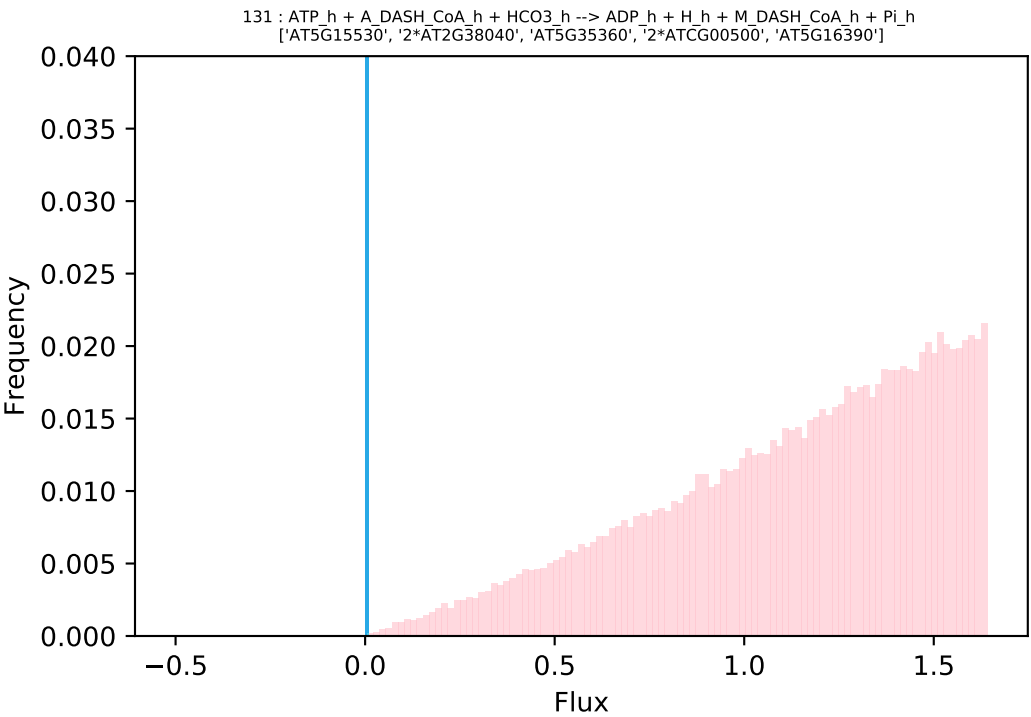

126 : NADP_m + iCit_m --> CO2_m + KG_m + NADPH_m
['AT5G14590']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

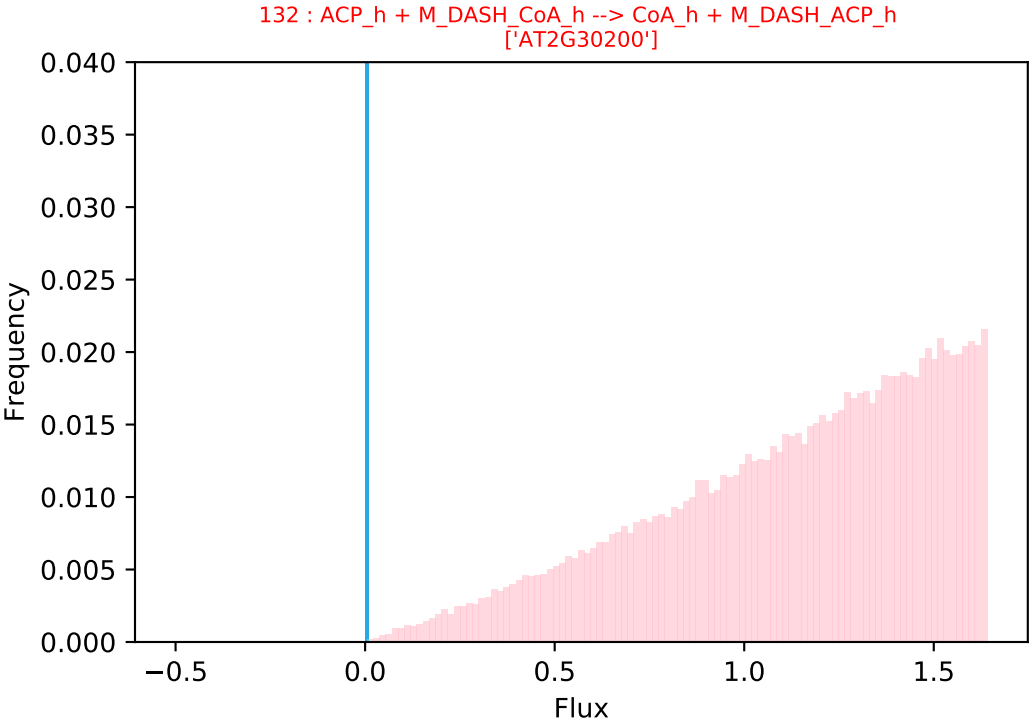

127 : iCit_c --> GLX_c + SCA_c
['AT3G21720']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

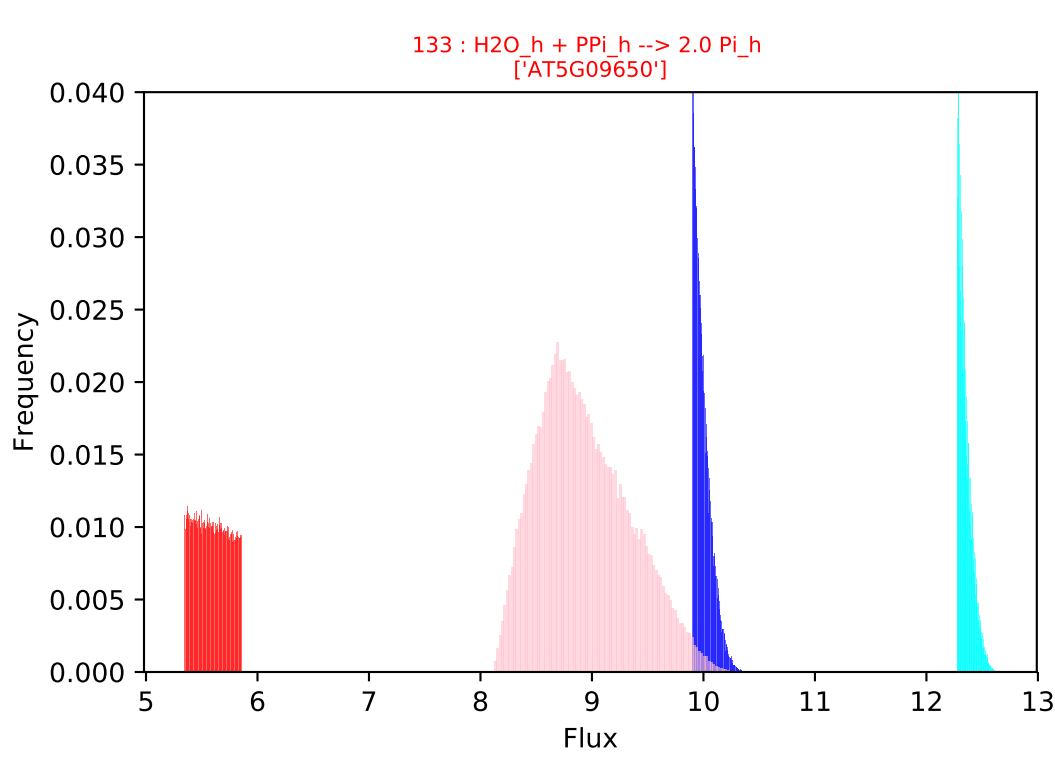

128 : A_DASH_CoA_c + GLX_c + H2O_c --> CoA_c + H_c + Mal_c
['AT5G03860']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

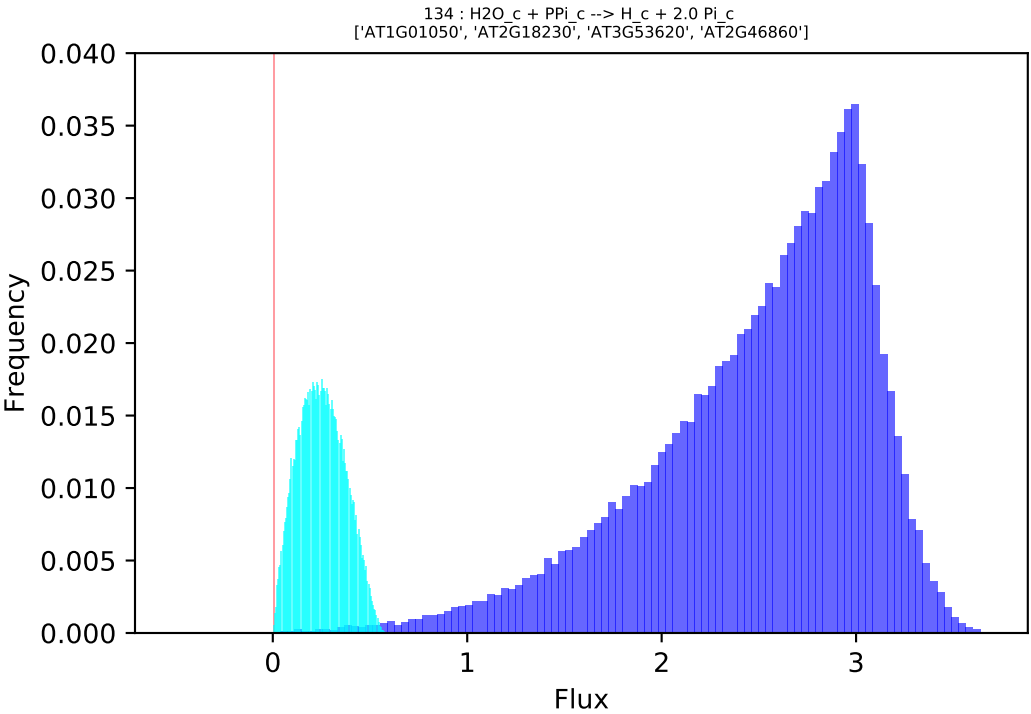

129 : ATP_c + Cit_c + CoA_c --> ADP_c + A_DASH_CoA_c + OAA_c + Pi_c
['AT1G09430', '4*AT3G06650AT5G49460', 'AT1G60810', '4*AT1G10670']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux


130 : AC_h + ATP_h + CoA_h --> AMP_h + A_DASH_CoA_h + H_h + PPi_h
['AT5G36880']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.5
0.0
0.5
1.0
1.5
Flux


131 : ATP_h + A_DASH_CoA_h + HCO3_h --> ADP_h + H_h + M_DASH_CoA_h + Pi_h
['AT5G15530', '2*AT2G38040', 'AT5G35360', '2*ATCG00500', 'AT5G16390']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.5
0.0
0.5
1.0
1.5
Flux


132 : ACP_h + M_DASH_CoA_h --> CoA_h + M_DASH_ACP_h
['AT2G30200']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.5
0.0
0.5
1.0
1.5
Flux


133 : H2O_h + PPi_h --> 2.0 Pi_h
['AT5G09650']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
5
6
7
8
9
10
11
12
13
Flux


134 : H2O_c + PPi_c --> H_c + 2.0 Pi_c
['AT1G01050', 'AT2G18230', 'AT3G53620', 'AT2G46860']
Frequency
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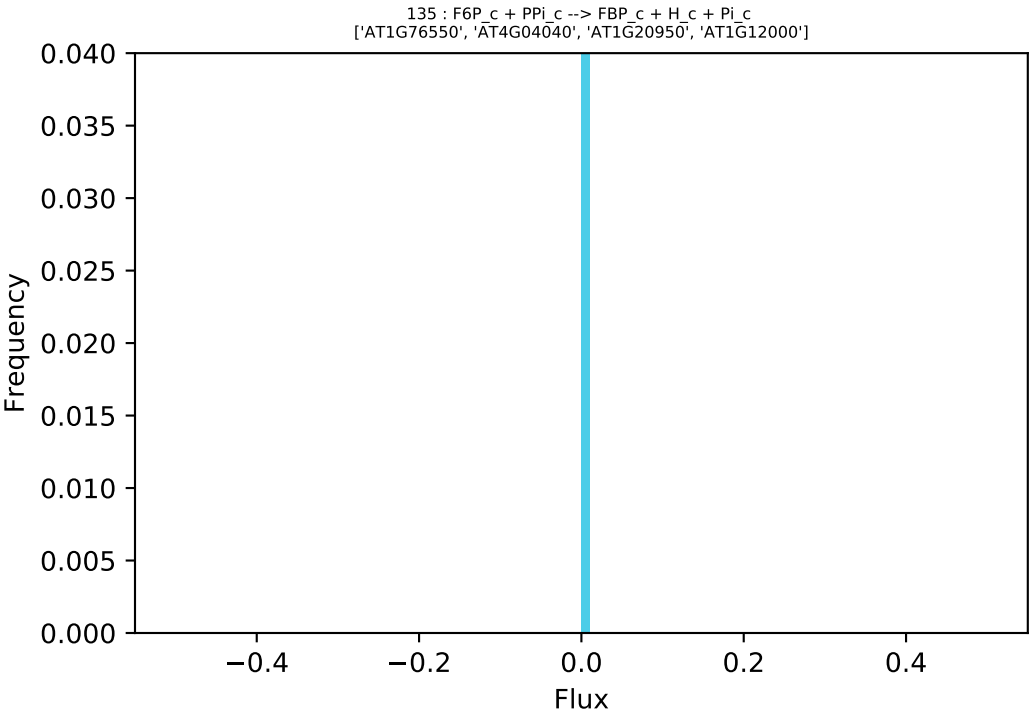
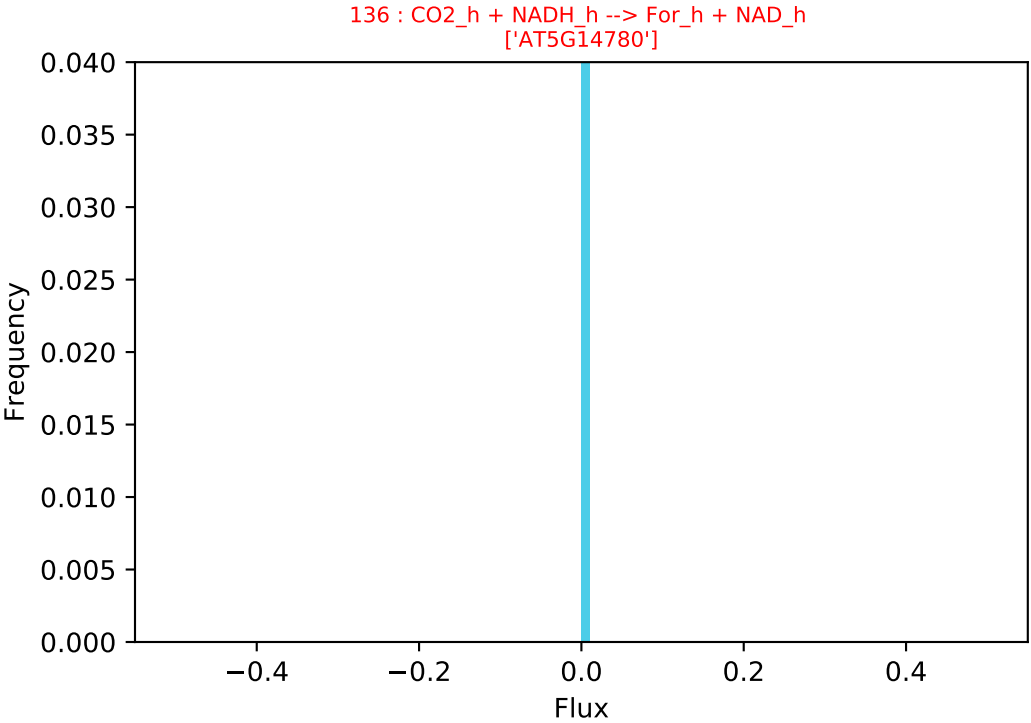
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0
1
2
3
Flux


135 : F6P_c + PPi_c --> FBP_c + H_c + Pi_c
['AT1G76550', 'AT4G04040', 'AT1G20950', 'AT1G12000']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux


136 : CO2_h + NADH_h --> For_h + NAD_h
['AT5G14780']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
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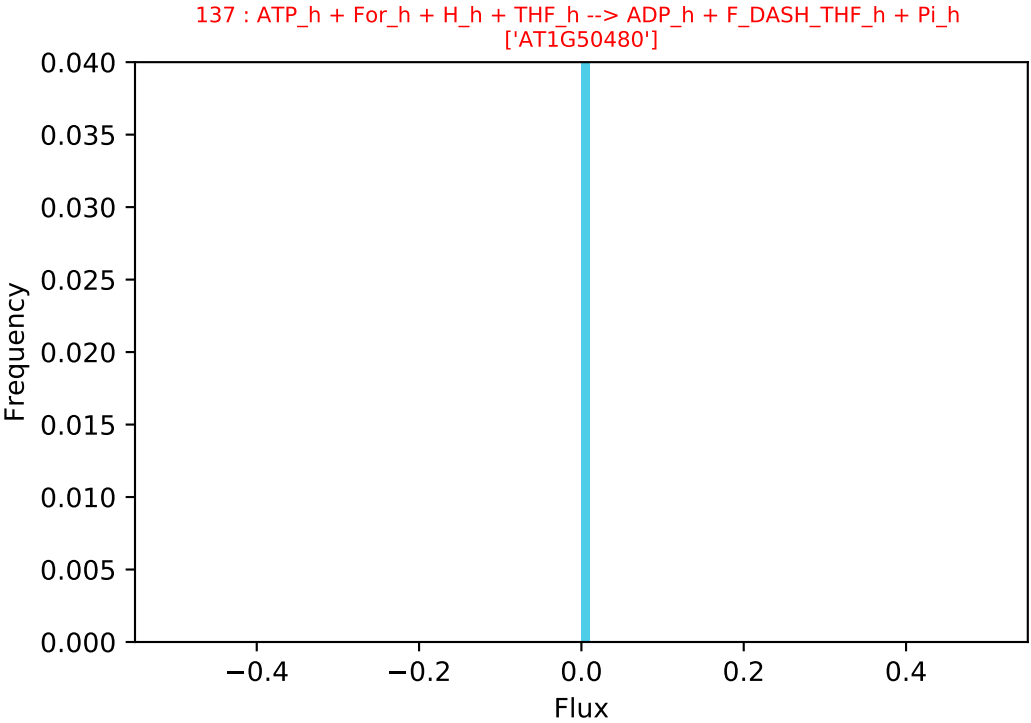
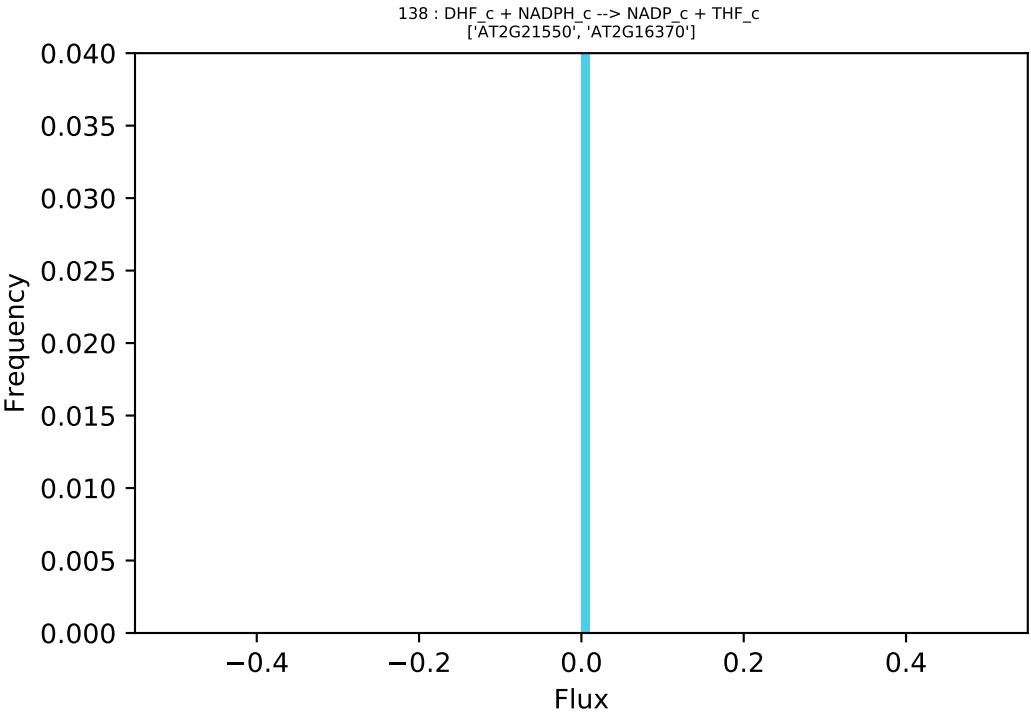
0.2
0.4
Flux


137 : ATP_h + For_h + H_h + THF_h --> ADP_h + F_DASH_THF_h + Pi_h
['AT1G50480']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux


138 : DHF_c + NADPH_c --> NADP_c + THF_c
['AT2G21550', 'AT2G16370']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
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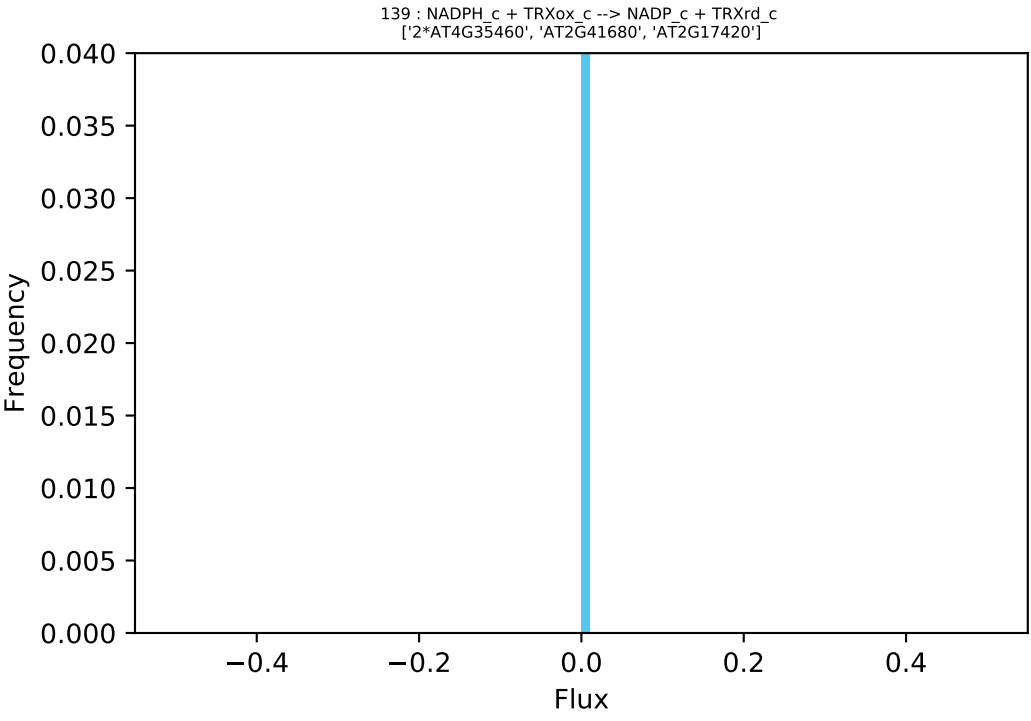
−0.2
0.0
0.2
0.4
Flux


139 : NADPH_c + TRXox_c --> NADP_c + TRXrd_c
['2*AT4G35460', 'AT2G41680', 'AT2G17420']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
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−0.2
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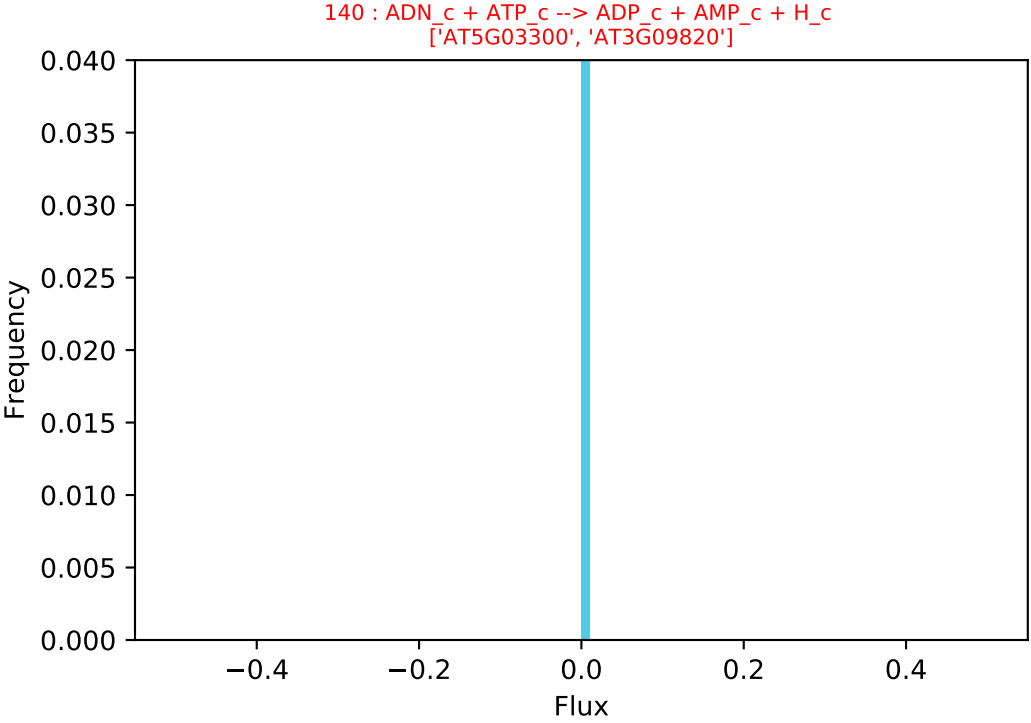
0.2
0.4
Flux


140 : ADN_c + ATP_c --> ADP_c + AMP_c + H_c
['AT5G03300', 'AT3G09820']
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0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
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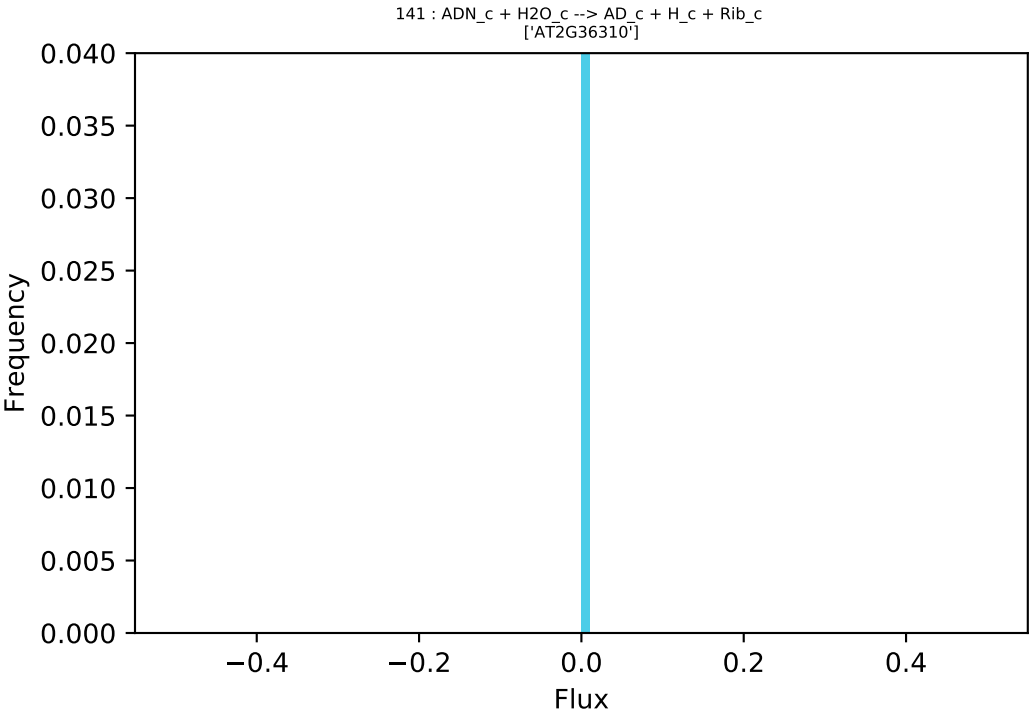
−0.2
0.0
0.2
0.4
Flux


141 : ADN_c + H2O_c --> AD_c + H_c + Rib_c
['AT2G36310']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
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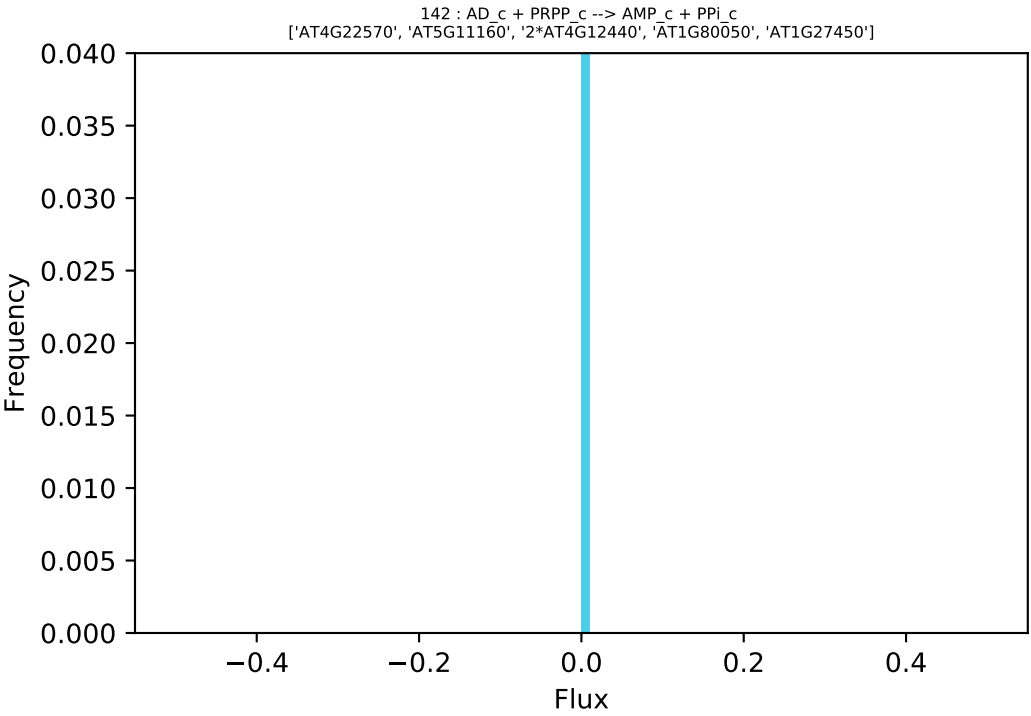
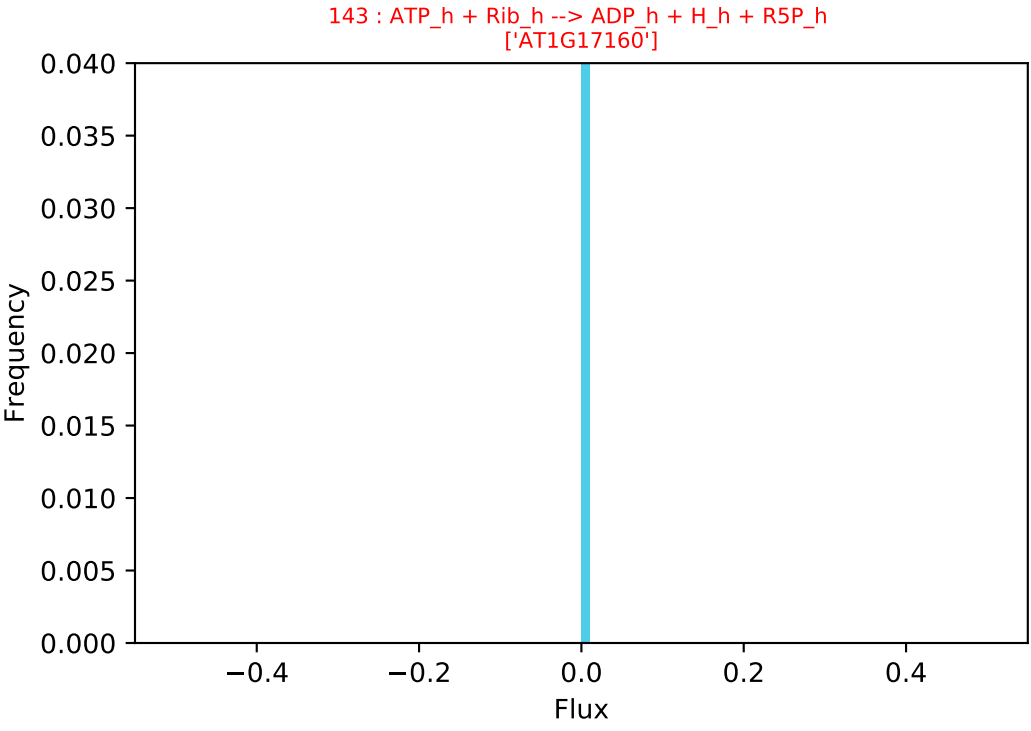
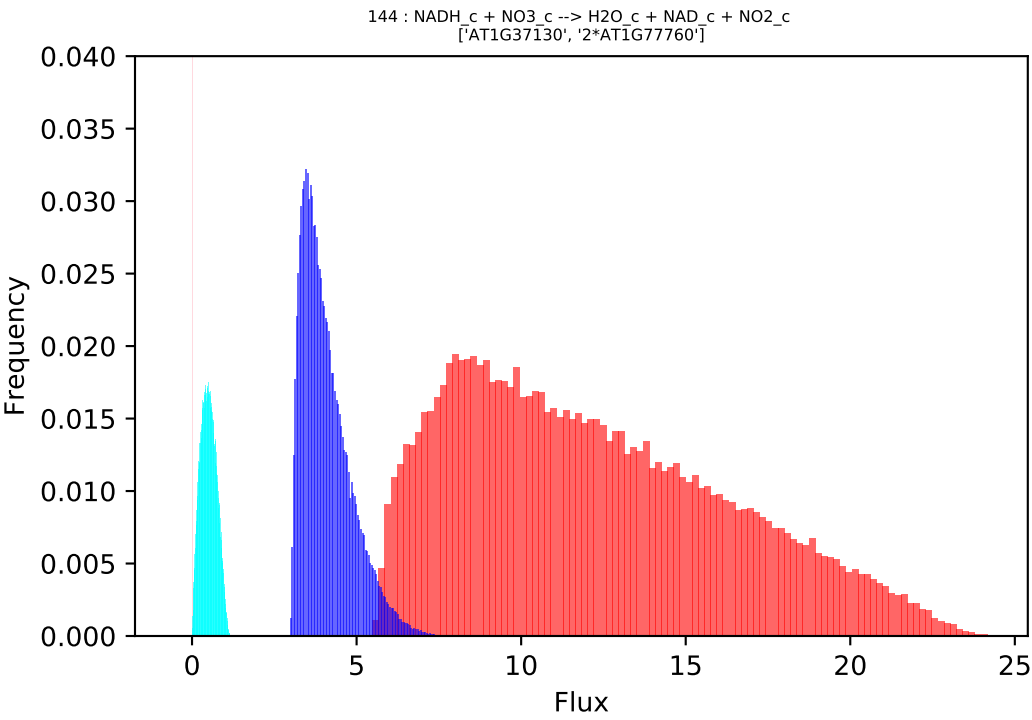
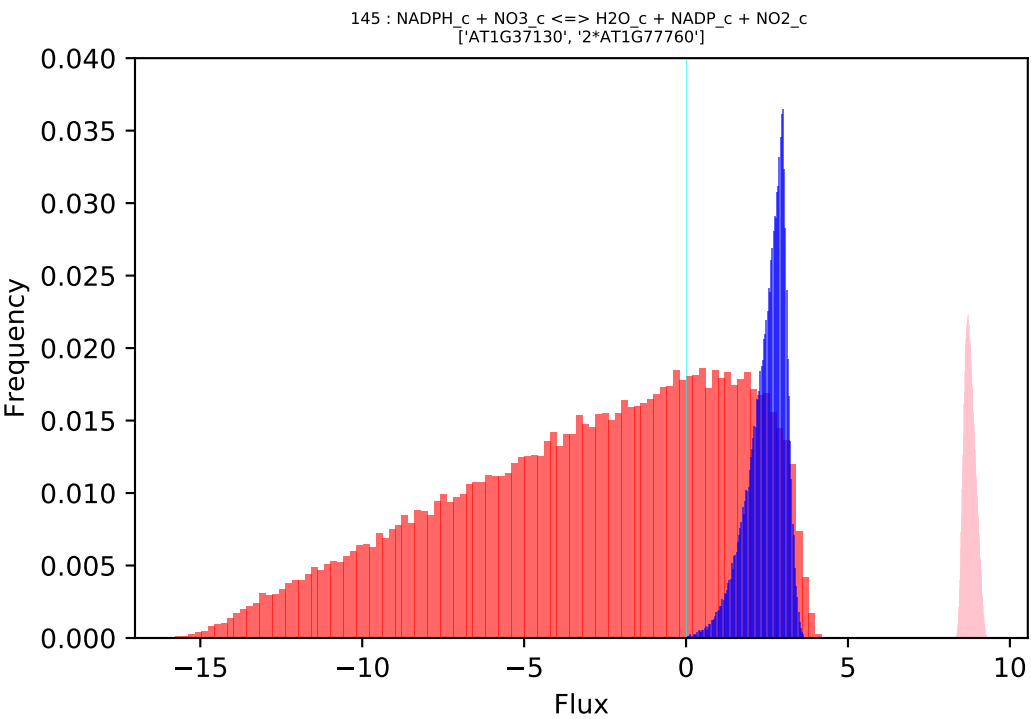
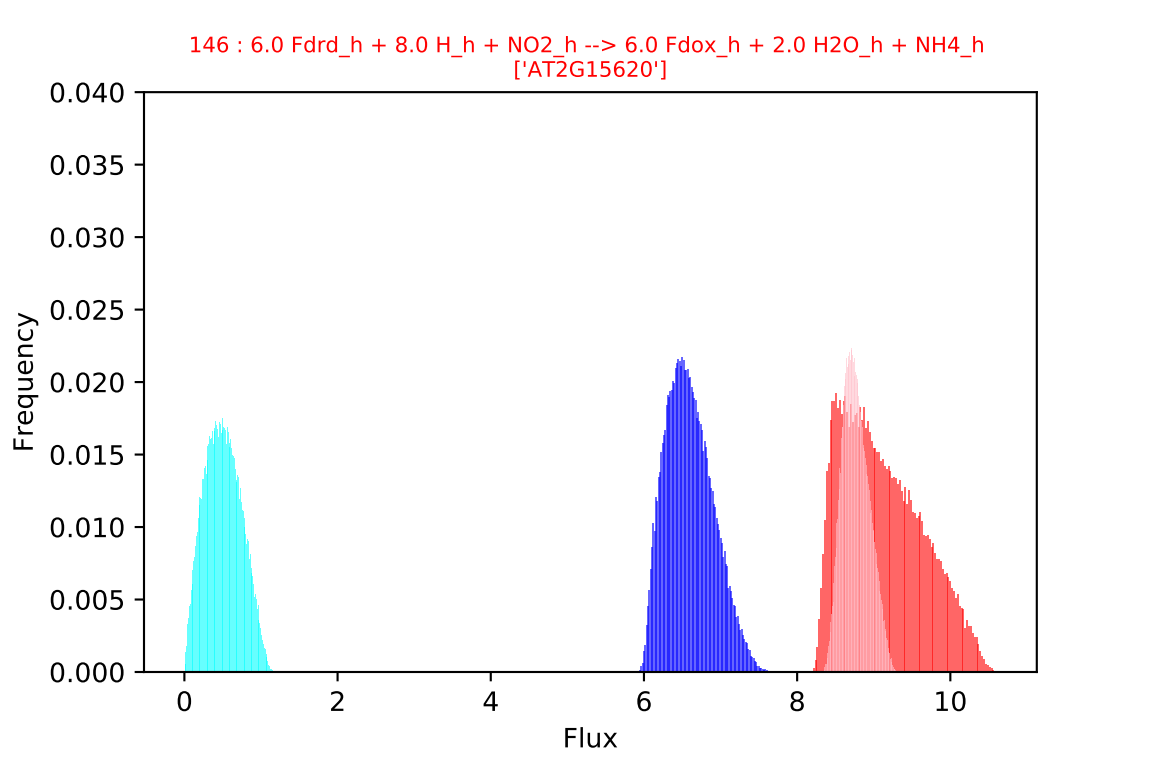
0.2
0.4
Flux

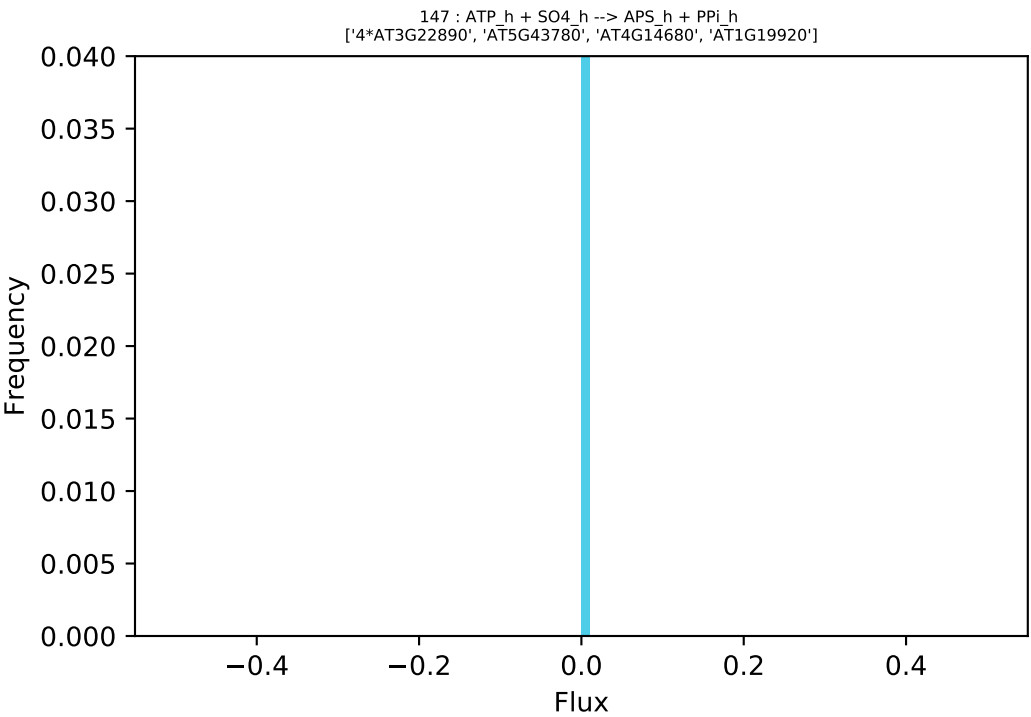

142 : AD_c + PRPP_c --> AMP_c + PPi_c
['AT4G22570', 'AT5G11160', '2*AT4G12440', 'AT1G80050', 'AT1G27450']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

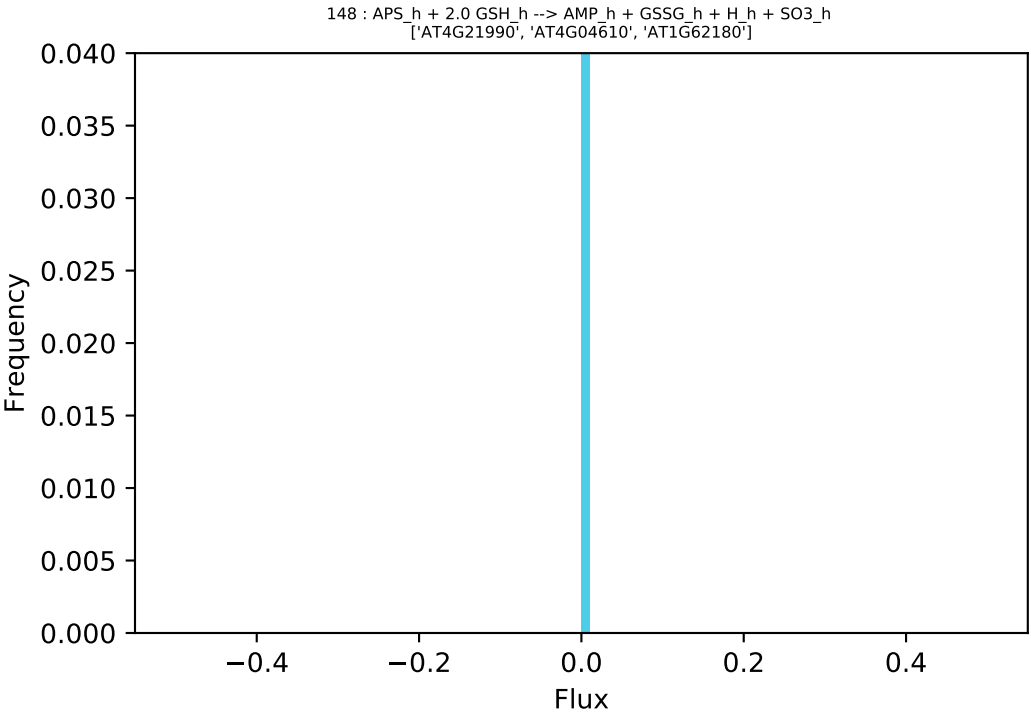

143 : ATP_h + Rib_h --> ADP_h + H_h + R5P_h
['AT1G17160']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

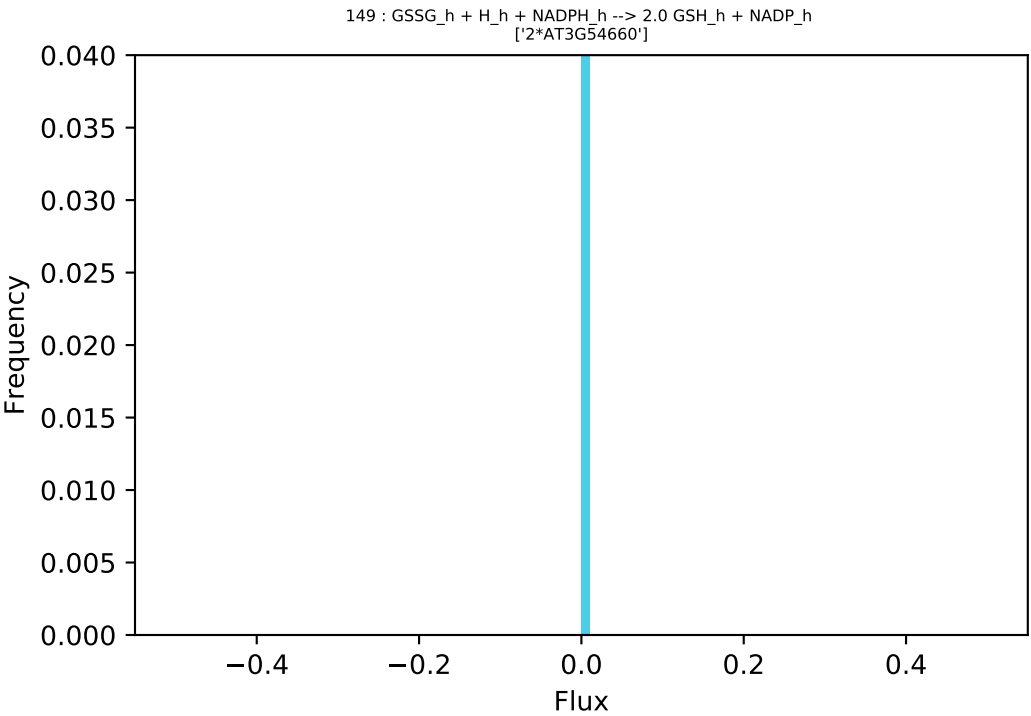

144 : NADH_c + NO3_c --> H2O_c + NAD_c + NO2_c
['AT1G37130', '2*AT1G77760']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0
5
10
15
20
25
Flux

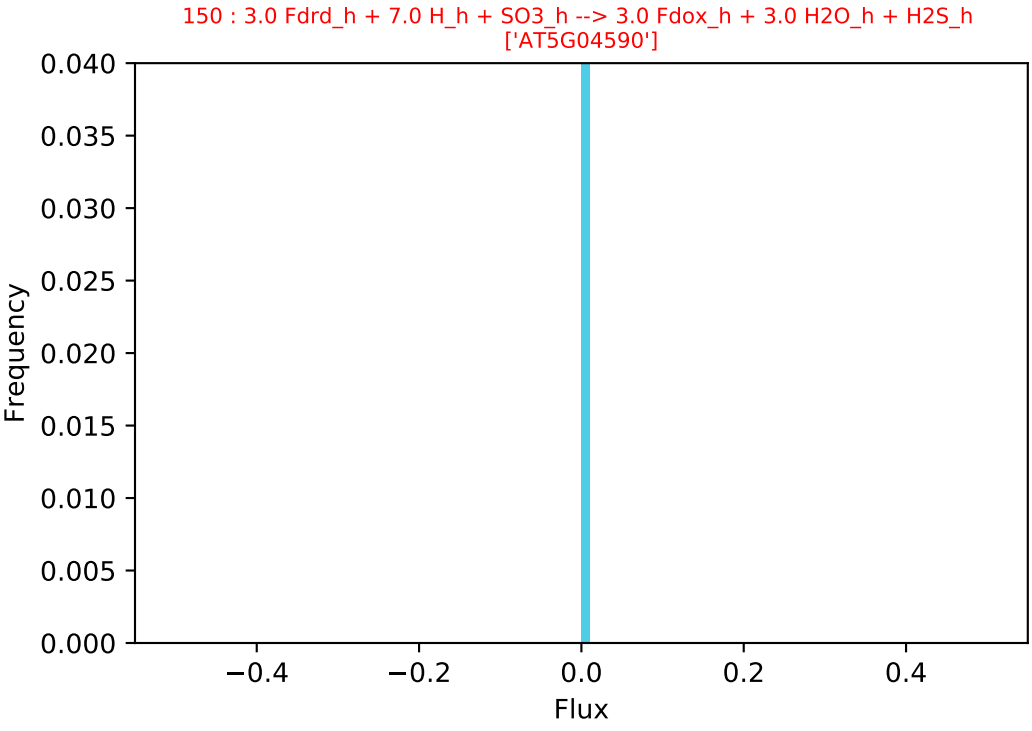

145 : NADPH_c + NO3_c <=> H2O_c + NADP_c + NO2_c
['AT1G37130', '2*AT1G77760']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−15
−10
−5
0
5
10
Flux

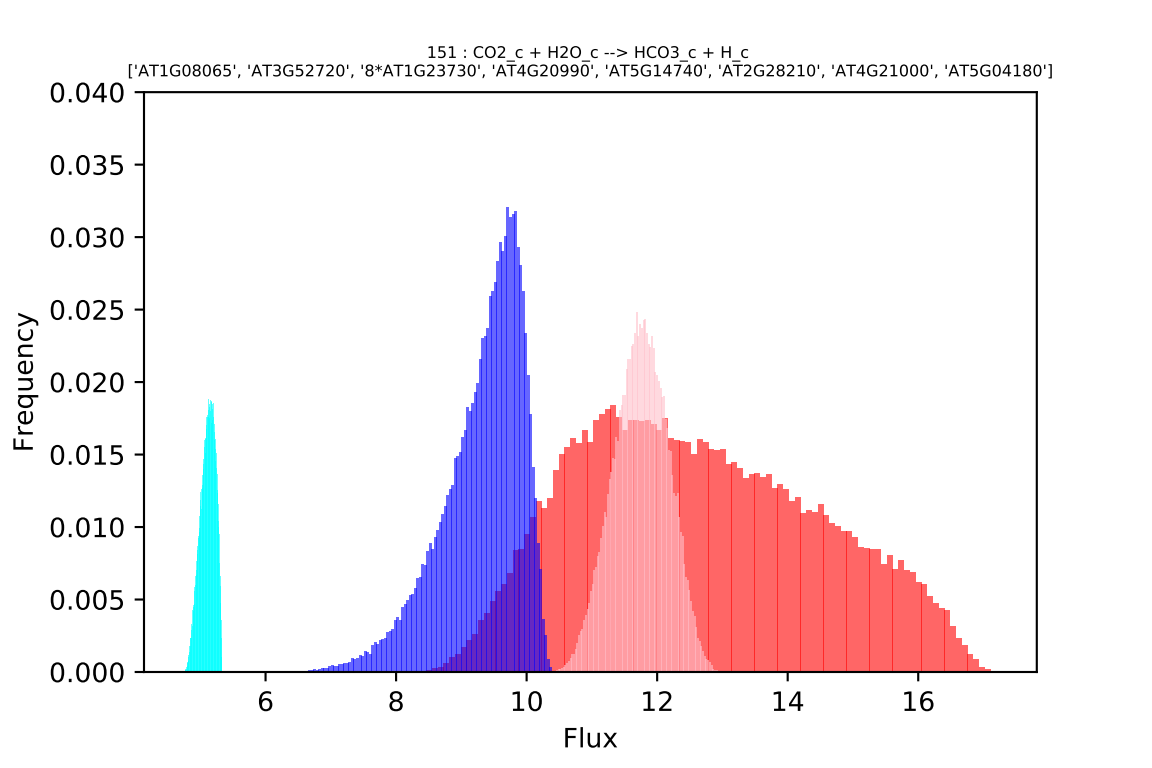

146 : 6.0 Fdrd_h + 8.0 H_h + NO2_h --> 6.0 Fdox_h + 2.0 H2O_h + NH4_h
['AT2G15620']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0
2
4
6
8
10
Flux

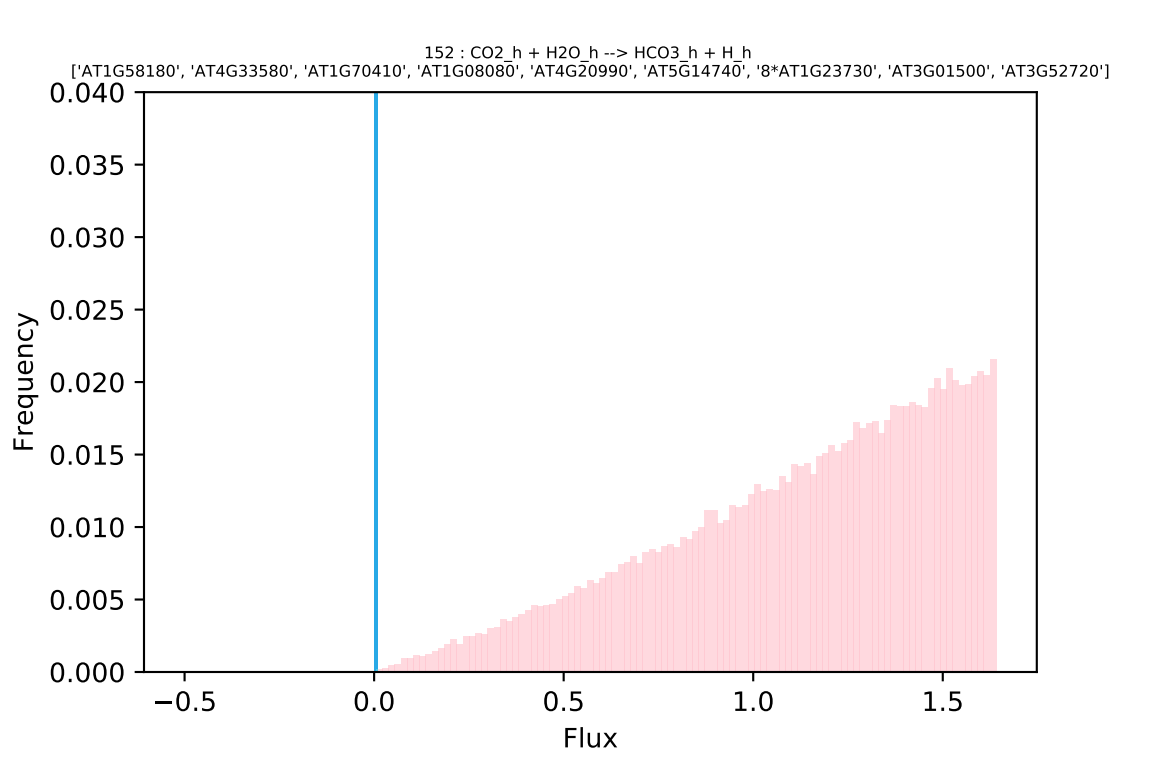

147 : ATP_h + SO4_h --> APS_h + PPi_h
['4*AT3G22890', 'AT5G43780', 'AT4G14680', 'AT1G19920']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

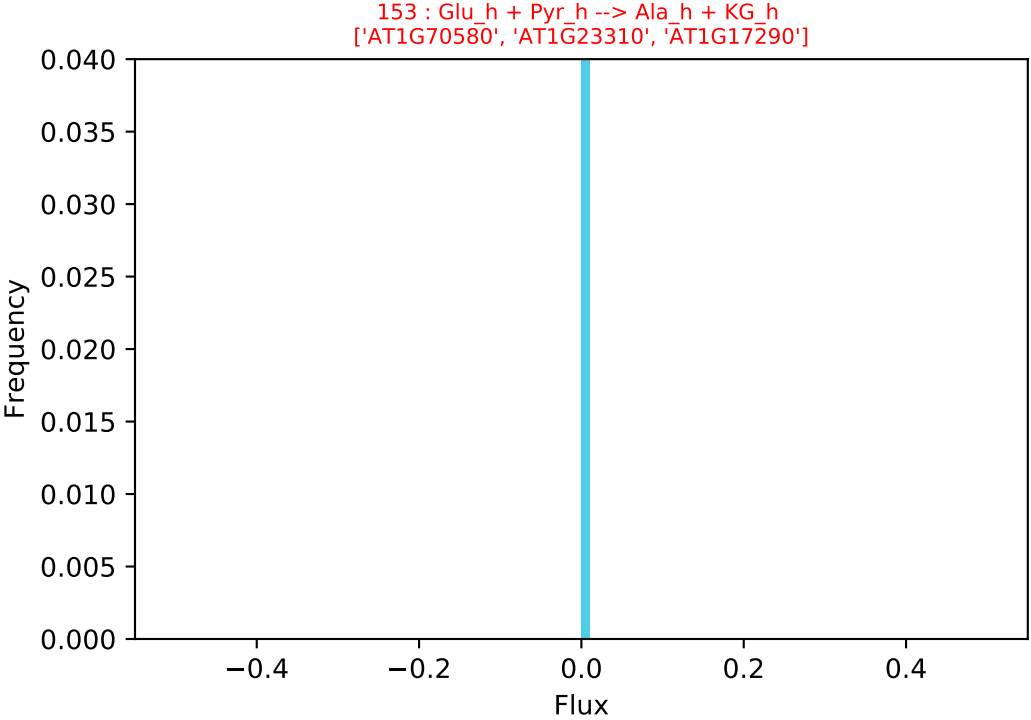

148 : APS_h + 2.0 GSH_h --> AMP_h + GSSG_h + H_h + SO3_h
['AT4G21990', 'AT4G04610', 'AT1G62180']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

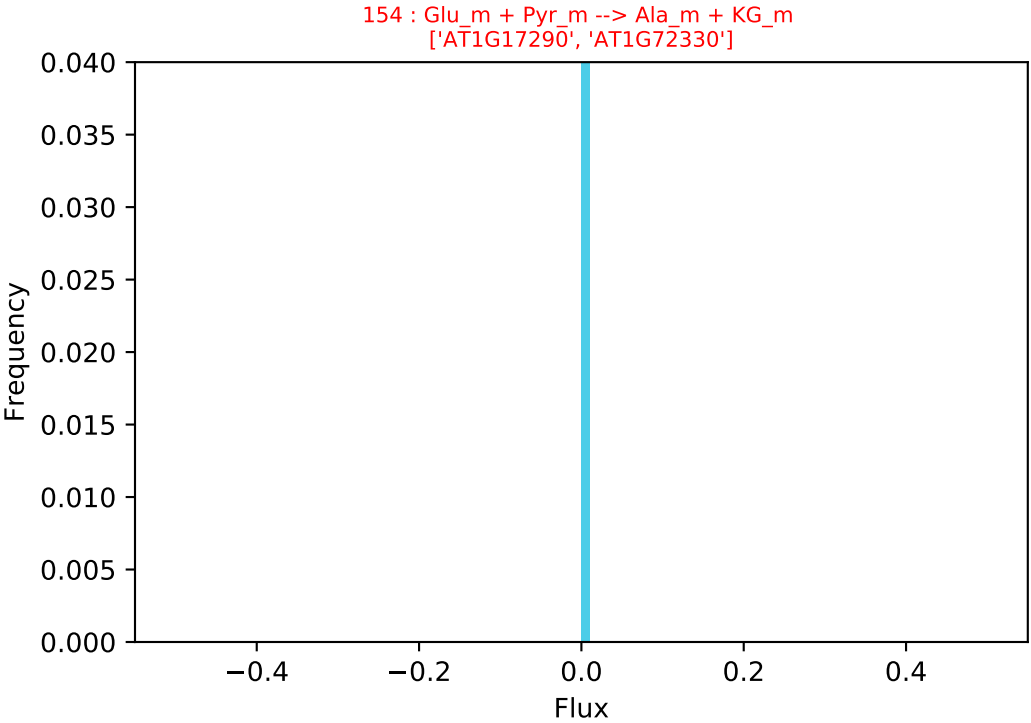

149 : GSSG_h + H_h + NADPH_h --> 2.0 GSH_h + NADP_h
['2*AT3G54660']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

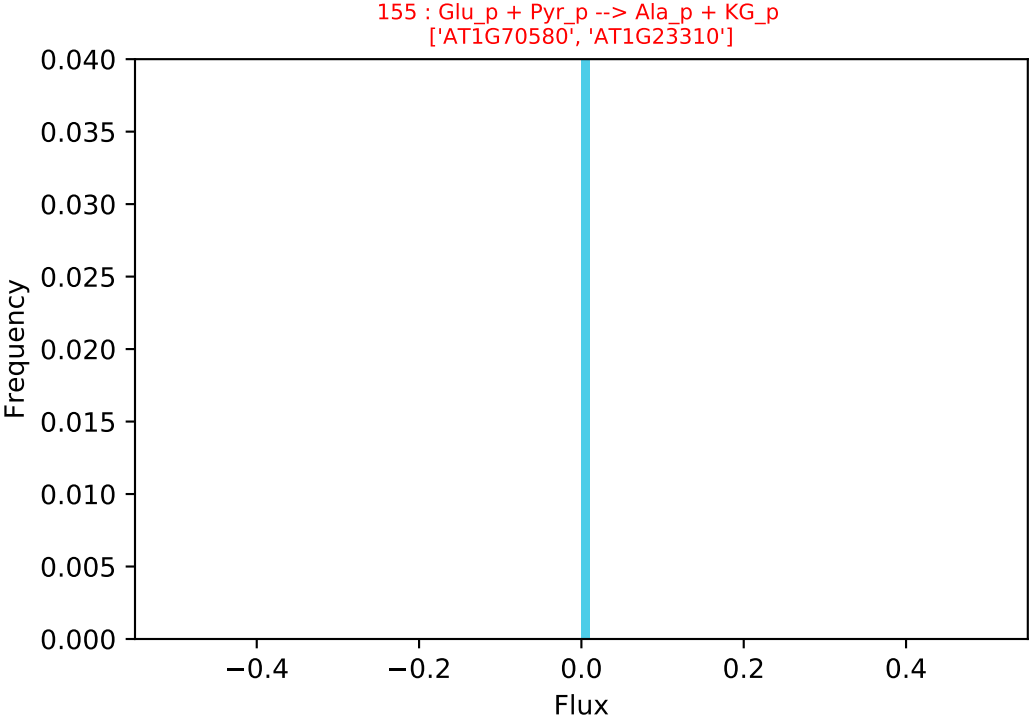

150 : 3.0 Fdrd_h + 7.0 H_h + SO3_h --> 3.0 Fdox_h + 3.0 H2O_h + H2S_h
['AT5G04590']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

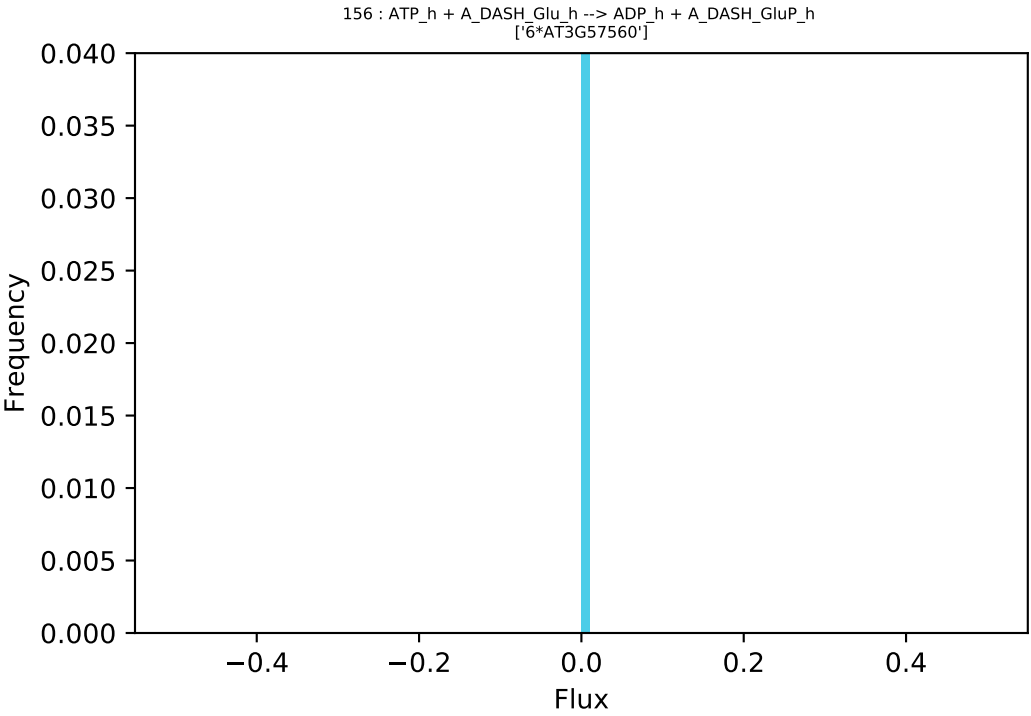

151 : CO2_c + H2O_c --> HCO3_c + H_c
['AT1G08065', 'AT3G52720', '8*AT1G23730', 'AT4G20990', 'AT5G14740', 'AT2G28210', 'AT4G21000', 'AT5G04180']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
6
8
10
12
14
16
Flux

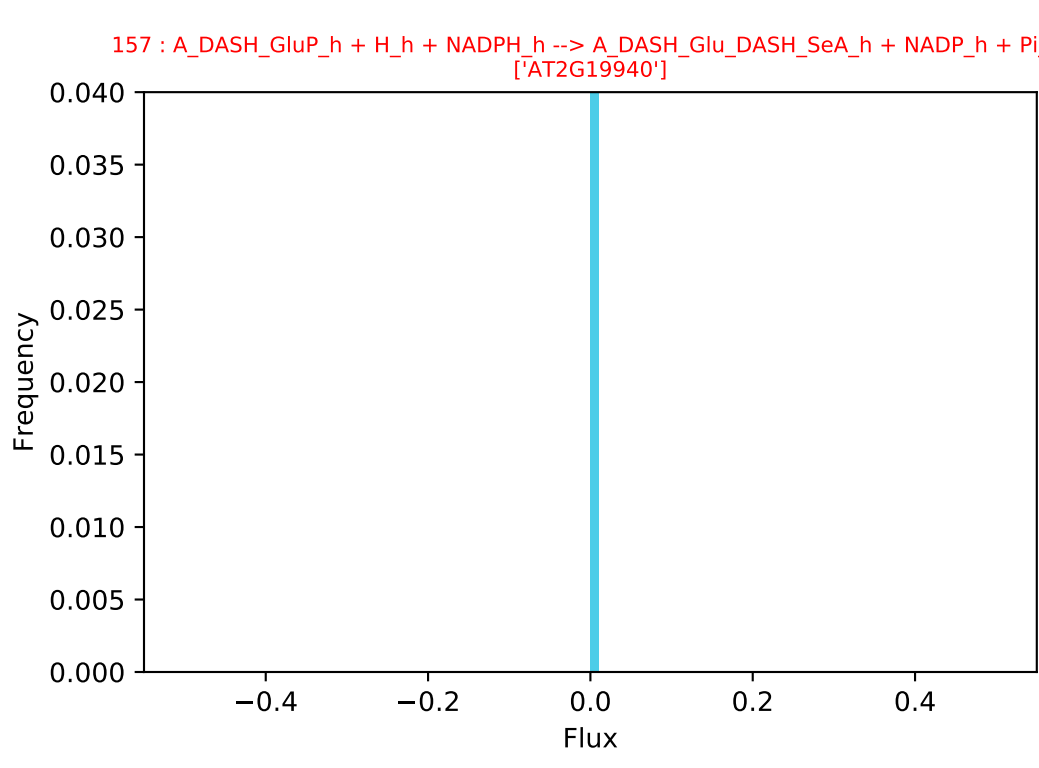

152 : CO2_h + H2O_h --> HCO3_h + H_h
['AT1G58180', 'AT4G33580', 'AT1G70410', 'AT1G08080', 'AT4G20990', 'AT5G14740', '8*AT1G23730', 'AT3G01500', 'AT3G52720']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
−0.5
0.0
0.5
1.0
1.5
Flux

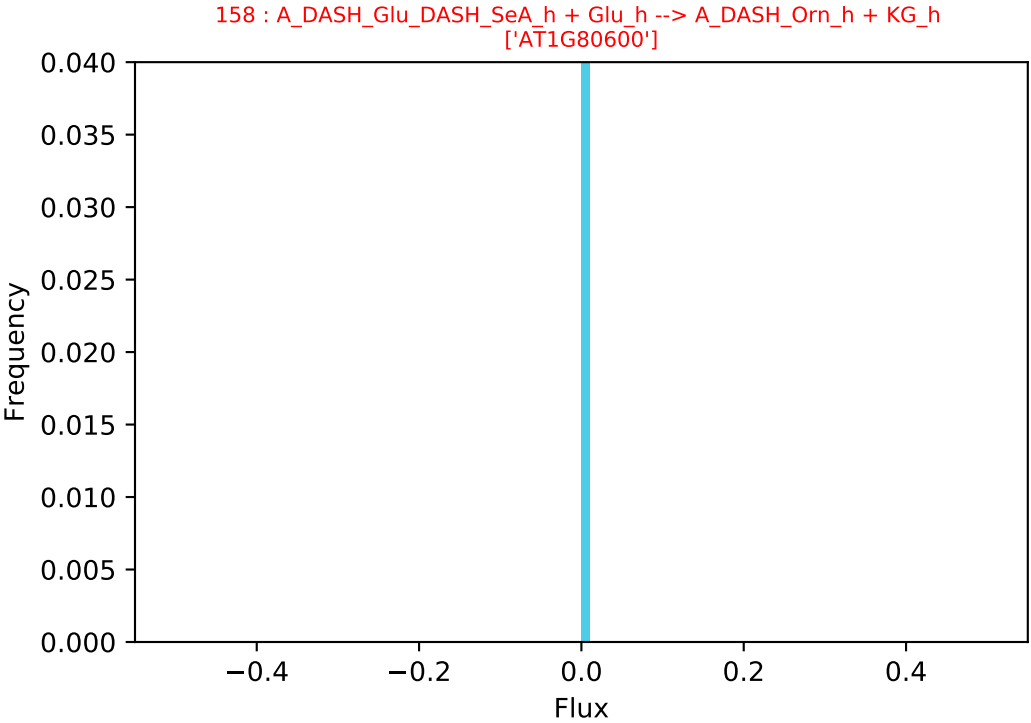

153 : Glu_h + Pyr_h --> Ala_h + KG_h
['AT1G70580', 'AT1G23310', 'AT1G17290']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

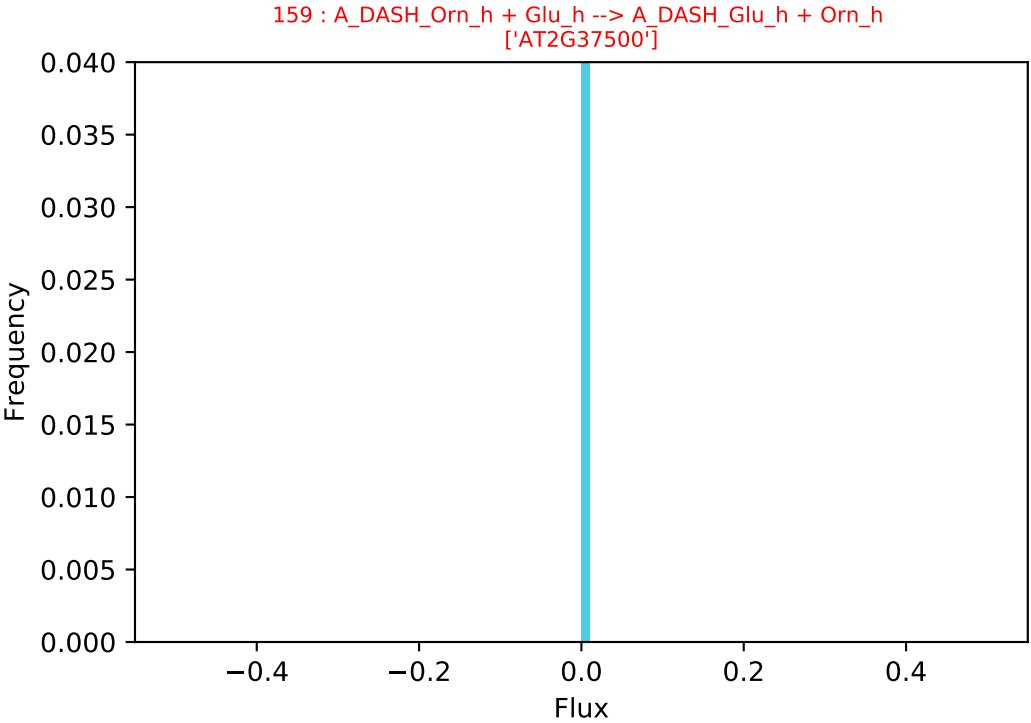

154 : Glu_m + Pyr_m --> Ala_m + KG_m
['AT1G17290', 'AT1G72330']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

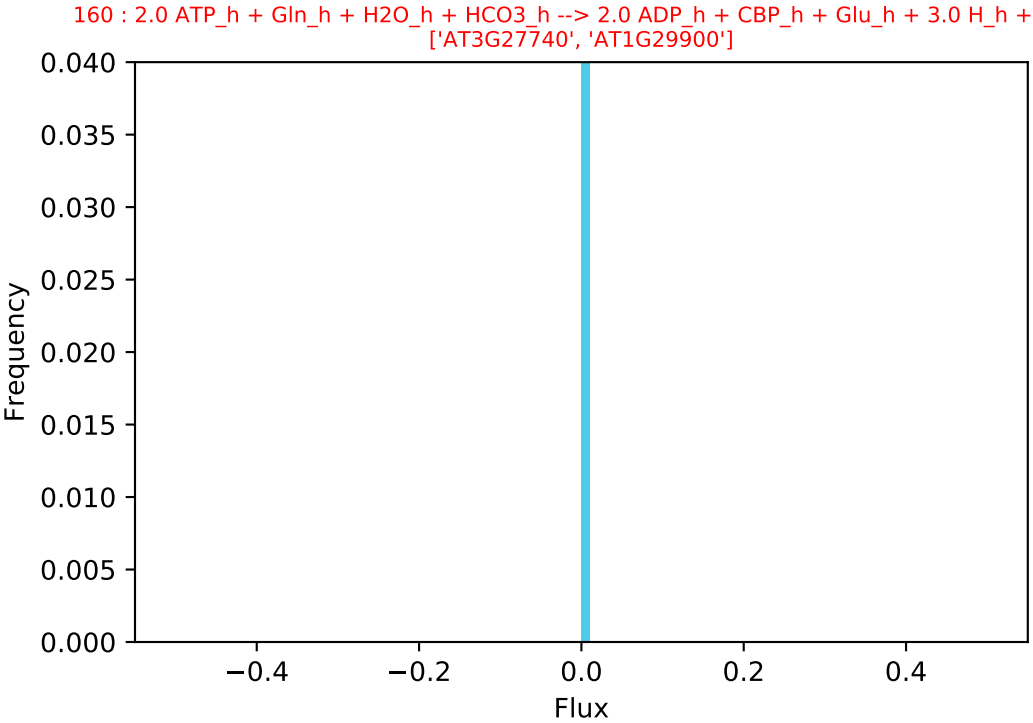

155 : Glu_p + Pyr_p --> Ala_p + KG_p
['AT1G70580', 'AT1G23310']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

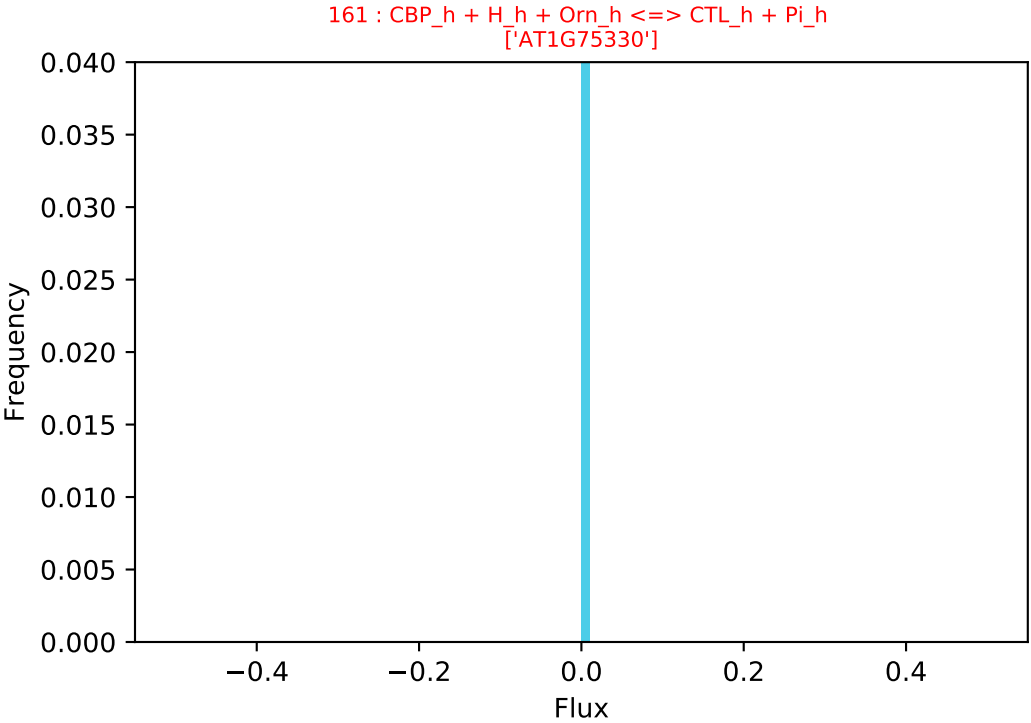

156 : ATP_h + A_DASH_Glu_h --> ADP_h + A_DASH_GluP_h
['6*AT3G57560']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

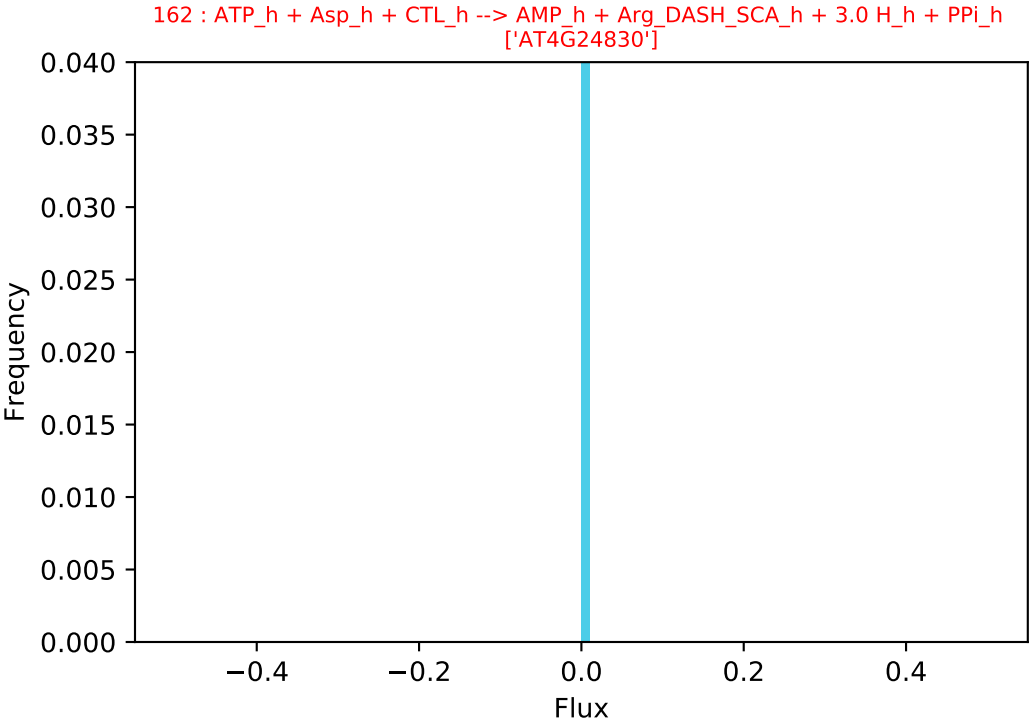

157 : A_DASH_GluP_h + H_h + NADPH_h --> A_DASH_Glu_DASH_SeA_h + NADP_h + Pi_h
['AT2G19940']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

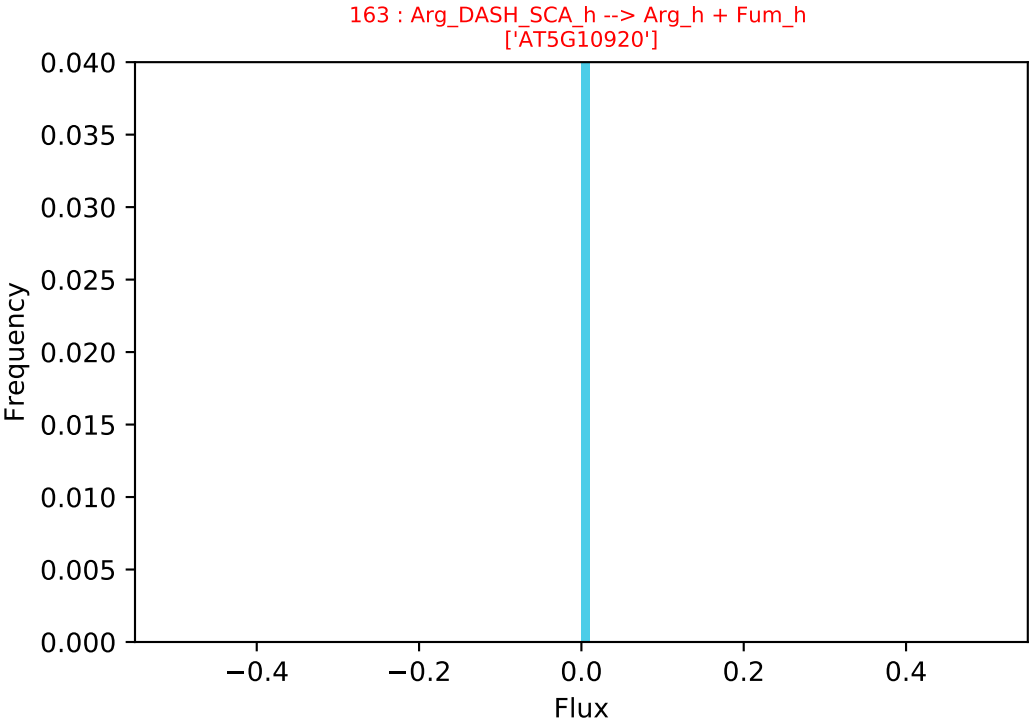

158 : A_DASH_Glu_DASH_SeA_h + Glu_h --> A_DASH_Orn_h + KG_h
['AT1G80600']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

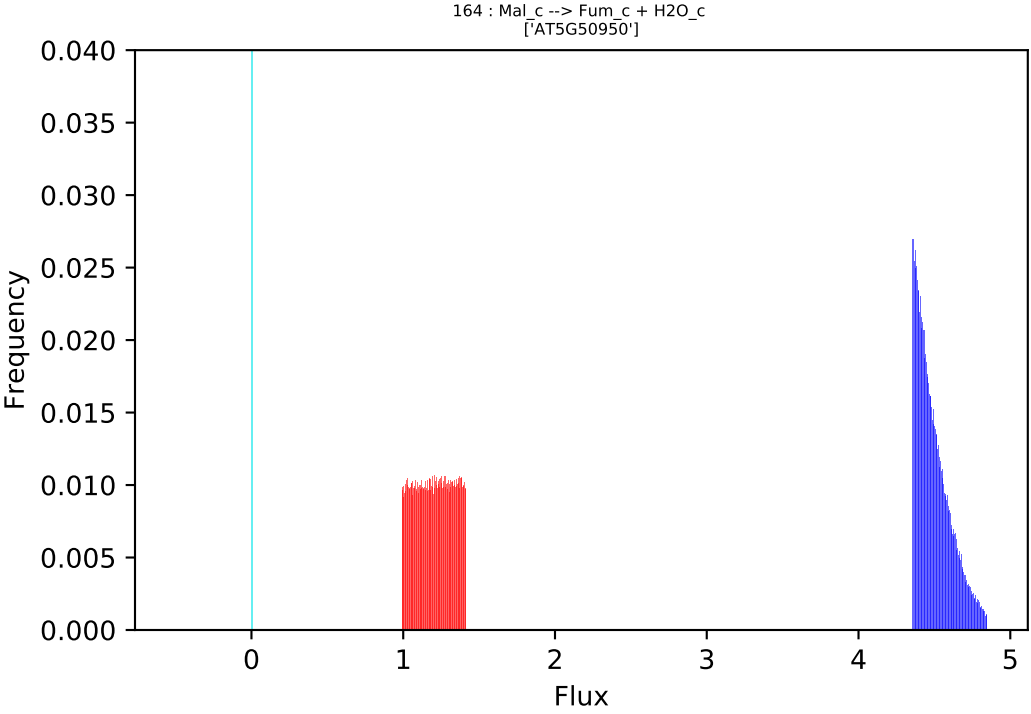

159 : A_DASH_Orn_h + Glu_h --> A_DASH_Glu_h + Orn_h
['AT2G37500']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

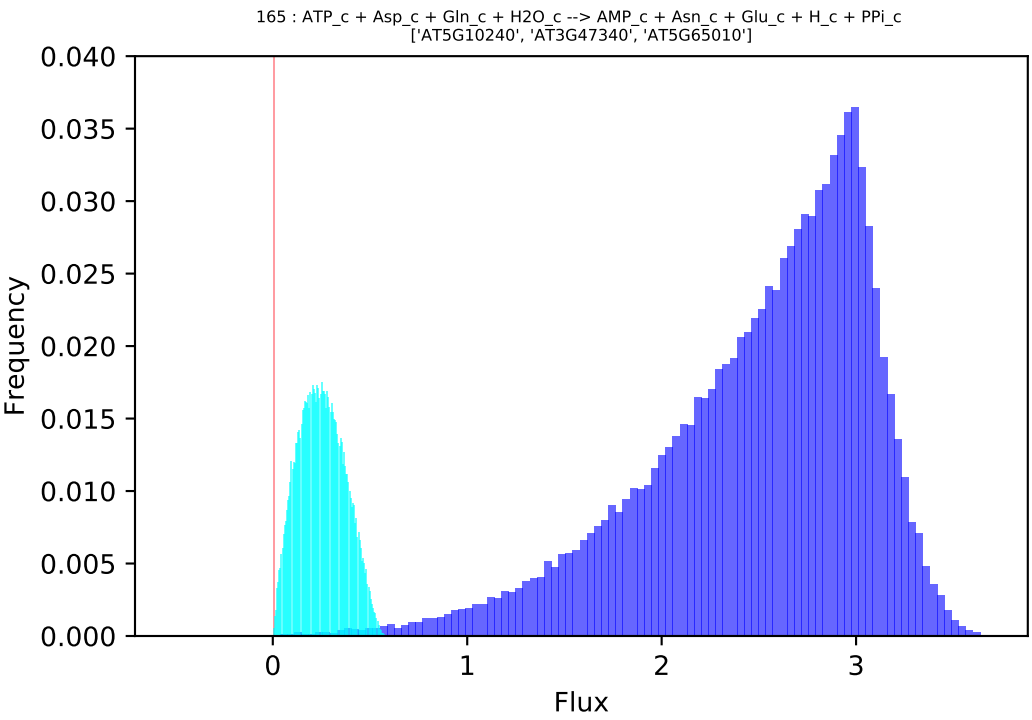

160 : 2.0 ATP_h + Gln_h + H2O_h + HCO3_h --> 2.0 ADP_h + CBP_h + Glu_h + 3.0 H_h + Pi_h
['AT3G27740', 'AT1G29900']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

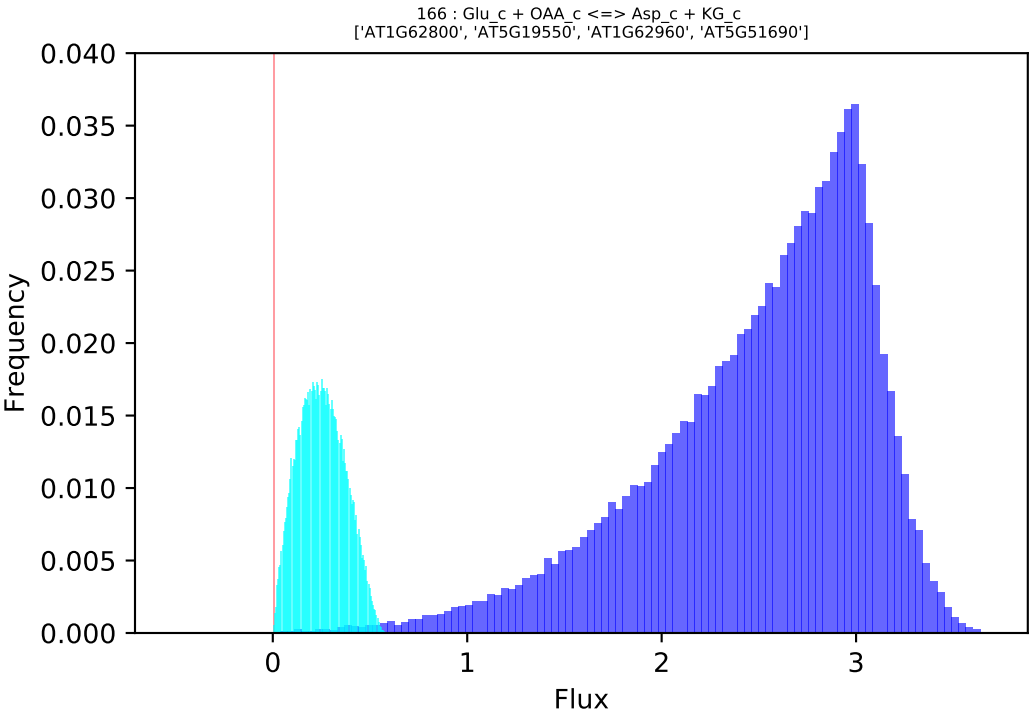

161 : CBP_h + H_h + Orn_h <=> CTL_h + Pi_h
['AT1G75330']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

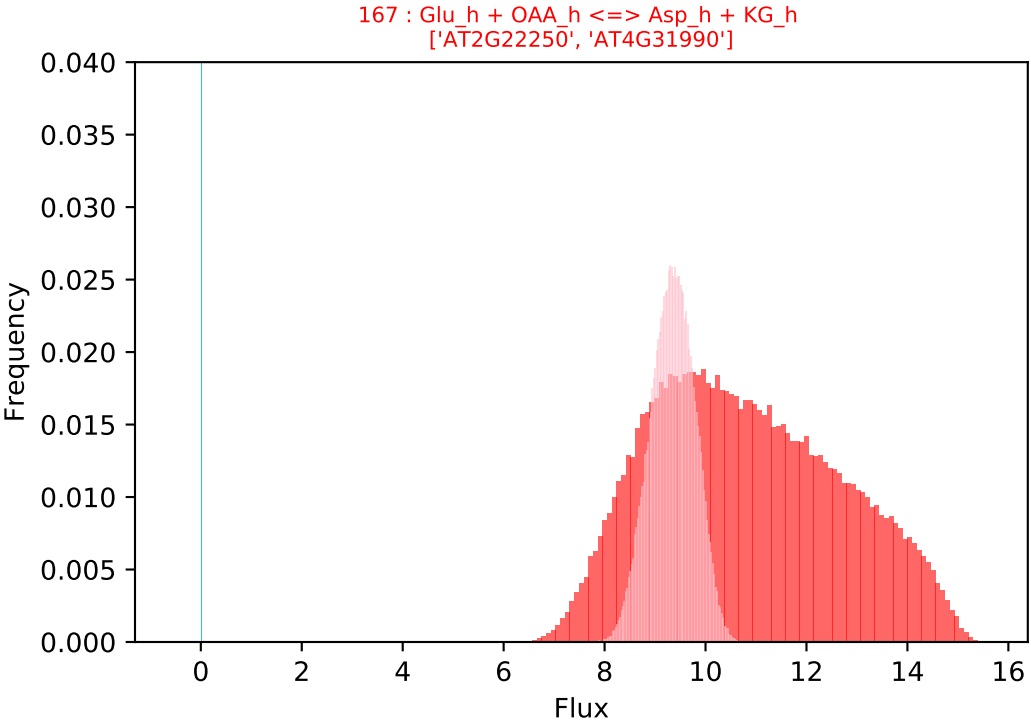

162 : ATP_h + Asp_h + CTL_h --> AMP_h + Arg_DASH_SCA_h + 3.0 H_h + PPi_h
['AT4G24830']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

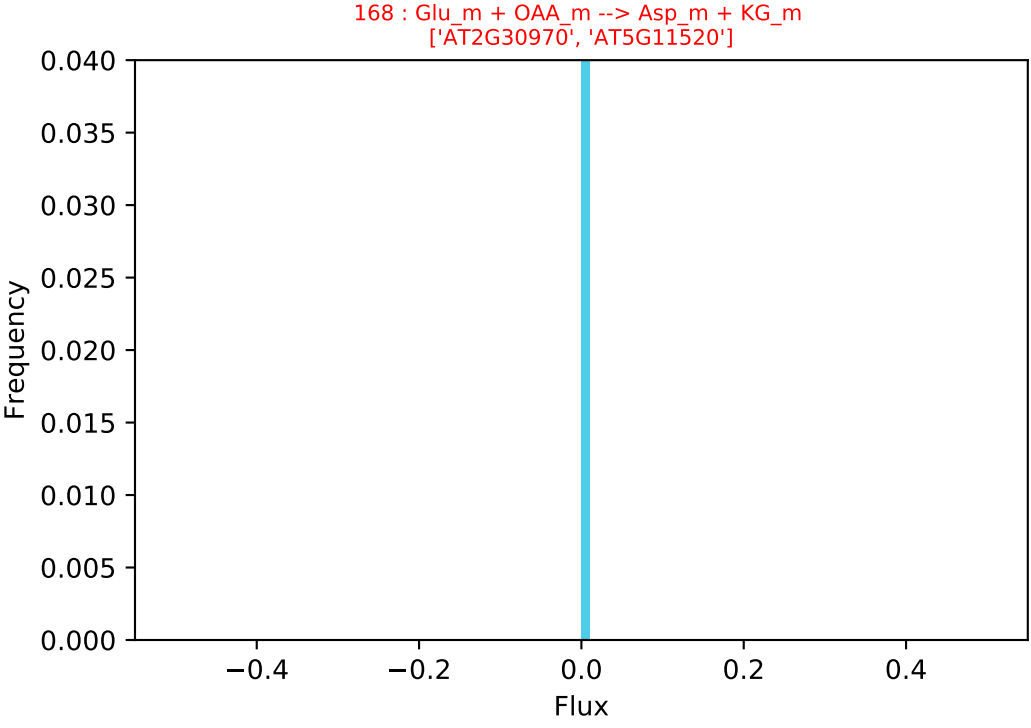

163 : Arg_DASH_SCA_h --> Arg_h + Fum_h
['AT5G10920']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

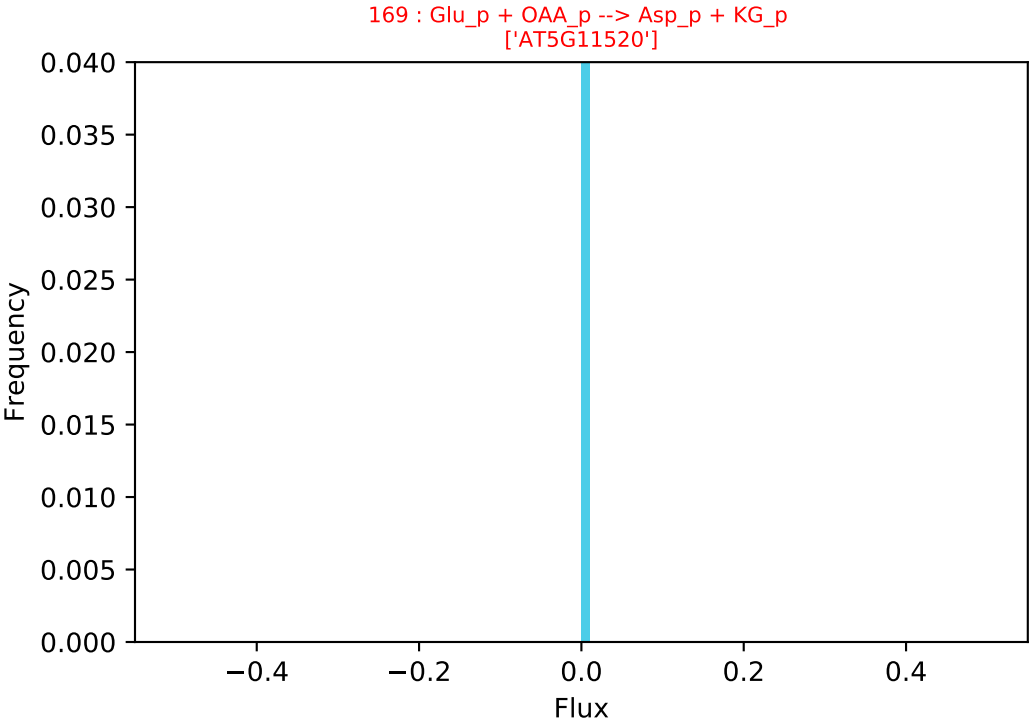

164 : Mal_c --> Fum_c + H2O_c
['AT5G50950']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0
1
2
3
4
5
Flux

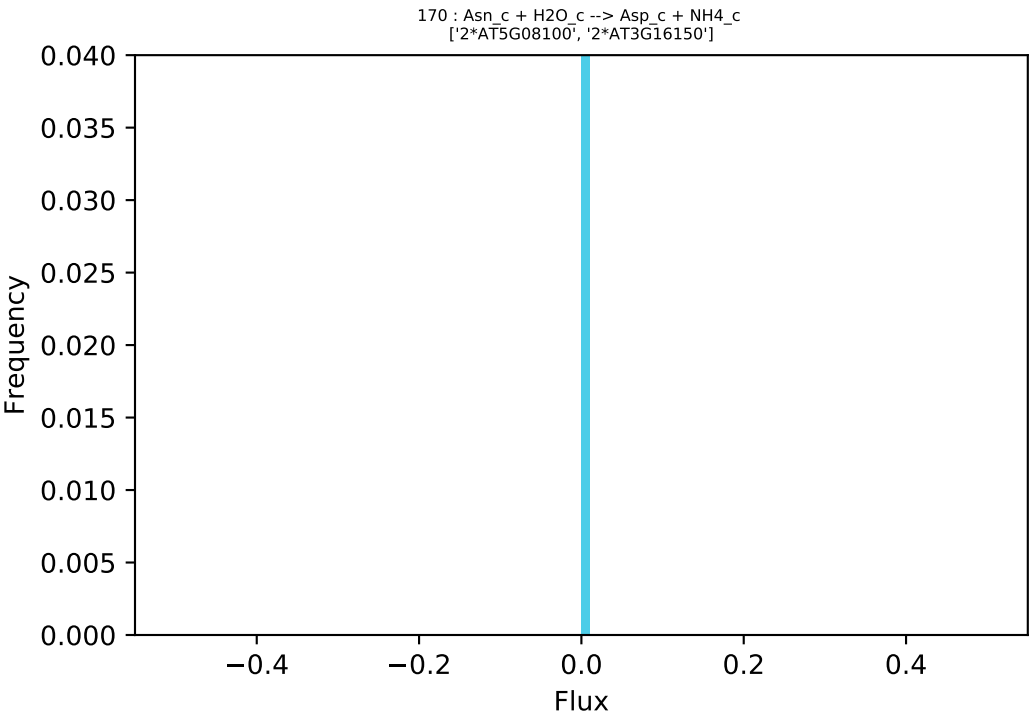

165 : ATP_c + Asp_c + Gln_c + H2O_c --> AMP_c + Asn_c + Glu_c + H_c + PPi_c
['AT5G10240', 'AT3G47340', 'AT5G65010']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0
1
2
3
Flux

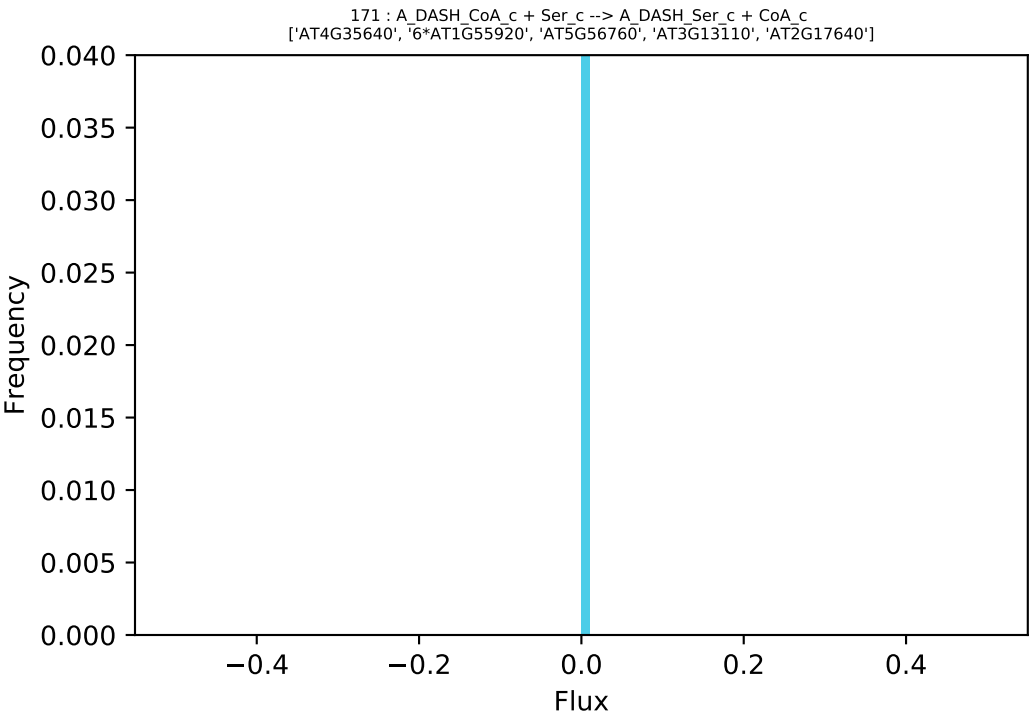

166 : Glu_c + OAA_c <=> Asp_c + KG_c
['AT1G62800', 'AT5G19550', 'AT1G62960', 'AT5G51690']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0
1
2
3
Flux

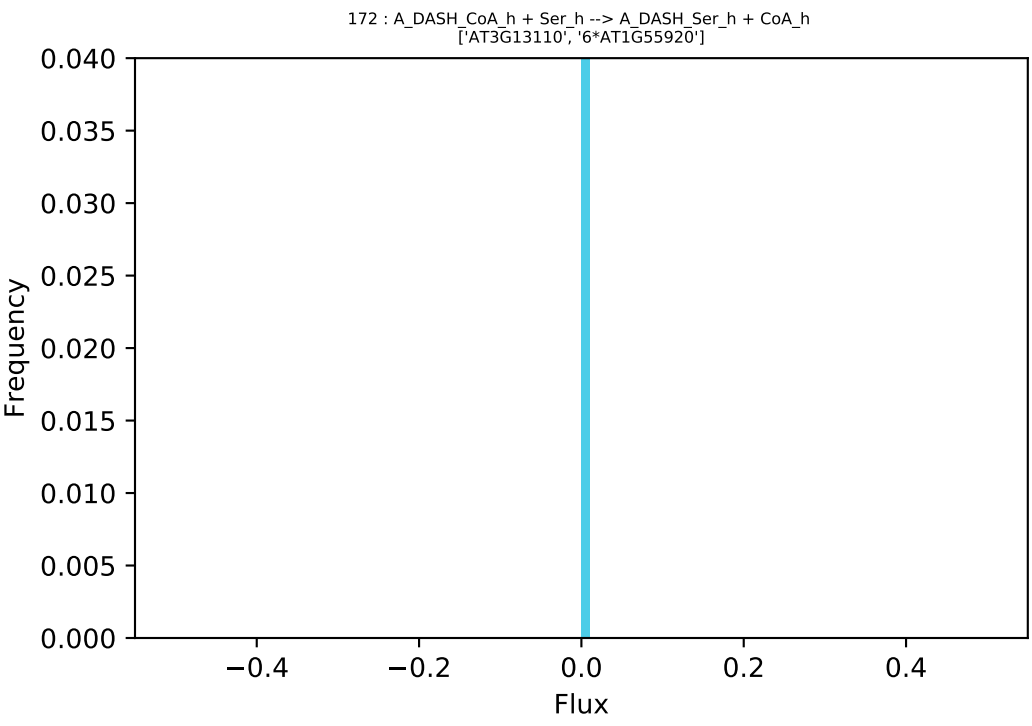

167 : Glu_h + OAA_h <=> Asp_h + KG_h
['AT2G22250', 'AT4G31990']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0
2
4
6
8
10
12
14
16
Flux

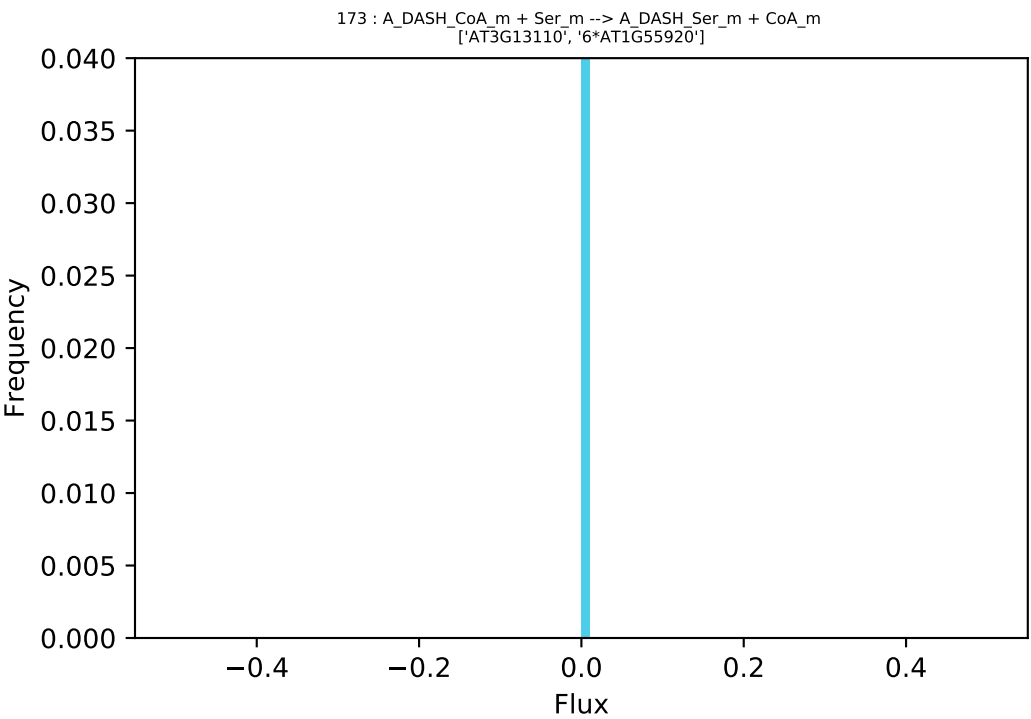

168 : Glu_m + OAA_m --> Asp_m + KG_m
['AT2G30970', 'AT5G11520']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

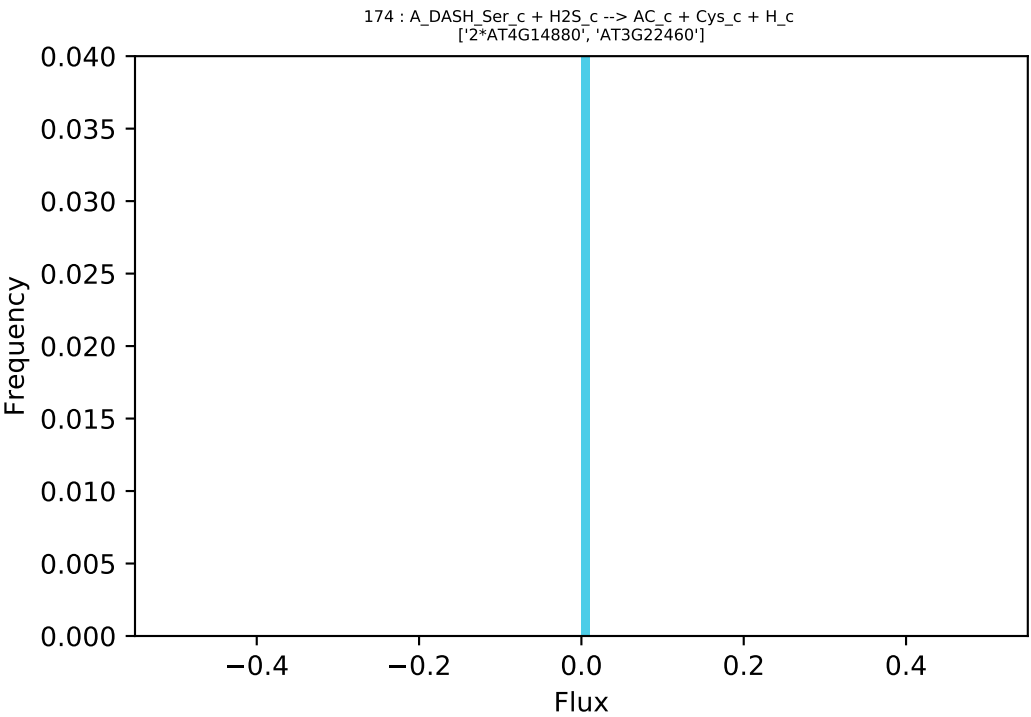

169 : Glu_p + OAA_p --> Asp_p + KG_p
['AT5G11520']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

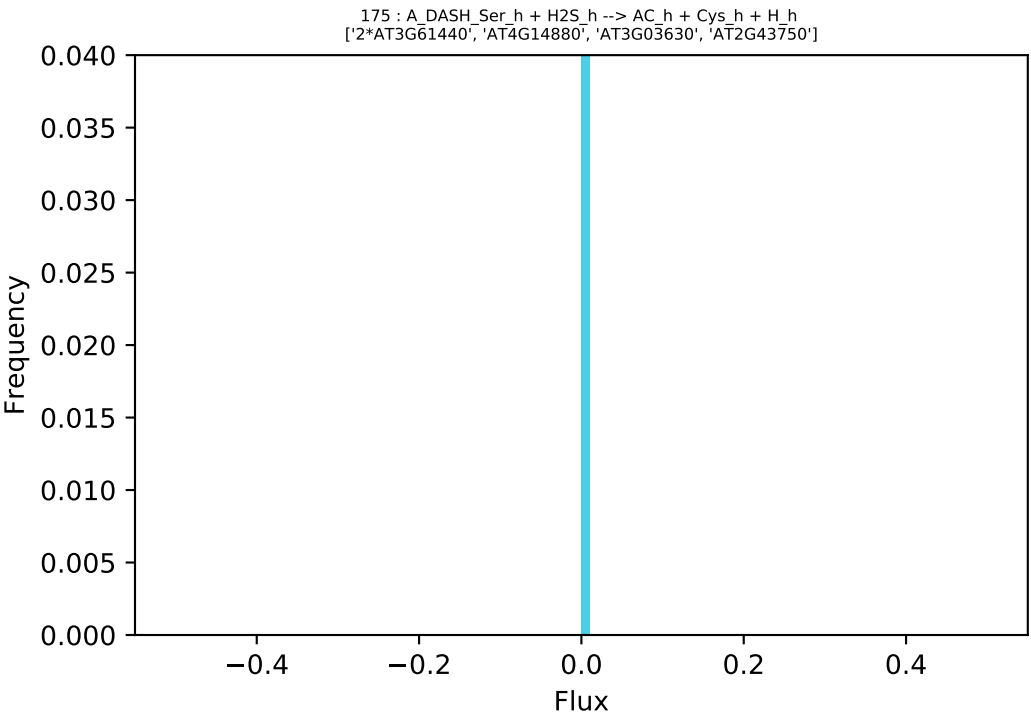

170 : Asn_c + H2O_c --> Asp_c + NH4_c
['2*AT5G08100', '2*AT3G16150']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

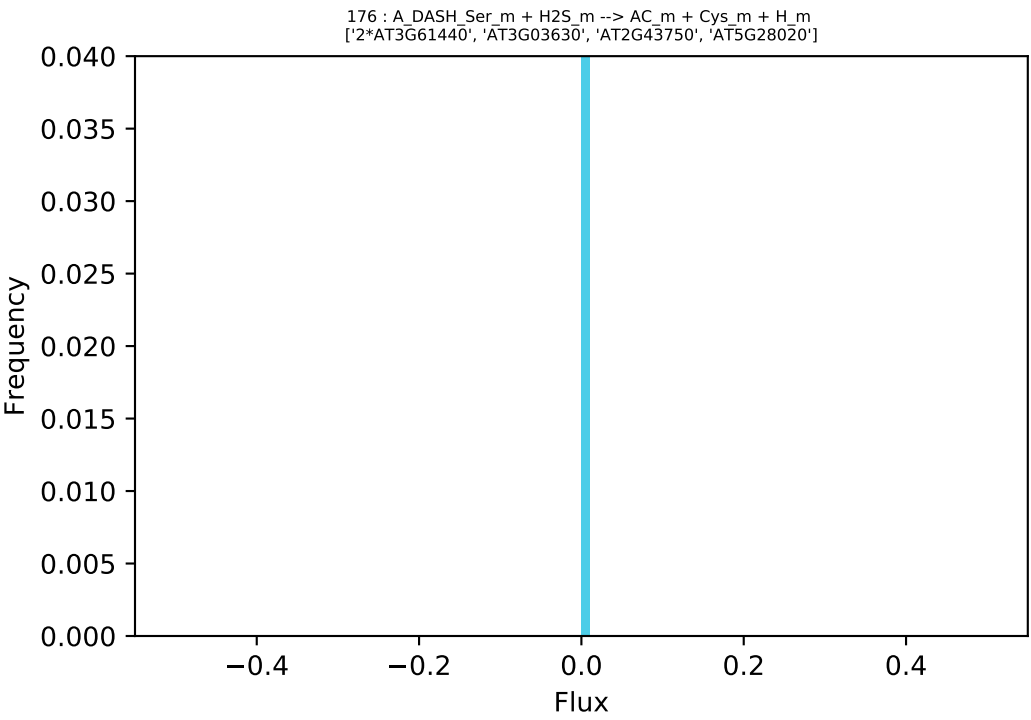

171 : A_DASH_CoA_c + Ser_c --> A_DASH_Ser_c + CoA_c
['AT4G35640', '6*AT1G55920', 'AT5G56760', 'AT3G13110', 'AT2G17640']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

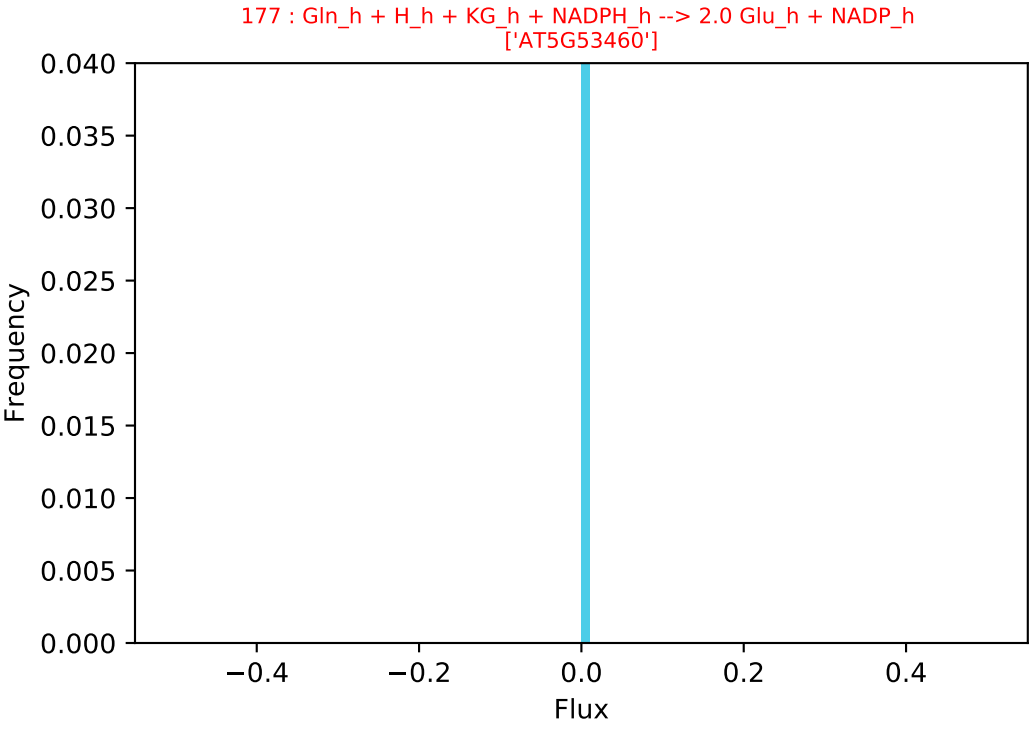

172 : A_DASH_CoA_h + Ser_h --> A_DASH_Ser_h + CoA_h
['AT3G13110', '6*AT1G55920']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

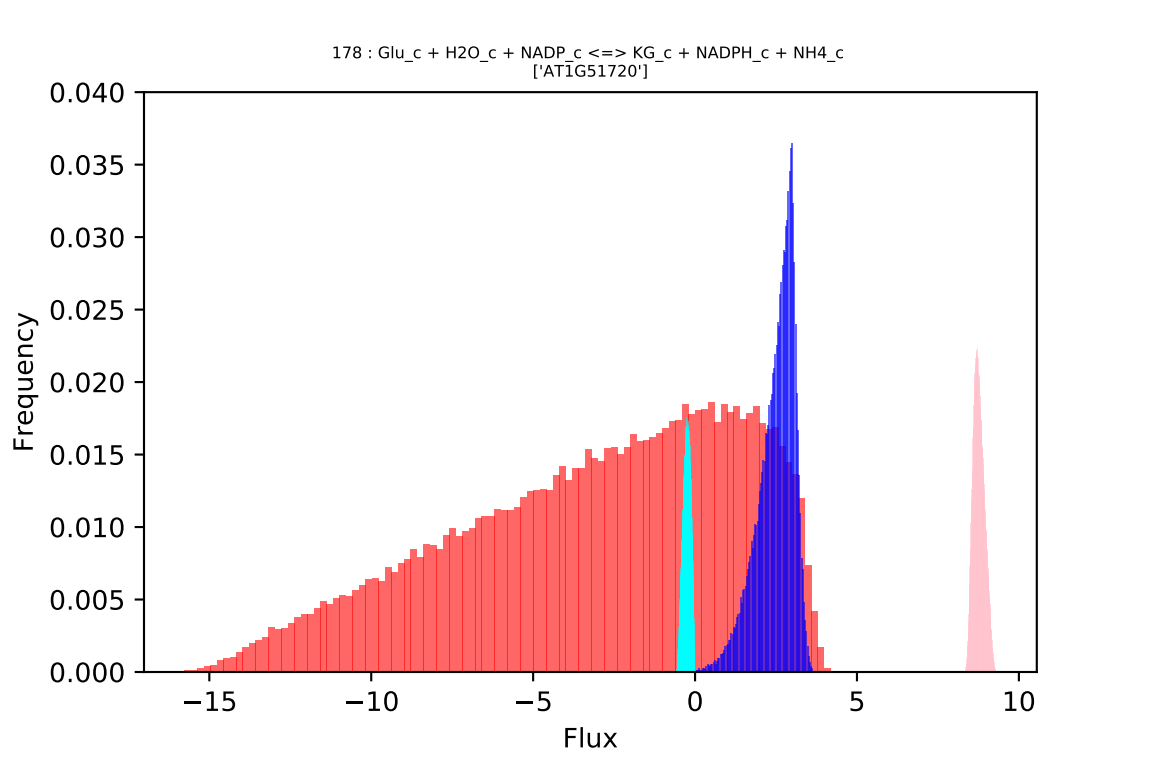

173 : A_DASH_CoA_m + Ser_m --> A_DASH_Ser_m + CoA_m
['AT3G13110', '6*AT1G55920']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

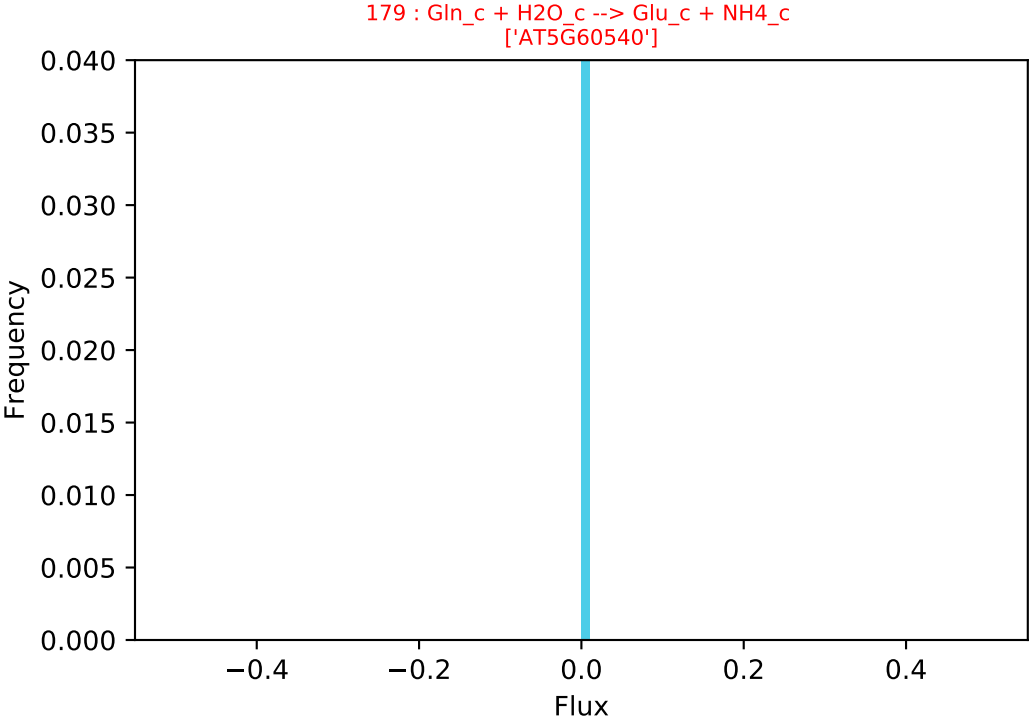

174 : A_DASH_Ser_c + H2S_c --> AC_c + Cys_c + H_c
['2*AT4G14880', 'AT3G22460']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

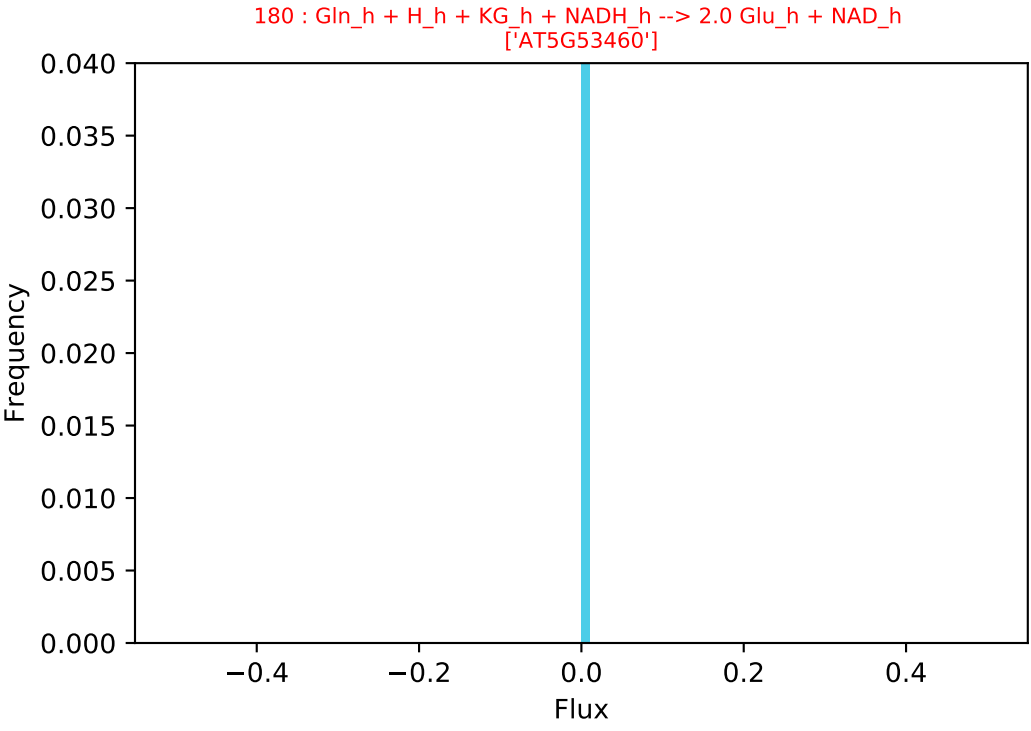

175 : A_DASH_Ser_h + H2S_h --> AC_h + Cys_h + H_h
['2*AT3G61440', 'AT4G14880', 'AT3G03630', 'AT2G43750']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

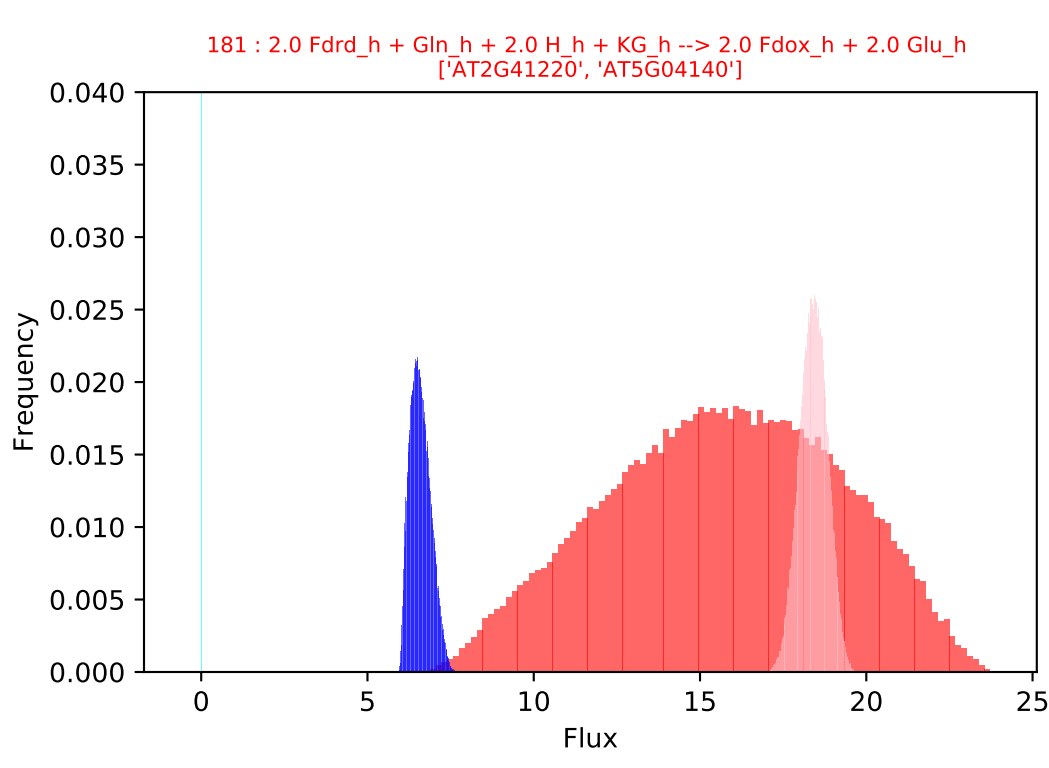

176 : A_DASH_Ser_m + H2S_m --> AC_m + Cys_m + H_m
['2*AT3G61440', 'AT3G03630', 'AT2G43750', 'AT5G28020']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

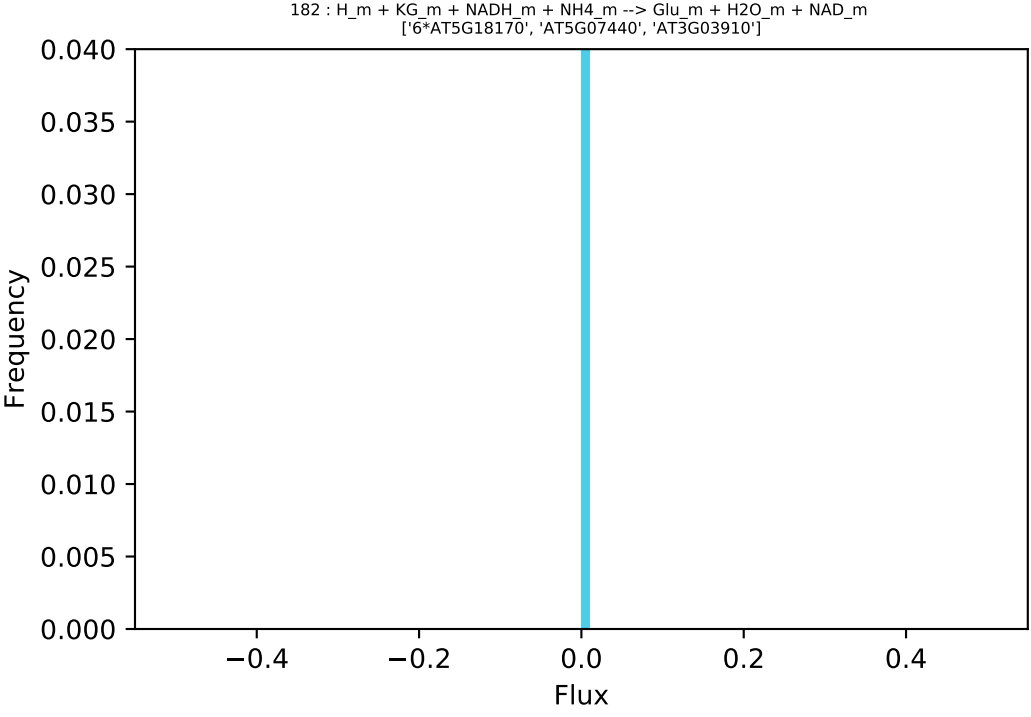

177 : Gln_h + H_h + KG_h + NADPH_h --> 2.0 Glu_h + NADP_h
['AT5G53460']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

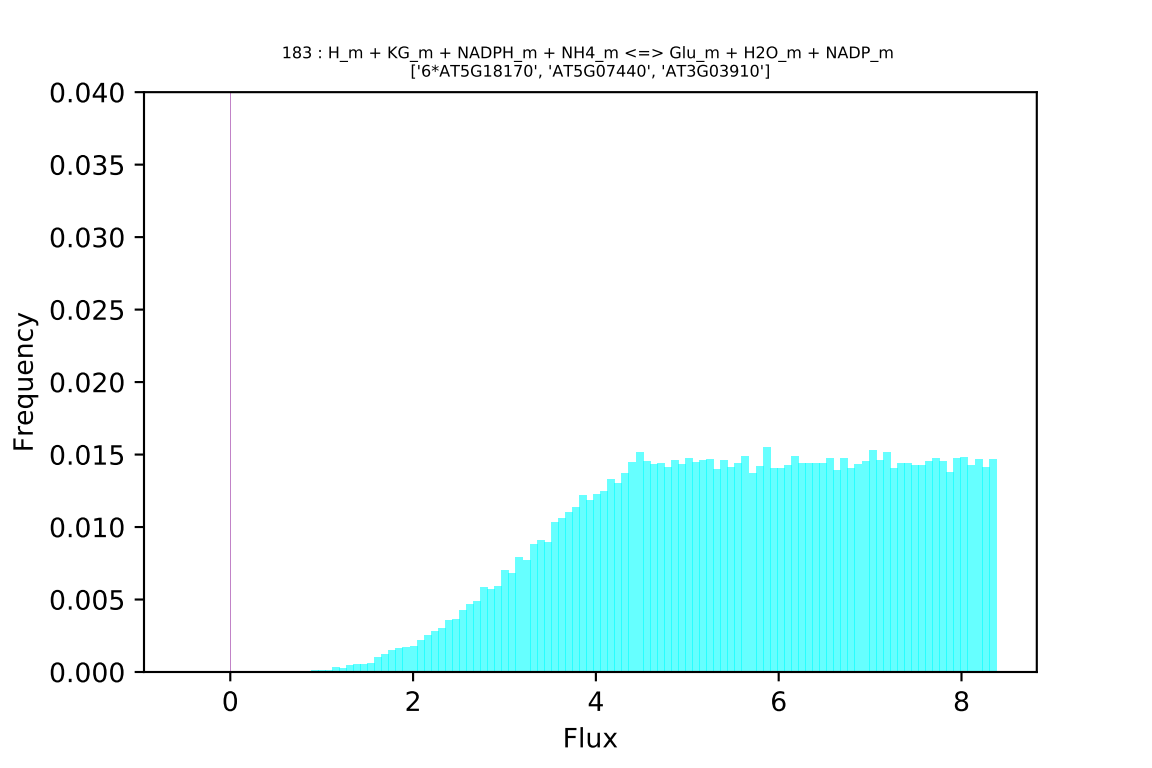

178 : Glu_c + H2O_c + NADP_c <=> KG_c + NADPH_c + NH4_c
['AT1G51720']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−15
−10
−5
0
5
10
Flux

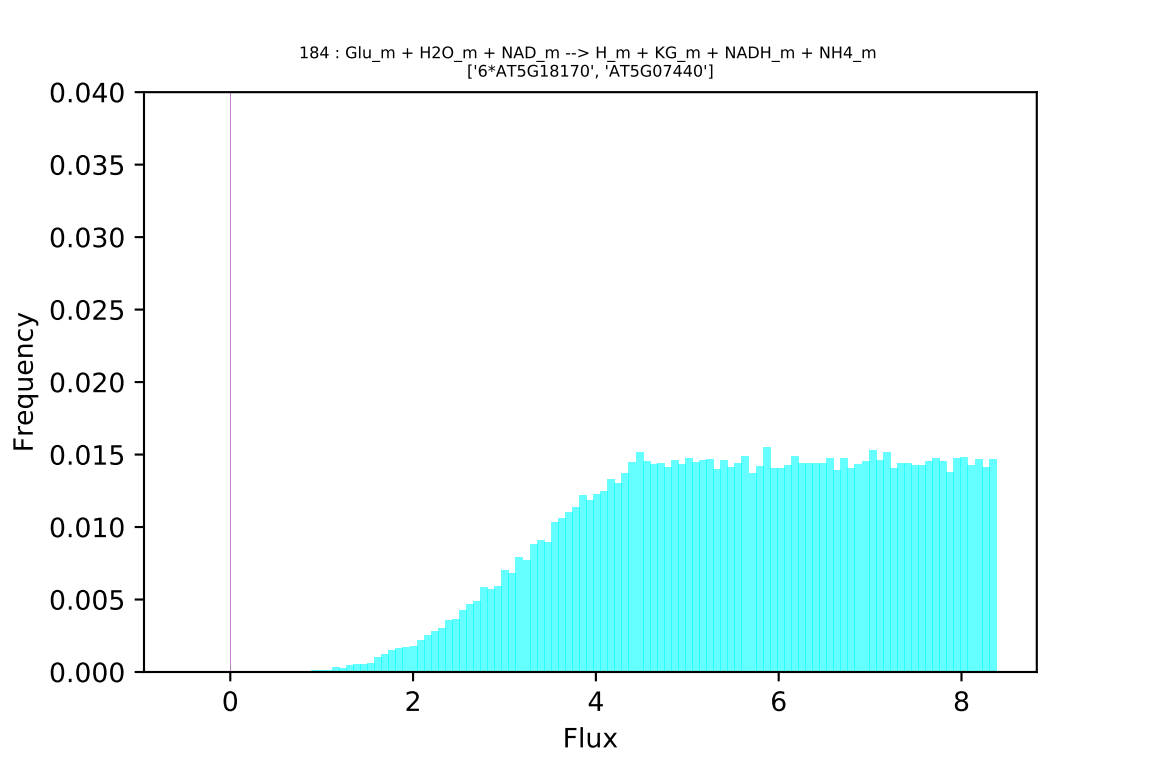

179 : Gln_c + H2O_c --> Glu_c + NH4_c
['AT5G60540']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

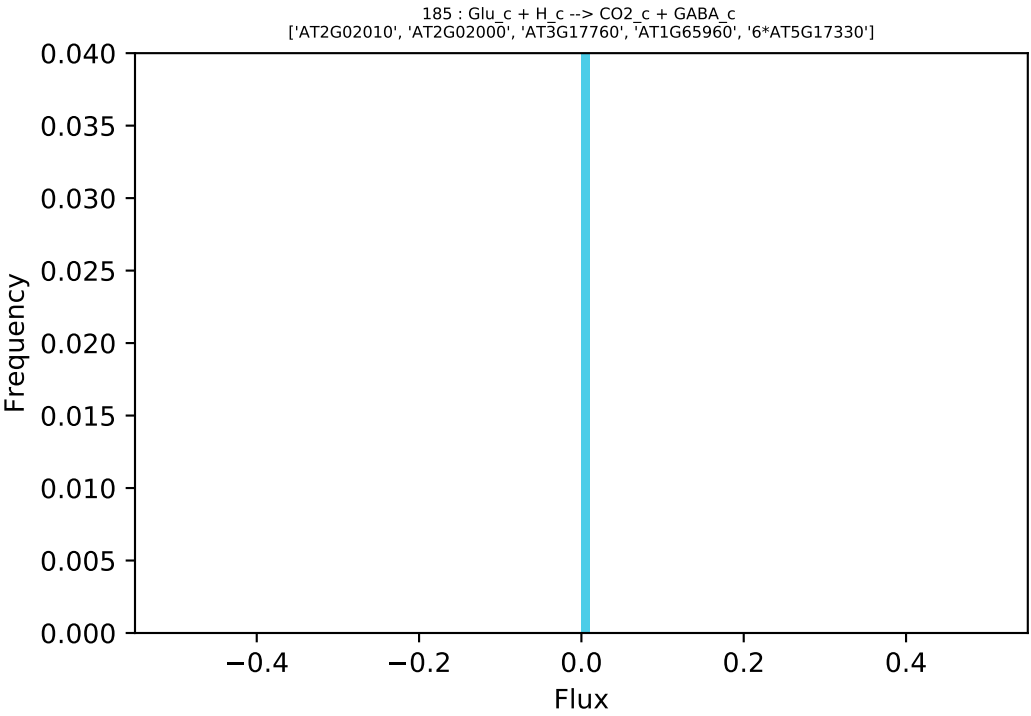

180 : Gln_h + H_h + KG_h + NADH_h --> 2.0 Glu_h + NAD_h
['AT5G53460']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

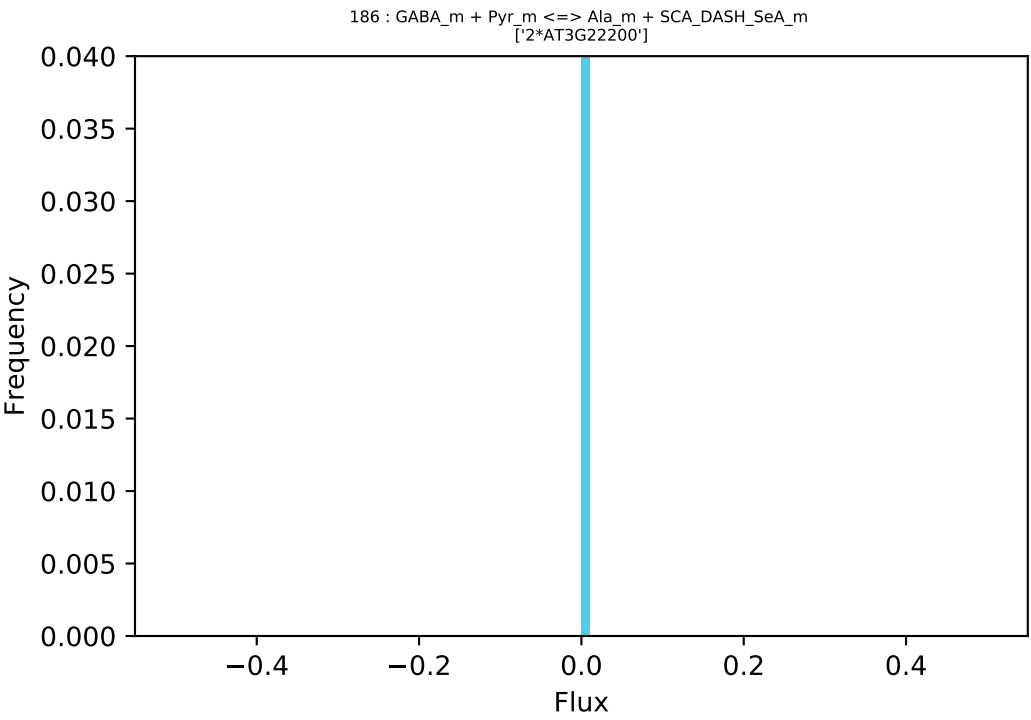

181 : 2.0 Fdrd_h + Gln_h + 2.0 H_h + KG_h --> 2.0 Fdox_h + 2.0 Glu_h
['AT2G41220', 'AT5G04140']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0
5
10
15
20
25
Flux

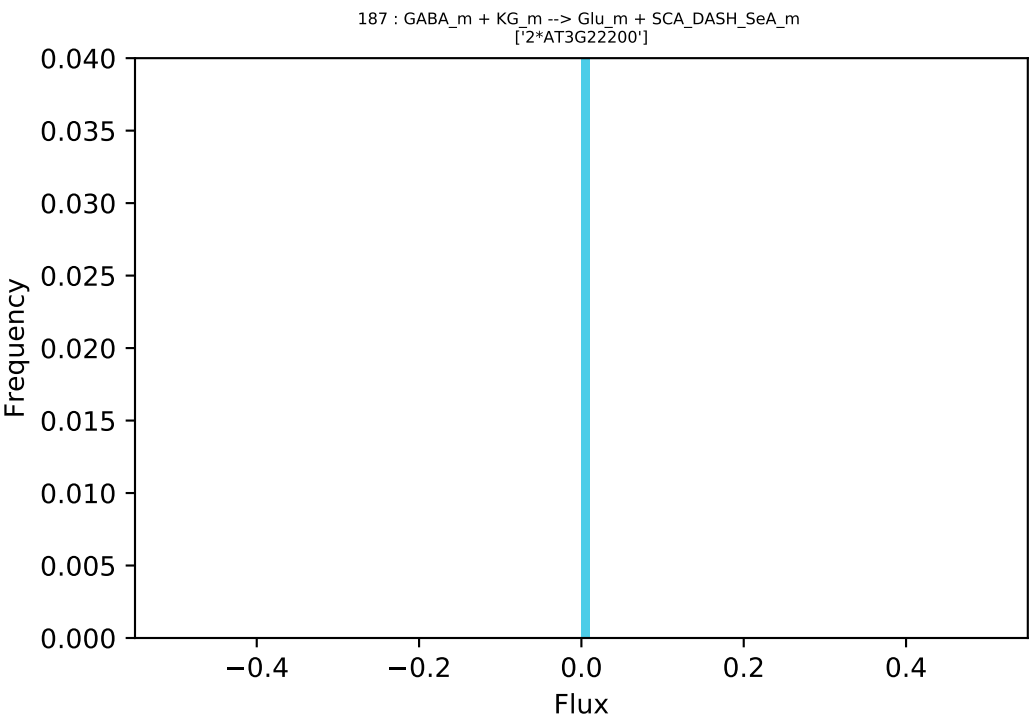

182 : H_m + KG_m + NADH_m + NH4_m --> Glu_m + H2O_m + NAD_m
['6*AT5G18170', 'AT5G07440', 'AT3G03910']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

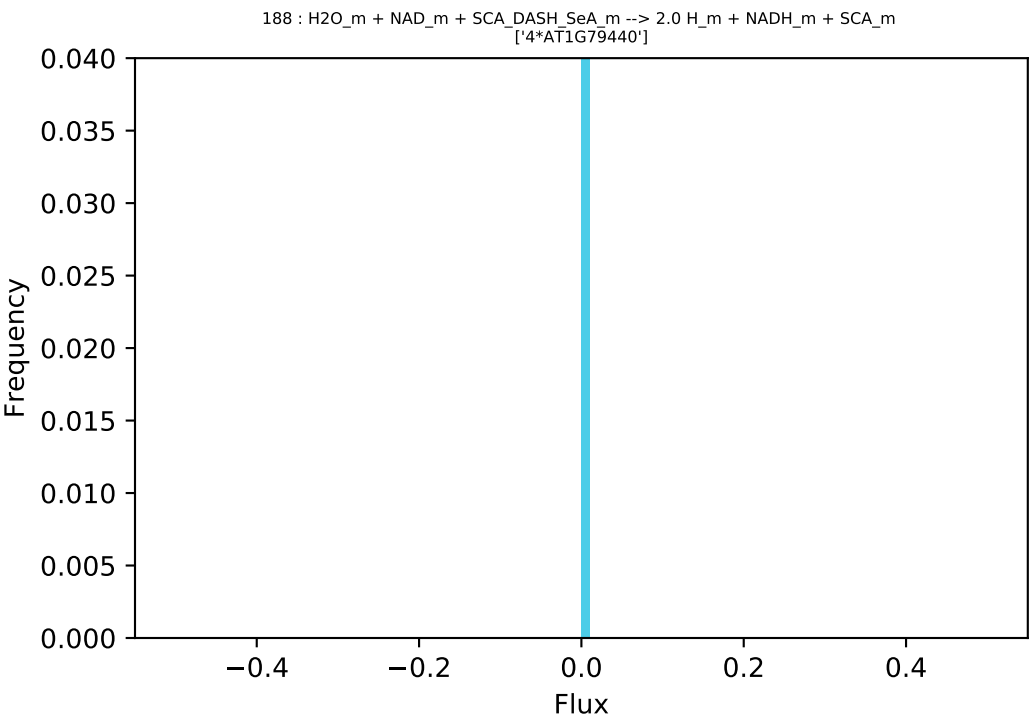

183 : H_m + KG_m + NADPH_m + NH4_m <=> Glu_m + H2O_m + NADP_m
['6*AT5G18170', 'AT5G07440', 'AT3G03910']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0
2
4
6
8
Flux

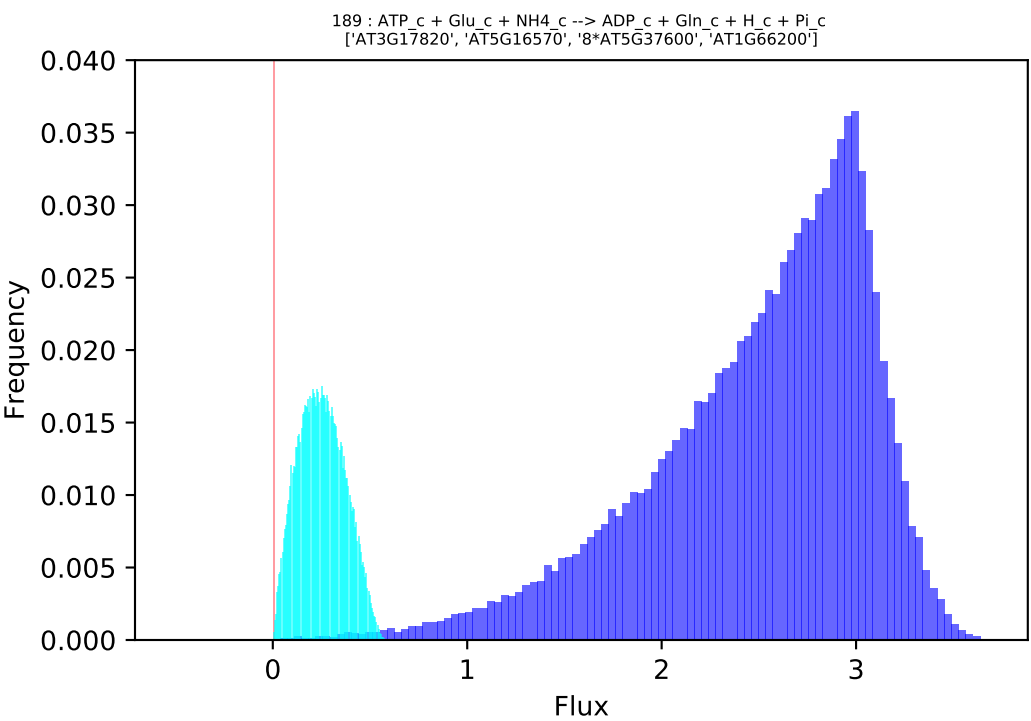

184 : Glu_m + H2O_m + NAD_m --> H_m + KG_m + NADH_m + NH4_m
['6*AT5G18170', 'AT5G07440']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0
2
4
6
8
Flux

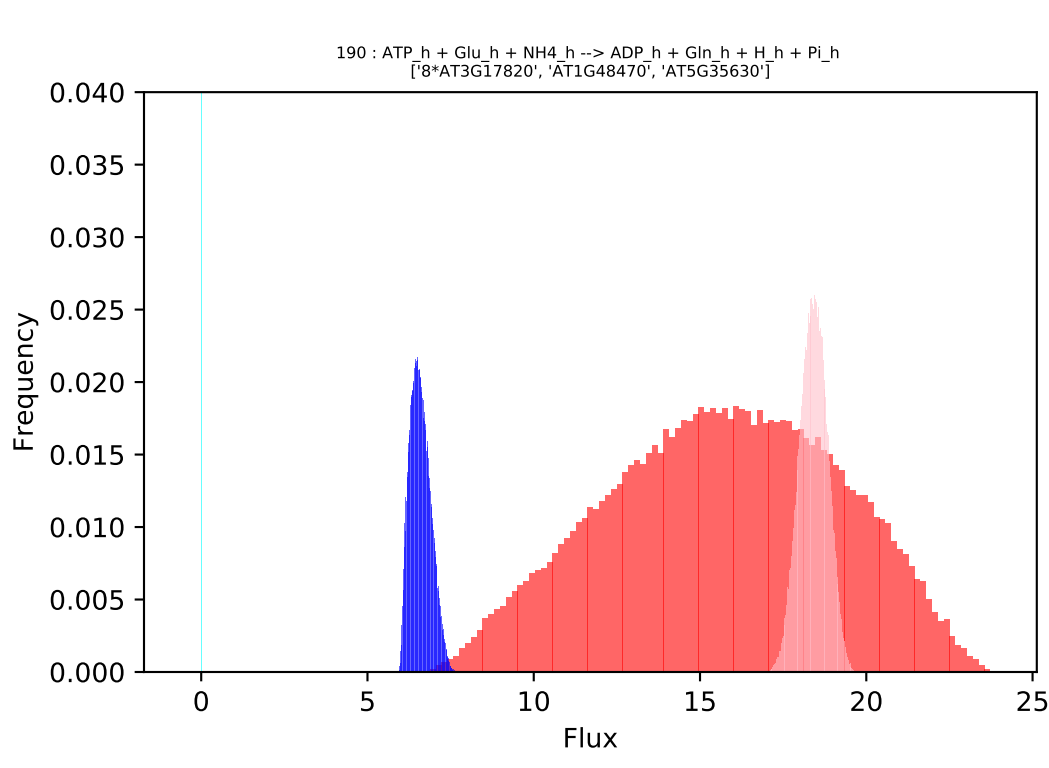

185 : Glu_c + H_c --> CO2_c + GABA_c
['AT2G02010', 'AT2G02000', 'AT3G17760', 'AT1G65960', '6*AT5G17330']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

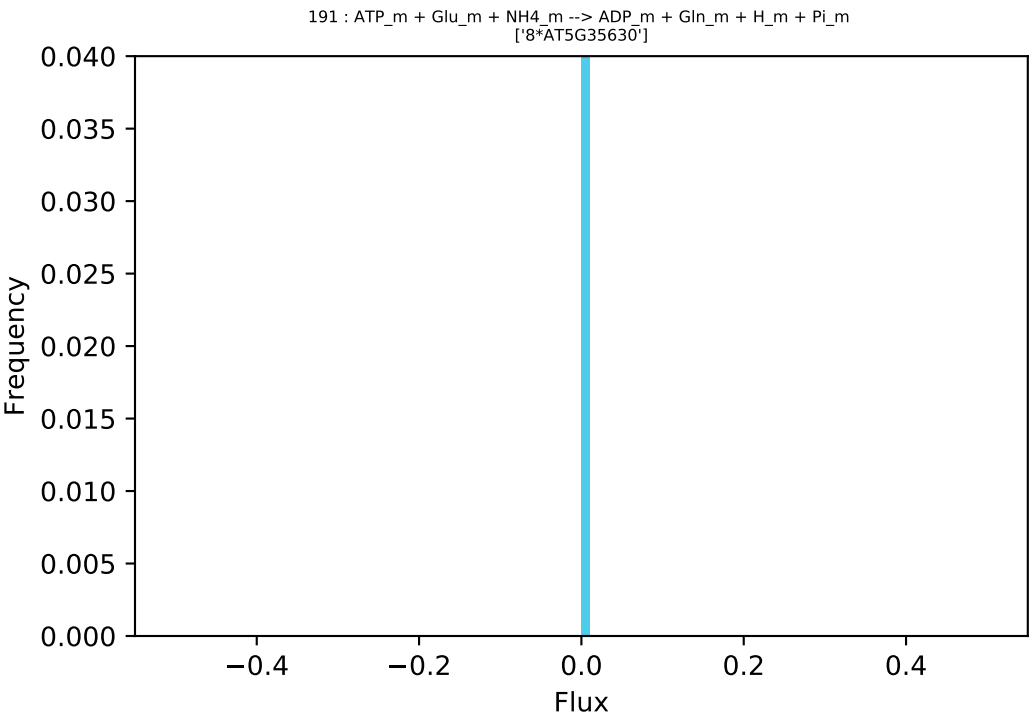

186 : GABA_m + Pyr_m <=> Ala_m + SCA_DASH_SeA_m
['2*AT3G22200']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

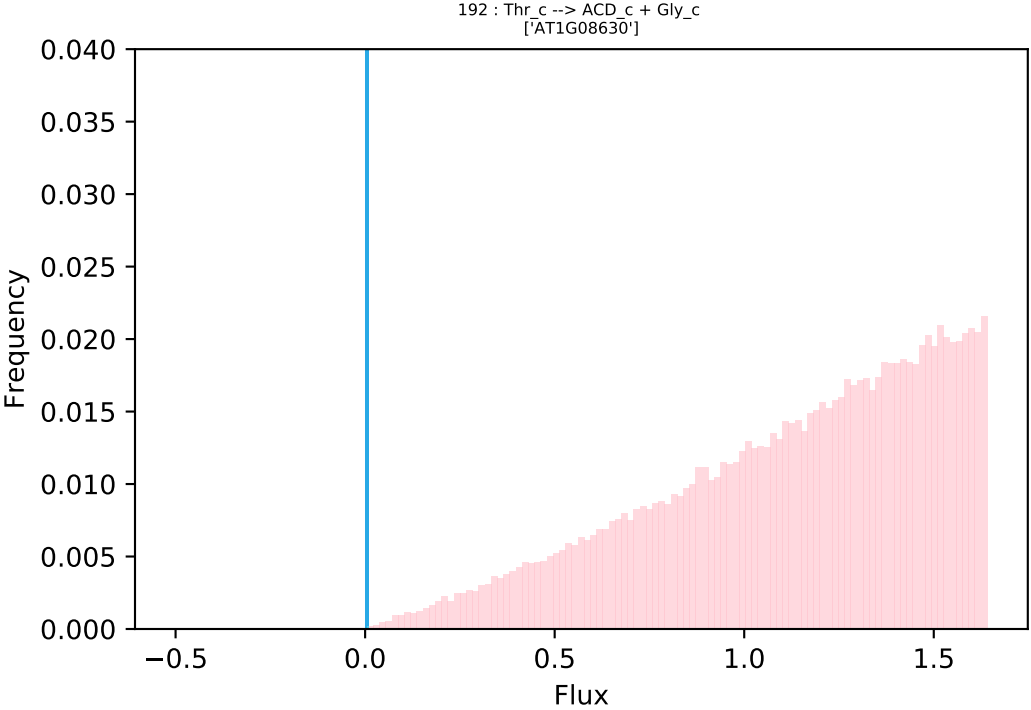

187 : GABA_m + KG_m --> Glu_m + SCA_DASH_SeA_m
['2*AT3G22200']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

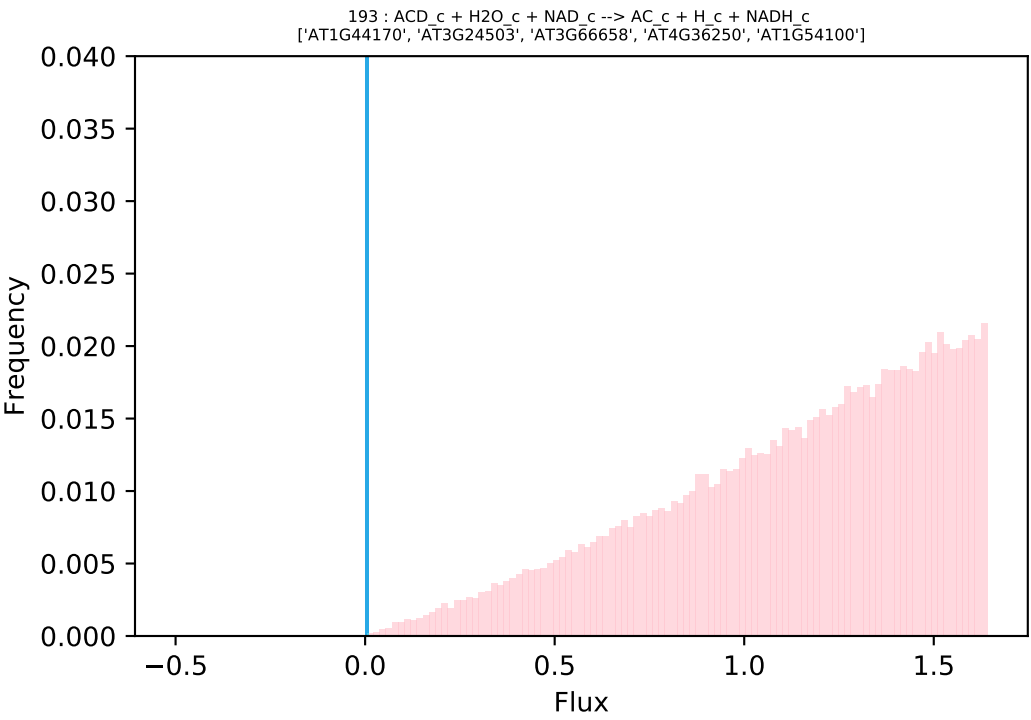

188 : H2O_m + NAD_m + SCA_DASH_SeA_m --> 2.0 H_m + NADH_m + SCA_m
['4*AT1G79440']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

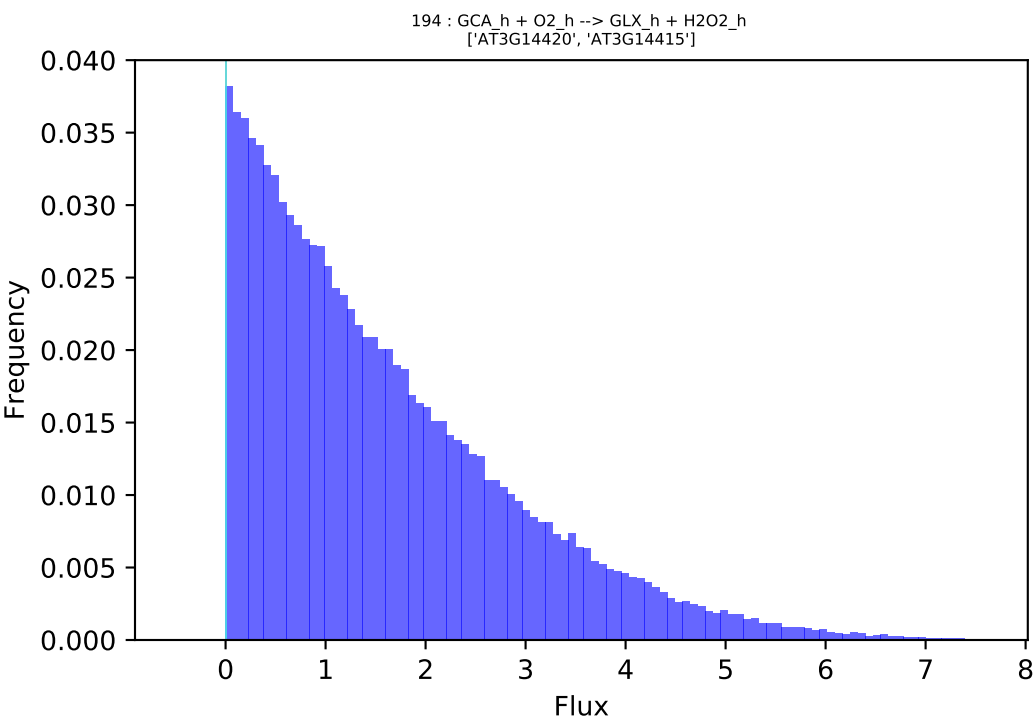

189 : ATP_c + Glu_c + NH4_c --> ADP_c + Gln_c + H_c + Pi_c
['AT3G17820', 'AT5G16570', '8*AT5G37600', 'AT1G66200']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0
1
2
3
Flux

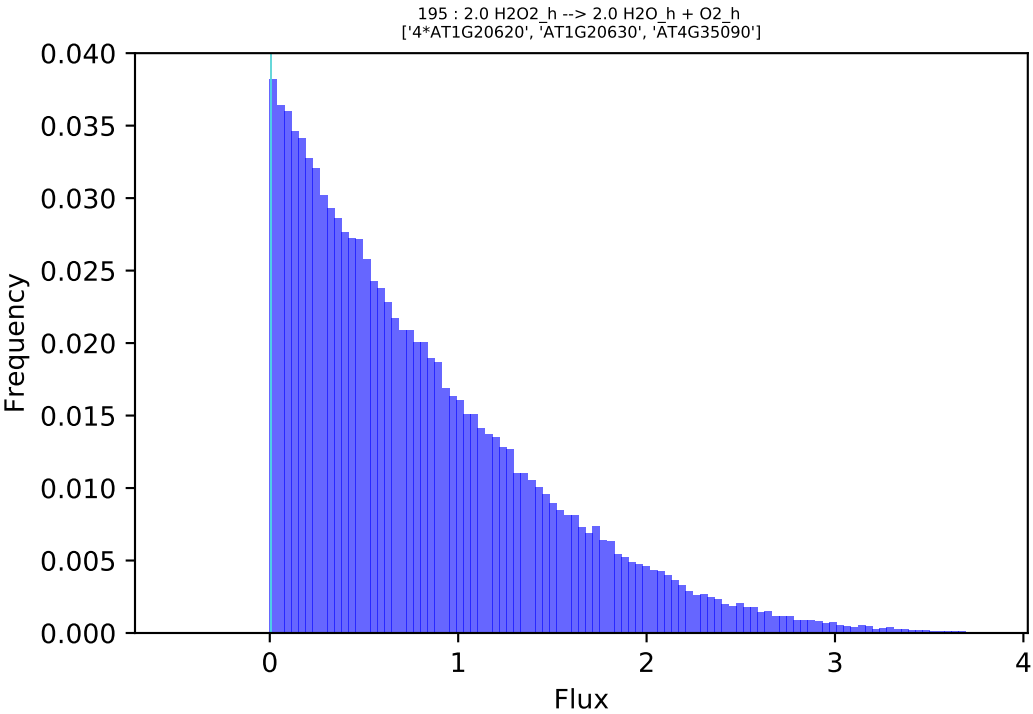

190 : ATP_h + Glu_h + NH4_h --> ADP_h + Gln_h + H_h + Pi_h
['8*AT3G17820', 'AT1G48470', 'AT5G35630']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0
5
10
15
20
25
Flux

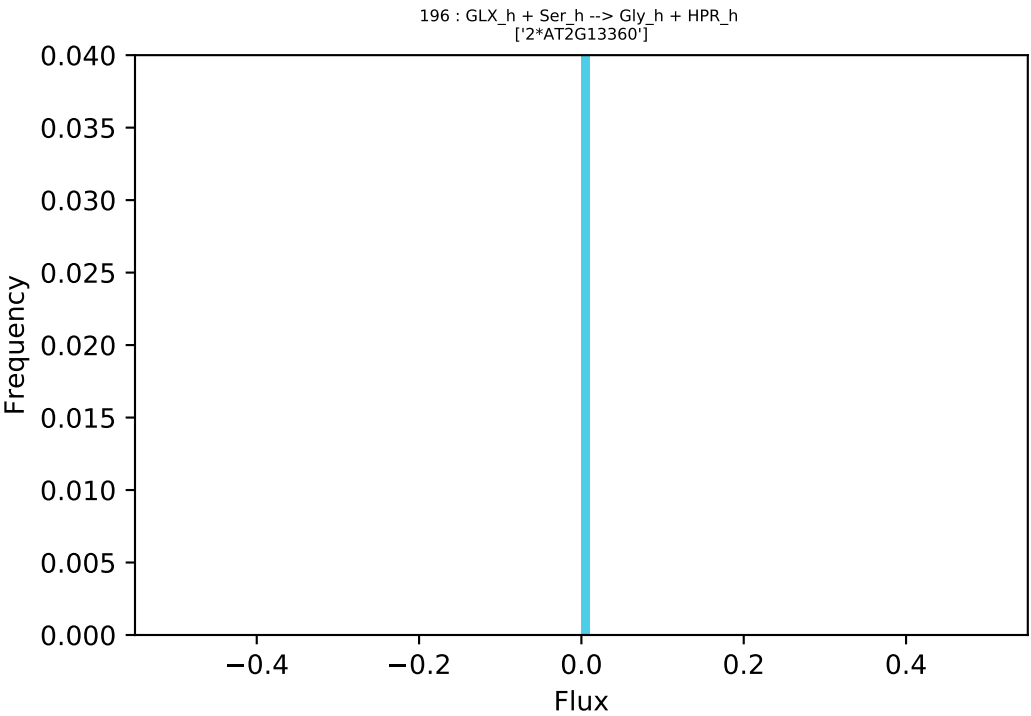

191 : ATP_m + Glu_m + NH4_m --> ADP_m + Gln_m + H_m + Pi_m
['8*AT5G35630']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

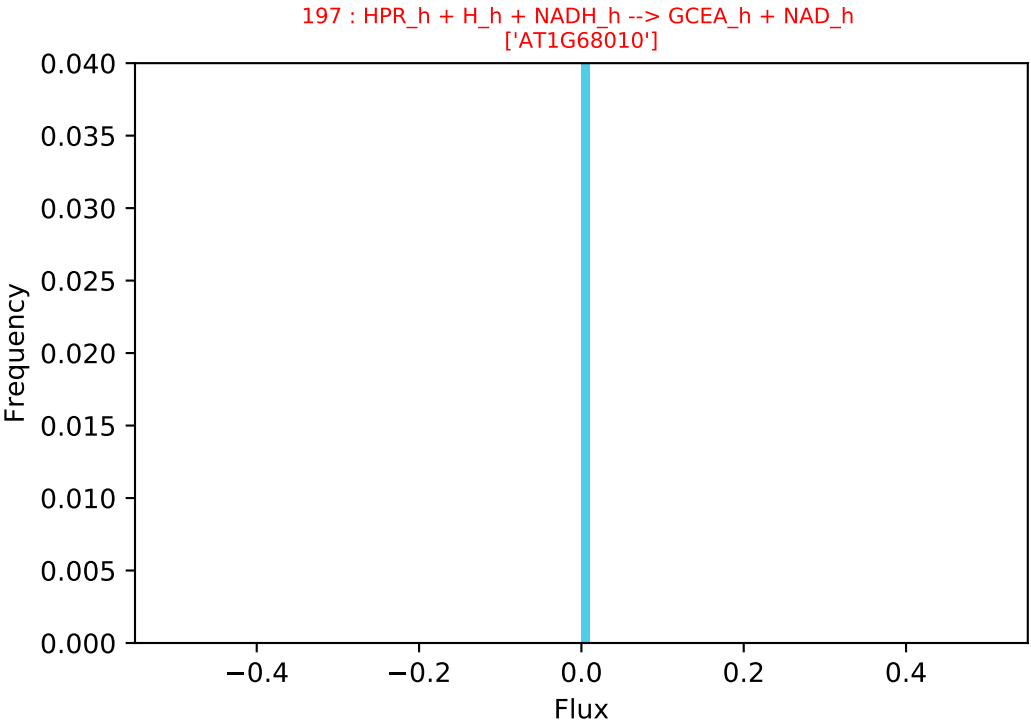

192 : Thr_c --> ACD_c + Gly_c
['AT1G08630']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.5
0.0
0.5
1.0
1.5
Flux

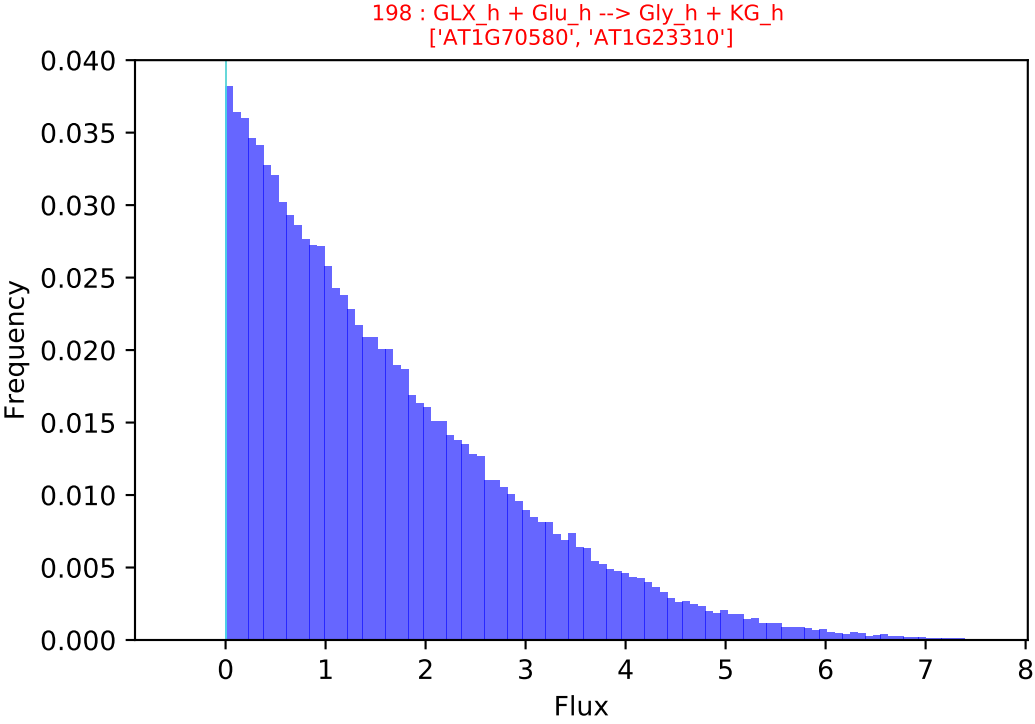

193 : ACD_c + H2O_c + NAD_c --> AC_c + H_c + NADH_c
['AT1G44170', 'AT3G24503', 'AT3G66658', 'AT4G36250', 'AT1G54100']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.5
0.0
0.5
1.0
1.5
Flux

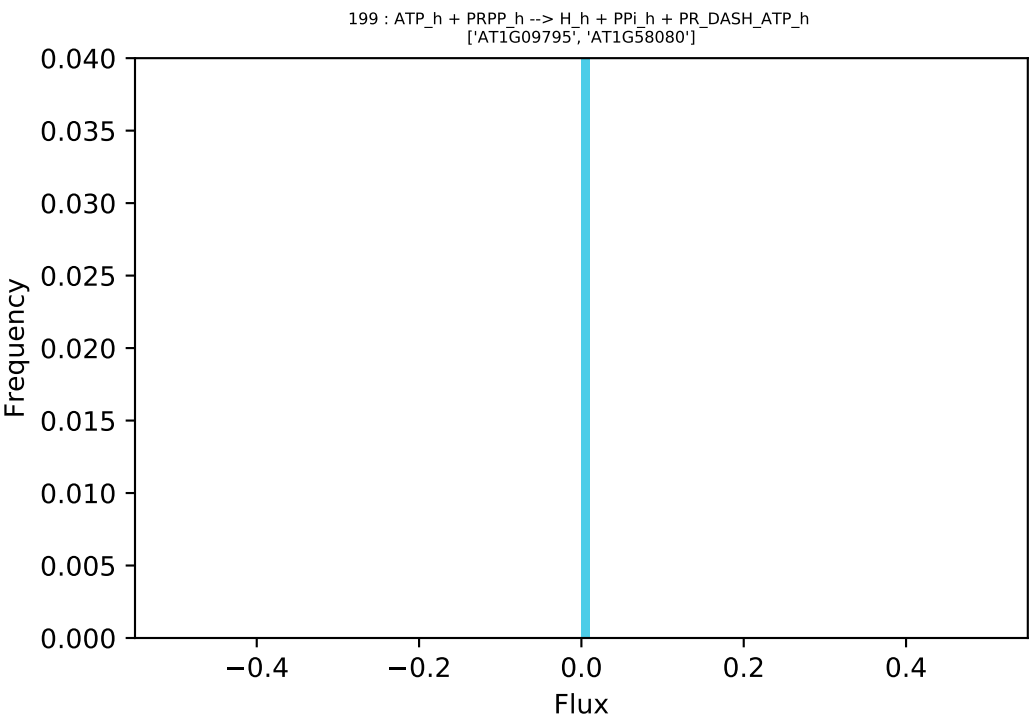

194 : GCA_h + O2_h --> GLX_h + H2O2_h
['AT3G14420', 'AT3G14415']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0
1
2
3
4
5
6
7
8
Flux

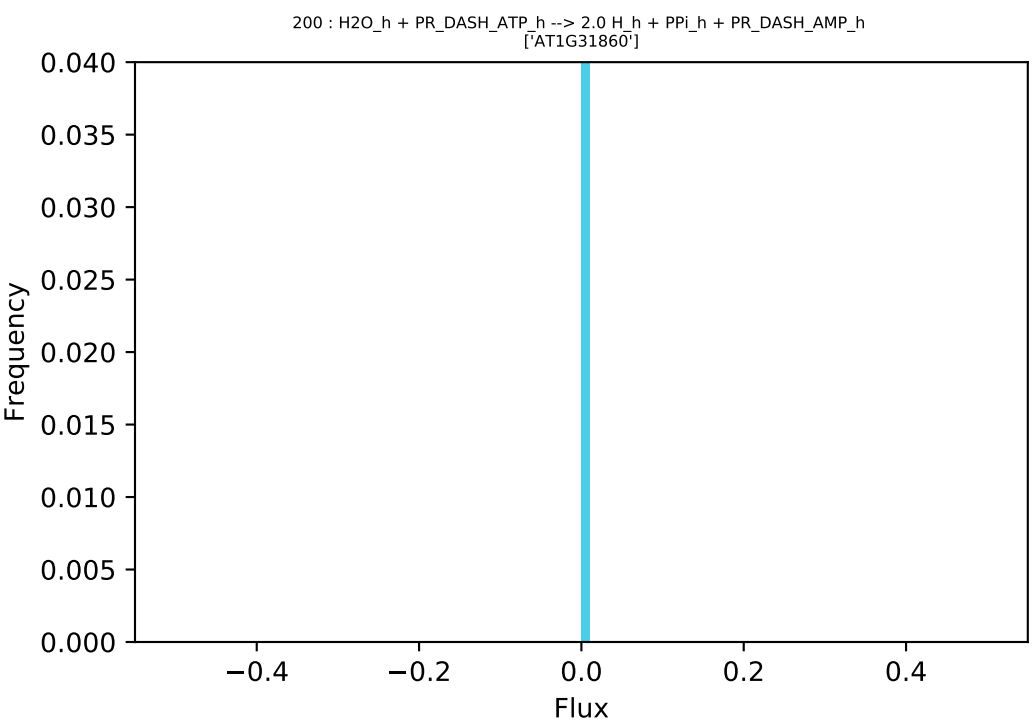

195 : 2.0 H2O2_h --> 2.0 H2O_h + O2_h
['4*AT1G20620', 'AT1G20630', 'AT4G35090']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0
1
2
3
4
Flux

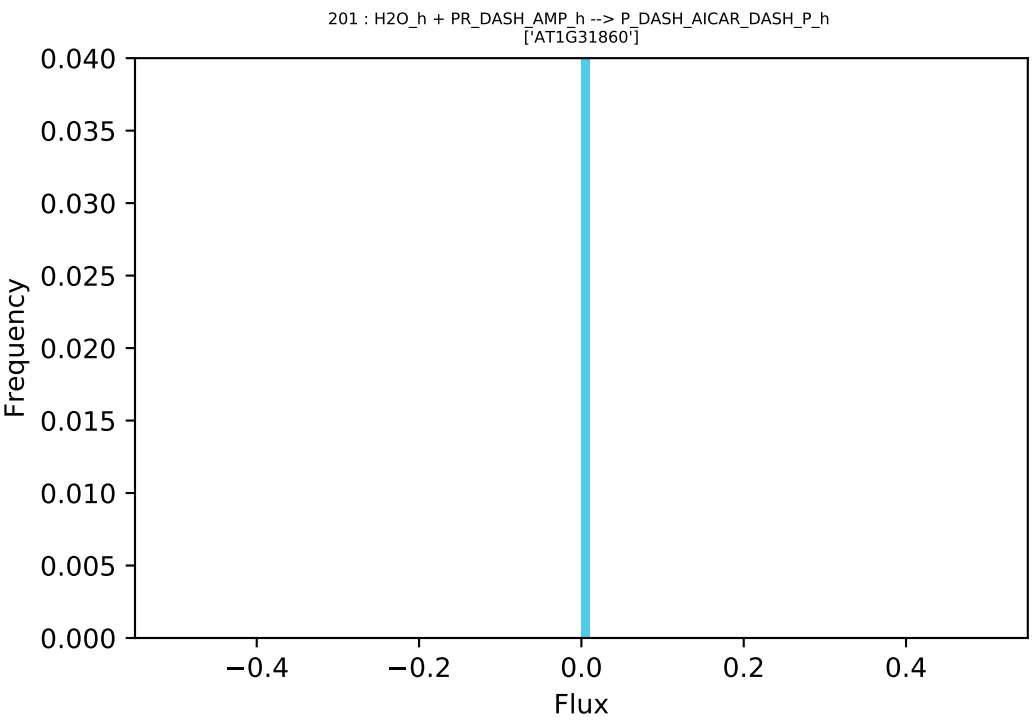

196 : GLX_h + Ser_h --> Gly_h + HPR_h
['2*AT2G13360']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

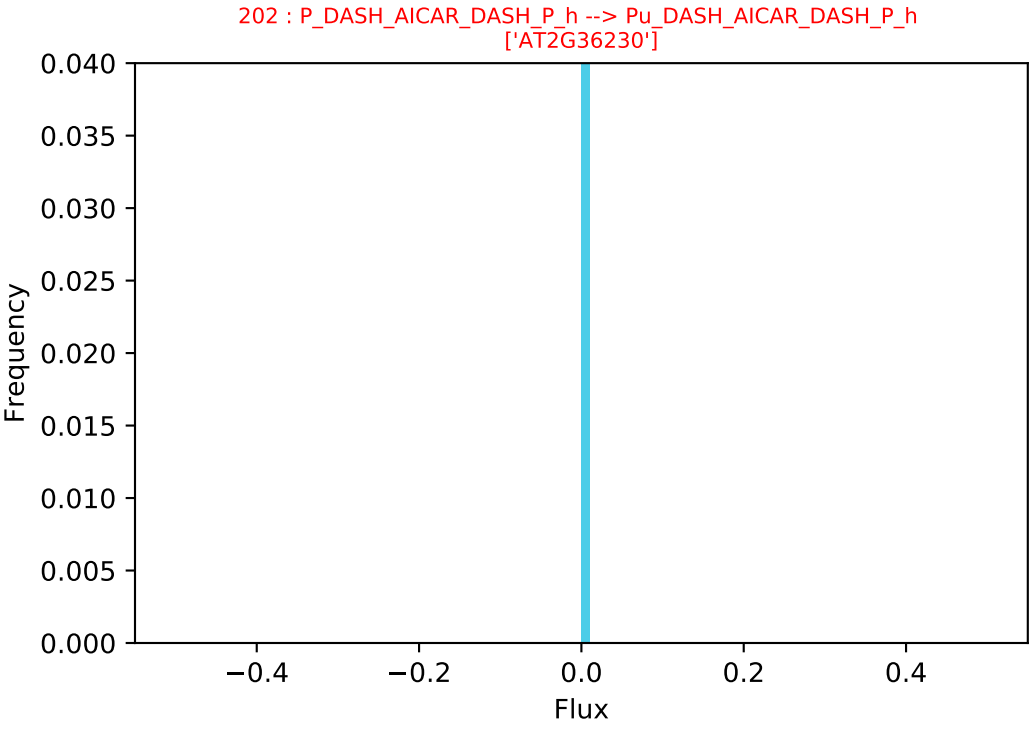

197 : HPR_h + H_h + NADH_h --> GCEA_h + NAD_h
['AT1G68010']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

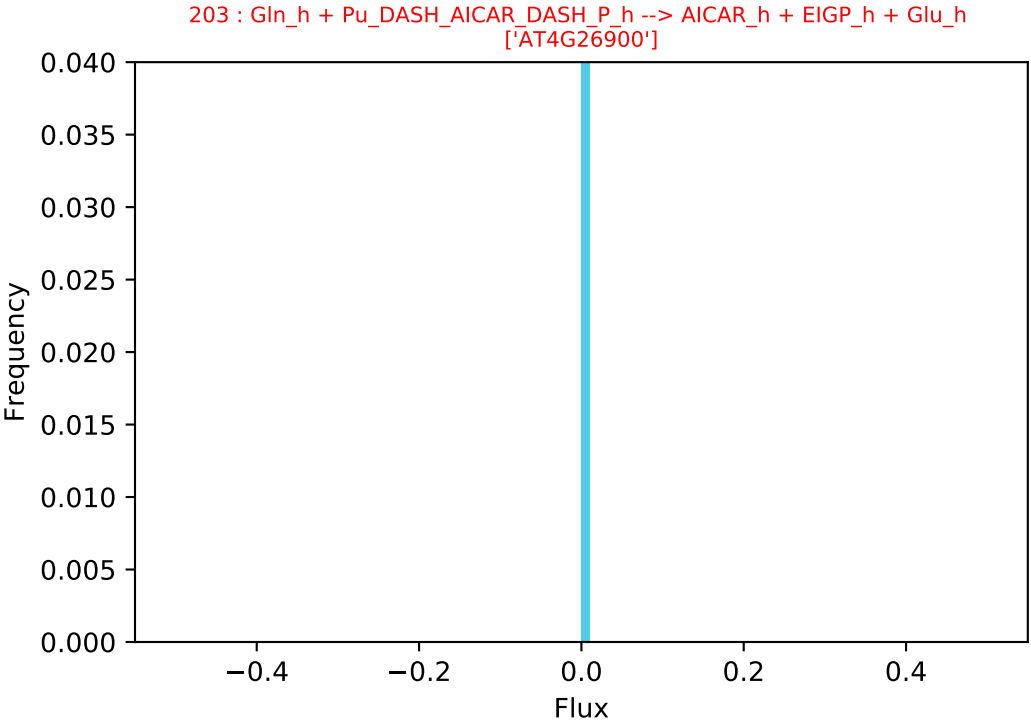

198 : GLX_h + Glu_h --> Gly_h + KG_h
['AT1G70580', 'AT1G23310']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0
1
2
3
4
5
6
7
8
Flux

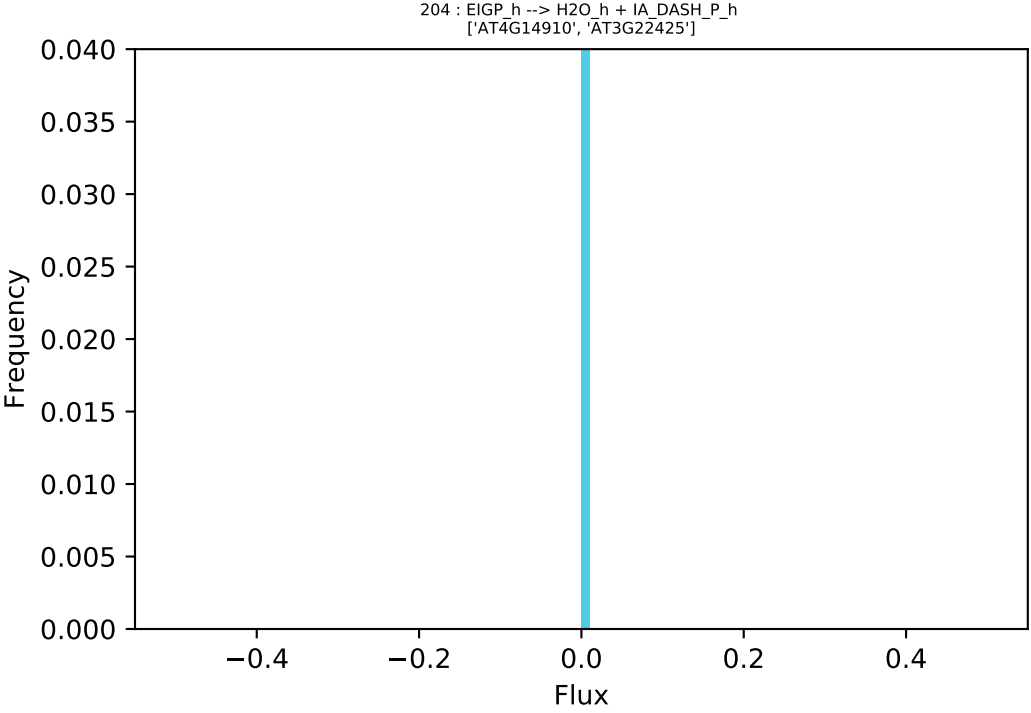

199 : ATP_h + PRPP_h --> H_h + PPi_h + PR_DASH_ATP_h
['AT1G09795', 'AT1G58080']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

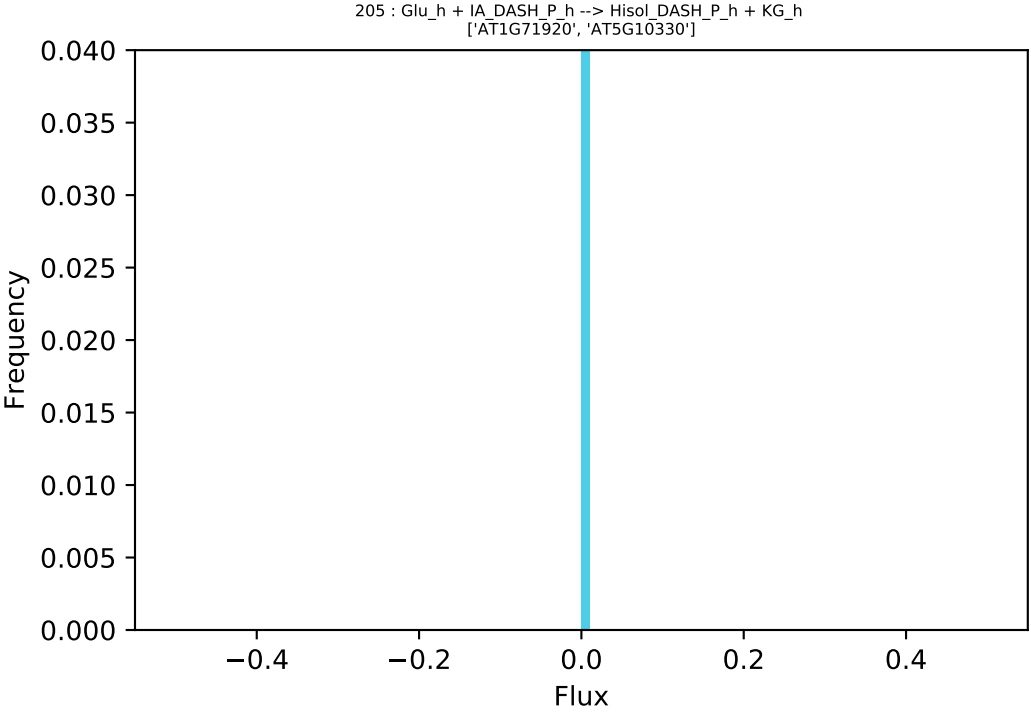

200 : H2O_h + PR_DASH_ATP_h --> 2.0 H_h + PPi_h + PR_DASH_AMP_h
['AT1G31860']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

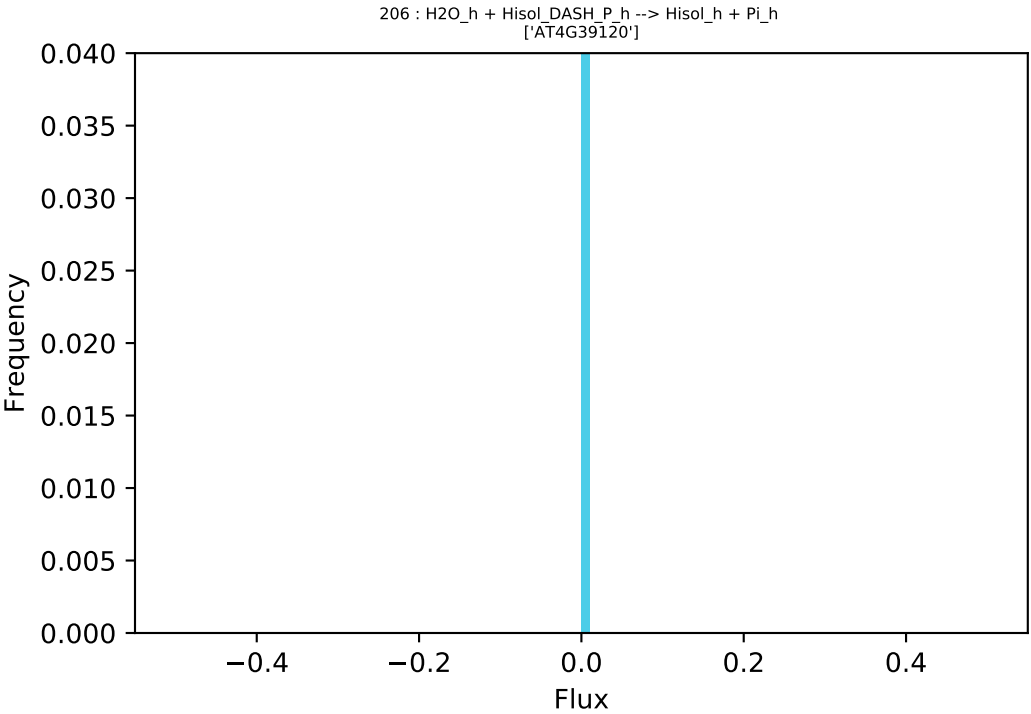

201 : H2O_h + PR_DASH_AMP_h --> P_DASH_AICAR_DASH_P_h
['AT1G31860']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

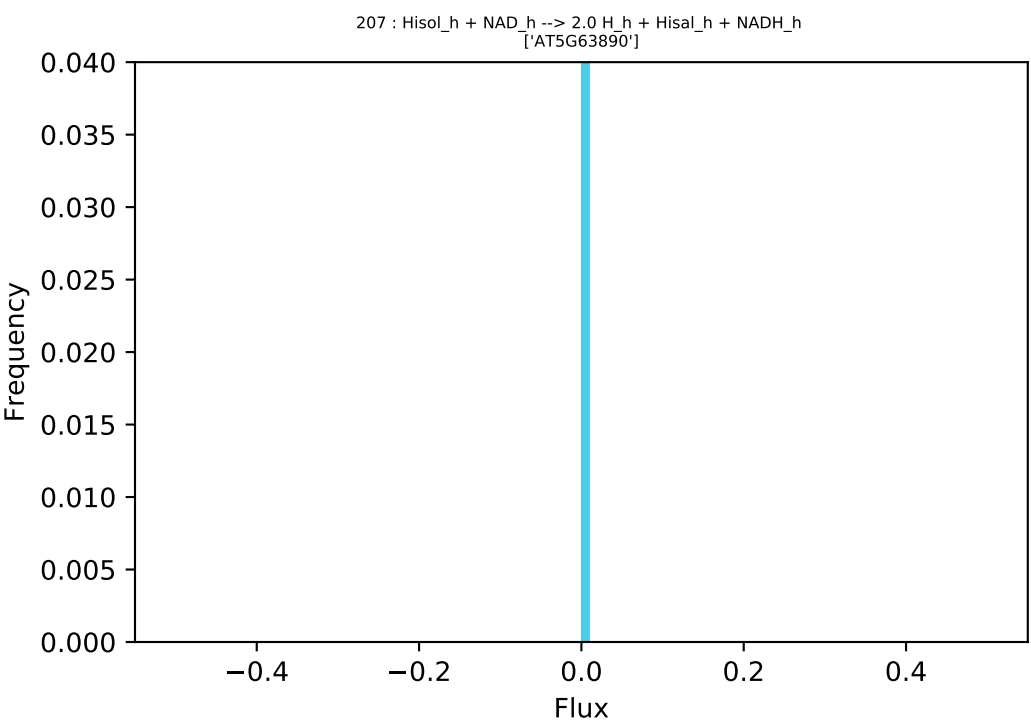

202 : P_DASH_AICAR_DASH_P_h --> Pu_DASH_AICAR_DASH_P_h
['AT2G36230']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

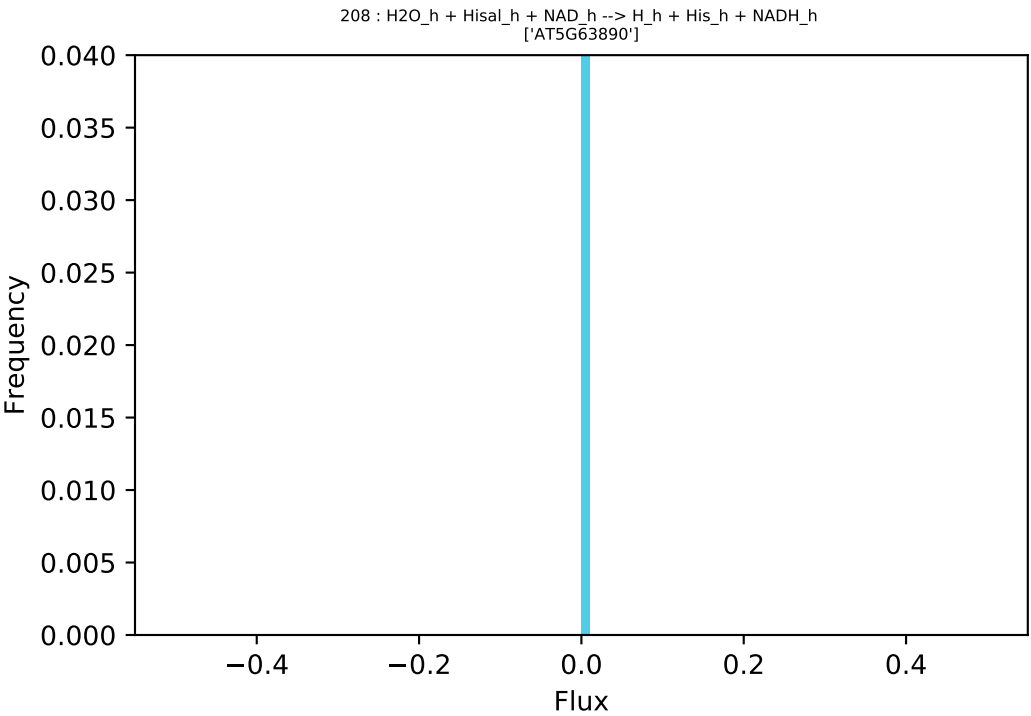

203 : Gln_h + Pu_DASH_AICAR_DASH_P_h --> AICAR_h + EIGP_h + Glu_h
['AT4G26900']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

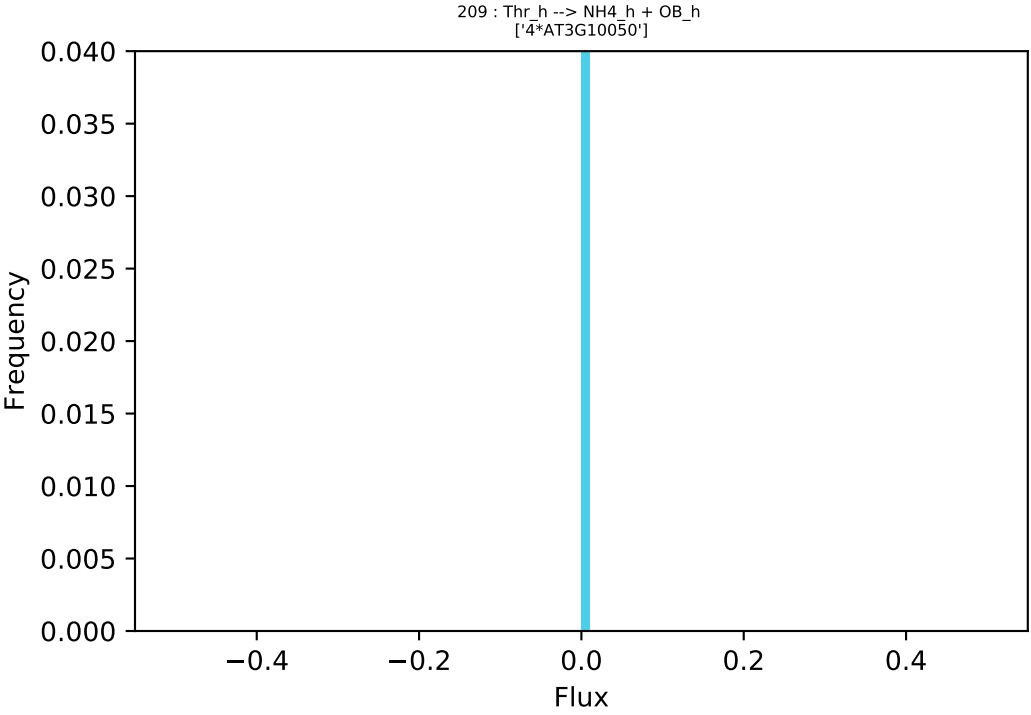

204 : EIGP_h --> H2O_h + IA_DASH_P_h
['AT4G14910', 'AT3G22425']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

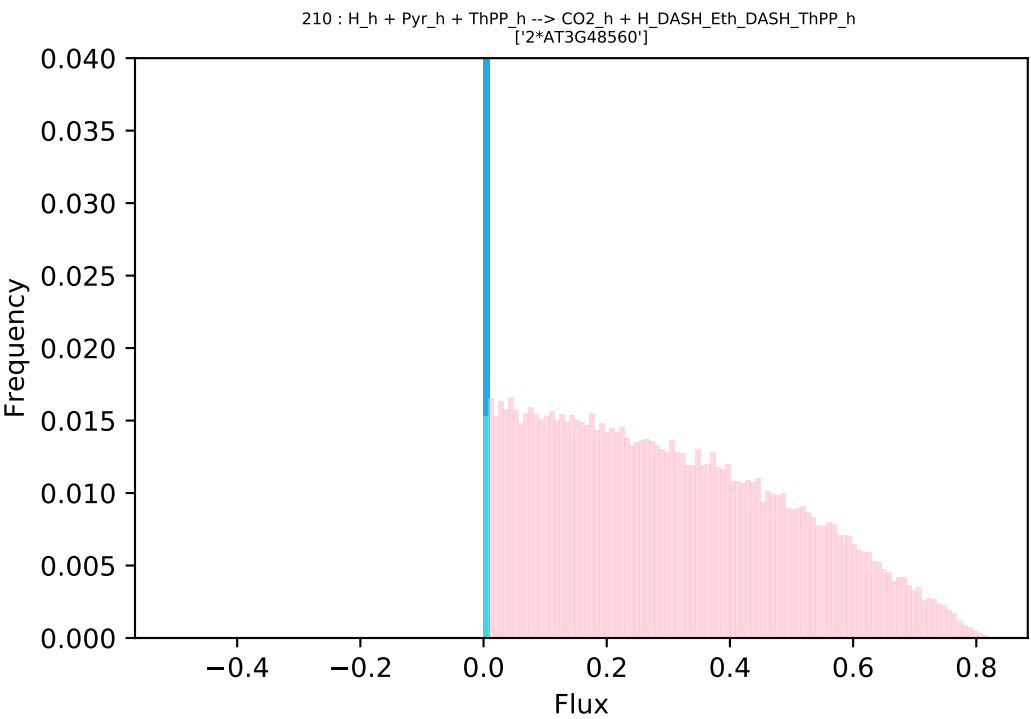

205 : Glu_h + IA_DASH_P_h --> Hisol_DASH_P_h + KG_h
['AT1G71920', 'AT5G10330']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

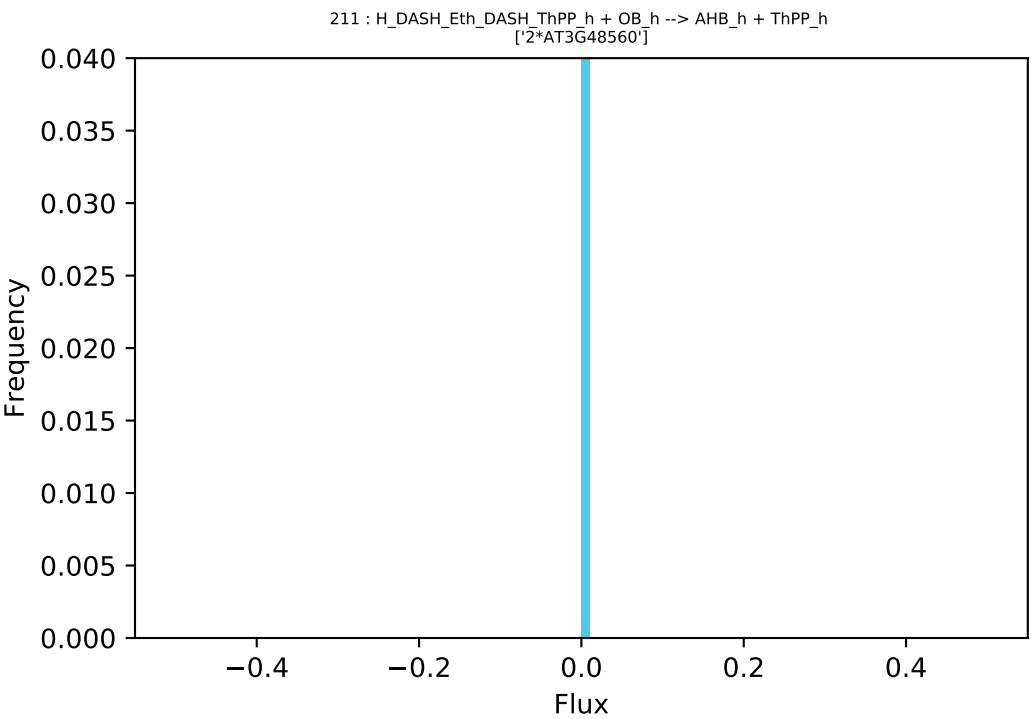

206 : H2O_h + Hisol_DASH_P_h --> Hisol_h + Pi_h
['AT4G39120']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

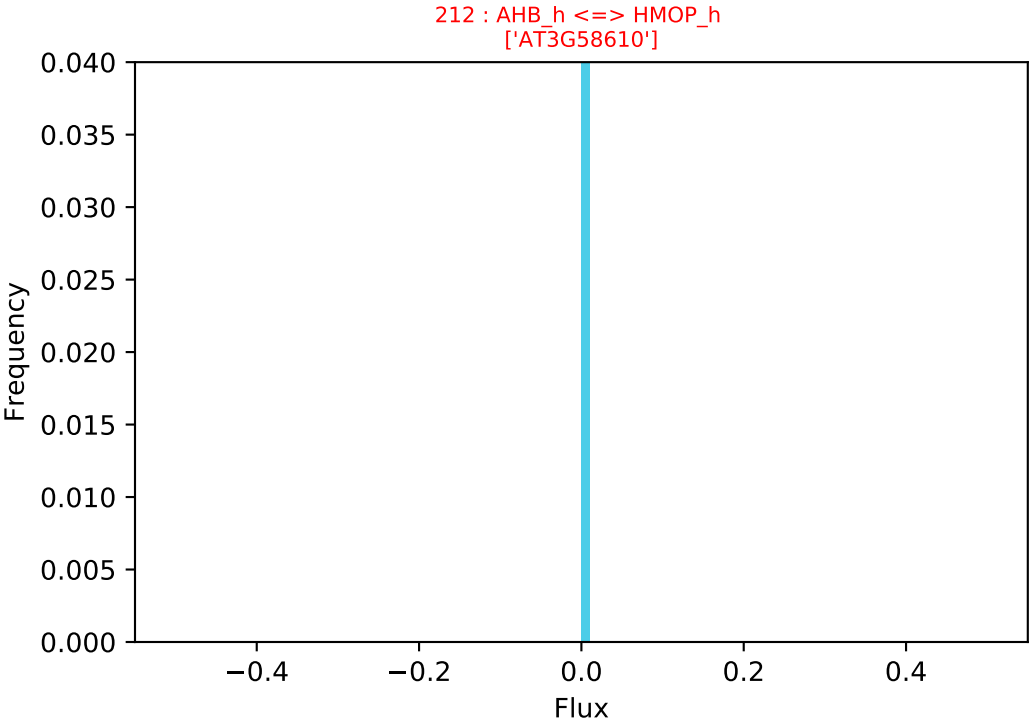

207 : Hisol_h + NAD_h --> 2.0 H_h + Hisal_h + NADH_h
['AT5G63890']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

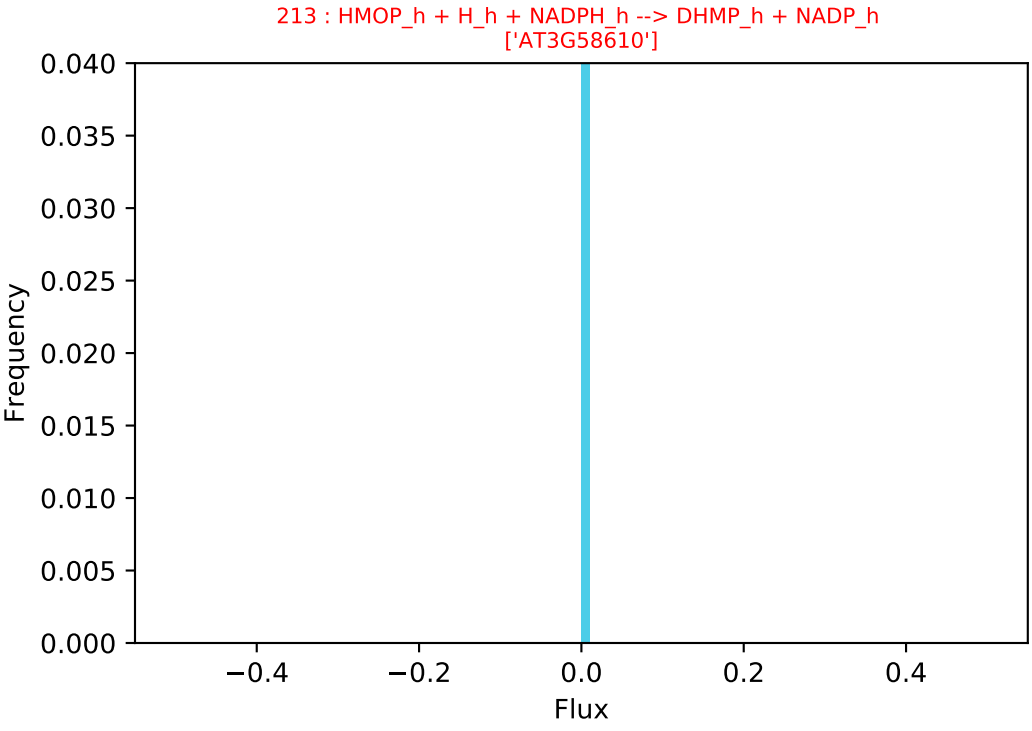

208 : H2O_h + Hisal_h + NAD_h --> H_h + His_h + NADH_h
['AT5G63890']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

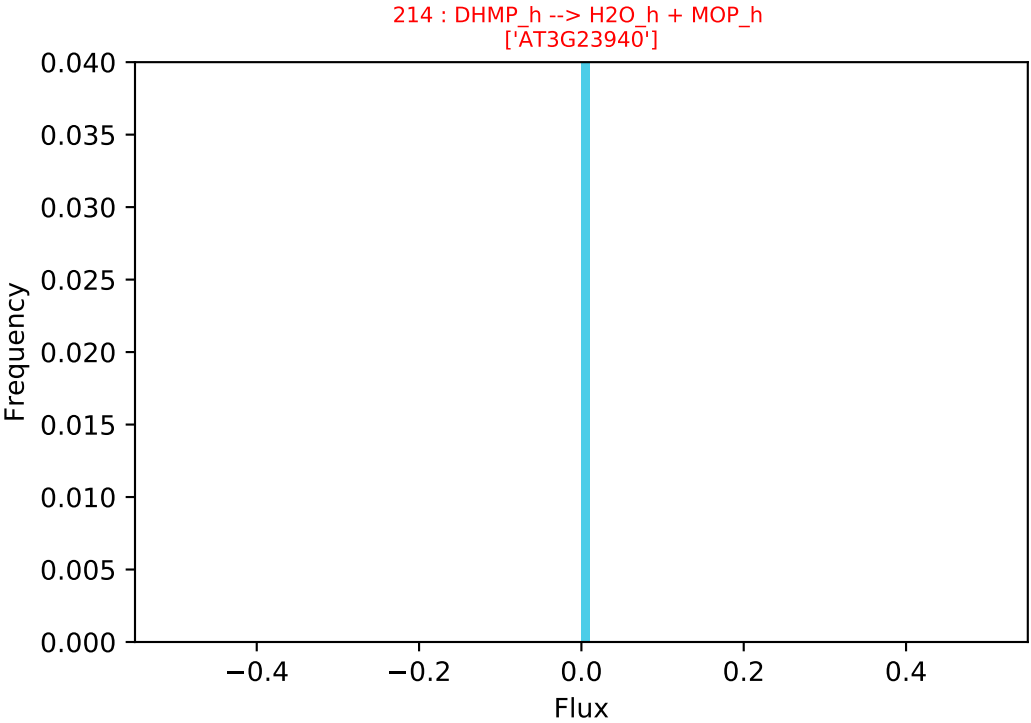

209 : Thr_h --> NH4_h + OB_h
['4*AT3G10050']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

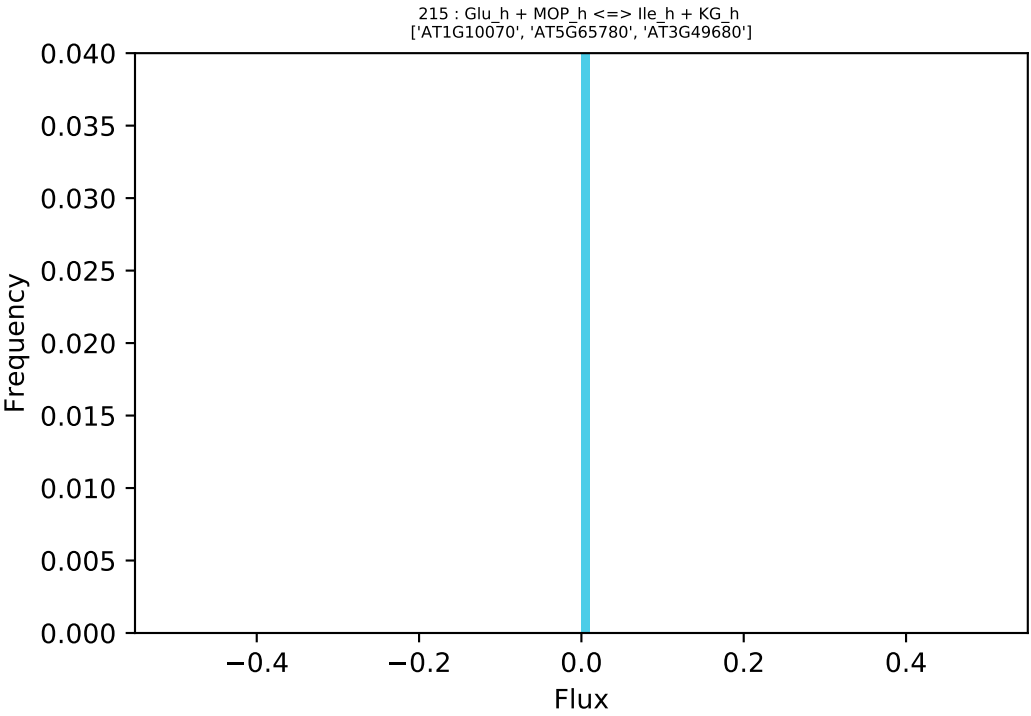

210 : H_h + Pyr_h + ThPP_h --> CO2_h + H_DASH_Eth_DASH_ThPP_h
['2*AT3G48560']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
0.6
0.8
Flux

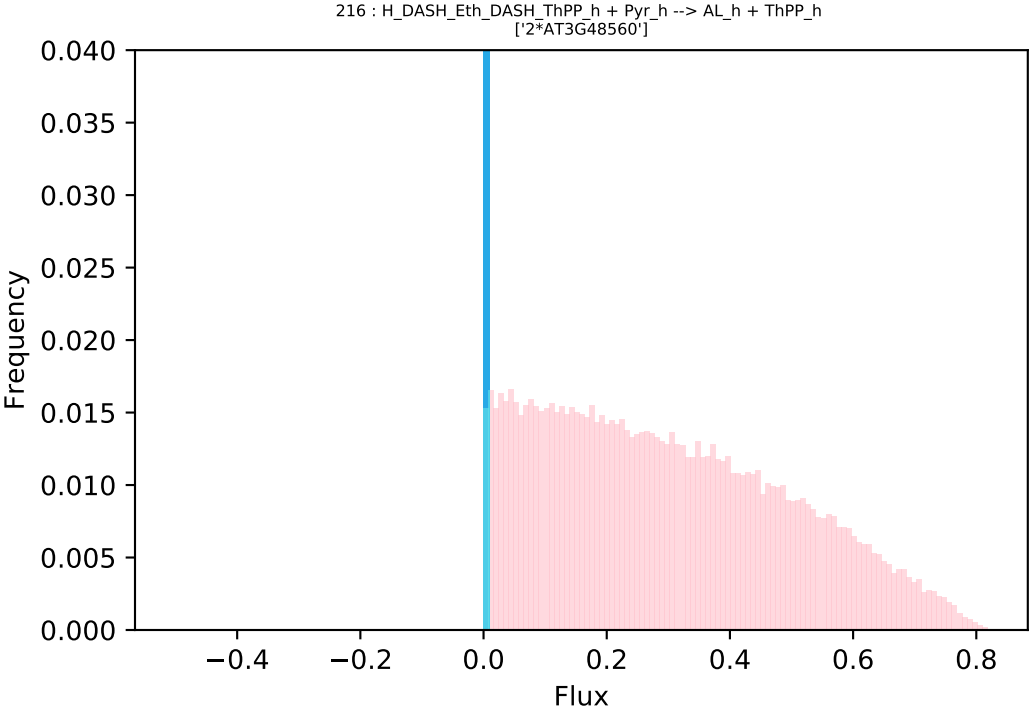

211 : H_DASH_Eth_DASH_ThPP_h + OB_h --> AHB_h + ThPP_h
['2*AT3G48560']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

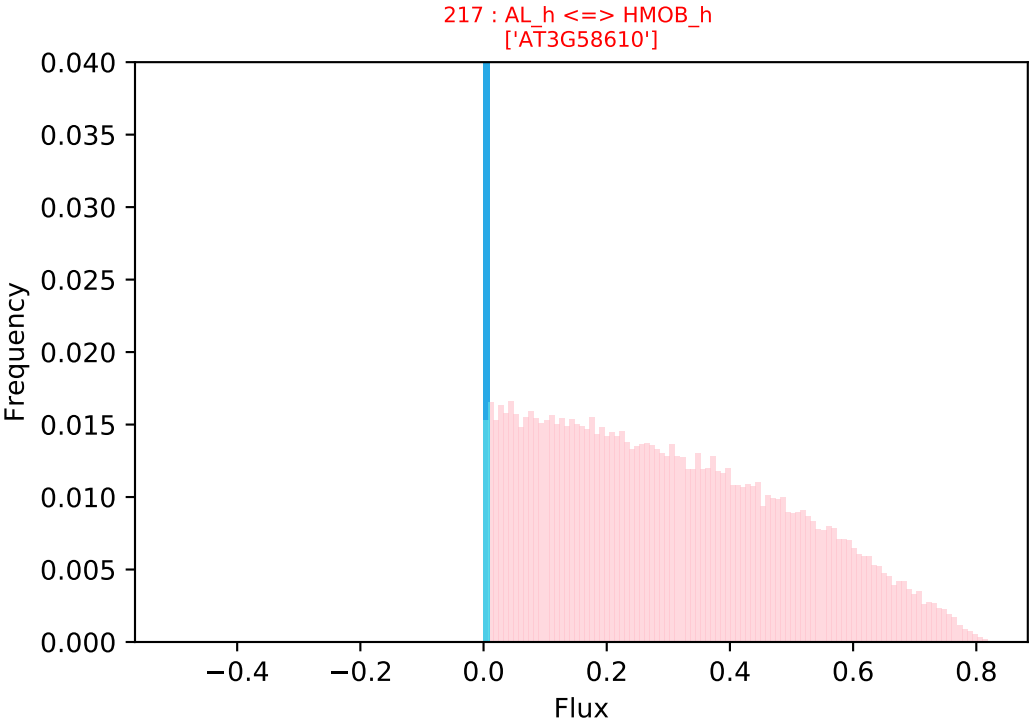

212 : AHB_h <=> HMOP_h
['AT3G58610']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

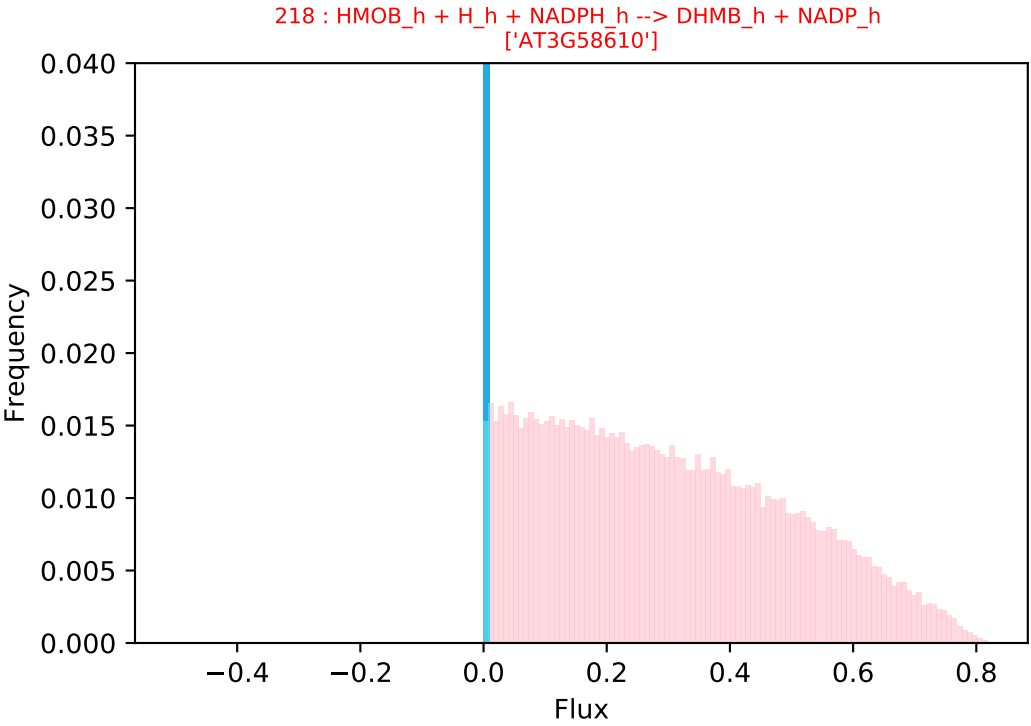

213 : HMOP_h + H_h + NADPH_h --> DHMP_h + NADP_h
['AT3G58610']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

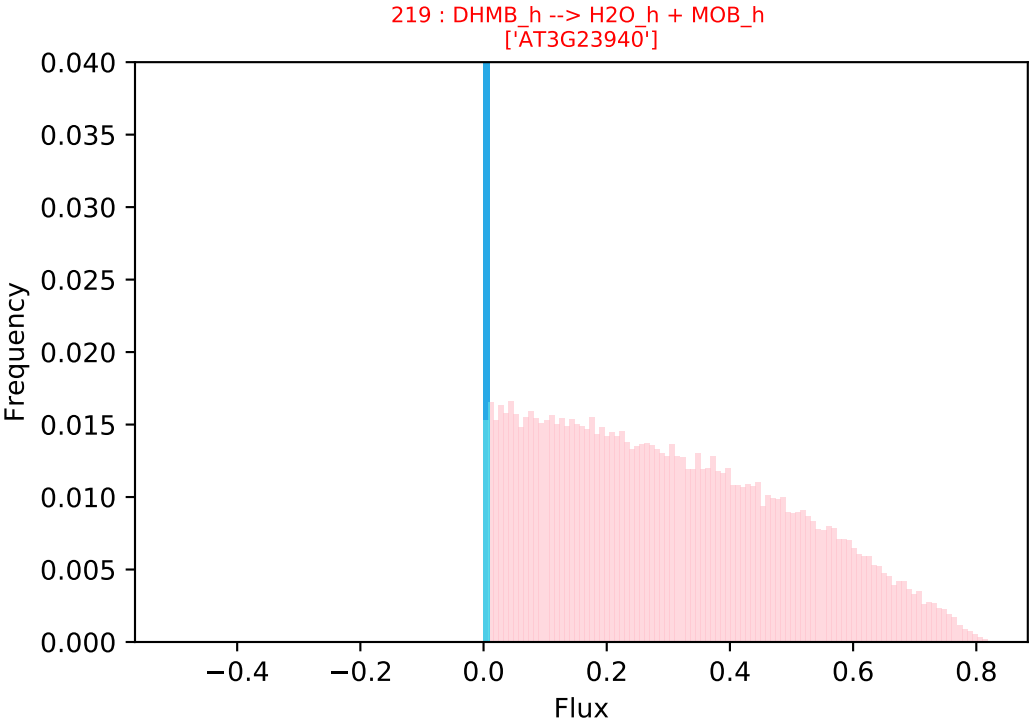

214 : DHMP_h --> H2O_h + MOP_h
['AT3G23940']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

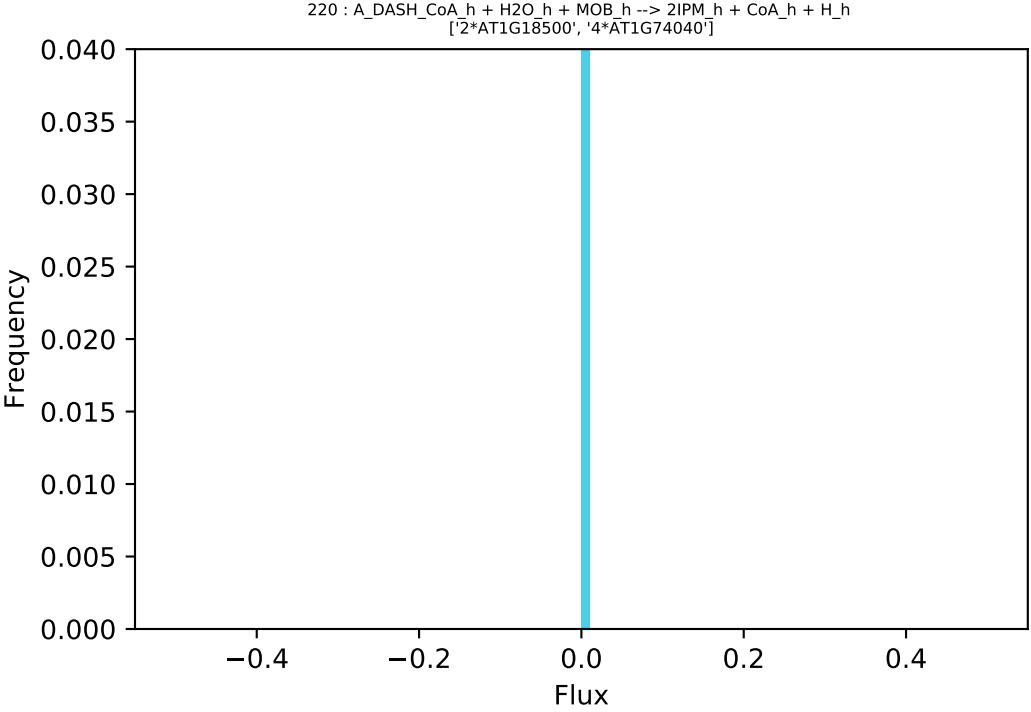

215 : Glu_h + MOP_h <=> Ile_h + KG_h
['AT1G10070', 'AT5G65780', 'AT3G49680']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

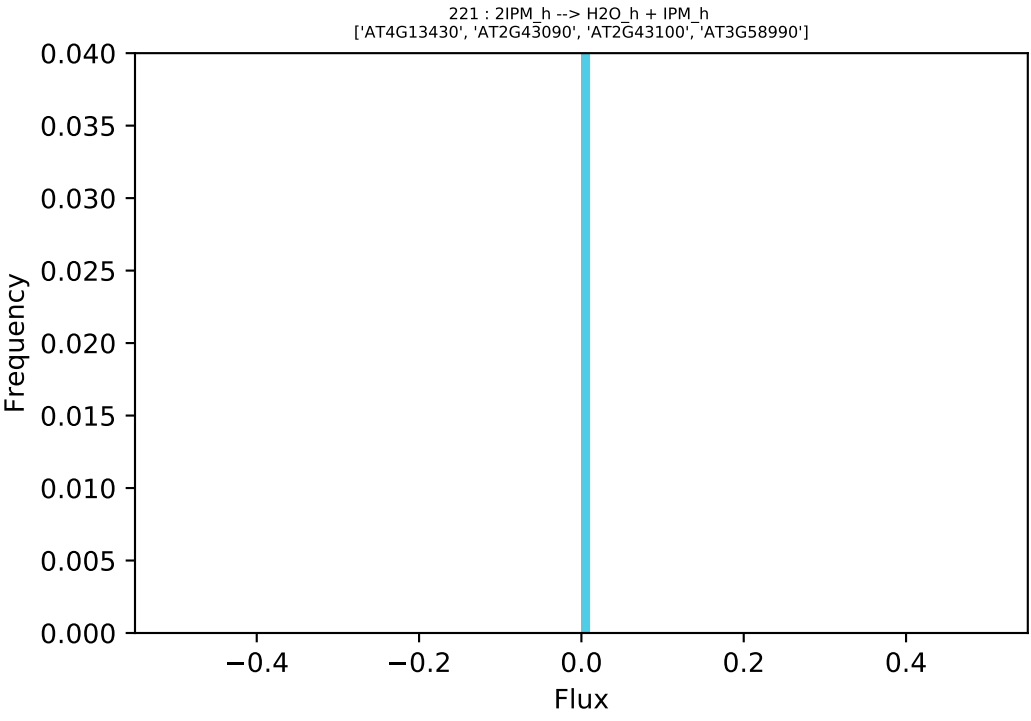

216 : H_DASH_Eth_DASH_ThPP_h + Pyr_h --> AL_h + ThPP_h
['2*AT3G48560']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
0.6
0.8
Flux

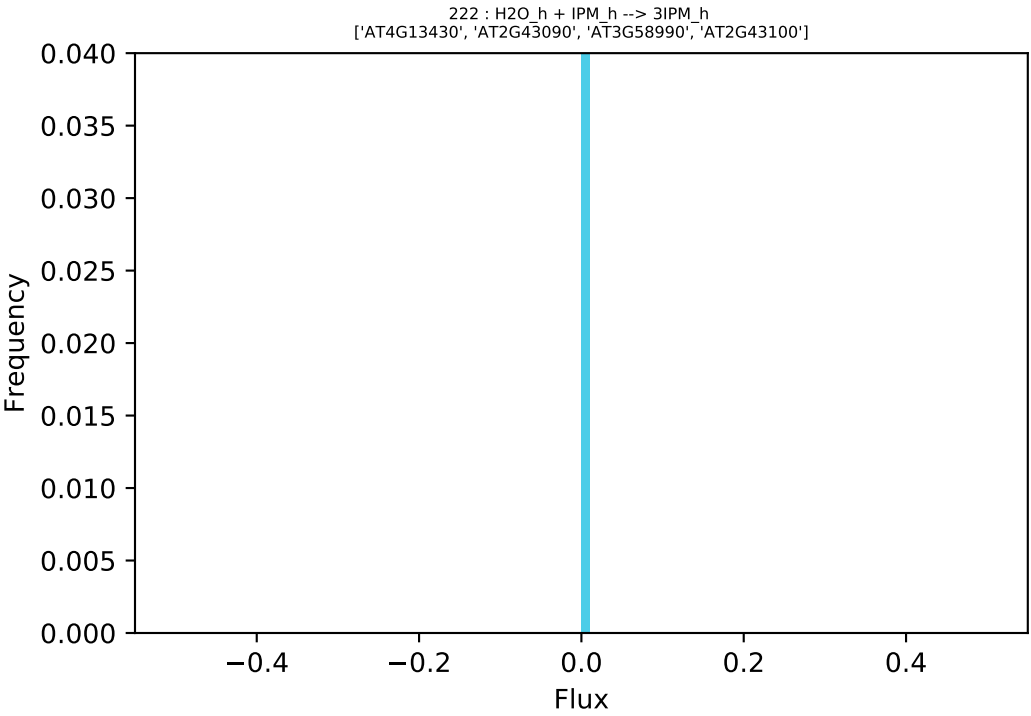

217 : AL_h <=> HMOB_h
['AT3G58610']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
0.6
0.8
Flux

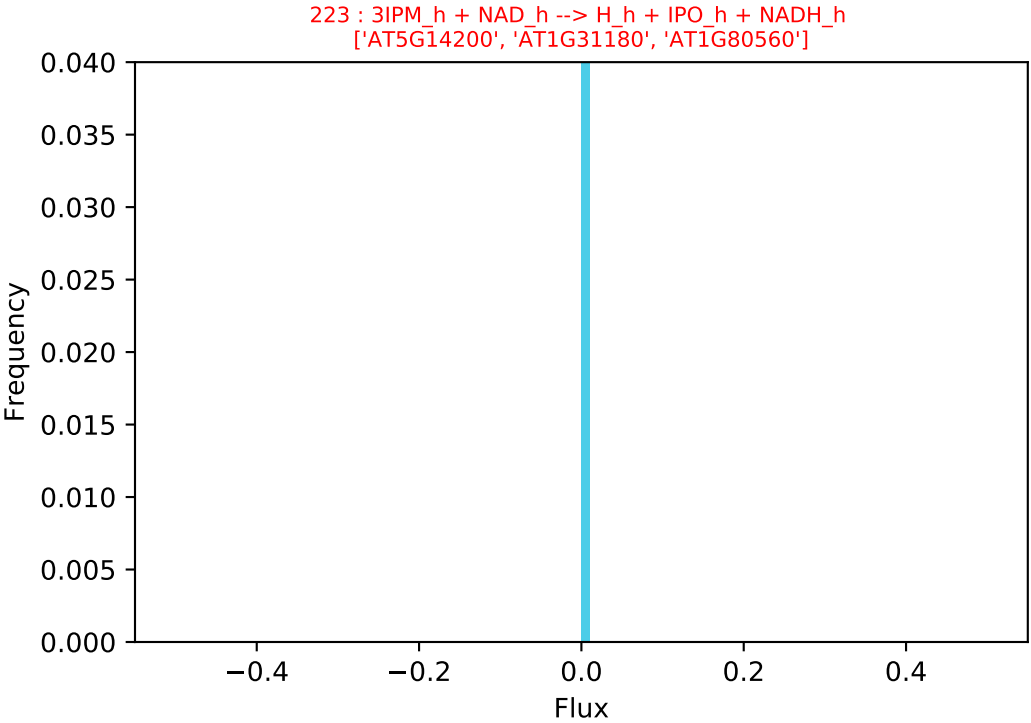

218 : HMOB_h + H_h + NADPH_h --> DHMB_h + NADP_h
['AT3G58610']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
0.6
0.8
Flux

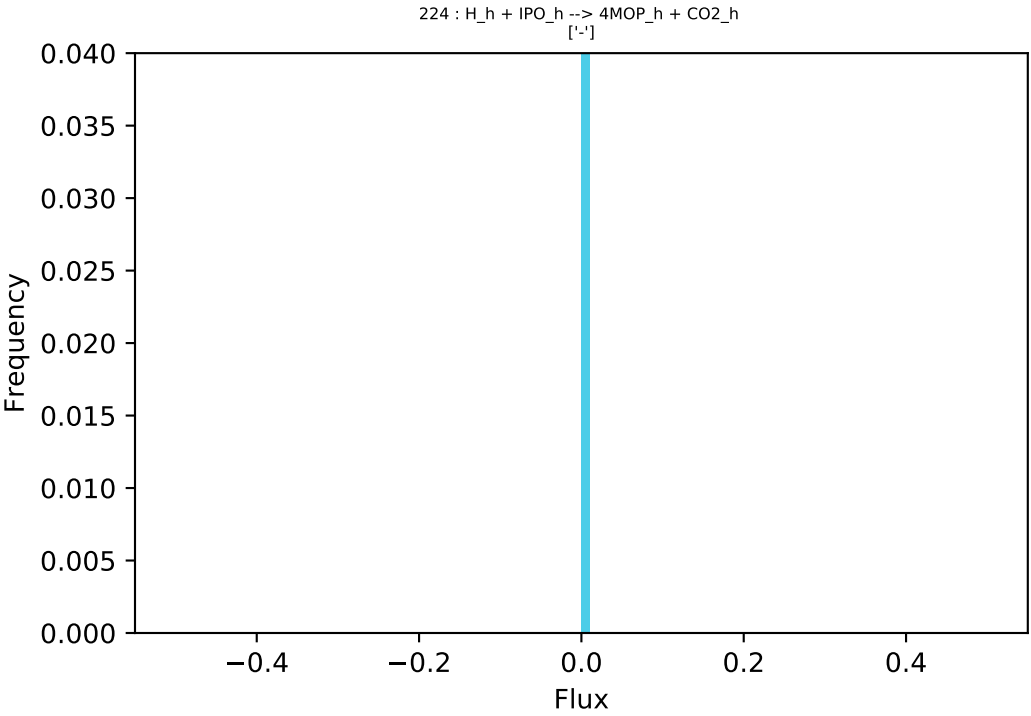

219 : DHMB_h --> H2O_h + MOB_h
['AT3G23940']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
0.6
0.8
Flux

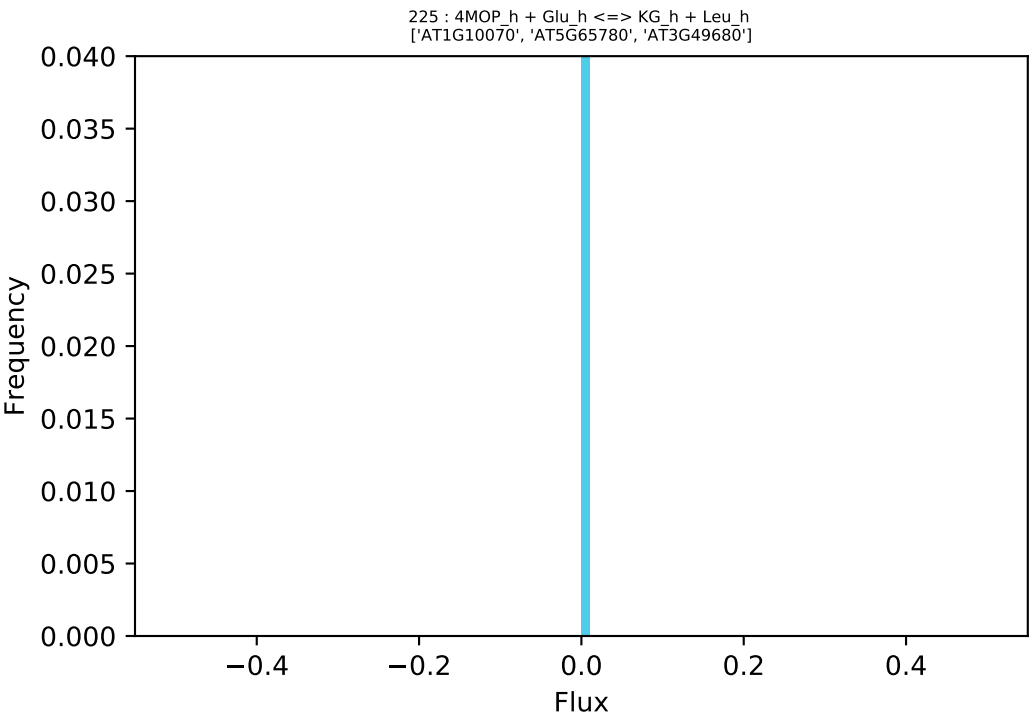

220 : A_DASH_CoA_h + H2O_h + MOB_h --> 2IPM_h + CoA_h + H_h
['2*AT1G18500', '4*AT1G74040']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

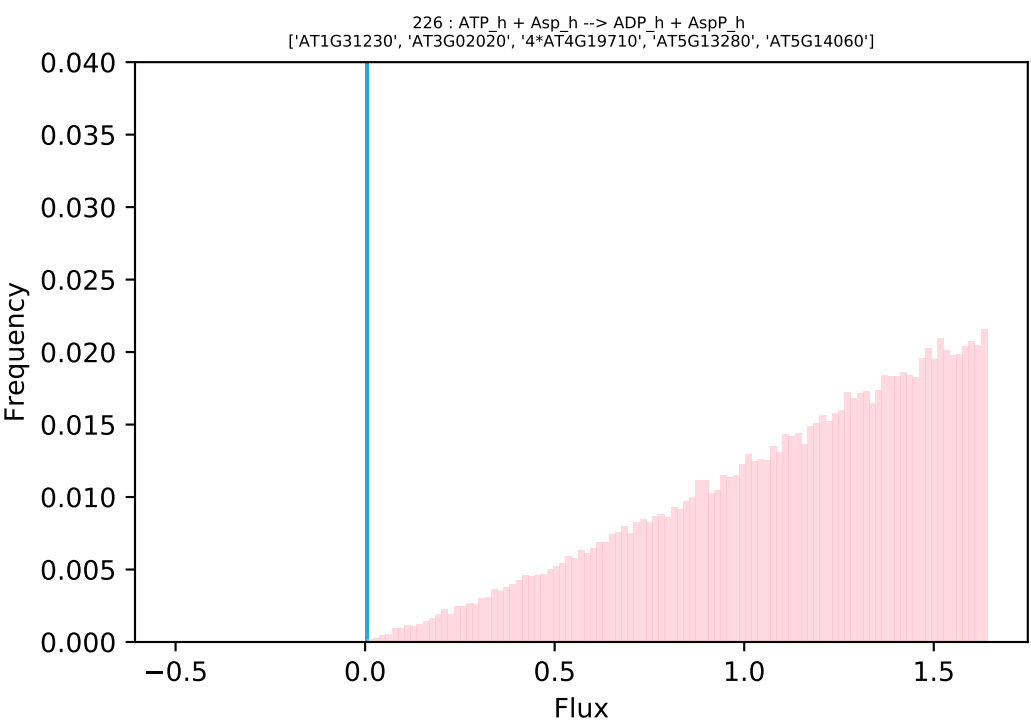

221 : 2IPM_h --> H2O_h + IPM_h
['AT4G13430', 'AT2G43090', 'AT2G43100', 'AT3G58990']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

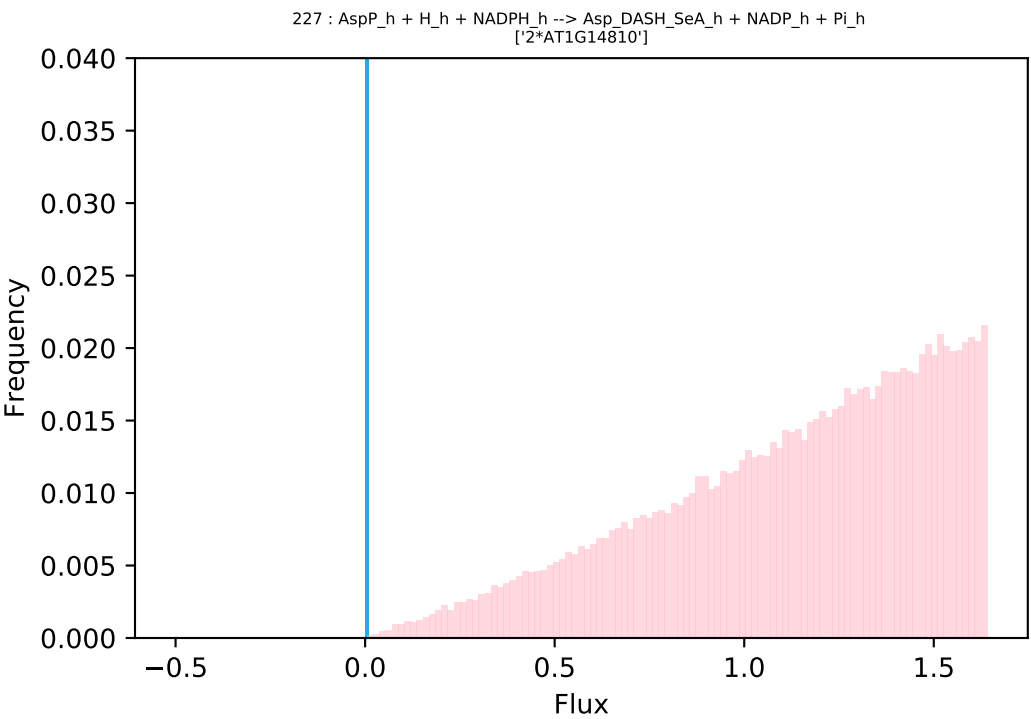

222 : H2O_h + IPM_h --> 3IPM_h
['AT4G13430', 'AT2G43090', 'AT3G58990', 'AT2G43100']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

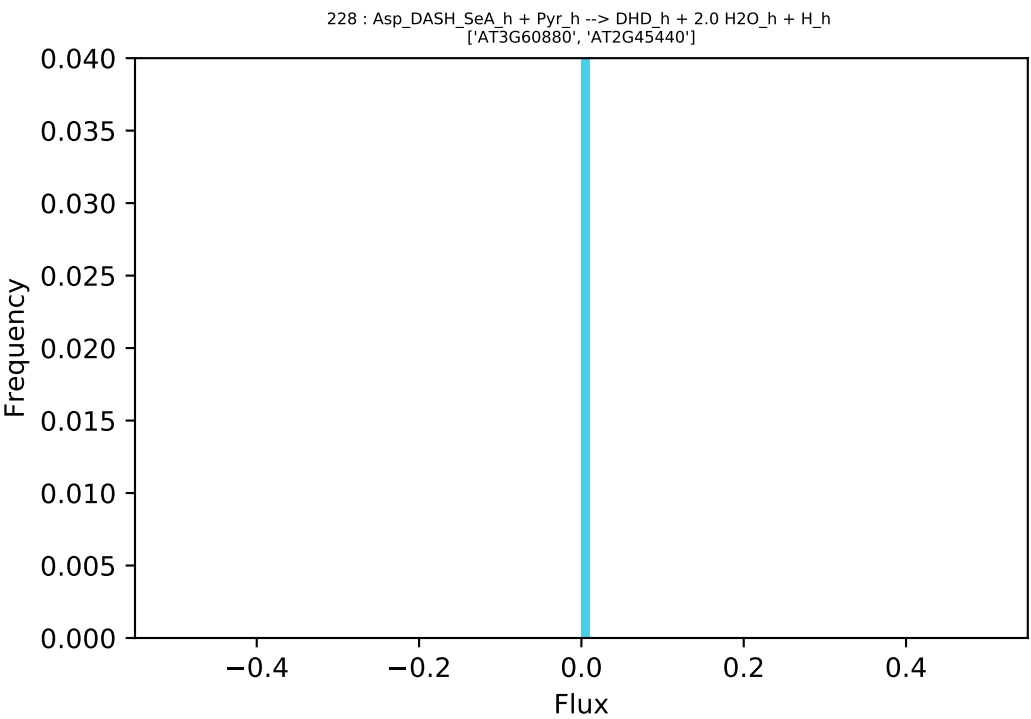

223 : 3IPM_h + NAD_h --> H_h + IPO_h + NADH_h
['AT5G14200', 'AT1G31180', 'AT1G80560']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

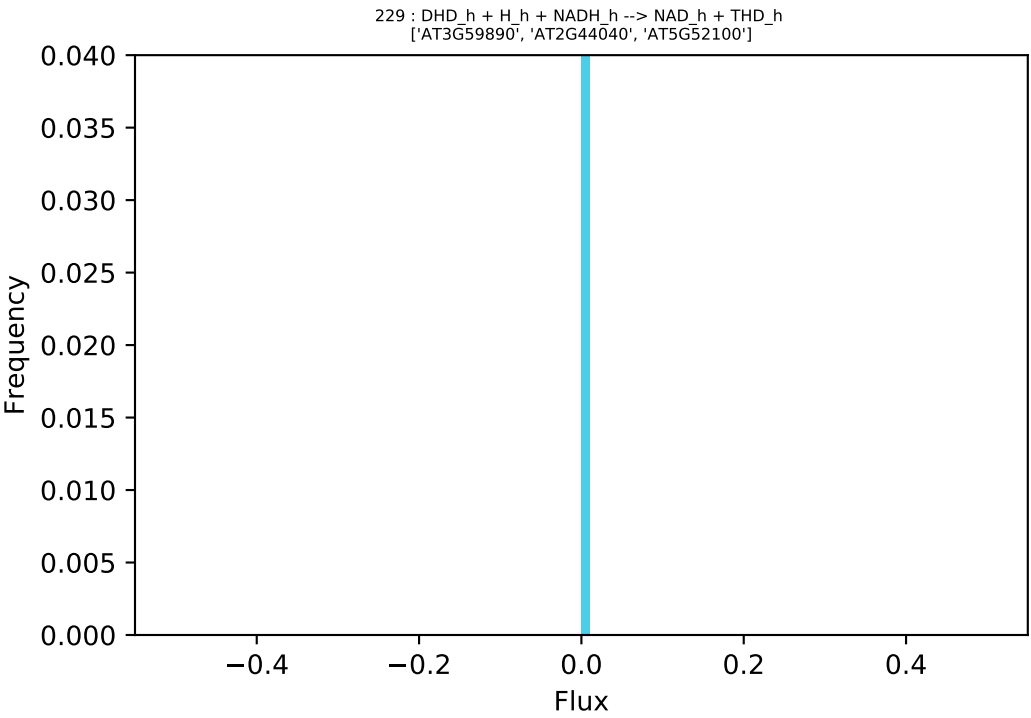

224 : H_h + IPO_h --> 4MOP_h + CO2_h
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

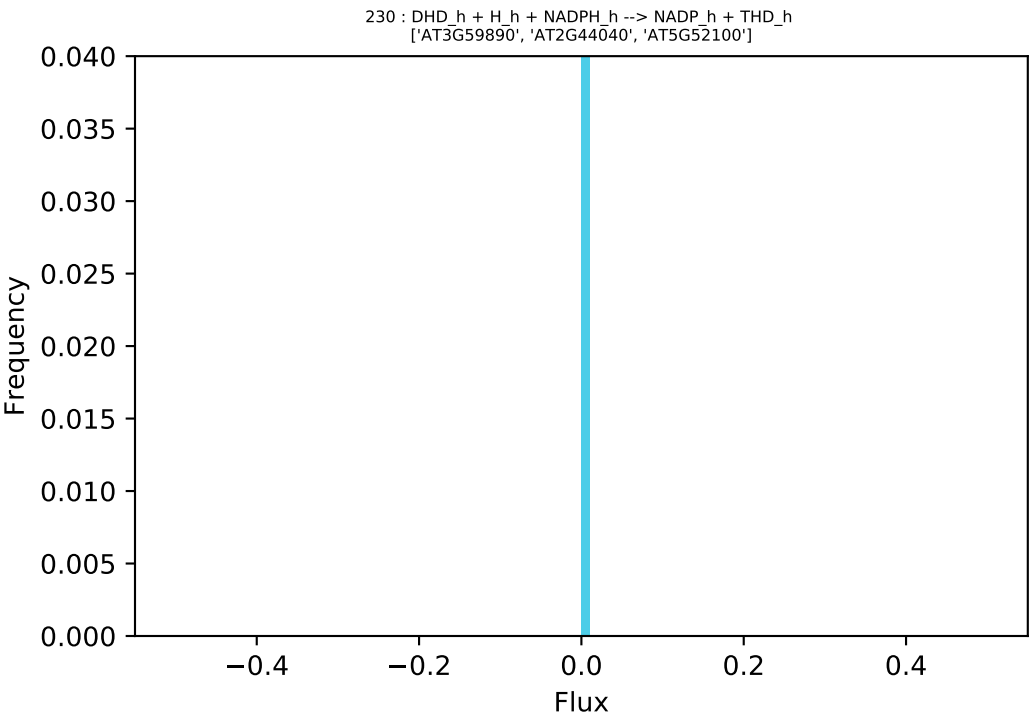

225 : 4MOP_h + Glu_h <=> KG_h + Leu_h
['AT1G10070', 'AT5G65780', 'AT3G49680']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

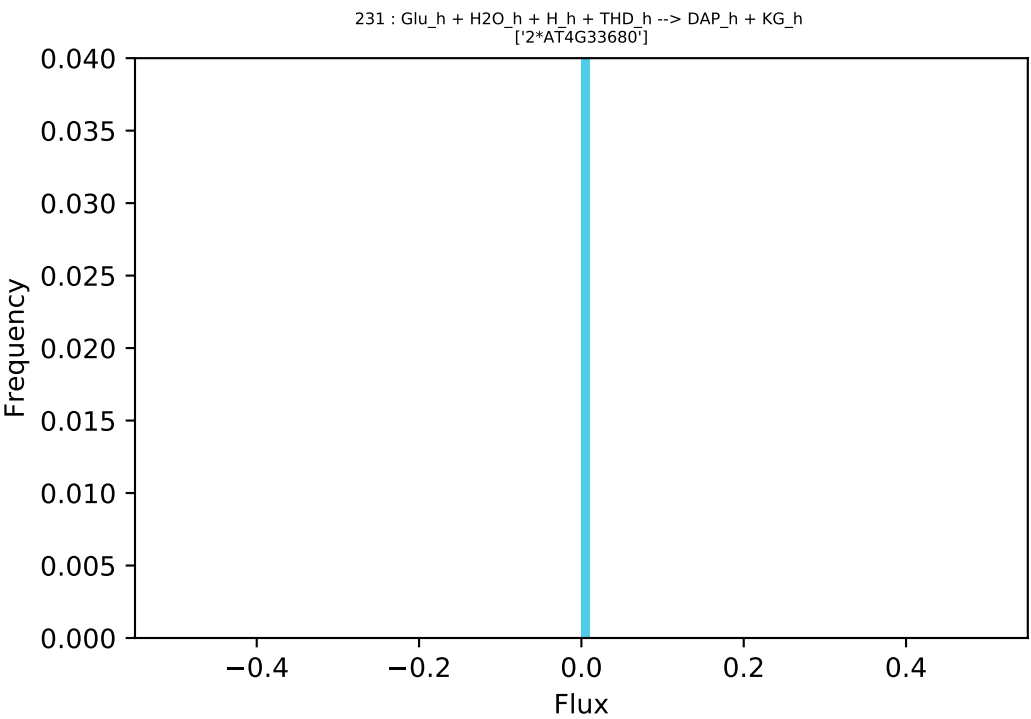

226 : ATP_h + Asp_h --> ADP_h + AspP_h
['AT1G31230', 'AT3G02020', '4*AT4G19710', 'AT5G13280', 'AT5G14060']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.5
0.0
0.5
1.0
1.5
Flux

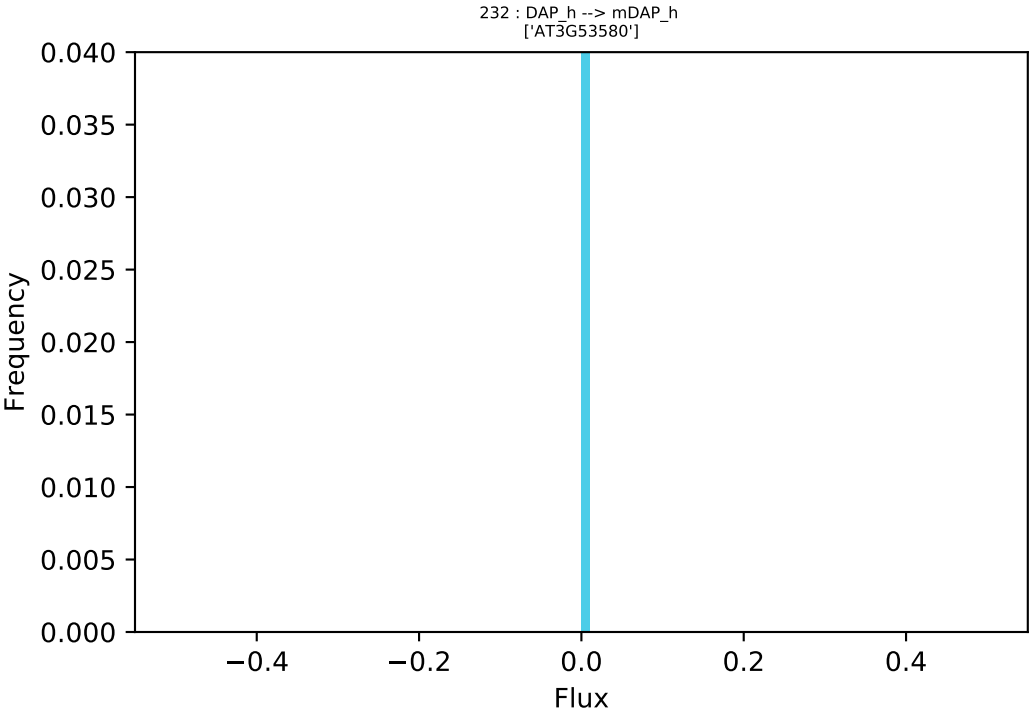

227 : AspP_h + H_h + NADPH_h --> Asp_DASH_SeA_h + NADP_h + Pi_h
['2*AT1G14810']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.5
0.0
0.5
1.0
1.5
Flux

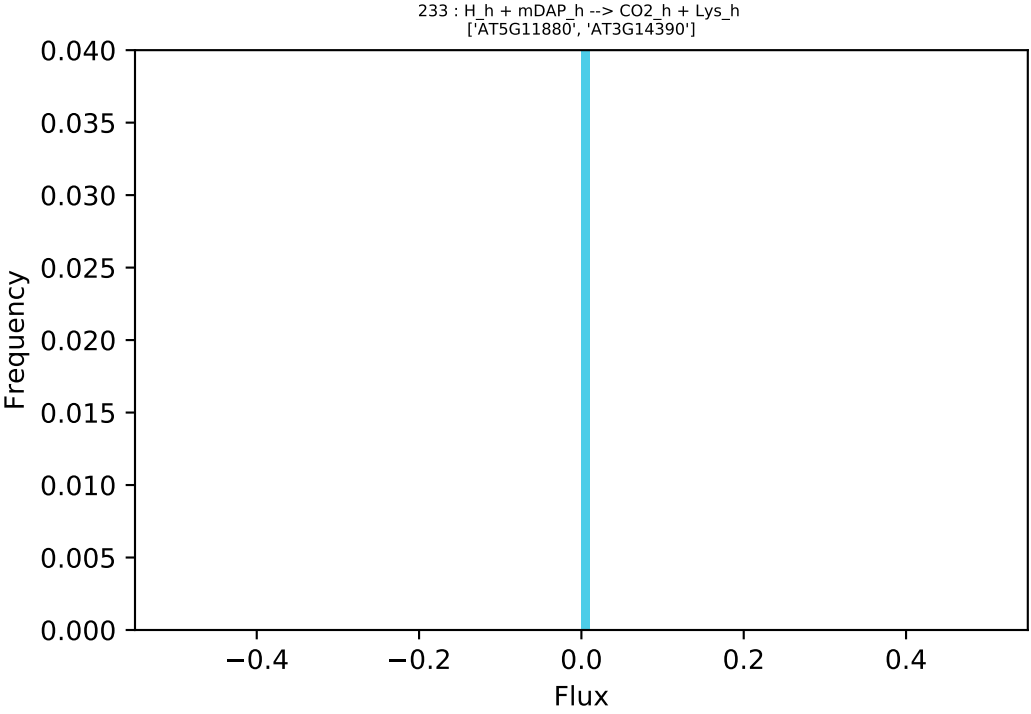

228 : Asp_DASH_SeA_h + Pyr_h --> DHD_h + 2.0 H2O_h + H_h
['AT3G60880', 'AT2G45440']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

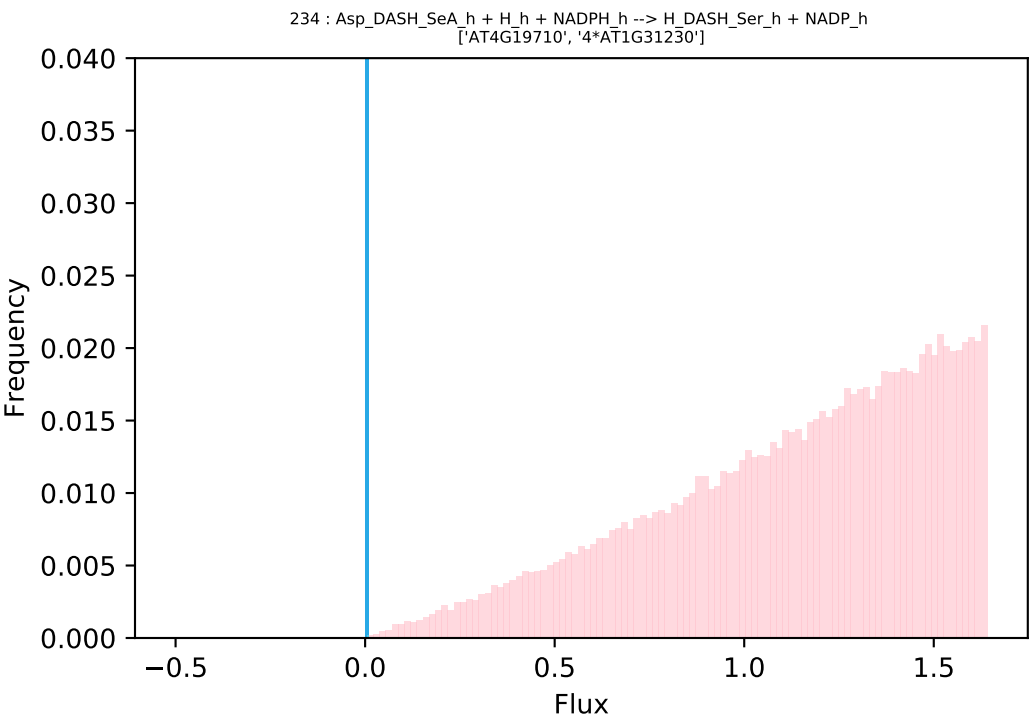

229 : DHD_h + H_h + NADH_h --> NAD_h + THD_h
['AT3G59890', 'AT2G44040', 'AT5G52100']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

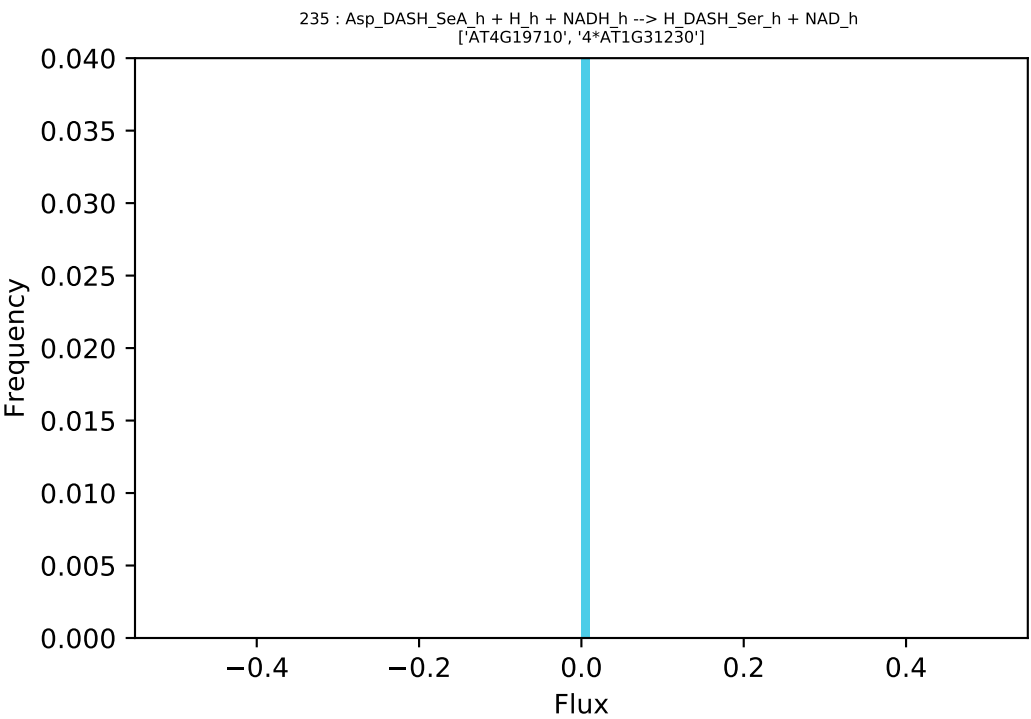

230 : DHD_h + H_h + NADPH_h --> NADP_h + THD_h
['AT3G59890', 'AT2G44040', 'AT5G52100']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

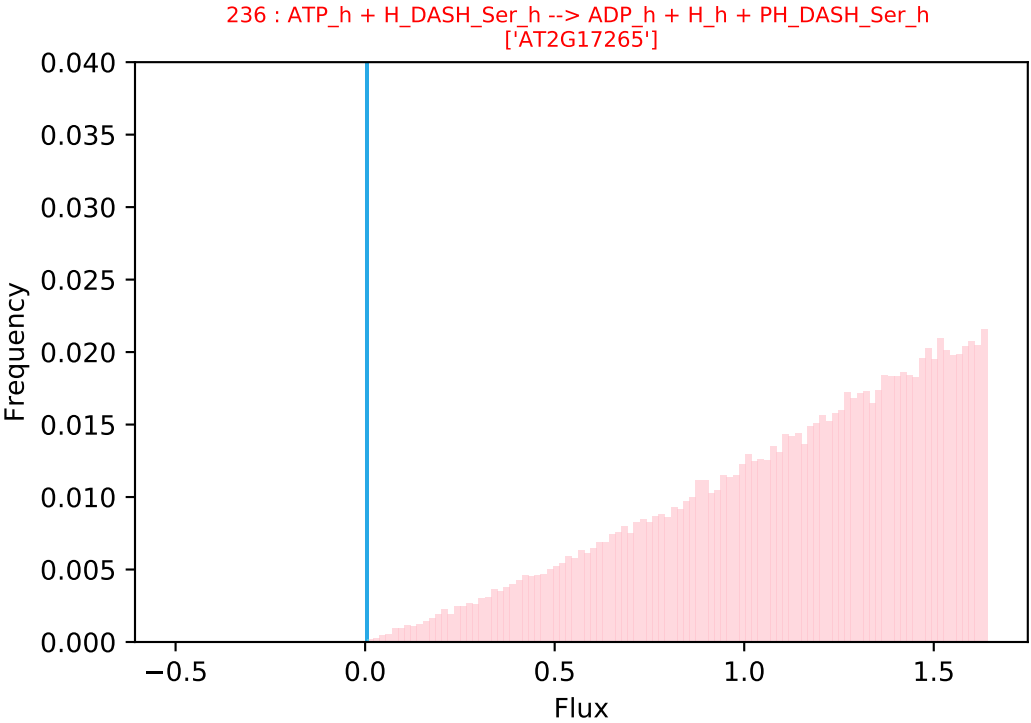

231 : Glu_h + H2O_h + H_h + THD_h --> DAP_h + KG_h
['2*AT4G33680']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

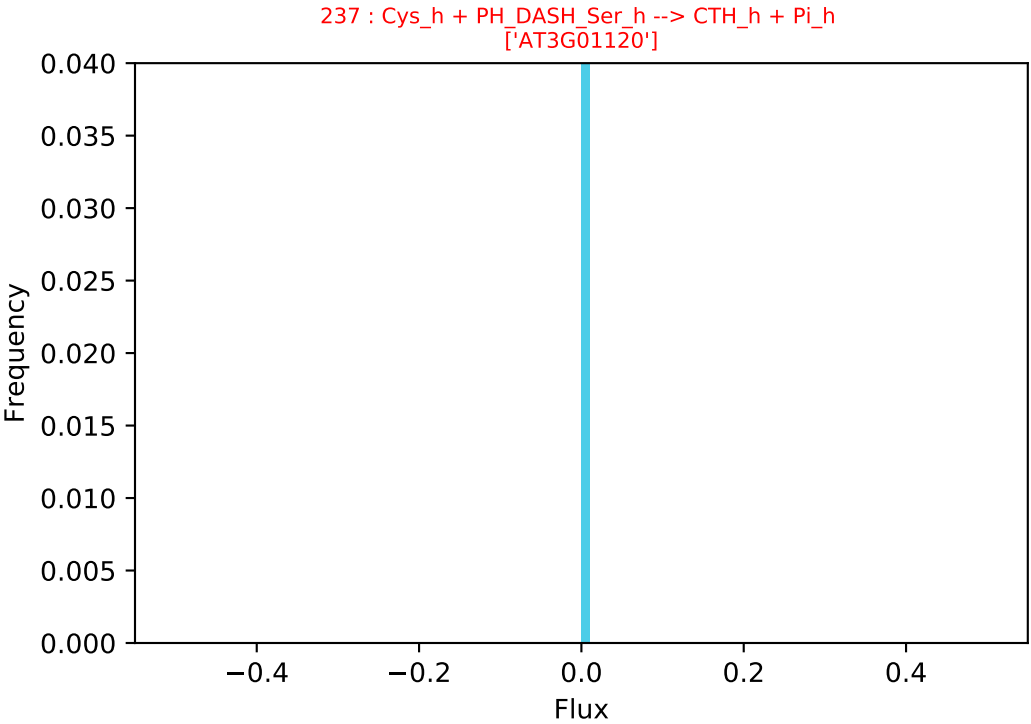

232 : DAP_h --> mDAP_h
['AT3G53580']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

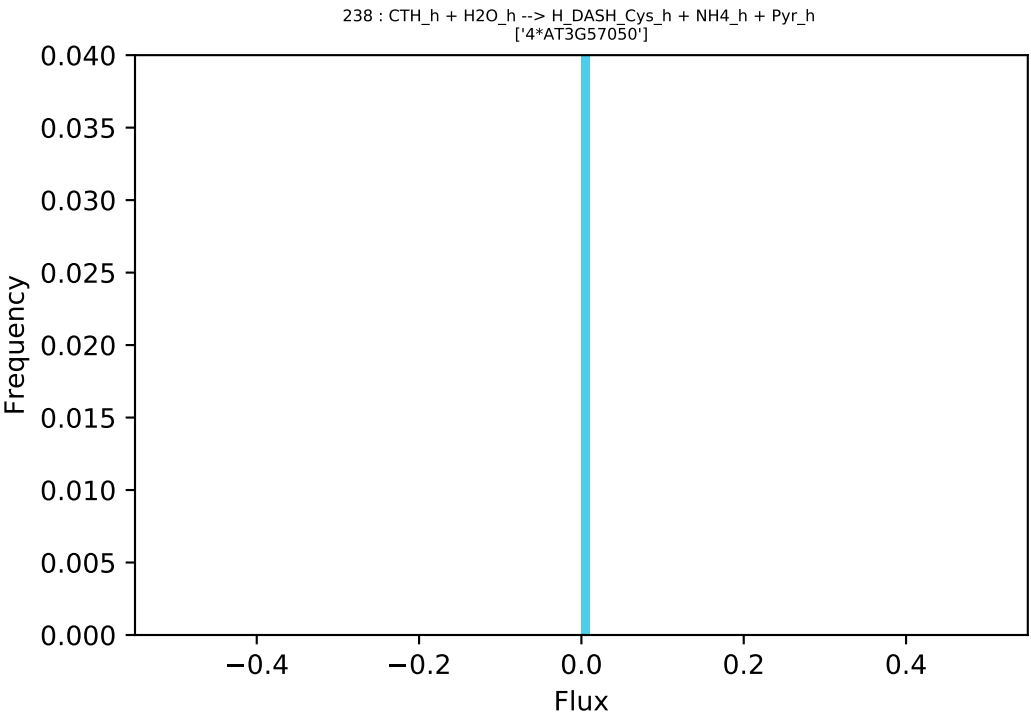

233 : H_h + mDAP_h --> CO2_h + Lys_h
['AT5G11880', 'AT3G14390']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

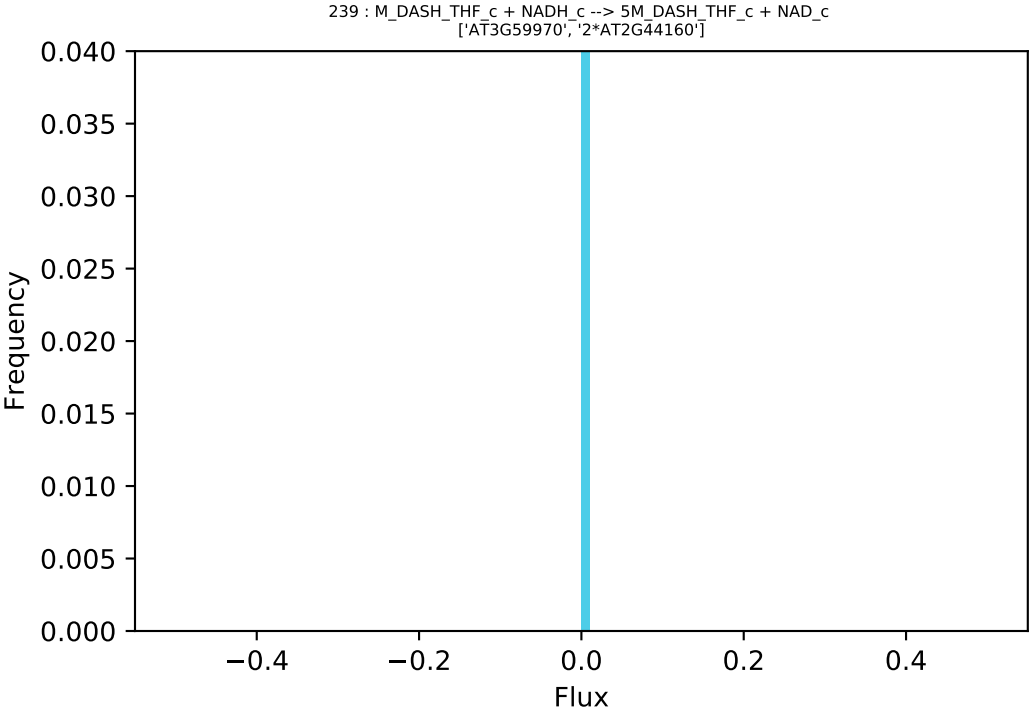

234 : Asp_DASH_SeA_h + H_h + NADPH_h --> H_DASH_Ser_h + NADP_h
['AT4G19710', '4*AT1G31230']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.5
0.0
0.5
1.0
1.5
Flux

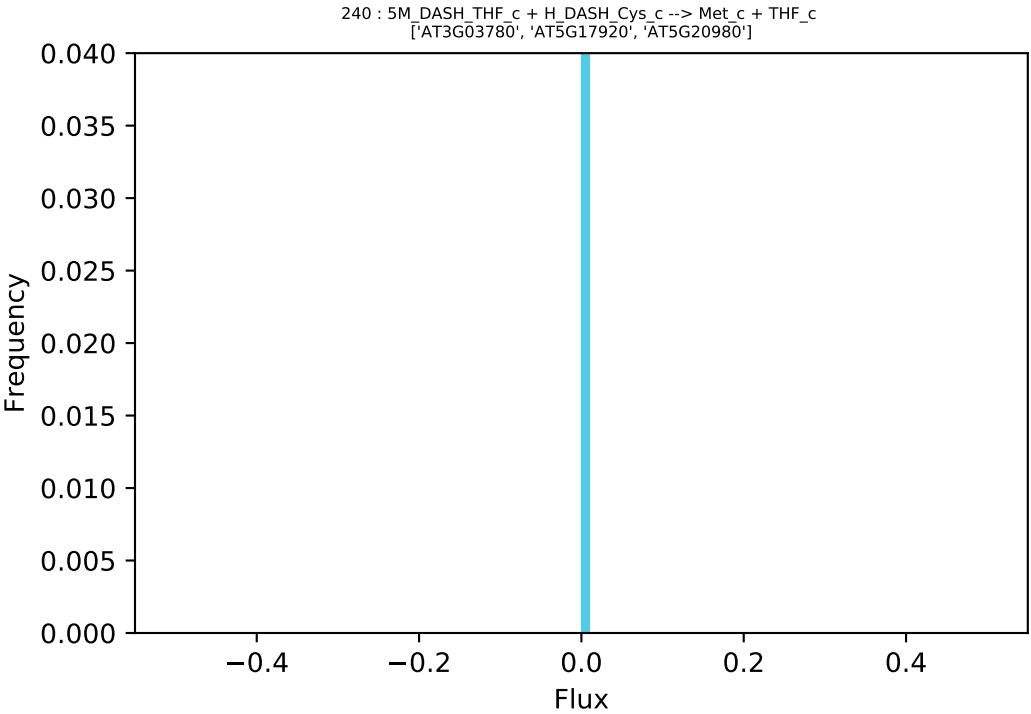

235 : Asp_DASH_SeA_h + H_h + NADH_h --> H_DASH_Ser_h + NAD_h
['AT4G19710', '4*AT1G31230']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

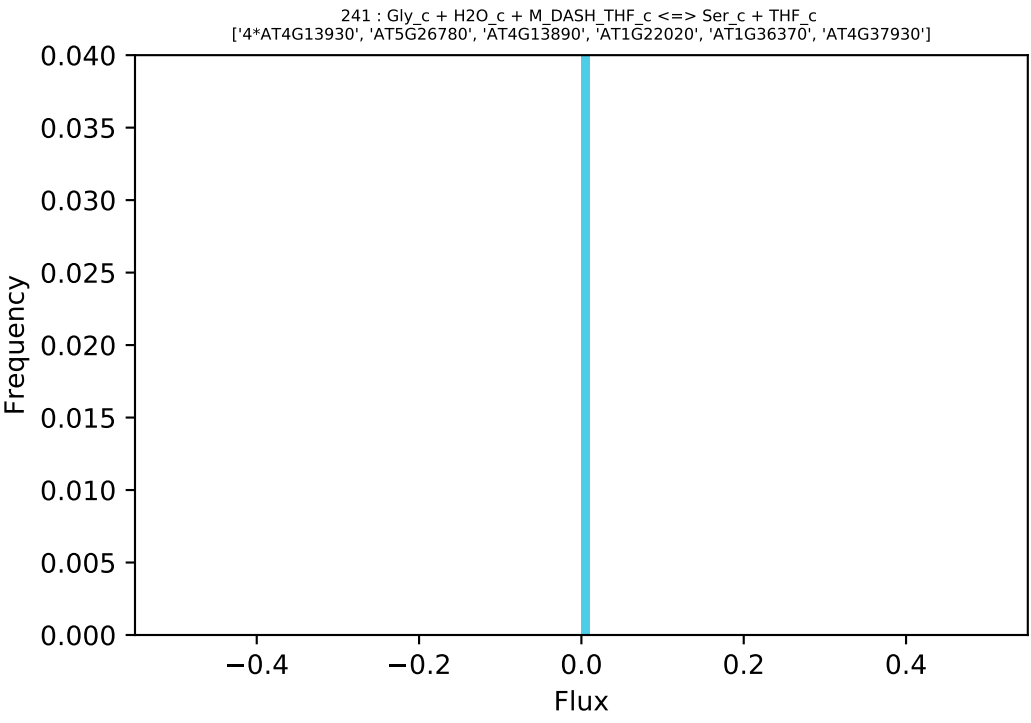

236 : ATP_h + H_DASH_Ser_h --> ADP_h + H_h + PH_DASH_Ser_h
['AT2G17265']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.5
0.0
0.5
1.0
1.5
Flux

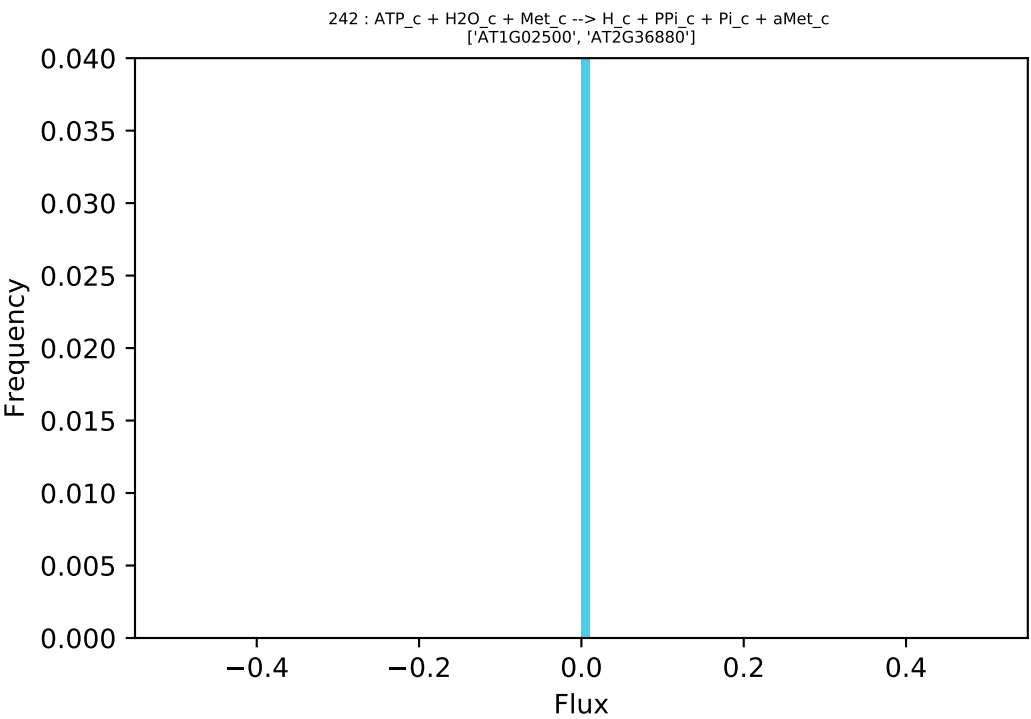

237 : Cys_h + PH_DASH_Ser_h --> CTH_h + Pi_h
['AT3G01120']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

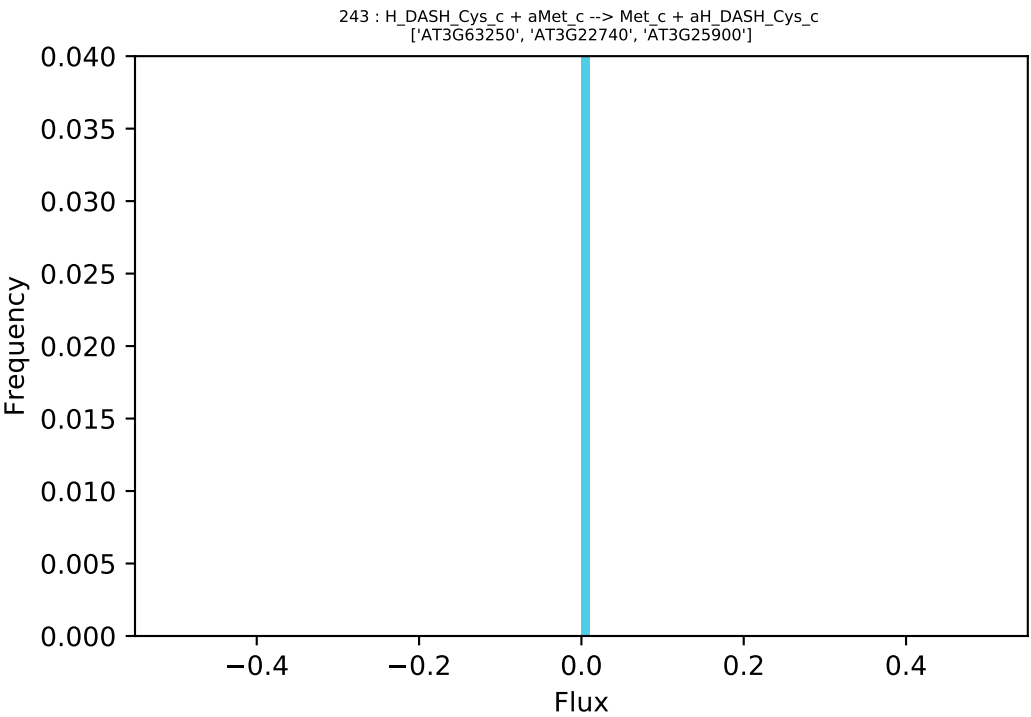

238 : CTH_h + H2O_h --> H_DASH_Cys_h + NH4_h + Pyr_h
['4*AT3G57050']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

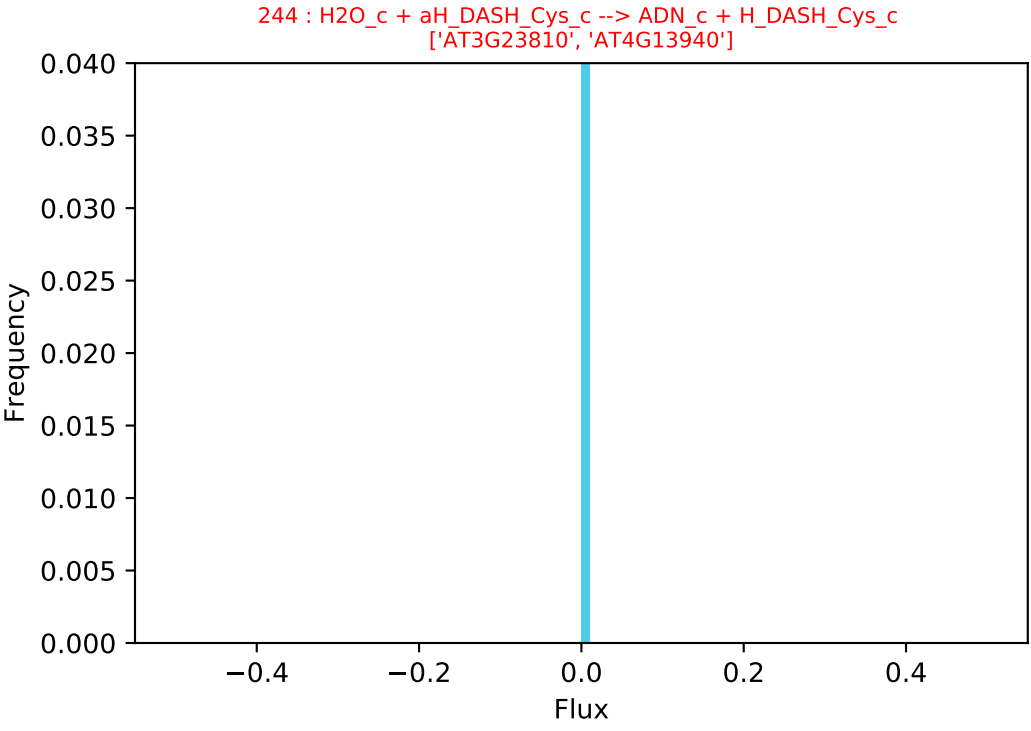

239 : M_DASH_THF_c + NADH_c --> 5M_DASH_THF_c + NAD_c
['AT3G59970', '2*AT2G44160']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

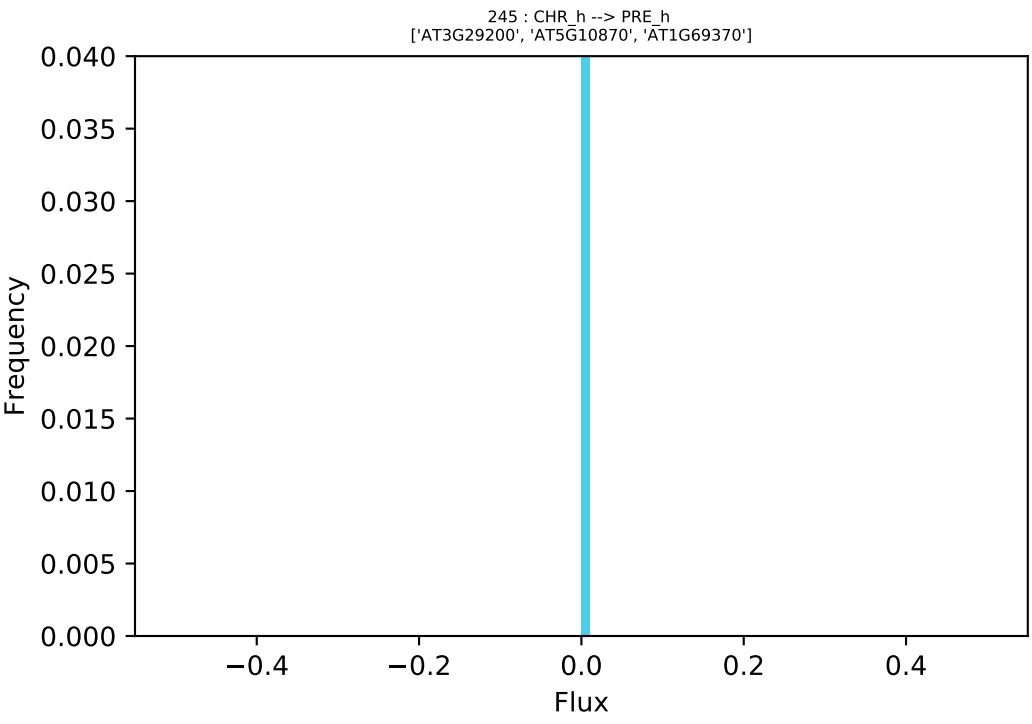

240 : 5M_DASH_THF_c + H_DASH_Cys_c --> Met_c + THF_c
['AT3G03780', 'AT5G17920', 'AT5G20980']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

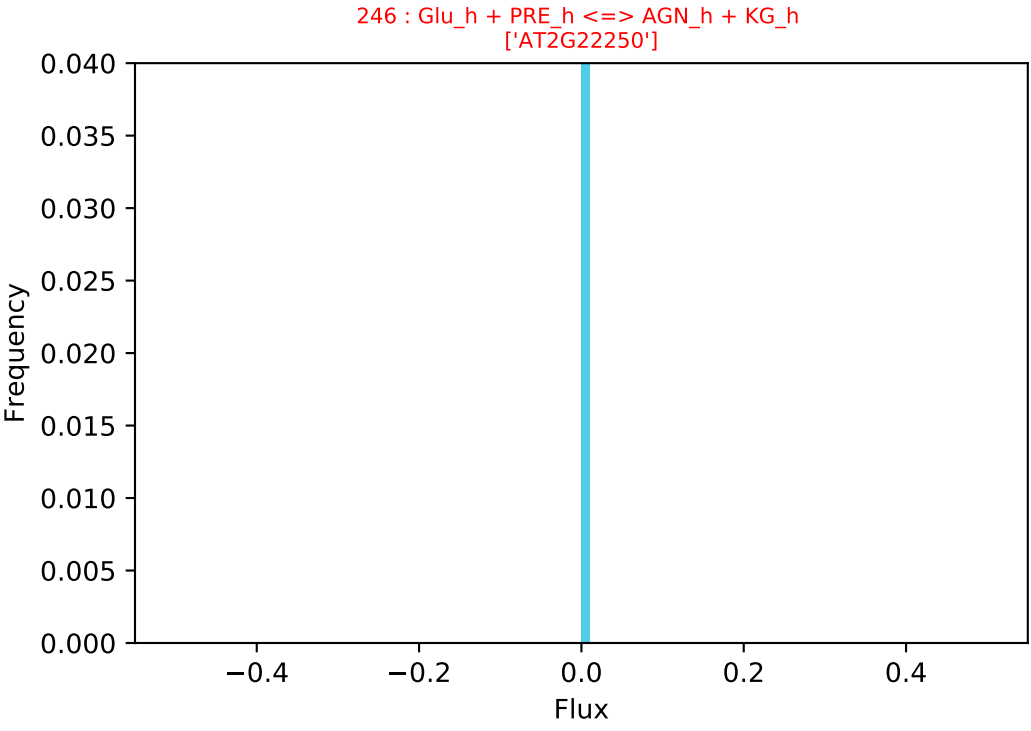

241 : Gly_c + H2O_c + M_DASH_THF_c <=> Ser_c + THF_c
['4*AT4G13930', 'AT5G26780', 'AT4G13890', 'AT1G22020', 'AT1G36370', 'AT4G37930']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

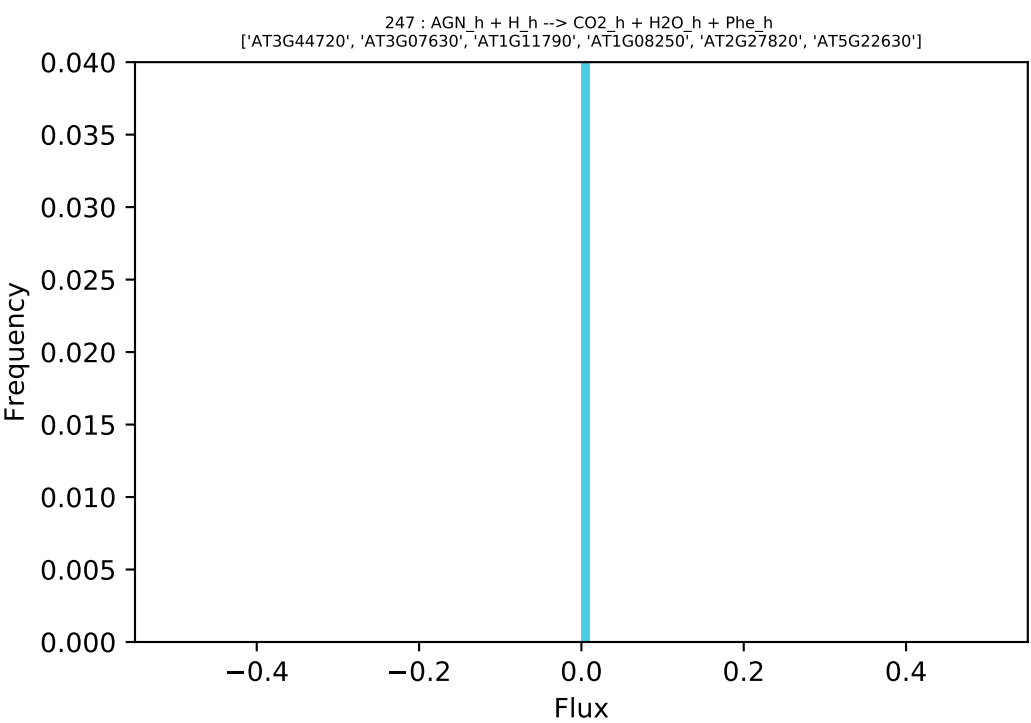

242 : ATP_c + H2O_c + Met_c --> H_c + PPi_c + Pi_c + aMet_c
['AT1G02500', 'AT2G36880']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

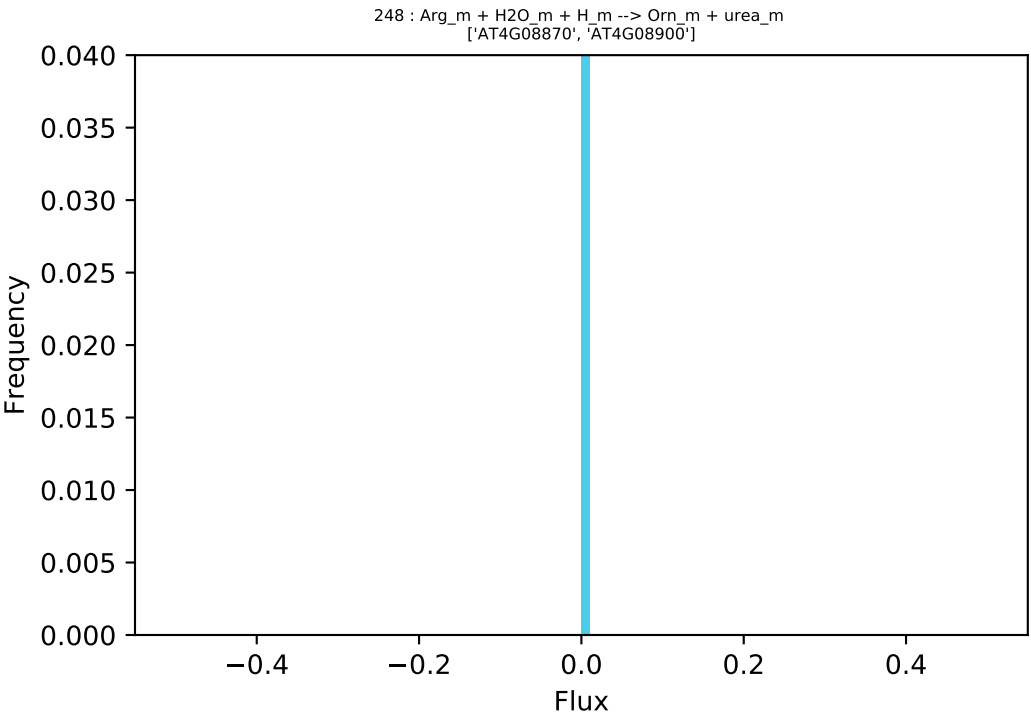

243 : H_DASH_Cys_c + aMet_c --> Met_c + aH_DASH_Cys_c
['AT3G63250', 'AT3G22740', 'AT3G25900']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

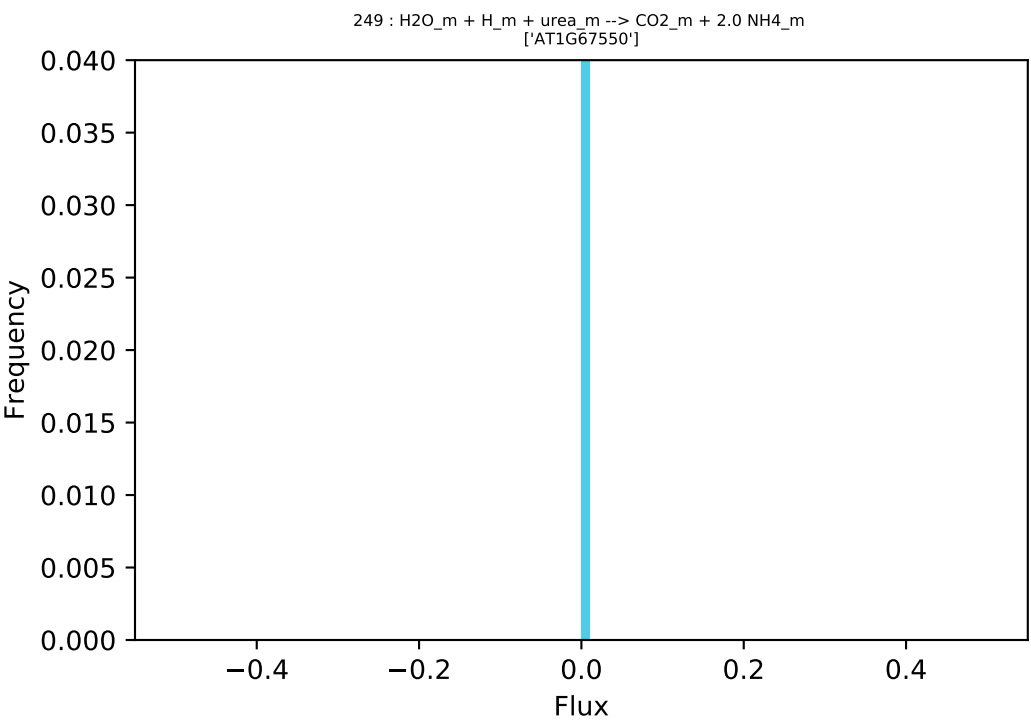

244 : H2O_c + aH_DASH_Cys_c --> ADN_c + H_DASH_Cys_c
['AT3G23810', 'AT4G13940']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

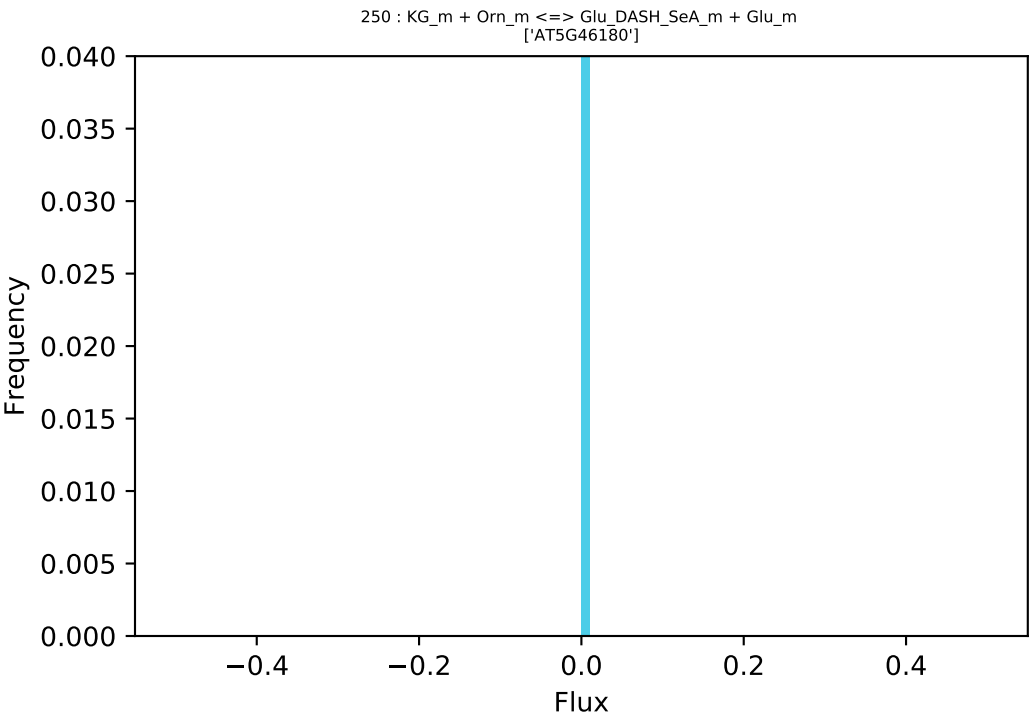

245 : CHR_h --> PRE_h
['AT3G29200', 'AT5G10870', 'AT1G69370']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

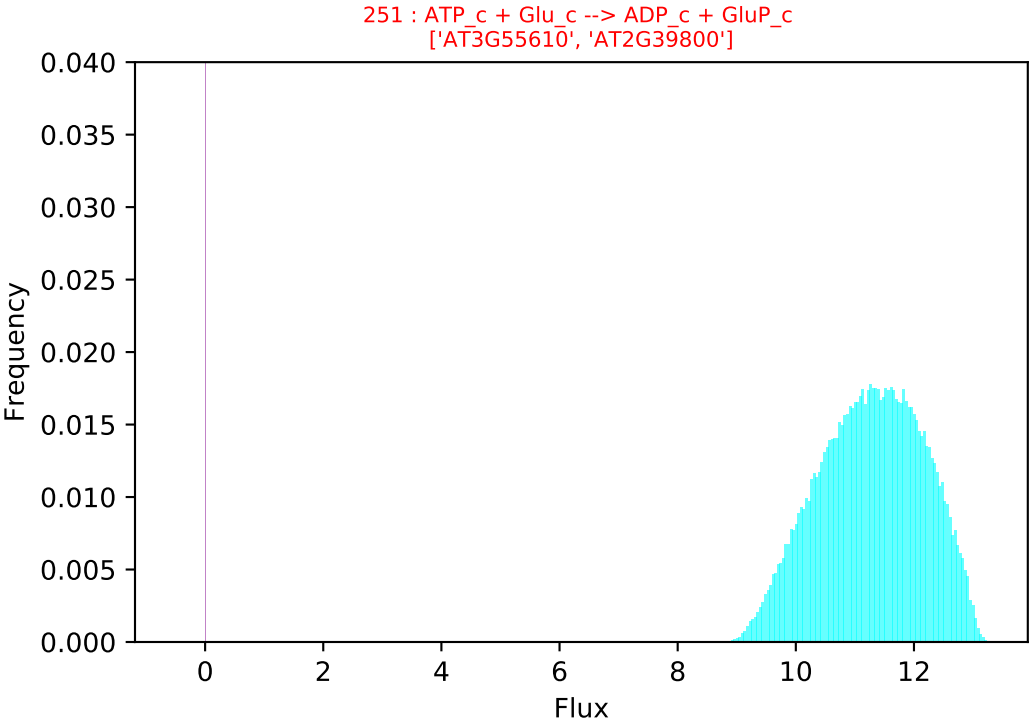

246 : Glu_h + PRE_h <=> AGN_h + KG_h
['AT2G22250']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

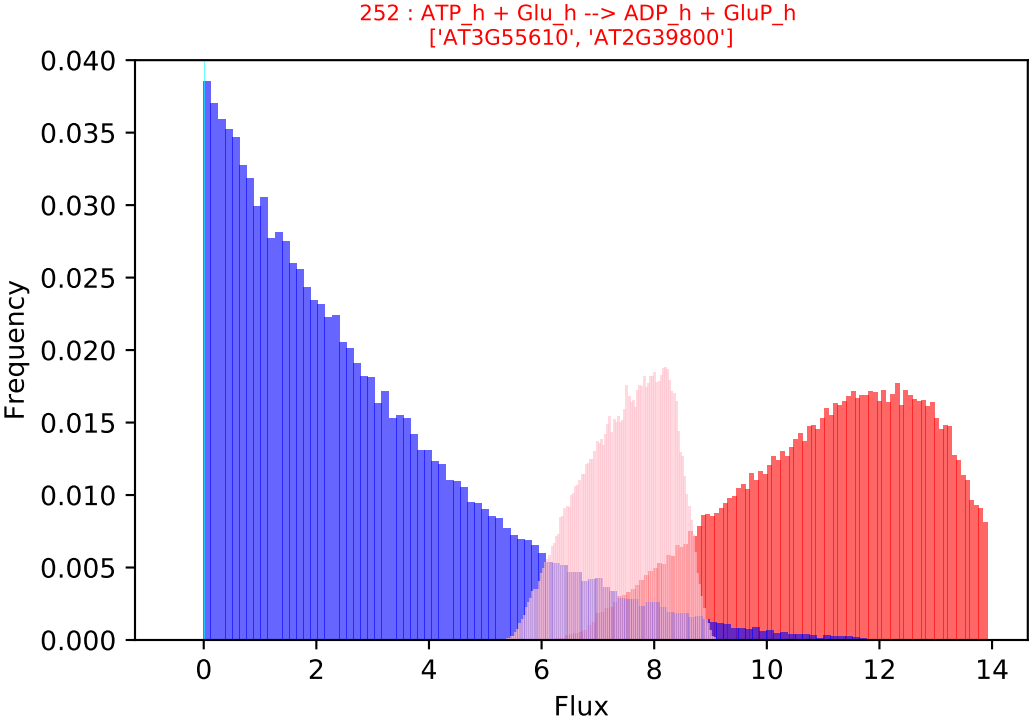

247 : AGN_h + H_h --> CO2_h + H2O_h + Phe_h
['AT3G44720', 'AT3G07630', 'AT1G11790', 'AT1G08250', 'AT2G27820', 'AT5G22630']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

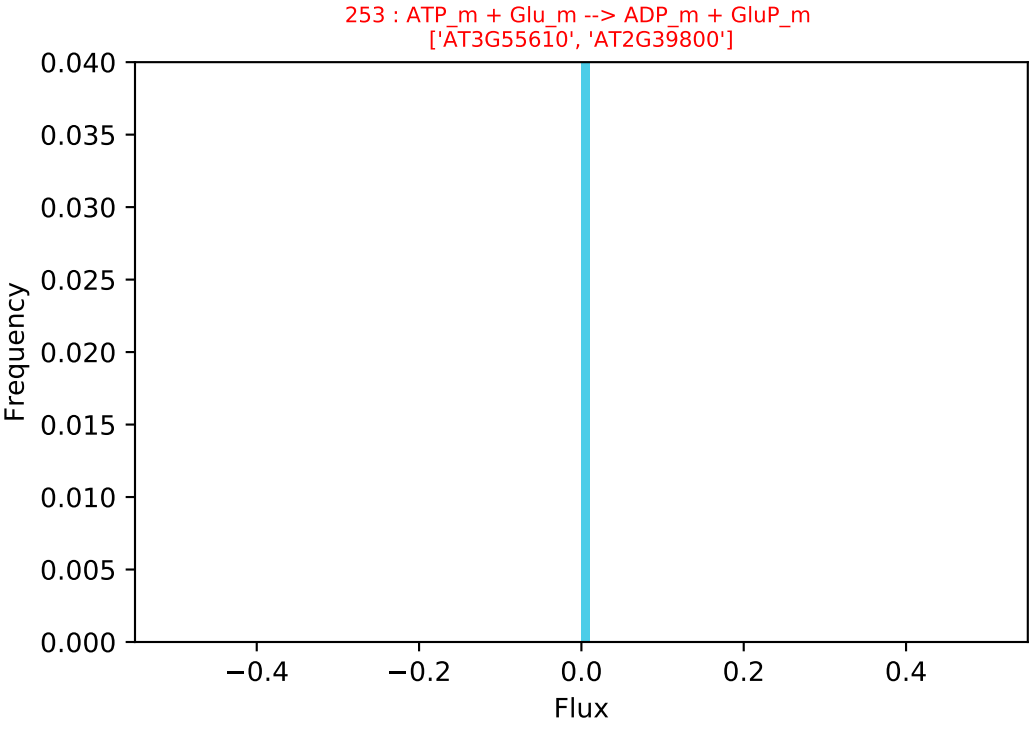

248 : Arg_m + H2O_m + H_m --> Orn_m + urea_m
['AT4G08870', 'AT4G08900']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

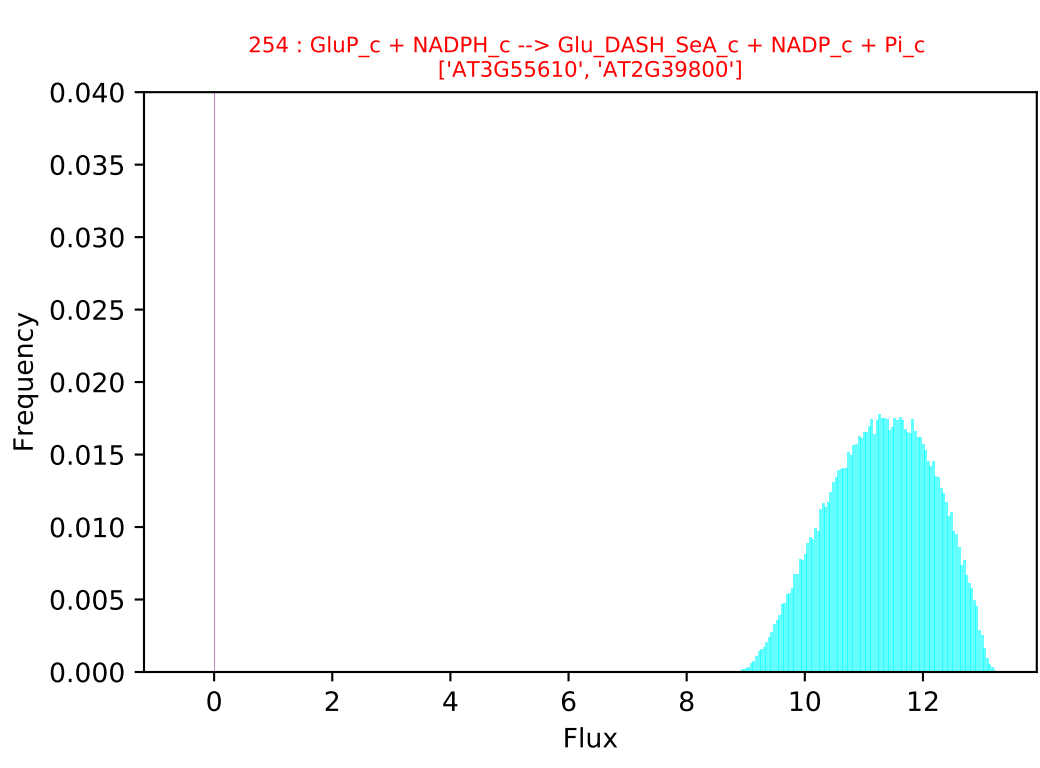

249 : H2O_m + H_m + urea_m --> CO2_m + 2.0 NH4_m
['AT1G67550']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

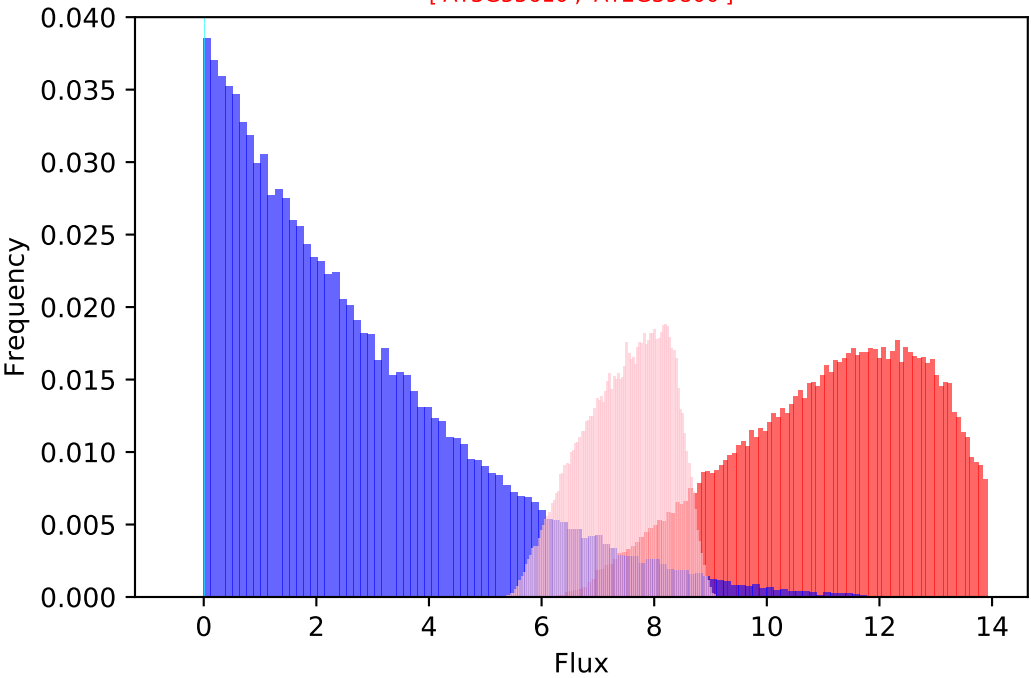

250 : KG_m + Orn_m <=> Glu_DASH_SeA_m + Glu_m
['AT5G46180']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

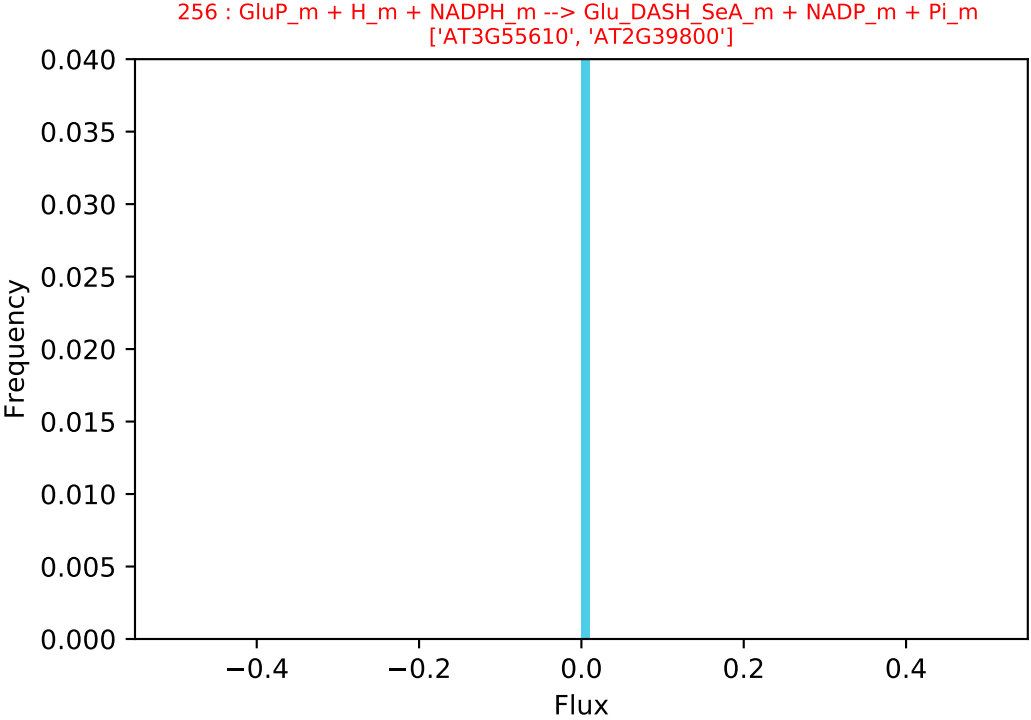

251 : ATP_c + Glu_c --> ADP_c + GluP_c
['AT3G55610', 'AT2G39800']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0
2
4
6
8
10
12
Flux

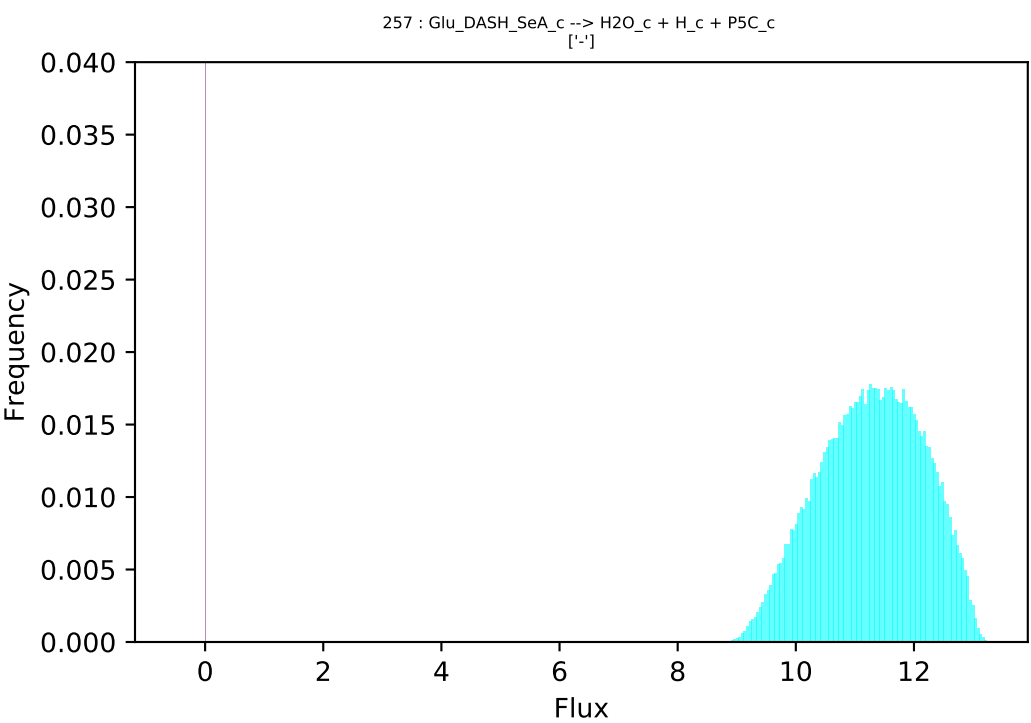

252 : ATP_h + Glu_h --> ADP_h + GluP_h
['AT3G55610', 'AT2G39800']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0
2
4
6
8
10
12
14
Flux

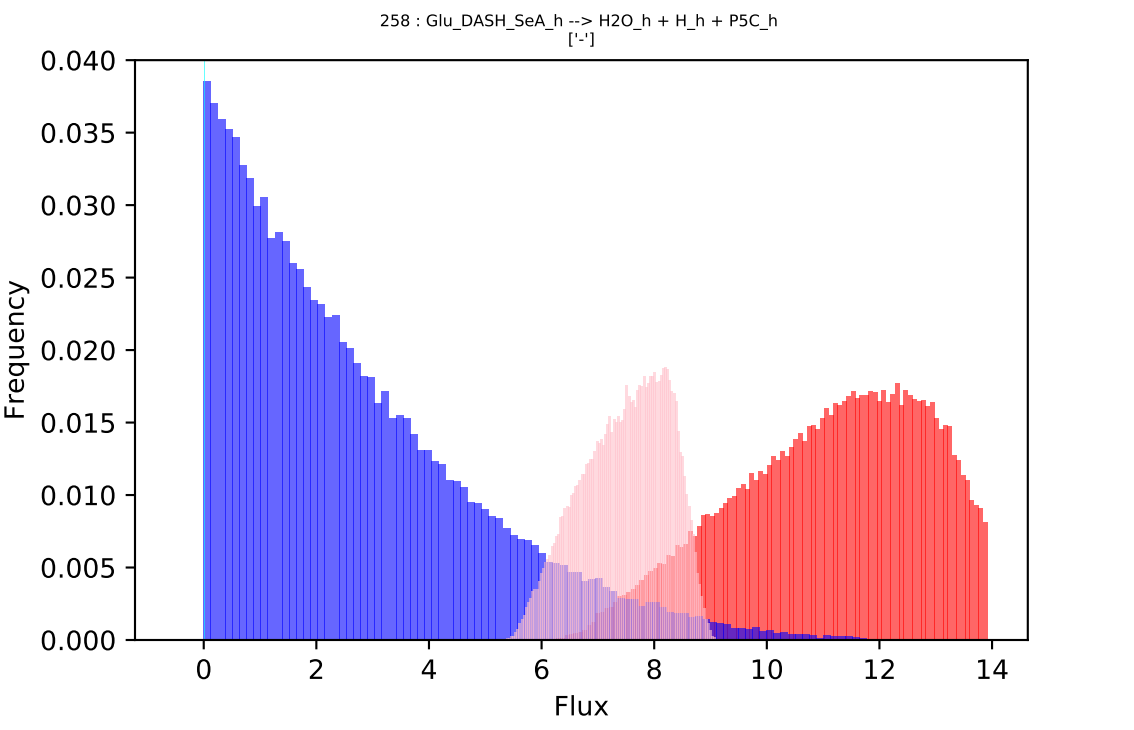

253 : ATP_m + Glu_m --> ADP_m + GluP_m
['AT3G55610', 'AT2G39800']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

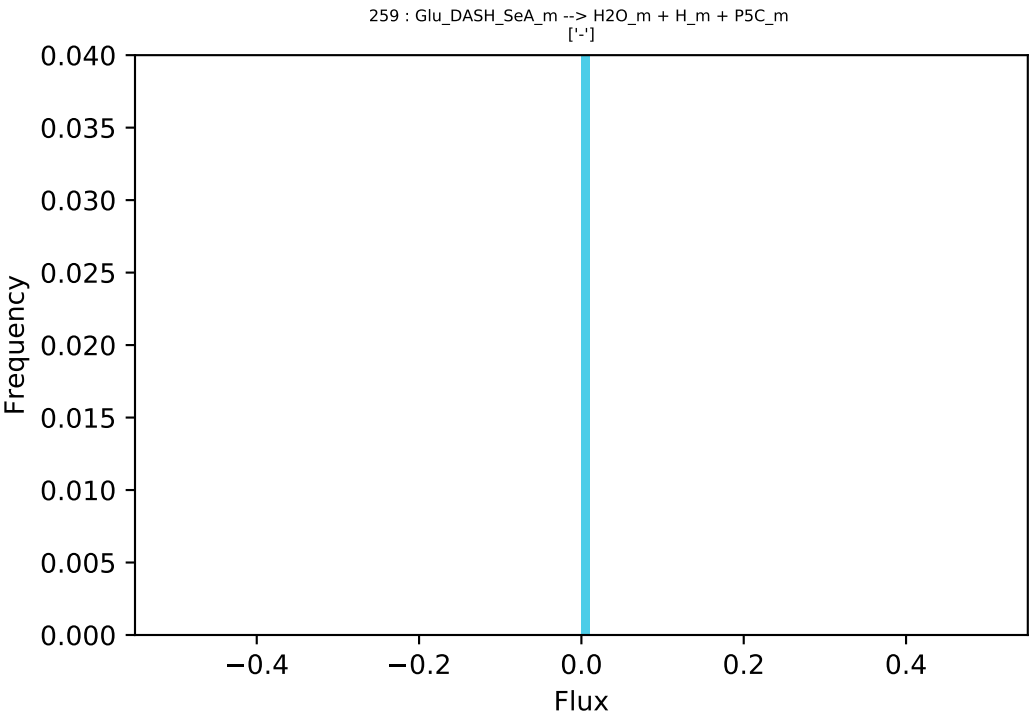

254 : GluP_c + NADPH_c --> Glu_DASH_SeA_c + NADP_c + Pi_c
['AT3G55610', 'AT2G39800']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0
2
4
6
8
10
12
Flux

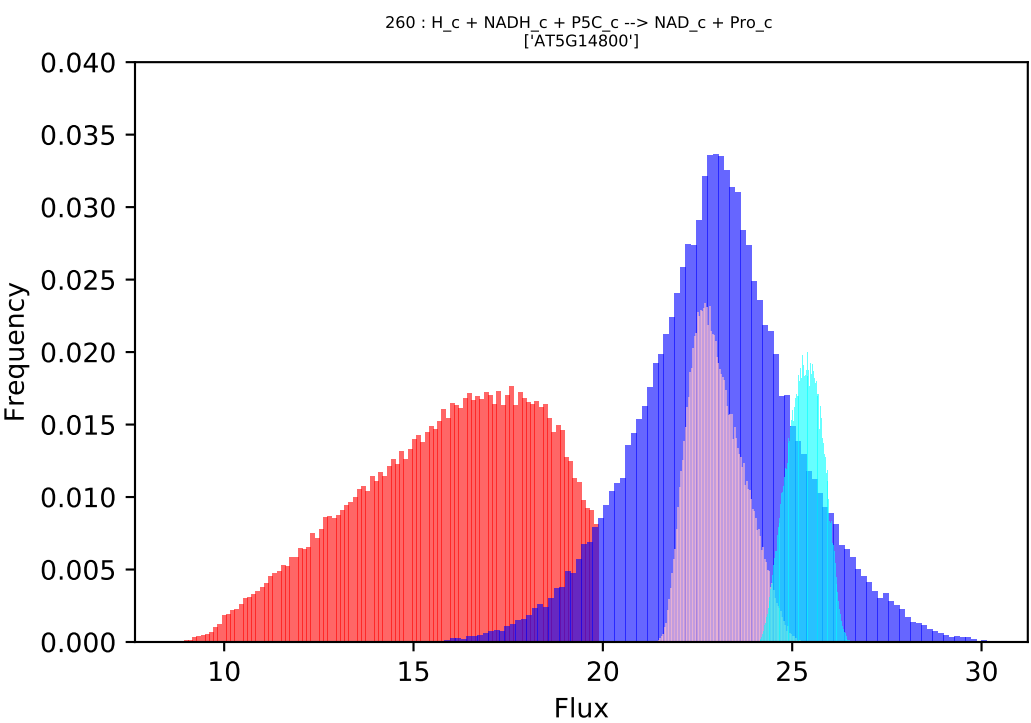

255 : GluP_h + H_h + NADPH_h --> Glu_DASH_SeA_h + NADP_h + Pi_h
['AT3G55610', 'AT2G39800']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0
2
4
6
8
10
12
14
Flux

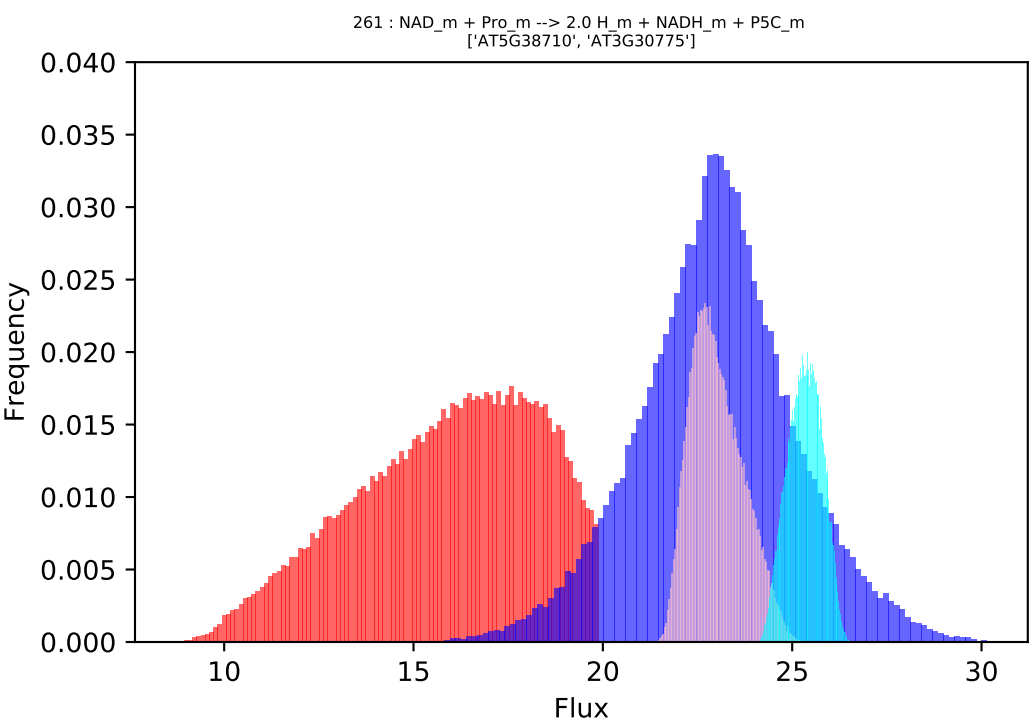

256 : GluP_m + H_m + NADPH_m --> Glu_DASH_SeA_m + NADP_m + Pi_m
['AT3G55610', 'AT2G39800']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

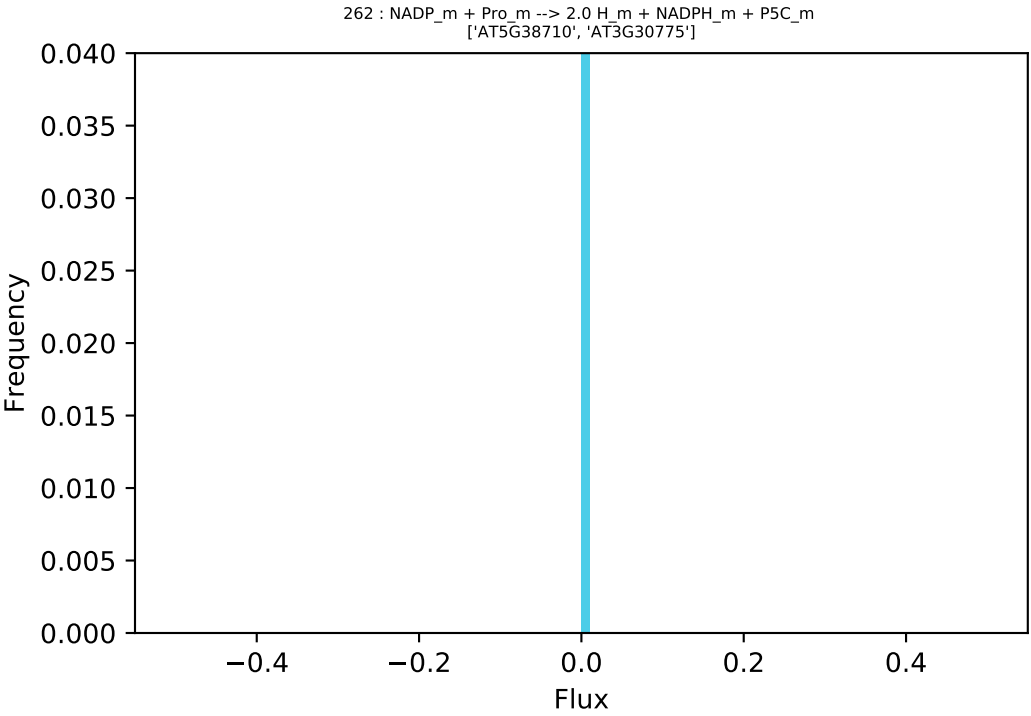

257 : Glu_DASH_SeA_c --> H2O_c + H_c + P5C_c
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0
2
4
6
8
10
12
Flux

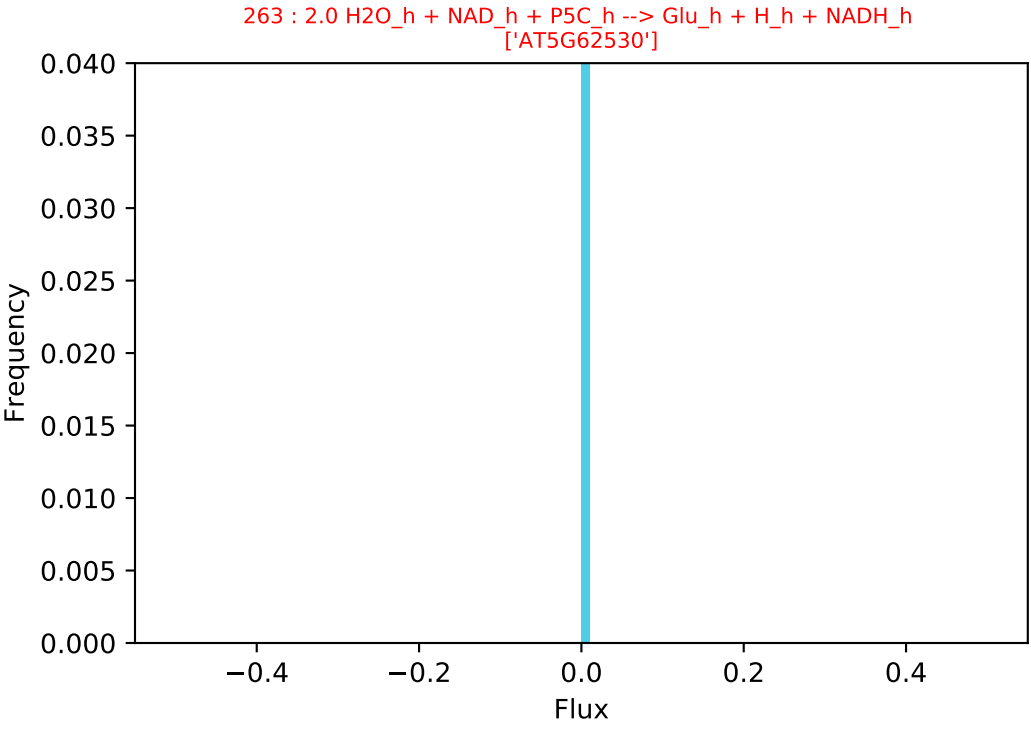

258 : Glu_DASH_SeA_h --> H2O_h + H_h + P5C_h
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0
2
4
6
8
10
12
14
Flux

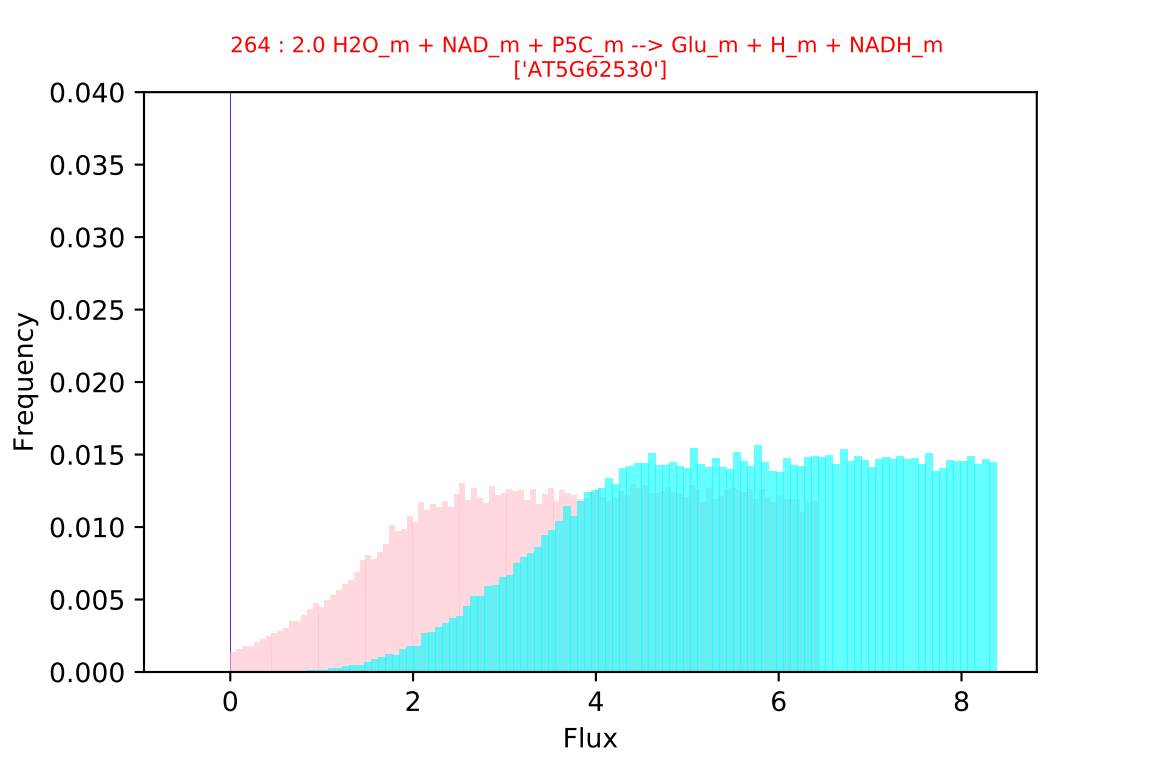

259 : Glu_DASH_SeA_m --> H2O_m + H_m + P5C_m
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

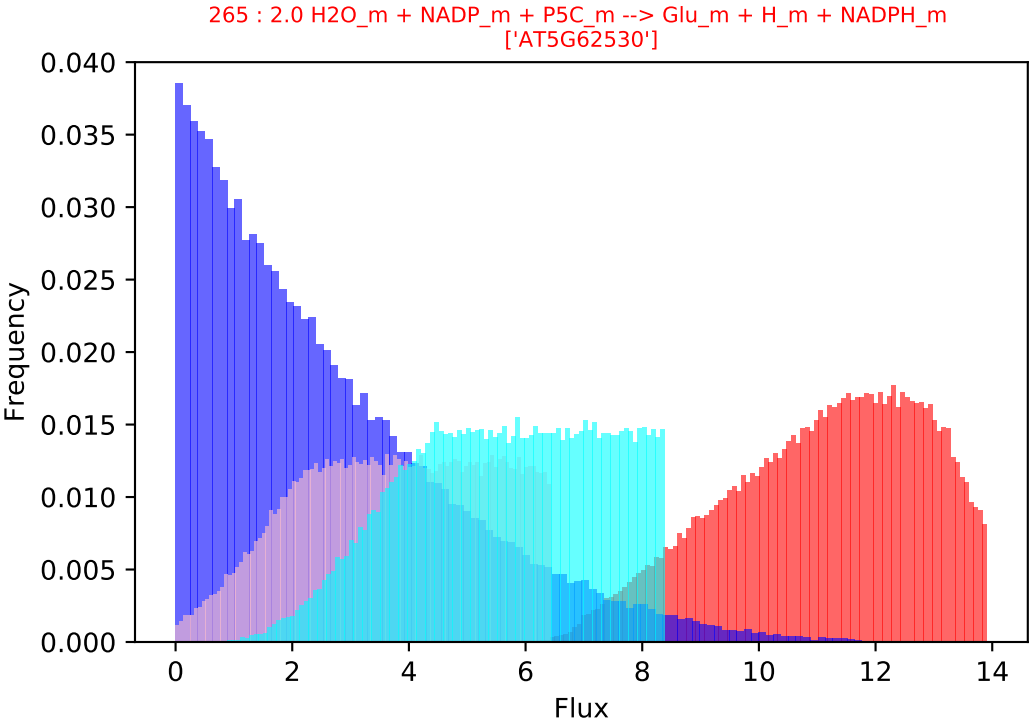

260 : H_c + NADH_c + P5C_c --> NAD_c + Pro_c
['AT5G14800']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
10
15
20
25
30
Flux

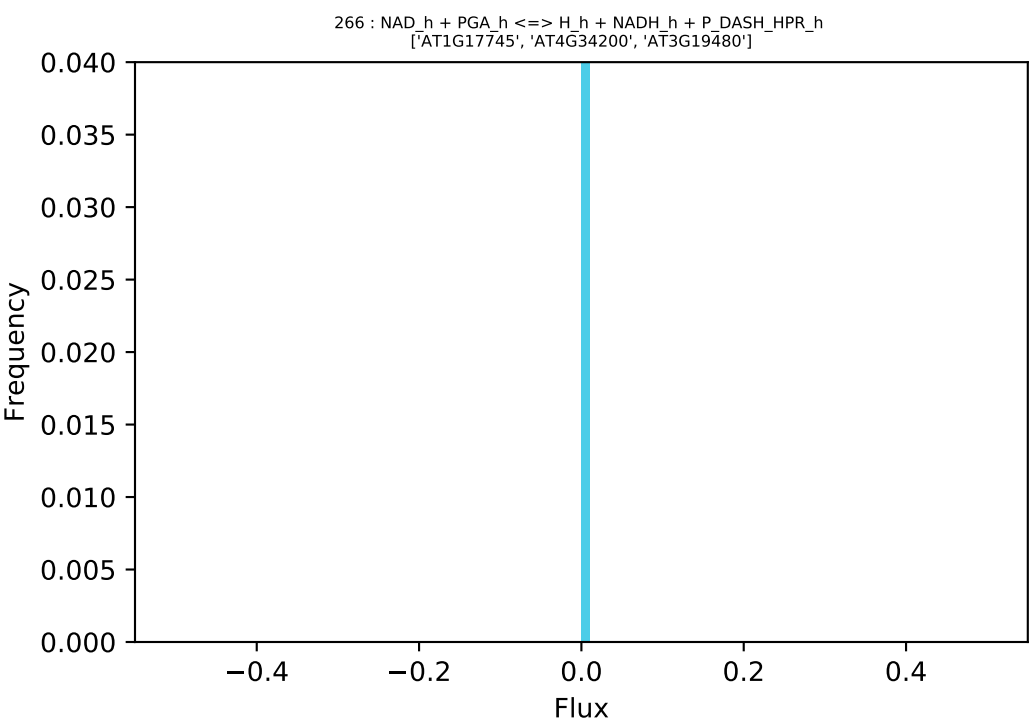

261 : NAD_m + Pro_m --> 2.0 H_m + NADH_m + P5C_m
['AT5G38710', 'AT3G30775']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
10
15
20
25
30
Flux

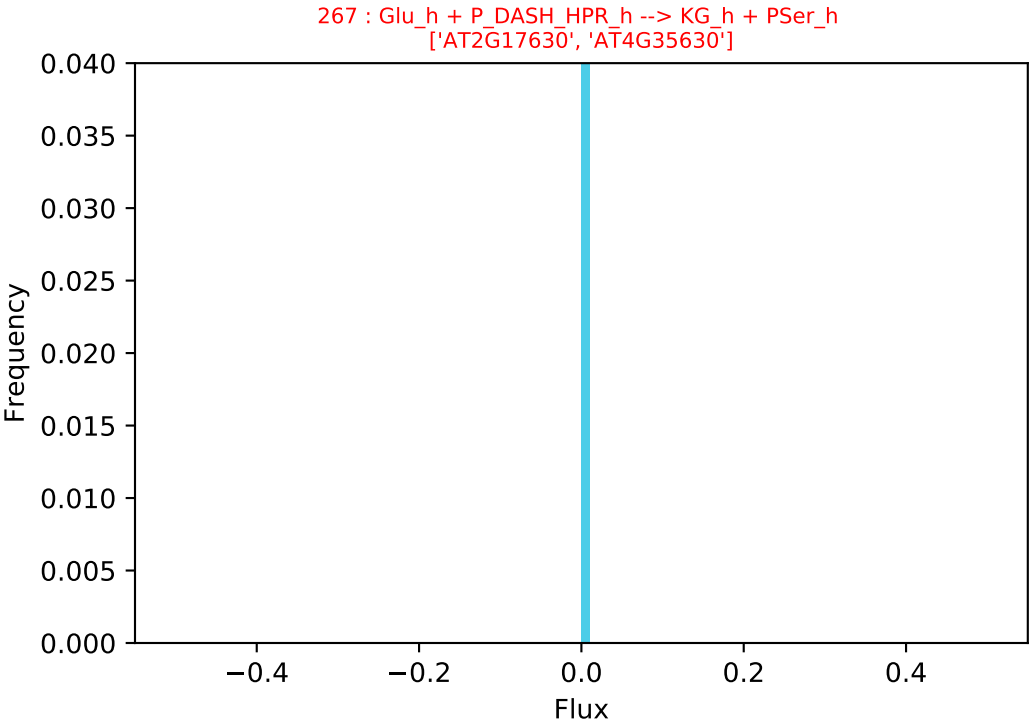

262 : NADP_m + Pro_m --> 2.0 H_m + NADPH_m + P5C_m
['AT5G38710', 'AT3G30775']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

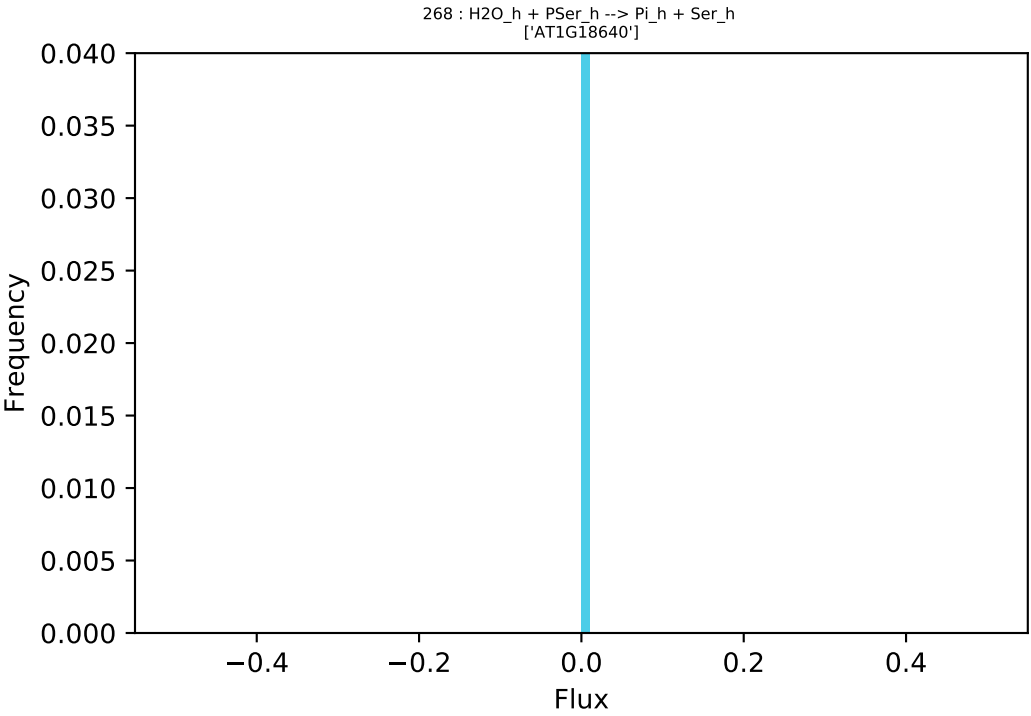

263 : 2.0 H2O_h + NAD_h + P5C_h --> Glu_h + H_h + NADH_h
['AT5G62530']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

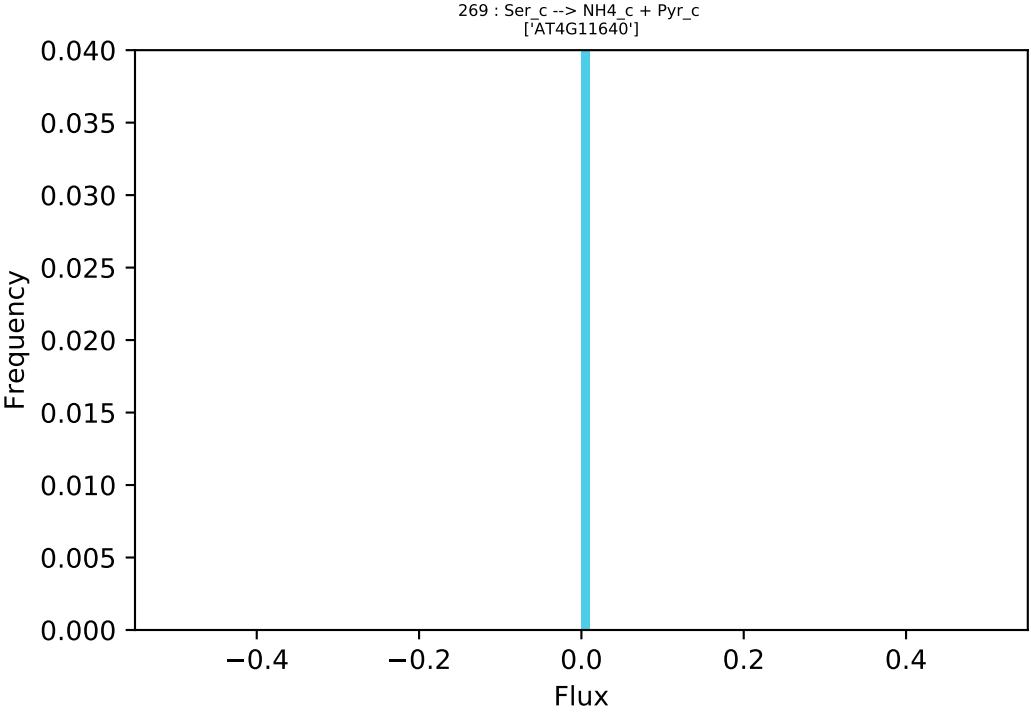

264 : 2.0 H2O_m + NAD_m + P5C_m --> Glu_m + H_m + NADH_m
['AT5G62530']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0
2
4
6
8
Flux

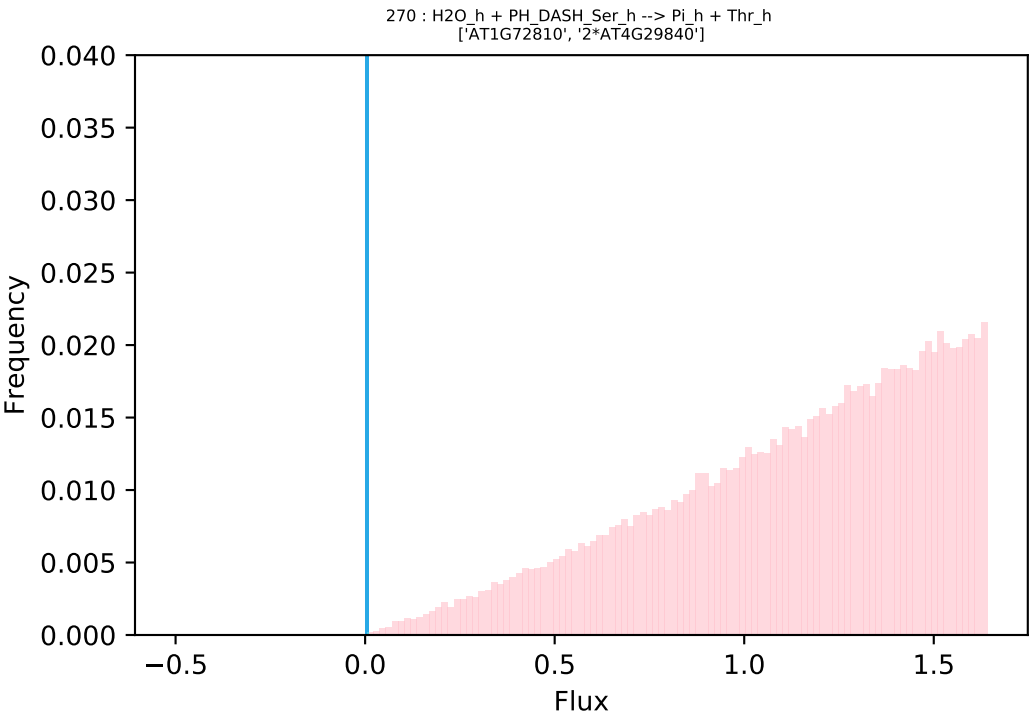

265 : 2.0 H2O_m + NADP_m + P5C_m --> Glu_m + H_m + NADPH_m
['AT5G62530']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0
2
4
6
8
10
12
14
Flux

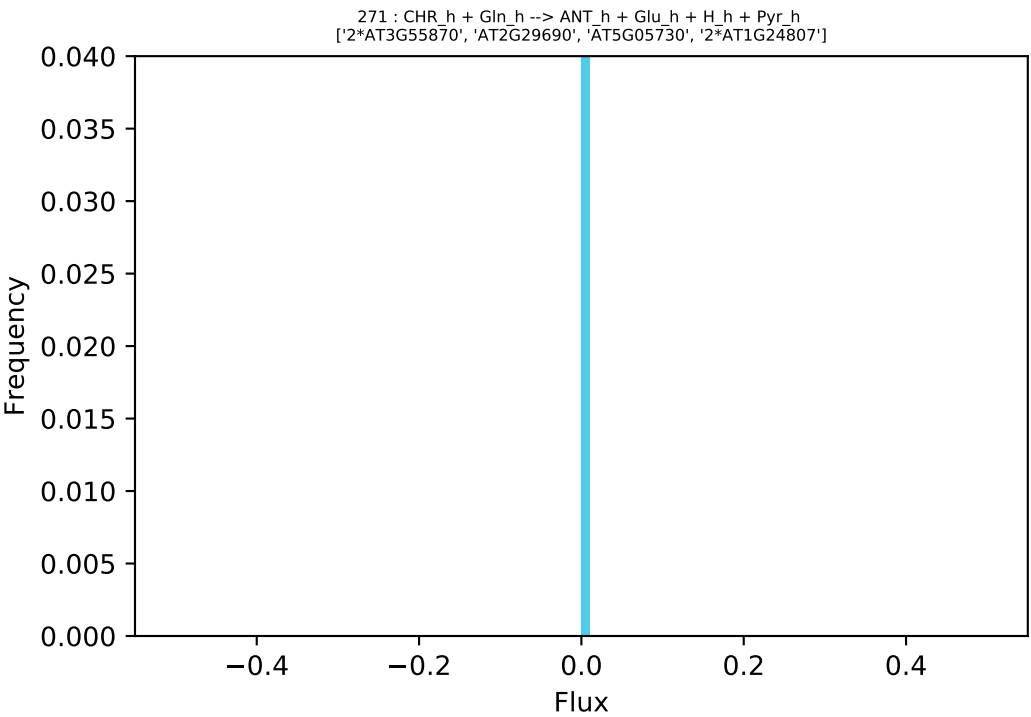

266 : NAD_h + PGA_h <=> H_h + NADH_h + P_DASH_HPR_h
['AT1G17745', 'AT4G34200', 'AT3G19480']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

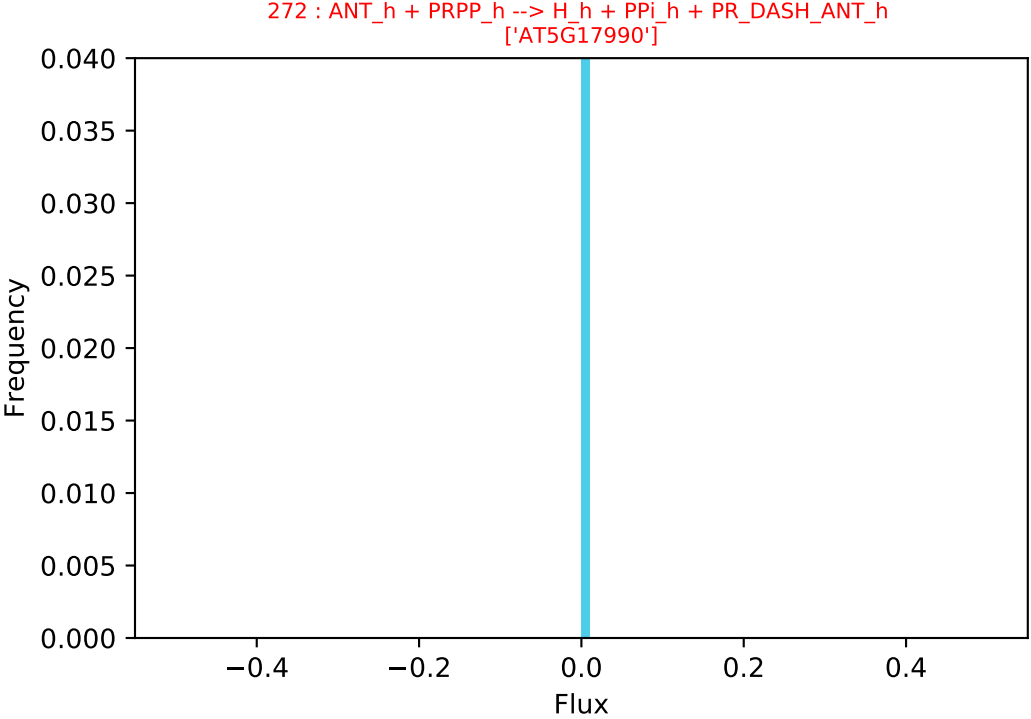

267 : Glu_h + P_DASH_HPR_h --> KG_h + PSer_h
['AT2G17630', 'AT4G35630']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

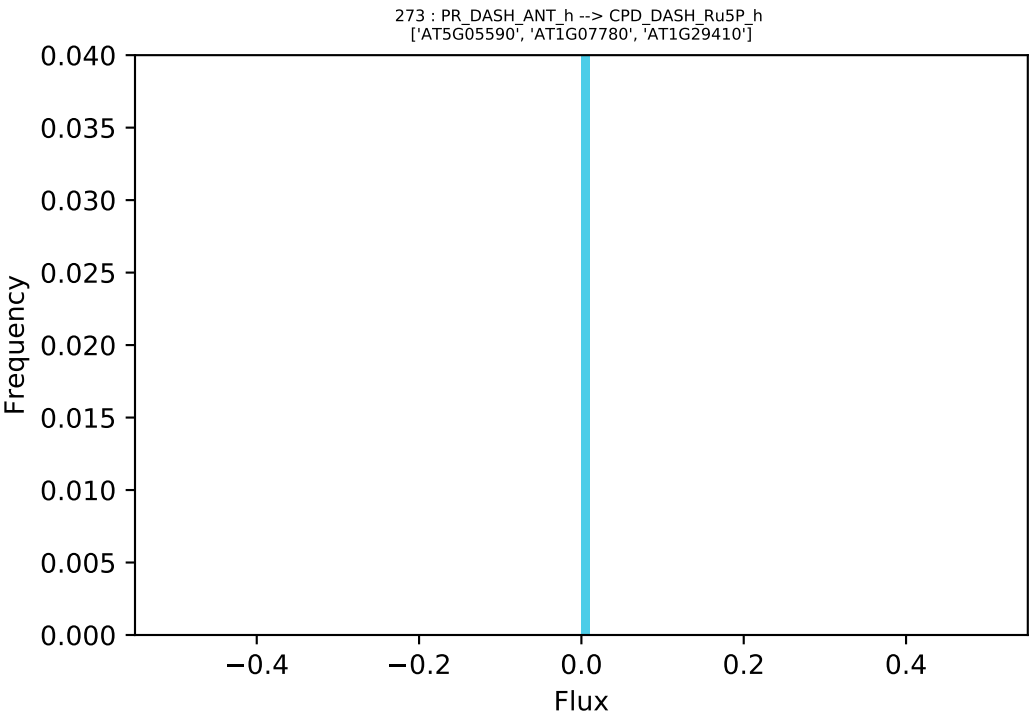

268 : H2O_h + PSer_h --> Pi_h + Ser_h
['AT1G18640']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

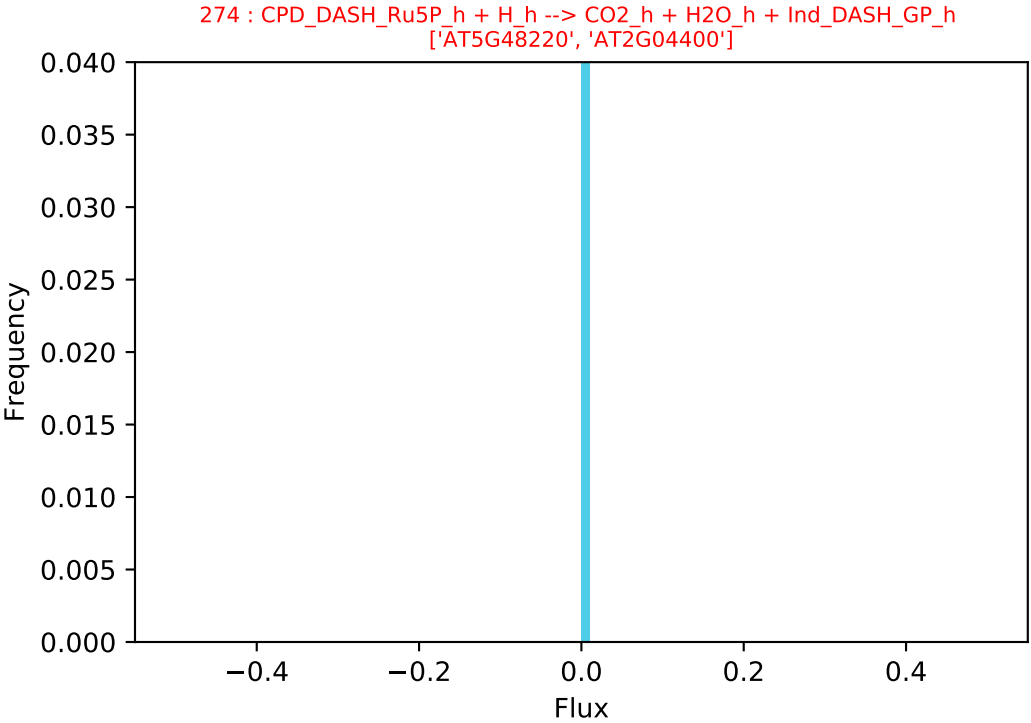

269 : Ser_c --> NH4_c + Pyr_c
['AT4G11640']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

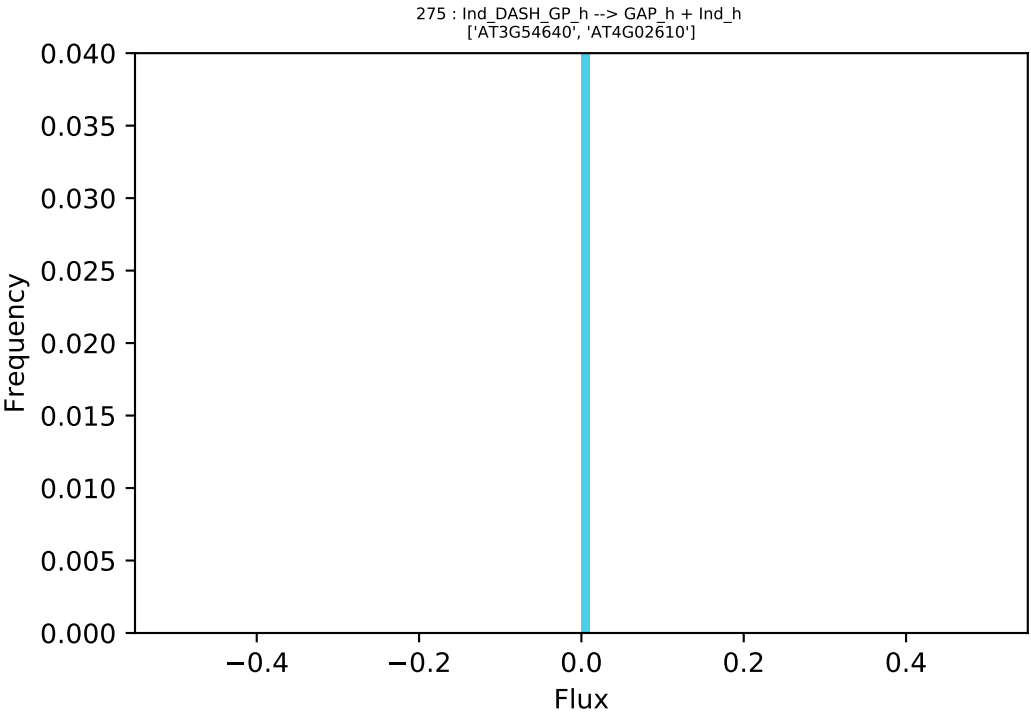

270 : H2O_h + PH_DASH_Ser_h --> Pi_h + Thr_h
['AT1G72810', '2*AT4G29840']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.5
0.0
0.5
1.0
1.5
Flux

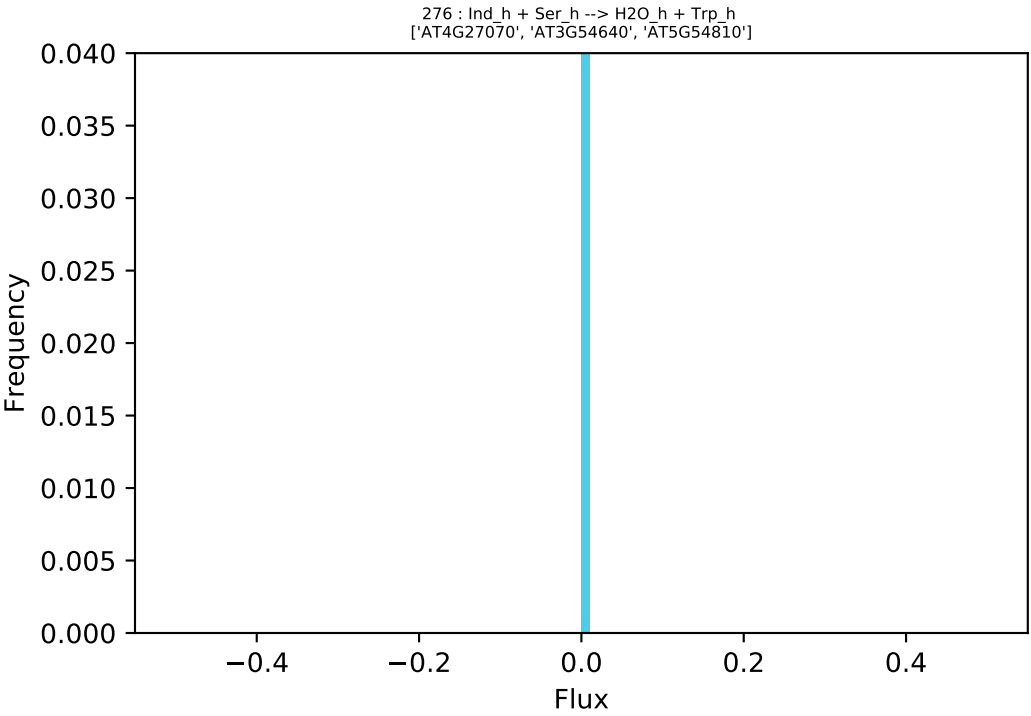

271 : CHR_h + Gln_h --> ANT_h + Glu_h + H_h + Pyr_h
['2*AT3G55870', 'AT2G29690', 'AT5G05730', '2*AT1G24807']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

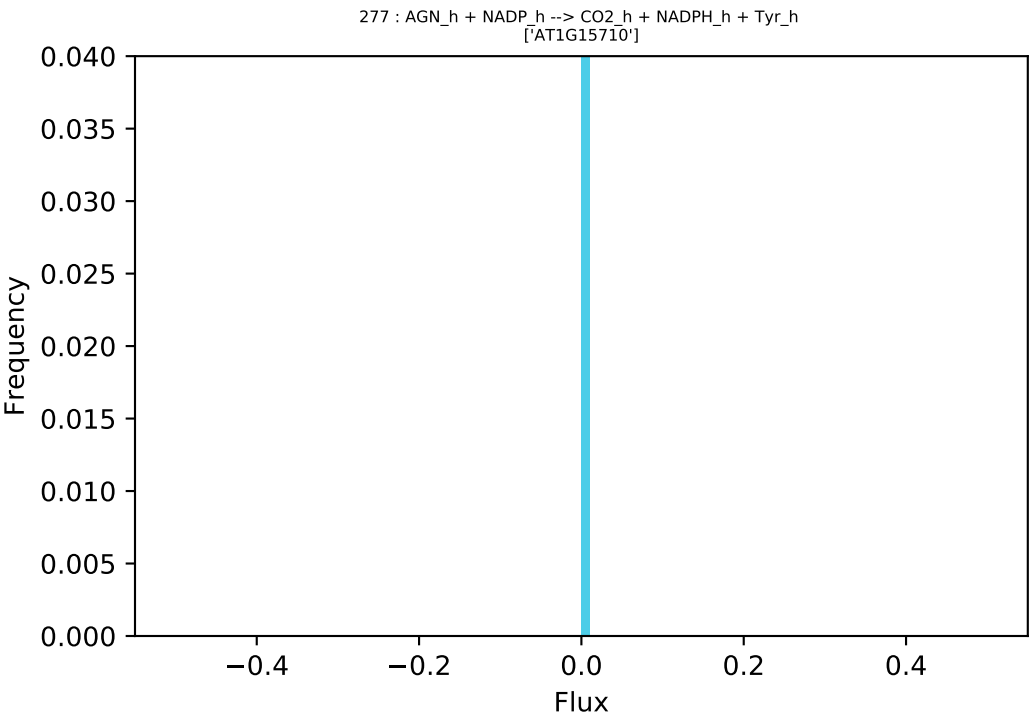

272 : ANT_h + PRPP_h --> H_h + PPi_h + PR_DASH_ANT_h
['AT5G17990']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

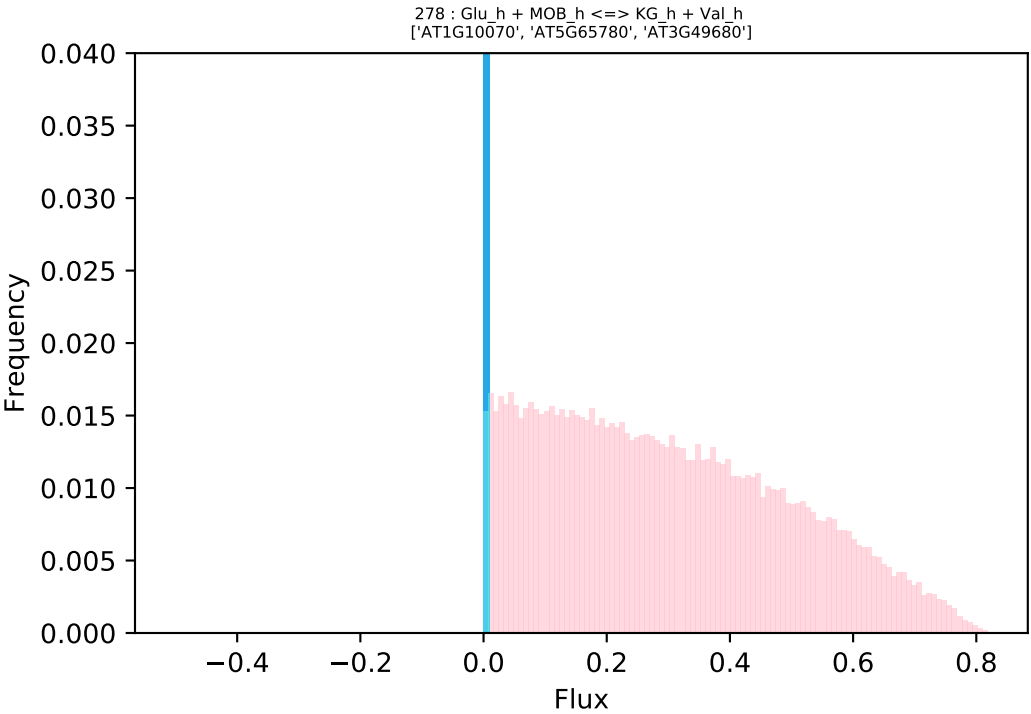

273 : PR_DASH_ANT_h --> CPD_DASH_Ru5P_h
['AT5G05590', 'AT1G07780', 'AT1G29410']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

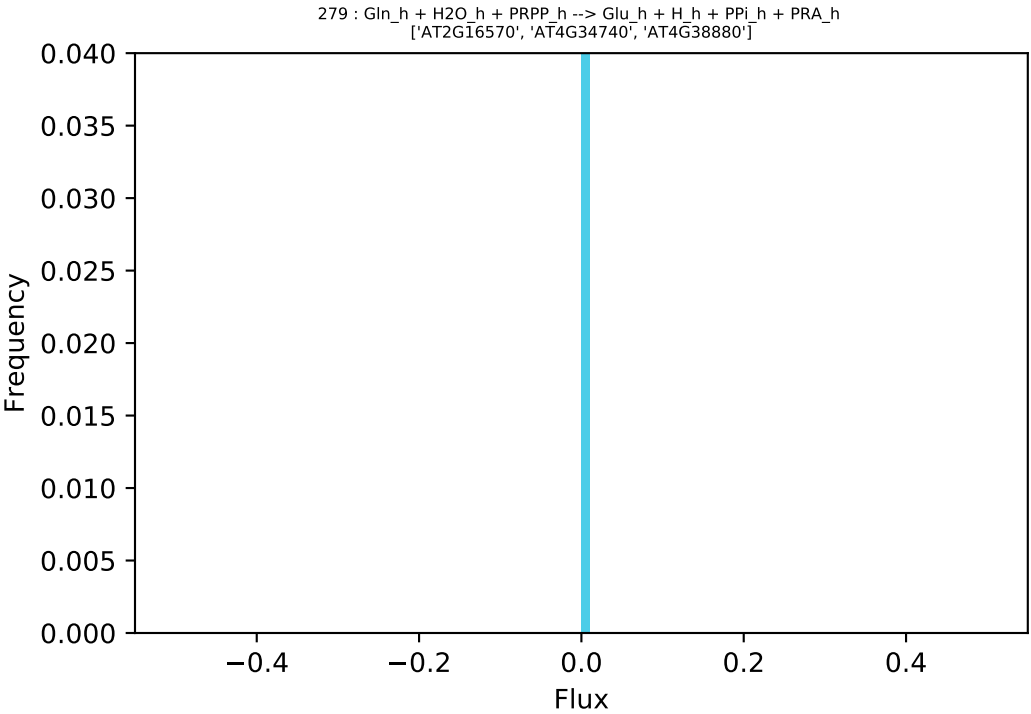

274 : CPD_DASH_Ru5P_h + H_h --> CO2_h + H2O_h + Ind_DASH_GP_h
['AT5G48220', 'AT2G04400']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

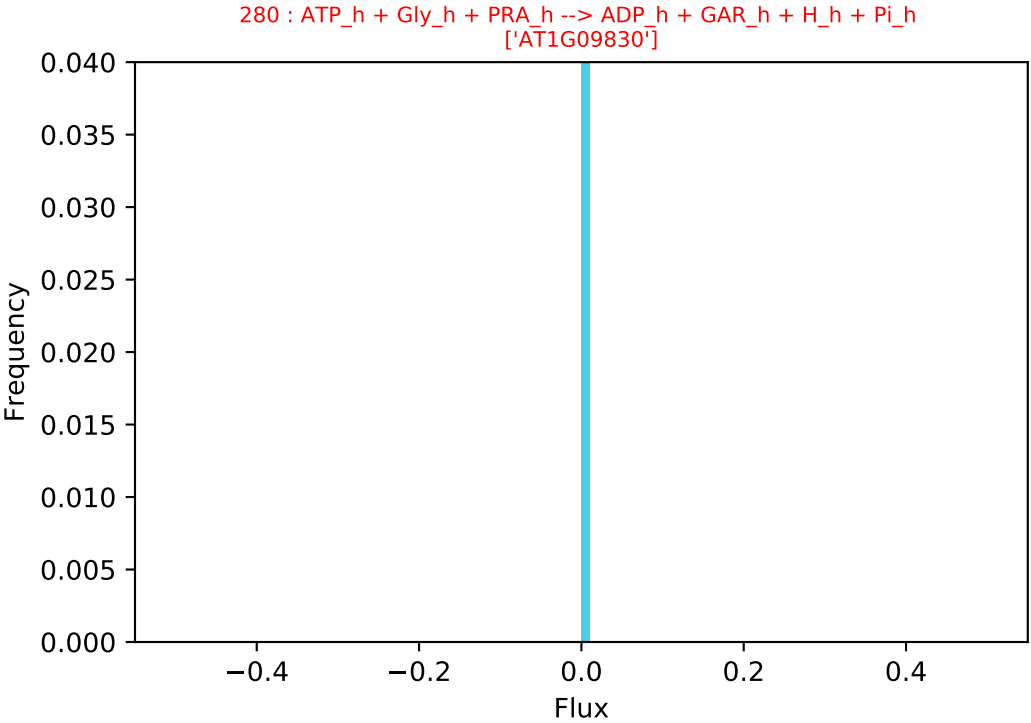

275 : Ind_DASH_GP_h --> GAP_h + Ind_h
['AT3G54640', 'AT4G02610']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

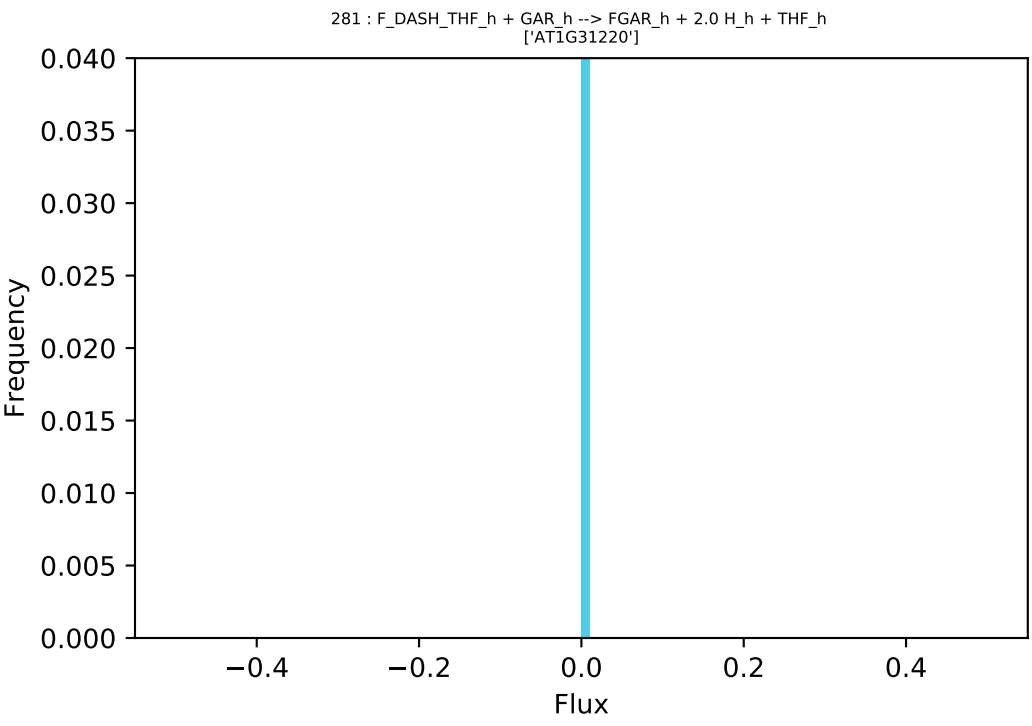

276 : Ind_h + Ser_h --> H2O_h + Trp_h
['AT4G27070', 'AT3G54640', 'AT5G54810']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

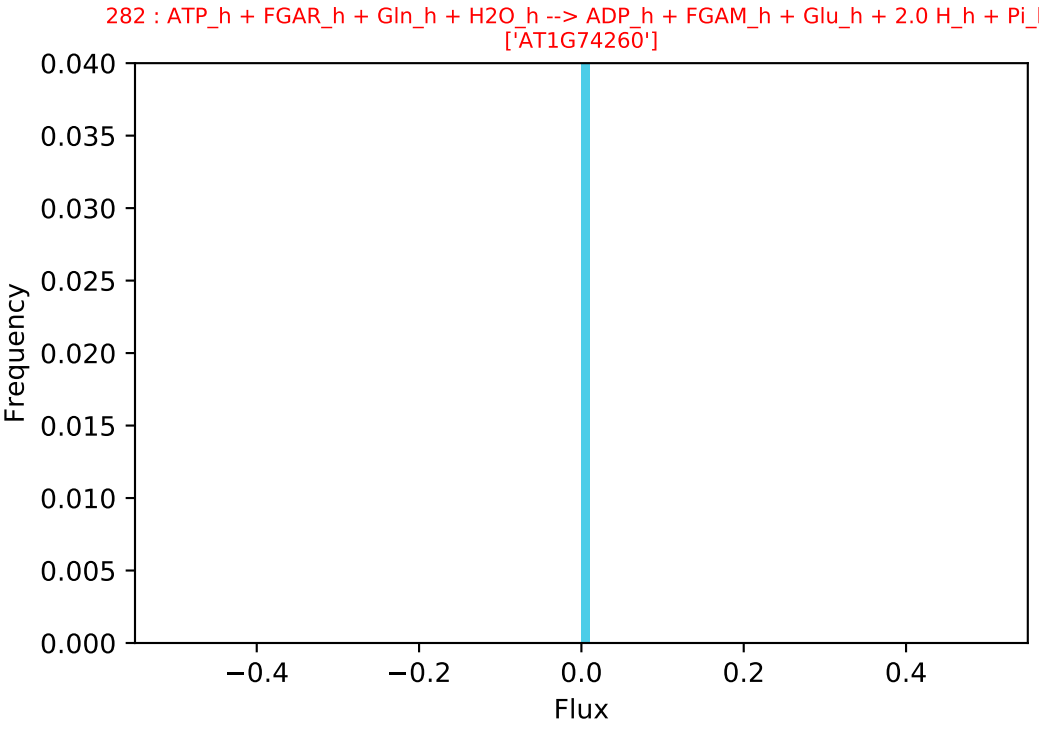

277 : AGN_h + NADP_h --> CO2_h + NADPH_h + Tyr_h
['AT1G15710']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

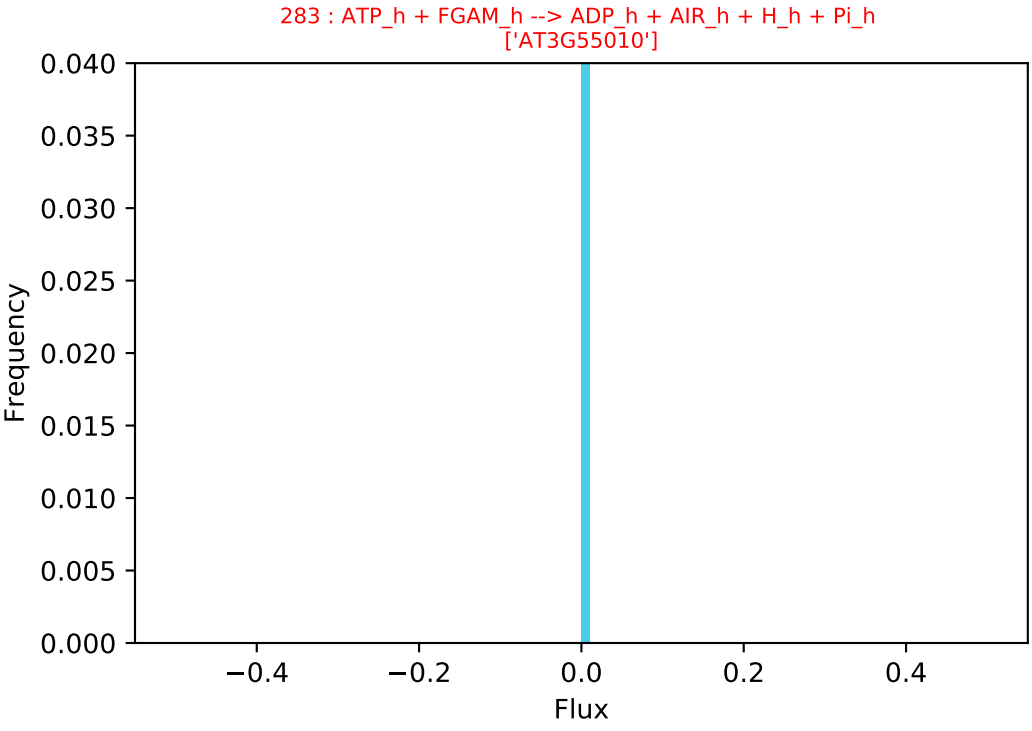

278 : Glu_h + MOB_h <=> KG_h + Val_h
['AT1G10070', 'AT5G65780', 'AT3G49680']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
0.6
0.8
Flux

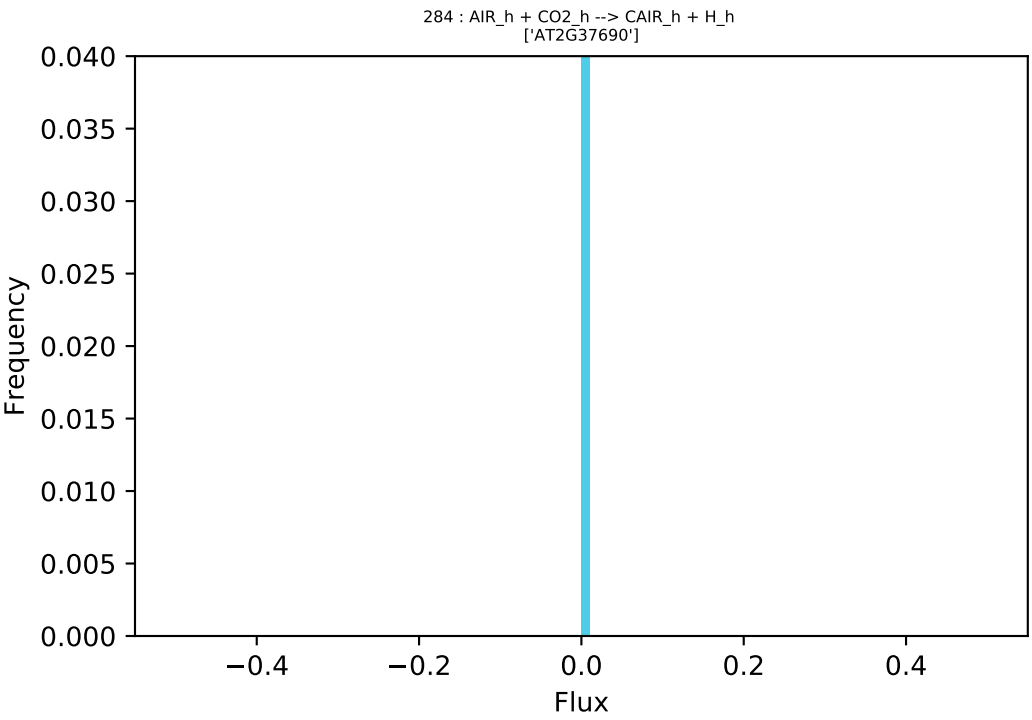

279 : Gln_h + H2O_h + PRPP_h --> Glu_h + H_h + PPi_h + PRA_h
['AT2G16570', 'AT4G34740', 'AT4G38880']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

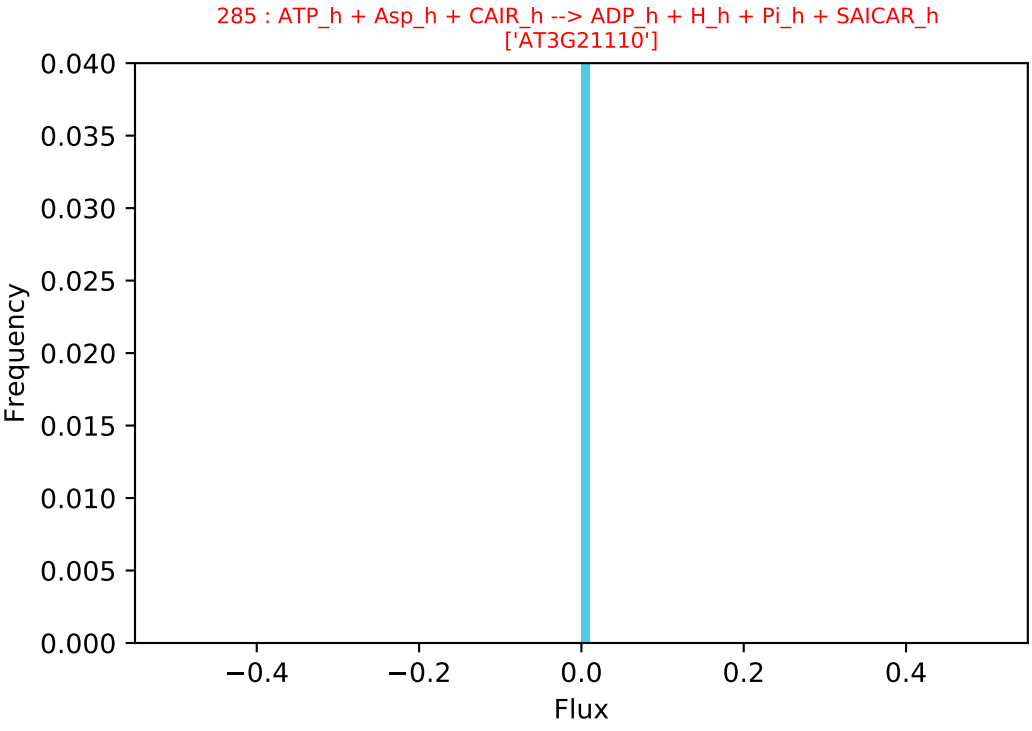

280 : ATP_h + Gly_h + PRA_h --> ADP_h + GAR_h + H_h + Pi_h
['AT1G09830']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

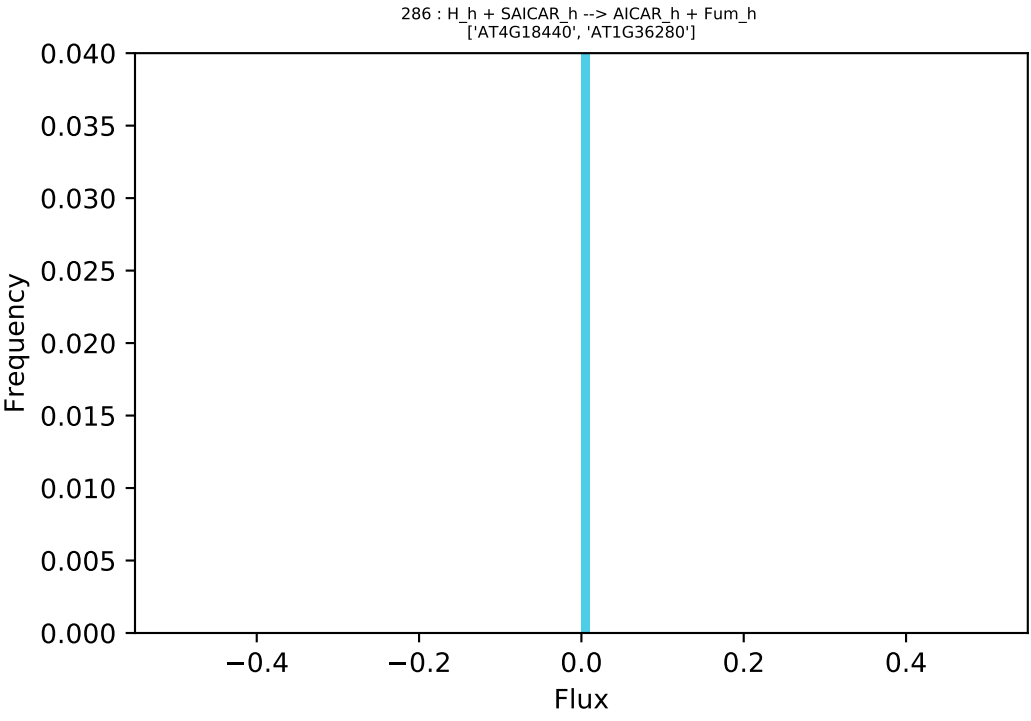

281 : F_DASH_THF_h + GAR_h --> FGAR_h + 2.0 H_h + THF_h
['AT1G31220']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

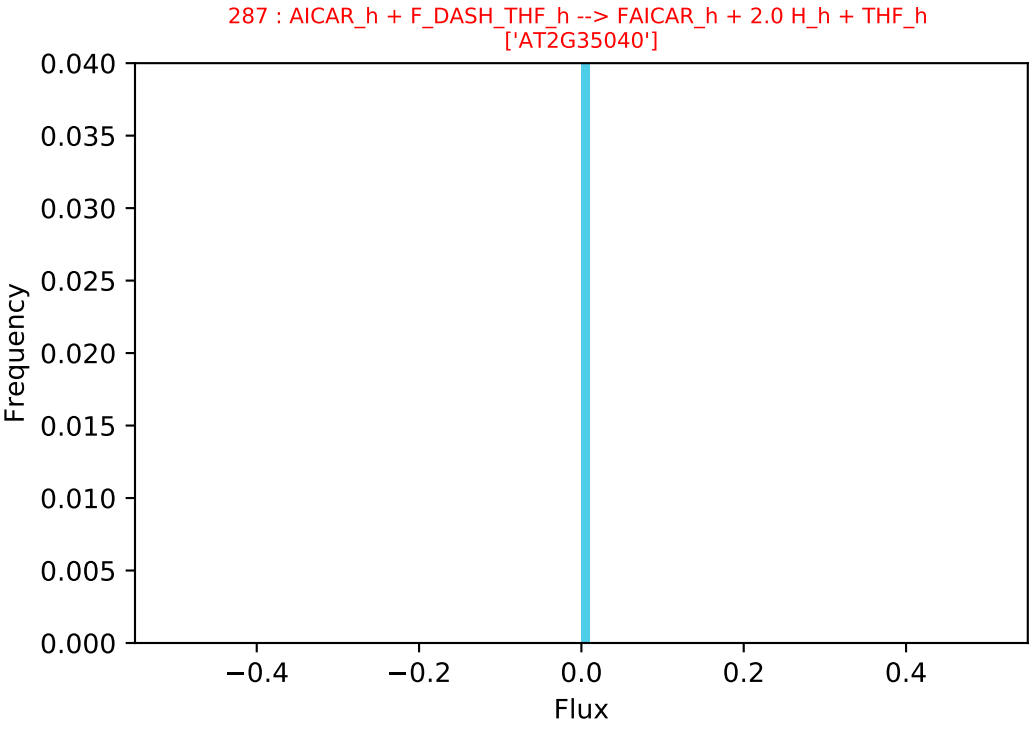

282 : ATP_h + FGAR_h + Gln_h + H2O_h --> ADP_h + FGAM_h + Glu_h + 2.0 H_h + Pi_h
['AT1G74260']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

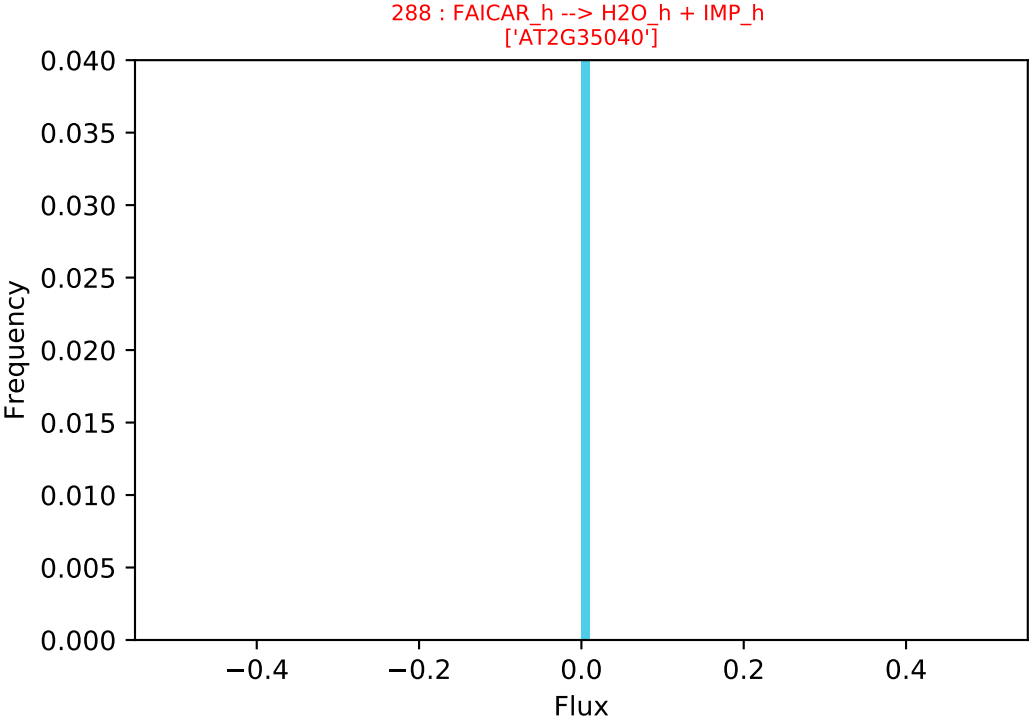

283 : ATP_h + FGAM_h --> ADP_h + AIR_h + H_h + Pi_h
['AT3G55010']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

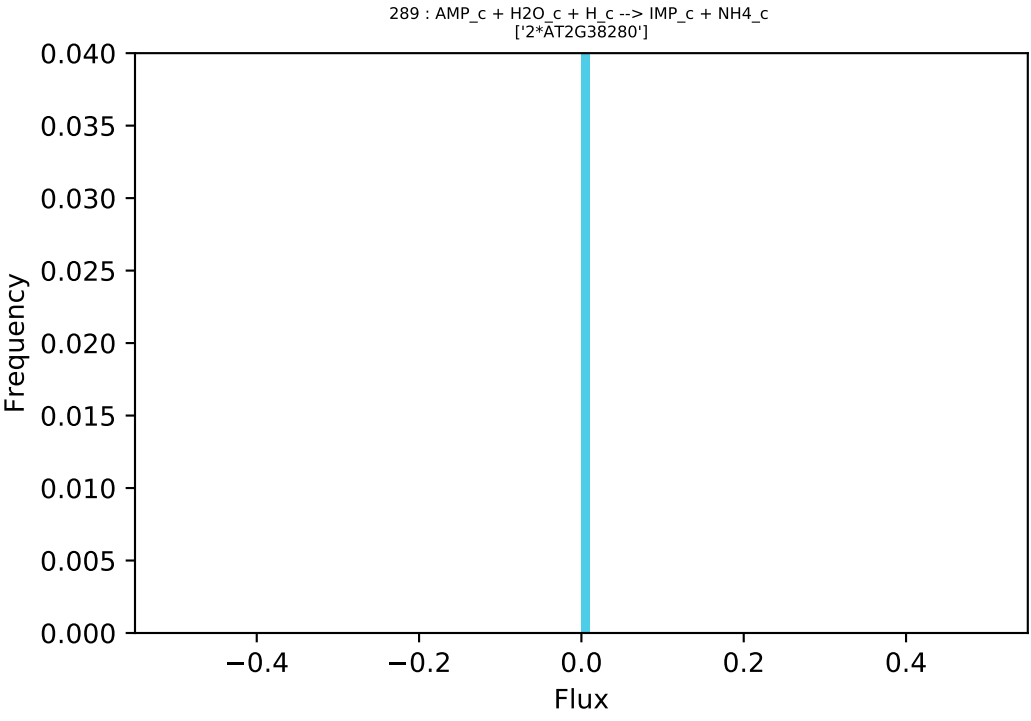

284 : AIR_h + CO2_h --> CAIR_h + H_h
['AT2G37690']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

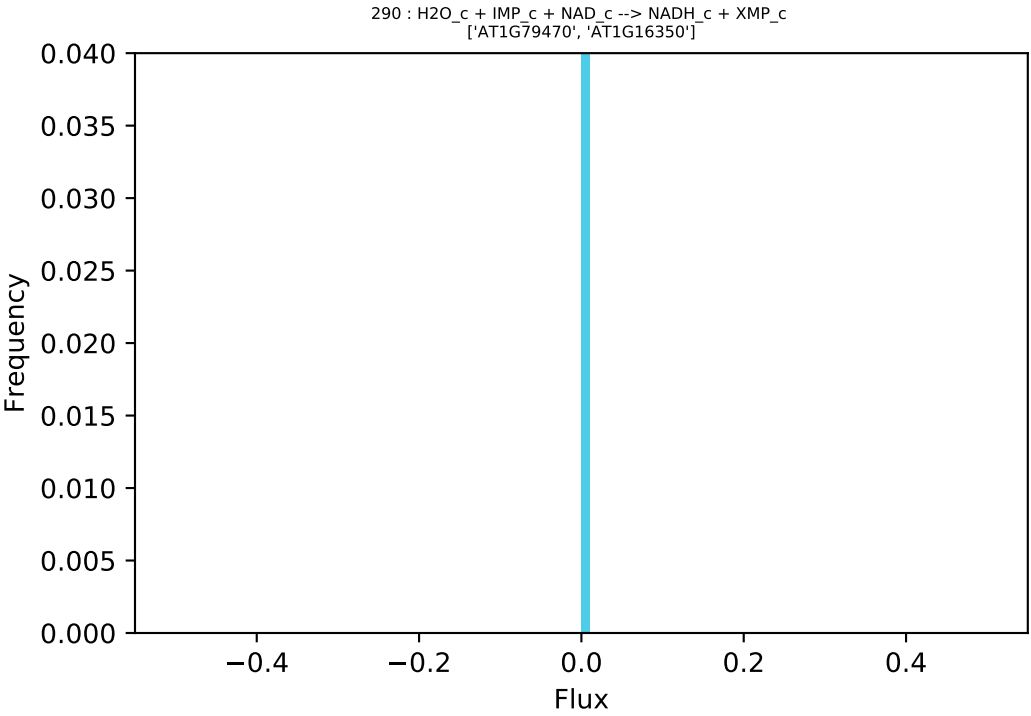

285 : ATP_h + Asp_h + CAIR_h --> ADP_h + H_h + Pi_h + SAICAR_h
['AT3G21110']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

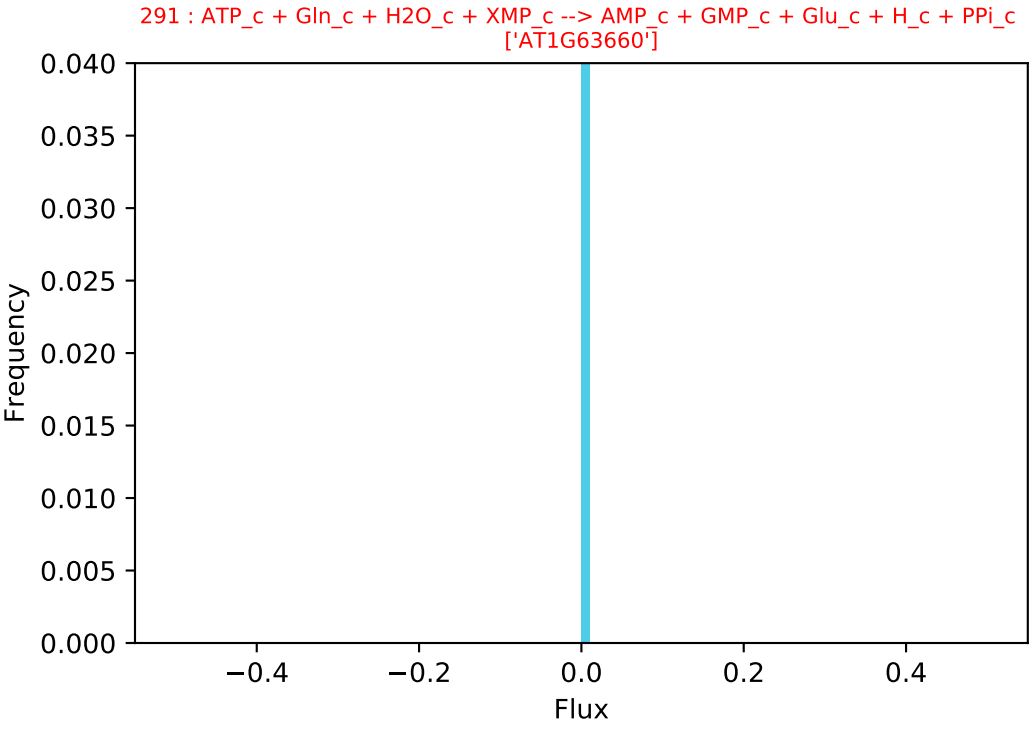

286 : H_h + SAICAR_h --> AICAR_h + Fum_h
['AT4G18440', 'AT1G36280']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

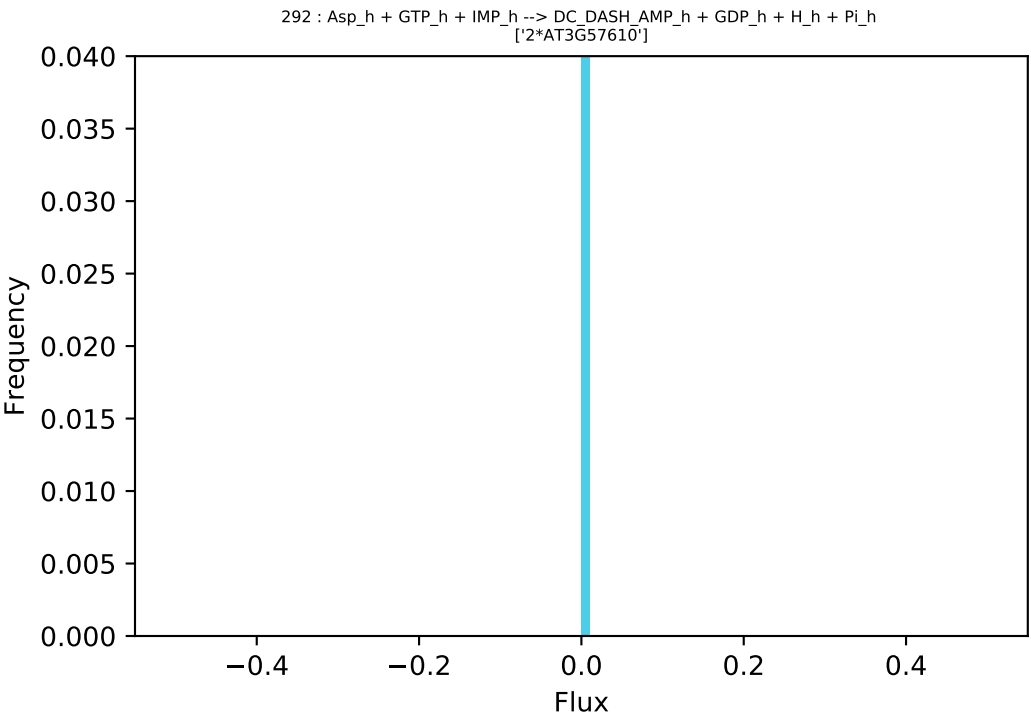

287 : AICAR_h + F_DASH_THF_h --> FAICAR_h + 2.0 H_h + THF_h
['AT2G35040']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

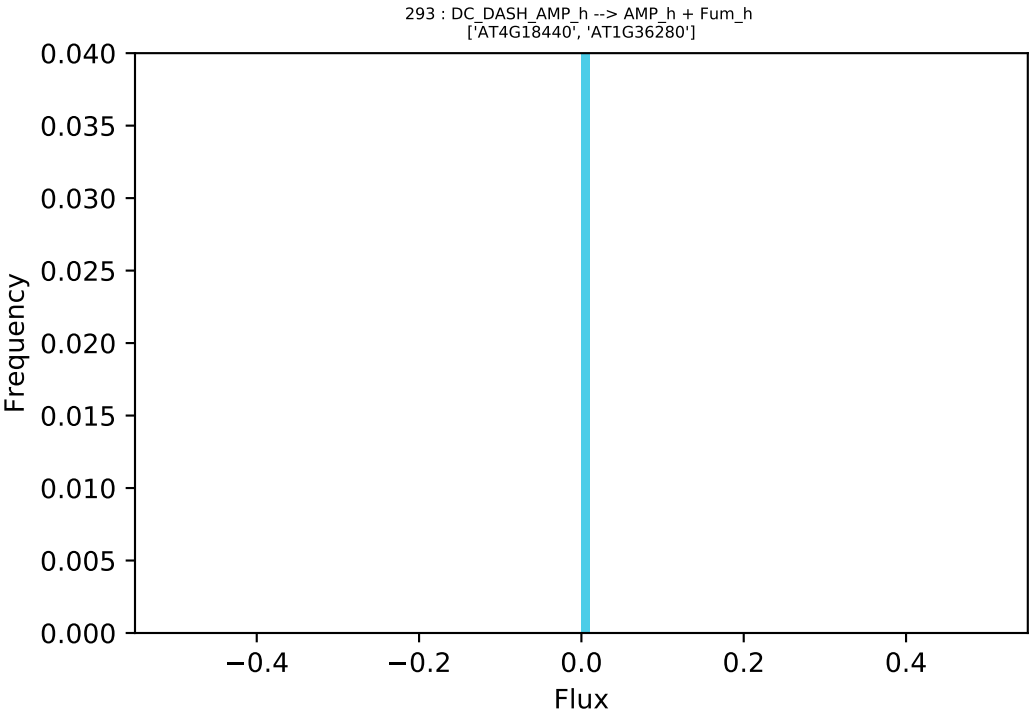

288 : FAICAR_h --> H2O_h + IMP_h
['AT2G35040']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

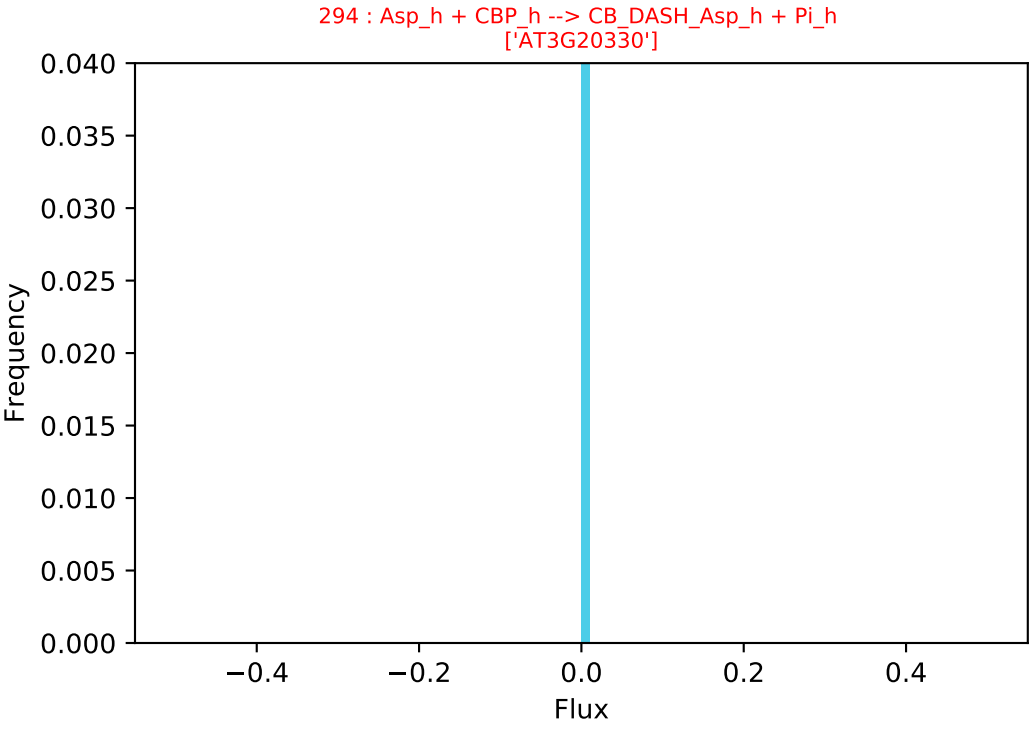

289 : AMP_c + H2O_c + H_c --> IMP_c + NH4_c
['2*AT2G38280']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

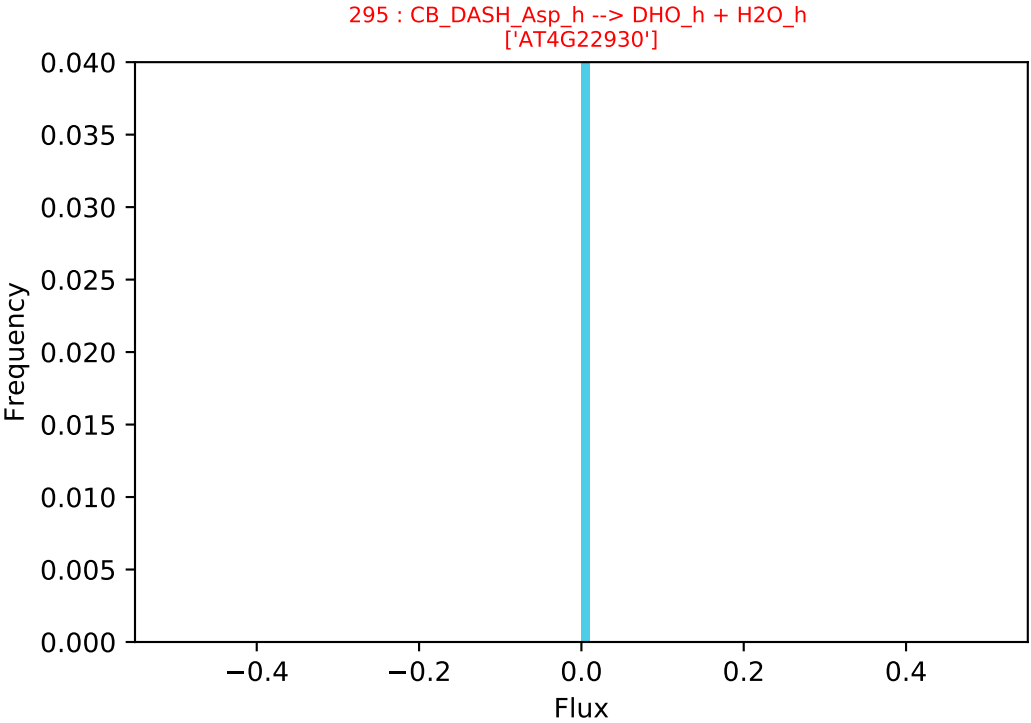

290 : H2O_c + IMP_c + NAD_c --> NADH_c + XMP_c
['AT1G79470', 'AT1G16350']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

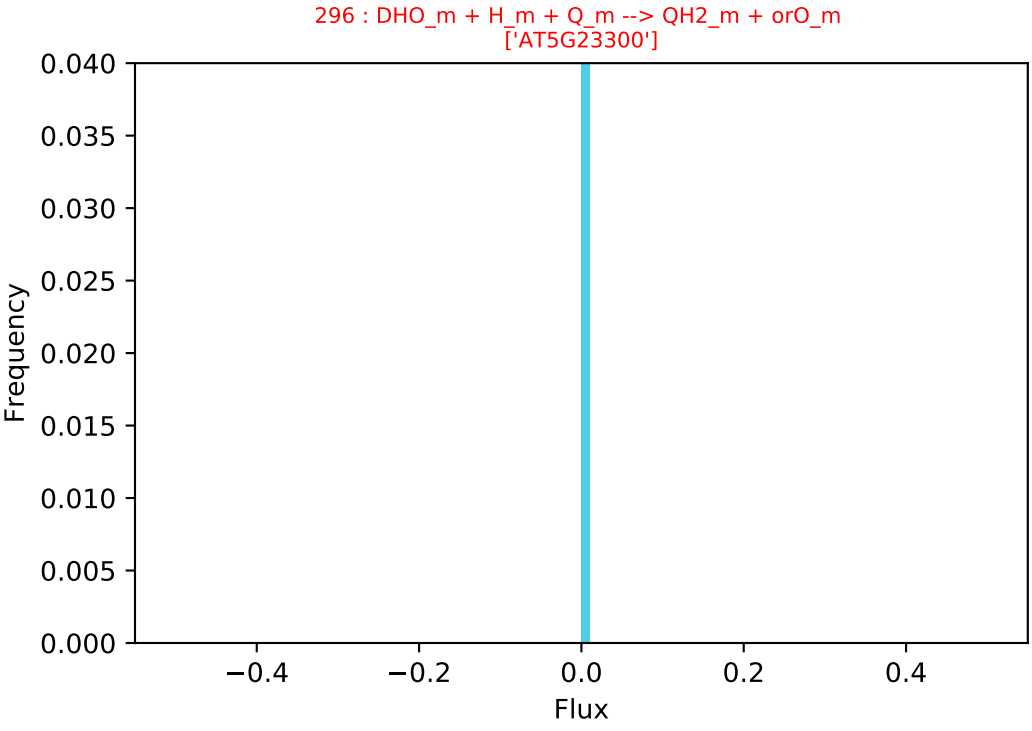

291 : ATP_c + Gln_c + H2O_c + XMP_c --> AMP_c + GMP_c + Glu_c + H_c + PPi_c
['AT1G63660']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

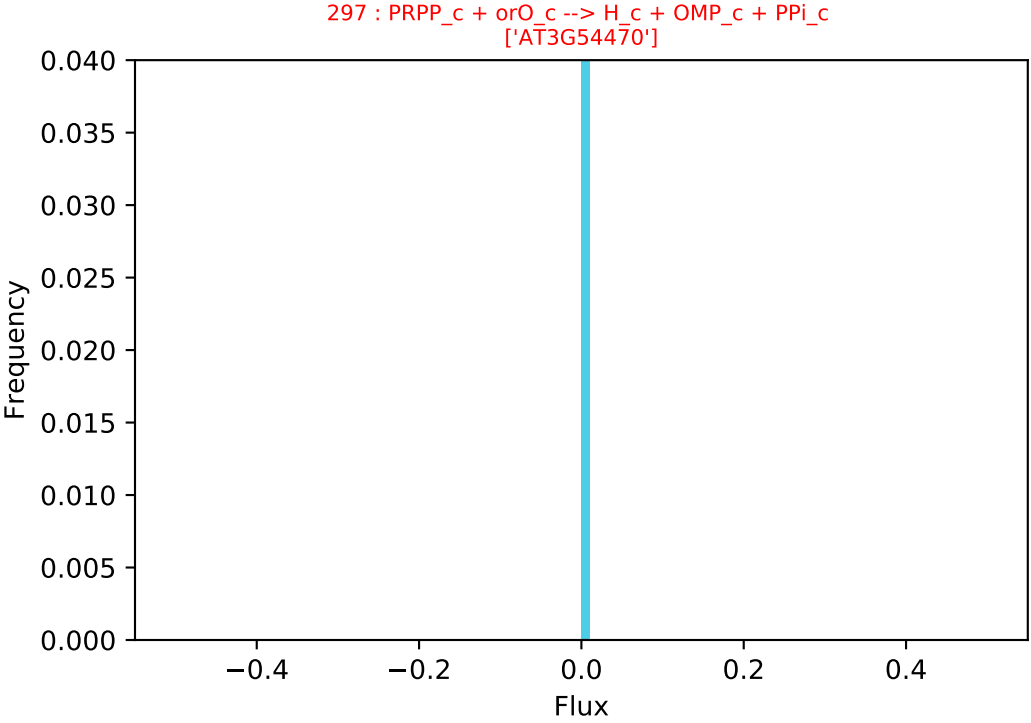

292 : Asp_h + GTP_h + IMP_h --> DC_DASH_AMP_h + GDP_h + H_h + Pi_h
['2*AT3G57610']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

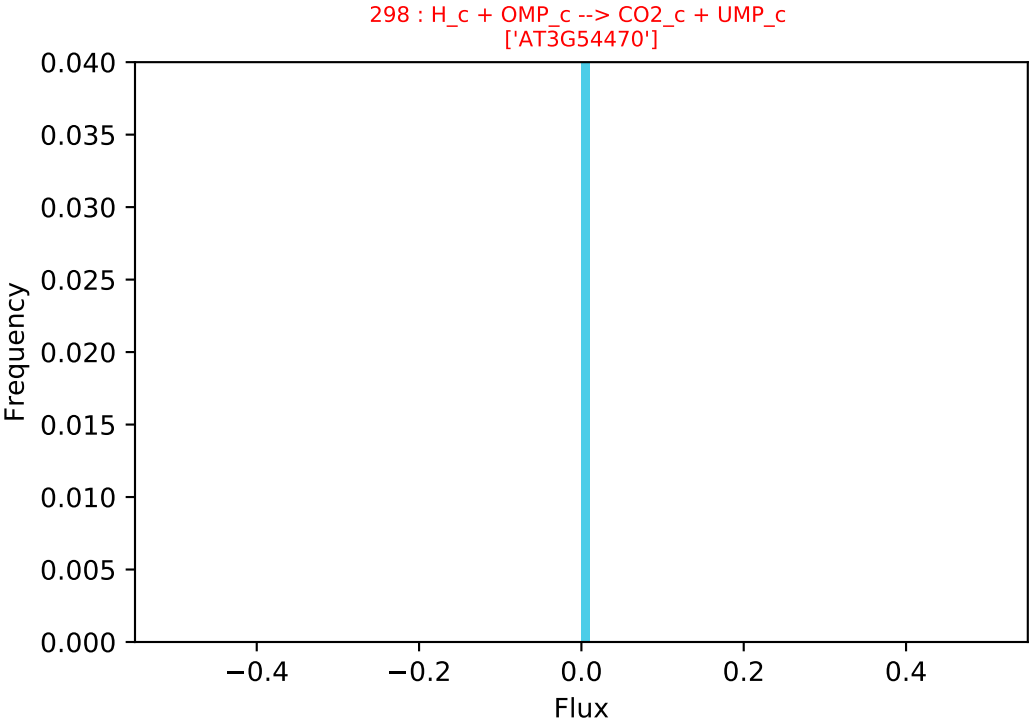

293 : DC_DASH_AMP_h --> AMP_h + Fum_h
['AT4G18440', 'AT1G36280']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

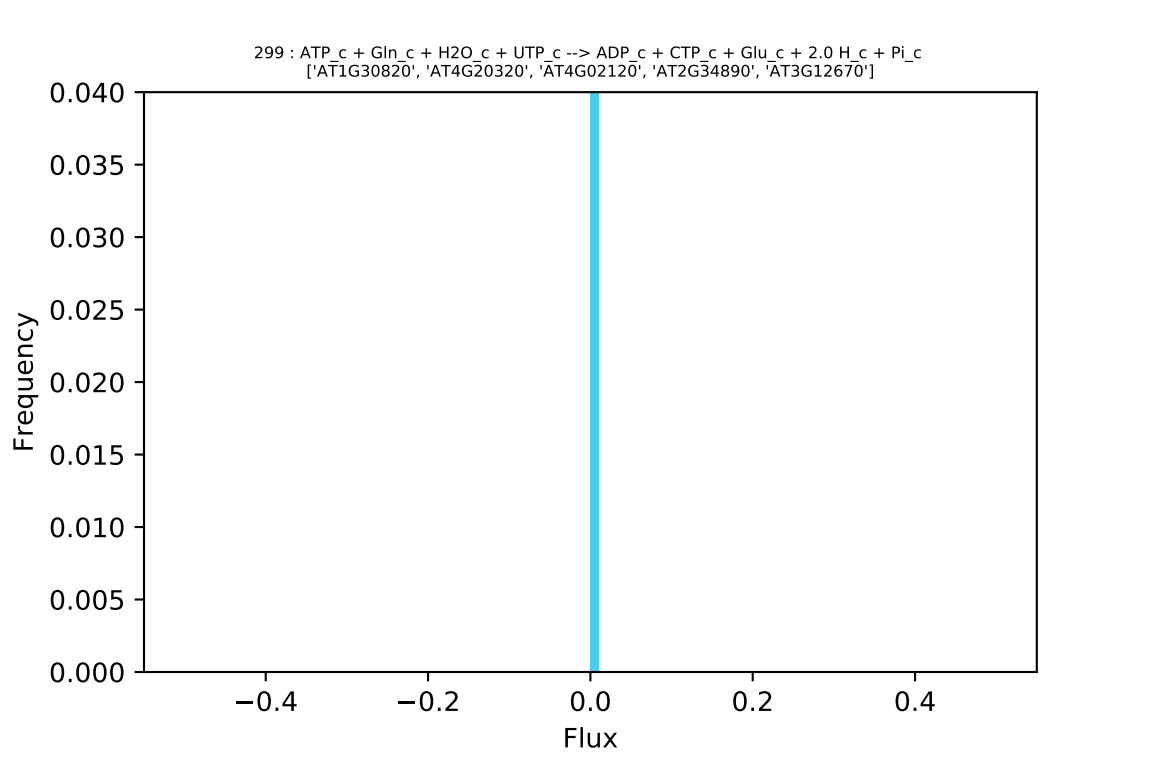

294 : Asp_h + CBP_h --> CB_DASH_Asp_h + Pi_h
['AT3G20330']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

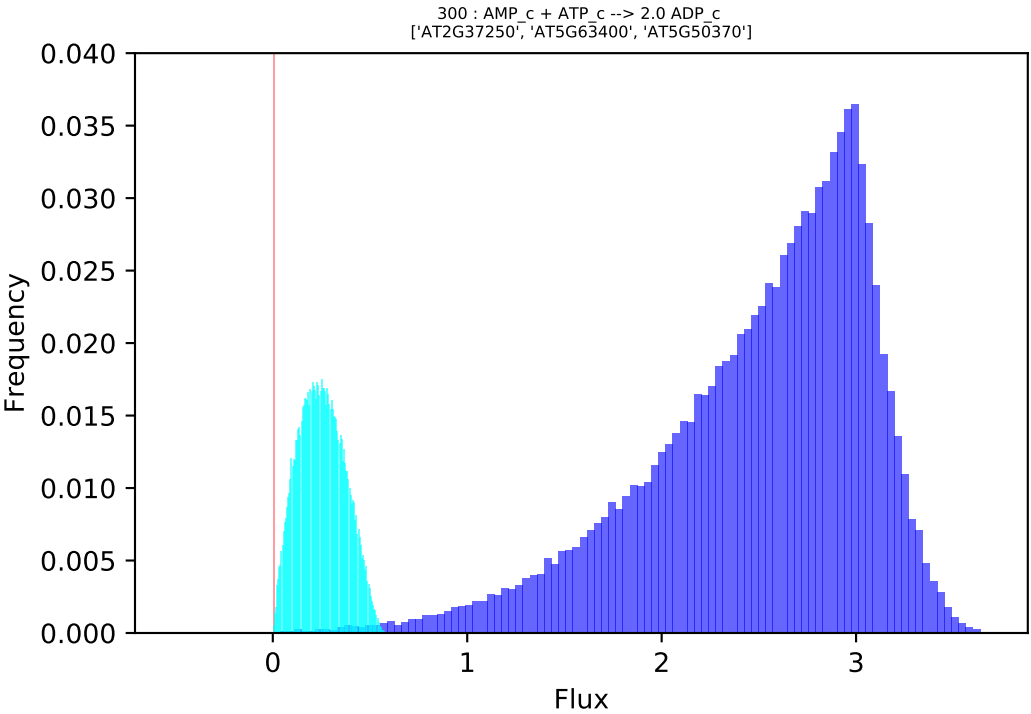

295 : CB_DASH_Asp_h --> DHO_h + H2O_h
['AT4G22930']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

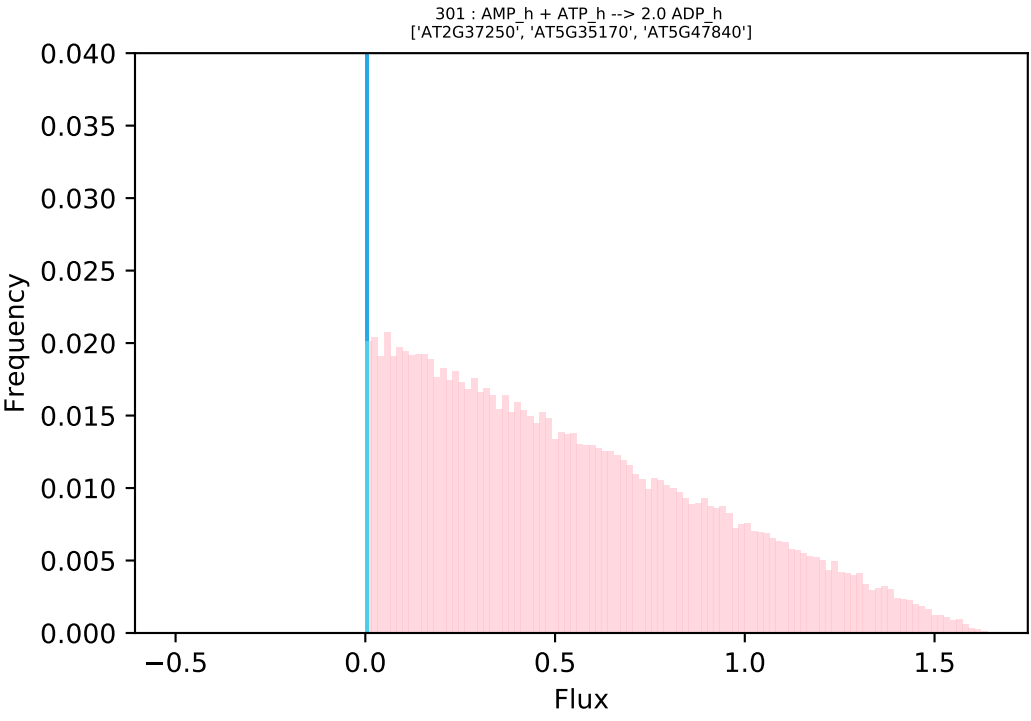

296 : DHO_m + H_m + Q_m --> QH2_m + orO_m
['AT5G23300']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

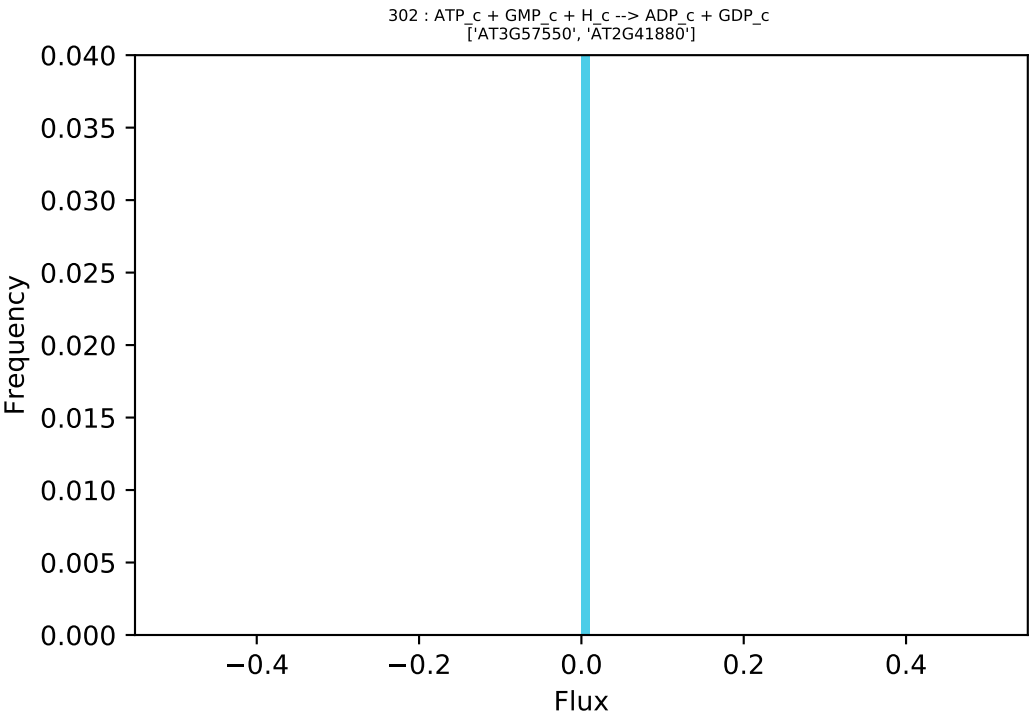

297 : PRPP_c + orO_c --> H_c + OMP_c + PPi_c
['AT3G54470']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

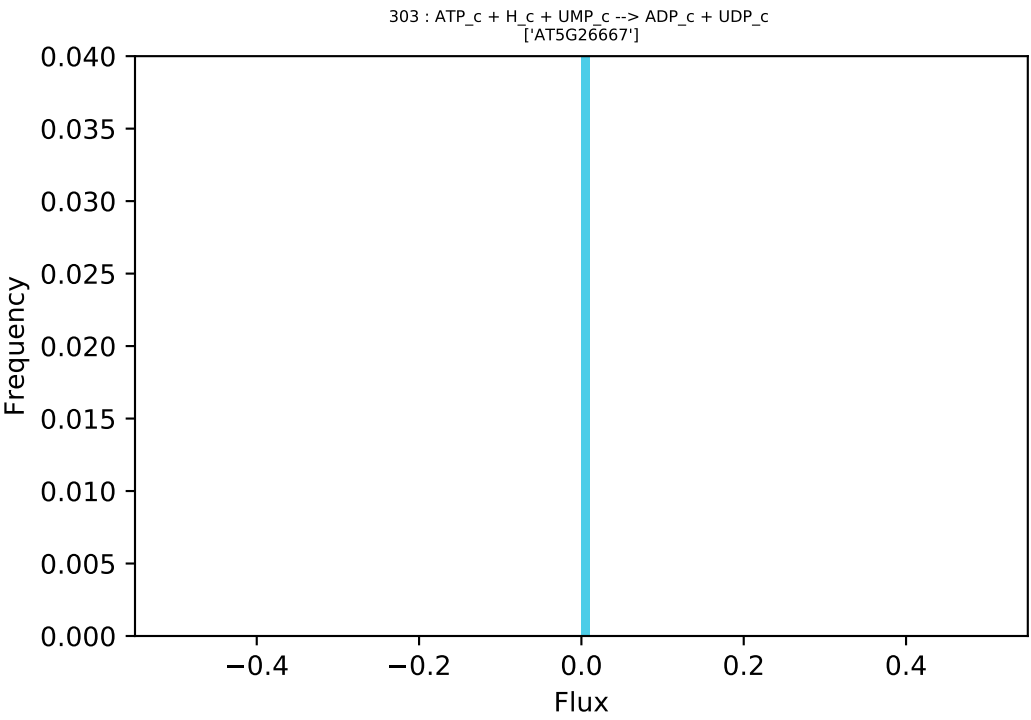

298 : H_c + OMP_c --> CO2_c + UMP_c
['AT3G54470']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

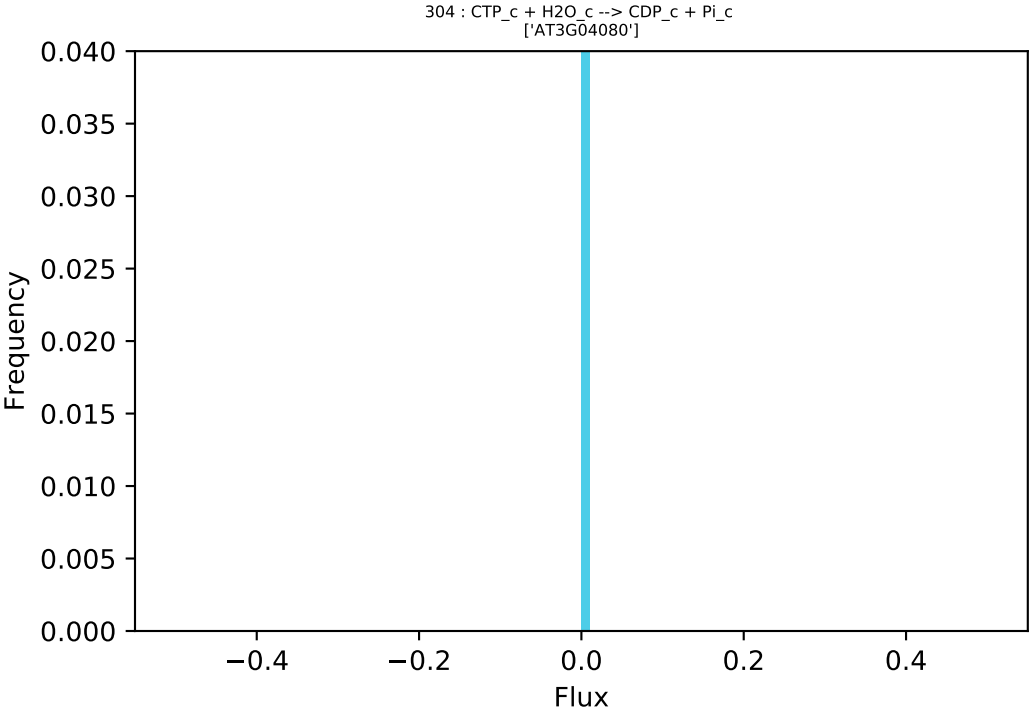

299 : ATP_c + Gln_c + H2O_c + UTP_c --> ADP_c + CTP_c + Glu_c + 2.0 H_c + Pi_c
['AT1G30820', 'AT4G20320', 'AT4G02120', 'AT2G34890', 'AT3G12670']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

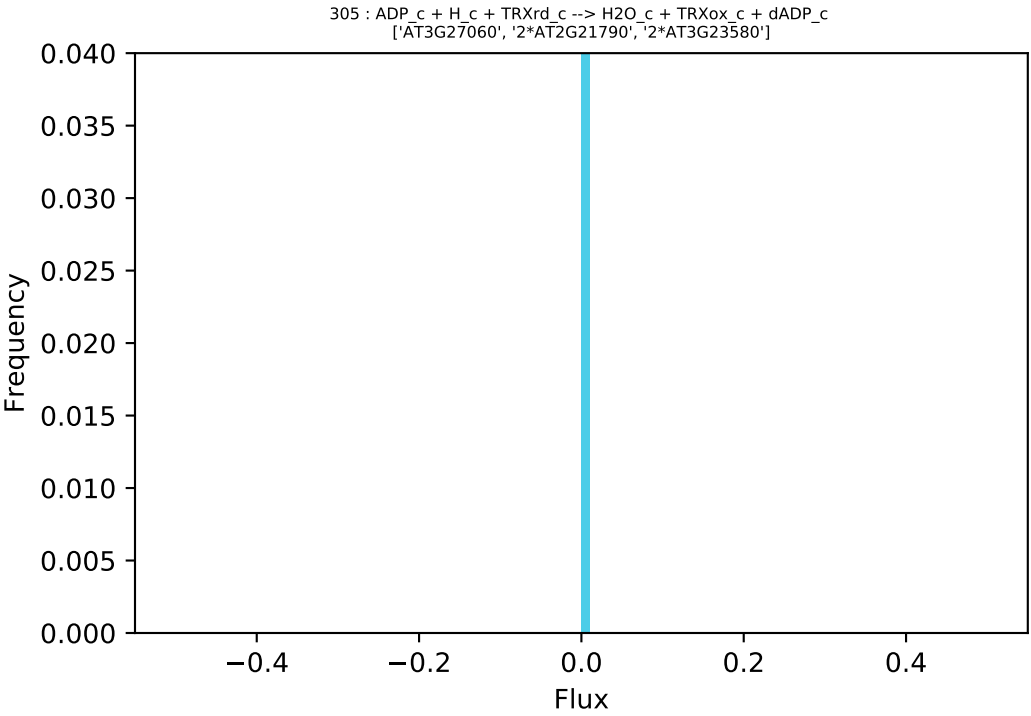

300 : AMP_c + ATP_c --> 2.0 ADP_c
['AT2G37250', 'AT5G63400', 'AT5G50370']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0
1
2
3
Flux

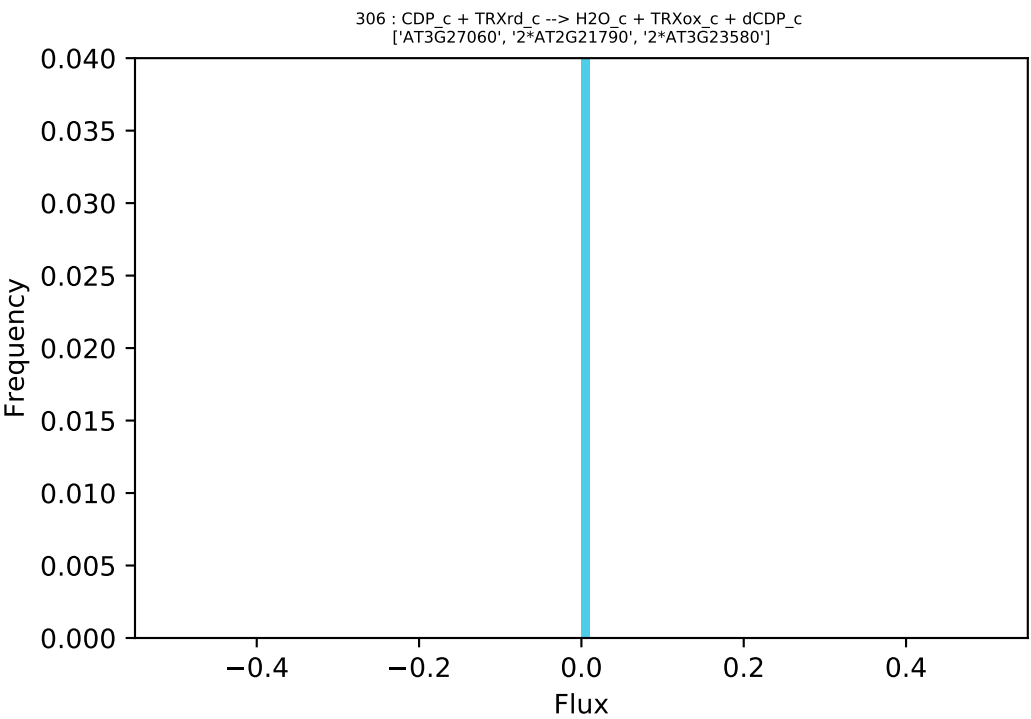

301 : AMP_h + ATP_h --> 2.0 ADP_h
['AT2G37250', 'AT5G35170', 'AT5G47840']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.5
0.0
0.5
1.0
1.5
Flux

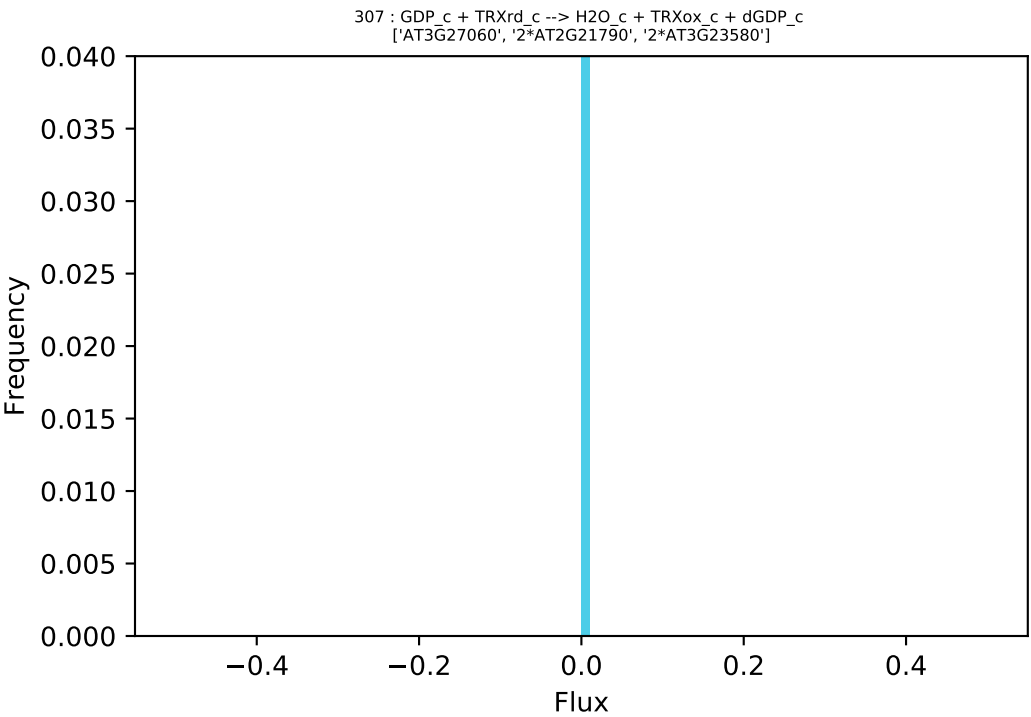

302 : ATP_c + GMP_c + H_c --> ADP_c + GDP_c
['AT3G57550', 'AT2G41880']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

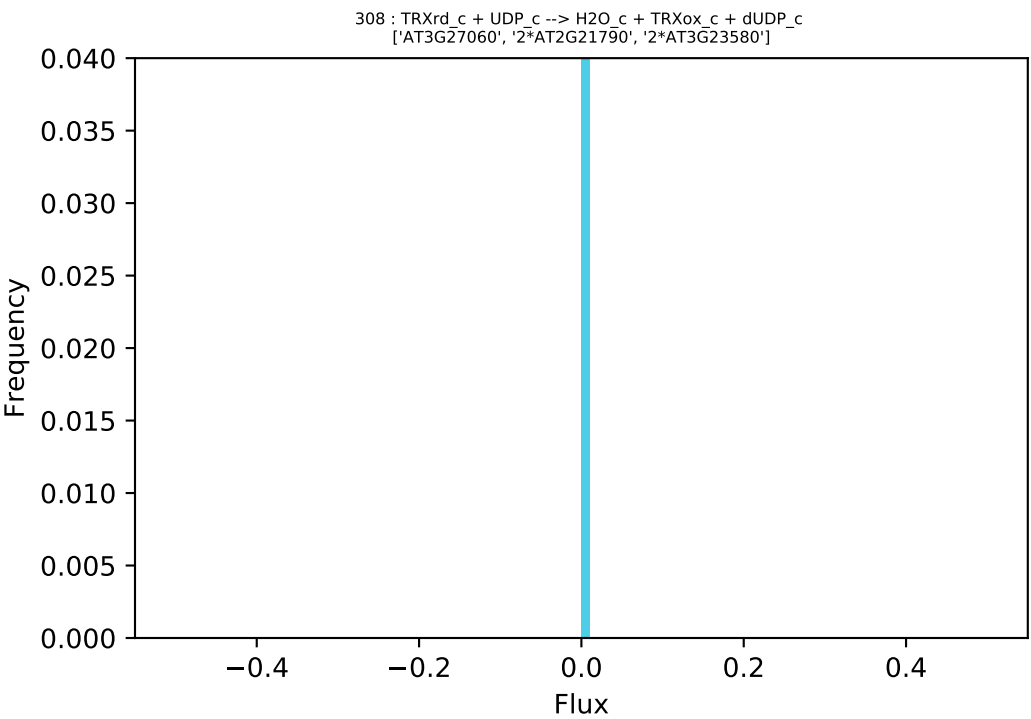

303 : ATP_c + H_c + UMP_c --> ADP_c + UDP_c
['AT5G26667']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

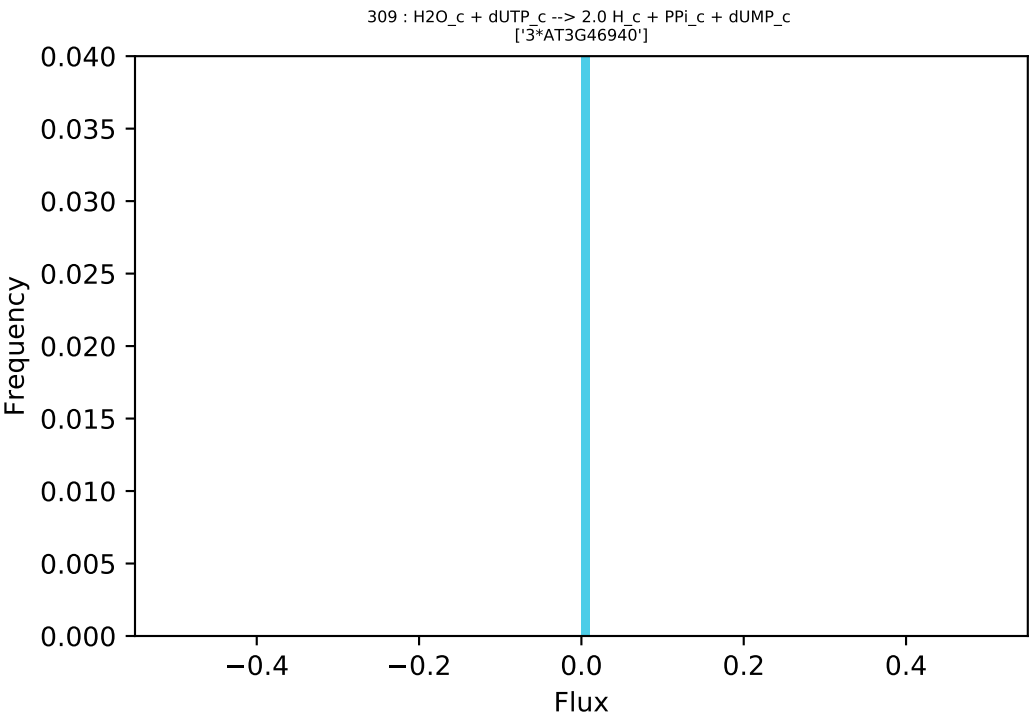

304 : CTP_c + H2O_c --> CDP_c + Pi_c
['AT3G04080']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

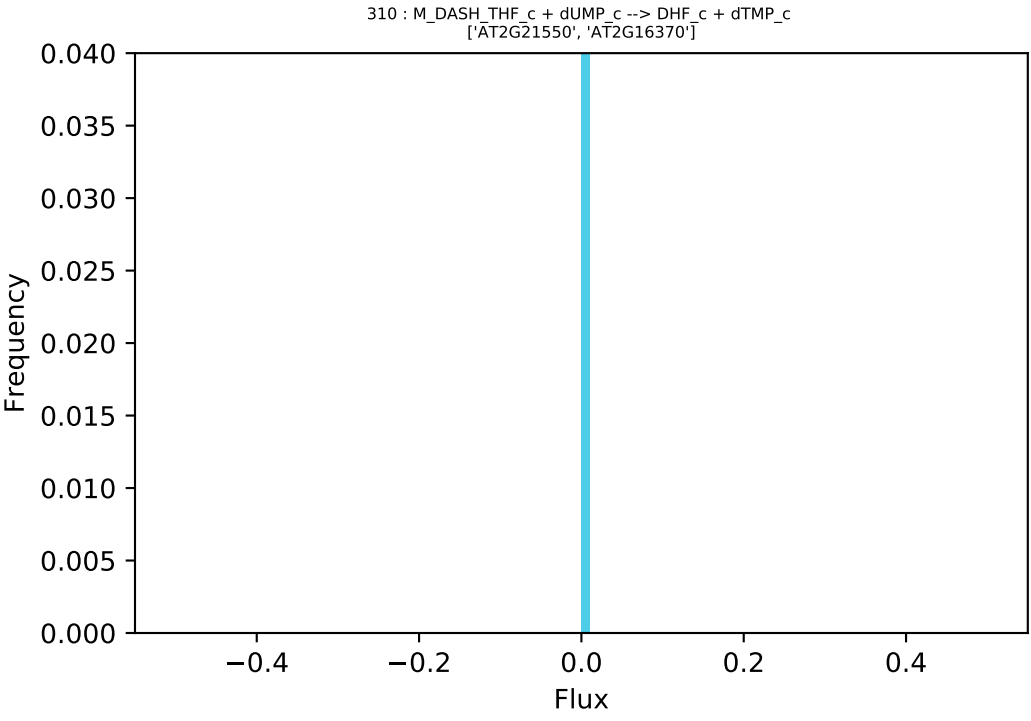

305 : ADP_c + H_c + TRXrd_c --> H2O_c + TRXox_c + dADP_c
['AT3G27060', '2*AT2G21790', '2*AT3G23580']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

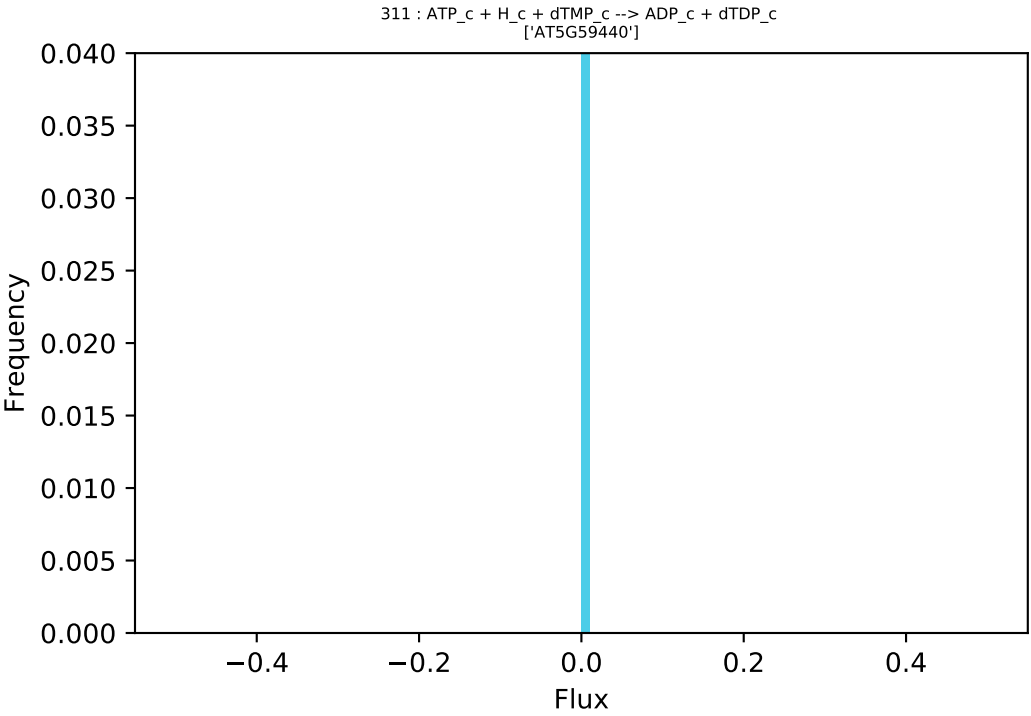

306 : CDP_c + TRXrd_c --> H2O_c + TRXox_c + dCDP_c
['AT3G27060', '2*AT2G21790', '2*AT3G23580']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

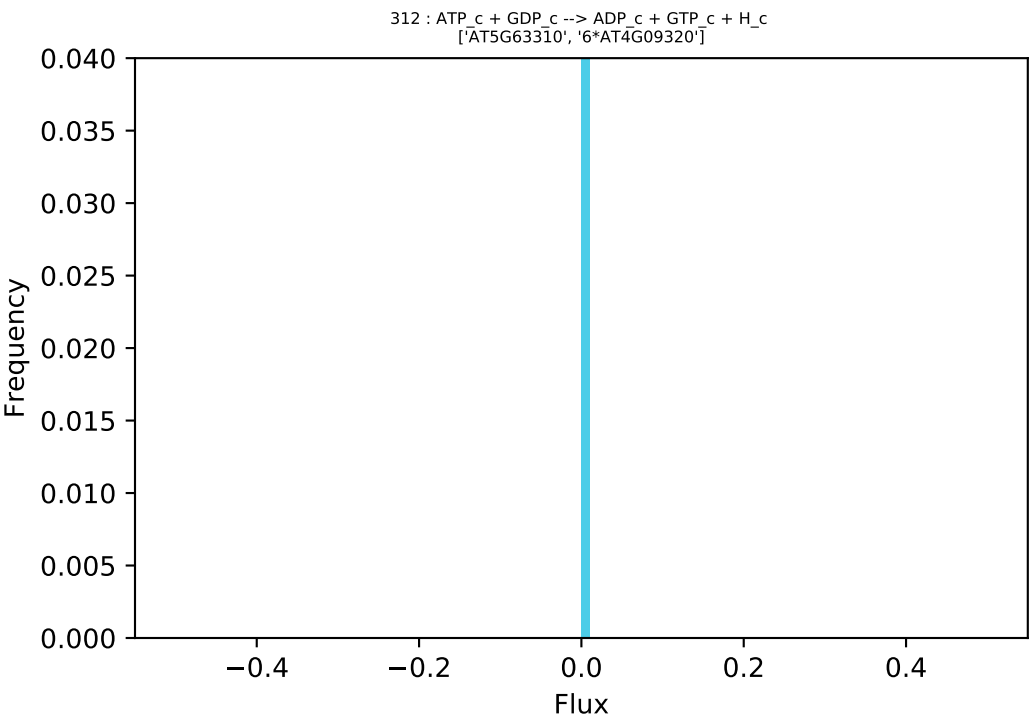

307 : GDP_c + TRXrd_c --> H2O_c + TRXox_c + dGDP_c
['AT3G27060', '2*AT2G21790', '2*AT3G23580']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

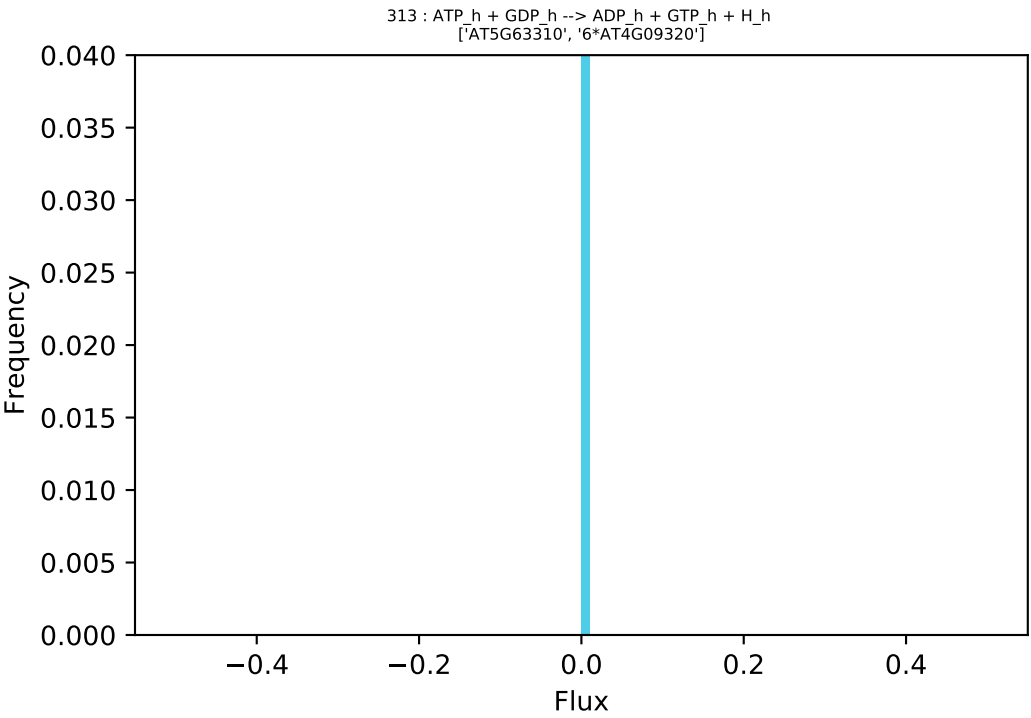

308 : TRXrd_c + UDP_c --> H2O_c + TRXox_c + dUDP_c
['AT3G27060', '2*AT2G21790', '2*AT3G23580']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

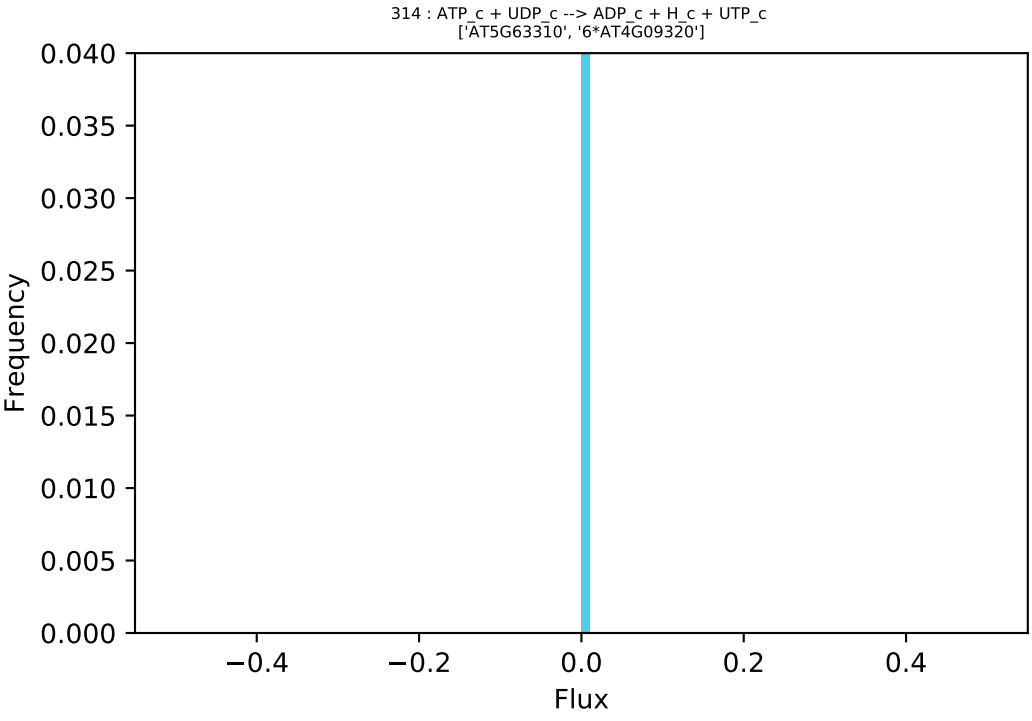

309 : H2O_c + dUTP_c --> 2.0 H_c + PPi_c + dUMP_c
['3*AT3G46940']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

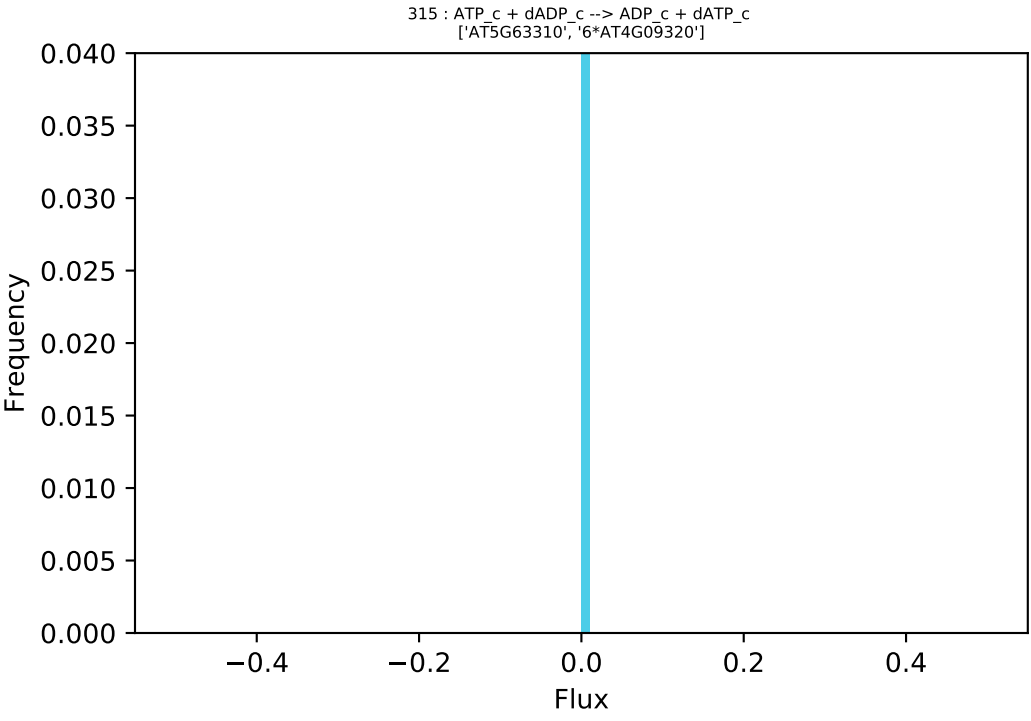

310 : M_DASH_THF_c + dUMP_c --> DHF_c + dTMP_c
['AT2G21550', 'AT2G16370']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

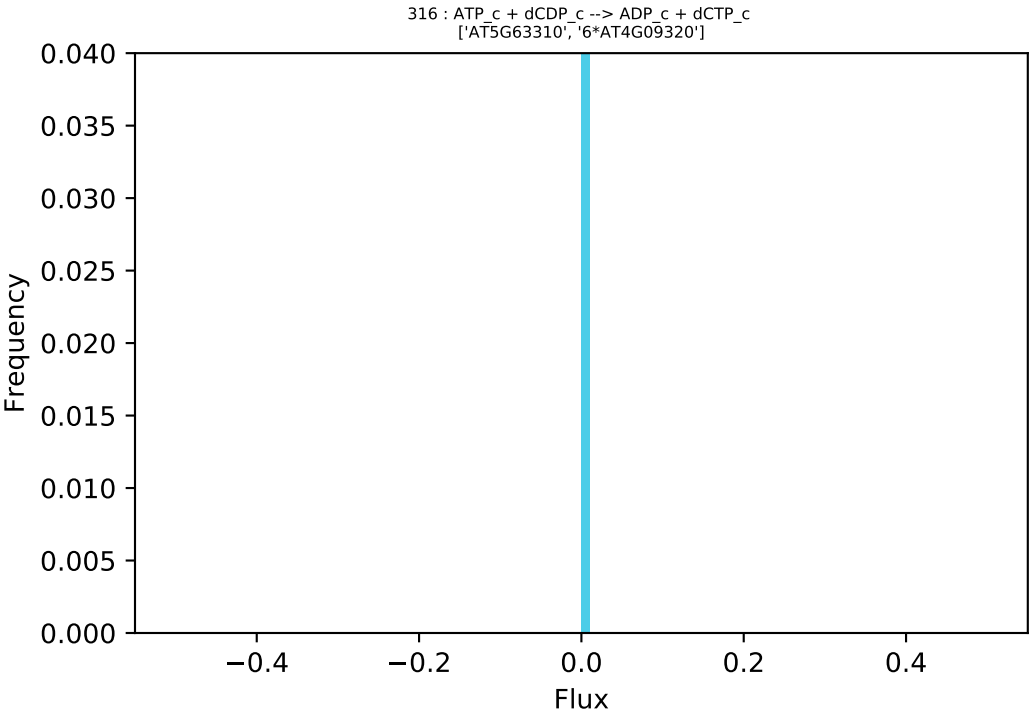

311 : ATP_c + H_c + dTMP_c --> ADP_c + dTDP_c
['AT5G59440']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

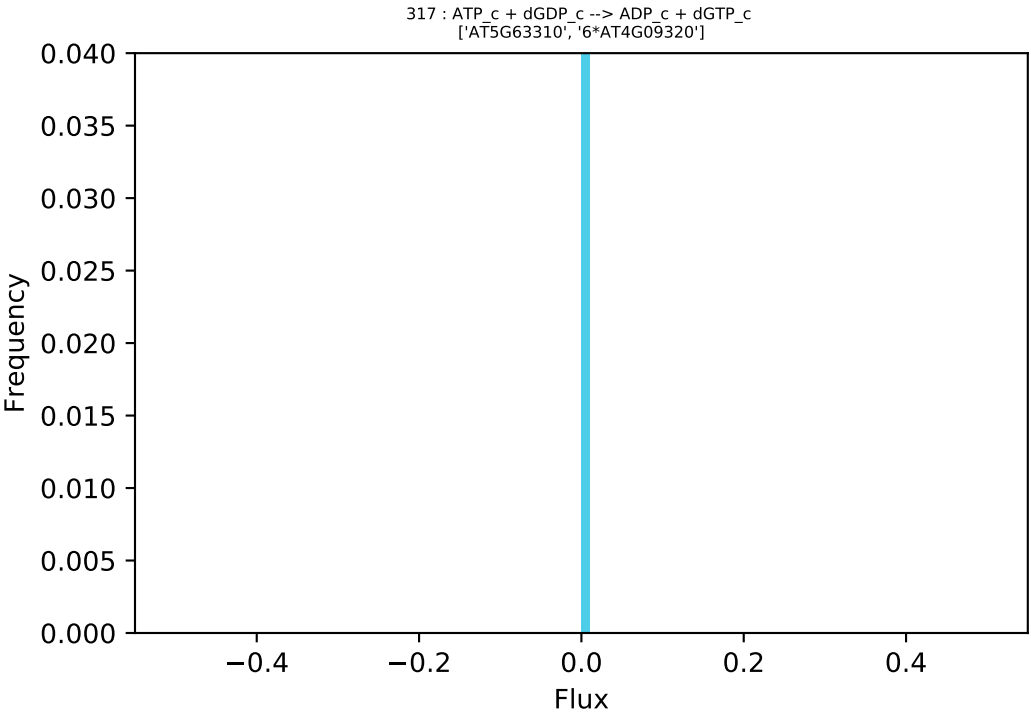

312 : ATP_c + GDP_c --> ADP_c + GTP_c + H_c
['AT5G63310', '6*AT4G09320']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

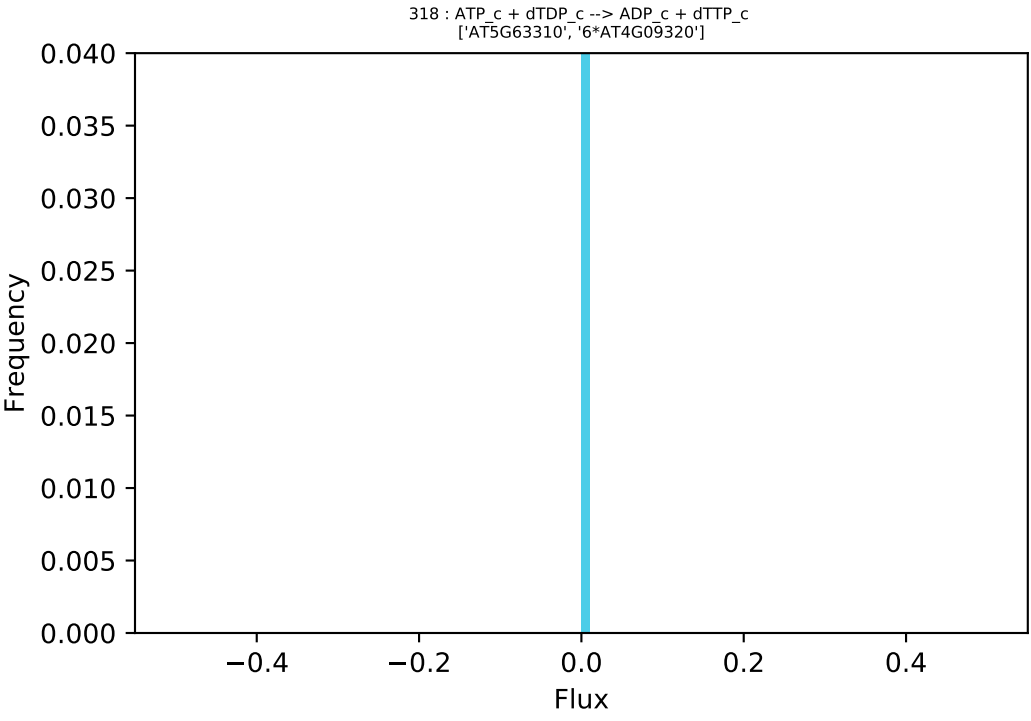

313 : ATP_h + GDP_h --> ADP_h + GTP_h + H_h
['AT5G63310', '6*AT4G09320']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

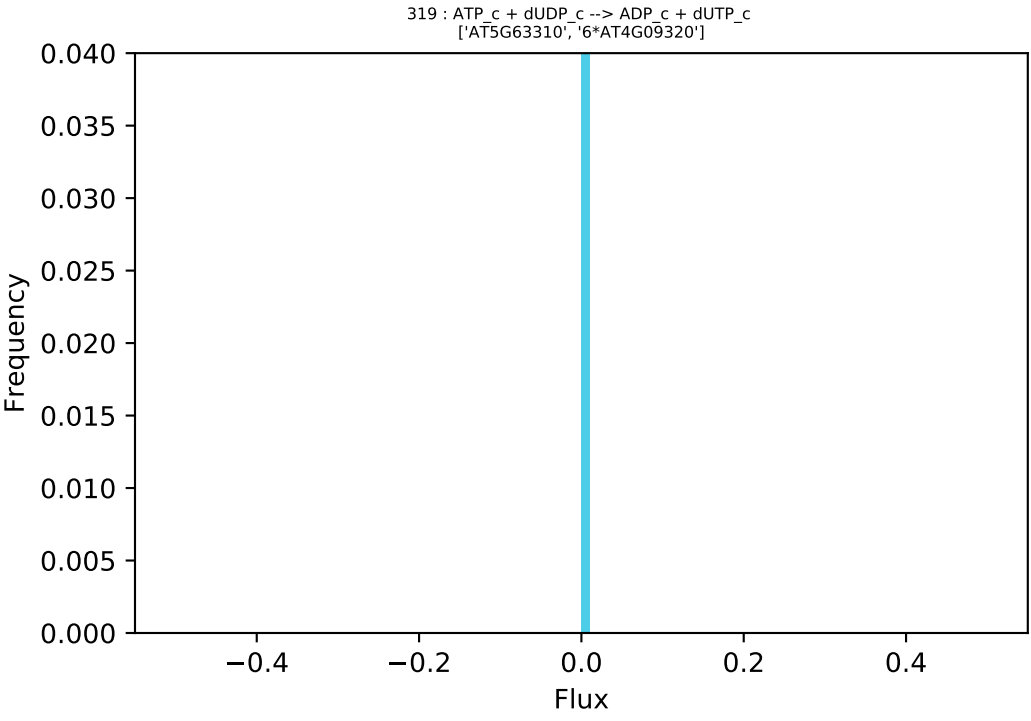

314 : ATP_c + UDP_c --> ADP_c + H_c + UTP_c
['AT5G63310', '6*AT4G09320']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

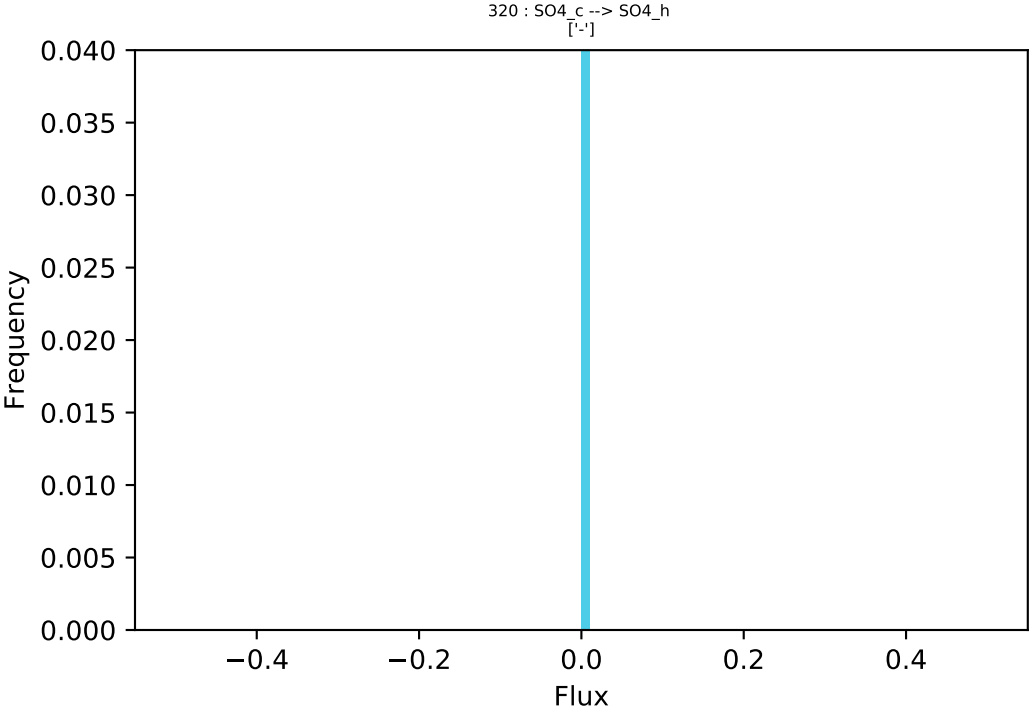

315 : ATP_c + dADP_c --> ADP_c + dATP_c
['AT5G63310', '6*AT4G09320']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

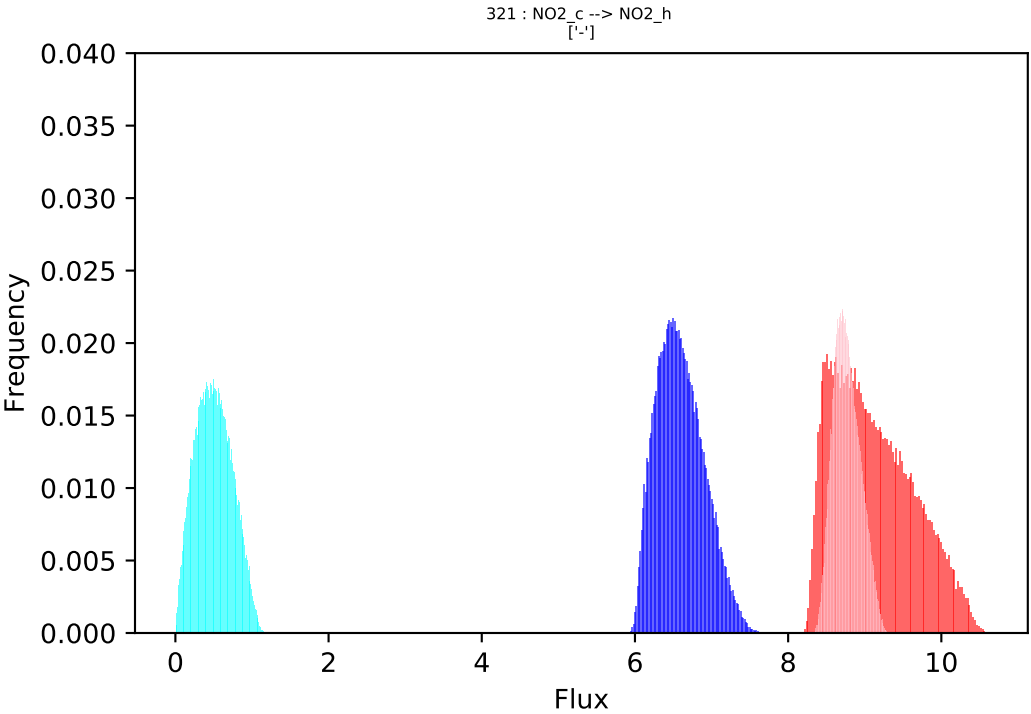

316 : ATP_c + dCDP_c --> ADP_c + dCTP_c
['AT5G63310', '6*AT4G09320']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

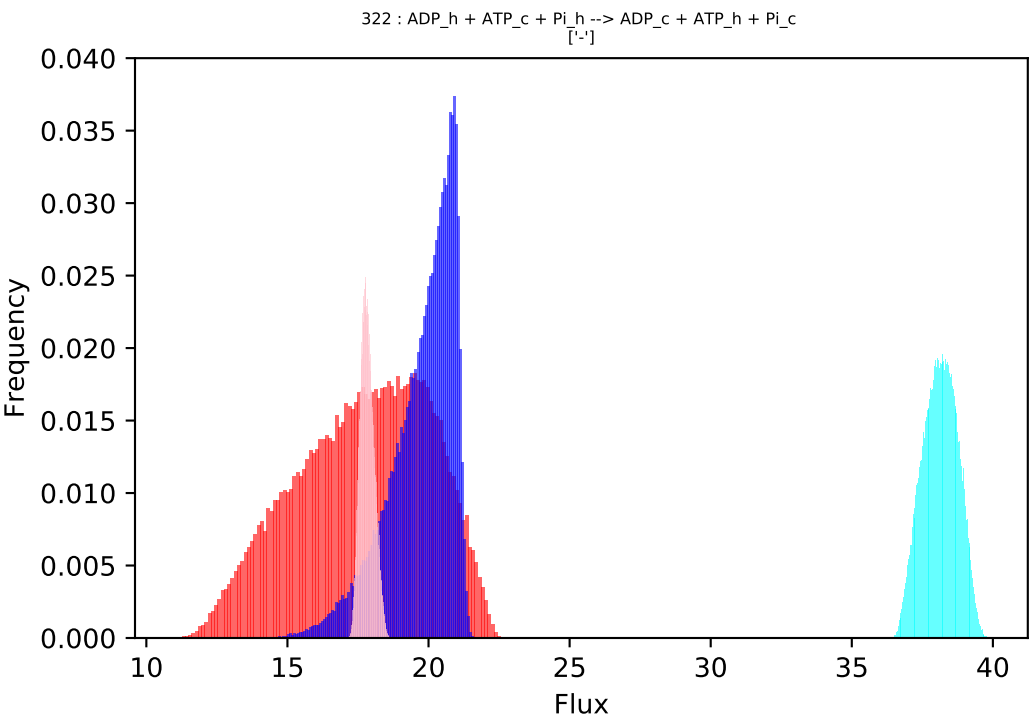

317 : ATP_c + dGDP_c --> ADP_c + dGTP_c
['AT5G63310', '6*AT4G09320']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

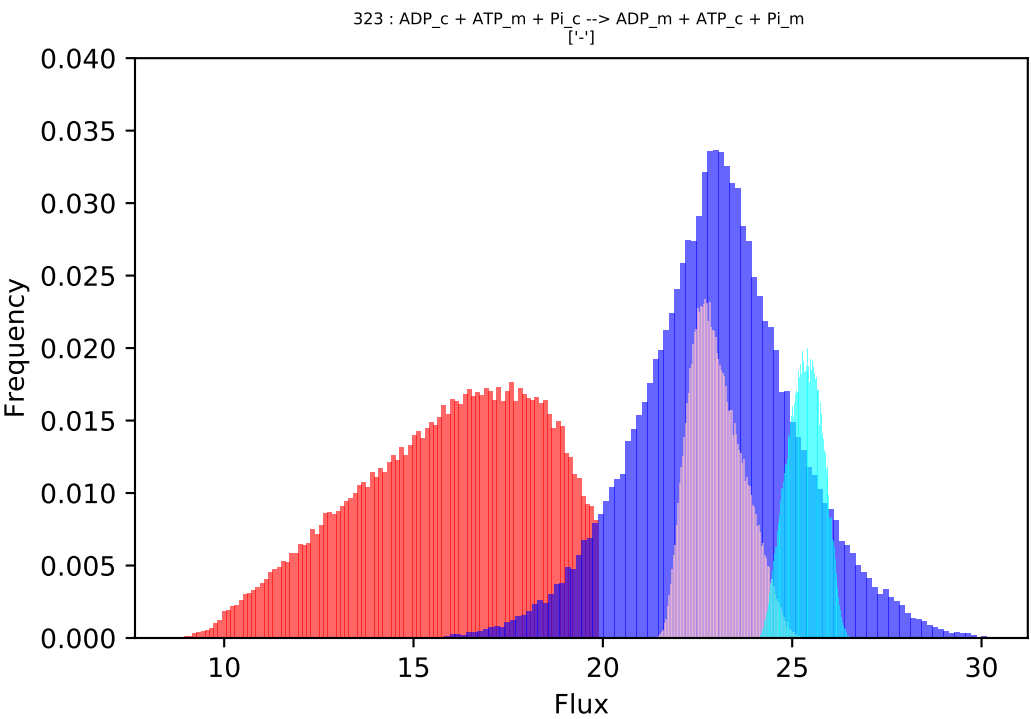

318 : ATP_c + dTDP_c --> ADP_c + dTTP_c
['AT5G63310', '6*AT4G09320']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

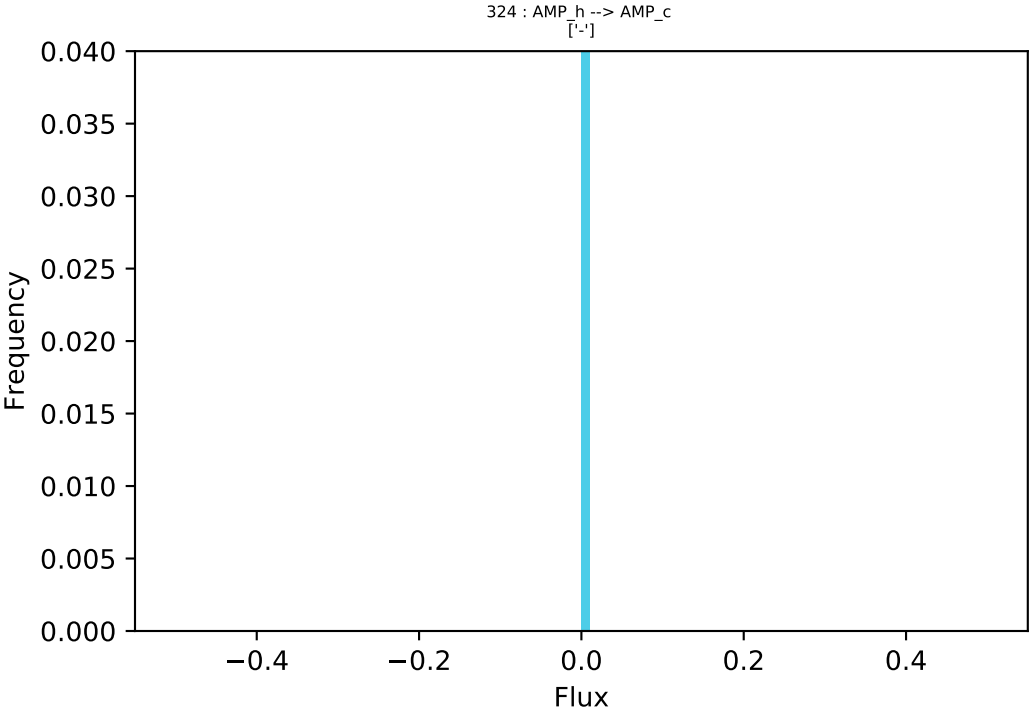

319 : ATP_c + dUDP_c --> ADP_c + dUTP_c
['AT5G63310', '6*AT4G09320']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

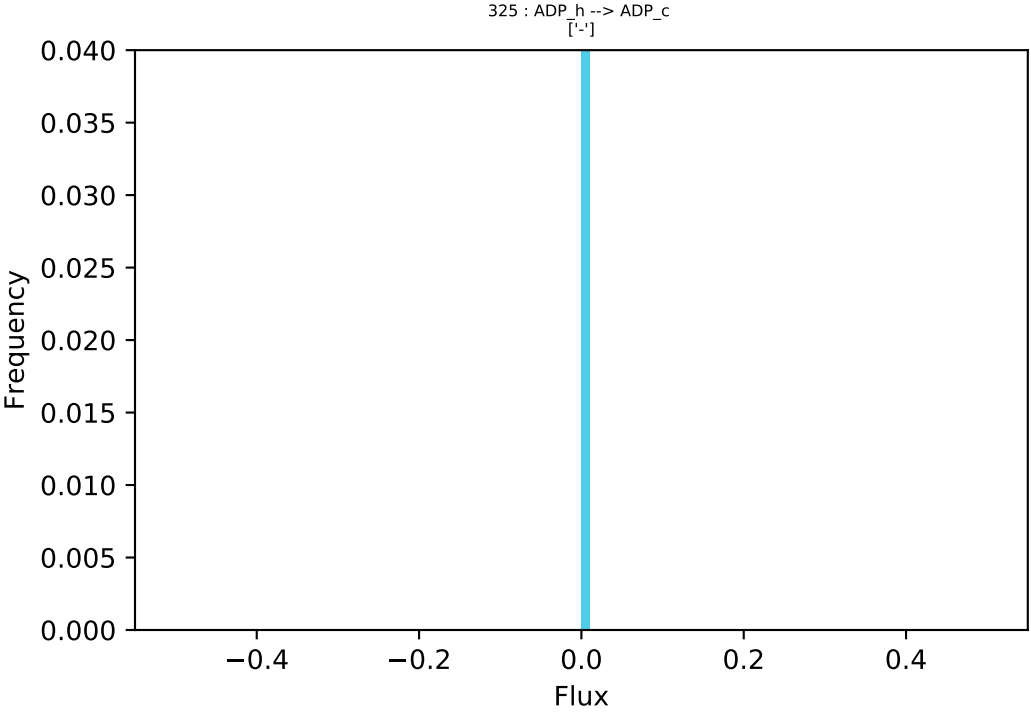

320 : SO4_c --> SO4_h
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

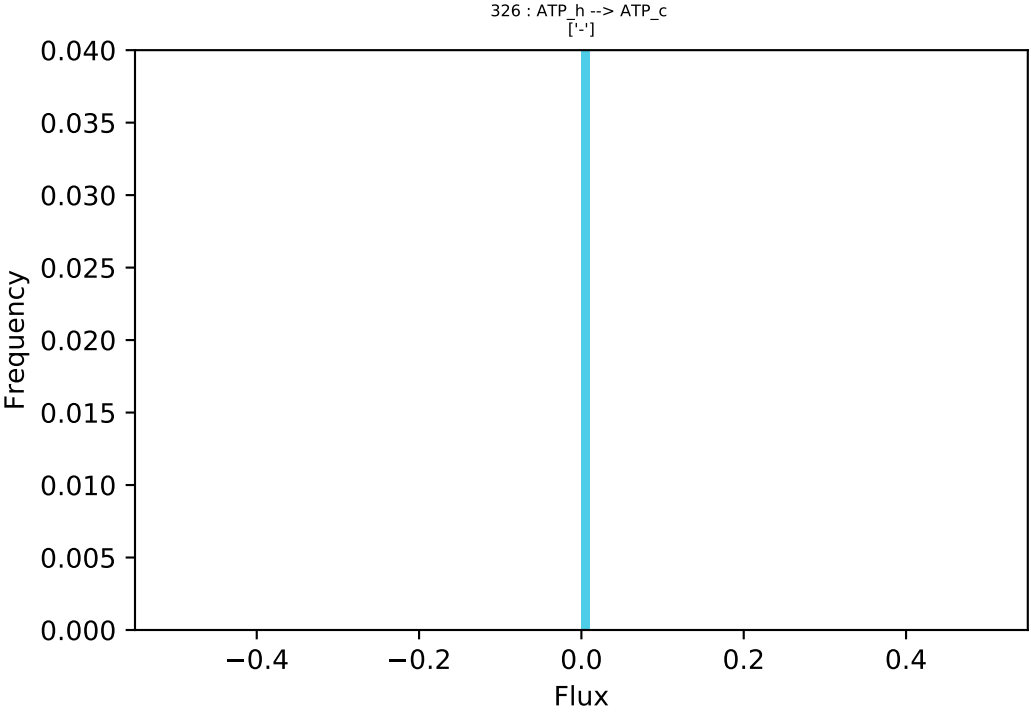

321 : NO2_c --> NO2_h
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0
2
4
6
8
10
Flux

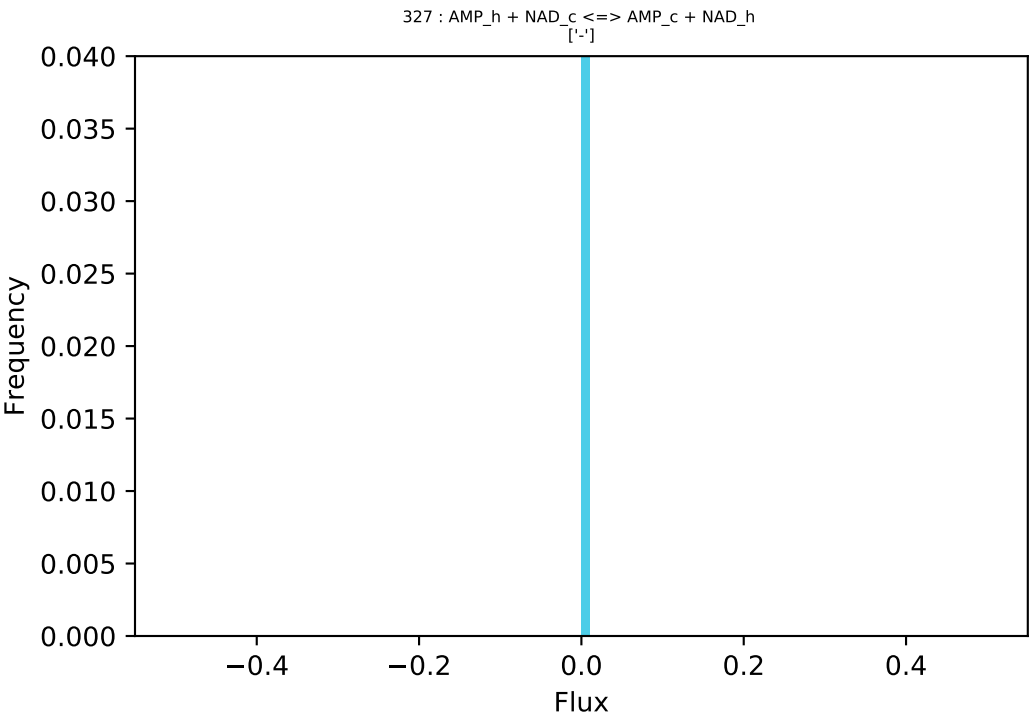

322 : ADP_h + ATP_c + Pi_h --> ADP_c + ATP_h + Pi_c
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
10
15
20
25
30
35
40
Flux

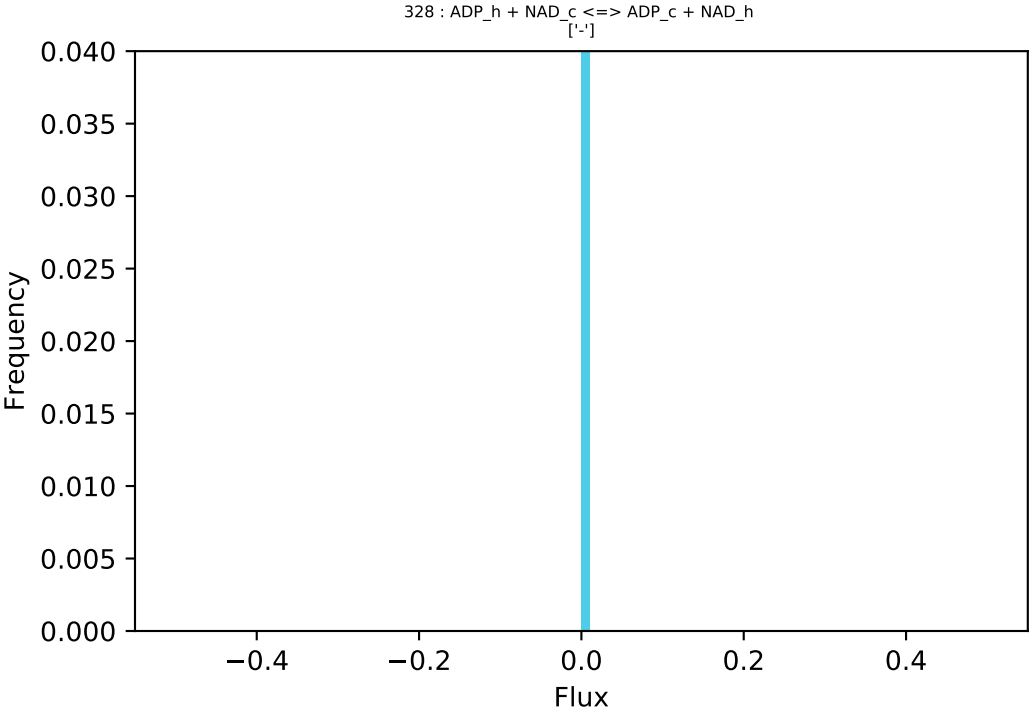

323 : ADP_c + ATP_m + Pi_c --> ADP_m + ATP_c + Pi_m
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
10
15
20
25
30
Flux

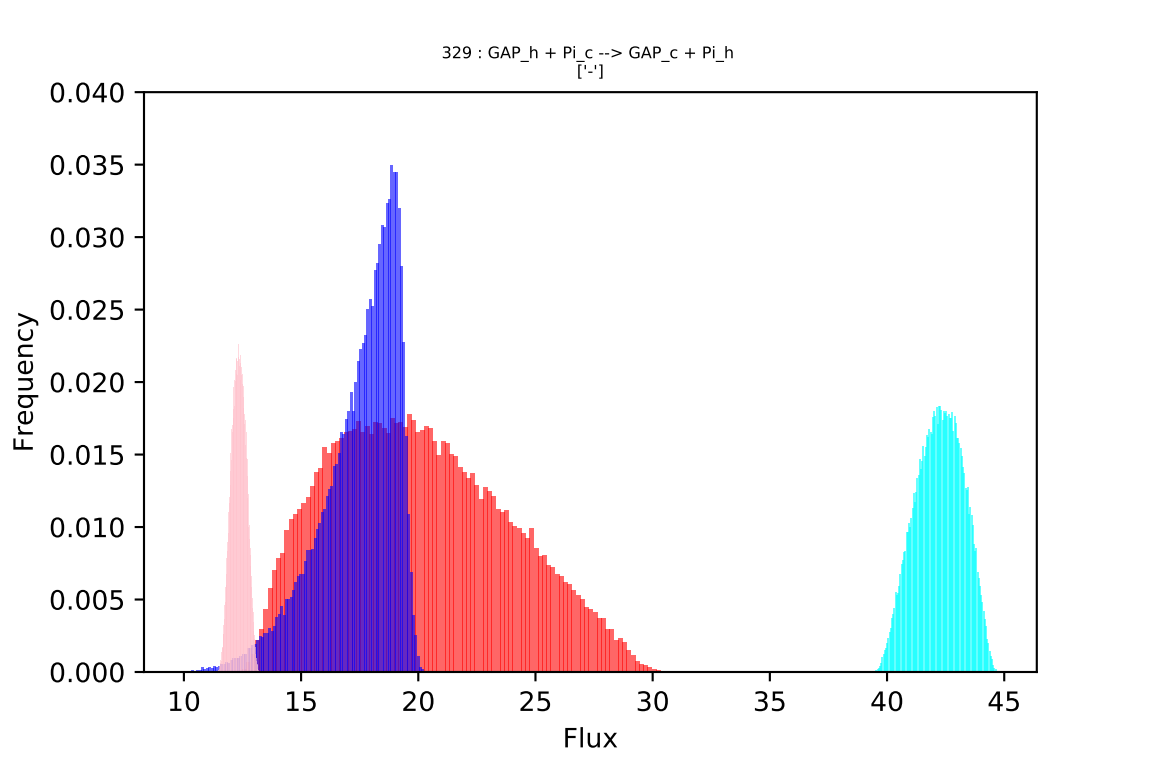

324 : AMP_h --> AMP_c
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

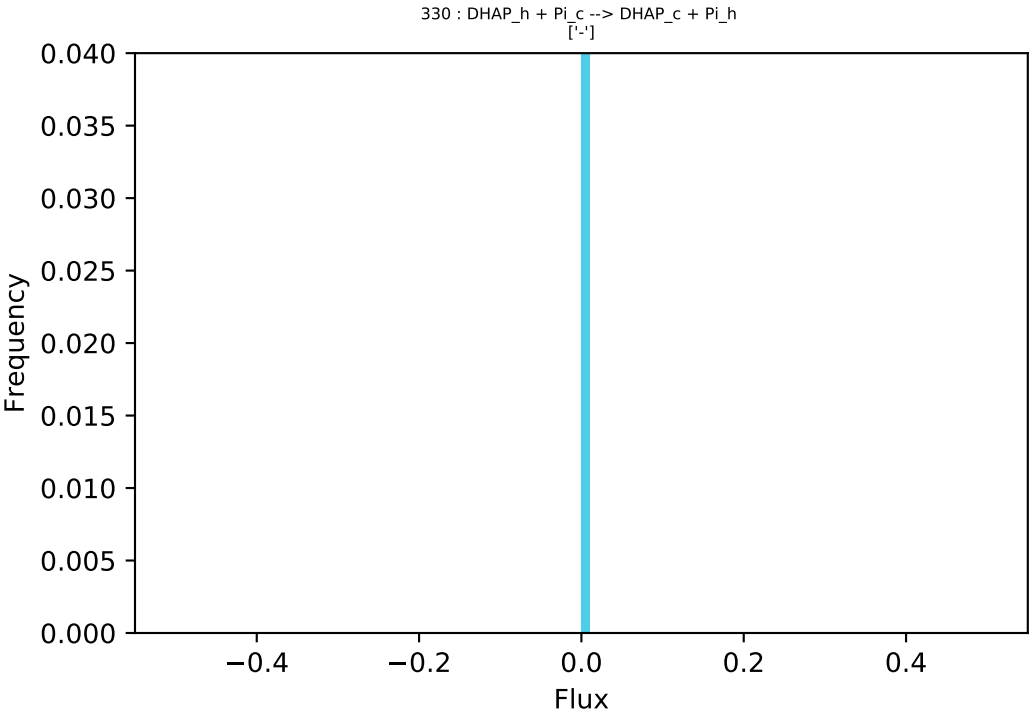

325 : ADP_h --> ADP_c
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

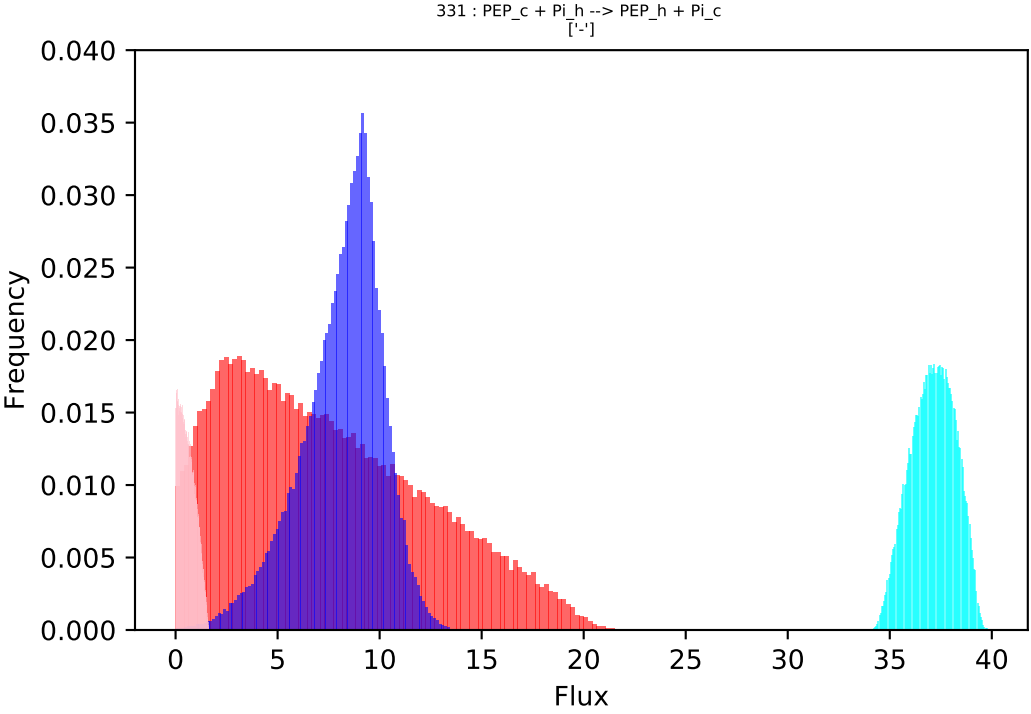

326 : ATP_h --> ATP_c
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

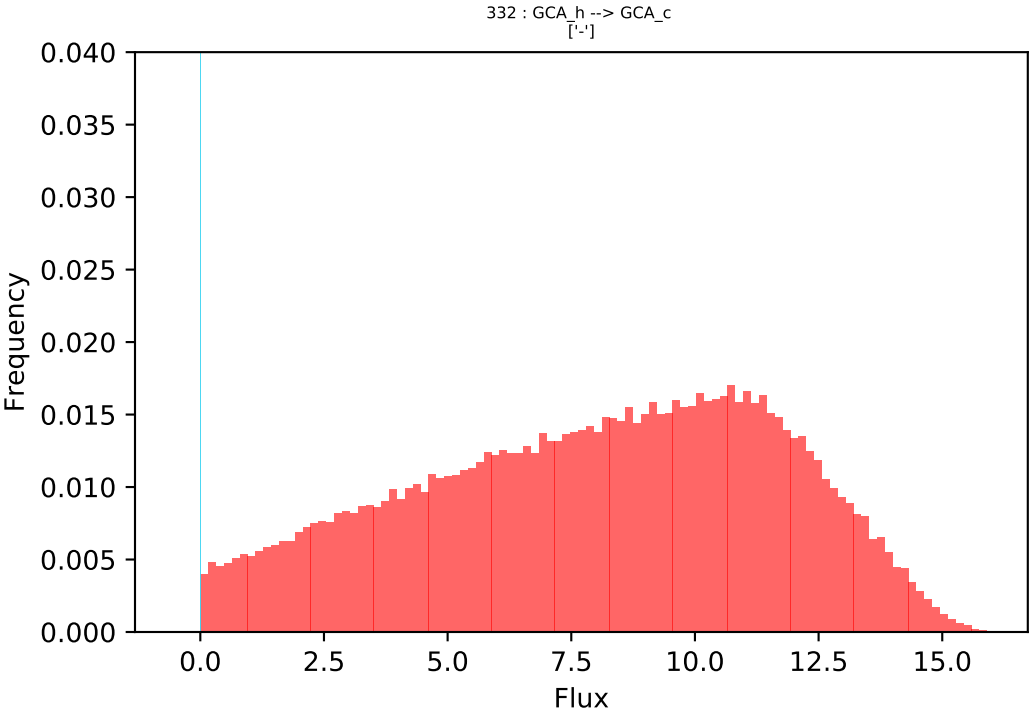

327 : AMP_h + NAD_c <=> AMP_c + NAD_h
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

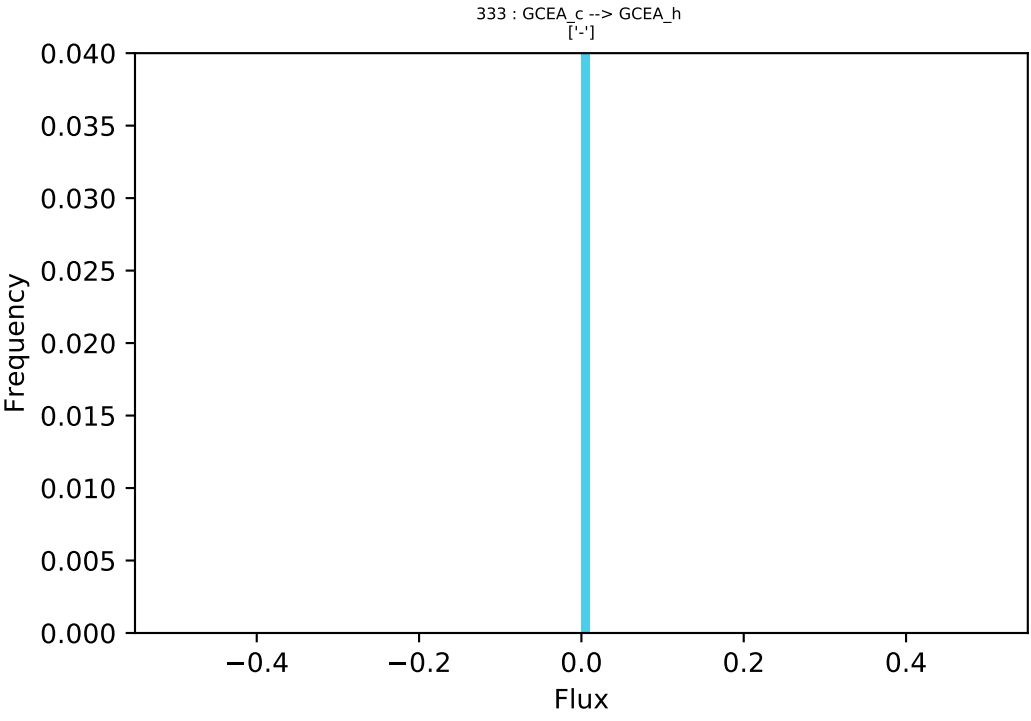

328 : ADP_h + NAD_c <=> ADP_c + NAD_h
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

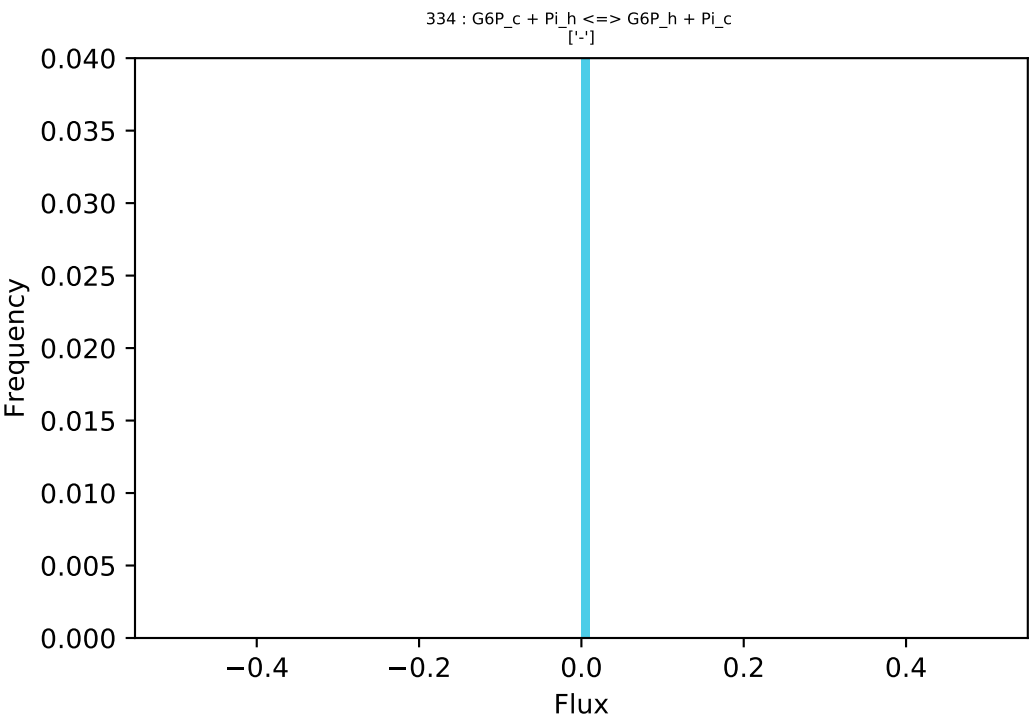

329 : GAP_h + Pi_c --> GAP_c + Pi_h
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
10
15
20
25
30
35
40
45
Flux

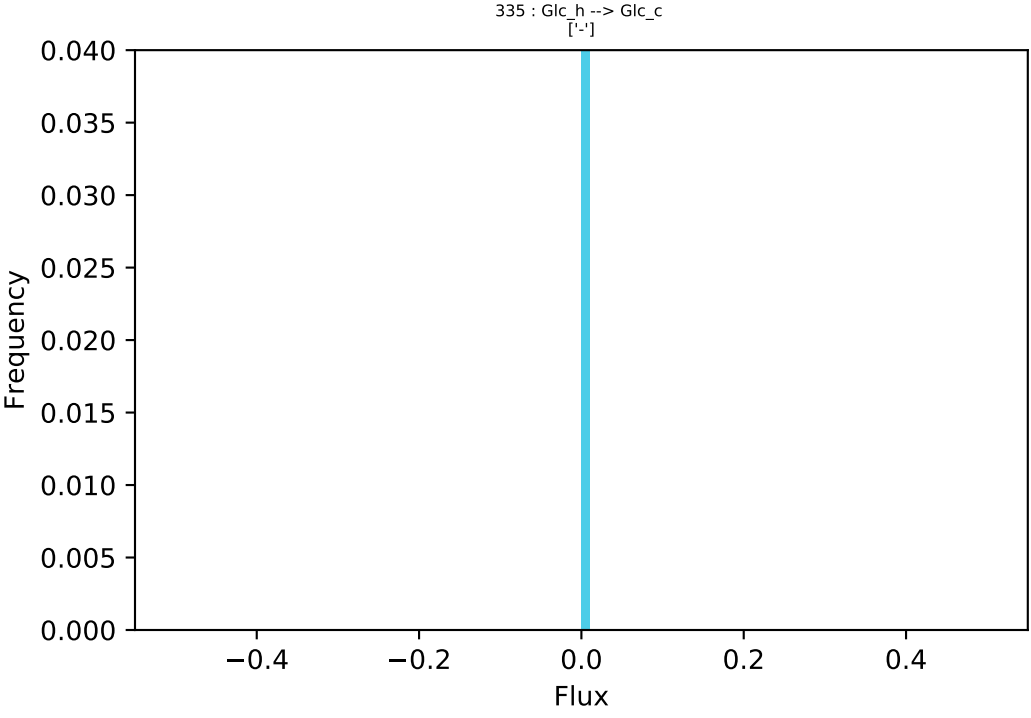

330 : DHAP_h + Pi_c --> DHAP_c + Pi_h
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

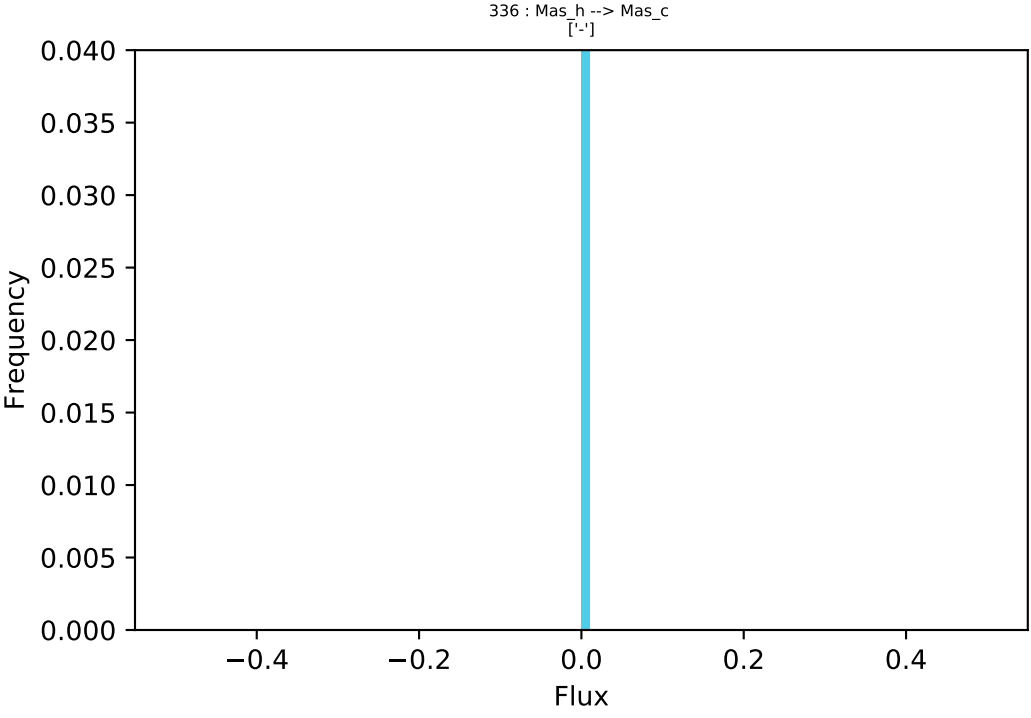

331 : PEP_c + Pi_h --> PEP_h + Pi_c
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0
5
10
15
20
25
30
35
40
Flux

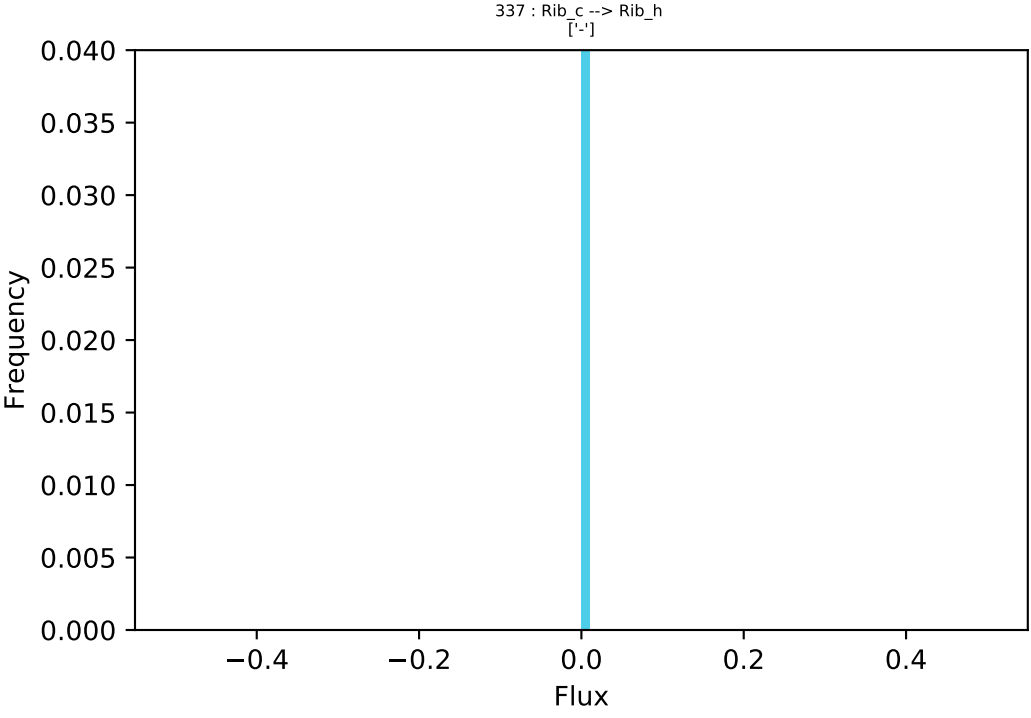

332 : GCA_h --> GCA_c
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0.0
2.5
5.0
7.5
10.0
12.5
15.0
Flux

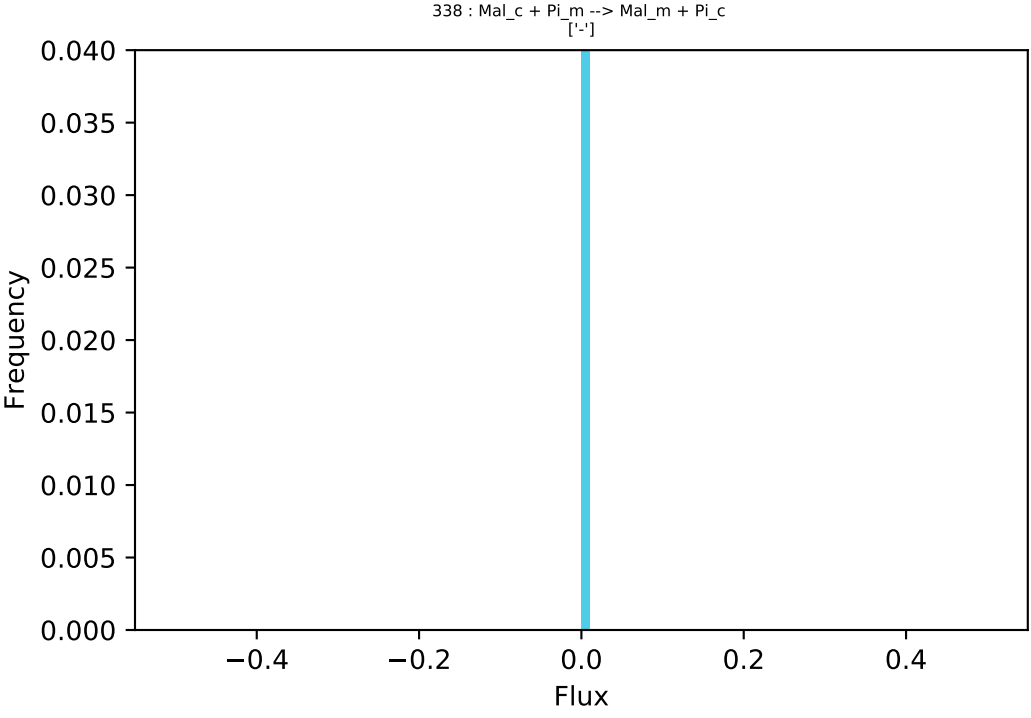

333 : GCEA_c --> GCEA_h
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

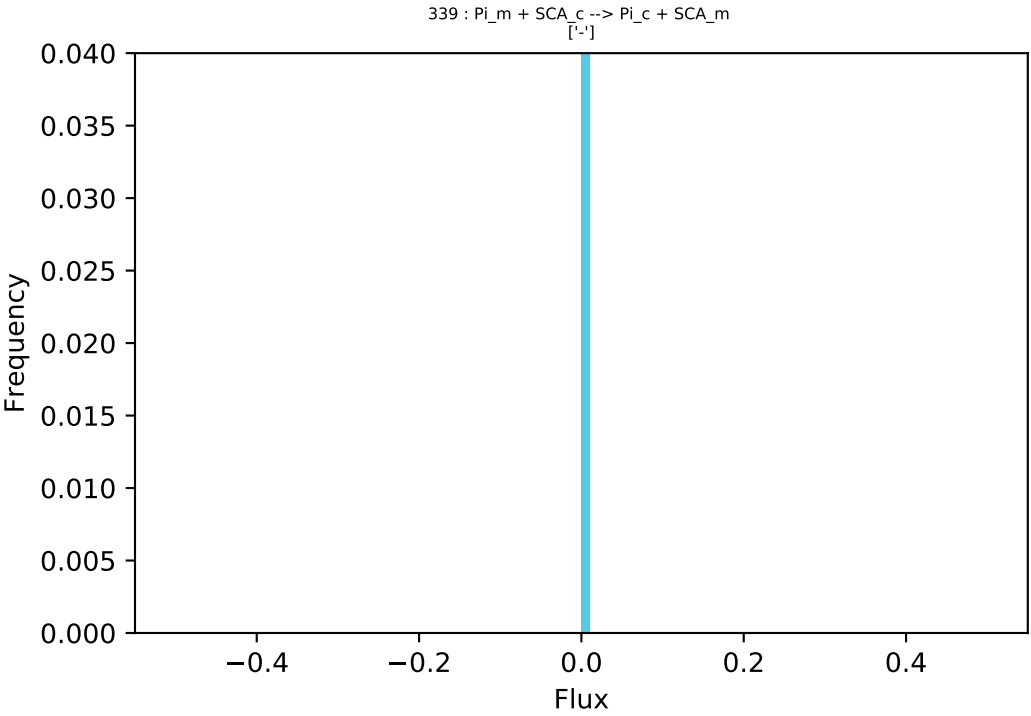

334 : G6P_c + Pi_h <=> G6P_h + Pi_c
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

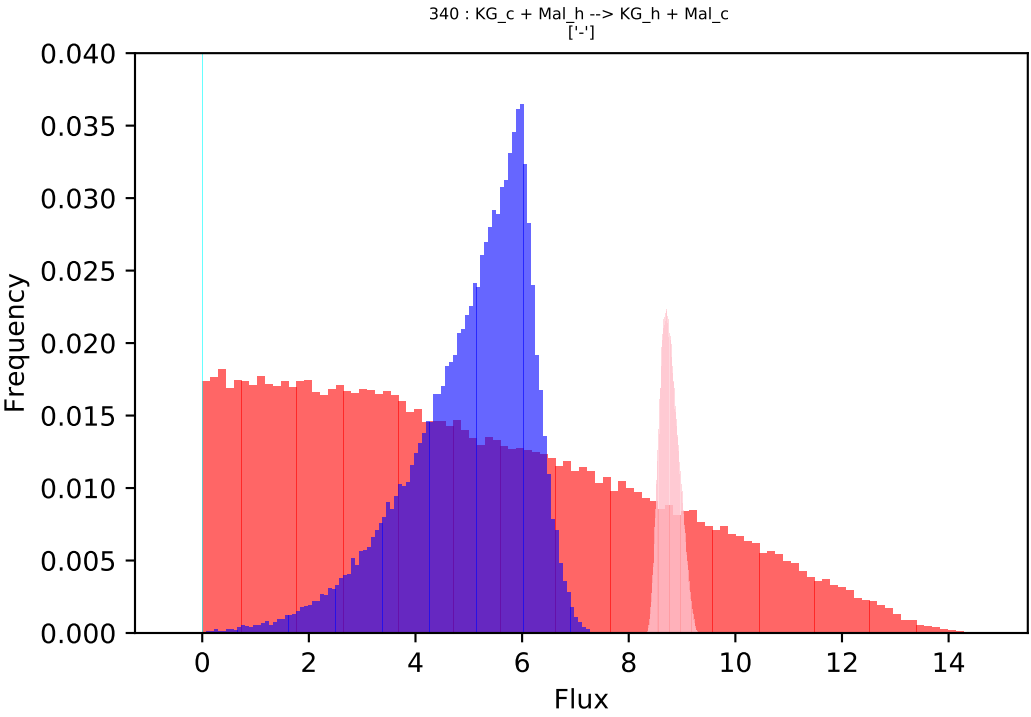

335 : Glc_h --> Glc_c
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

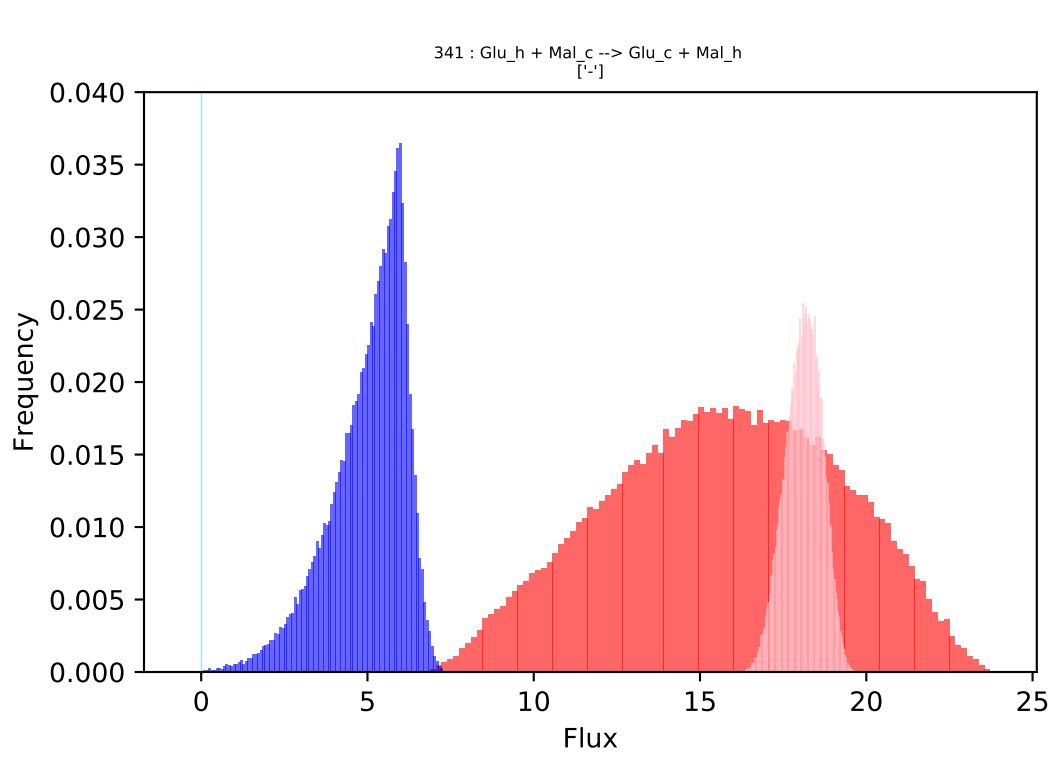

336 : Mas_h --> Mas_c
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

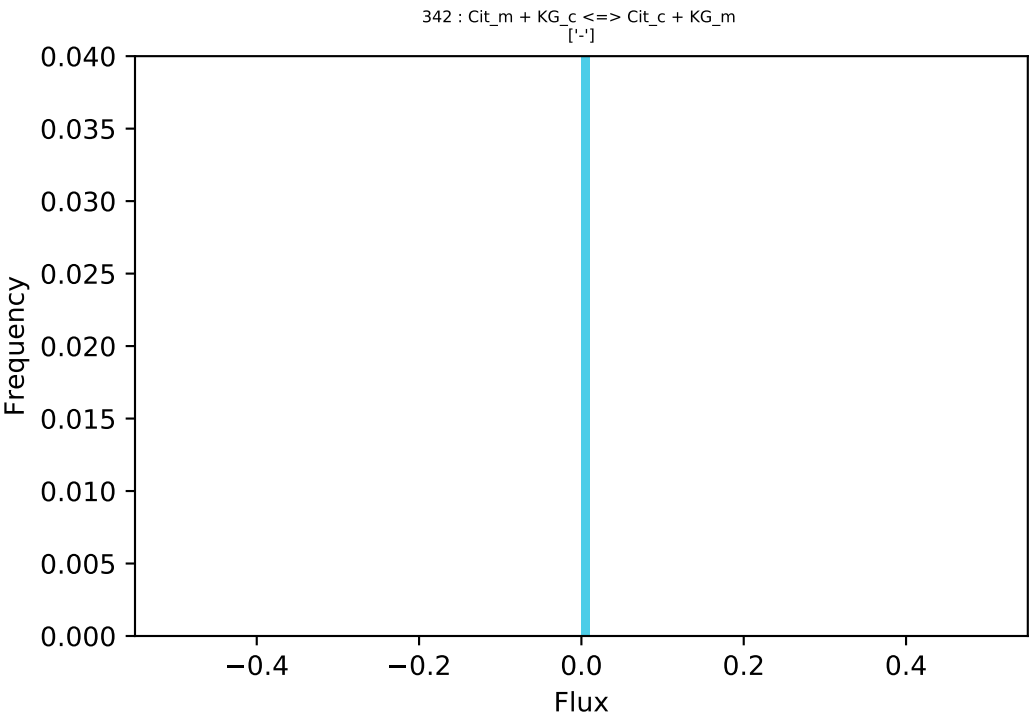

337 : Rib_c --> Rib_h
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

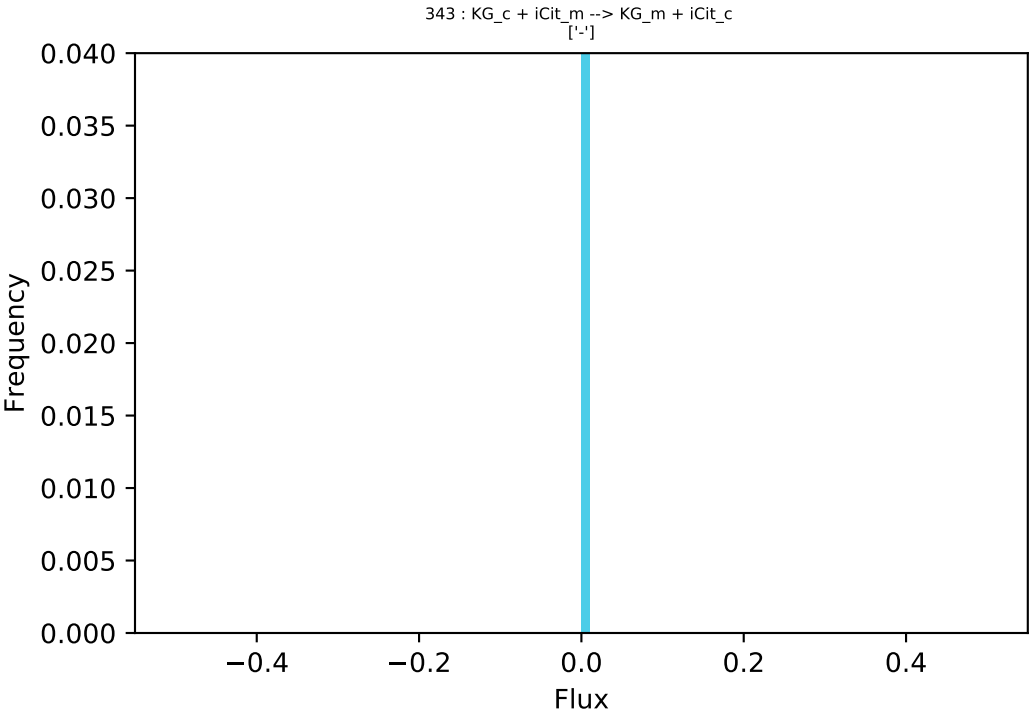

338 : Mal_c + Pi_m --> Mal_m + Pi_c
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

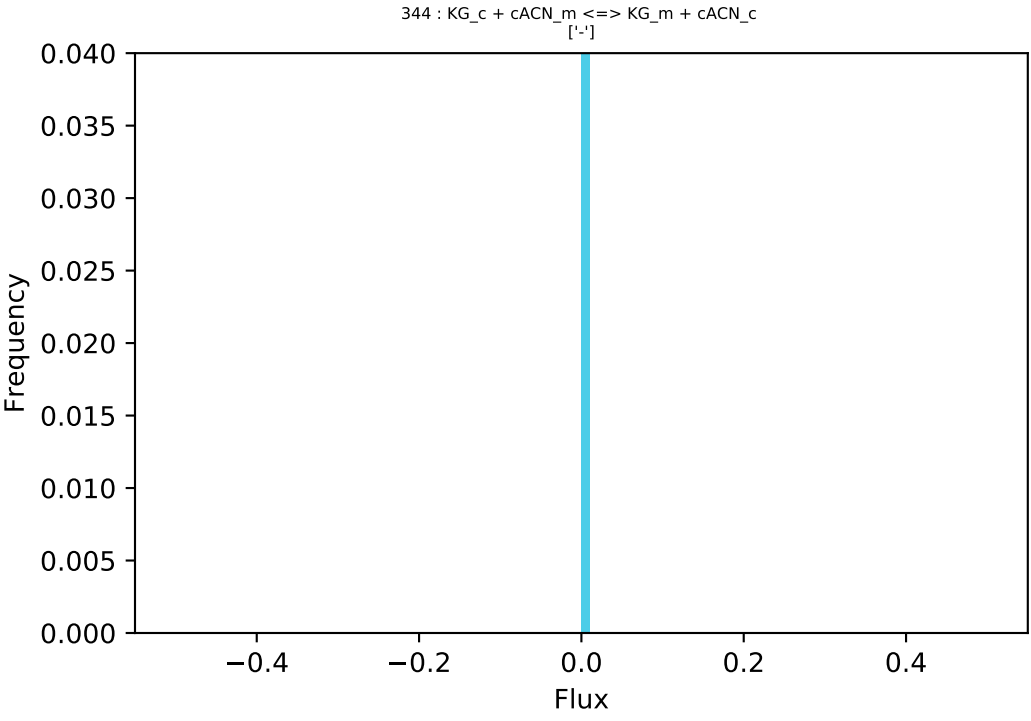

339 : Pi_m + SCA_c --> Pi_c + SCA_m
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

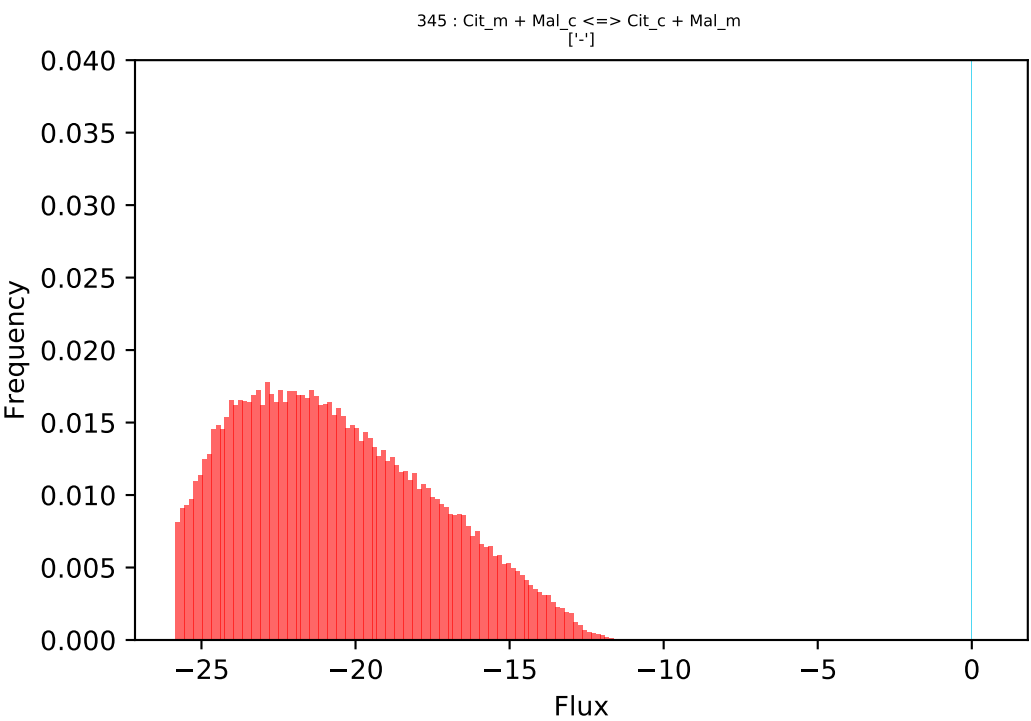

340 : KG_c + Mal_h --> KG_h + Mal_c
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0
2
4
6
8
10
12
14
Flux

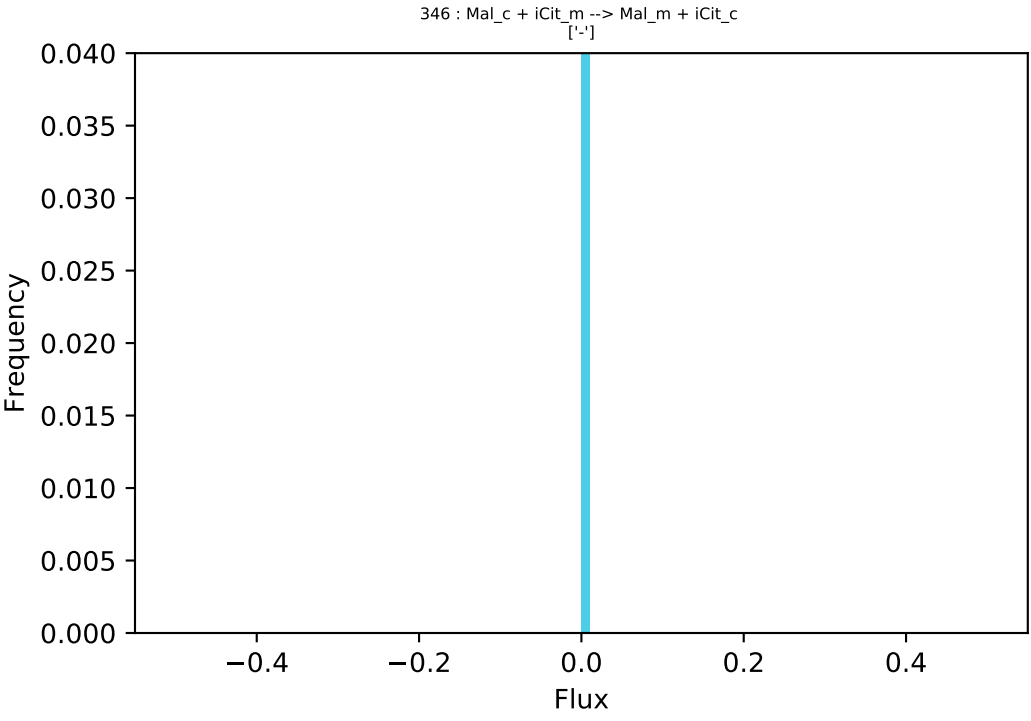

341 : Glu_h + Mal_c --> Glu_c + Mal_h
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0
5
10
15
20
25
Flux

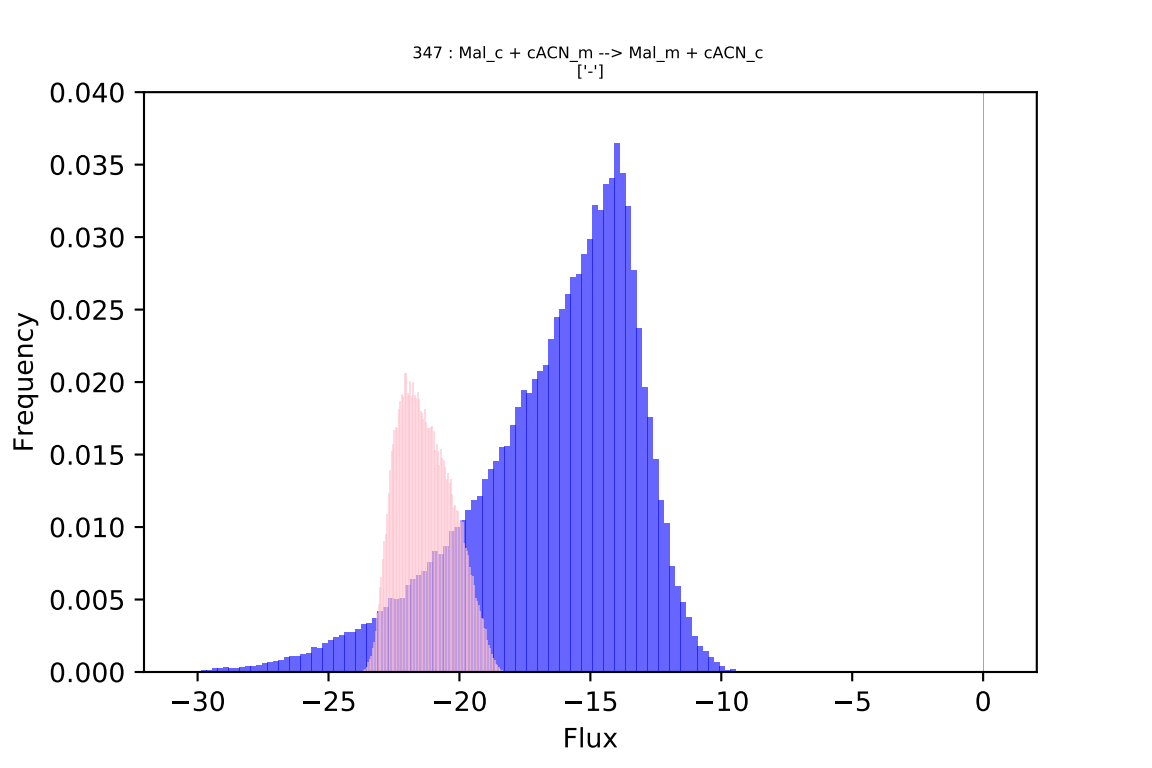

342 : Cit_m + KG_c <=> Cit_c + KG_m
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

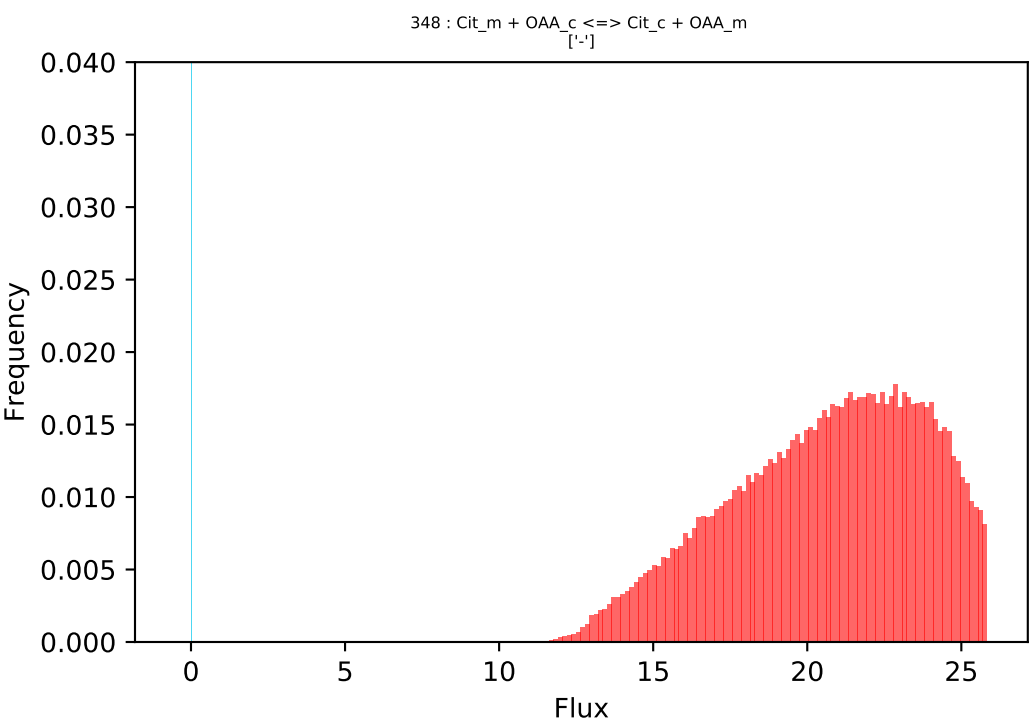

343 : KG_c + iCit_m --> KG_m + iCit_c
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

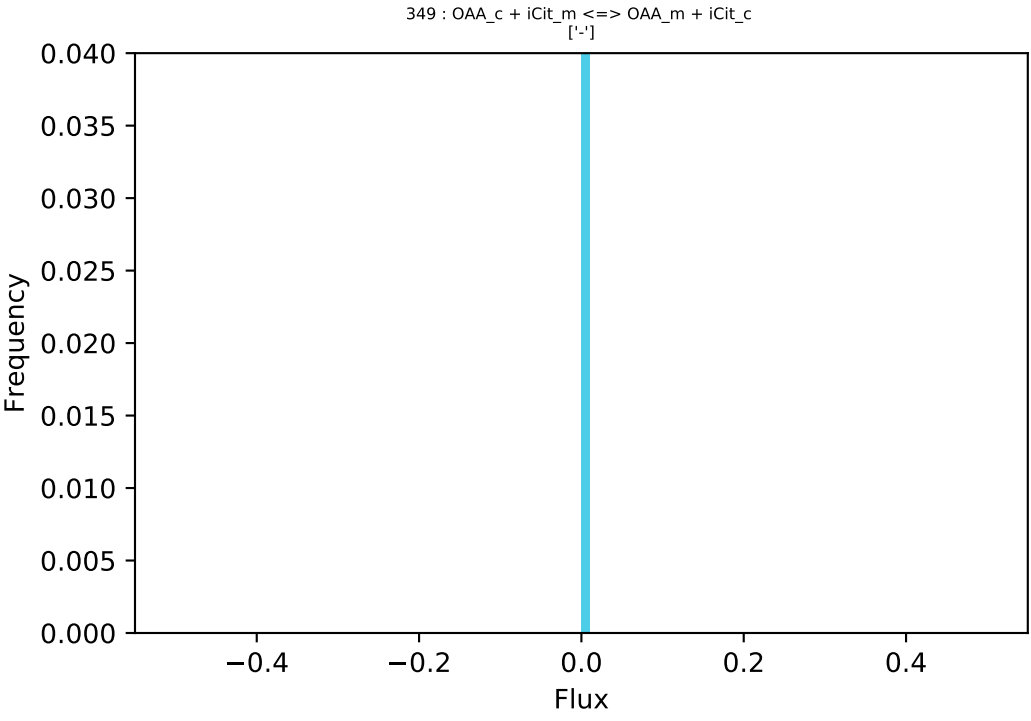

344 : KG_c + cACN_m <=> KG_m + cACN_c
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

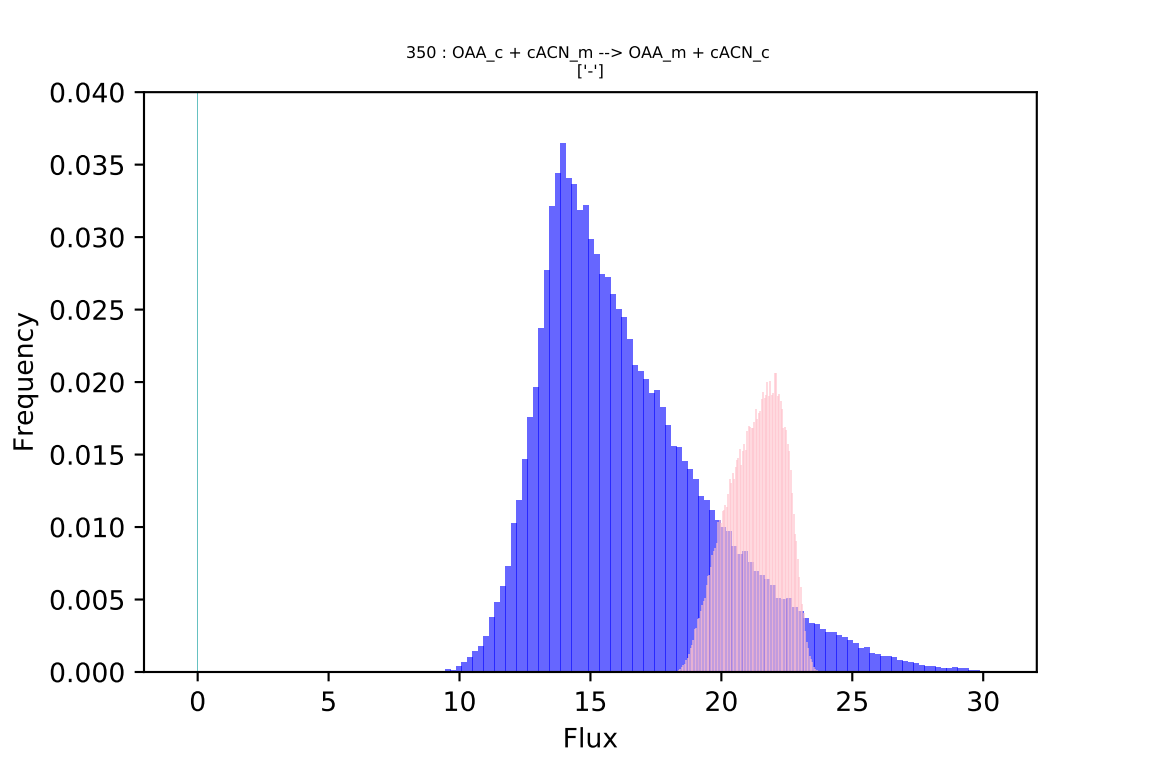

345 : Cit_m + Mal_c <=> Cit_c + Mal_m
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−25
−20
−15
−10
−5
0
Flux

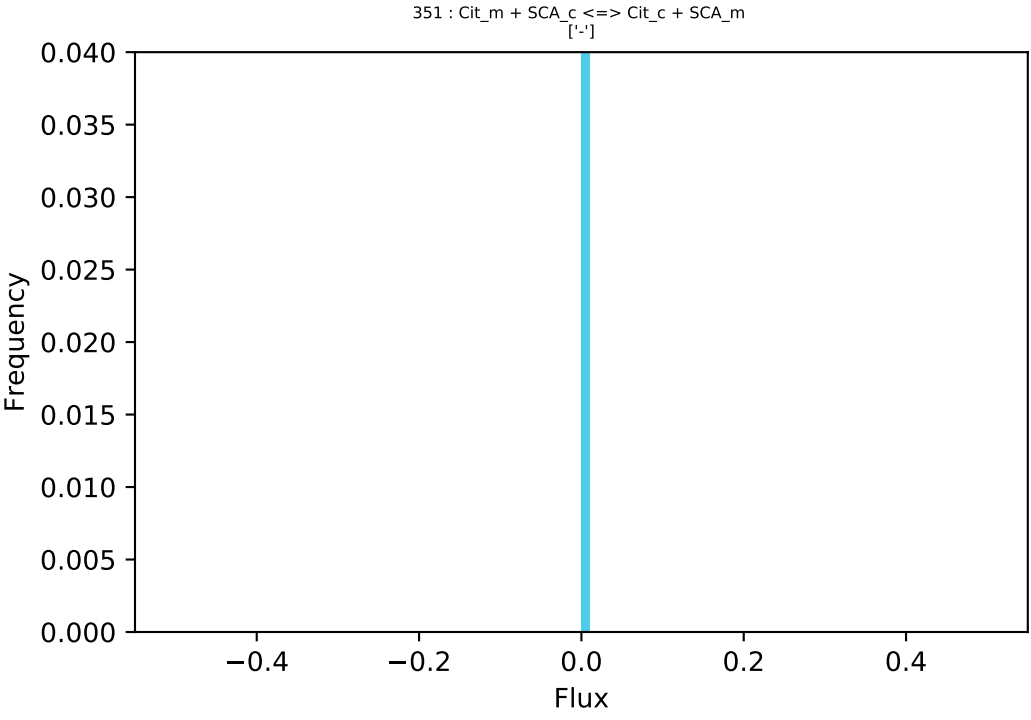

346 : Mal_c + iCit_m --> Mal_m + iCit_c
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

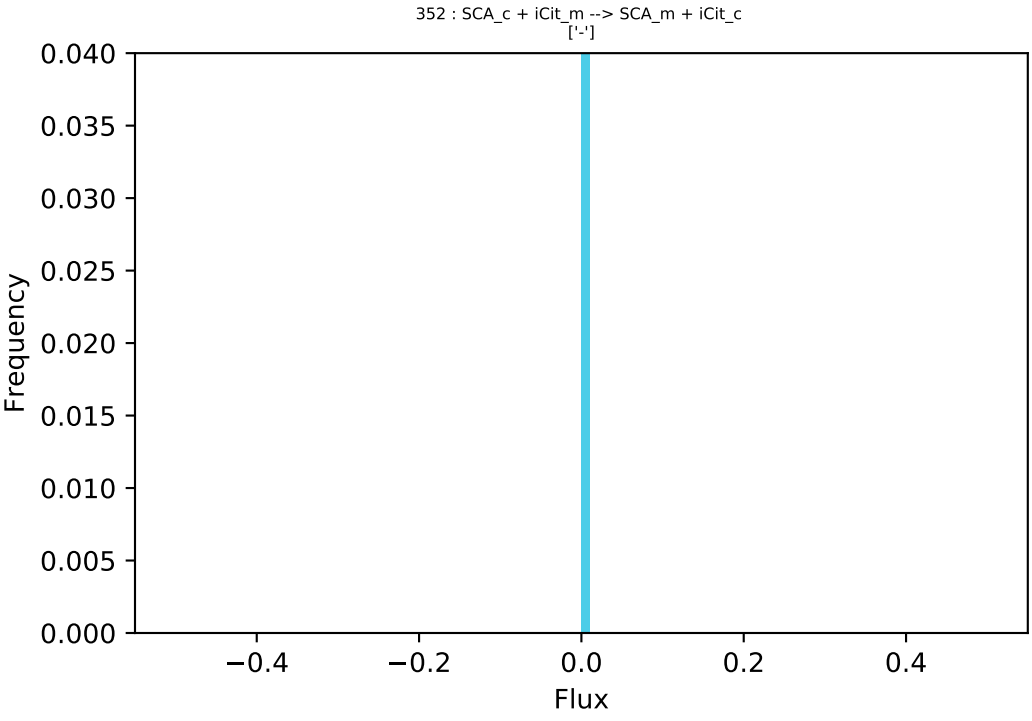

347 : Mal_c + cACN_m --> Mal_m + cACN_c
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−30
−25
−20
−15
−10
−5
0
Flux

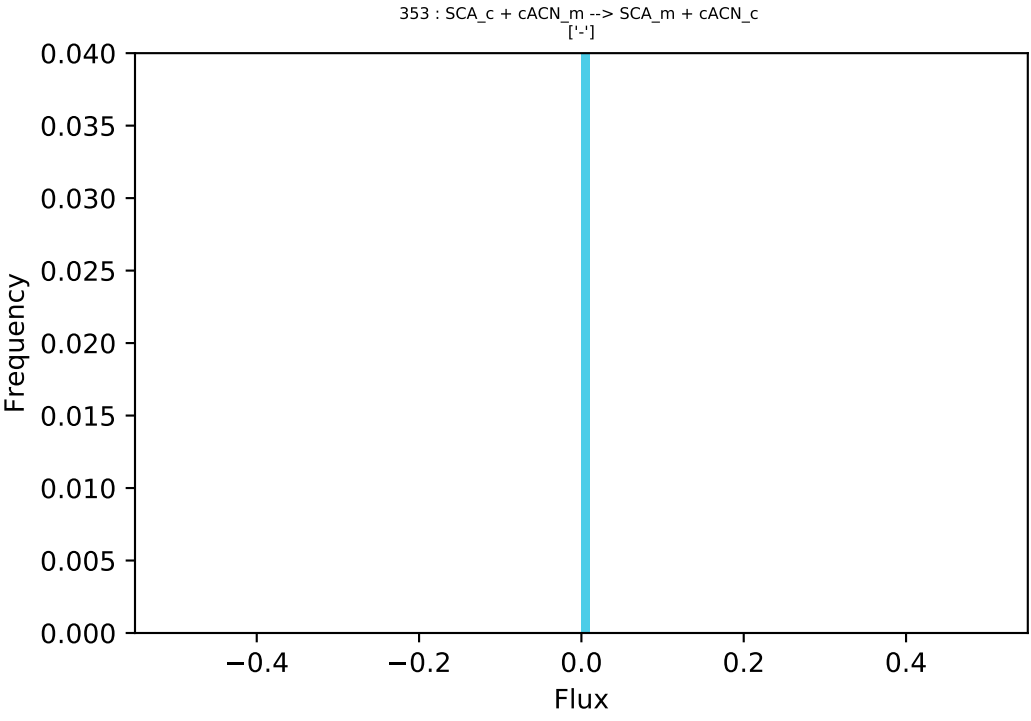

348 : Cit_m + OAA_c <=> Cit_c + OAA_m
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0
5
10
15
20
25
Flux

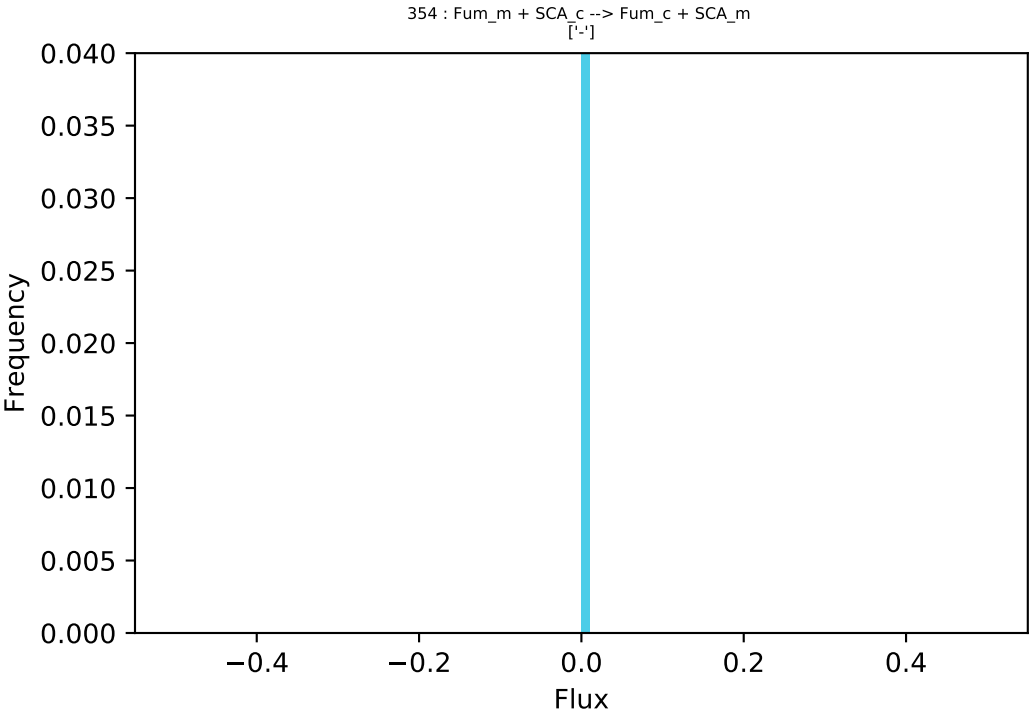

349 : OAA_c + iCit_m <=> OAA_m + iCit_c
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

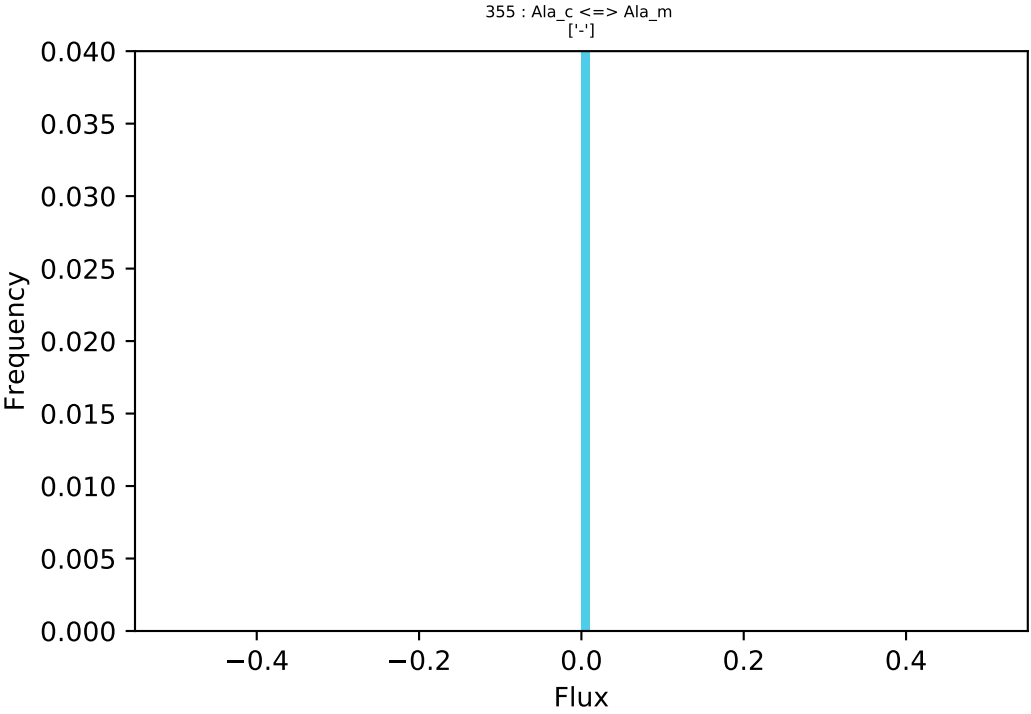

350 : OAA_c + cACN_m --> OAA_m + cACN_c
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0
5
10
15
20
25
30
Flux

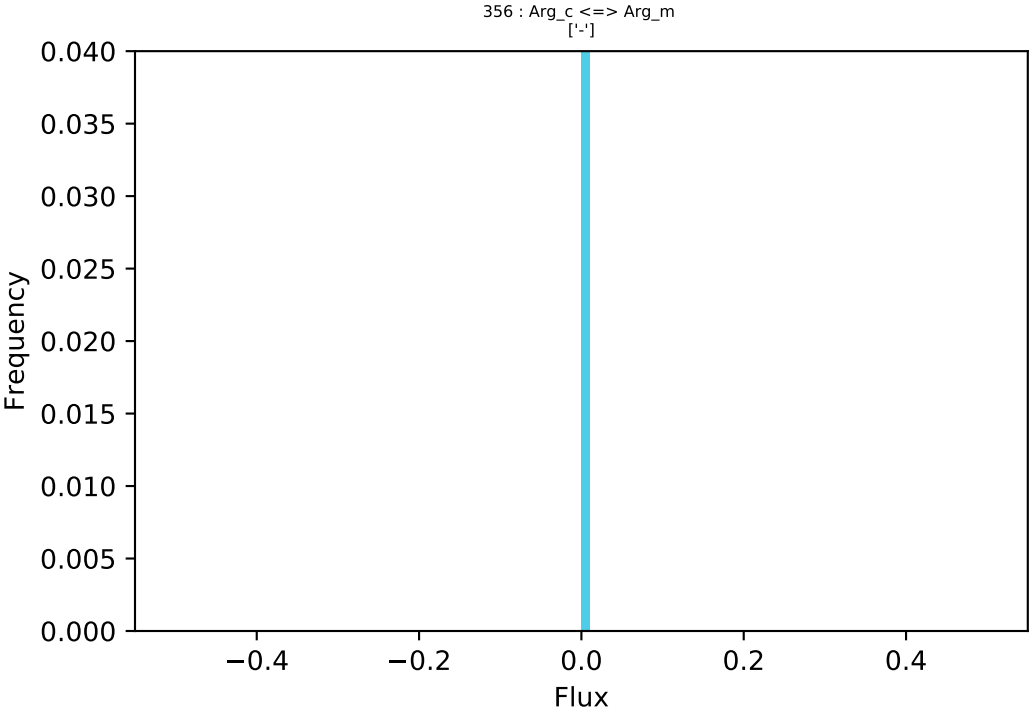

351 : Cit_m + SCA_c <=> Cit_c + SCA_m
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

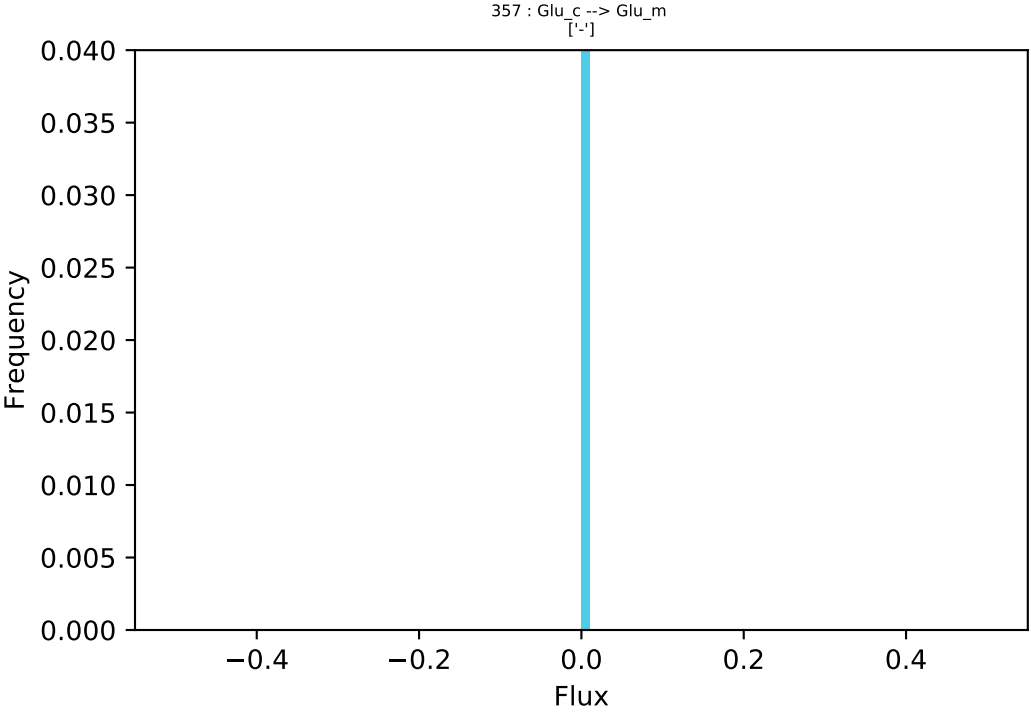

352 : SCA_c + iCit_m --> SCA_m + iCit_c
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

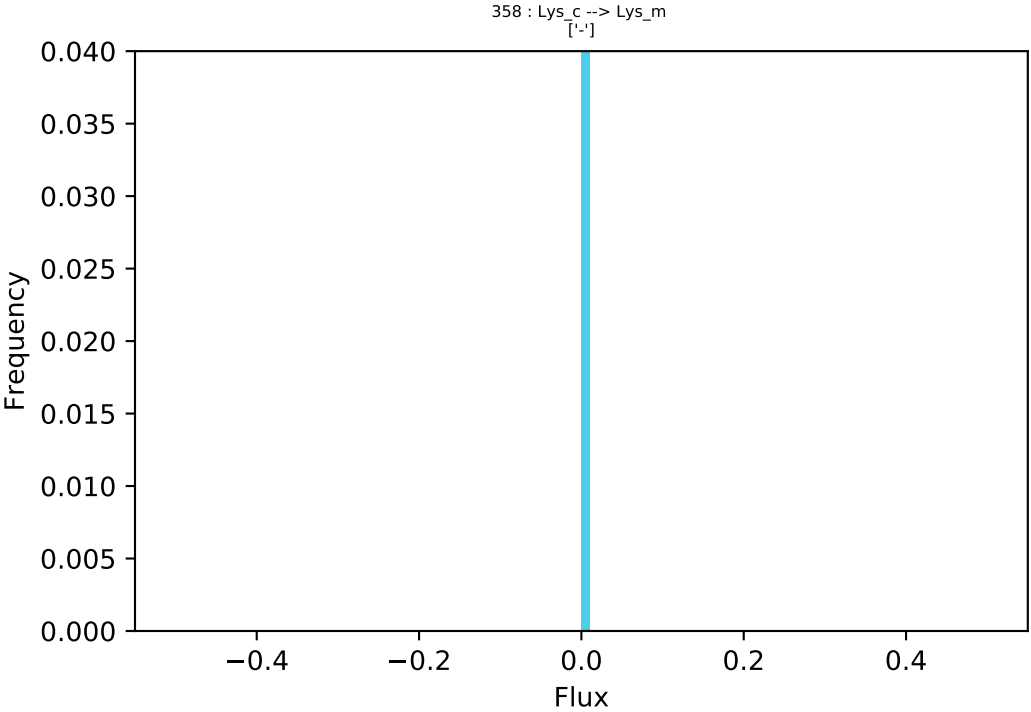

353 : SCA_c + cACN_m --> SCA_m + cACN_c
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

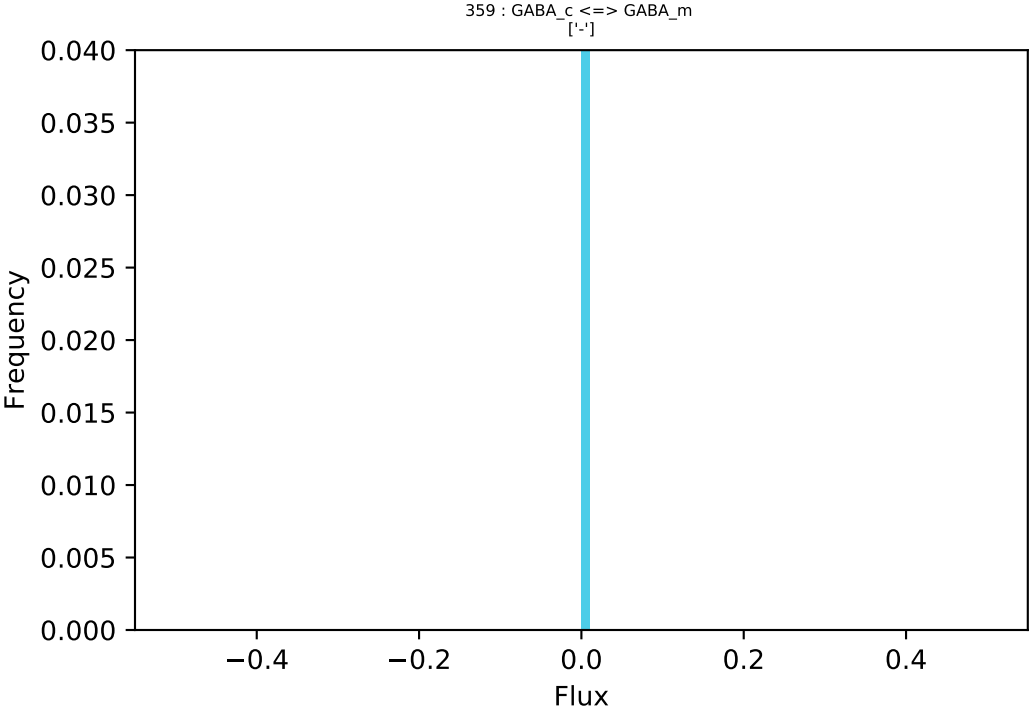

354 : Fum_m + SCA_c --> Fum_c + SCA_m
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

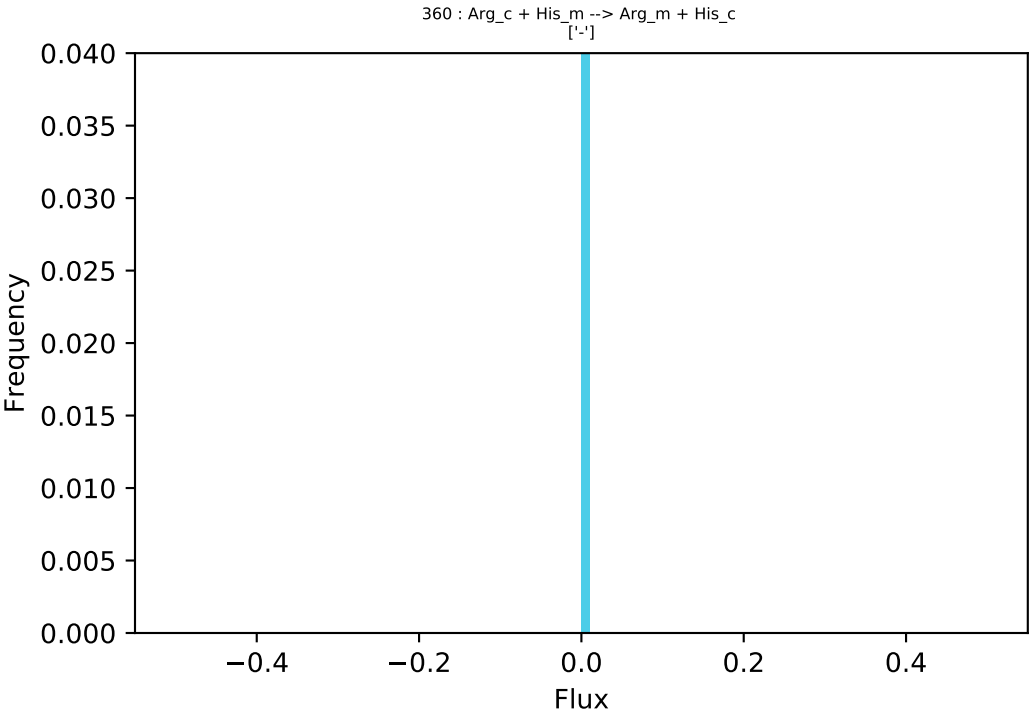

355 : Ala_c <=> Ala_m
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

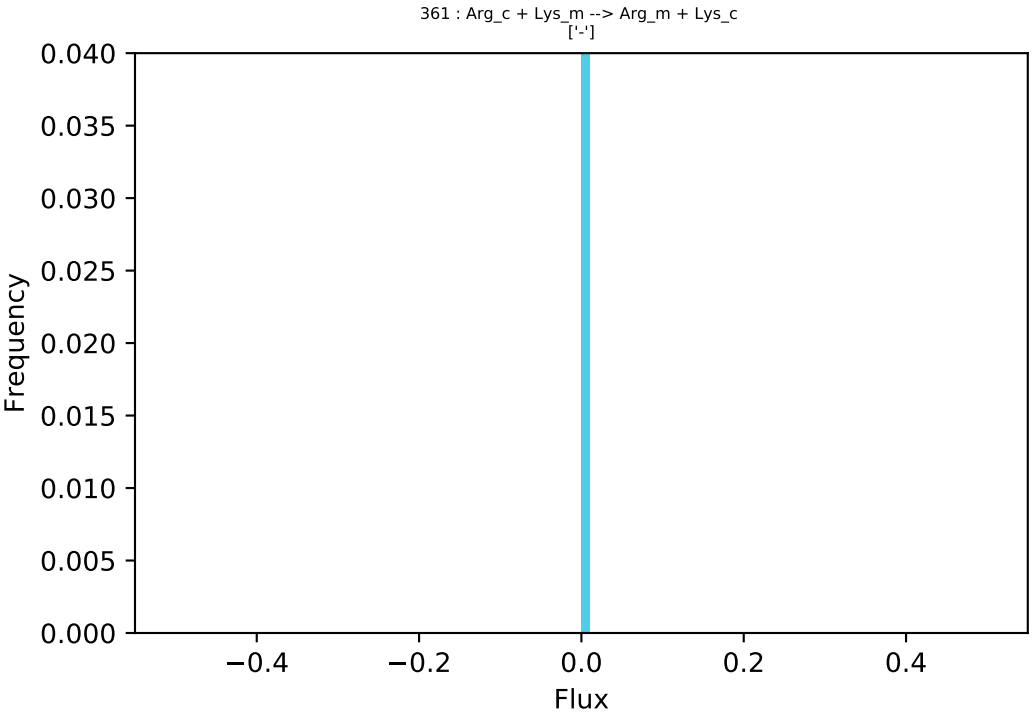

356 : Arg_c <=> Arg_m
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

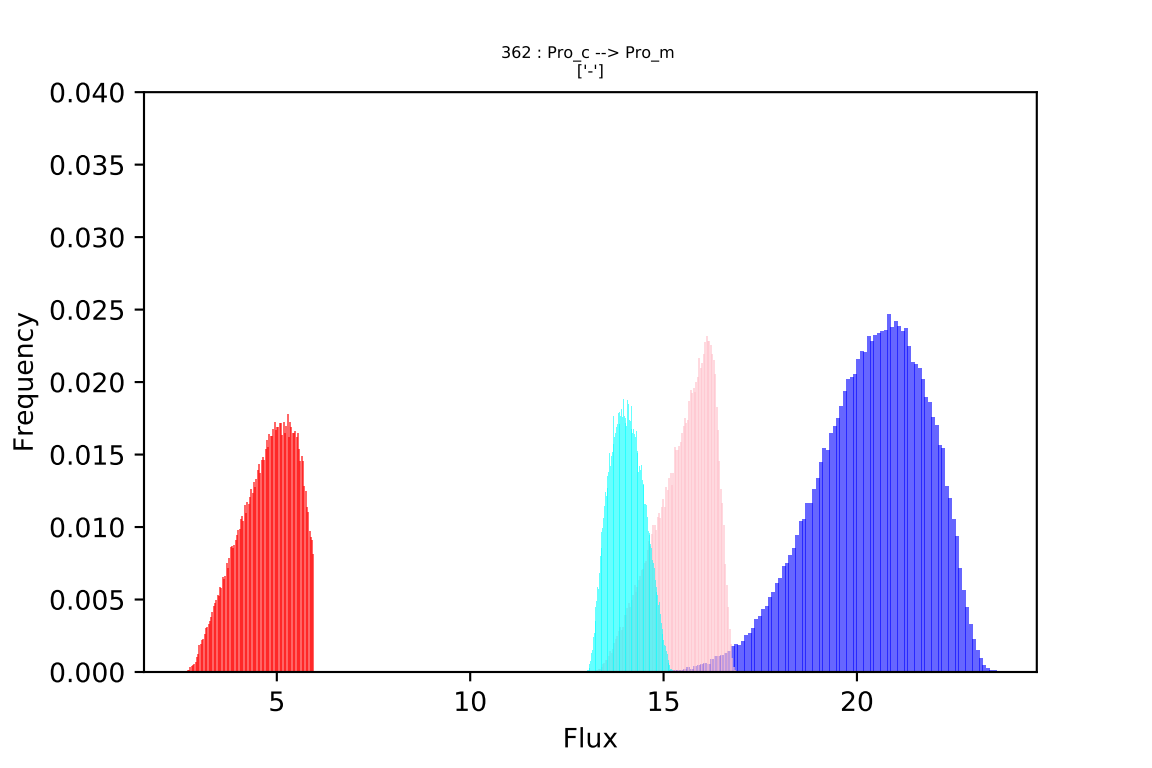

357 : Glu_c --> Glu_m
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

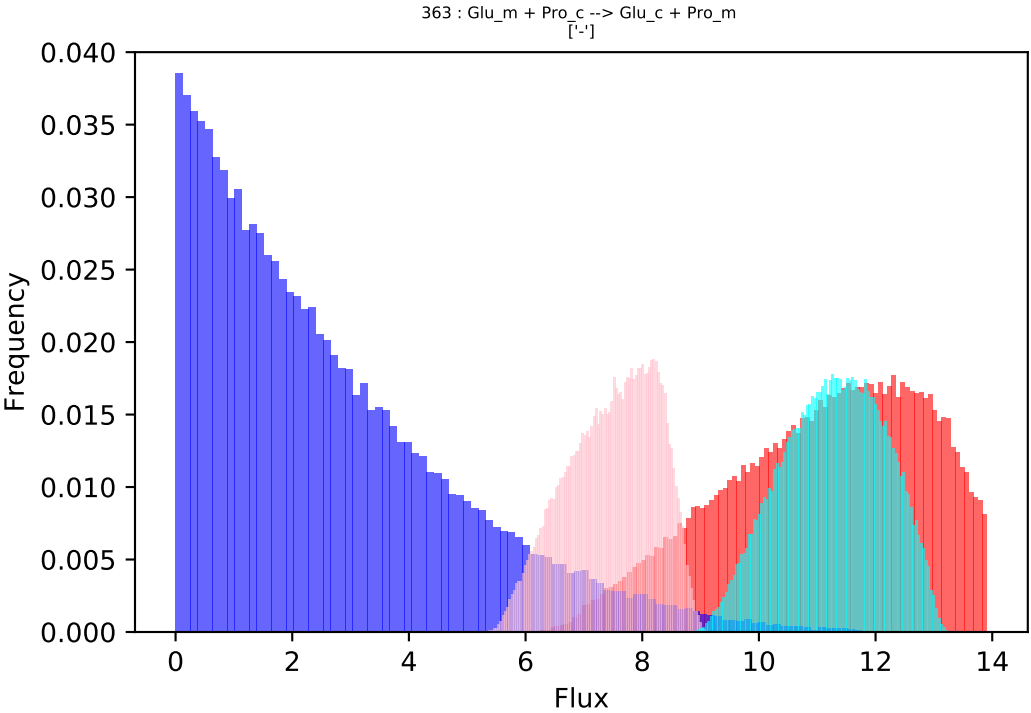

358 : Lys_c --> Lys_m
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

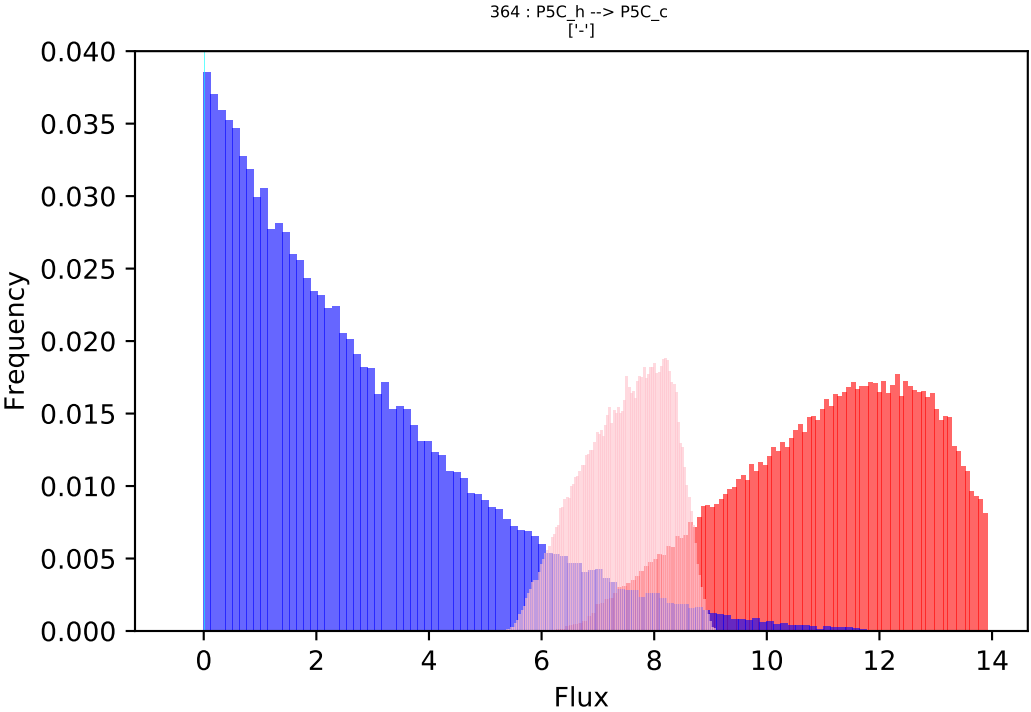

359 : GABA_c <=> GABA_m
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

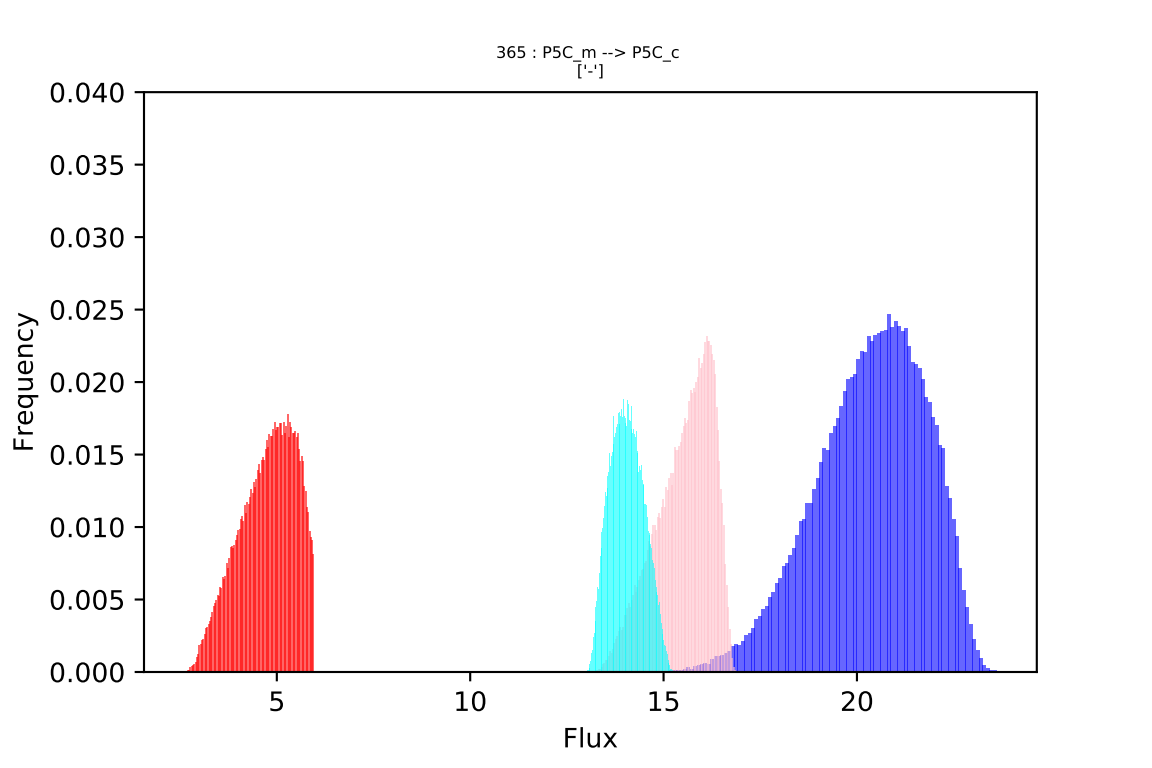

360 : Arg_c + His_m --> Arg_m + His_c
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

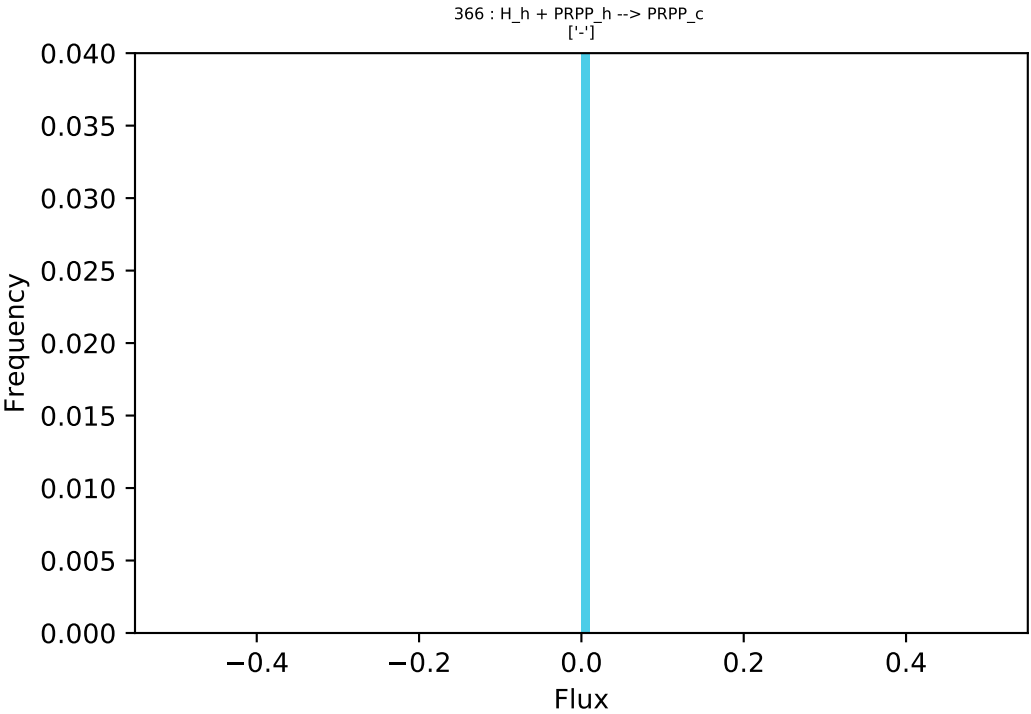

361 : Arg_c + Lys_m --> Arg_m + Lys_c
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

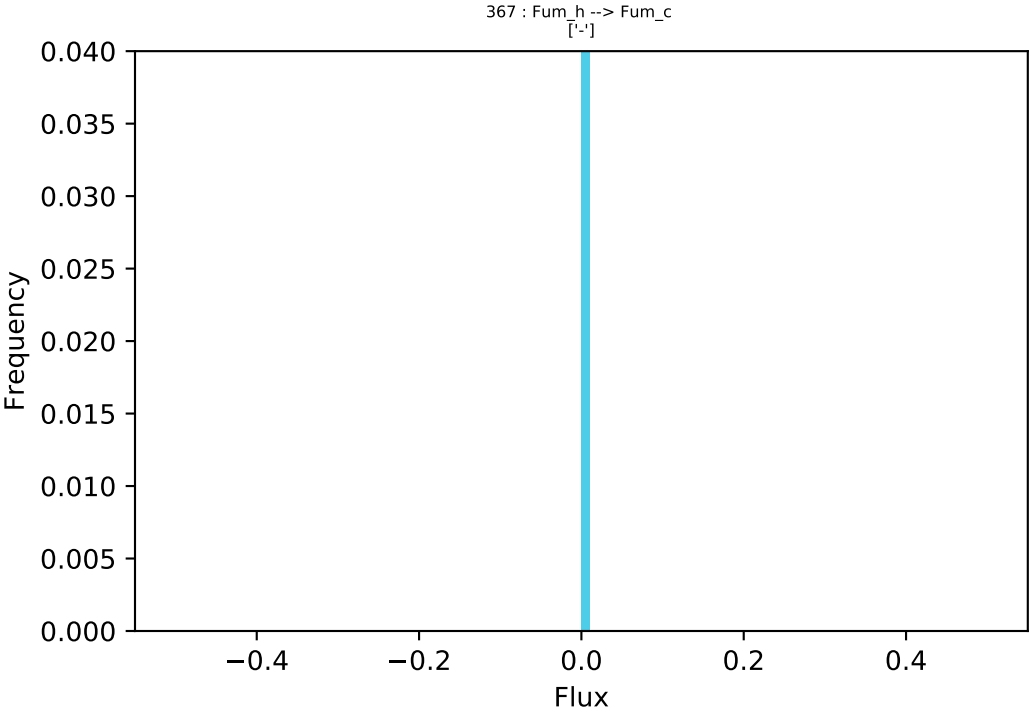

362 : Pro_c --> Pro_m
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
5
10
15
20
Flux

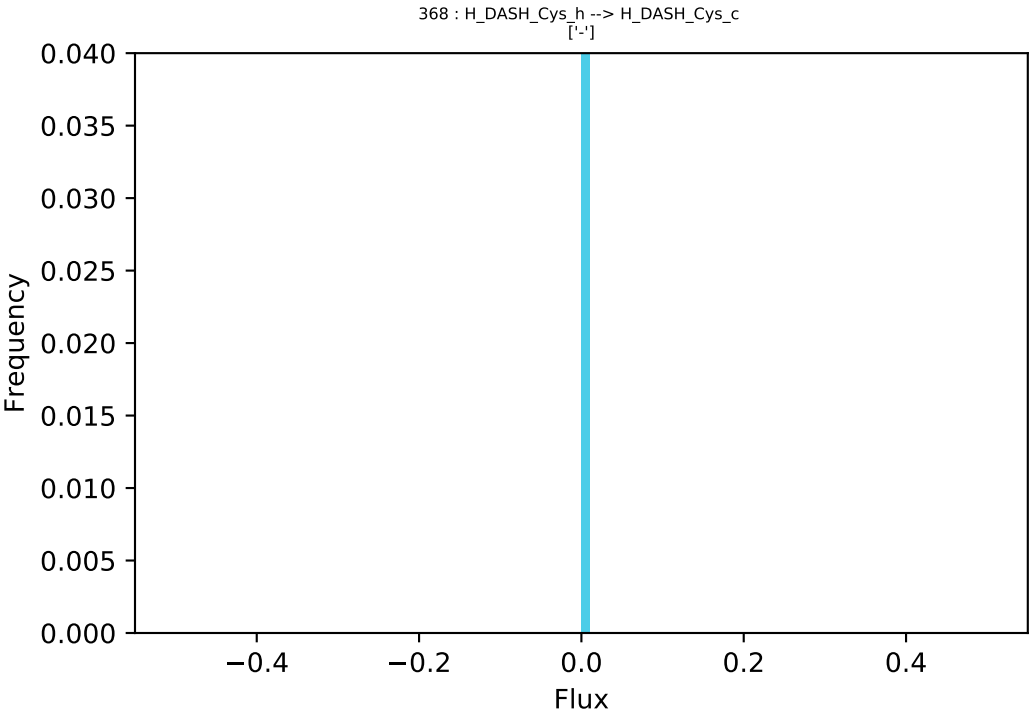

363 : Glu_m + Pro_c --> Glu_c + Pro_m
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0
2
4
6
8
10
12
14
Flux

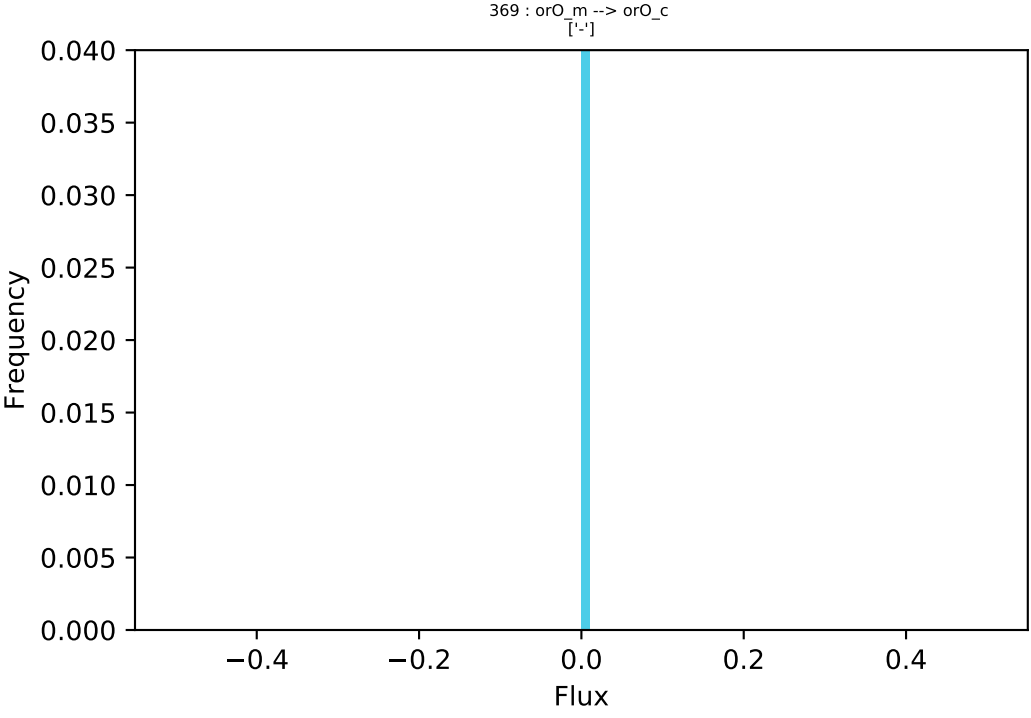

364 : P5C_h --> P5C_c
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0
2
4
6
8
10
12
14
Flux

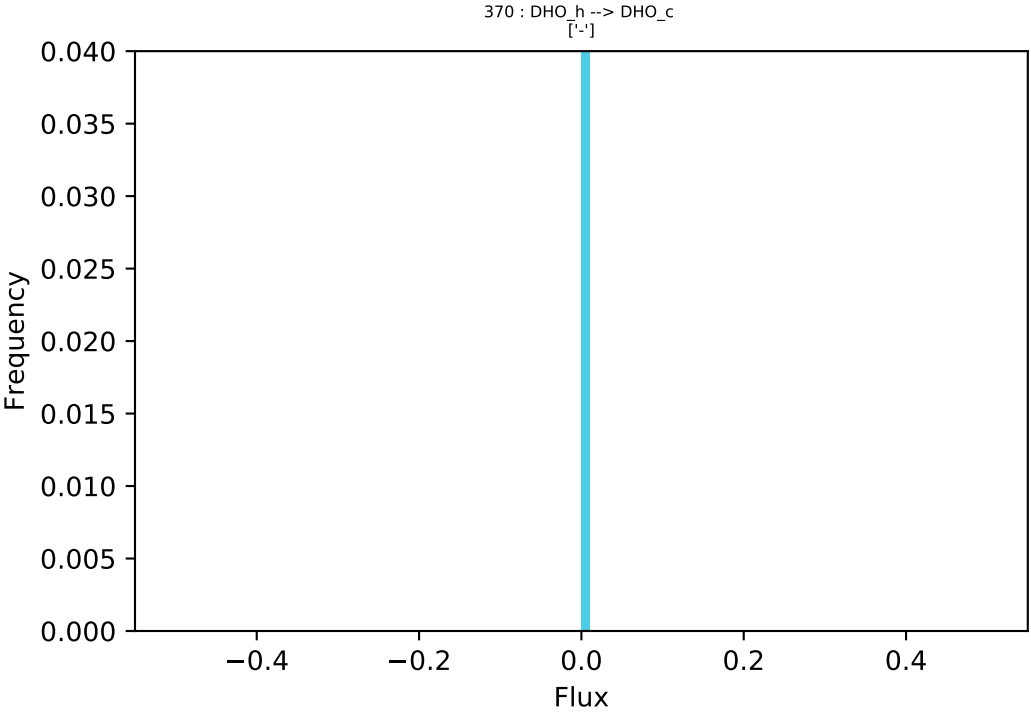

365 : P5C_m --> P5C_c
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
5
10
15
20
Flux

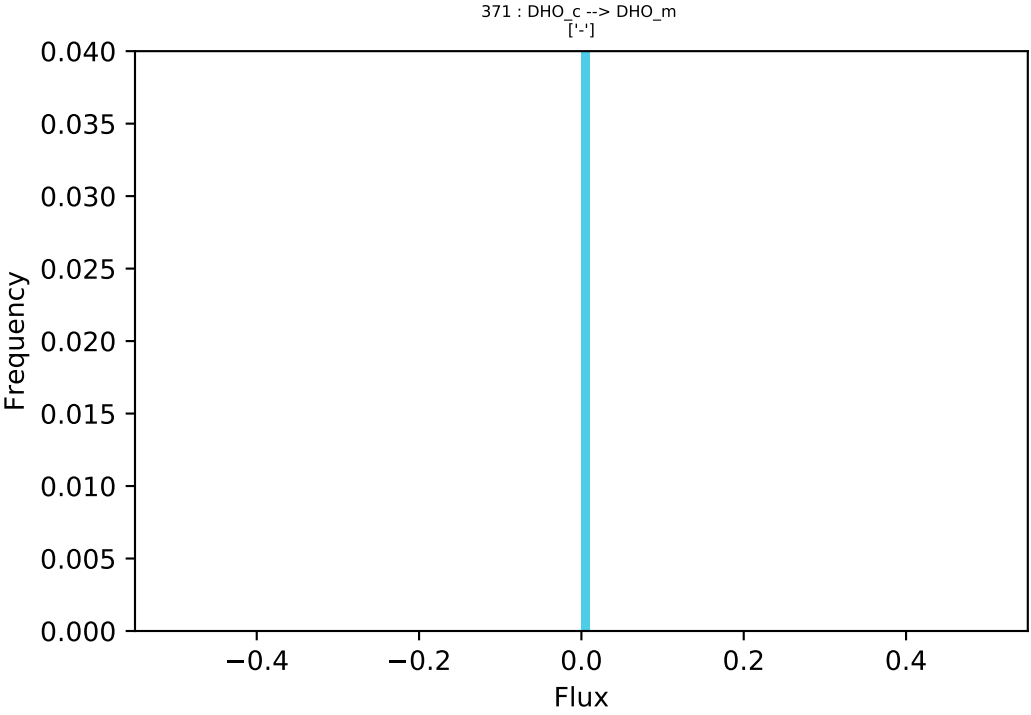

366 : H_h + PRPP_h --> PRPP_c
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

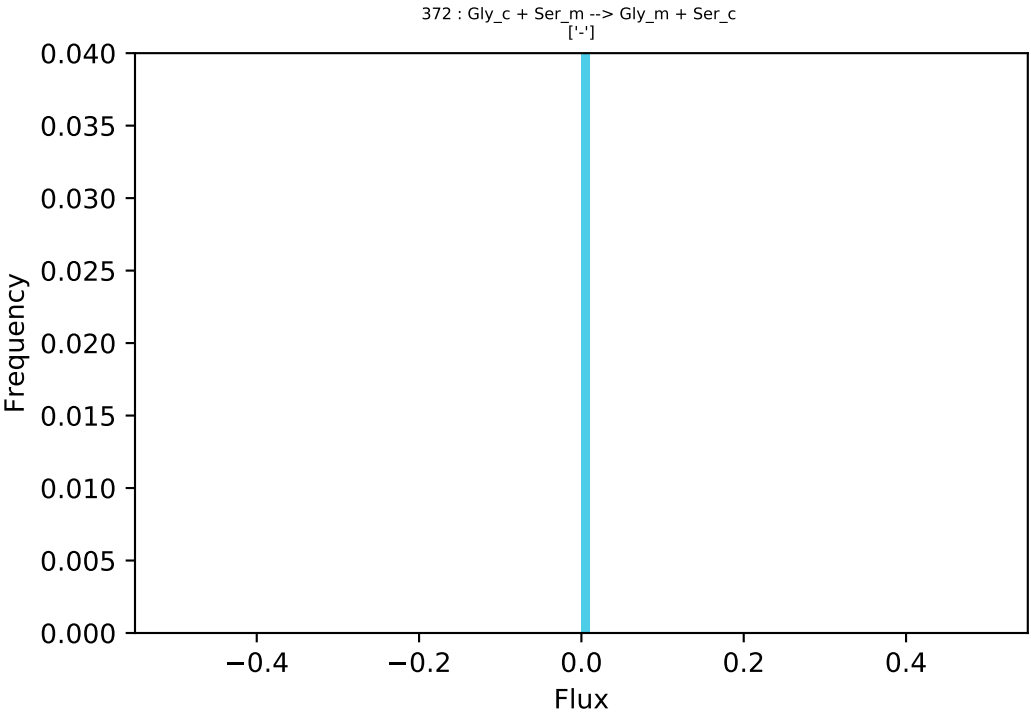

367 : Fum_h --> Fum_c
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

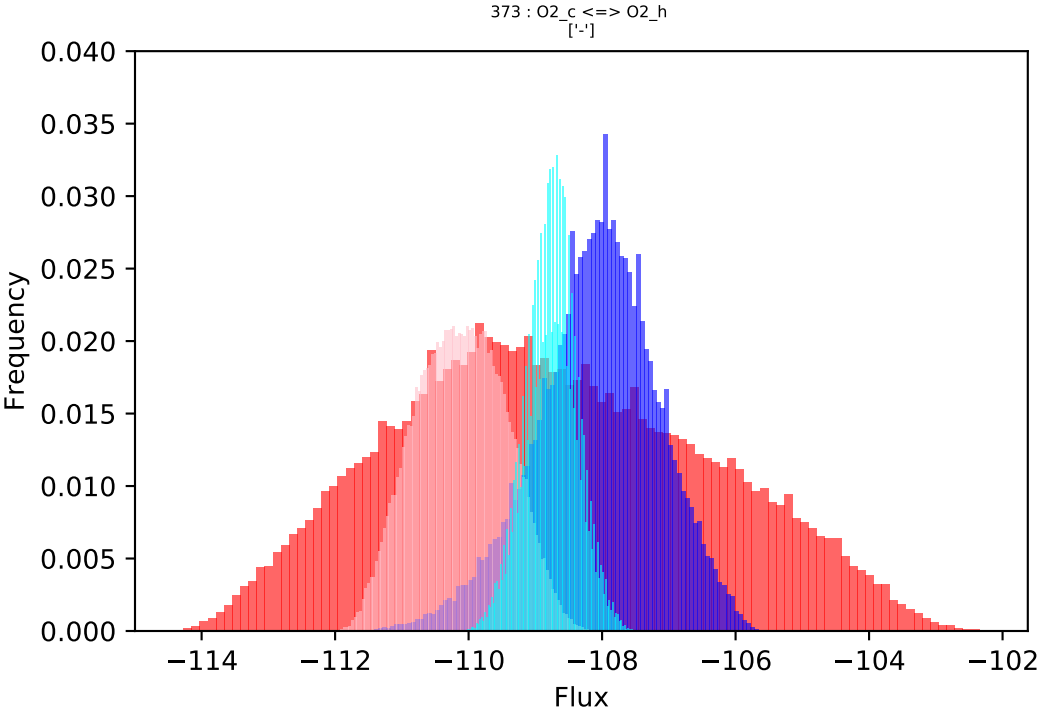

368 : H_DASH_Cys_h --> H_DASH_Cys_c
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

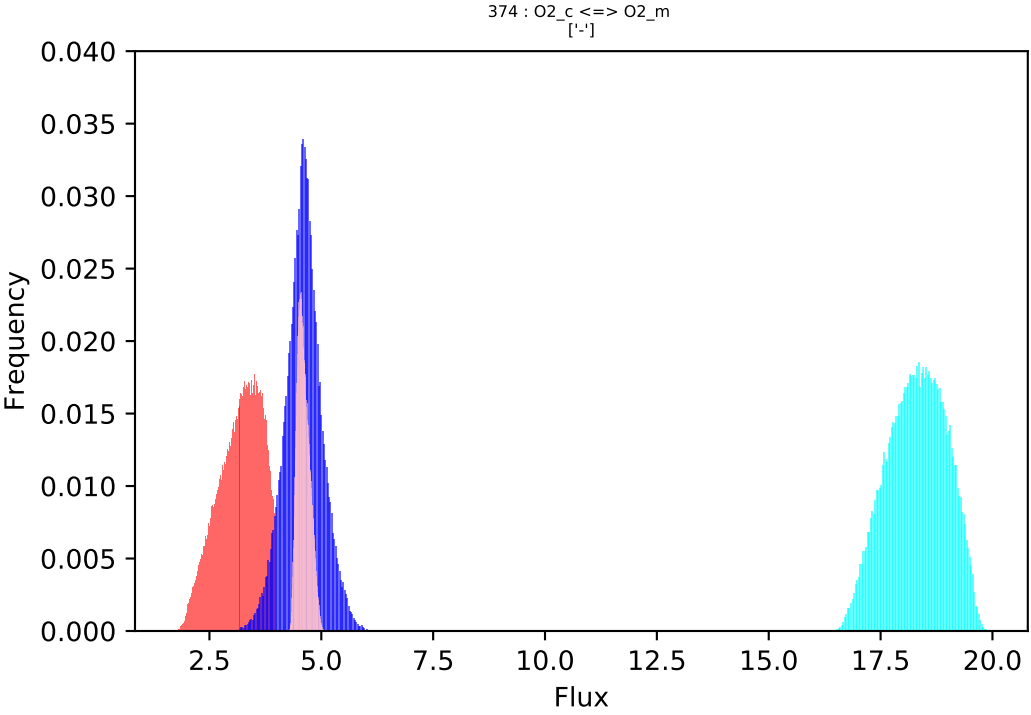

369 : orO_m --> orO_c
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

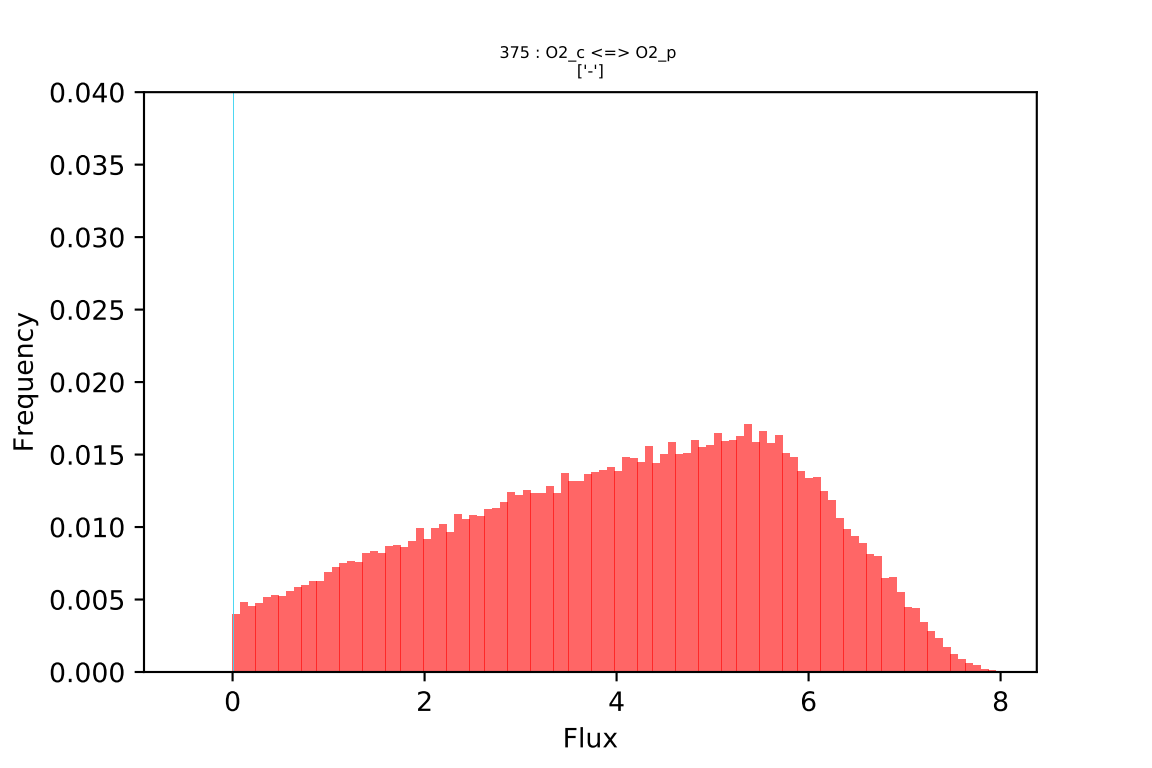

370 : DHO_h --> DHO_c
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

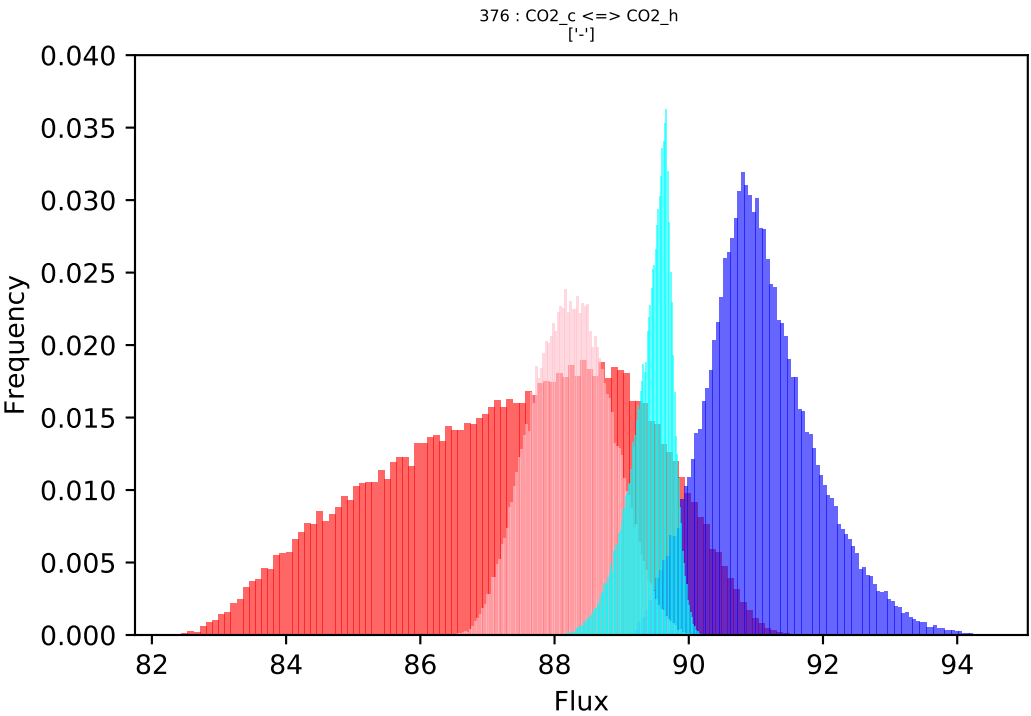

371 : DHO_c --> DHO_m
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

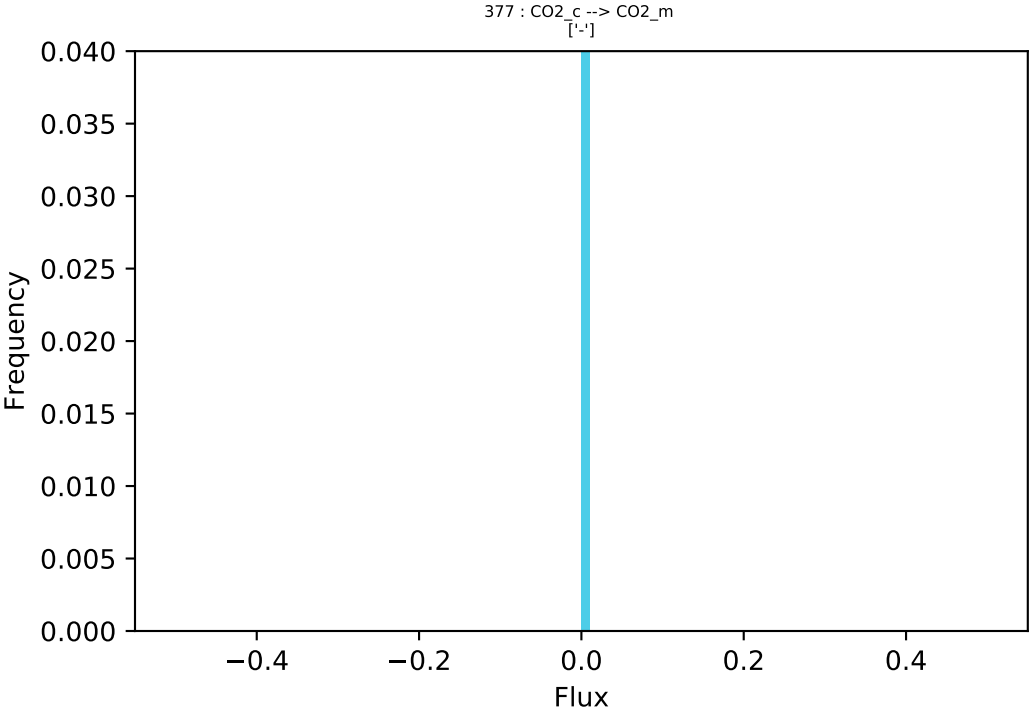

372 : Gly_c + Ser_m --> Gly_m + Ser_c
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

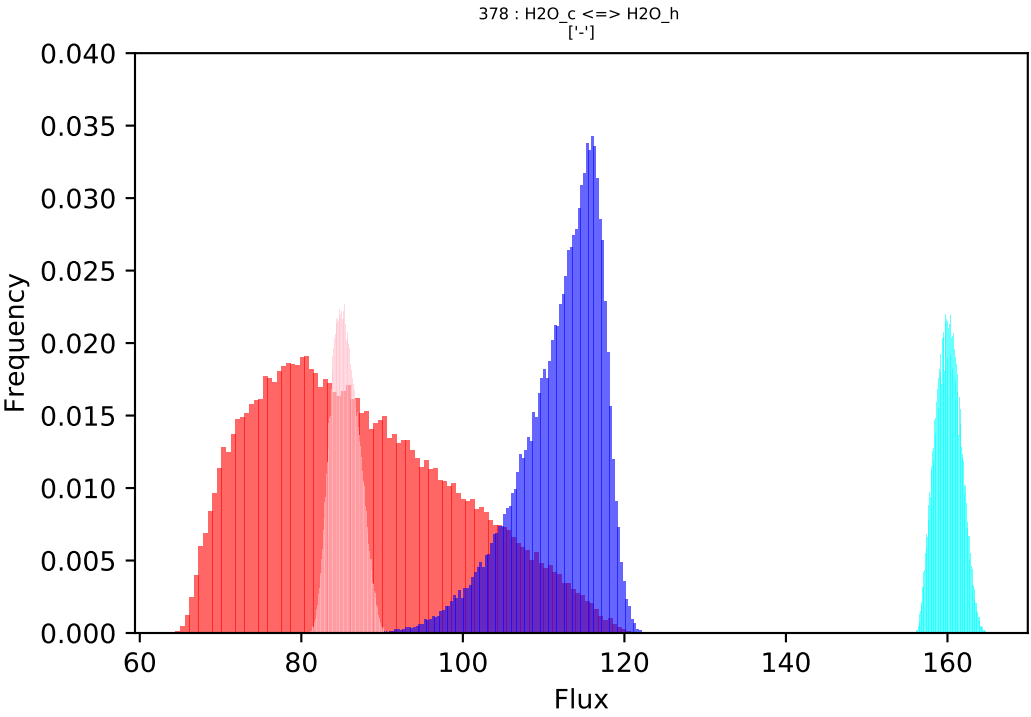

373 : O2_c <=> O2_h
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−114
−112
−110
−108
−106
−104
−102
Flux

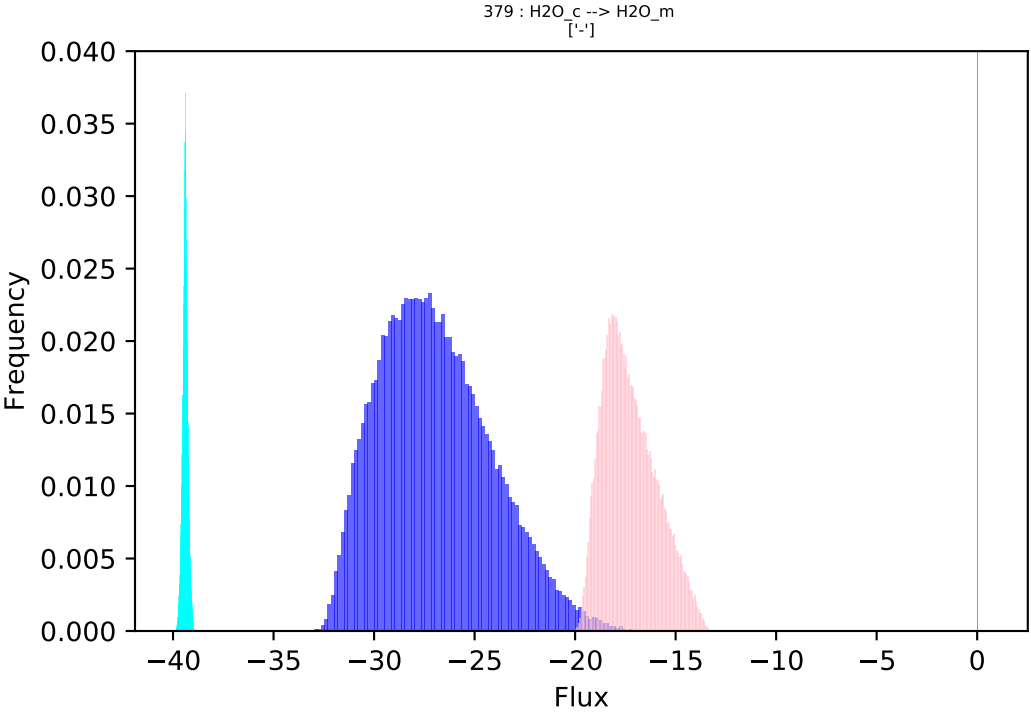

374 : O2_c <=> O2_m
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
2.5
5.0
7.5
10.0
12.5
15.0
17.5
20.0
Flux

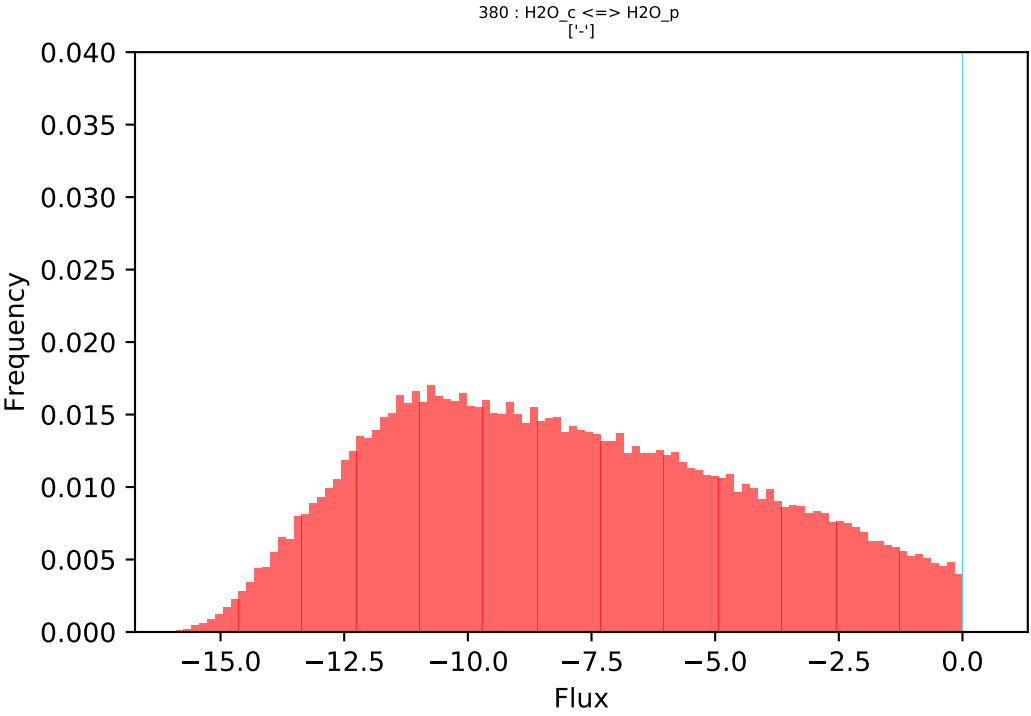

375 : O2_c <=> O2_p
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0
2
4
6
8
Flux

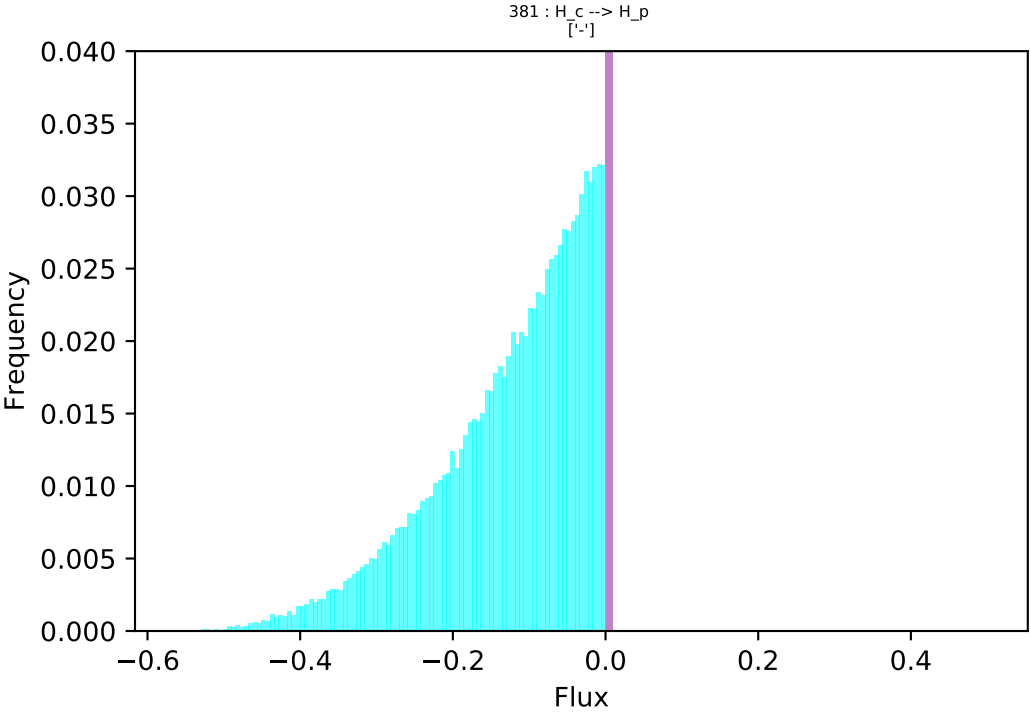

376 : CO2_c <=> CO2_h
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
82
84
86
88
90
92
94
Flux

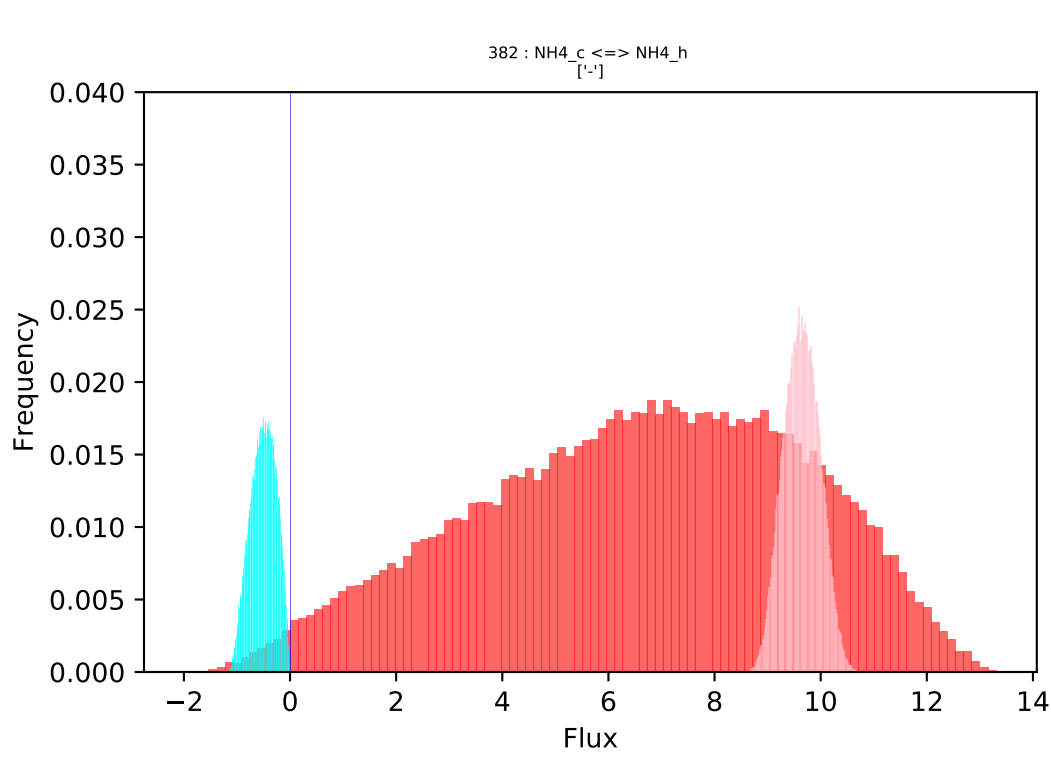

377 : CO2_c --> CO2_m
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

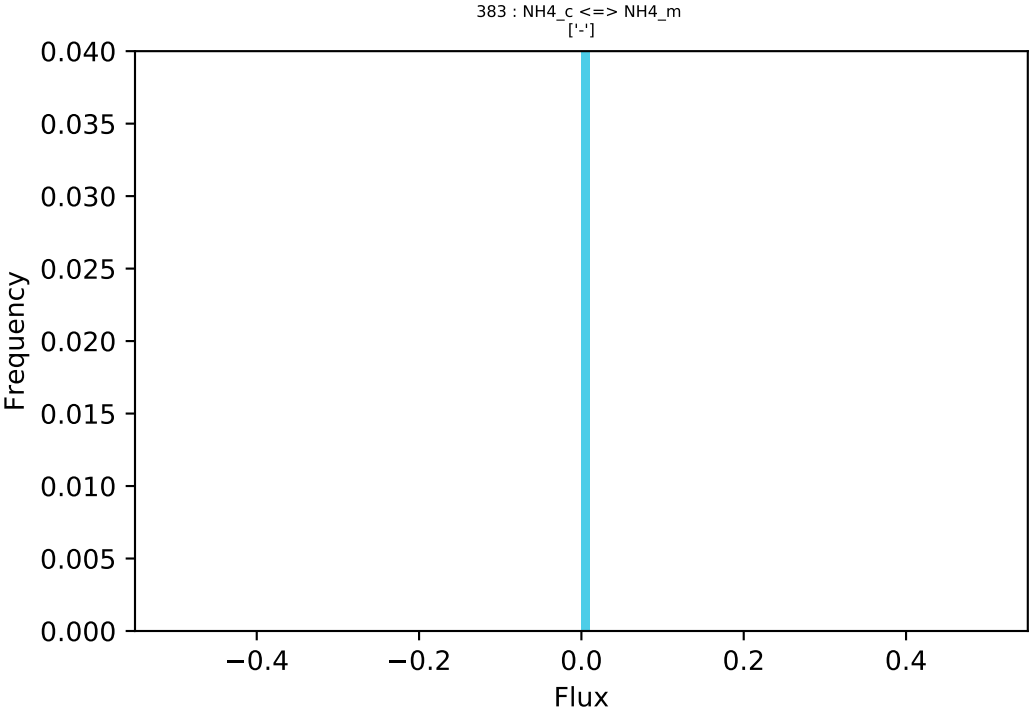

378 : H2O_c <=> H2O_h
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
60
80
100
120
140
160
Flux

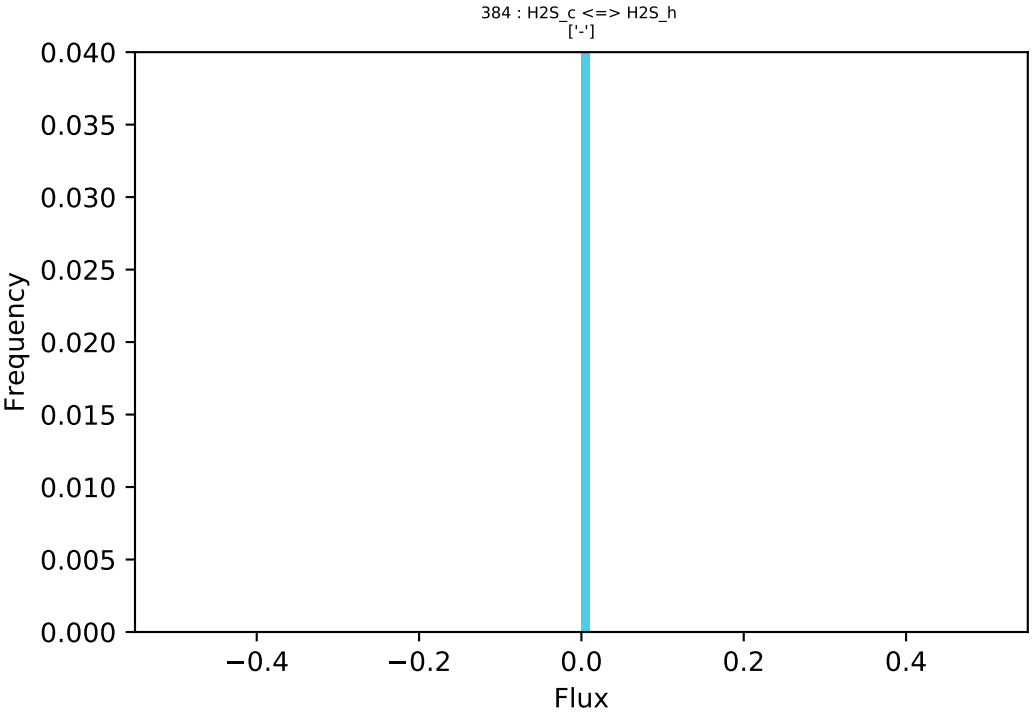

379 : H2O_c --> H2O_m
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−40
−35
−30
−25
−20
−15
−10
−5
0
Flux

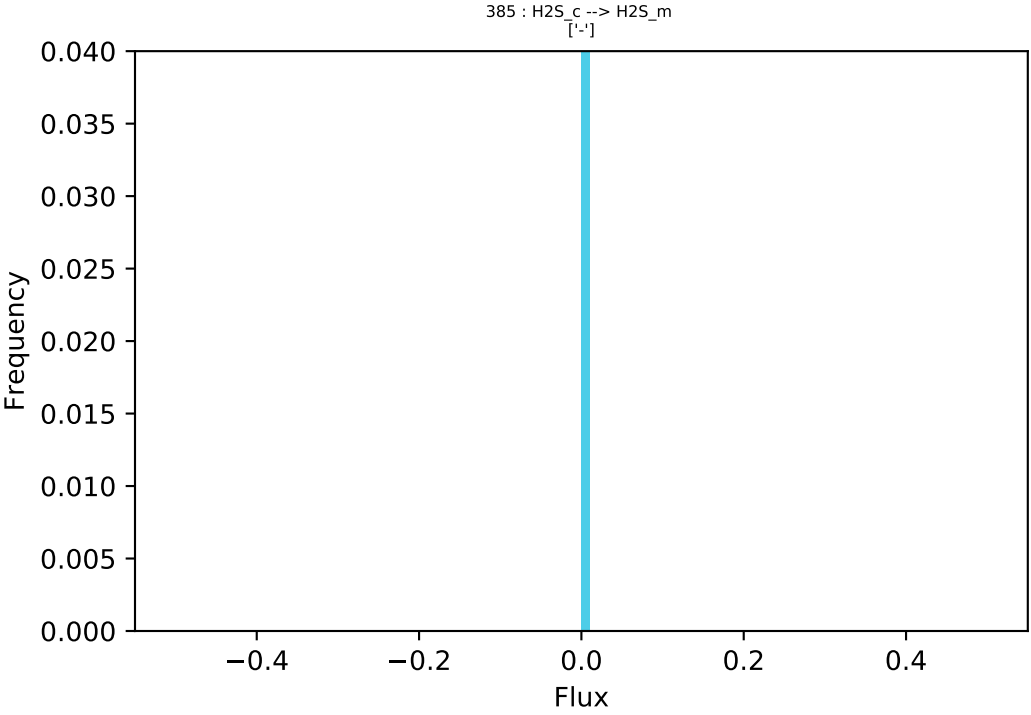

380 : H2O_c <=> H2O_p
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−15.0
−12.5
−10.0
−7.5
−5.0
−2.5
0.0
Flux

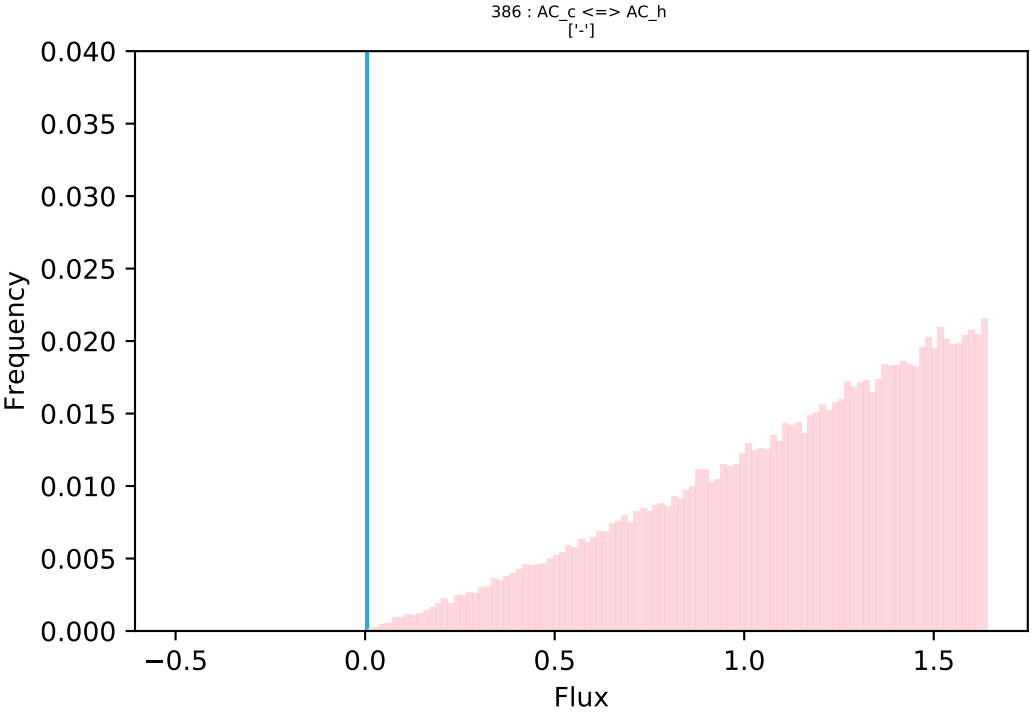

381 : H_c --> H_p
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.6
−0.4
−0.2
0.0
0.2
0.4
Flux

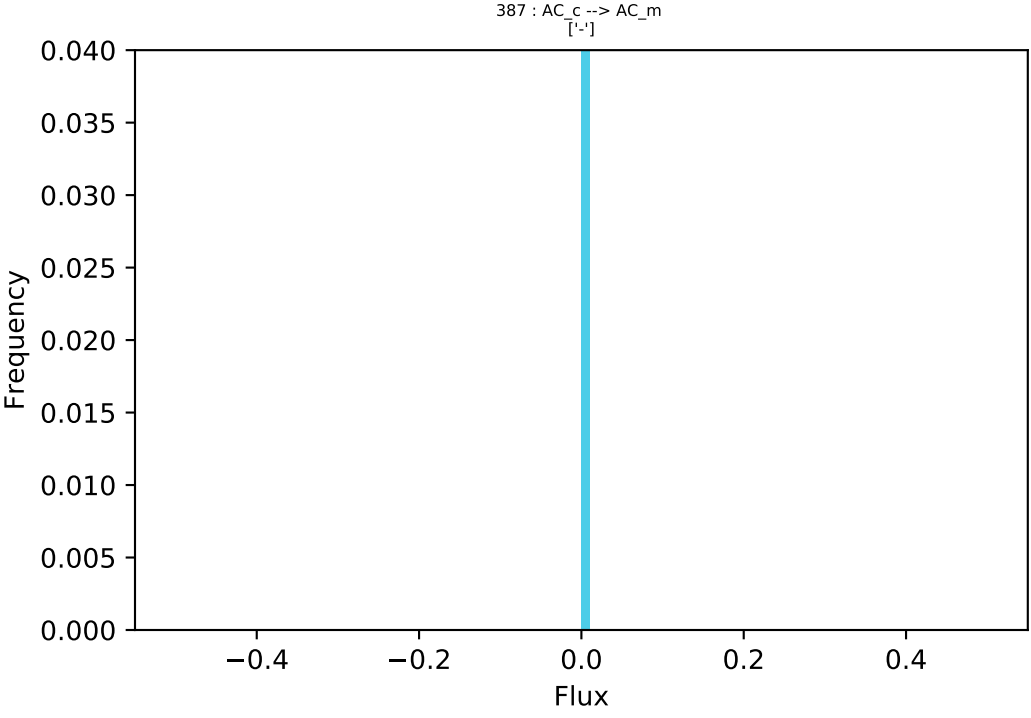

382 : NH4_c <=> NH4_h
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−2
0
2
4
6
8
10
12
14
Flux

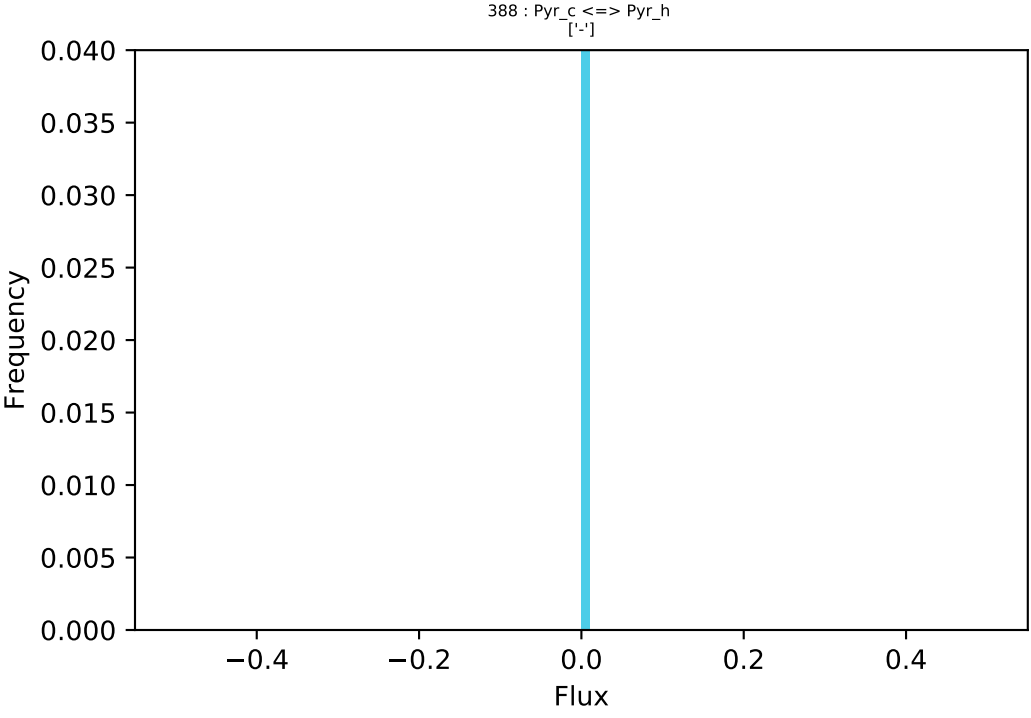

383 : NH4_c <=> NH4_m
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

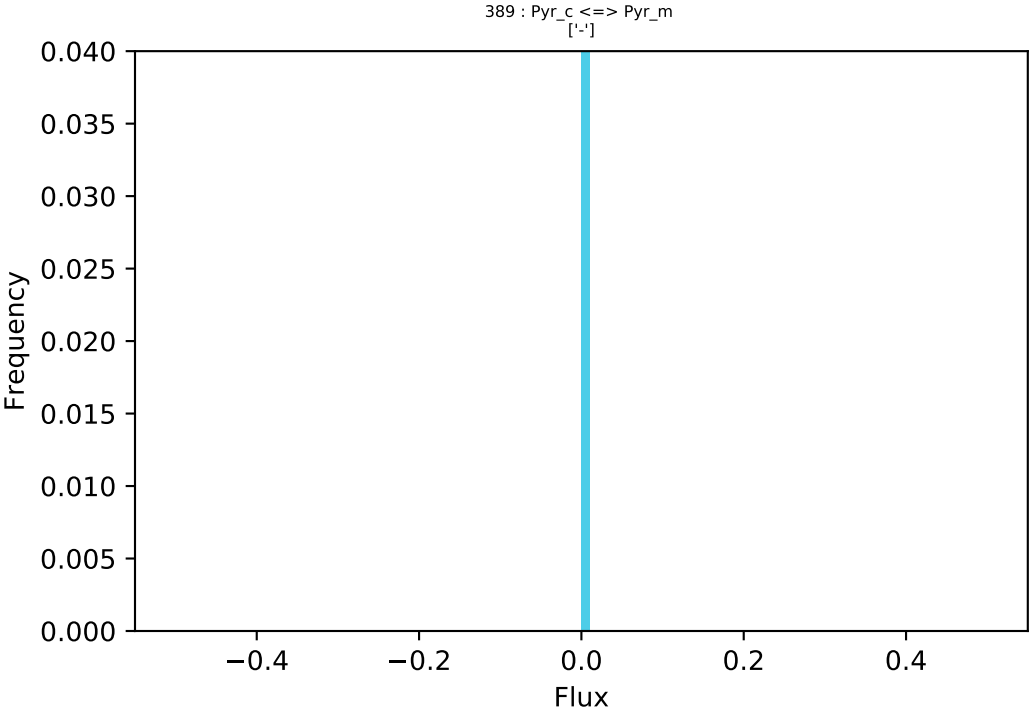

384 : H2S_c <=> H2S_h
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

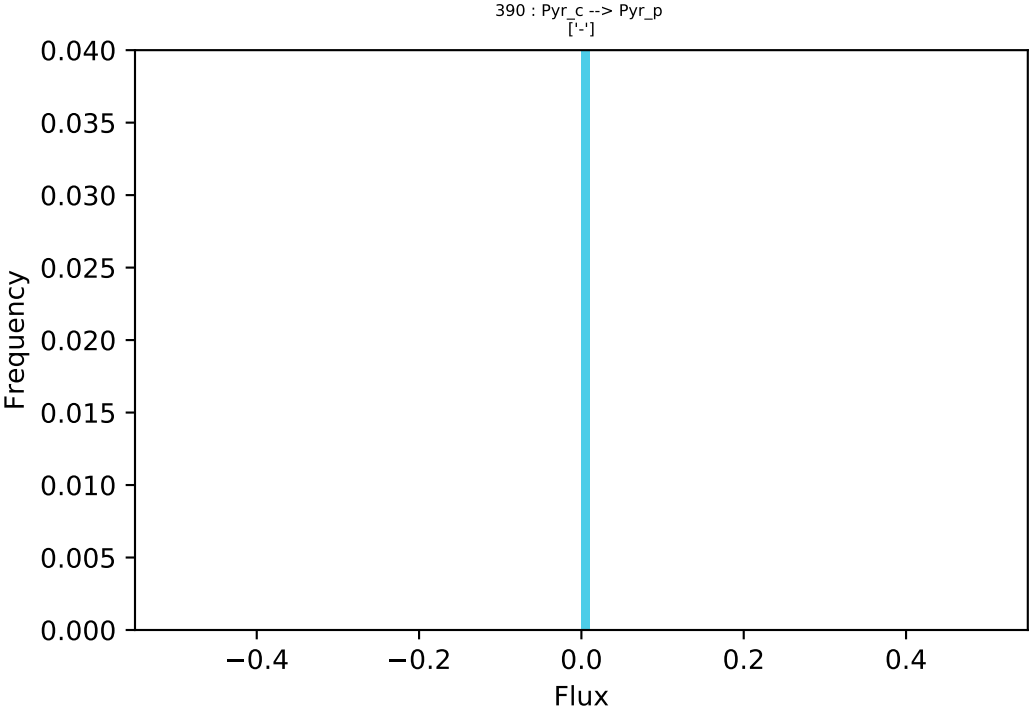

385 : H2S_c --> H2S_m
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

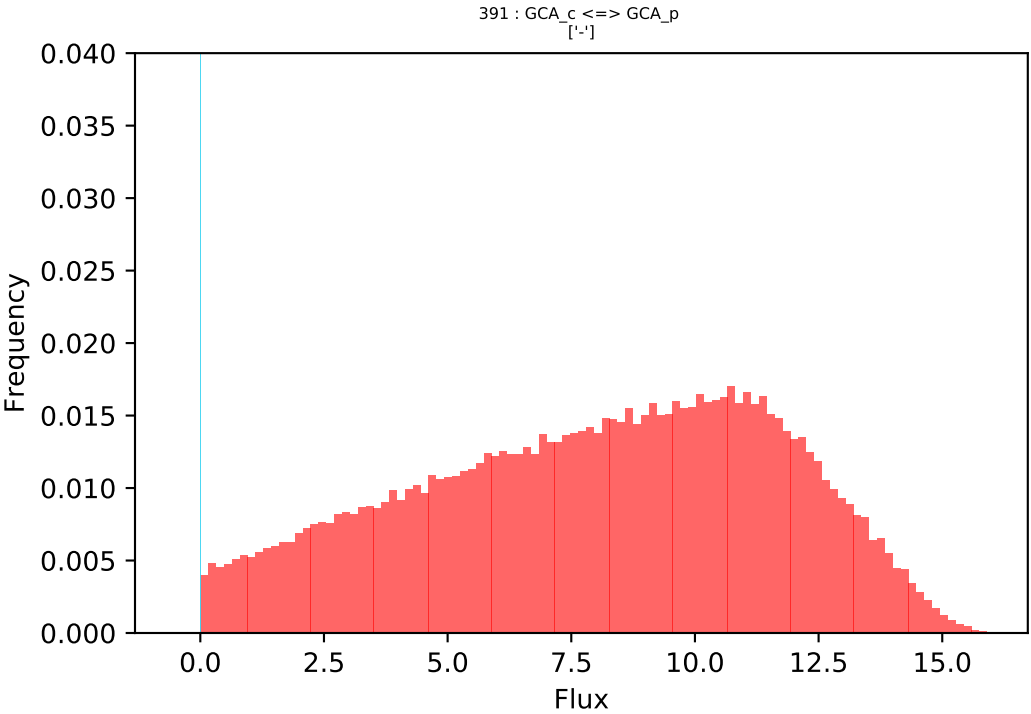

386 : AC_c <=> AC_h
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.5
0.0
0.5
1.0
1.5
Flux

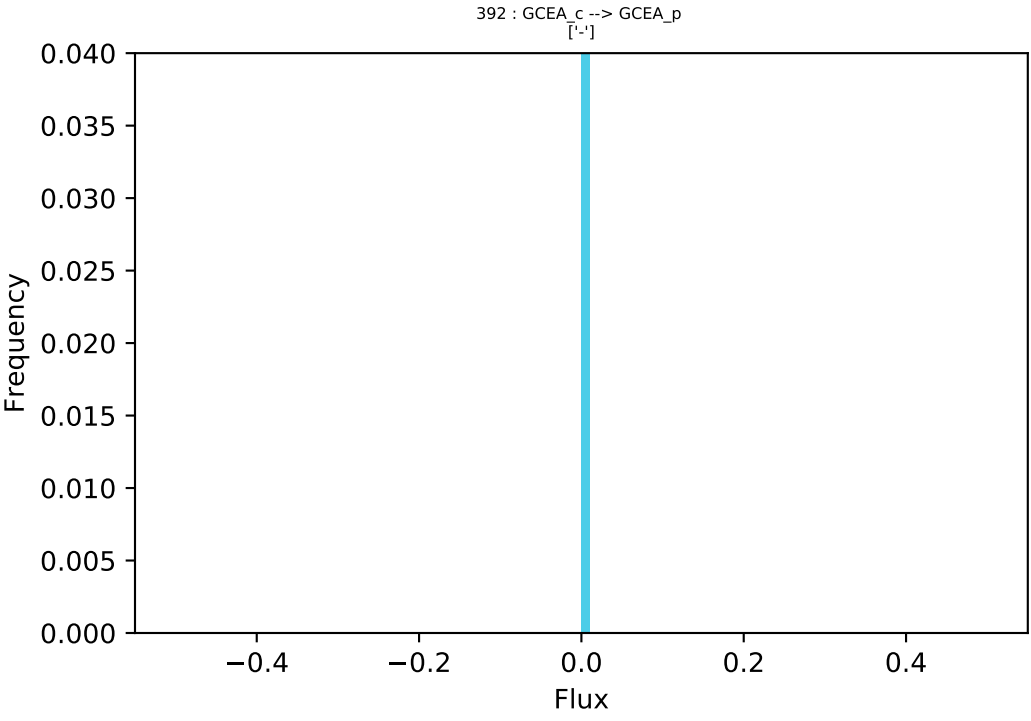

387 : AC_c --> AC_m
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

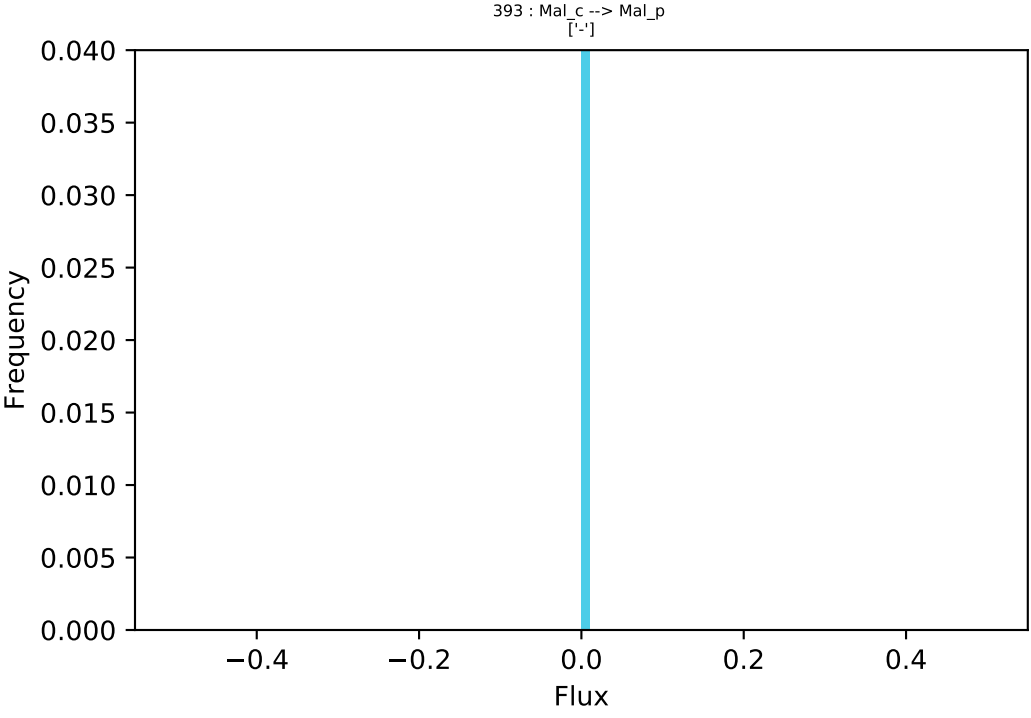

388 : Pyr_c <=> Pyr_h
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

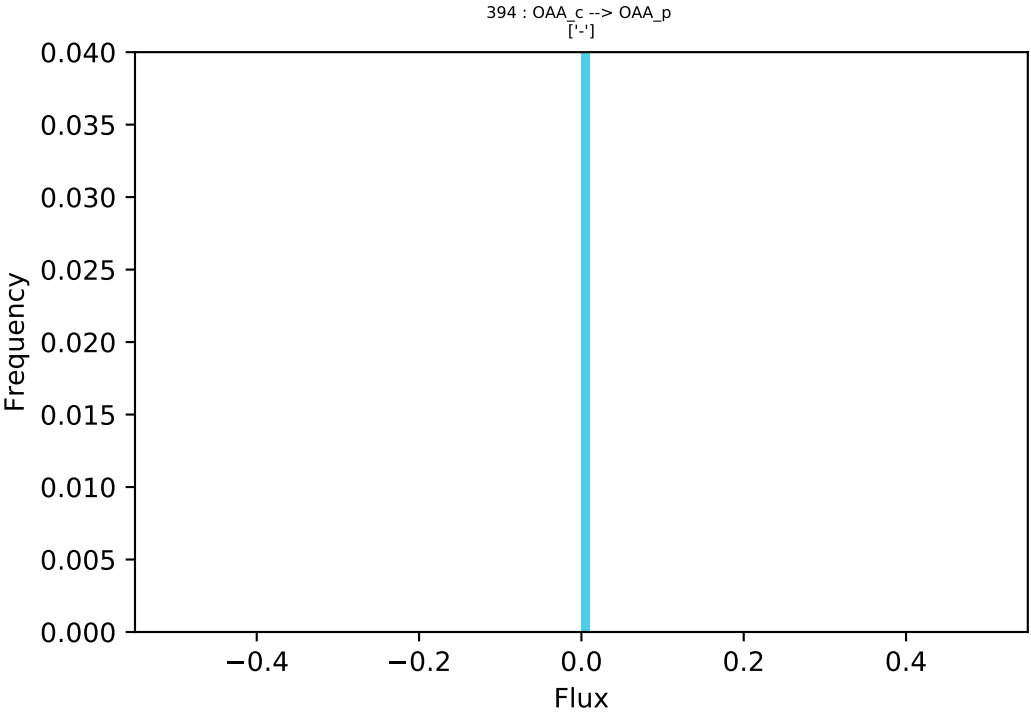

389 : Pyr_c <=> Pyr_m
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

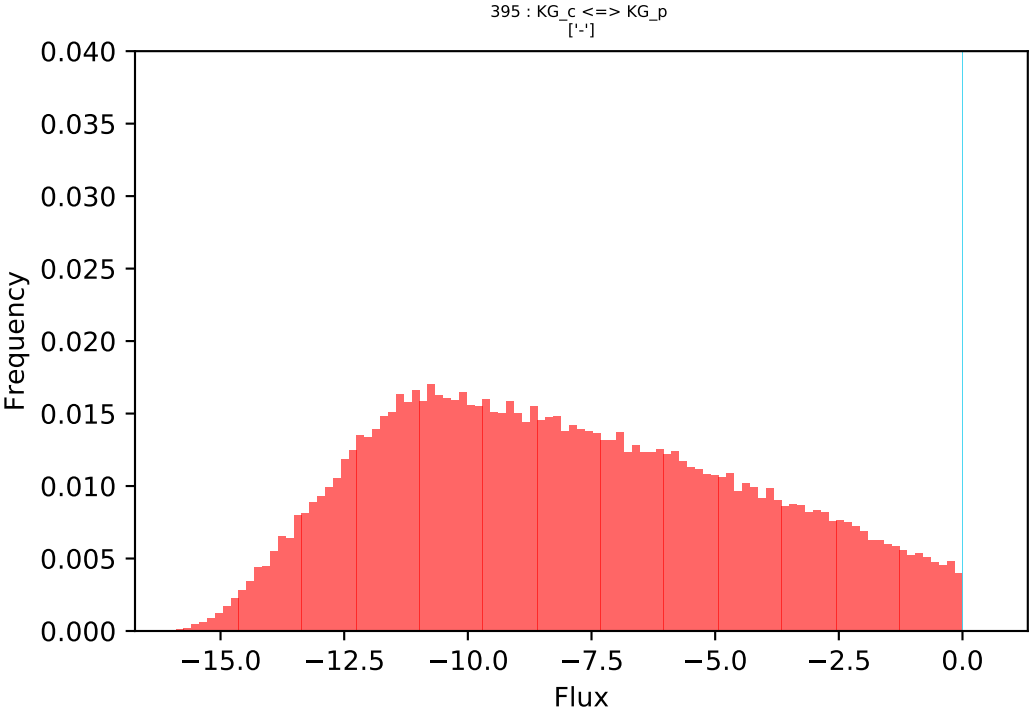

390 : Pyr_c --> Pyr_p
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

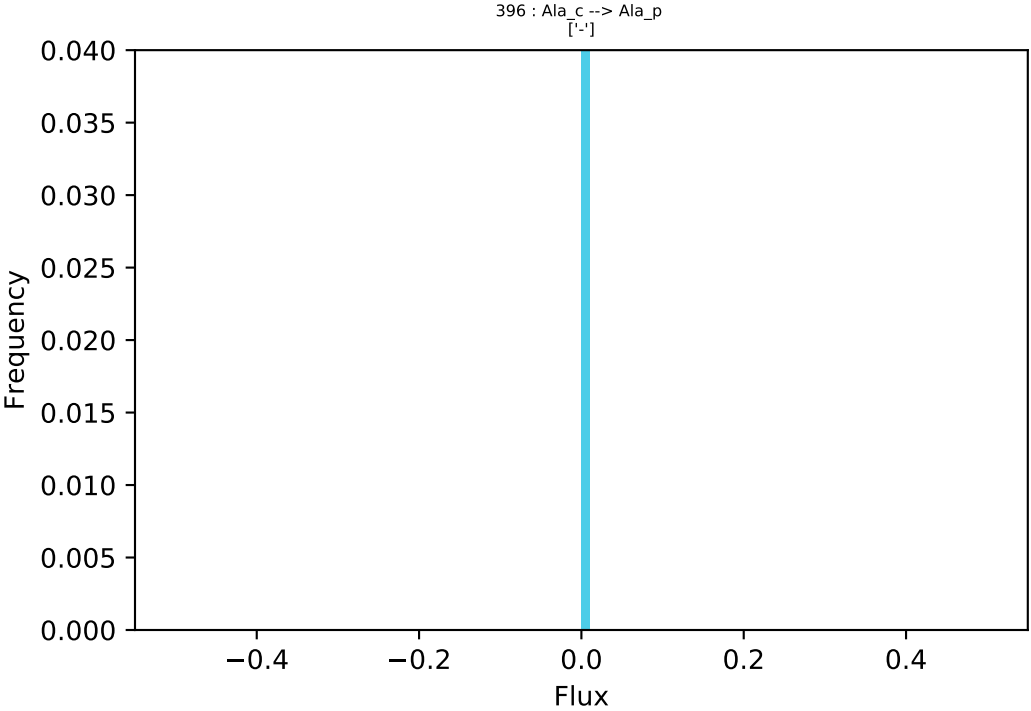

391 : GCA_c <=> GCA_p
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0.0
2.5
5.0
7.5
10.0
12.5
15.0
Flux

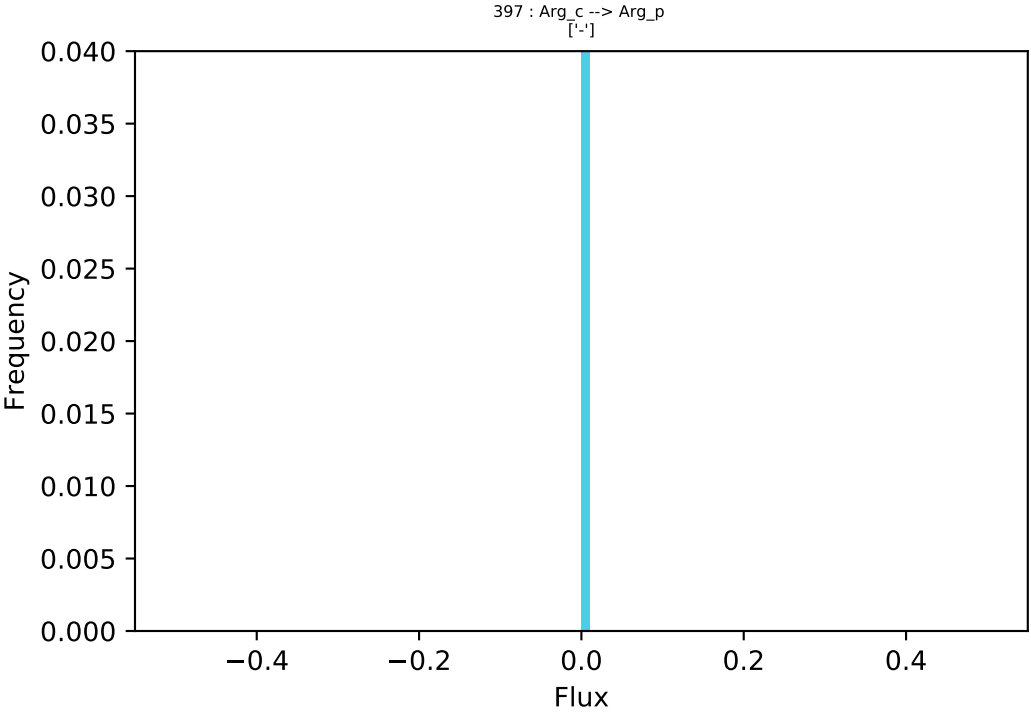

392 : GCEA_c --> GCEA_p
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

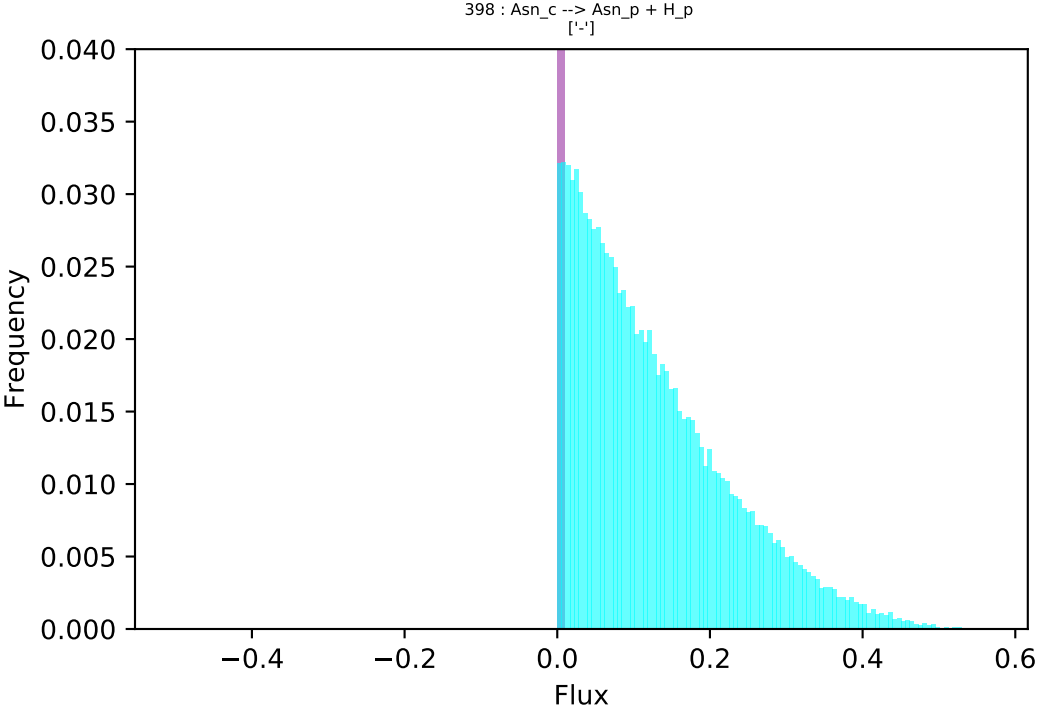

393 : Mal_c --> Mal_p
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

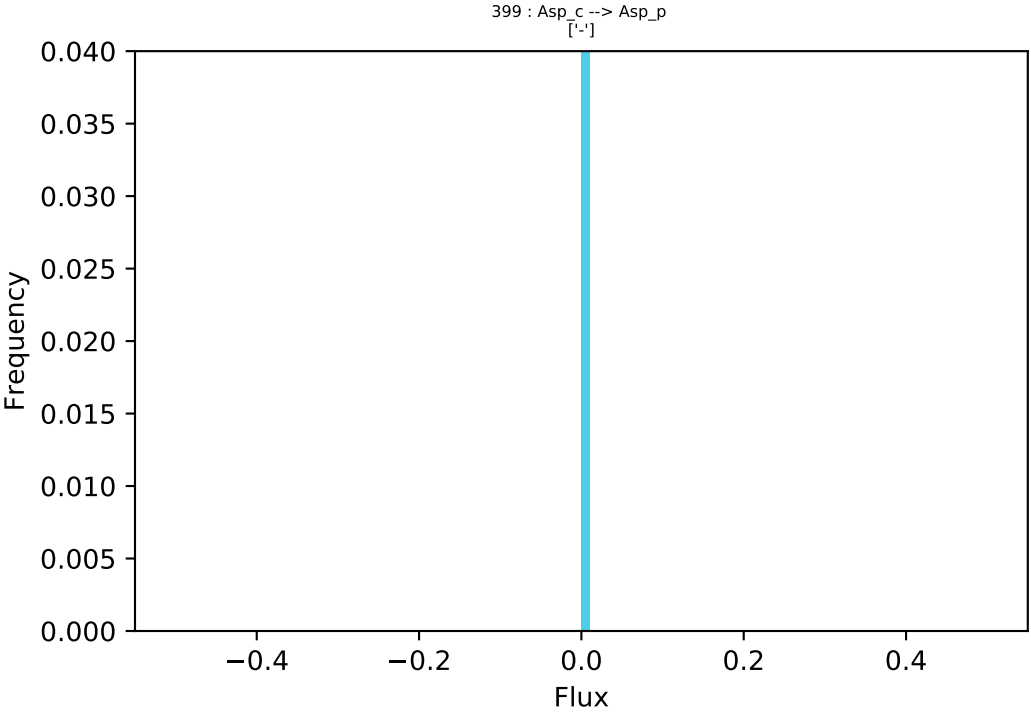

394 : OAA_c --> OAA_p
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

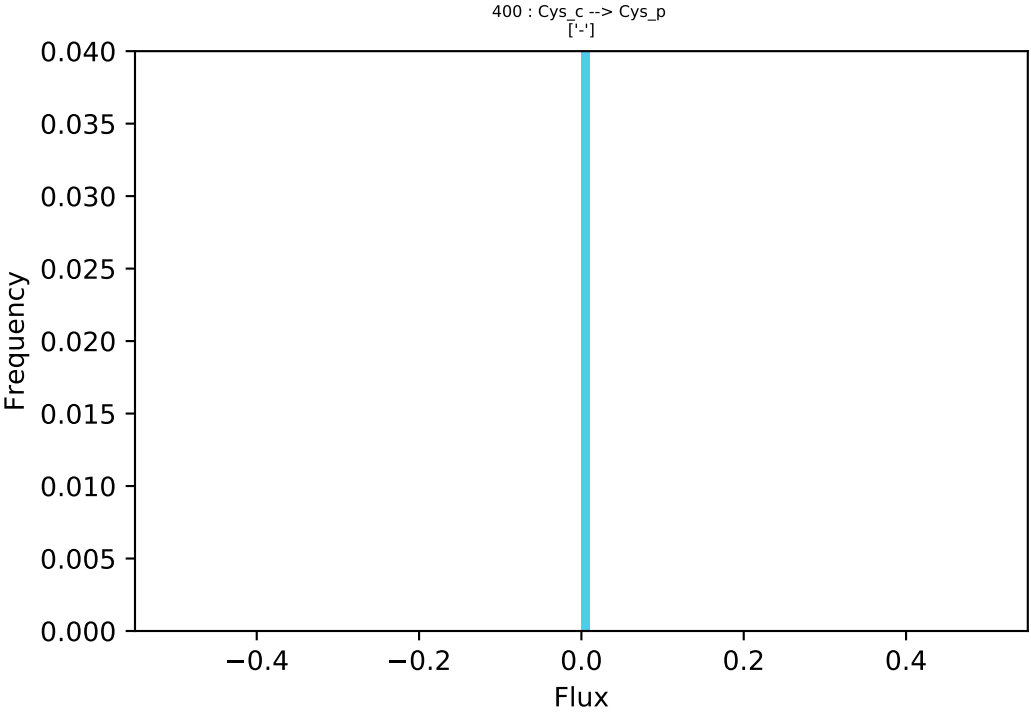

395 : KG_c <=> KG_p
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−15.0
−12.5
−10.0
−7.5
−5.0
−2.5
0.0
Flux

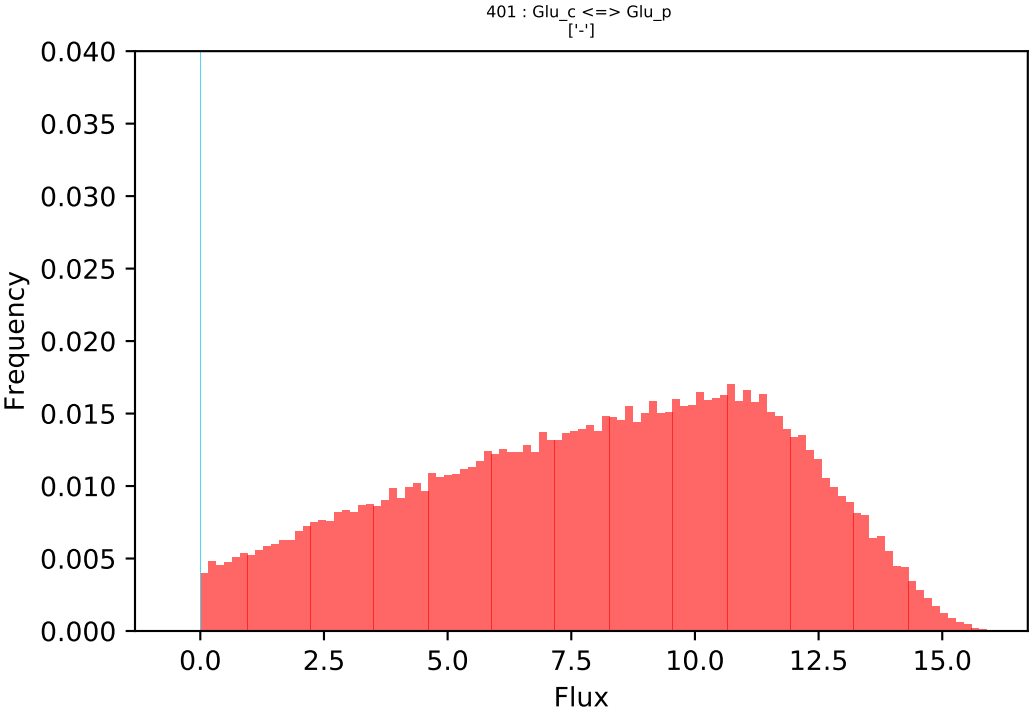

396 : Ala_c --> Ala_p
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

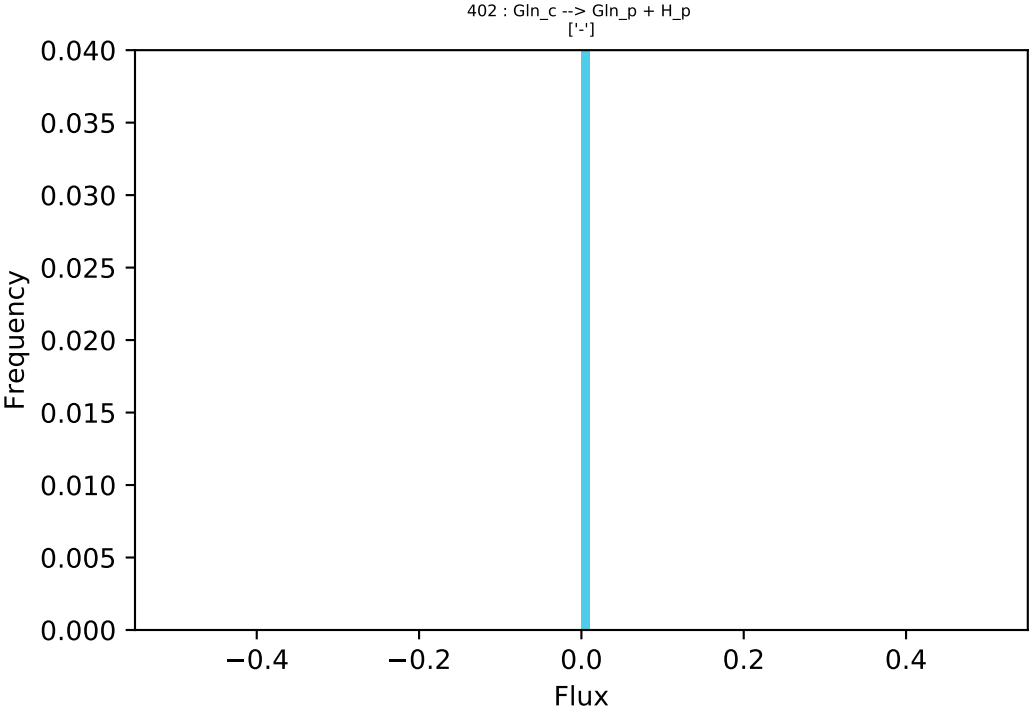

397 : Arg_c --> Arg_p
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

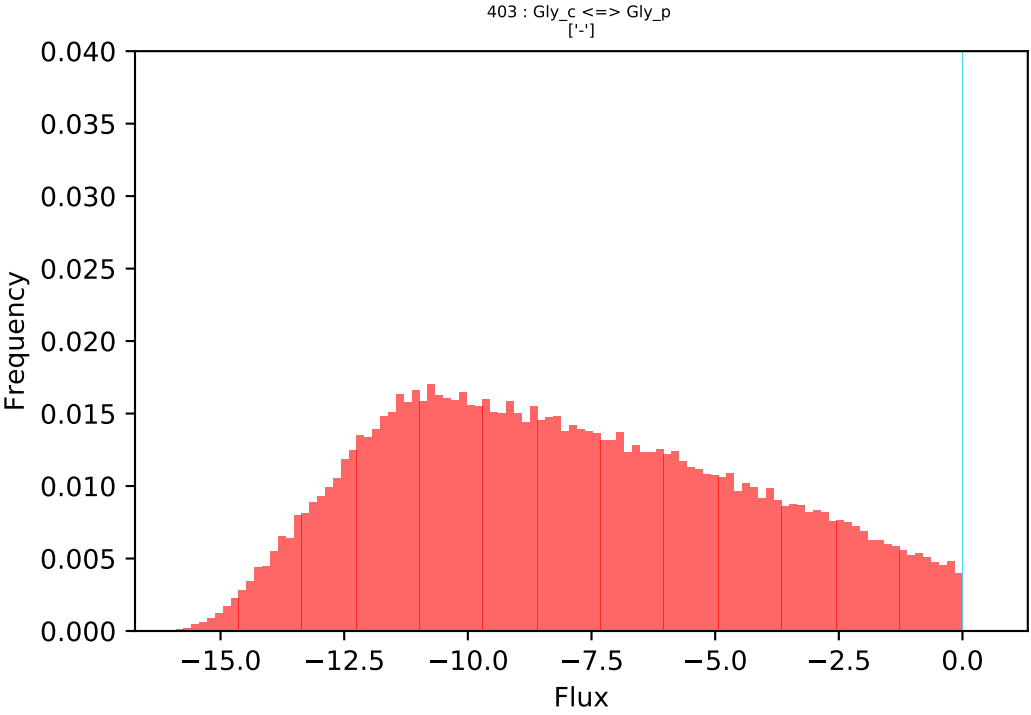

398 : Asn_c --> Asn_p + H_p
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
0.6
Flux

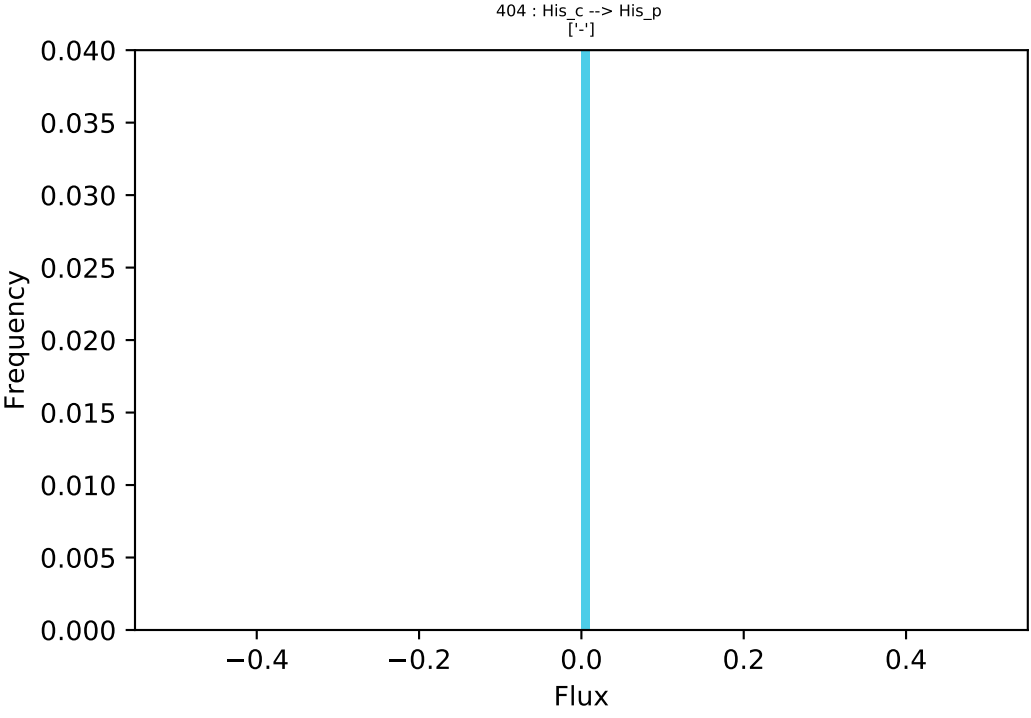

399 : Asp_c --> Asp_p
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

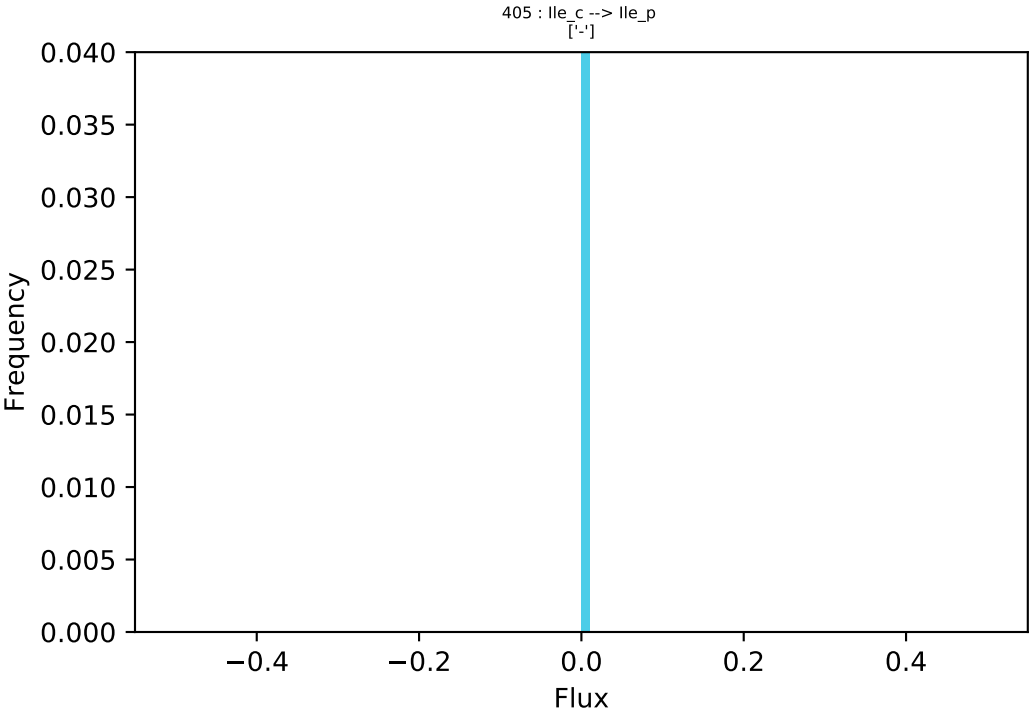

400 : Cys_c --> Cys_p
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

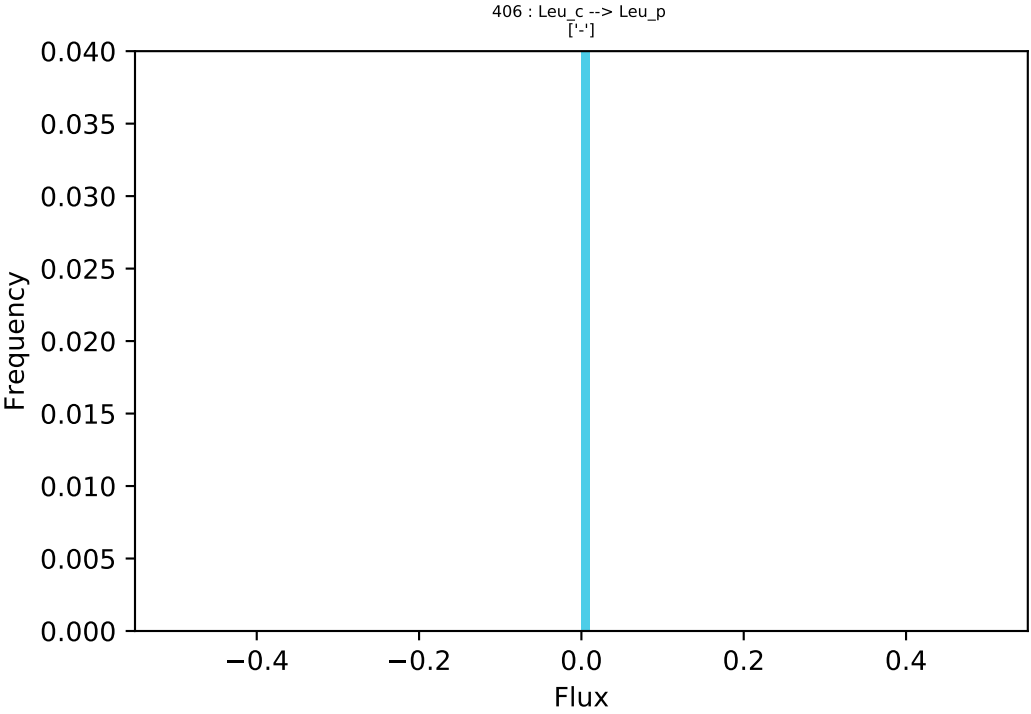

401 : Glu_c <=> Glu_p
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0.0
2.5
5.0
7.5
10.0
12.5
15.0
Flux

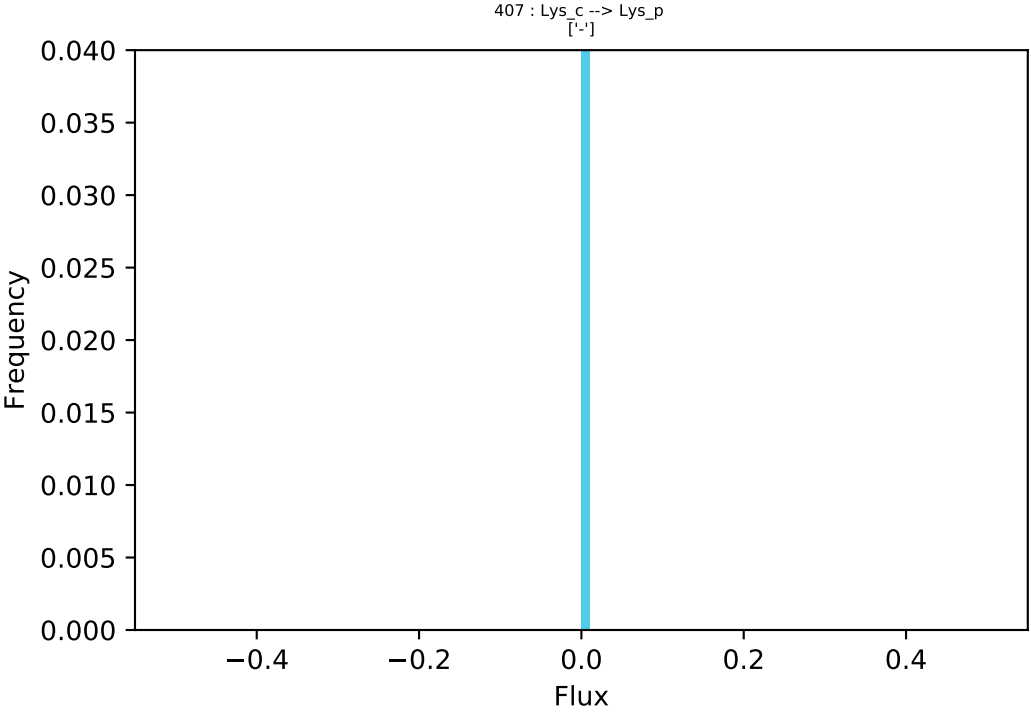

402 : Gln_c --> Gln_p + H_p
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

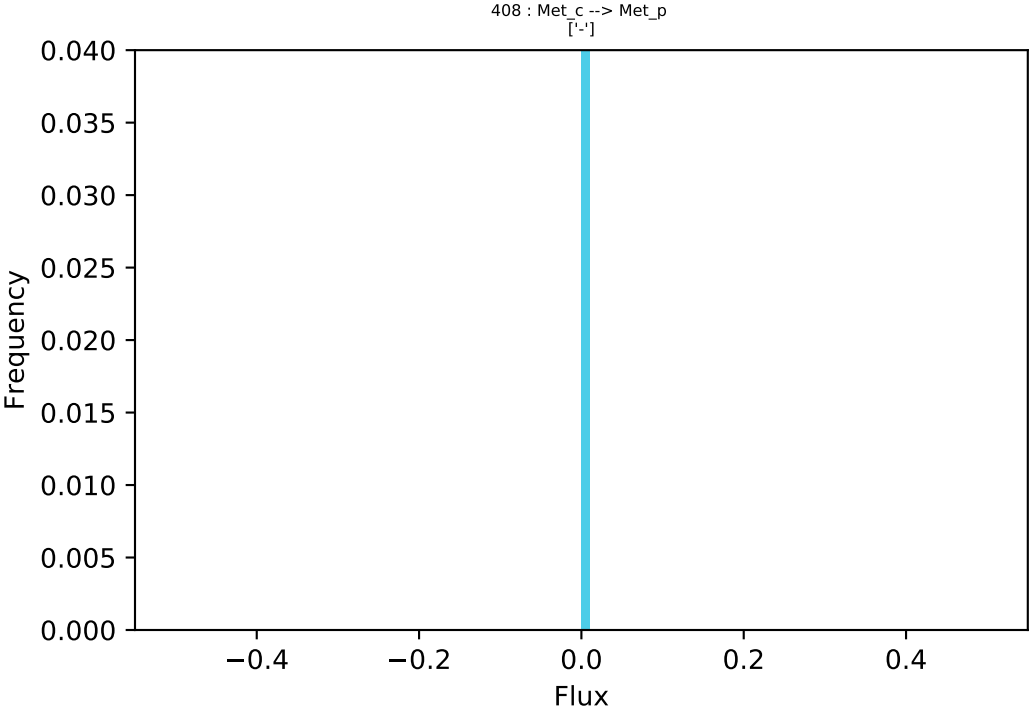

403 : Gly_c <=> Gly_p
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−15.0
−12.5
−10.0
−7.5
−5.0
−2.5
0.0
Flux

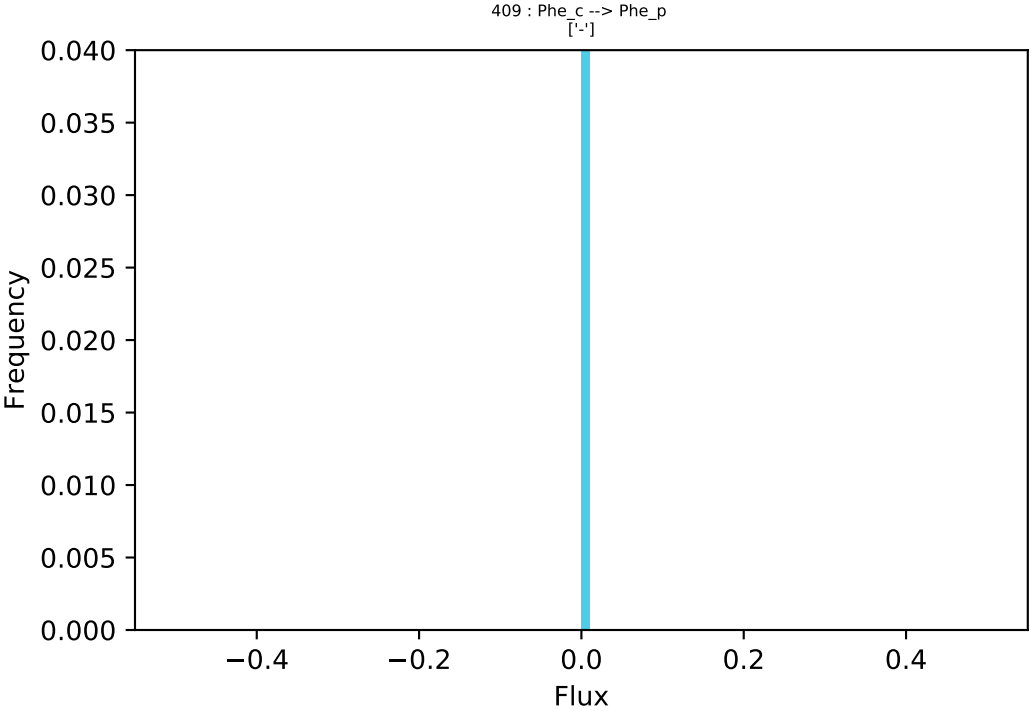

404 : His_c --> His_p
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

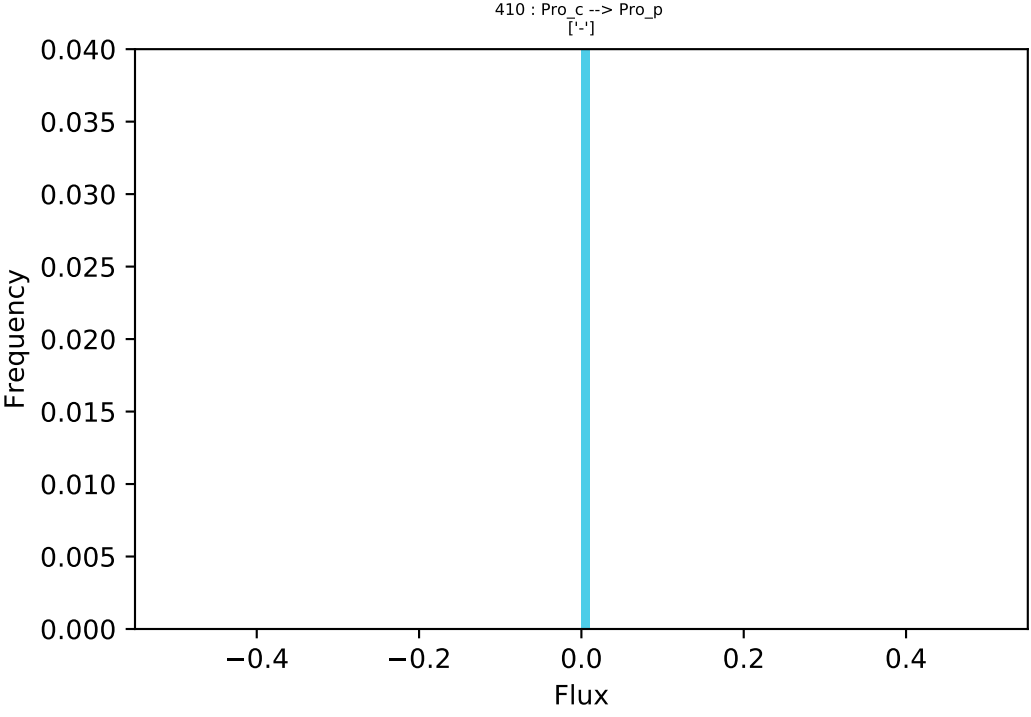

405 : Ile_c --> Ile_p
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

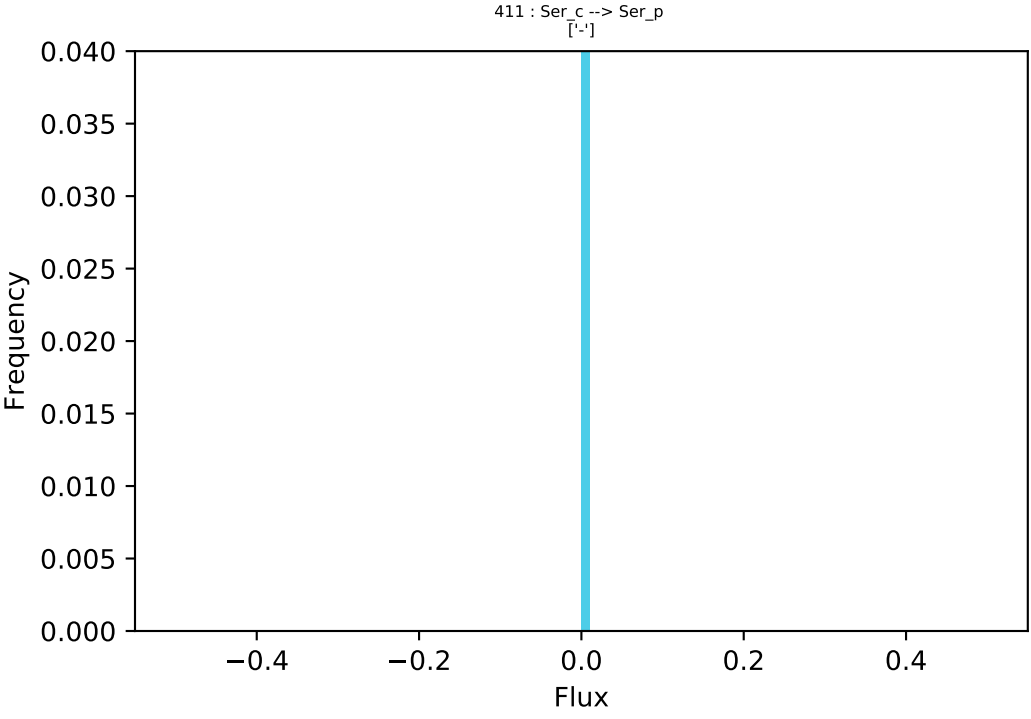

406 : Leu_c --> Leu_p
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

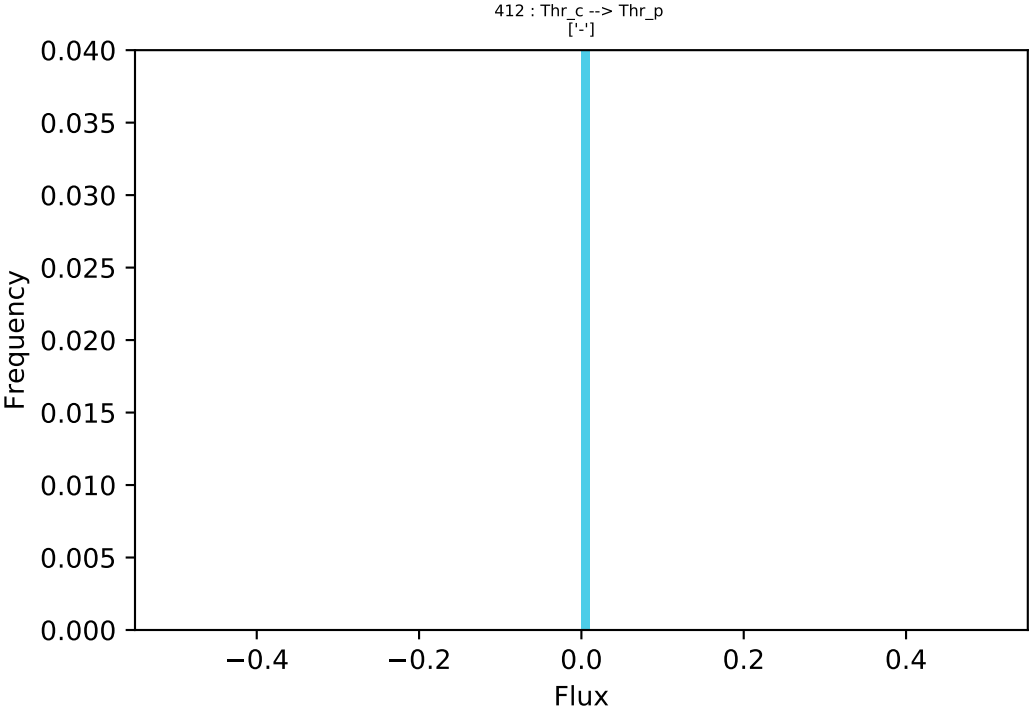

407 : Lys_c --> Lys_p
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

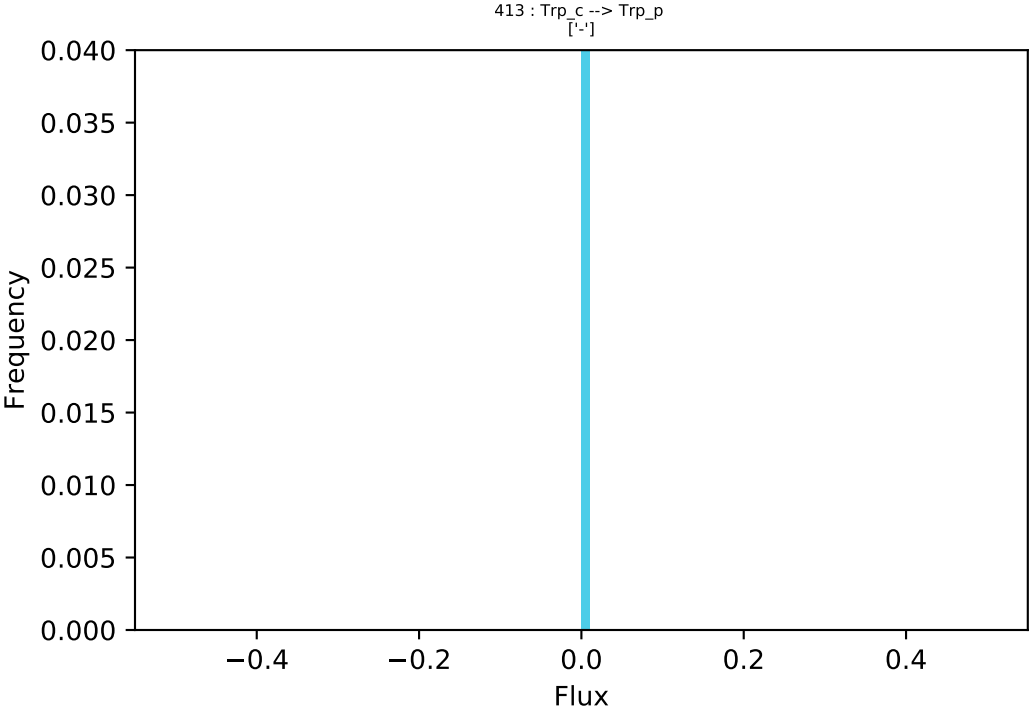

408 : Met_c --> Met_p
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

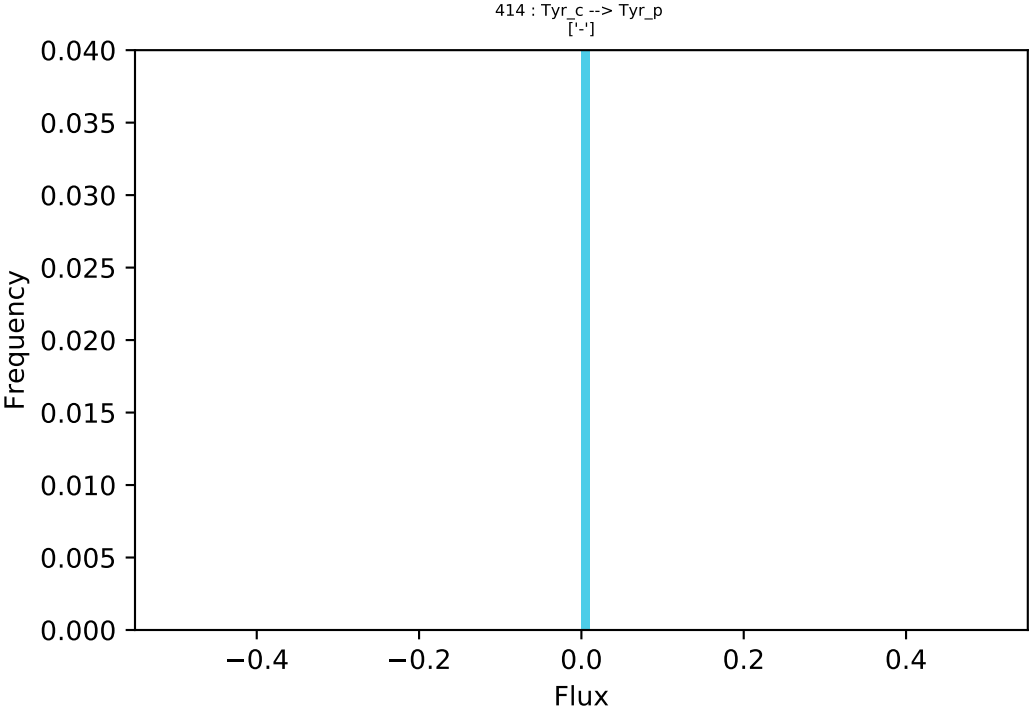

409 : Phe_c --> Phe_p
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

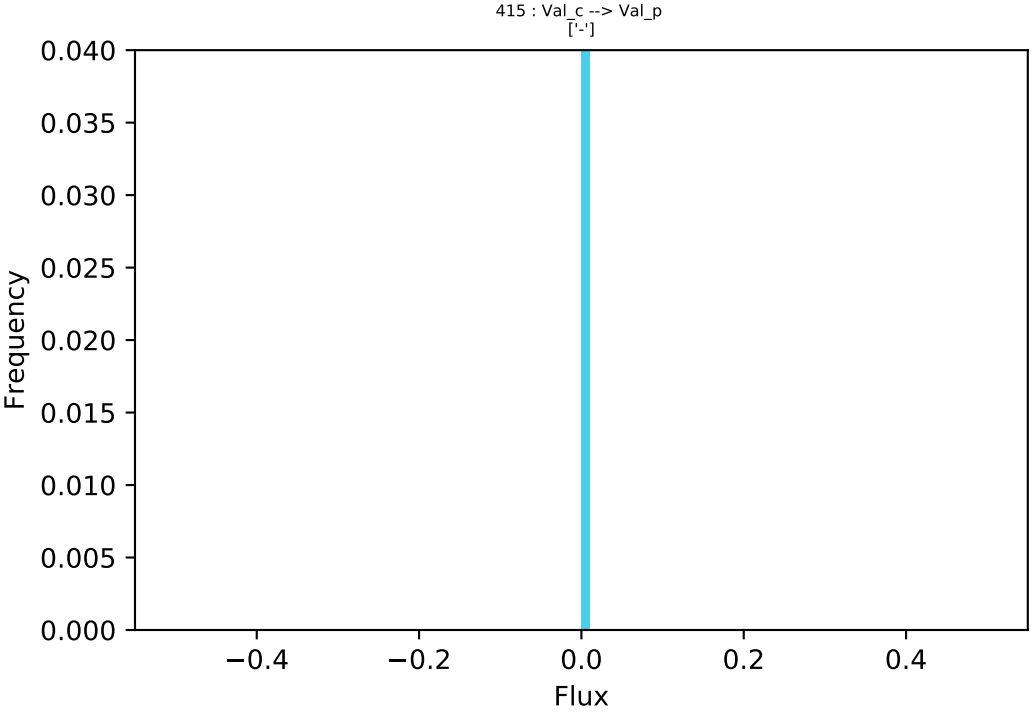

410 : Pro_c --> Pro_p
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

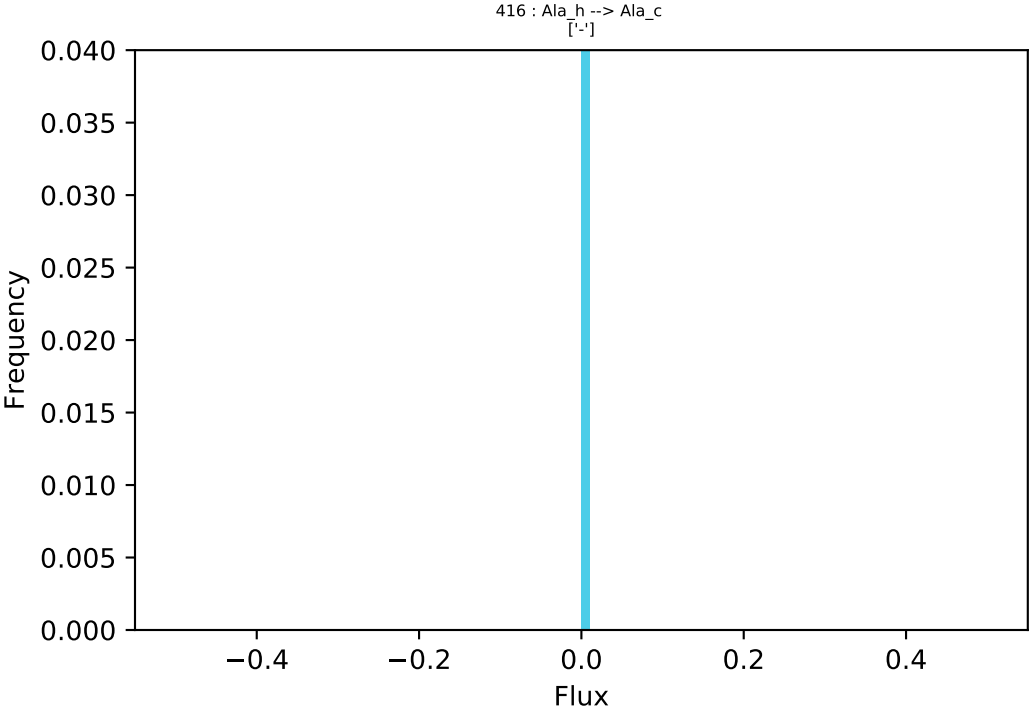

411 : Ser_c --> Ser_p
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

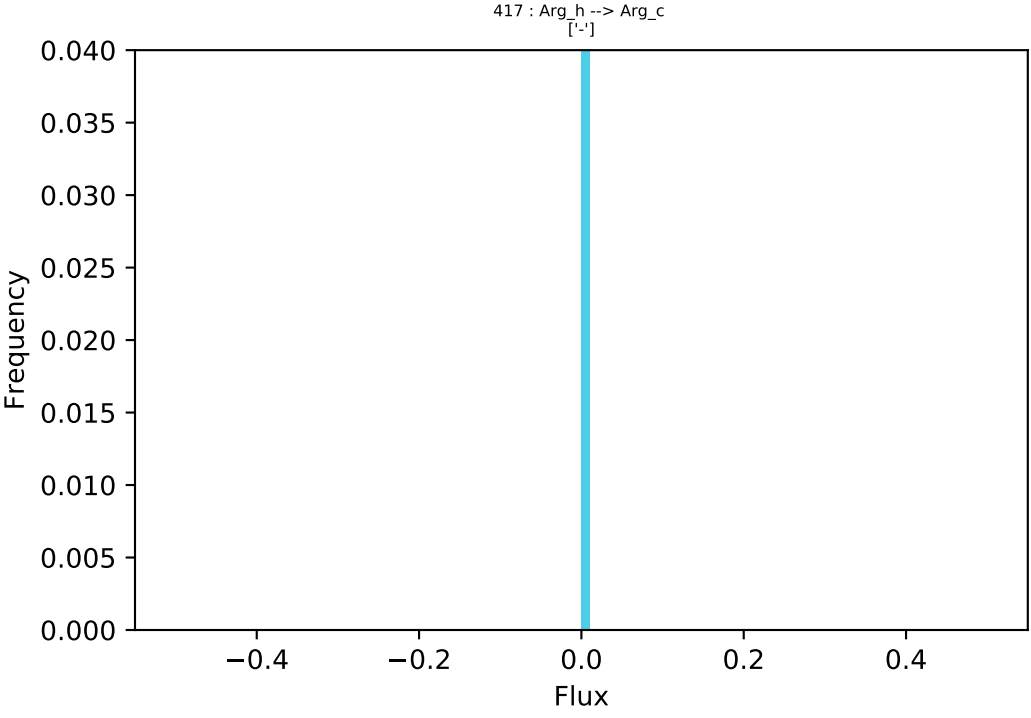

412 : Thr_c --> Thr_p
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

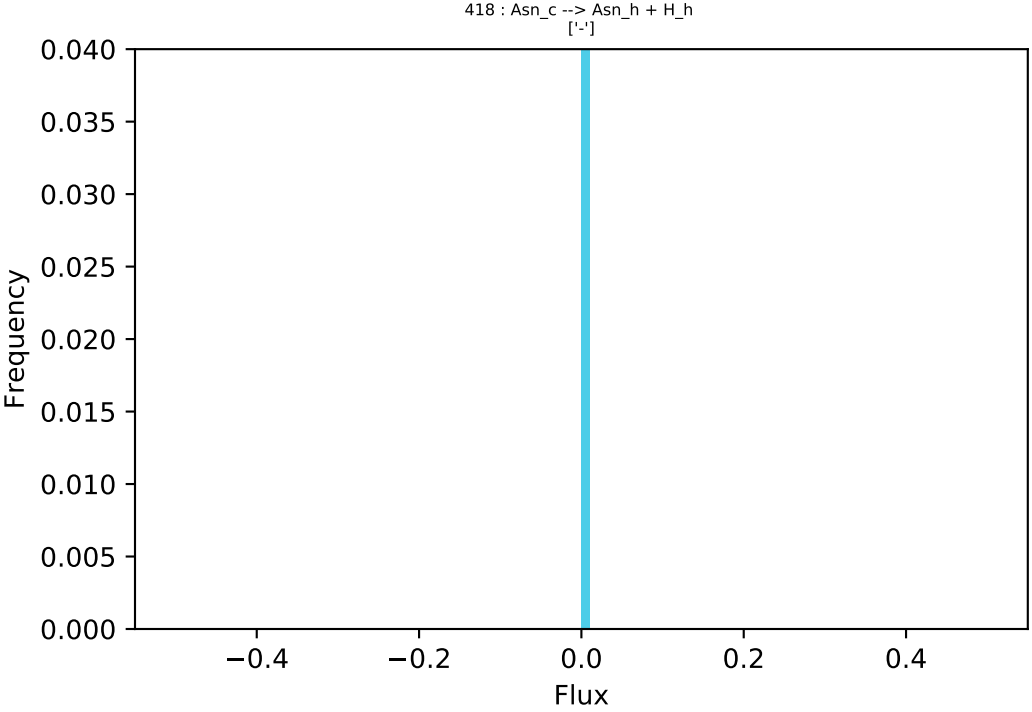

413 : Trp_c --> Trp_p
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

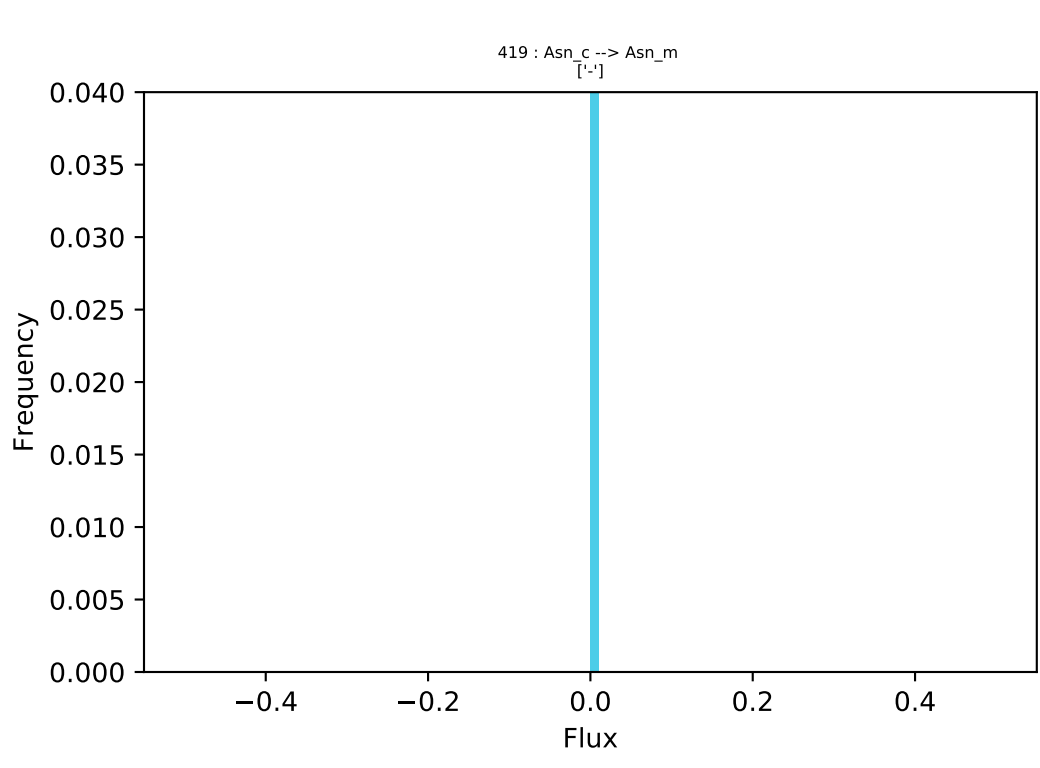

414 : Tyr_c --> Tyr_p
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

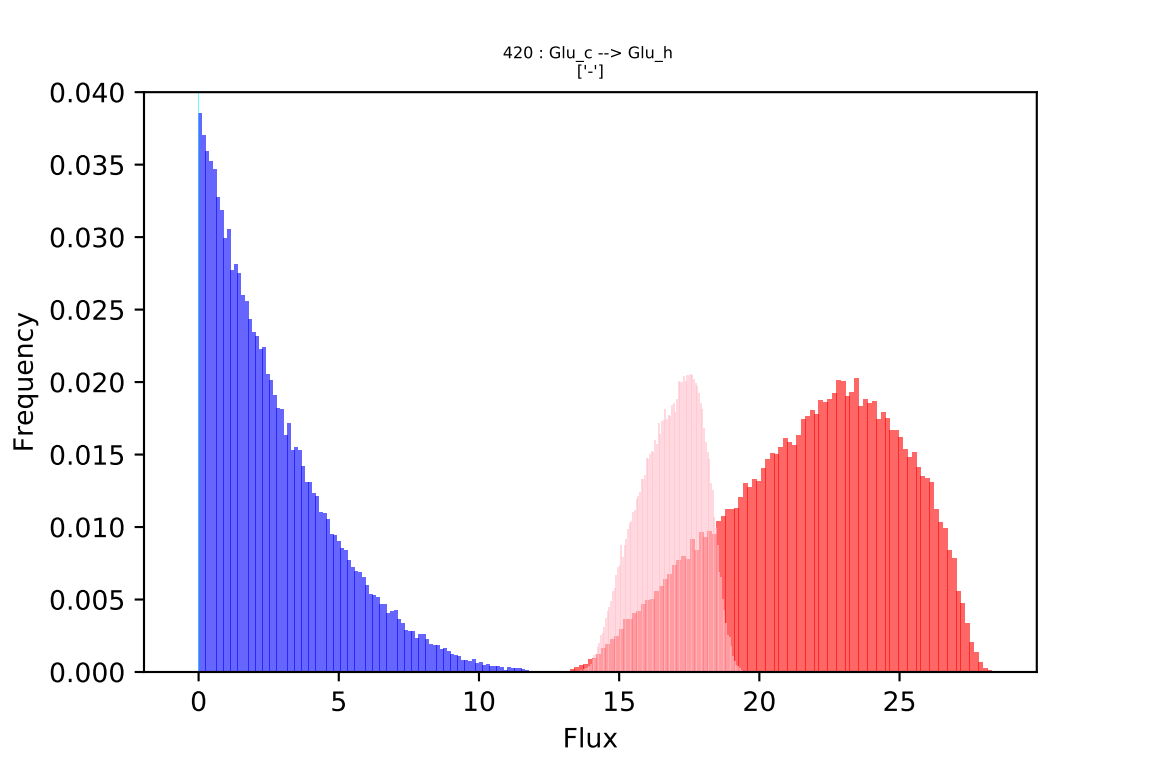

415 : Val_c --> Val_p
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

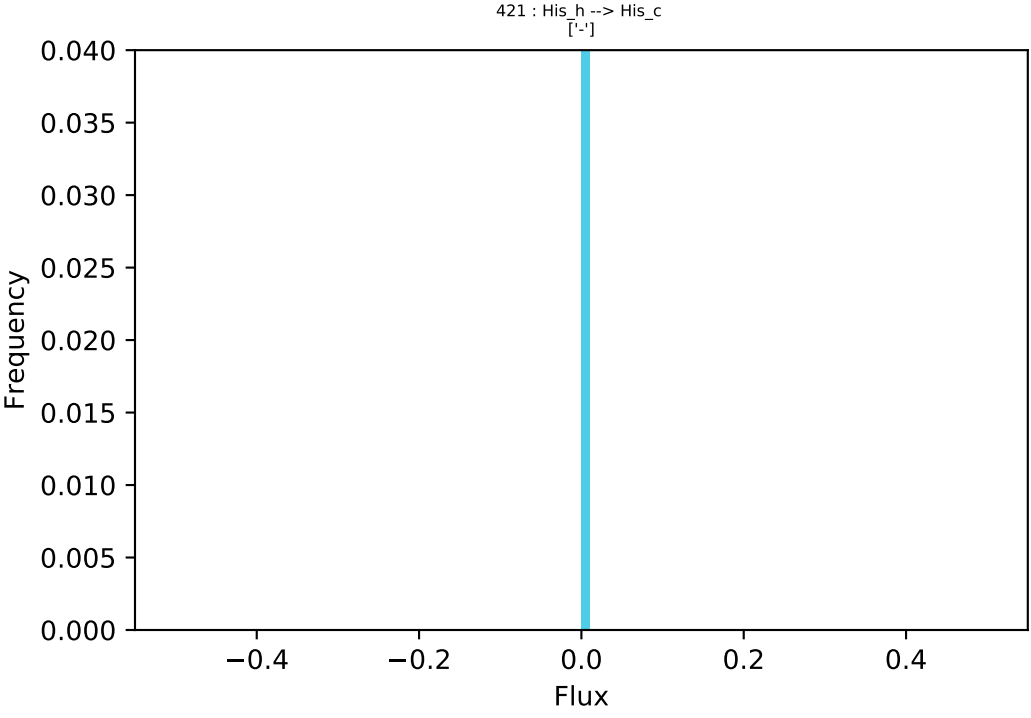

416 : Ala_h --> Ala_c
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

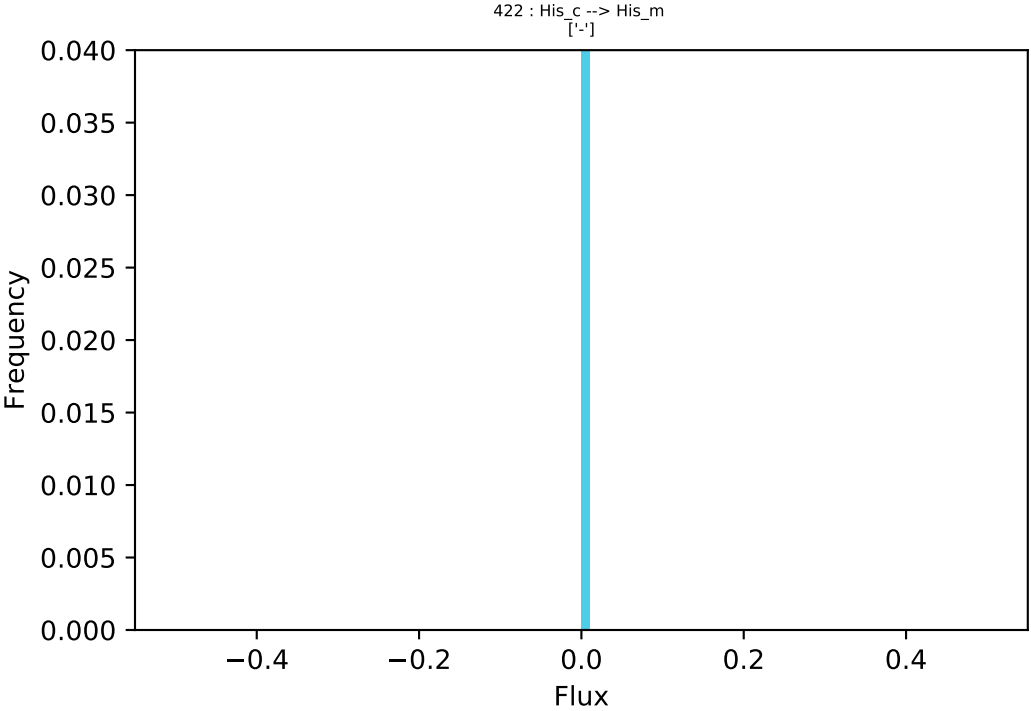

417 : Arg_h --> Arg_c
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

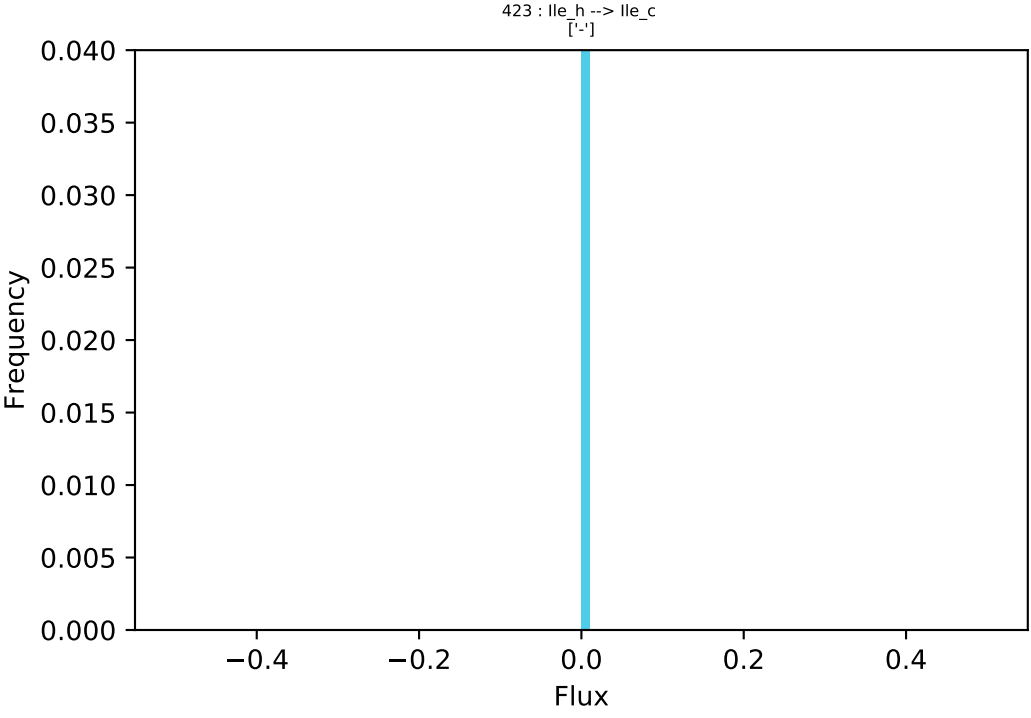

418 : Asn_c --> Asn_h + H_h
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

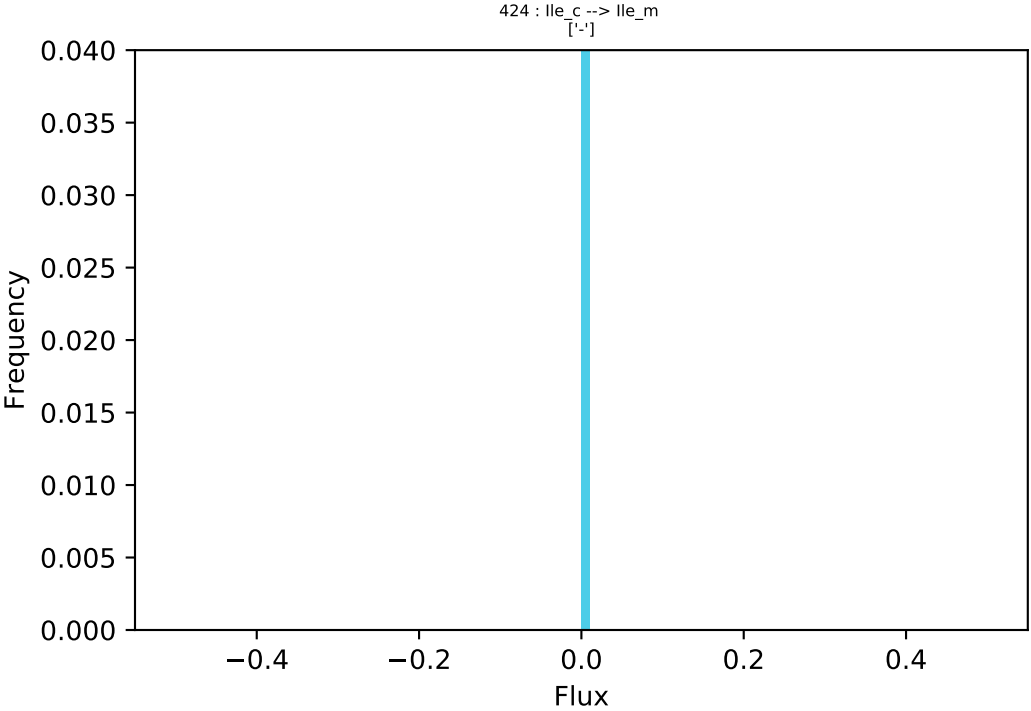

419 : Asn_c --> Asn_m
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

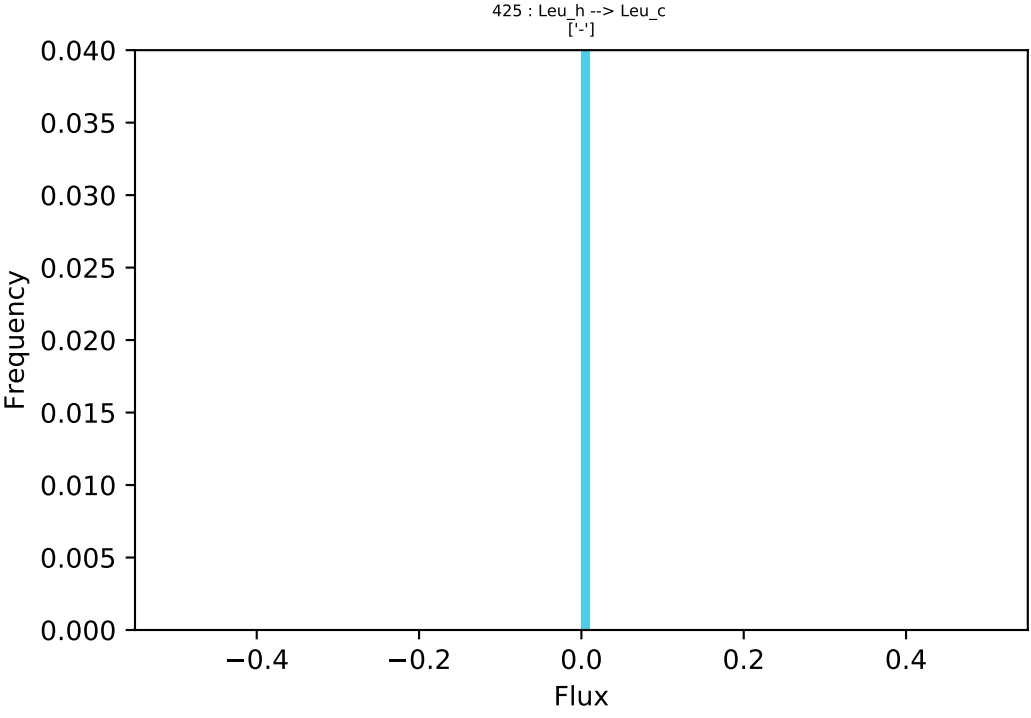

420 : Glu_c --> Glu_h
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0
5
10
15
20
25
Flux

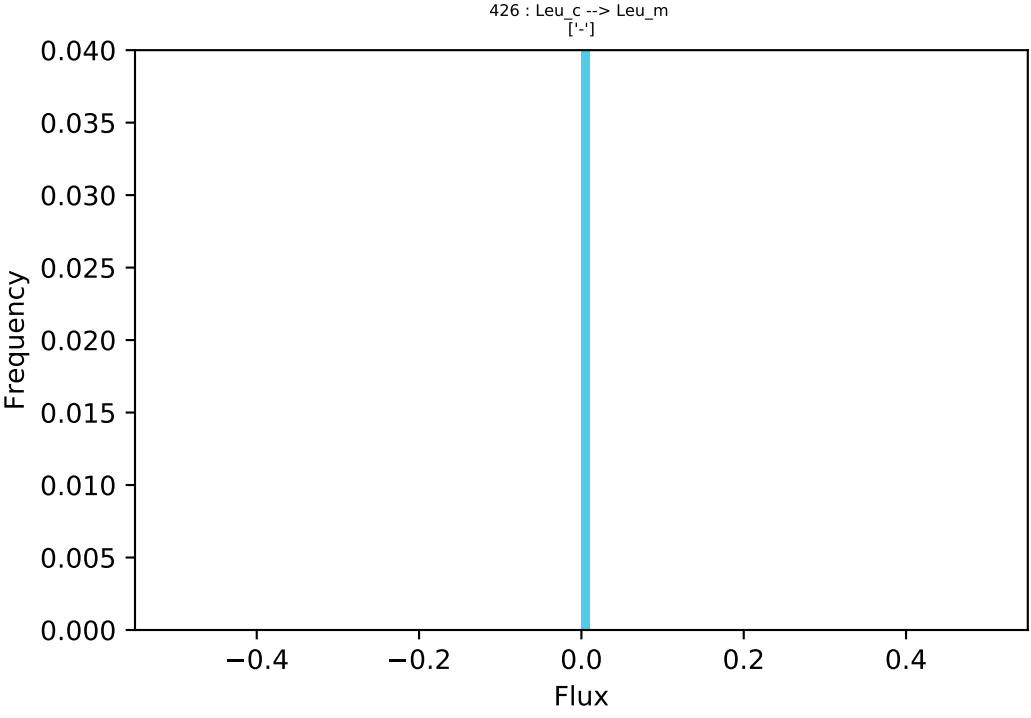

421 : His_h --> His_c
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

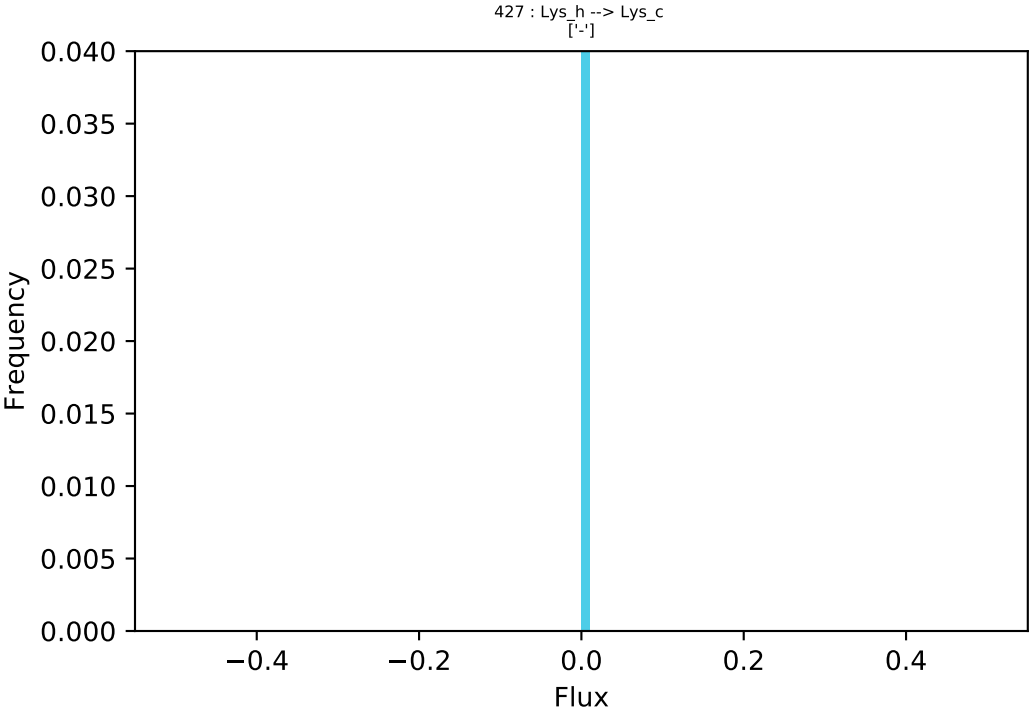

422 : His_c --> His_m
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

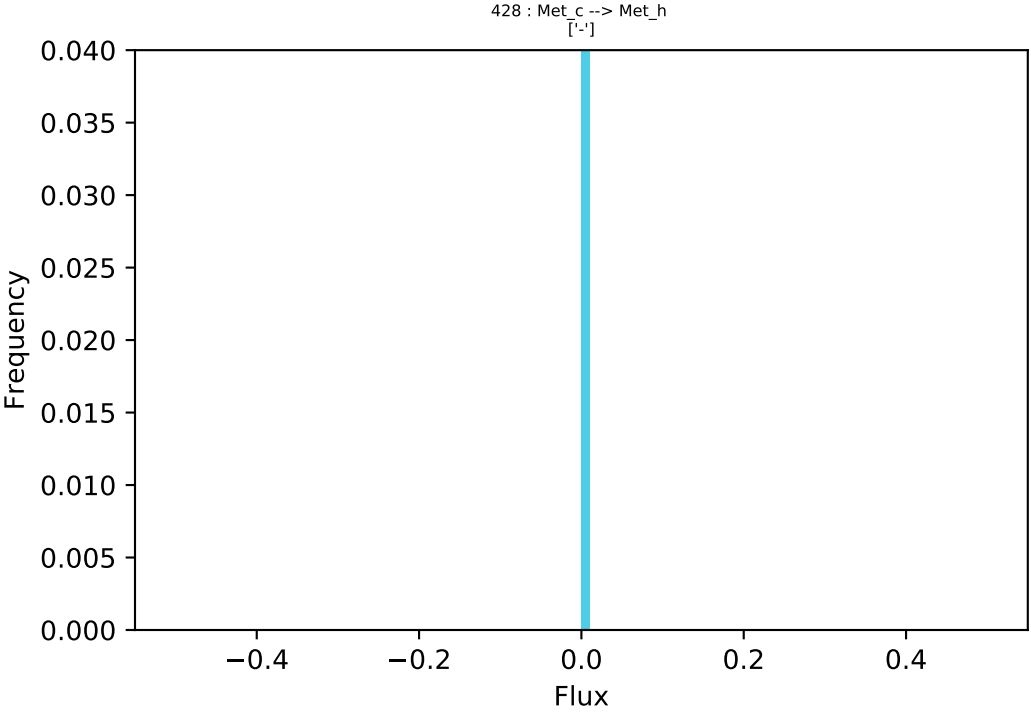

423 : Ile_h --> Ile_c
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

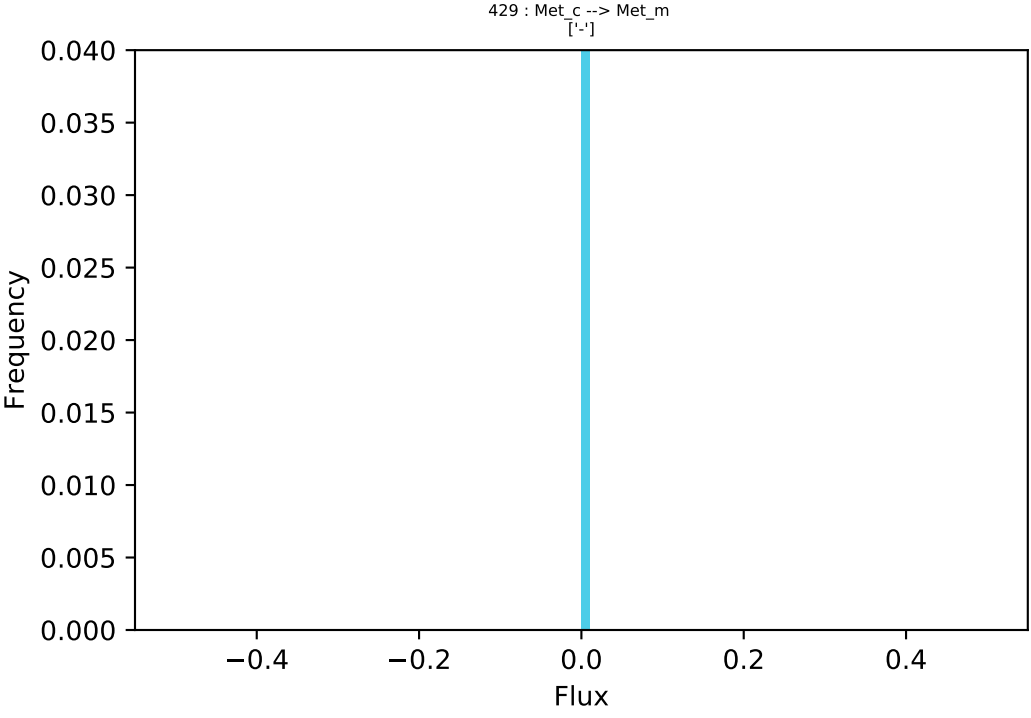

424 : Ile_c --> Ile_m
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

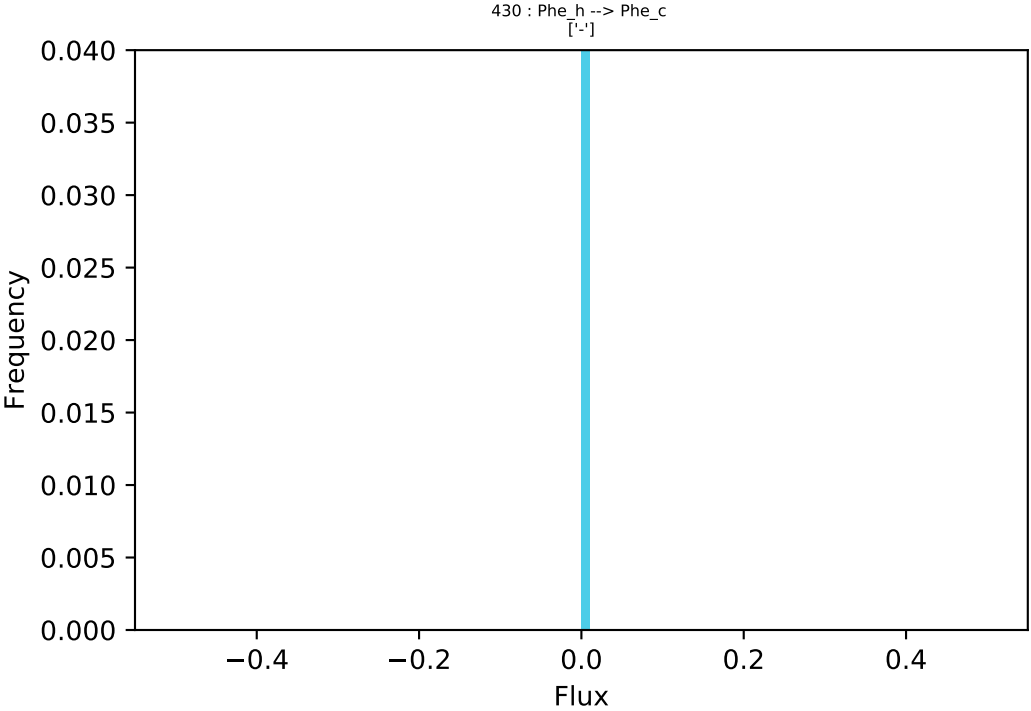

425 : Leu_h --> Leu_c
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

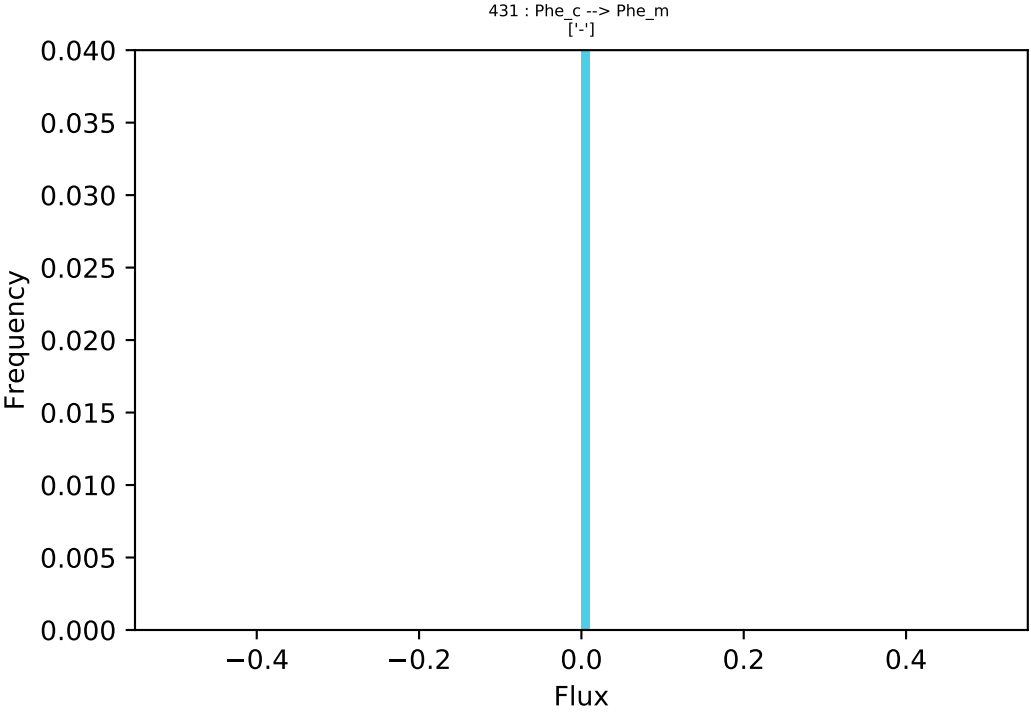

426 : Leu_c --> Leu_m
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

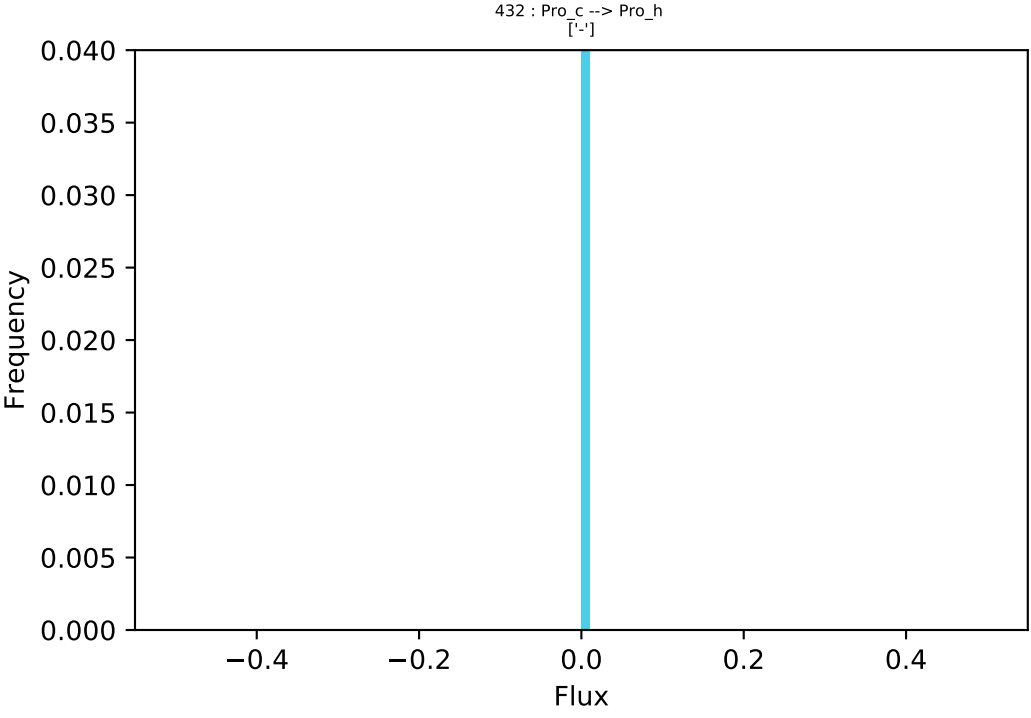

427 : Lys_h --> Lys_c
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

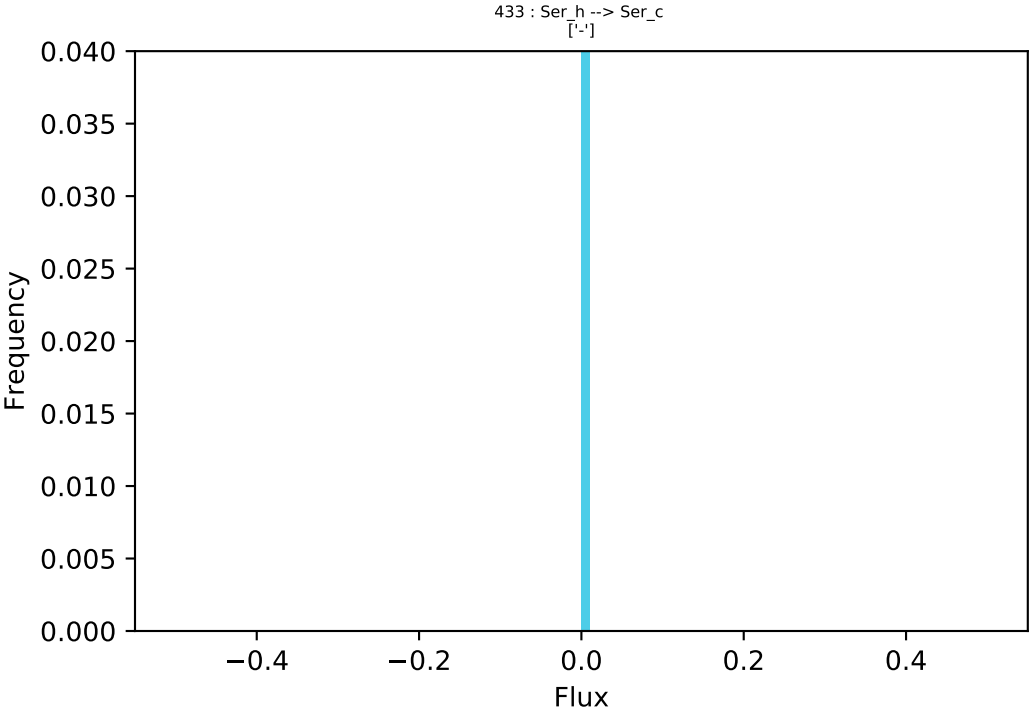

428 : Met_c --> Met_h
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

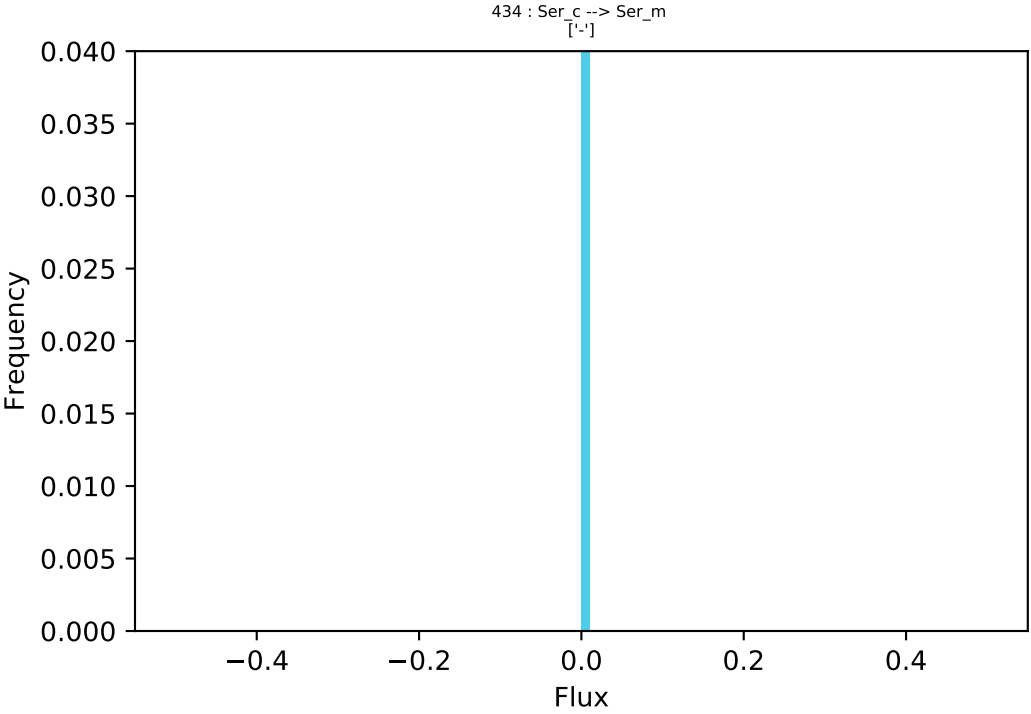

429 : Met_c --> Met_m
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

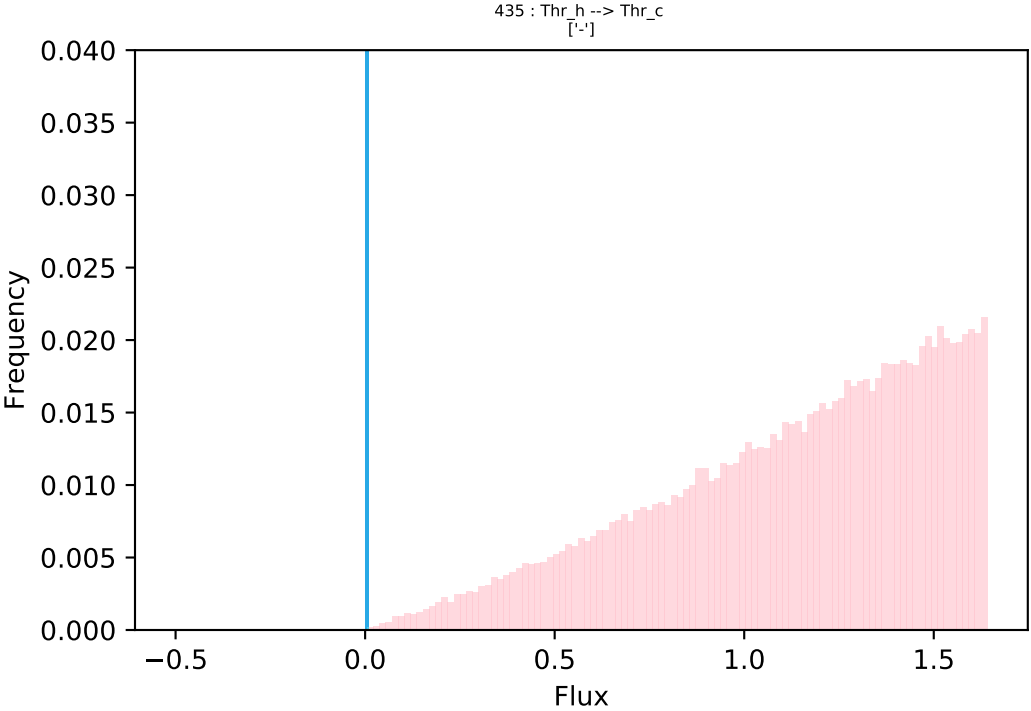

430 : Phe_h --> Phe_c
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

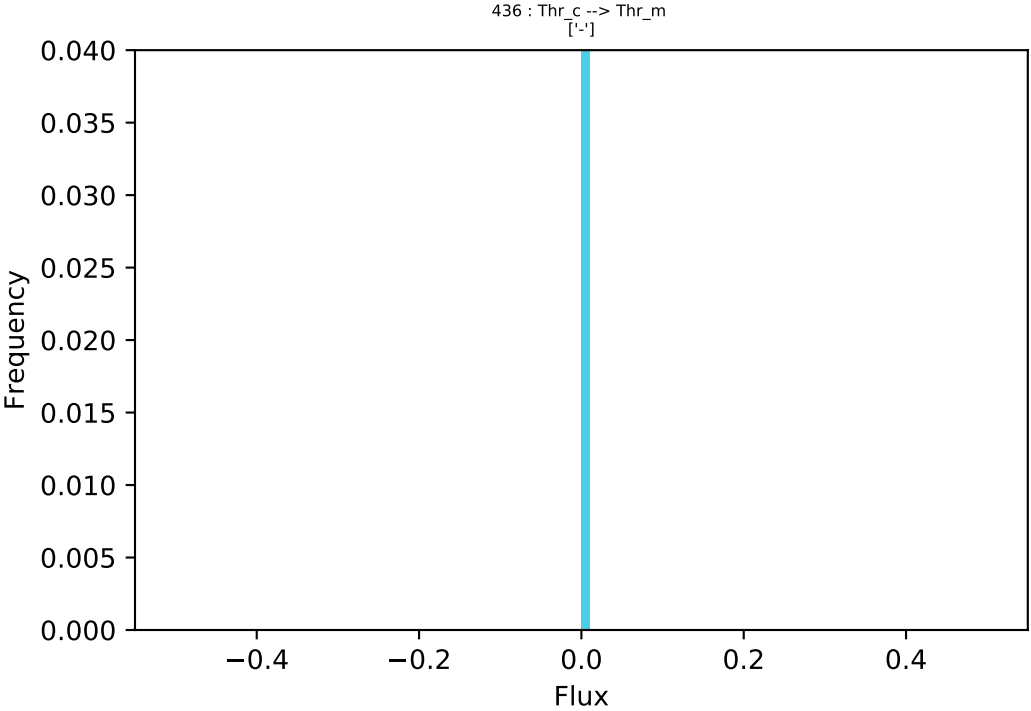

431 : Phe_c --> Phe_m
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

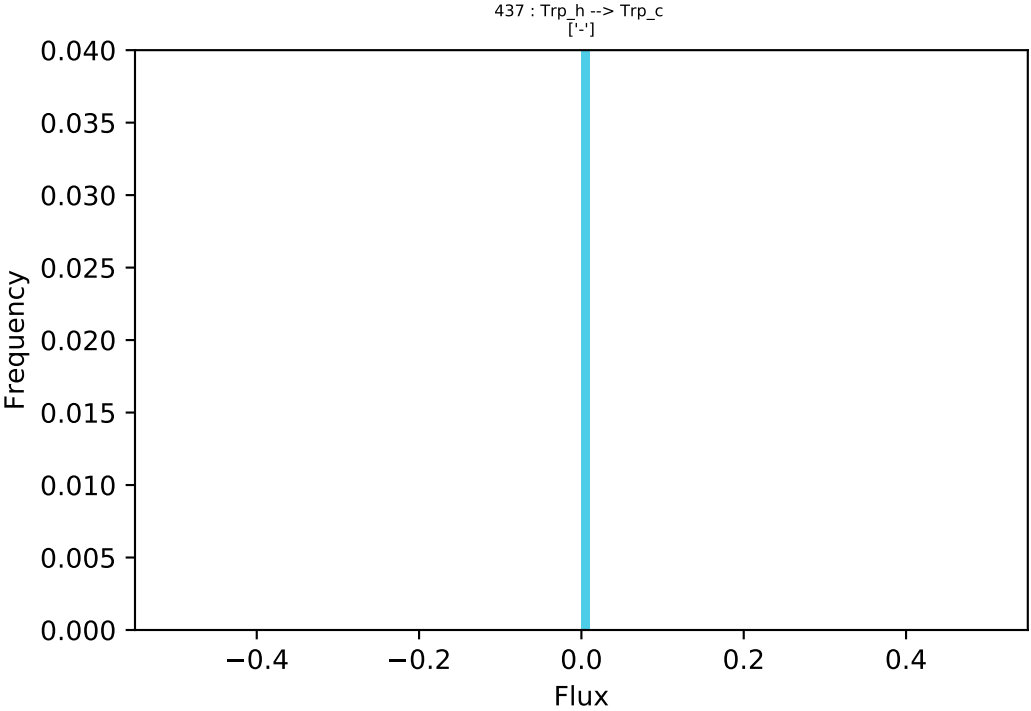

432 : Pro_c --> Pro_h
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

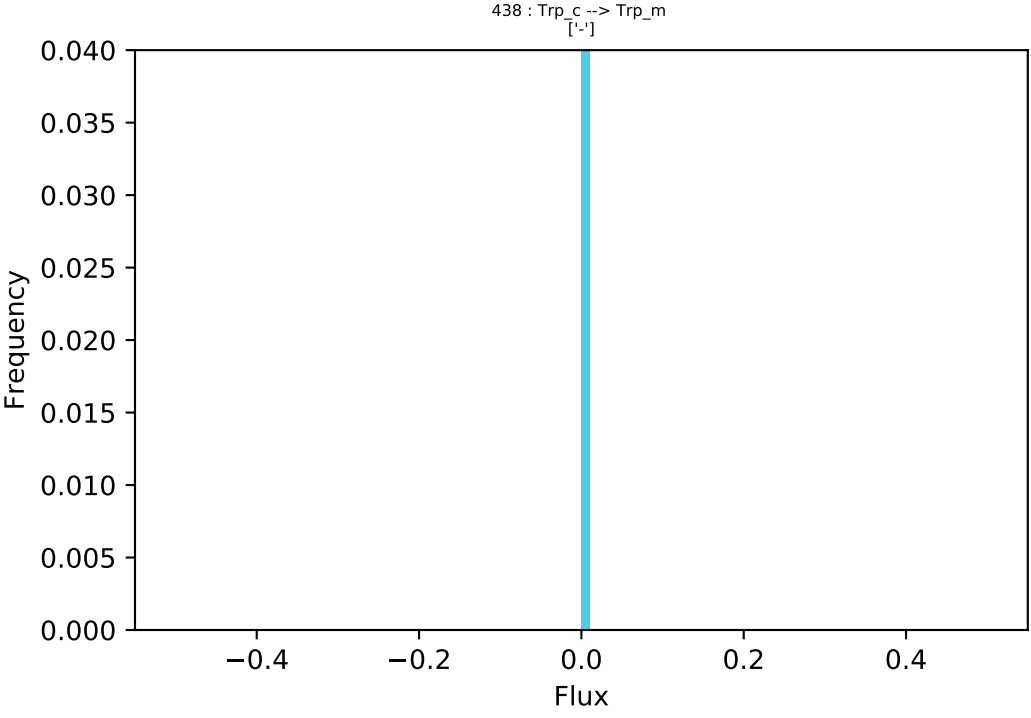

433 : Ser_h --> Ser_c
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

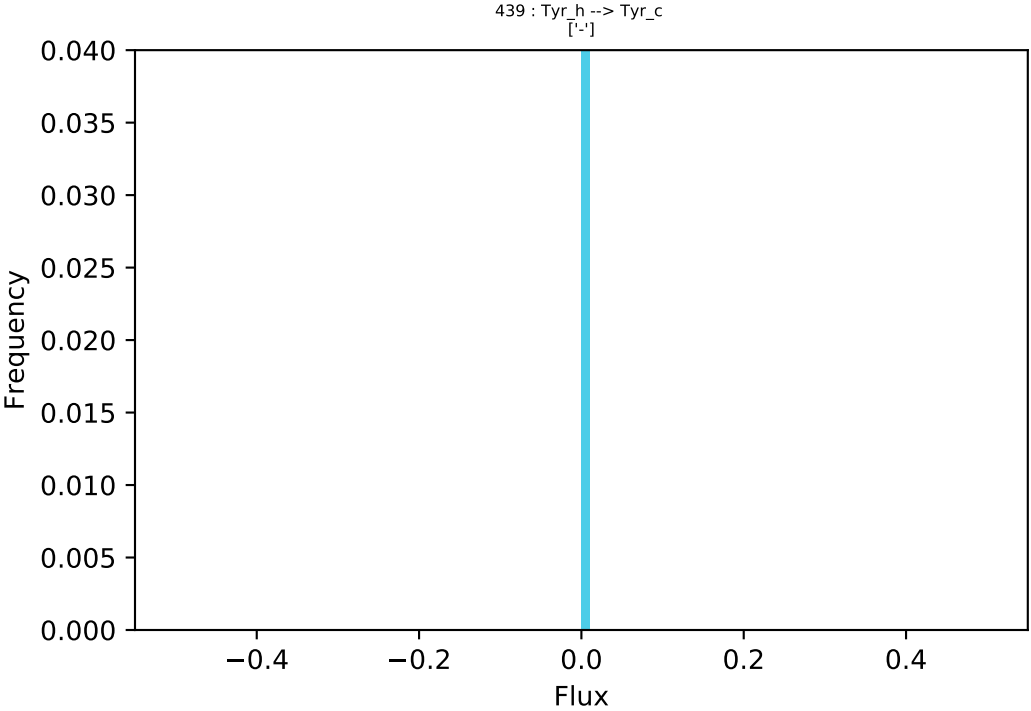

434 : Ser_c --> Ser_m
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

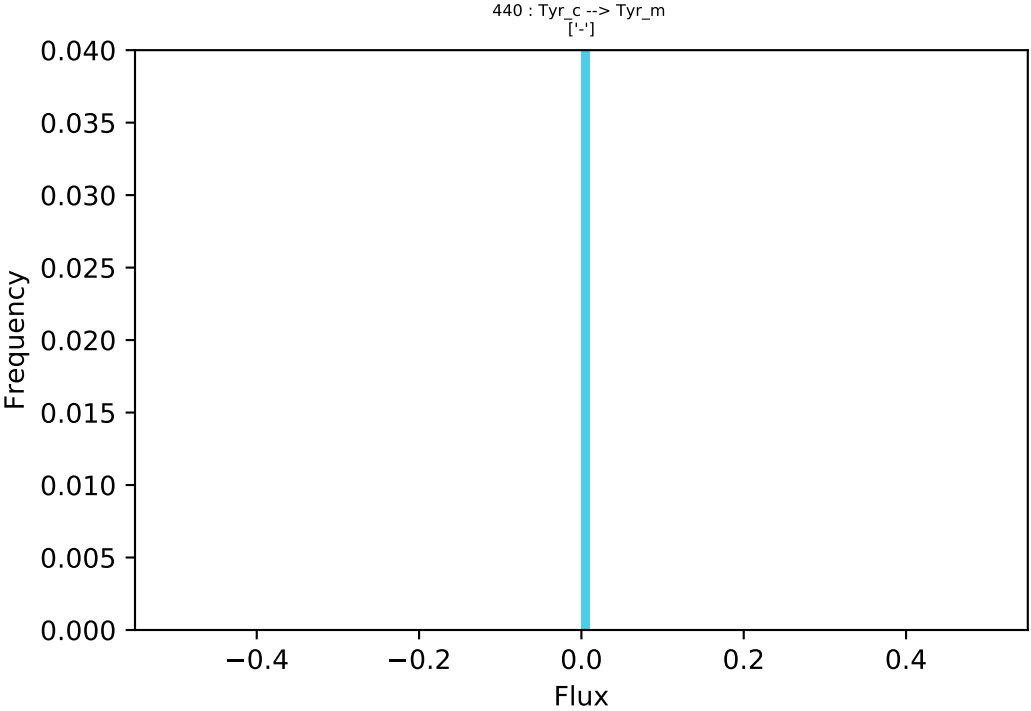

435 : Thr_h --> Thr_c
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.5
0.0
0.5
1.0
1.5
Flux

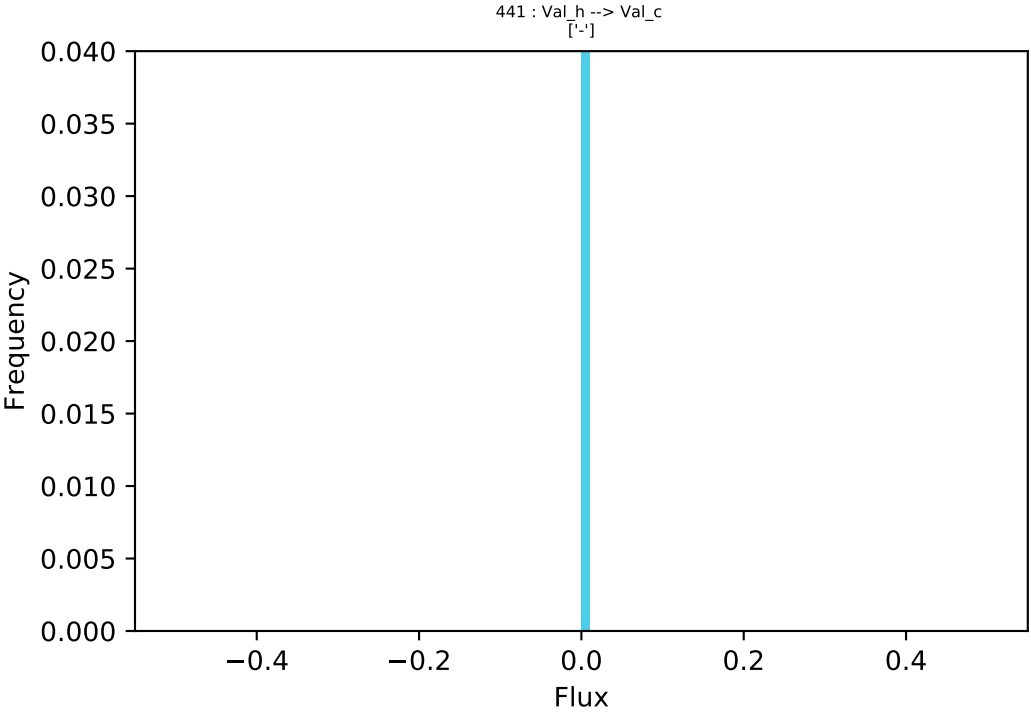

436 : Thr_c --> Thr_m
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

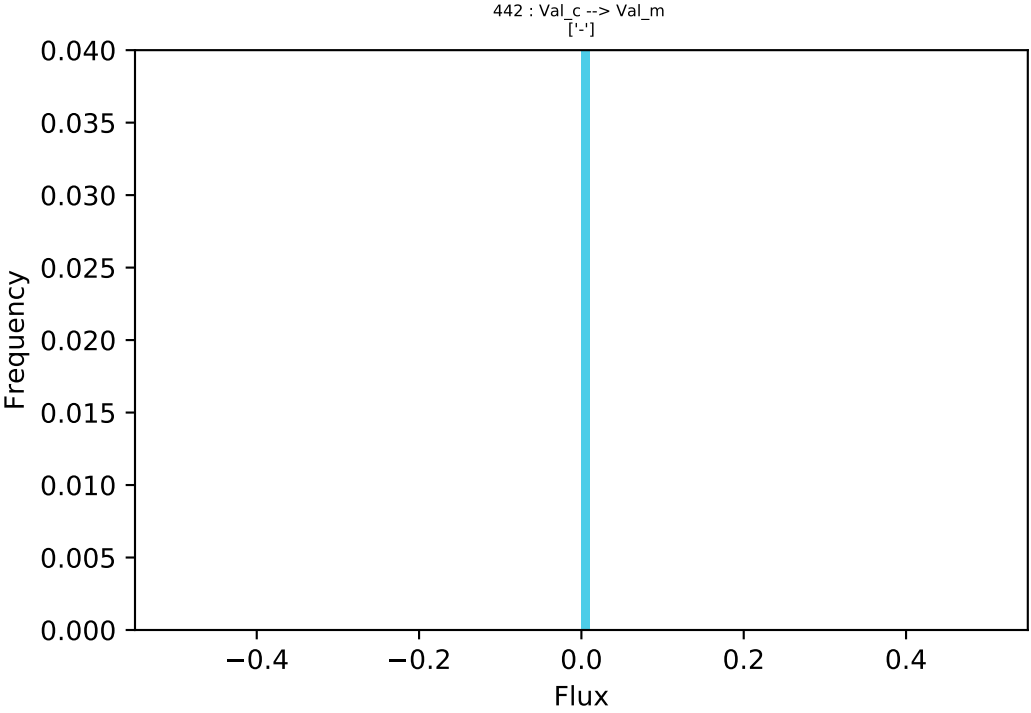

437 : Trp_h --> Trp_c
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

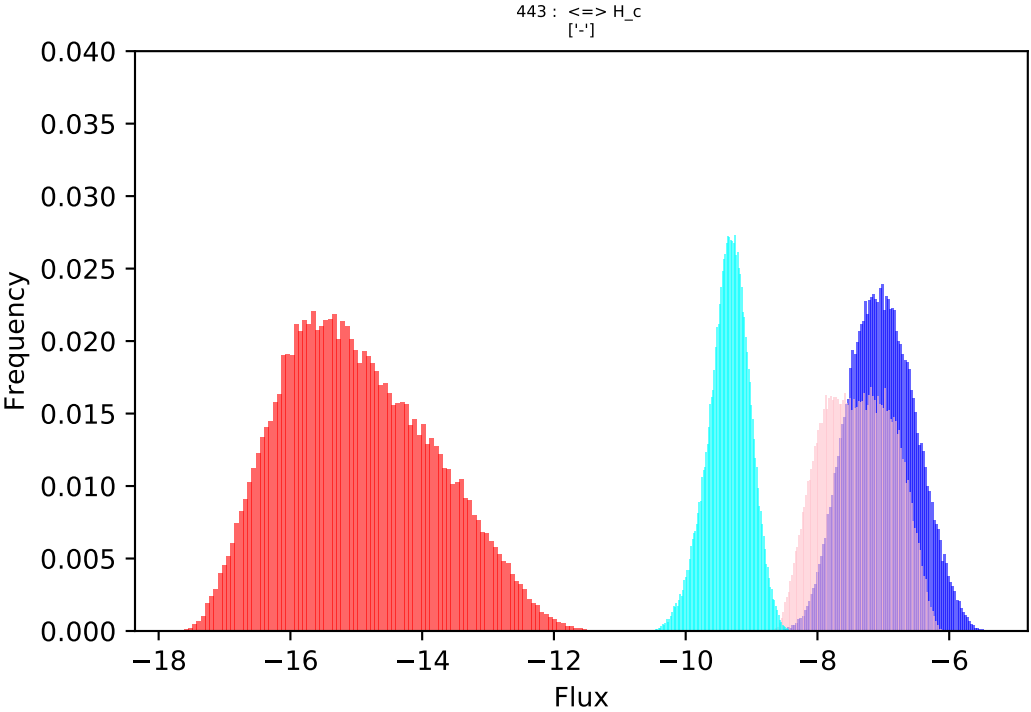

438 : Trp_c --> Trp_m
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

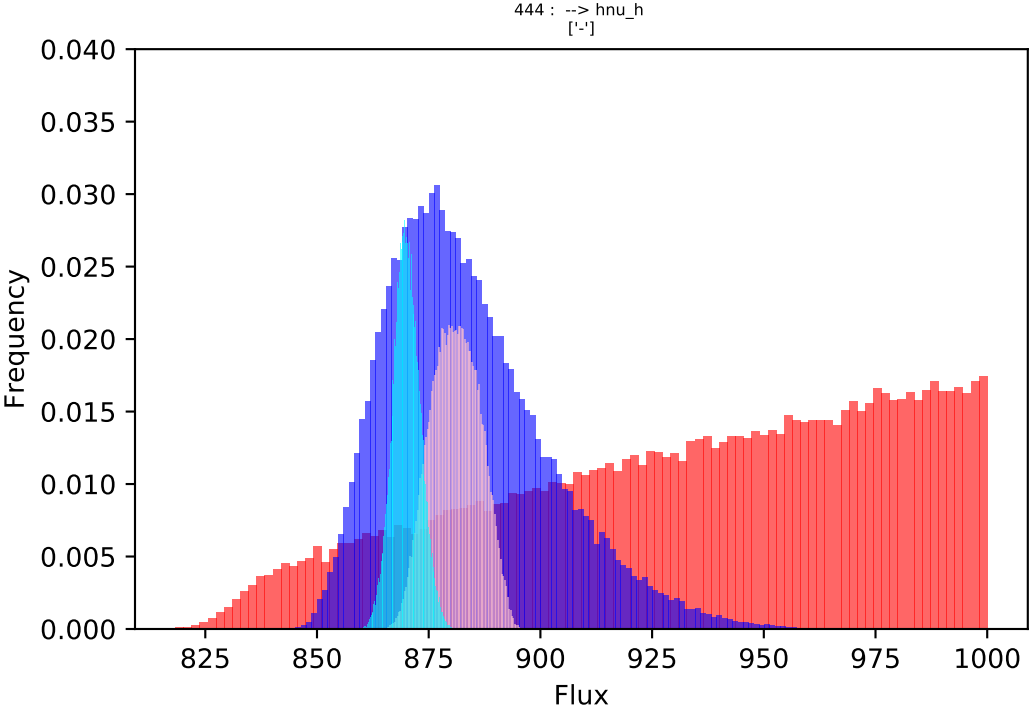

439 : Tyr_h --> Tyr_c
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

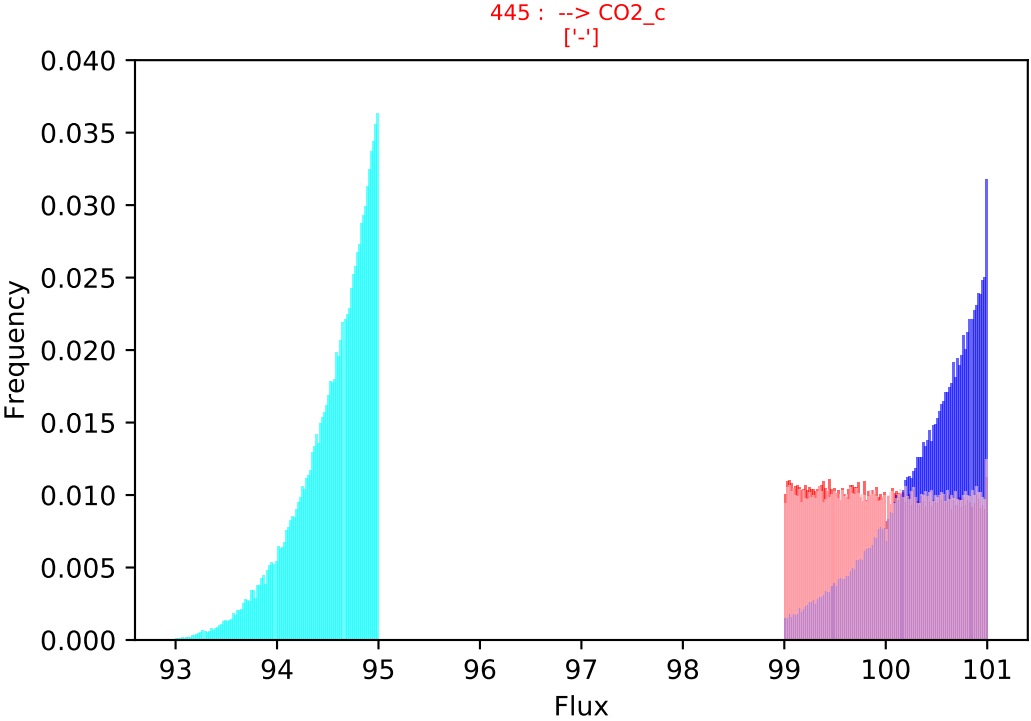

440 : Tyr_c --> Tyr_m
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

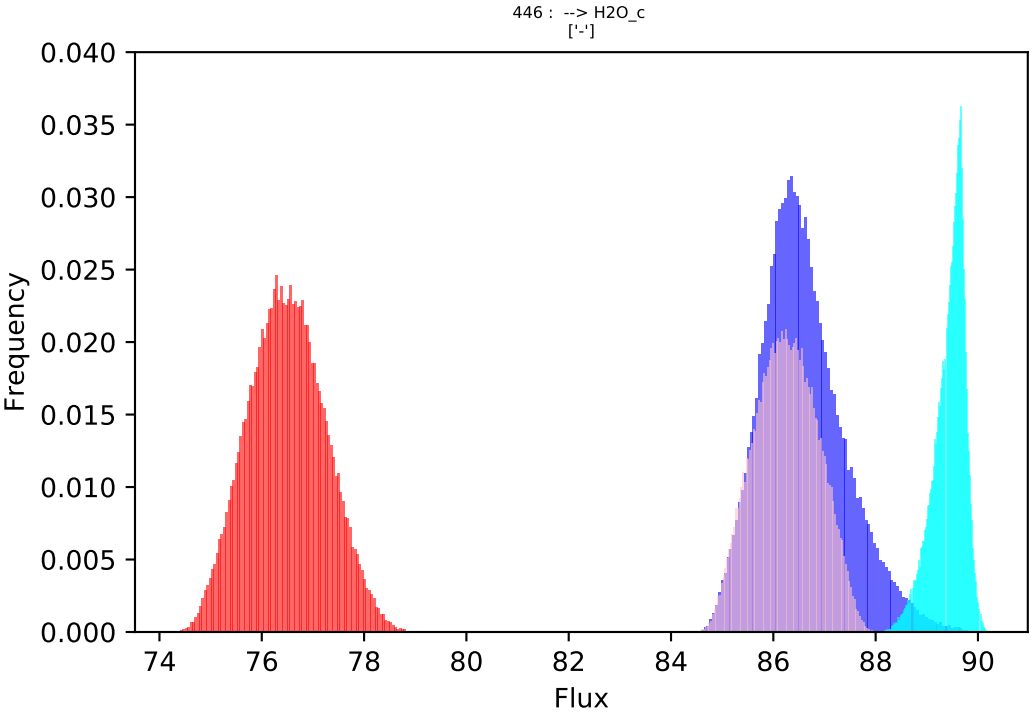

441 : Val_h --> Val_c
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

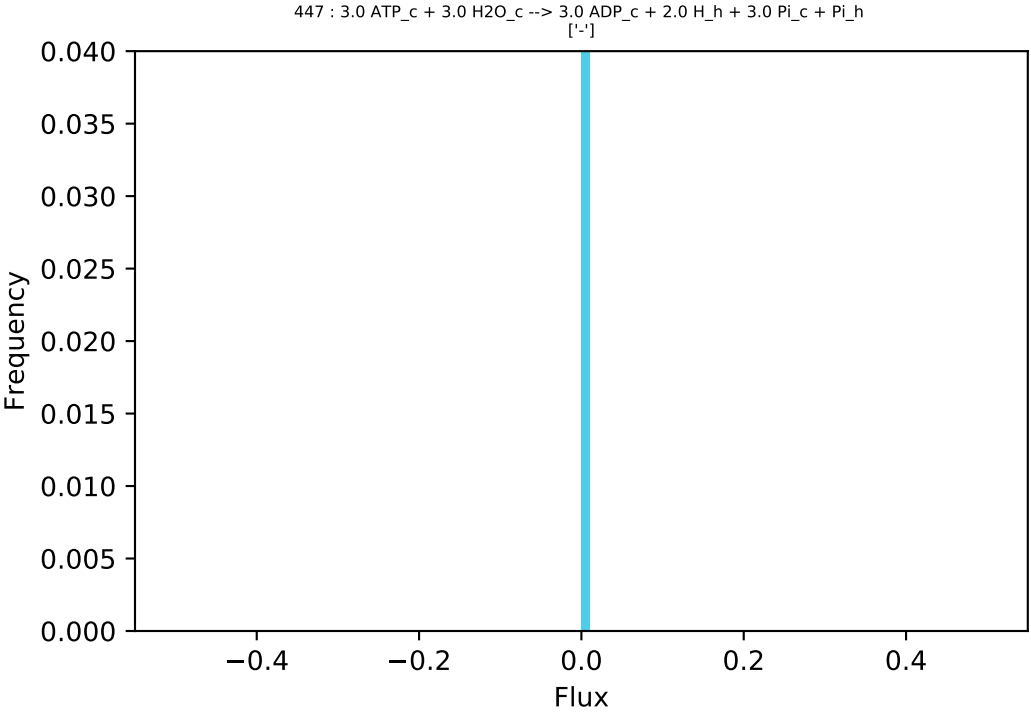

442 : Val_c --> Val_m
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

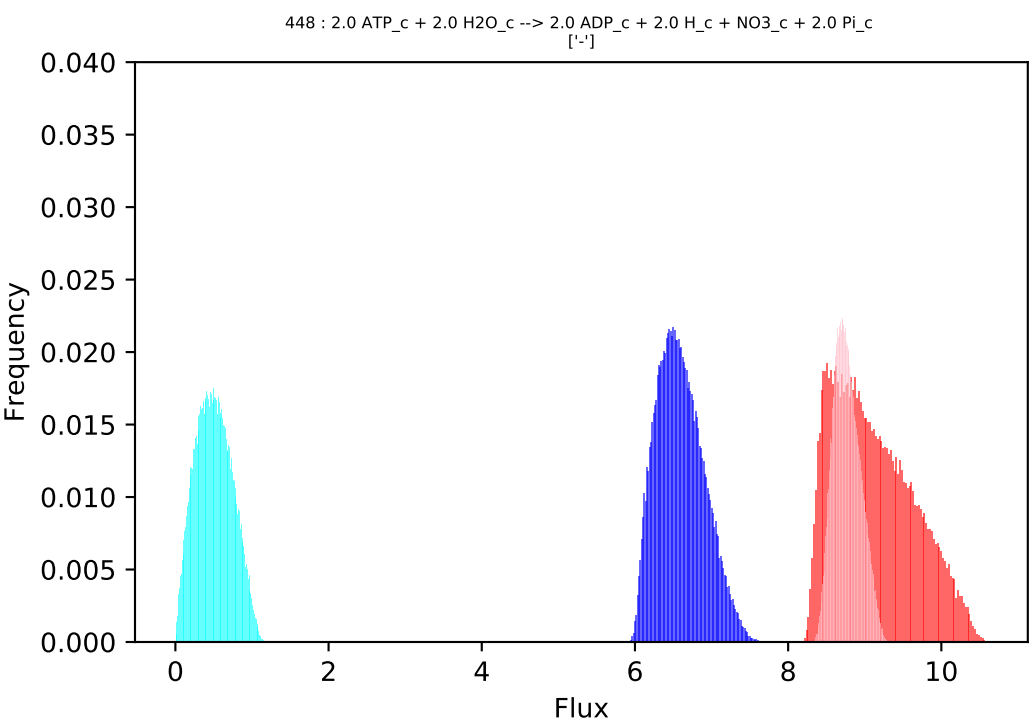

443 : <=> H_c
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−18
−16
−14
−12
−10
−8
−6
Flux

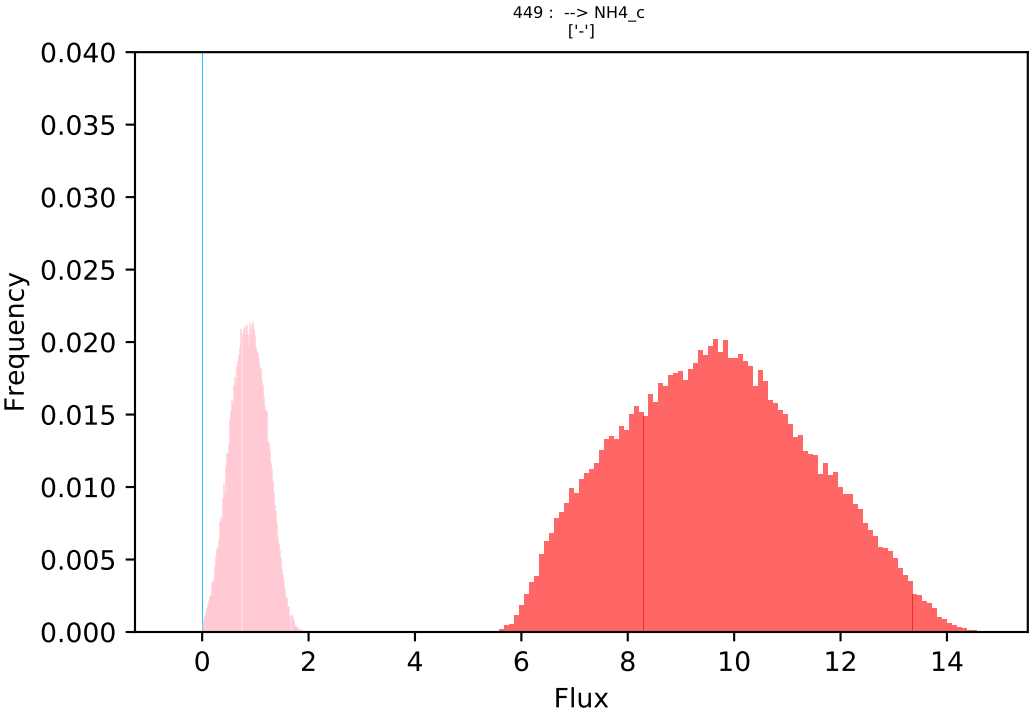

444 : --> hnu_h
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
825
850
875
900
925
950
975
1000
Flux

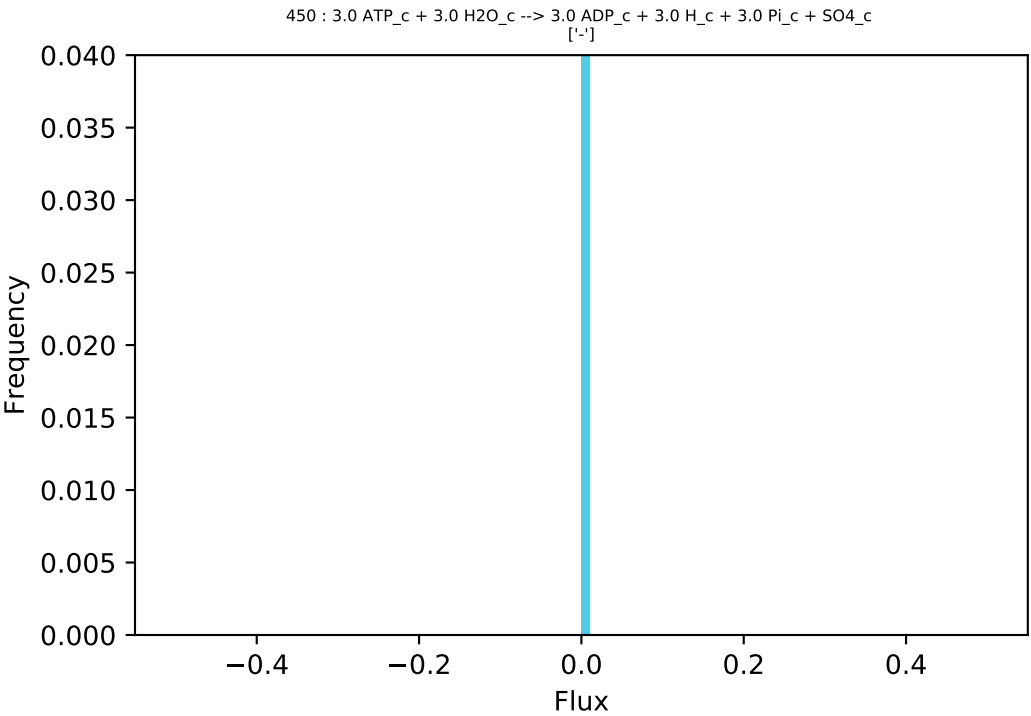

445 : --> CO2_c
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
93
94
95
96
97
98
99
100
101
Flux

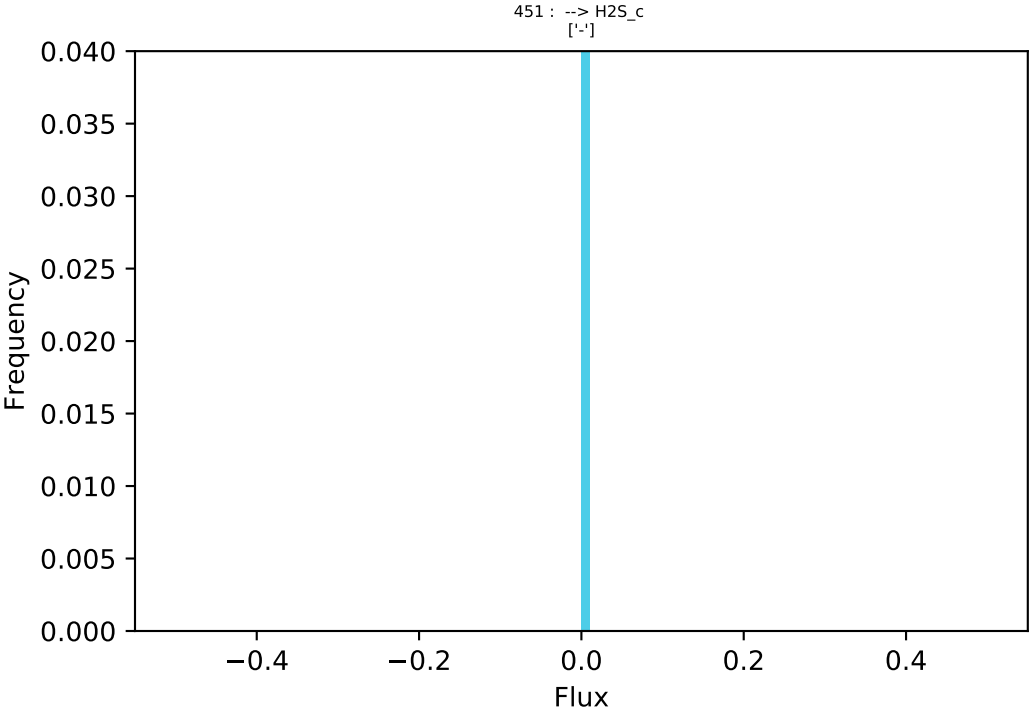

446 : --> H2O_c
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
74
76
78
80
82
84
86
88
90
Flux

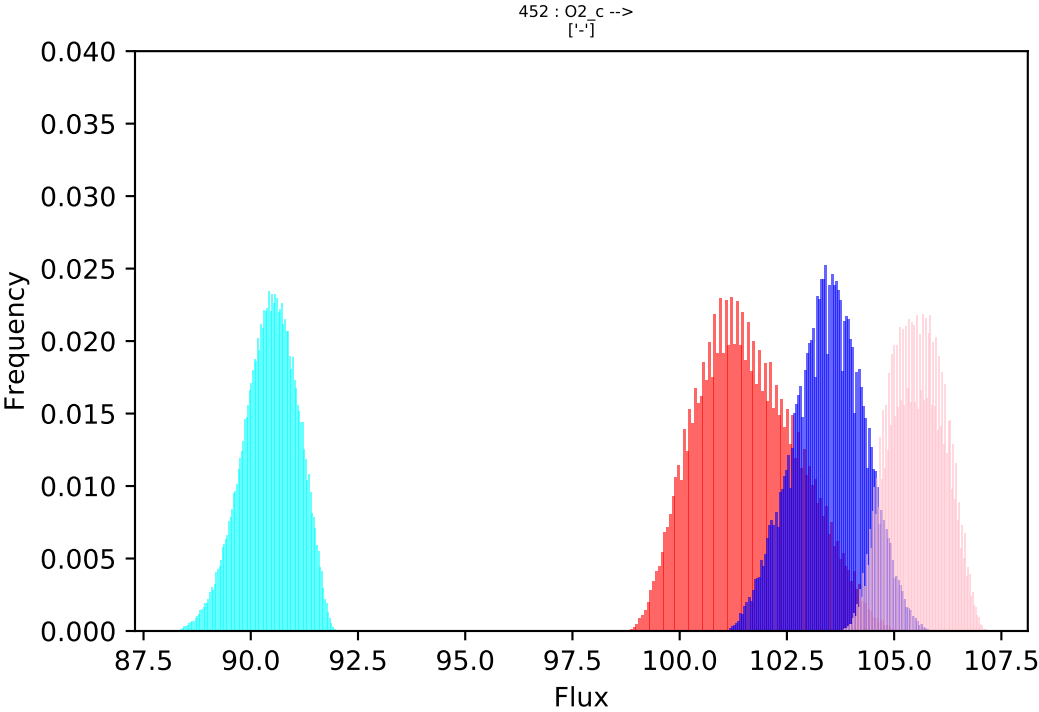

447 : 3.0 ATP_c + 3.0 H2O_c --> 3.0 ADP_c + 2.0 H_h + 3.0 Pi_c + Pi_h
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

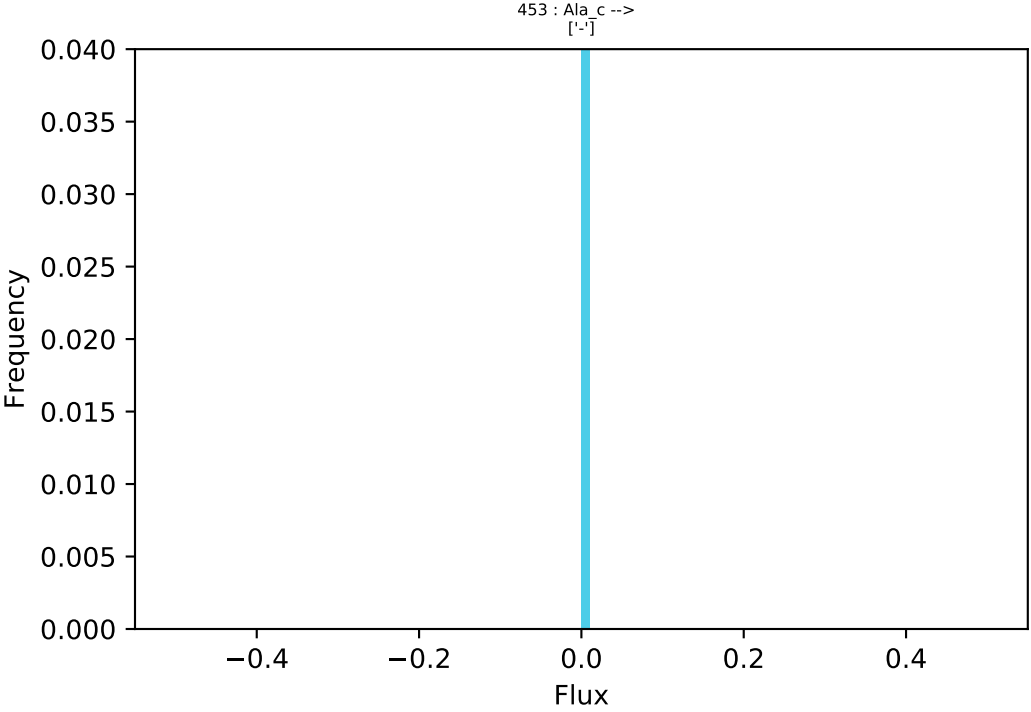

448 : 2.0 ATP_c + 2.0 H2O_c --> 2.0 ADP_c + 2.0 H_c + NO3_c + 2.0 Pi_c
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0
2
4
6
8
10
Flux

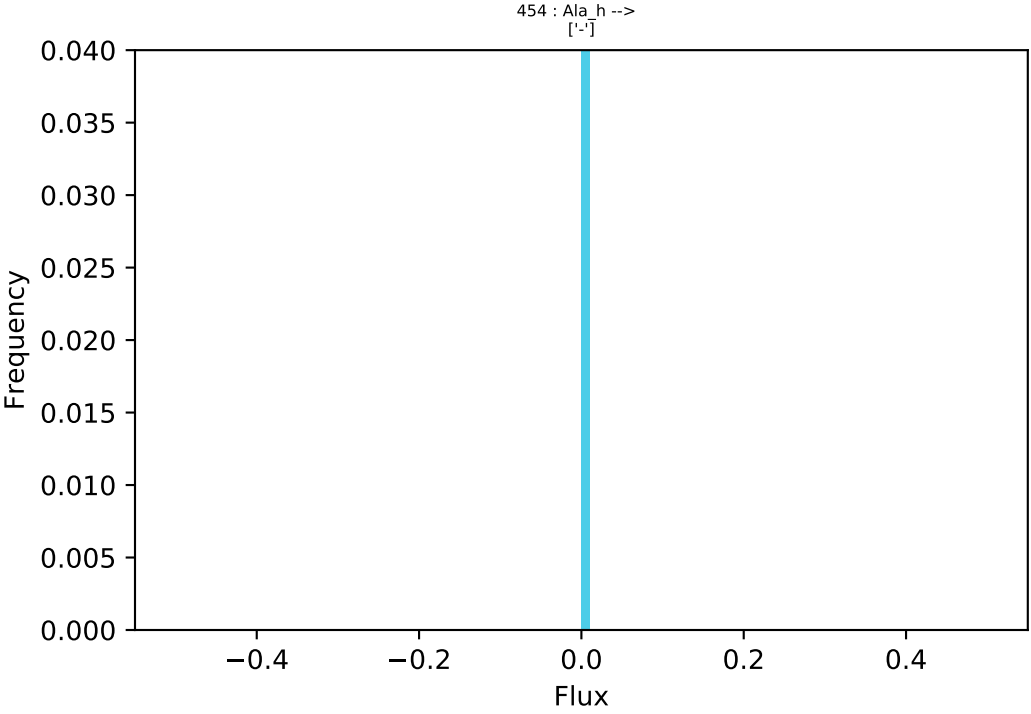

449 : --> NH4_c
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0
2
4
6
8
10
12
14
Flux

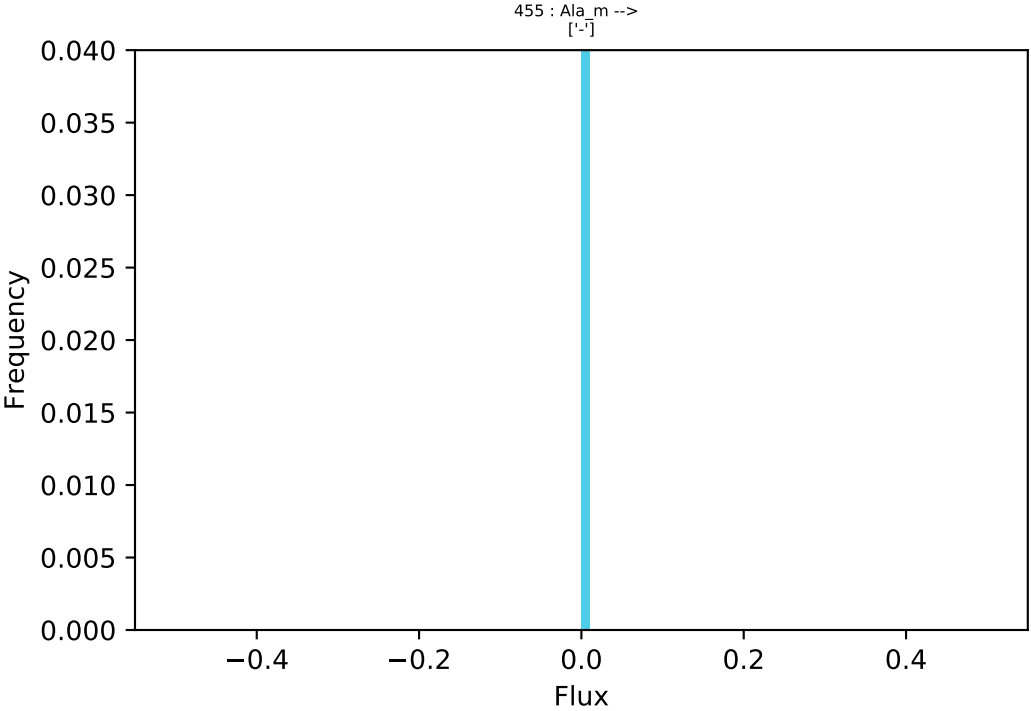

450 : 3.0 ATP_c + 3.0 H2O_c --> 3.0 ADP_c + 3.0 H_c + 3.0 Pi_c + SO4_c
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

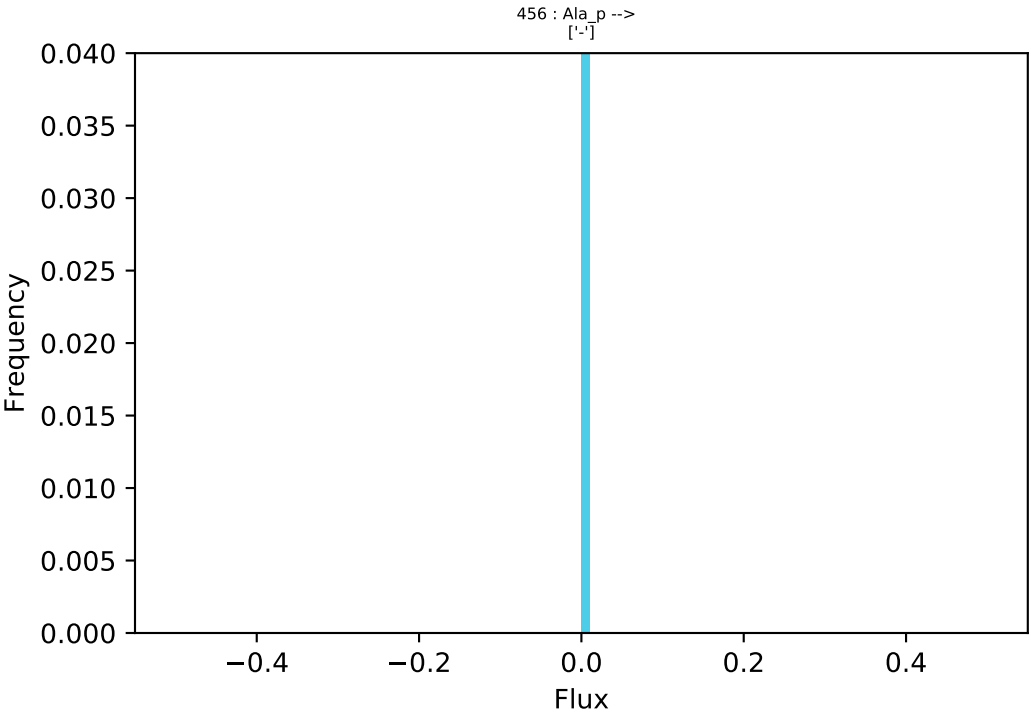

451 : --> H2S_c
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

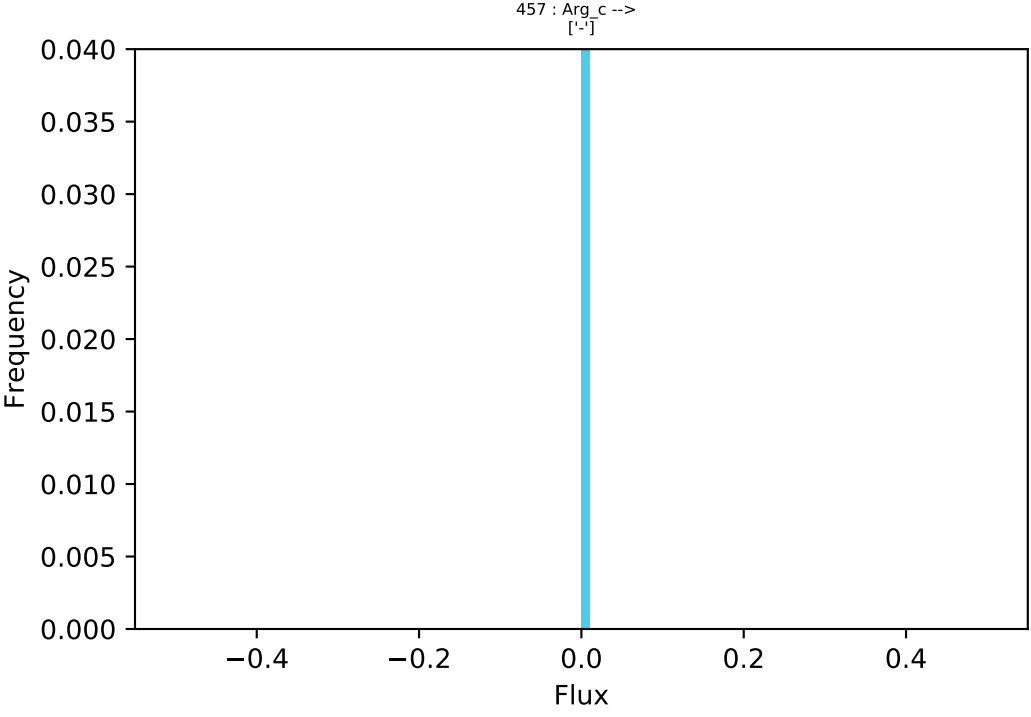

452 : O2_c -->
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
87.5
90.0
92.5
95.0
97.5
100.0
102.5
105.0
107.5
Flux

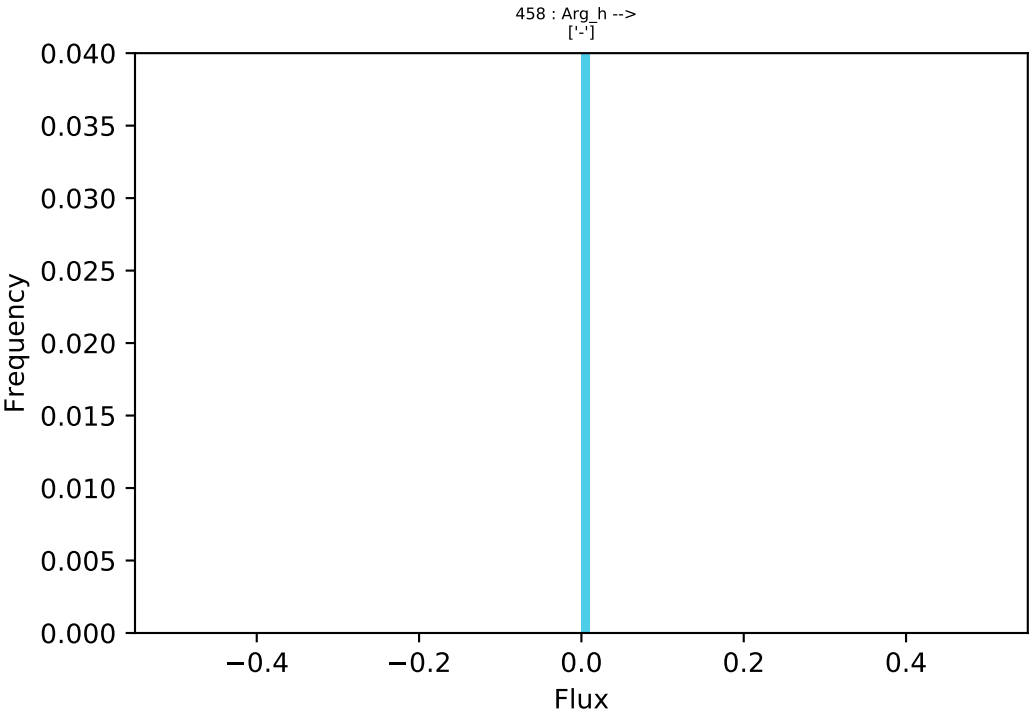

453 : Ala_c -->
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

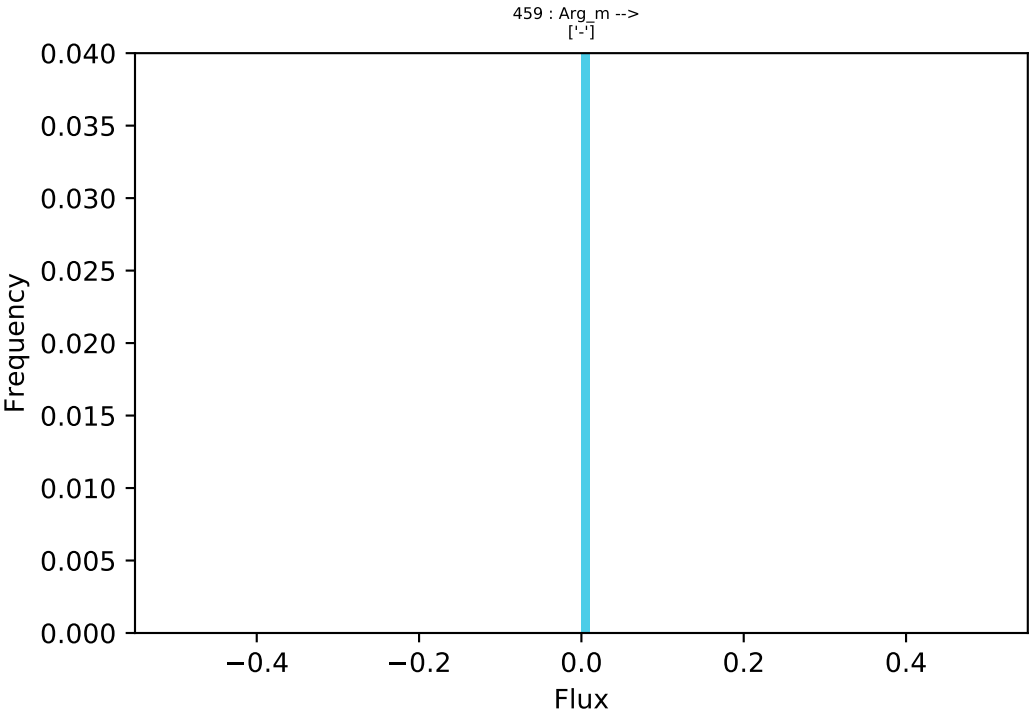

454 : Ala_h -->
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

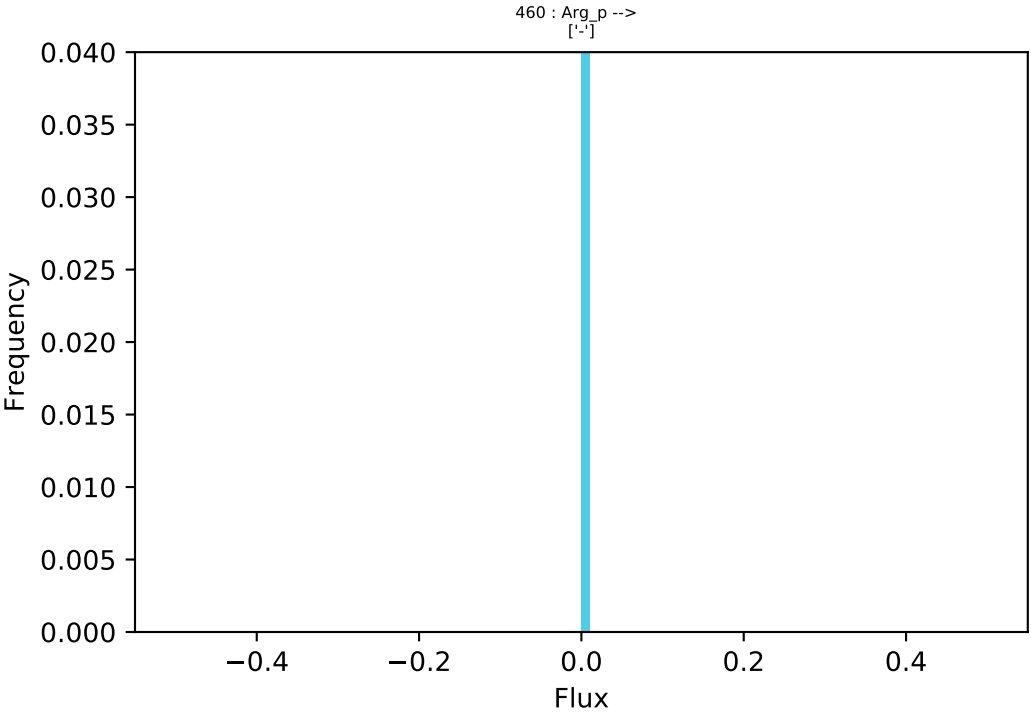

455 : Ala_m -->
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

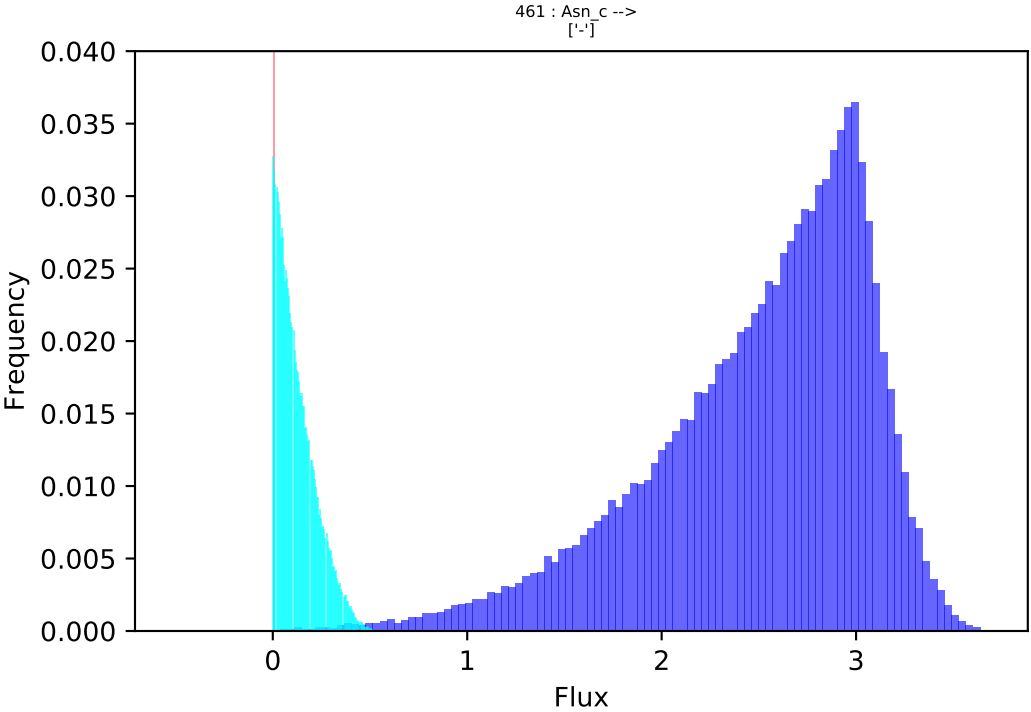

456 : Ala_p -->
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

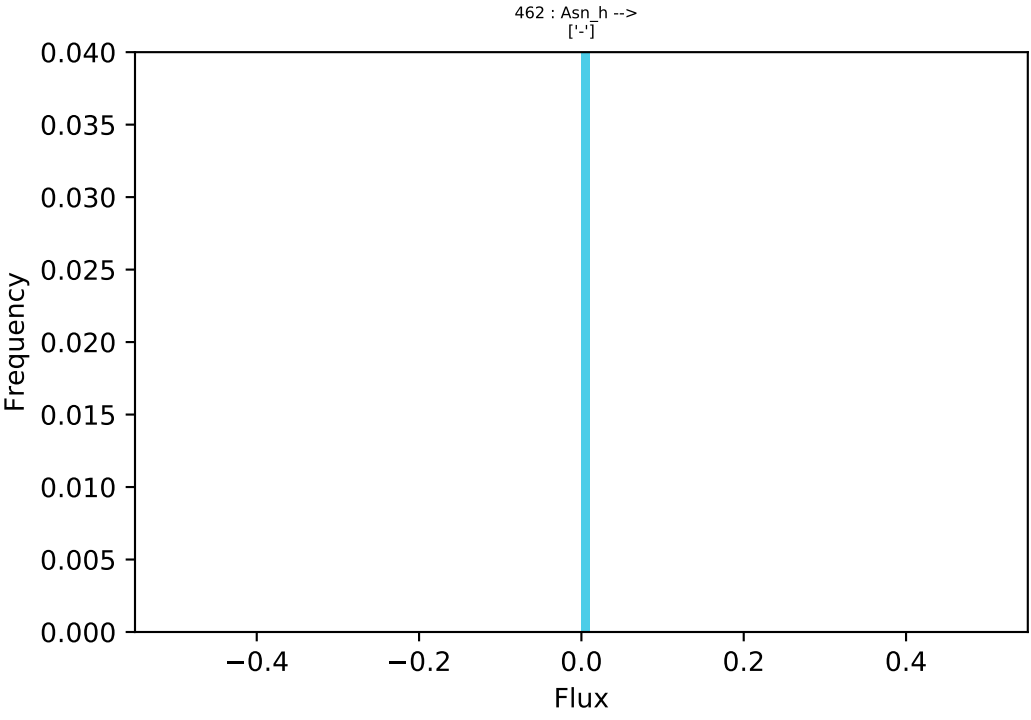

457 : Arg_c -->
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

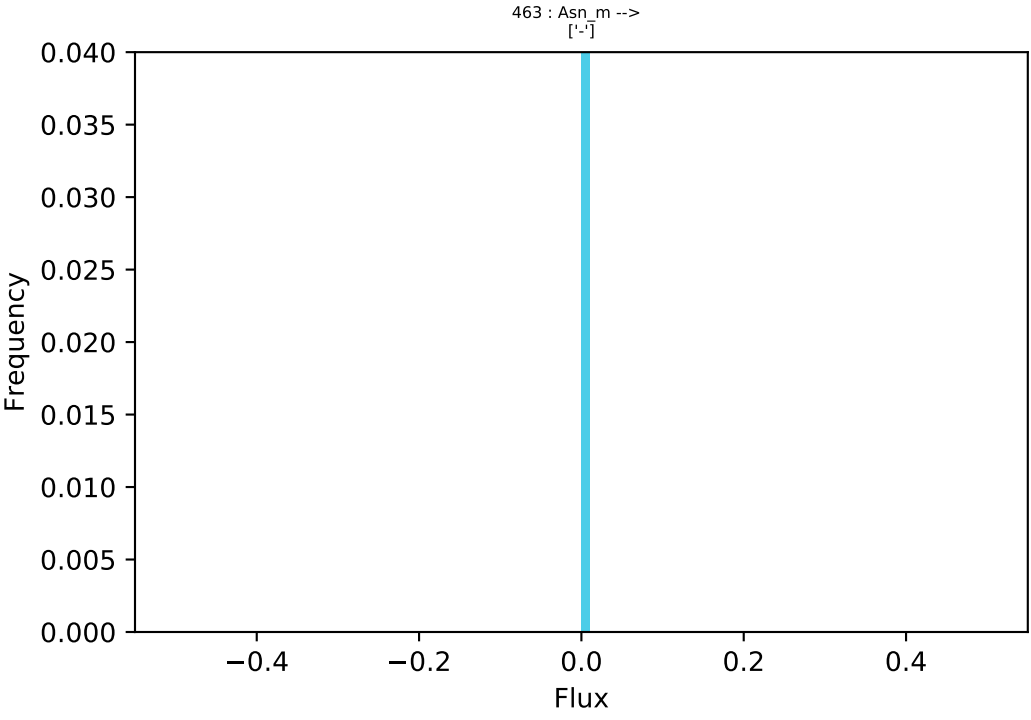

458 : Arg_h -->
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

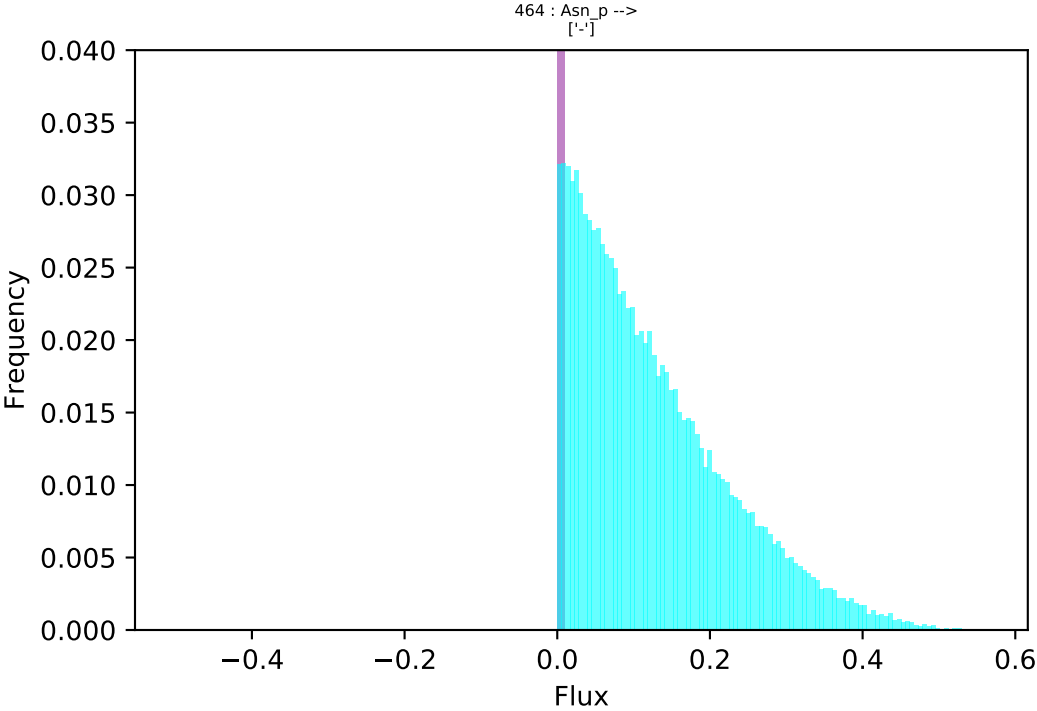

459 : Arg_m -->
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

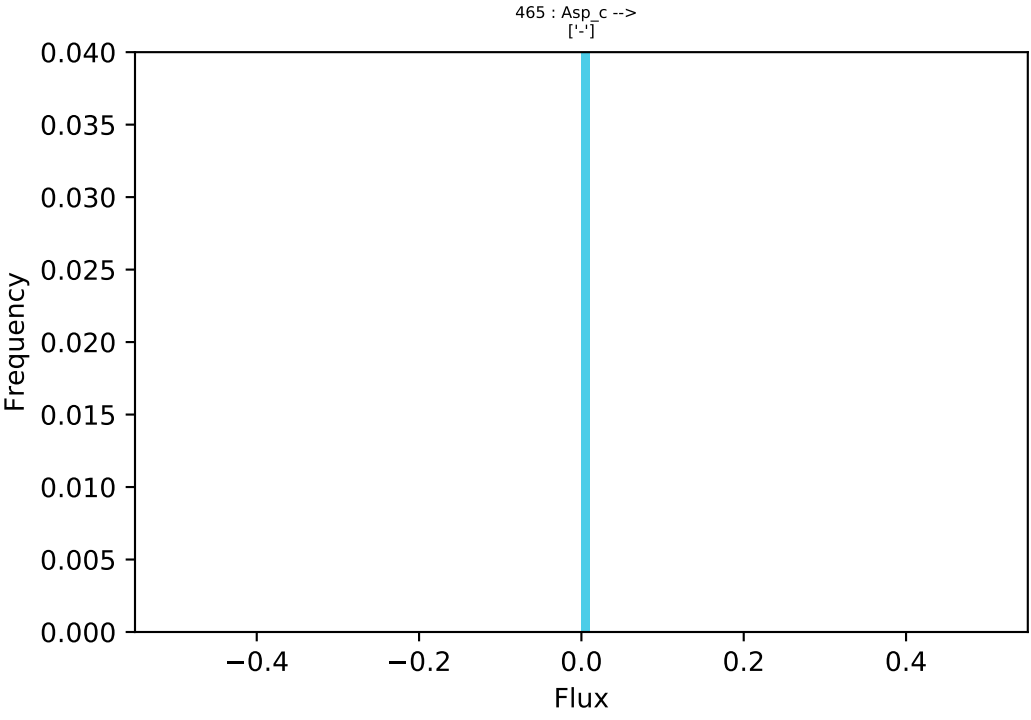

460 : Arg_p -->
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

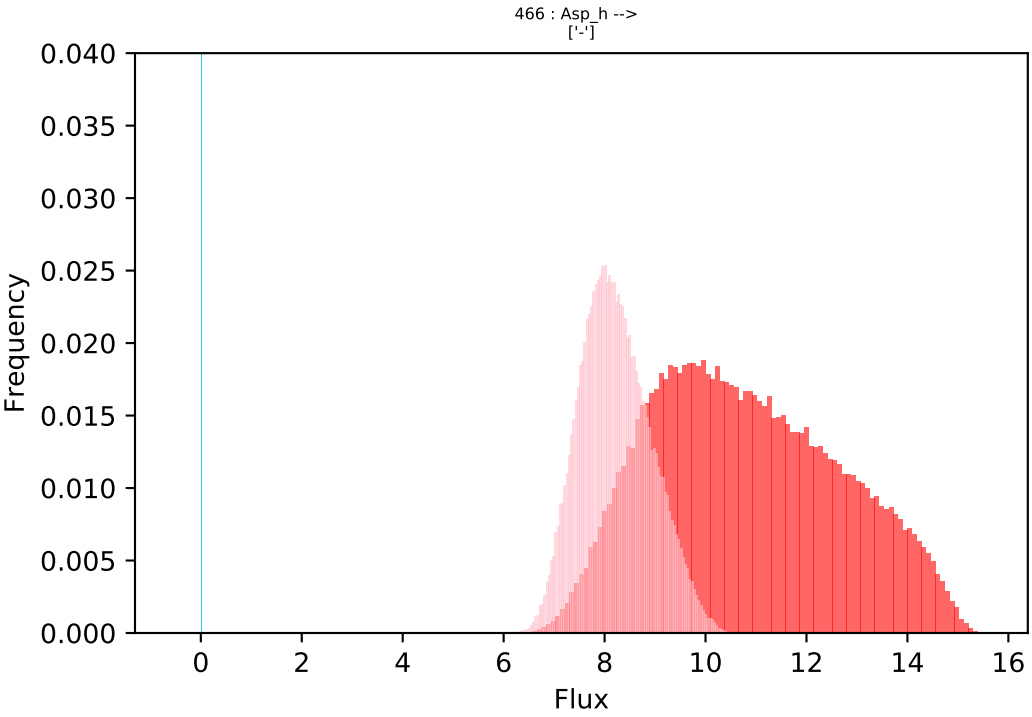

461 : Asn_c -->
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0
1
2
3
Flux

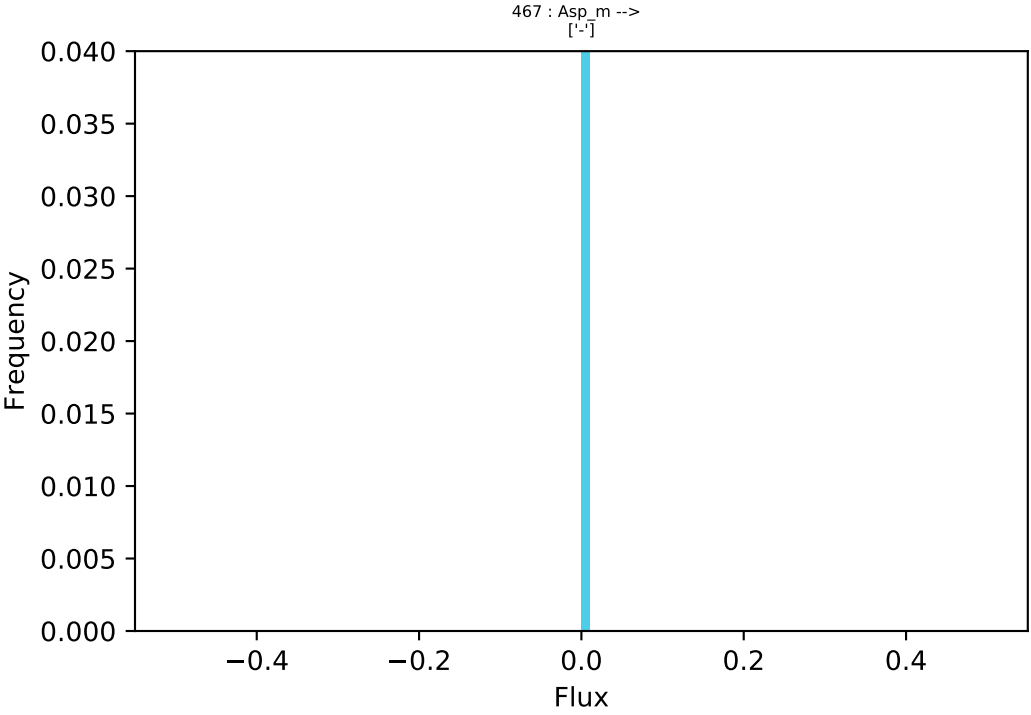

462 : Asn_h -->
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

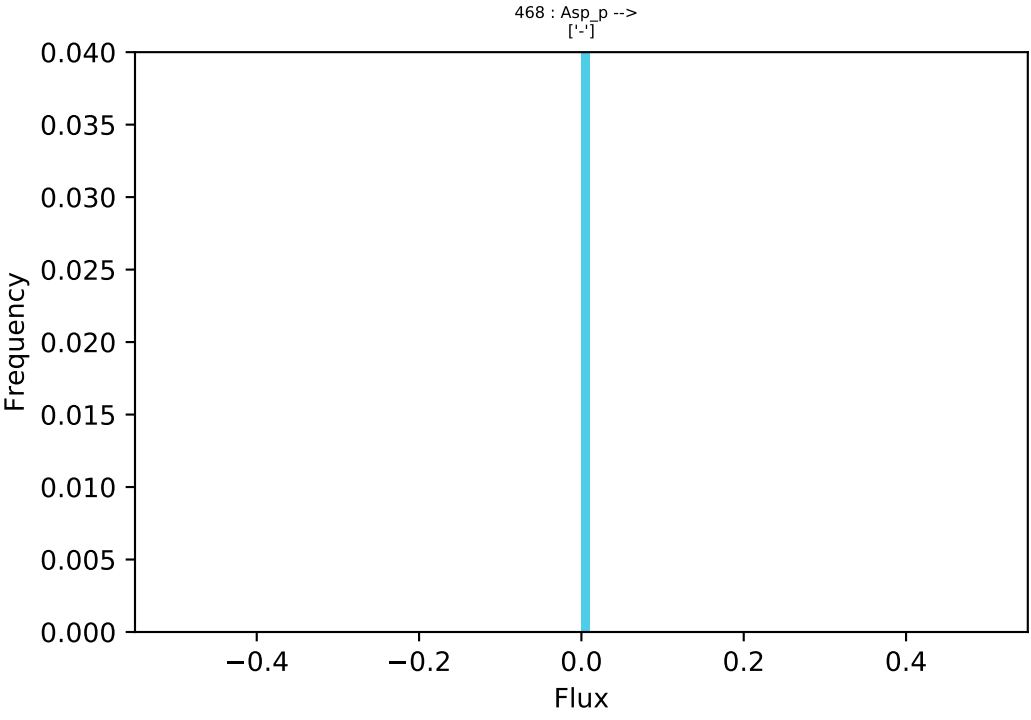

463 : Asn_m -->
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

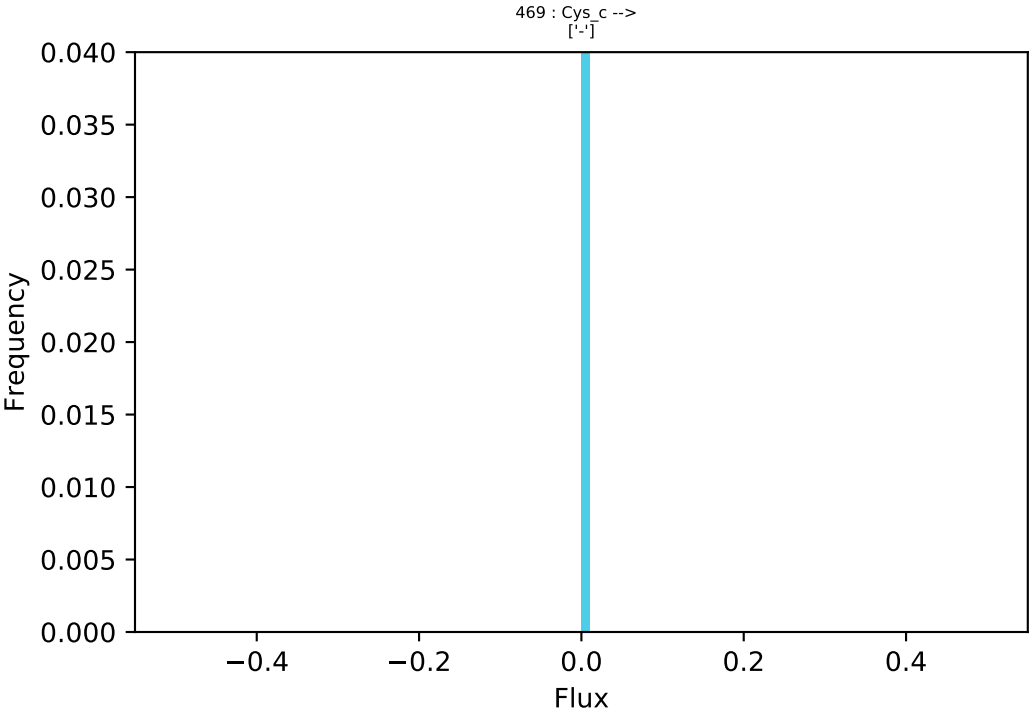

464 : Asn_p -->
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
0.6
Flux

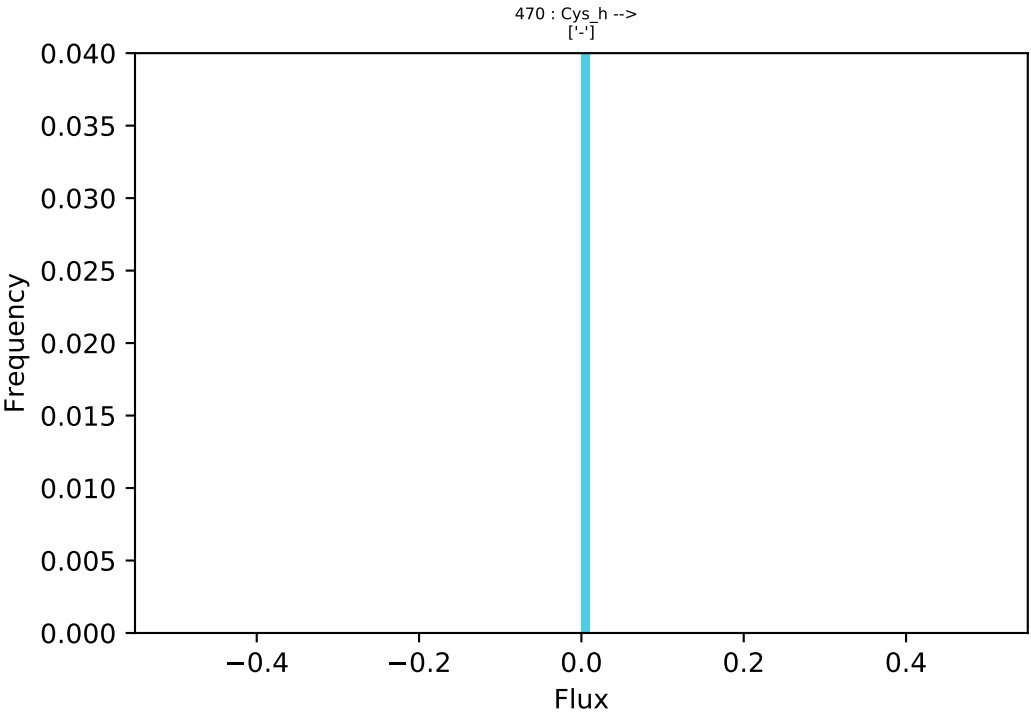

465 : Asp_c -->
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

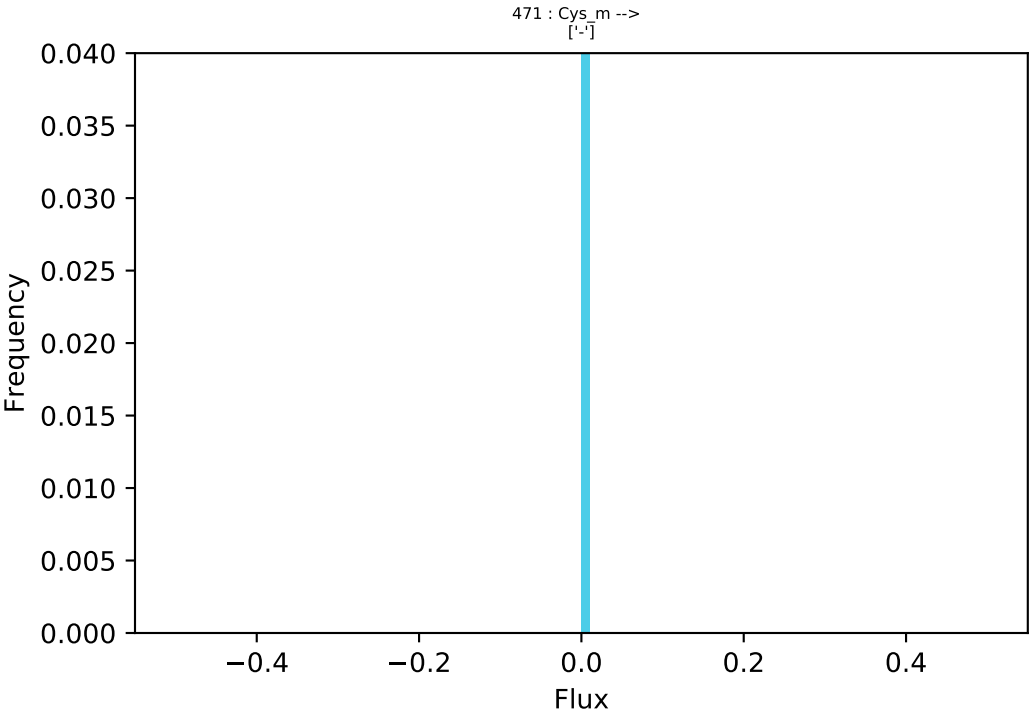

466 : Asp_h -->
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0
2
4
6
8
10
12
14
16
Flux

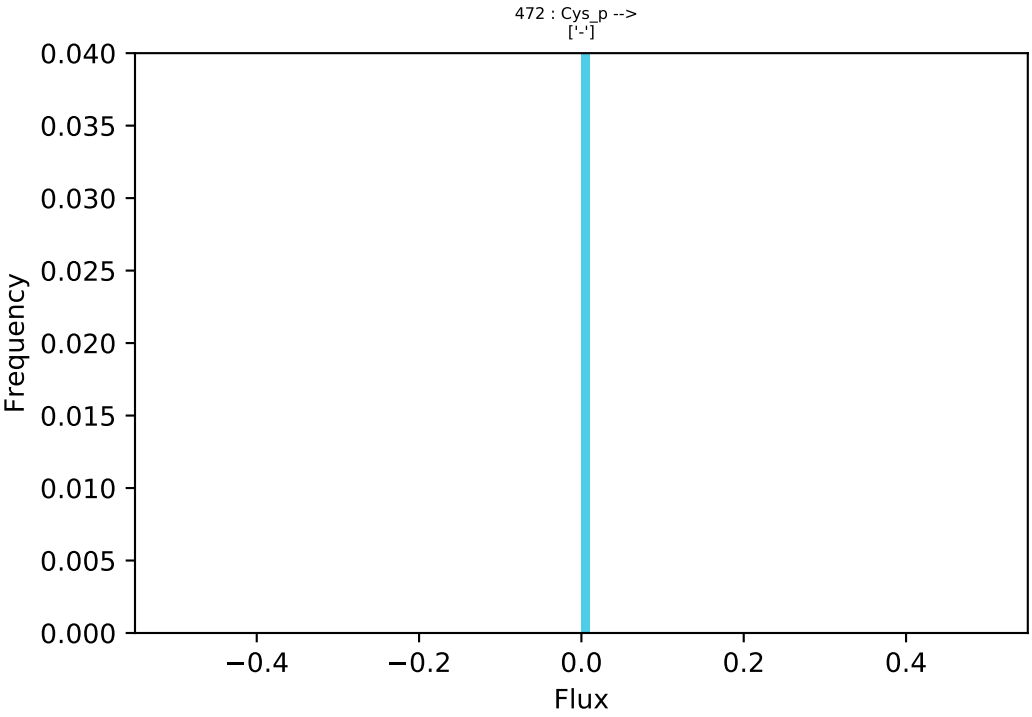

467 : Asp_m -->
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

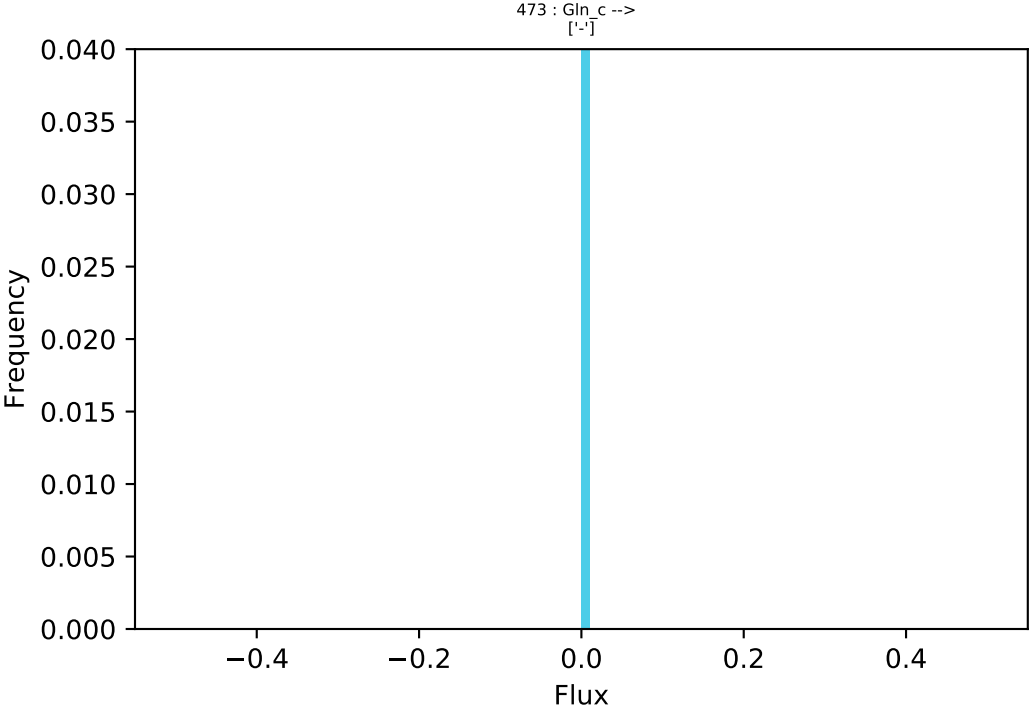

468 : Asp_p -->
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux


469 : Cys_c -->
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux


470 : Cys_h -->
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux


471 : Cys_m -->
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux


472 : Cys_p -->
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux


473 : Gln_c -->
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0.010
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Frequency
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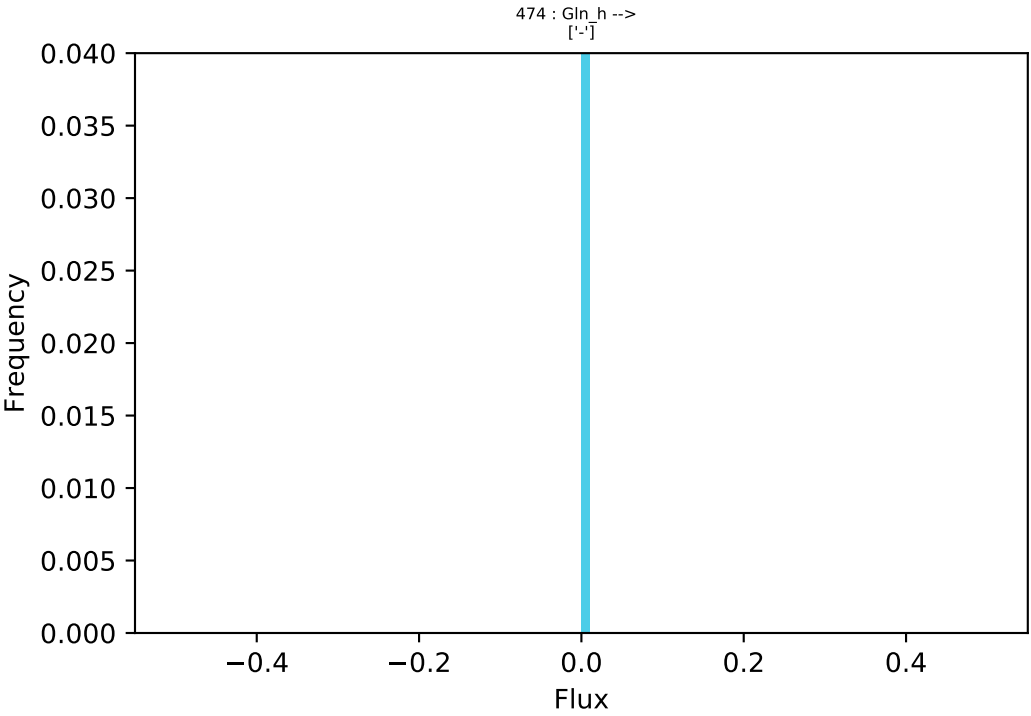
Flux


474 : Gln_h -->
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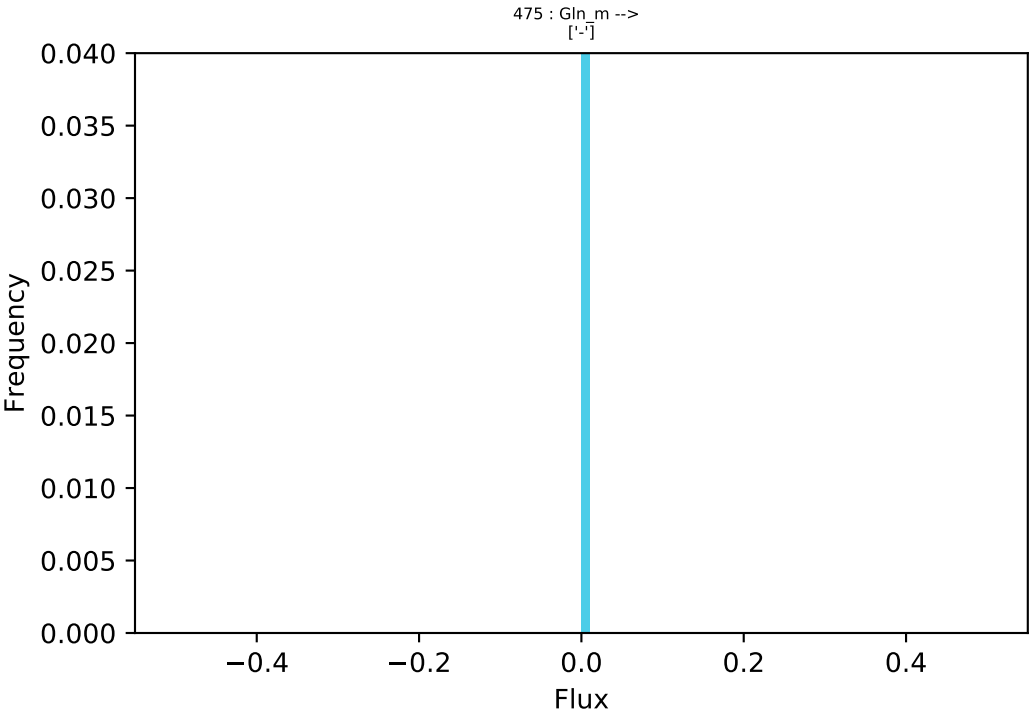
Flux


475 : Gln_m -->
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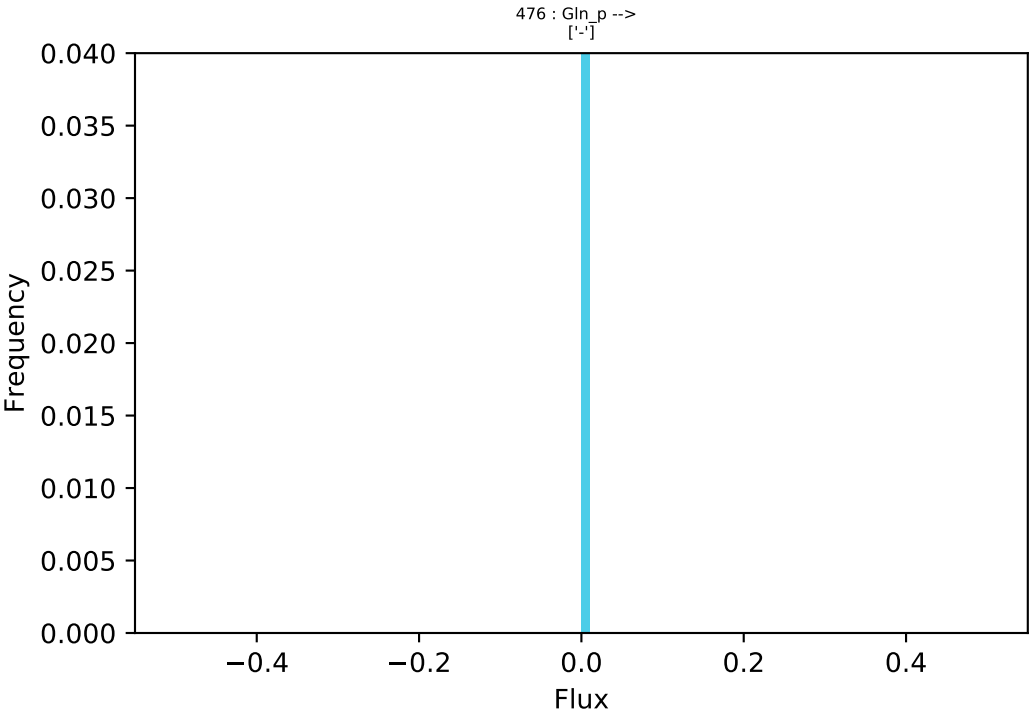
Flux


476 : Gln_p -->
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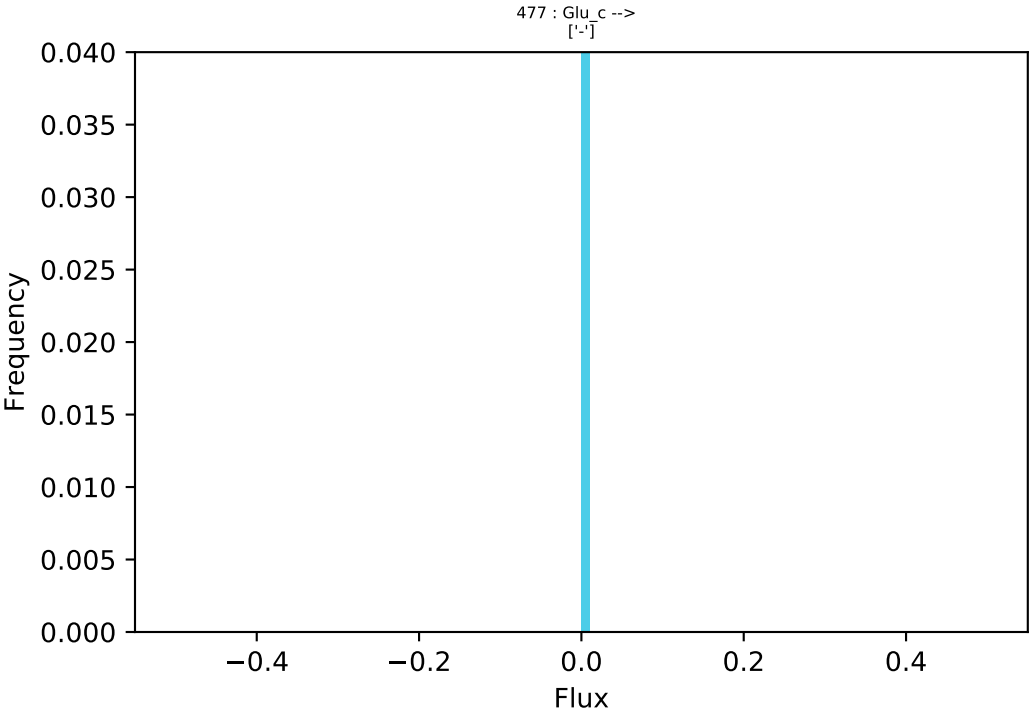
Flux


477 : Glu_c -->
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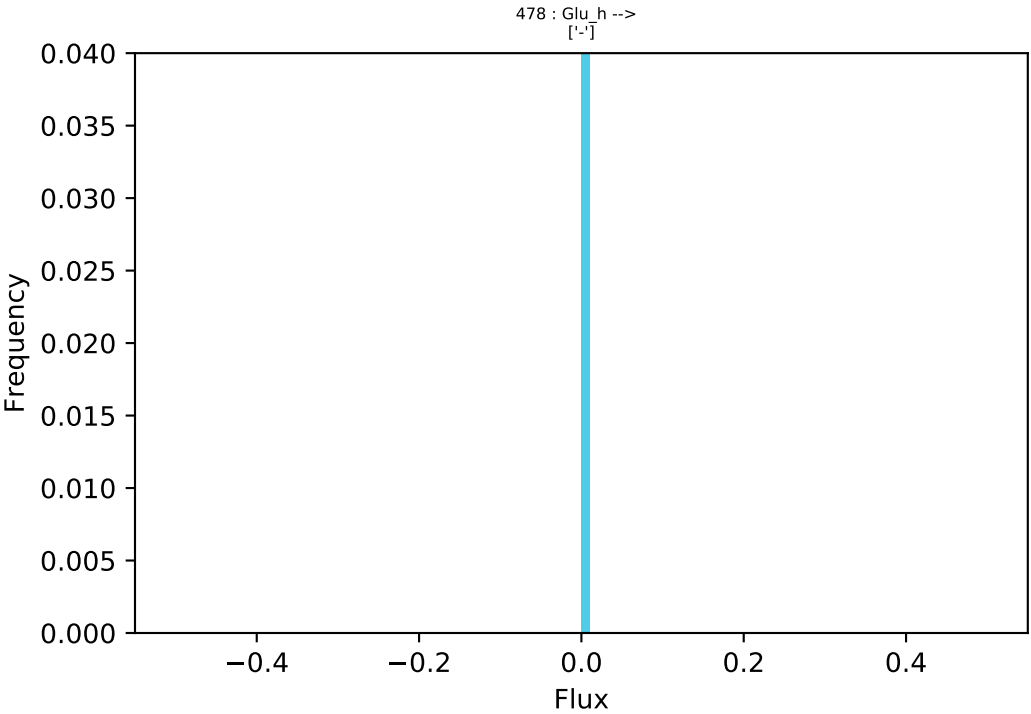
Flux


478 : Glu_h -->
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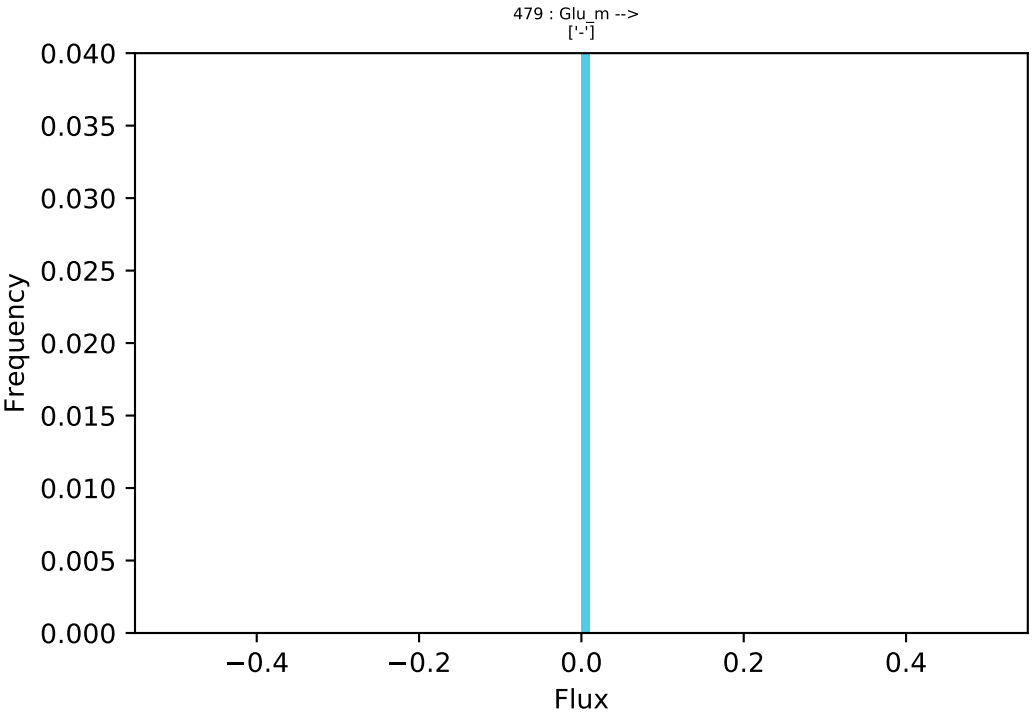
Flux


479 : Glu_m -->
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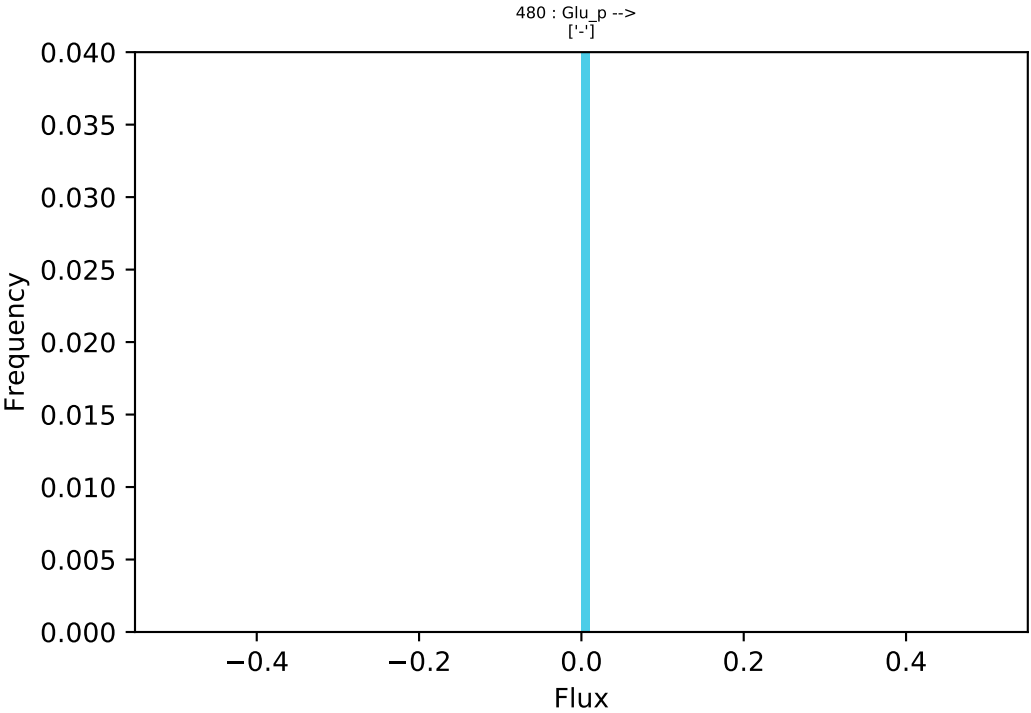
Flux


480 : Glu_p -->
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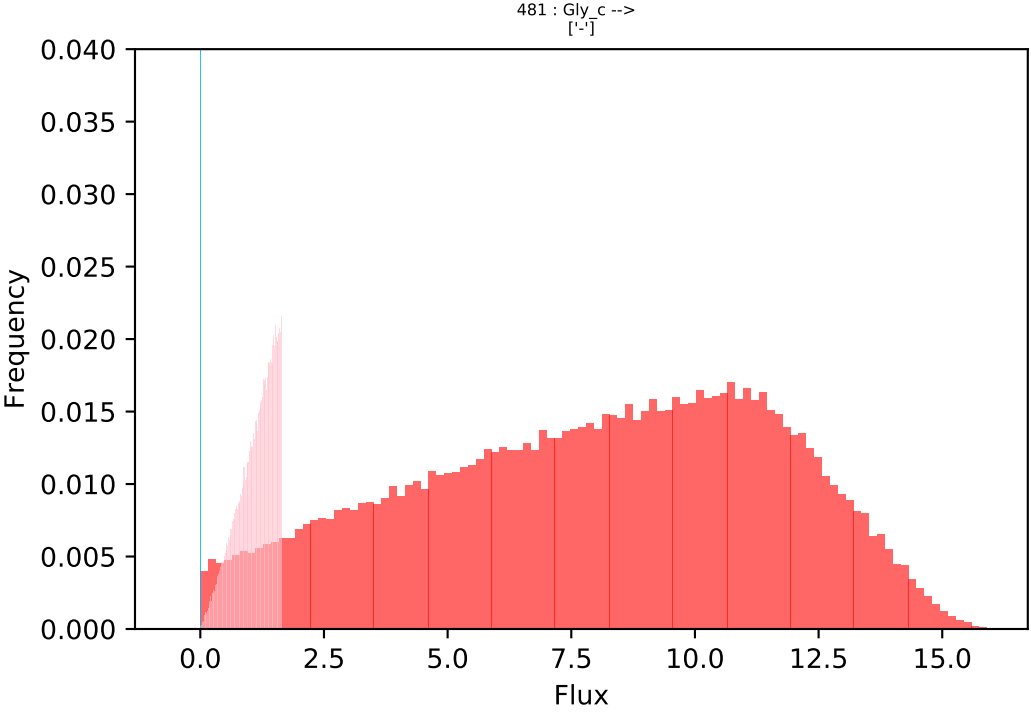
Flux


481 : Gly_c -->
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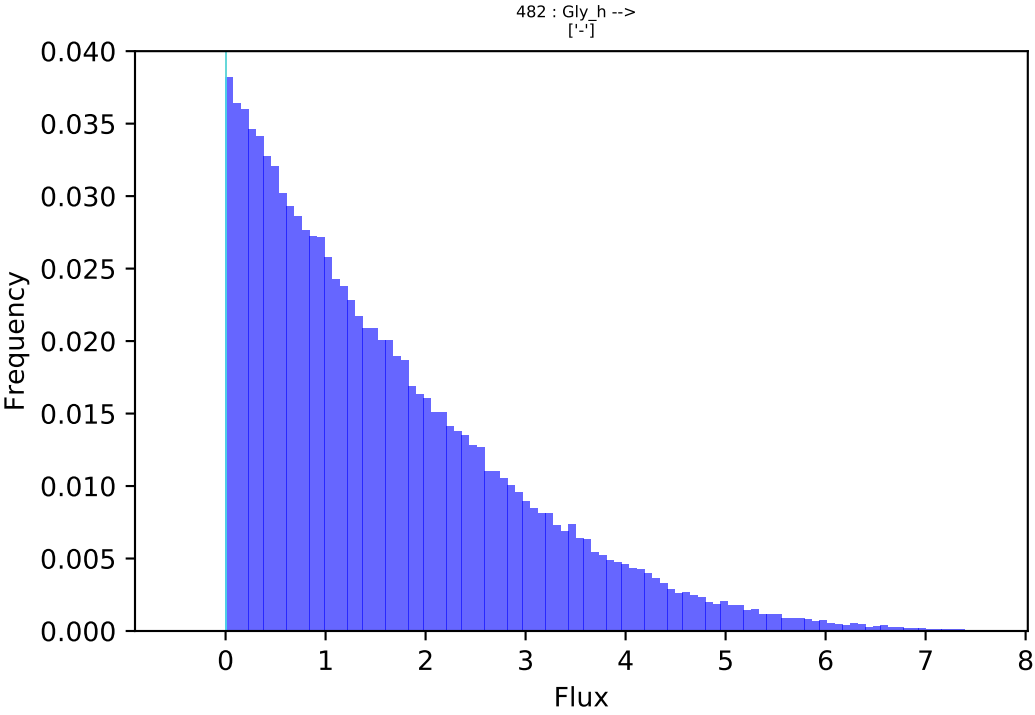
Flux


482 : Gly_h -->
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0.005
0.000
Frequency
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2
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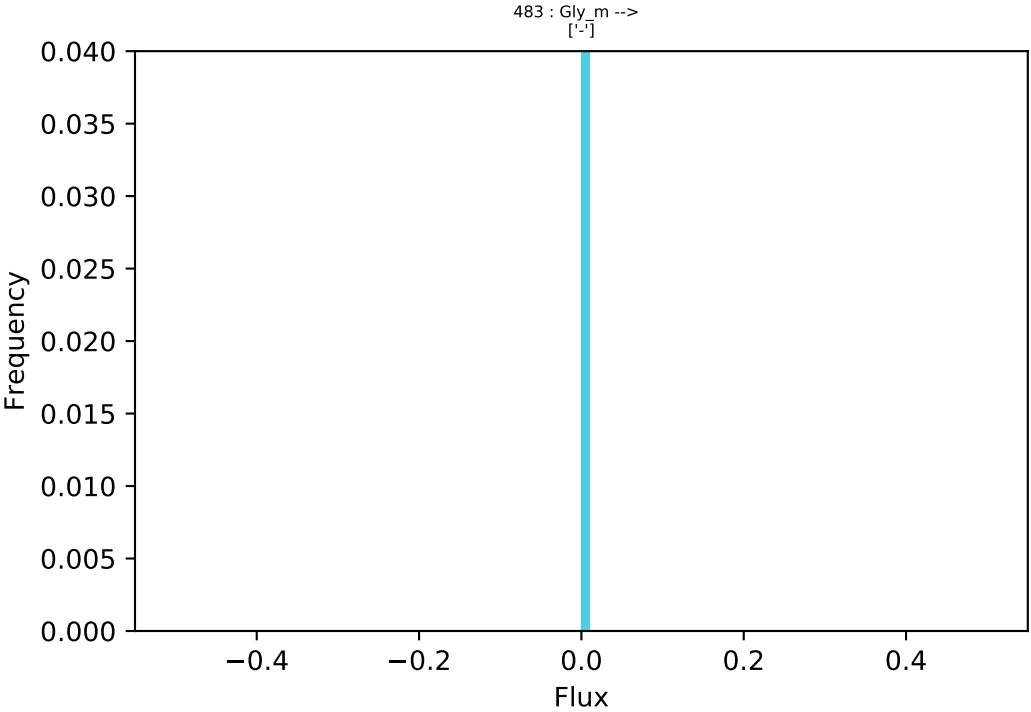
8
Flux


483 : Gly_m -->
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0.005
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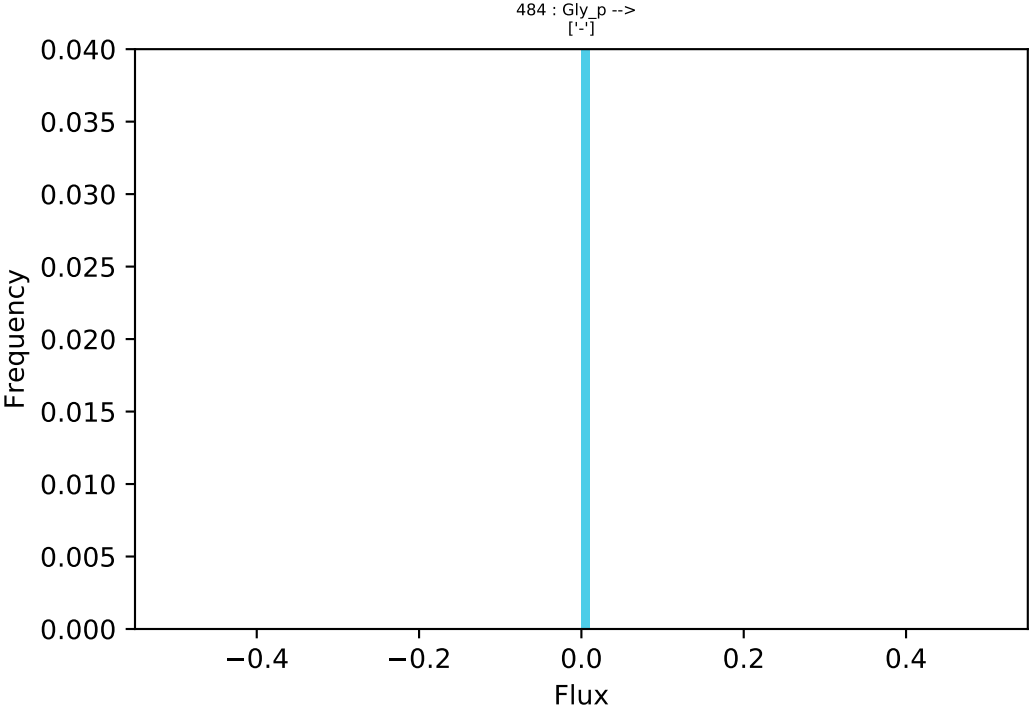
Flux


484 : Gly_p -->
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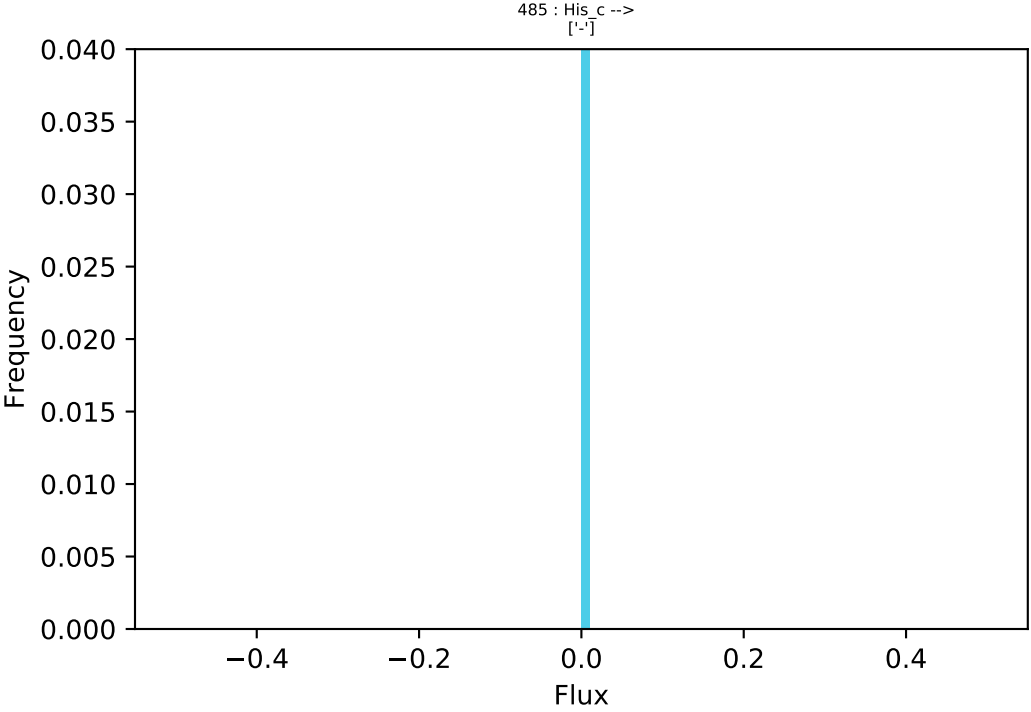
Flux


485 : His_c -->
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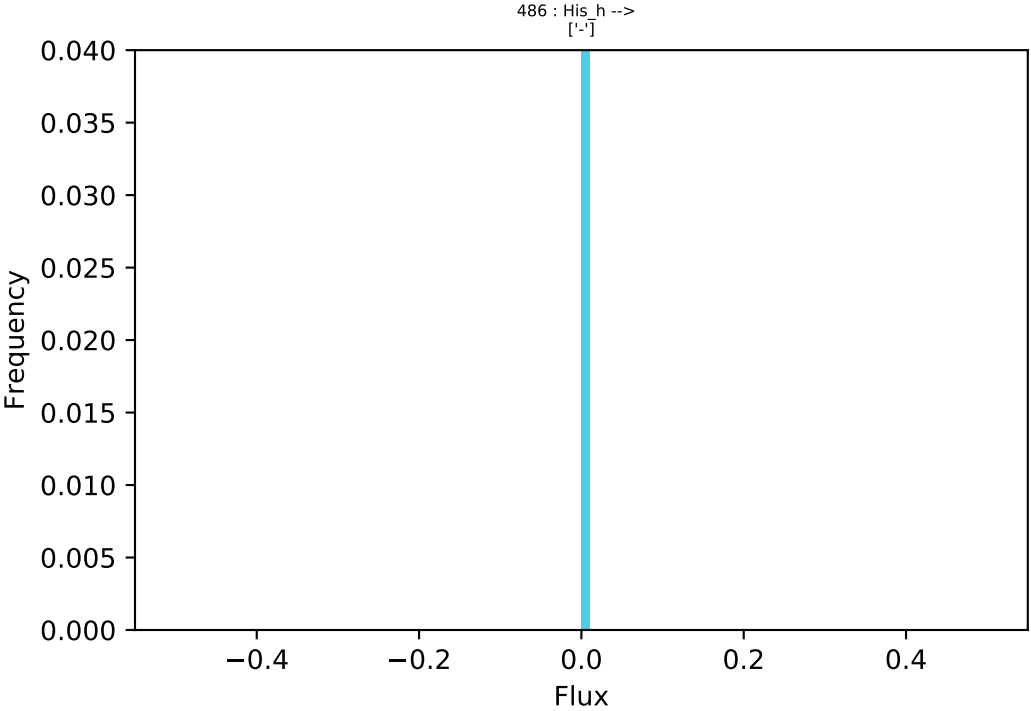
Flux


486 : His_h -->
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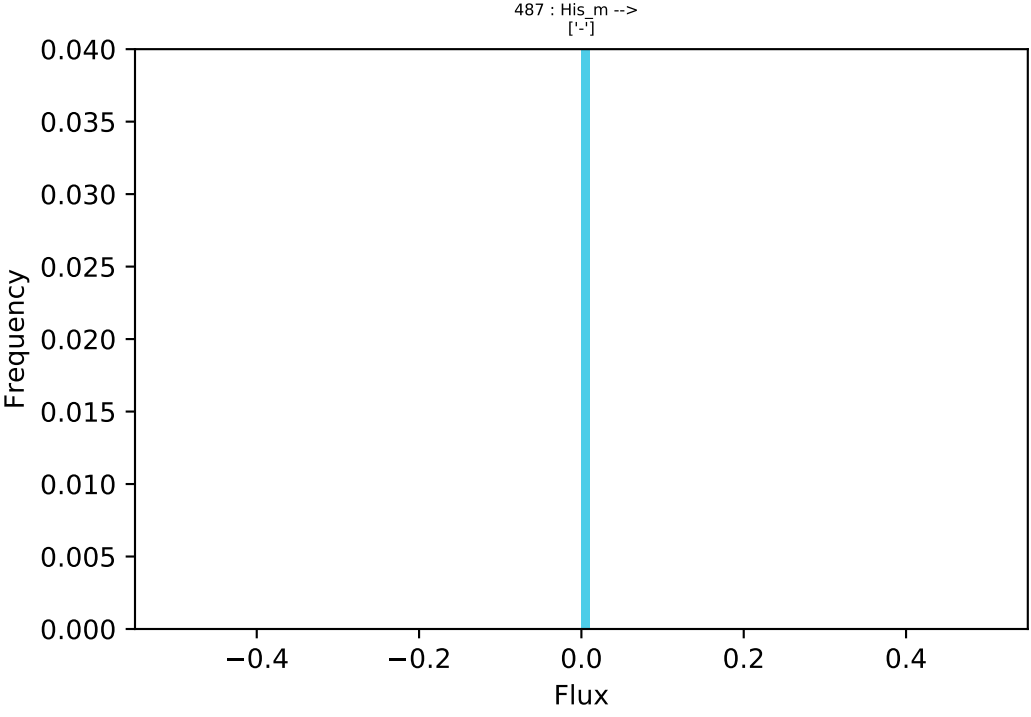
Flux


487 : His_m -->
['-']
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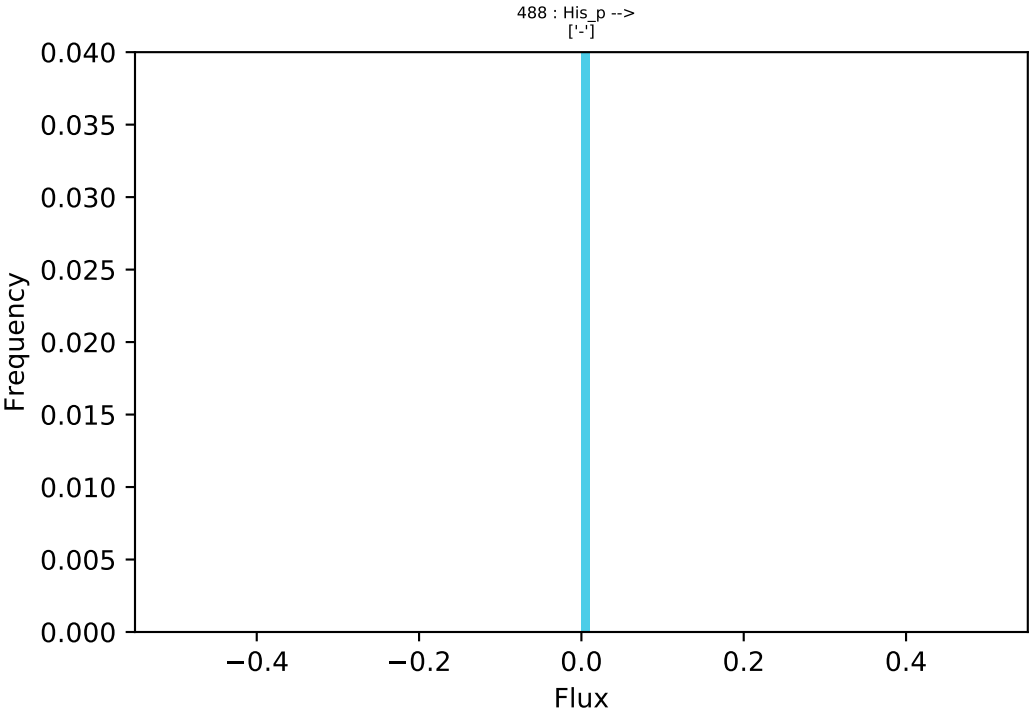
Flux


488 : His_p -->
['-']
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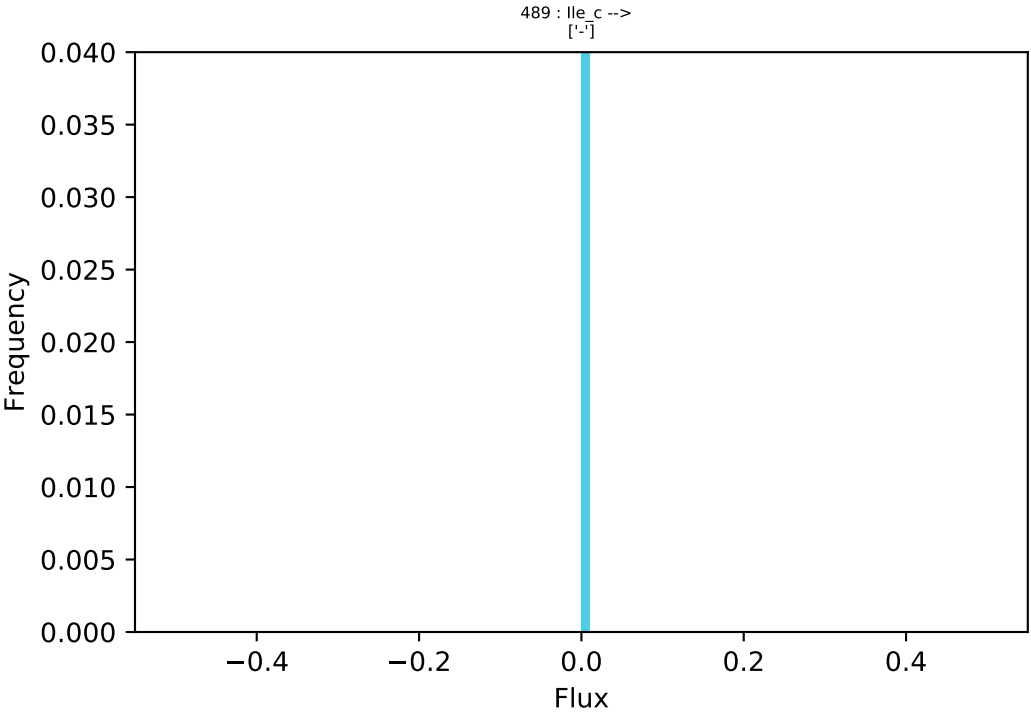
489 : Ile_c -->
['-']
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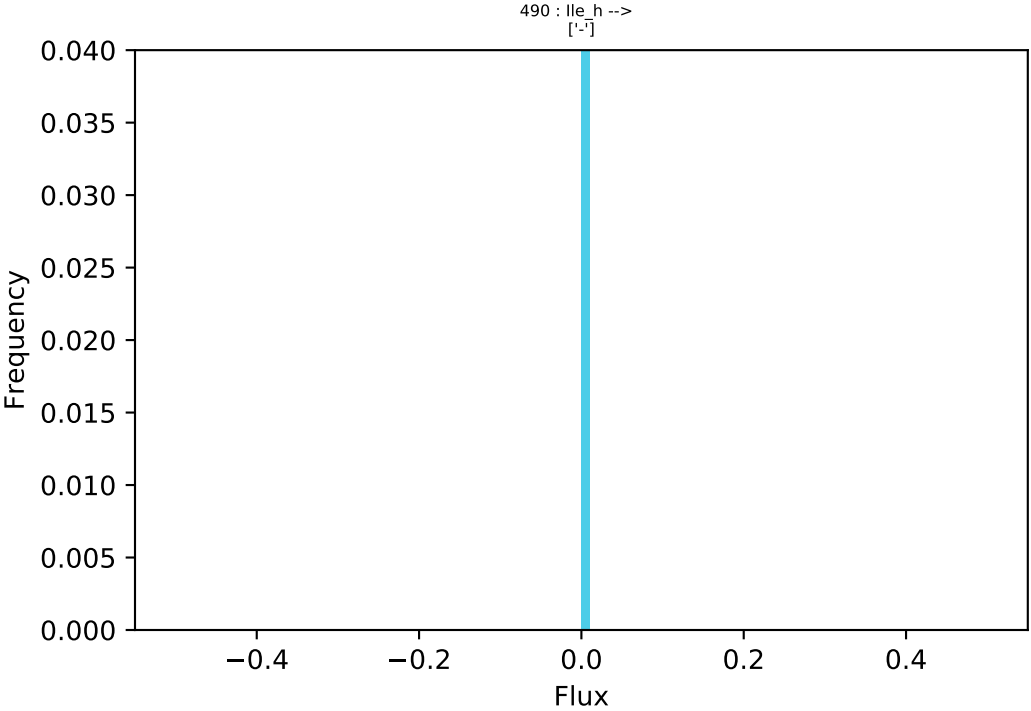
490 : Ile_h -->
['-']
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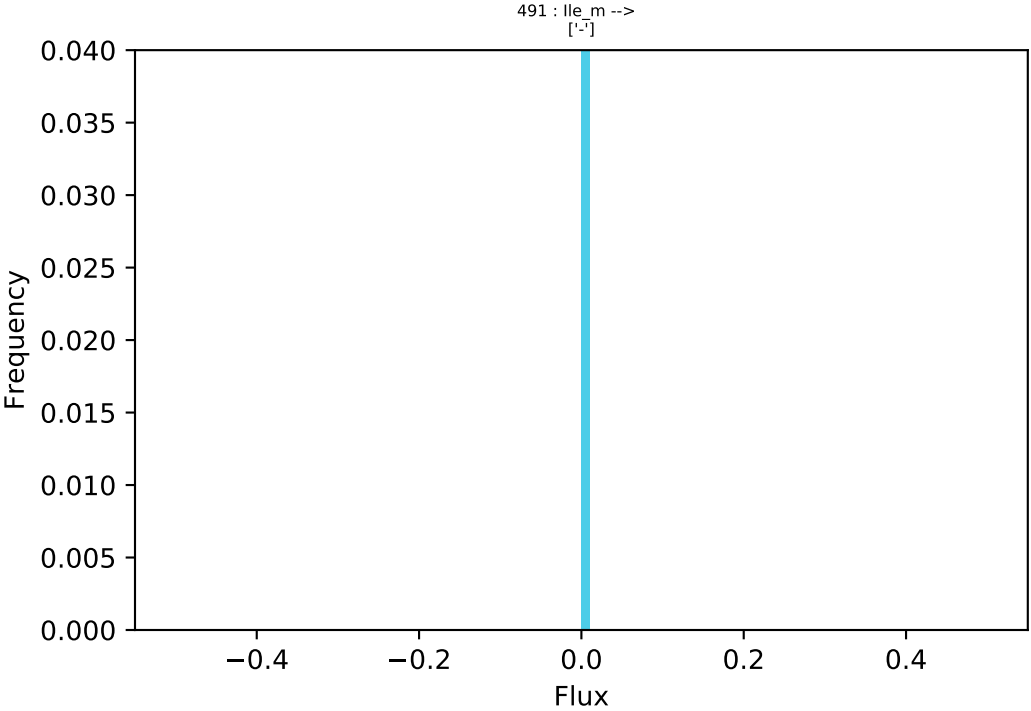
491 : Ile_m -->
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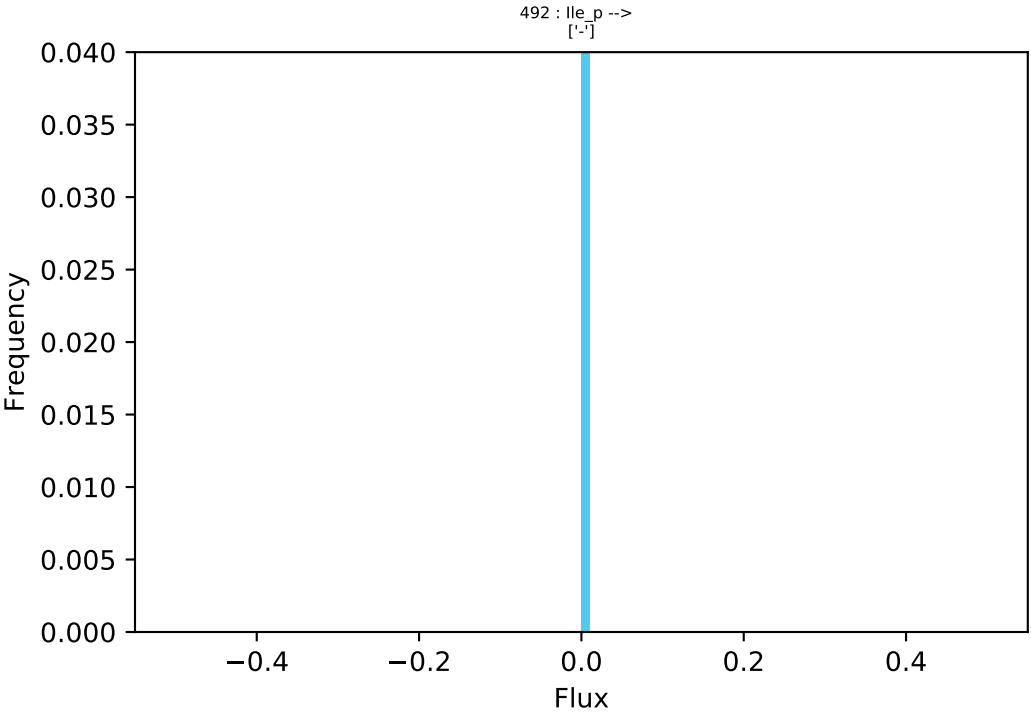
Flux


492 : Ile_p -->
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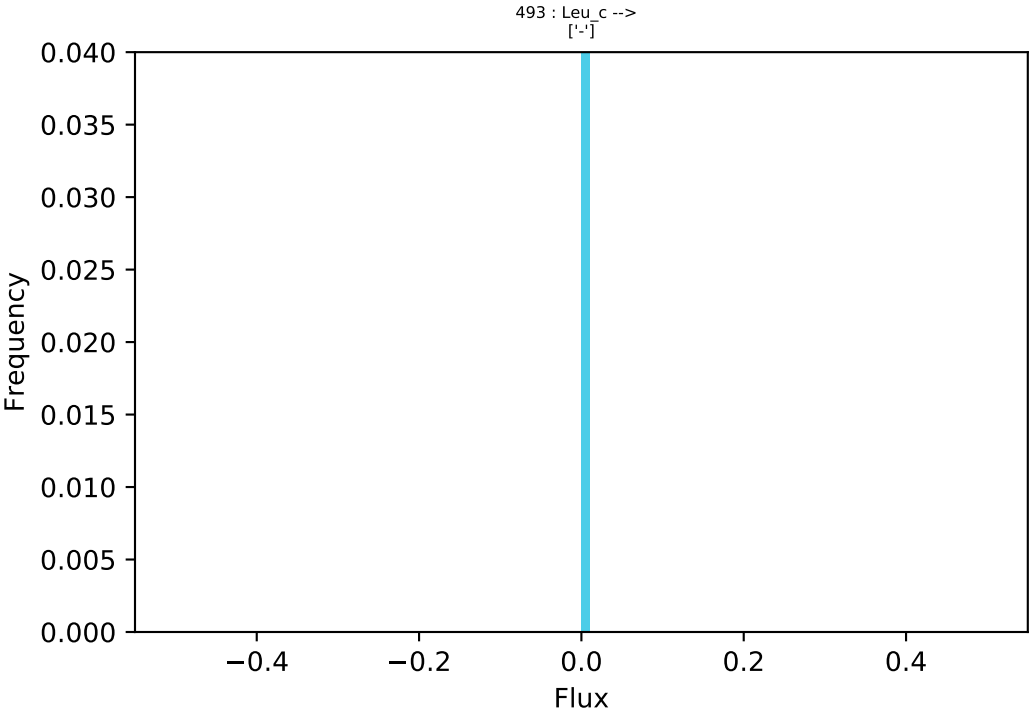
493 : Leu_c -->
['-']
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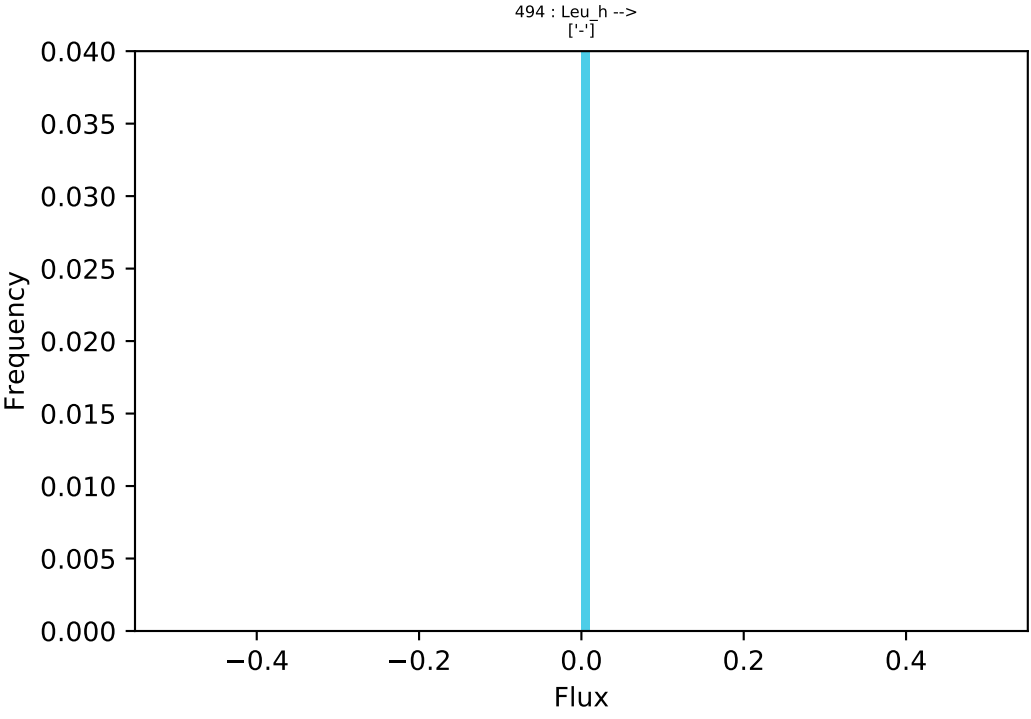
494 : Leu_h -->
['-']
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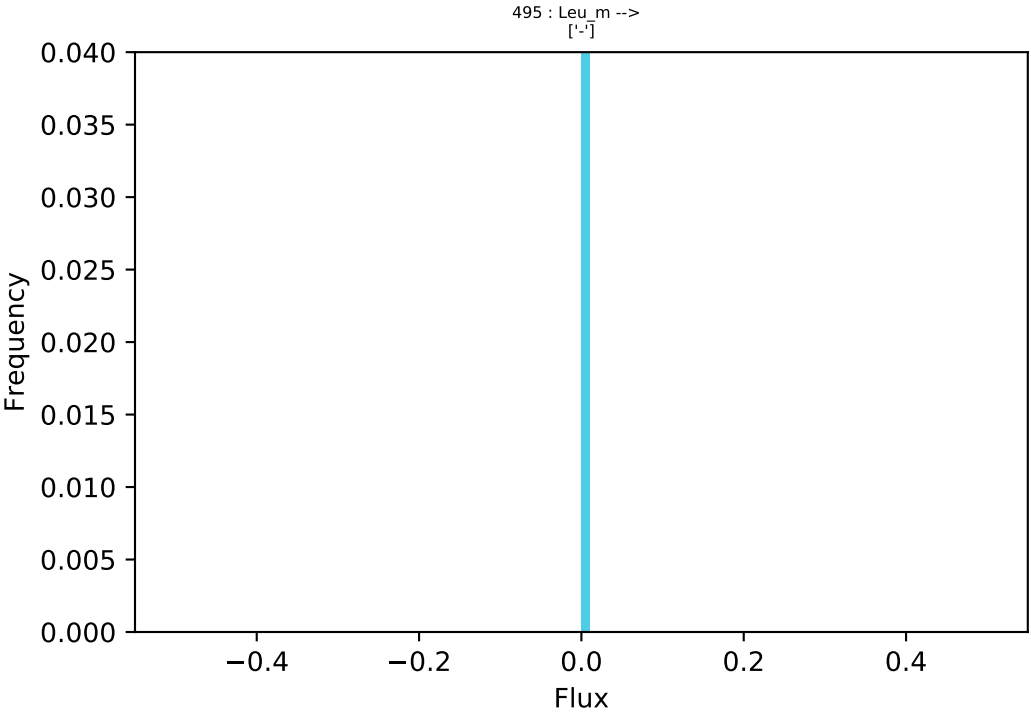
Flux


495 : Leu_m -->
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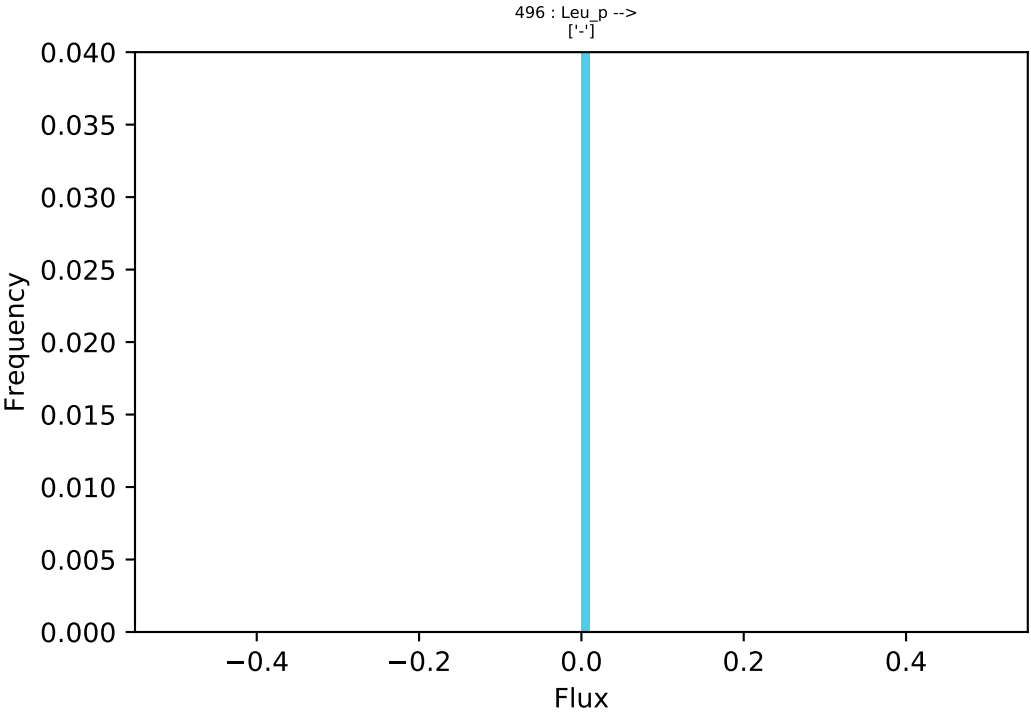
496 : Leu_p -->
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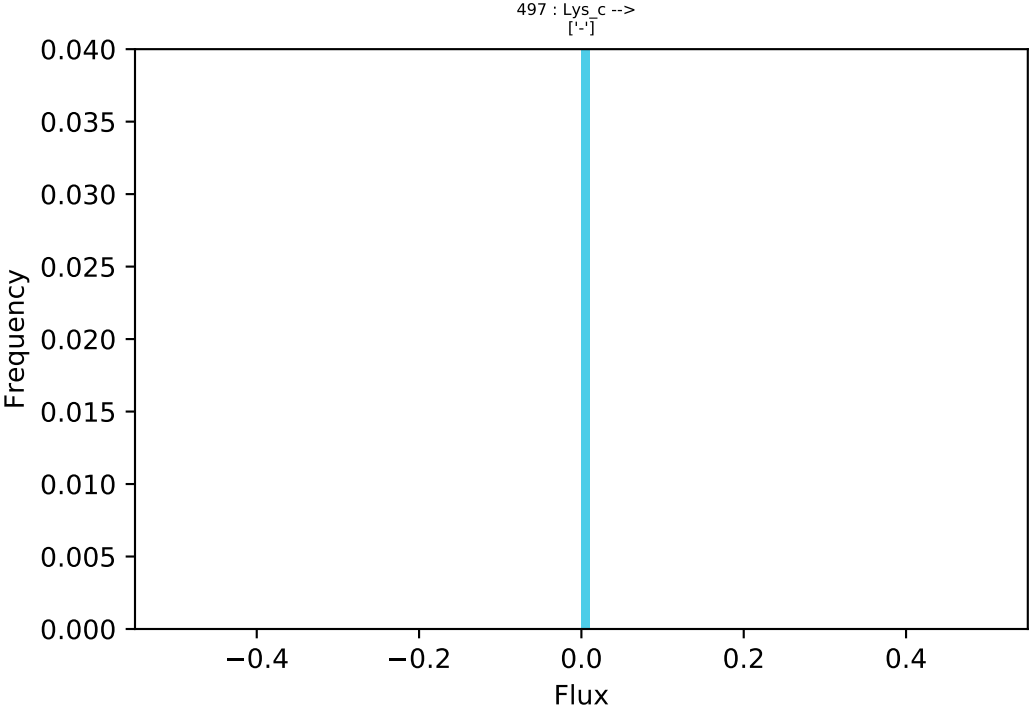
497 : Lys_c -->
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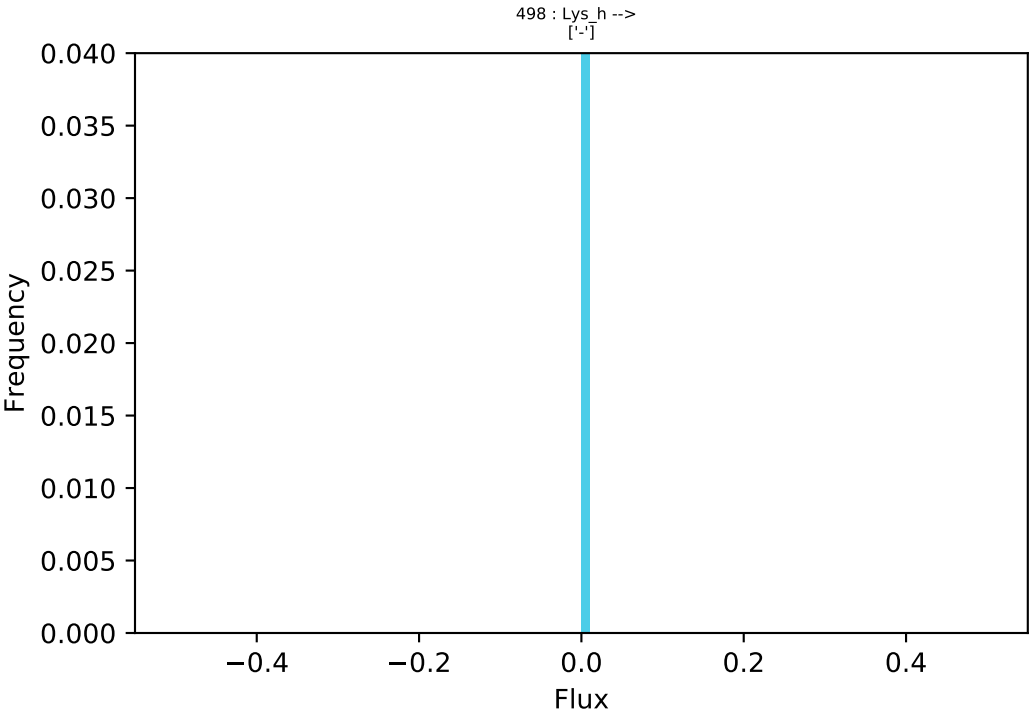
498 : Lys_h -->
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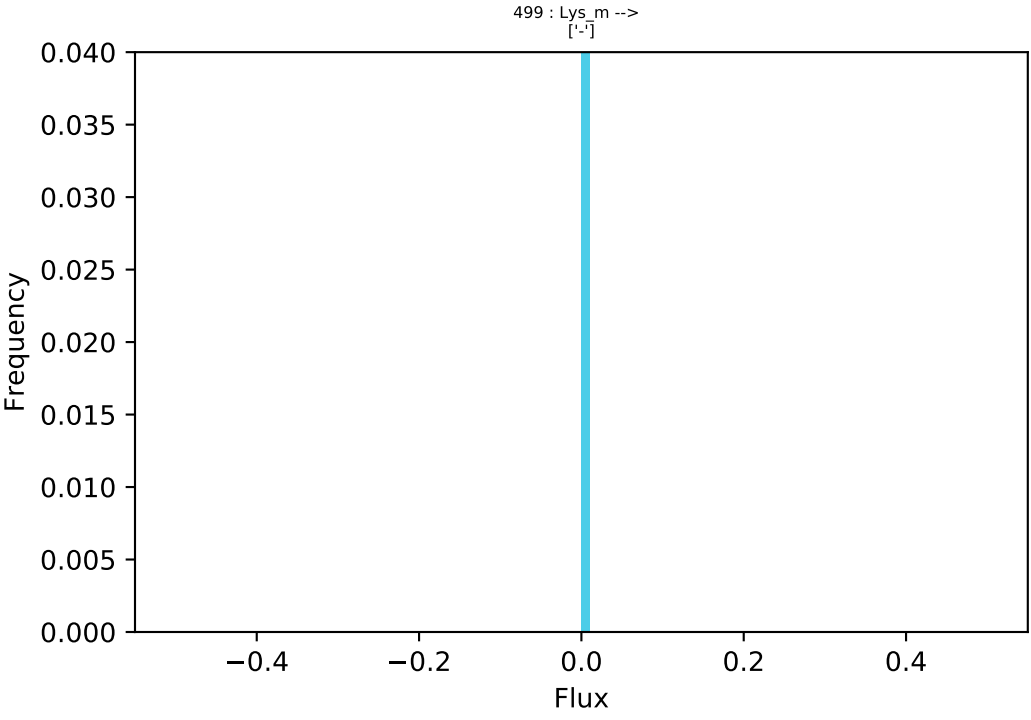
Flux


499 : Lys_m -->
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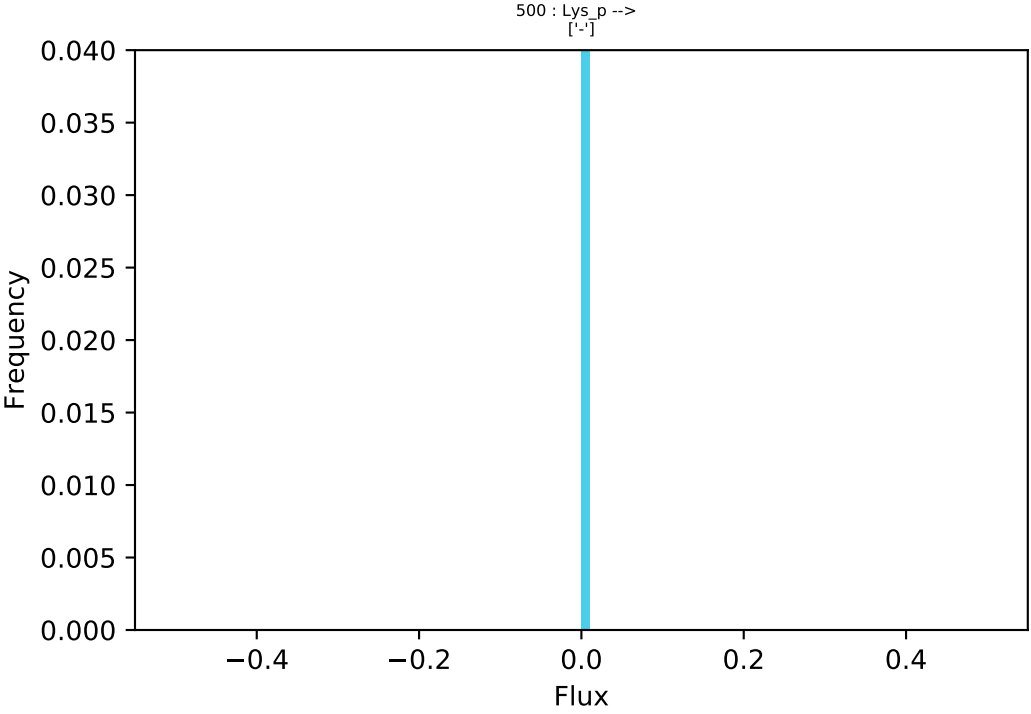
Flux


500 : Lys_p -->
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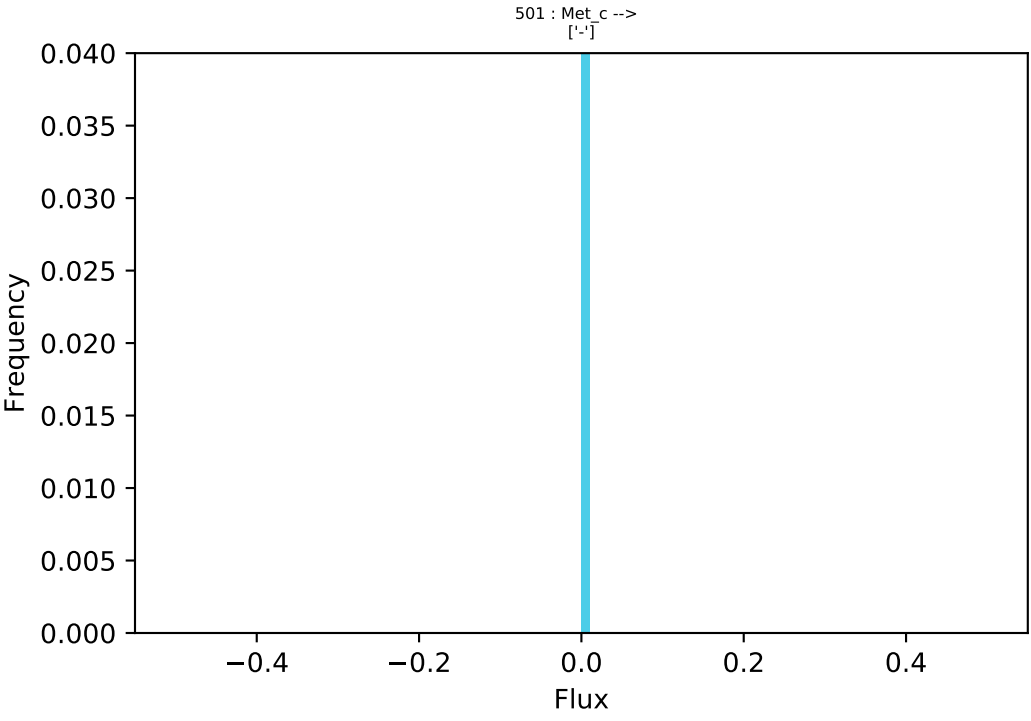
501 : Met_c -->
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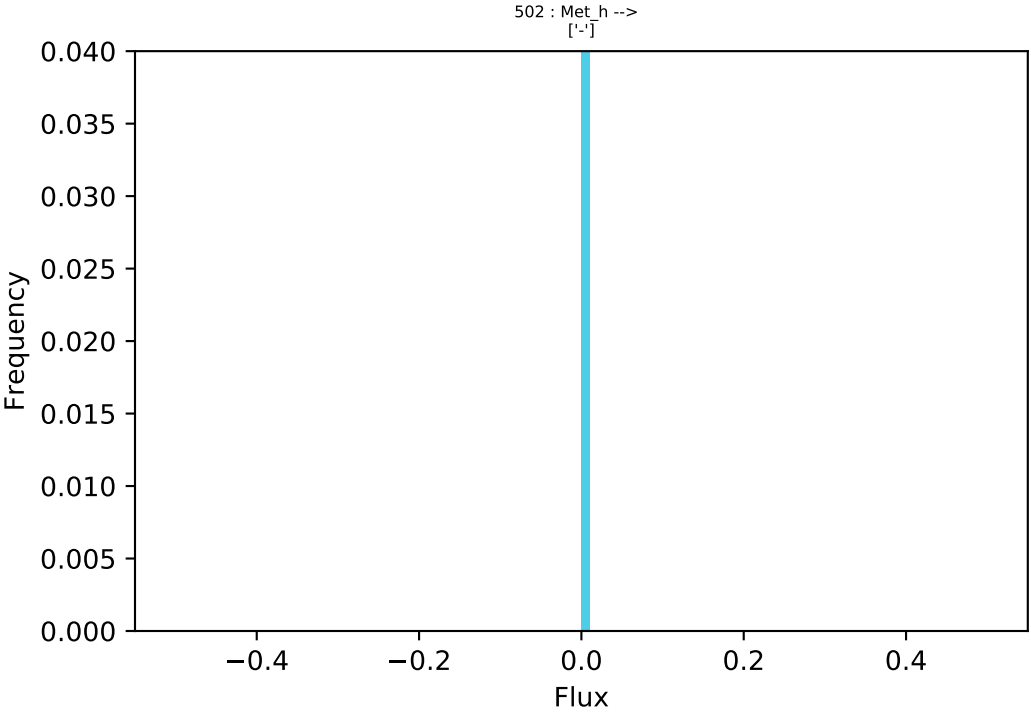
Flux


502 : Met_h -->
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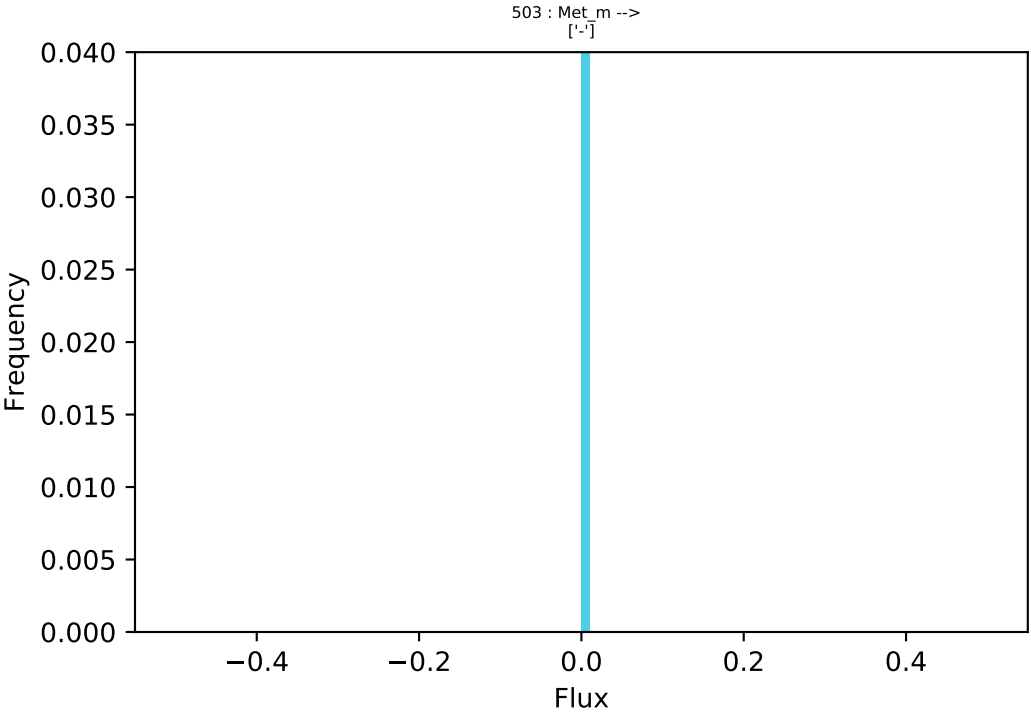
Flux


503 : Met_m -->
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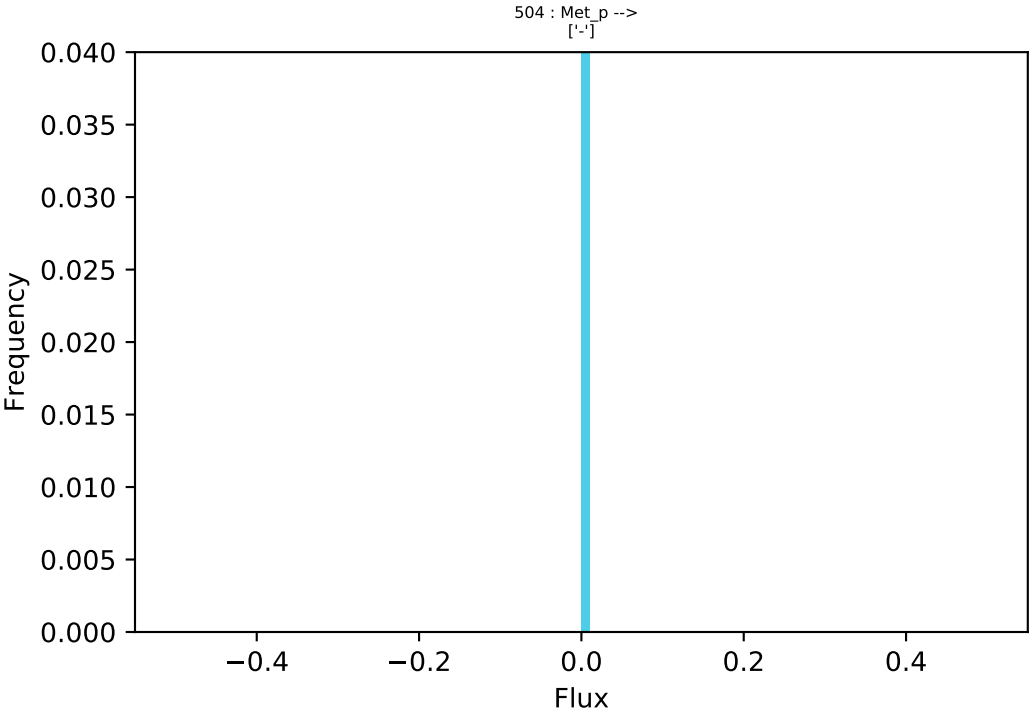
Flux


504 : Met_p -->
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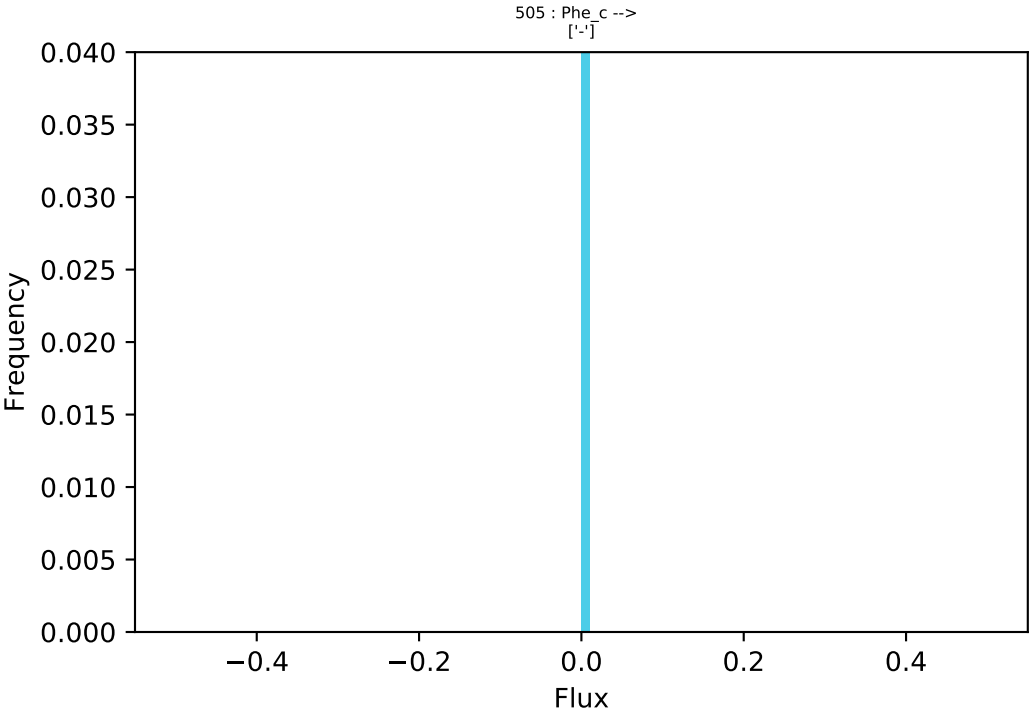
Flux


505 : Phe_c -->
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Frequency
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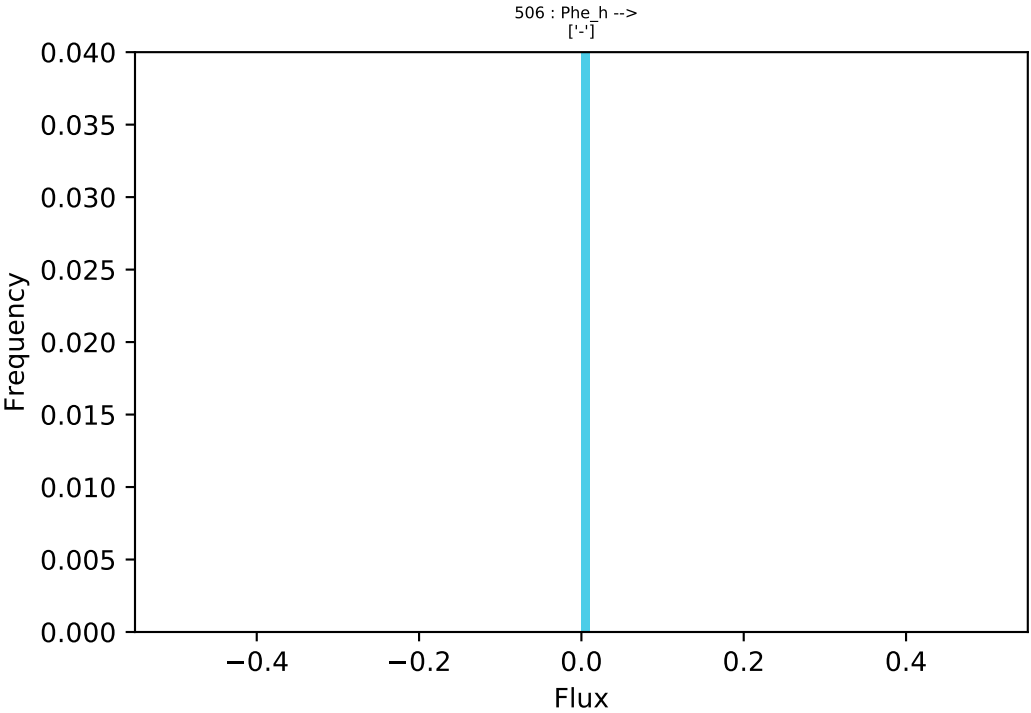
Flux


506 : Phe_h -->
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Frequency
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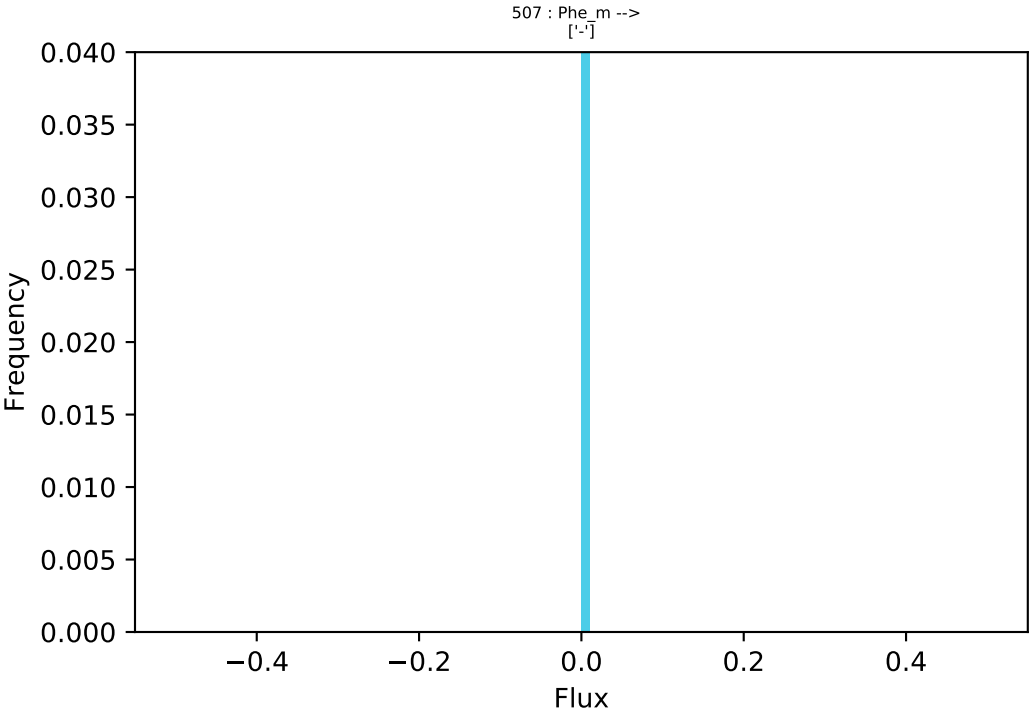
Flux


507 : Phe_m -->
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Frequency
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−0.2
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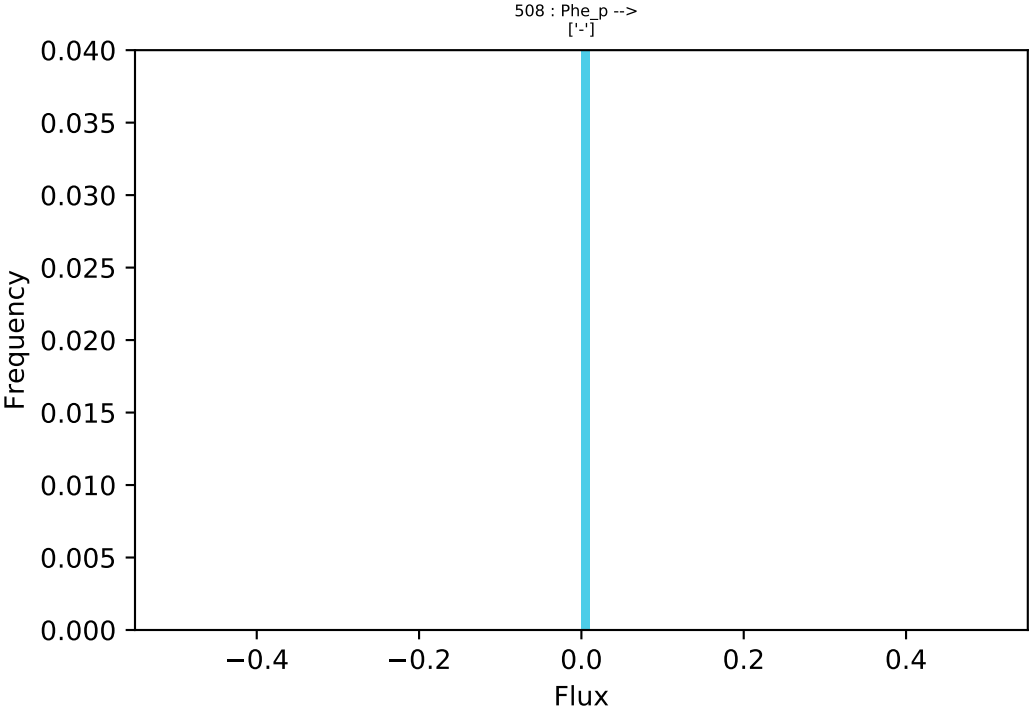
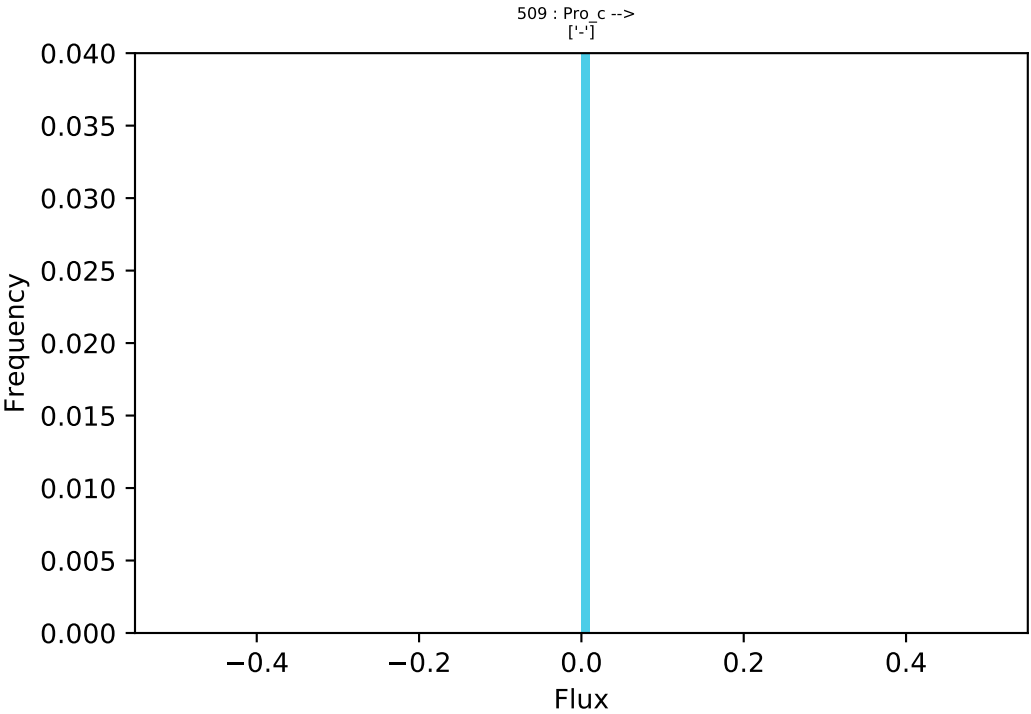
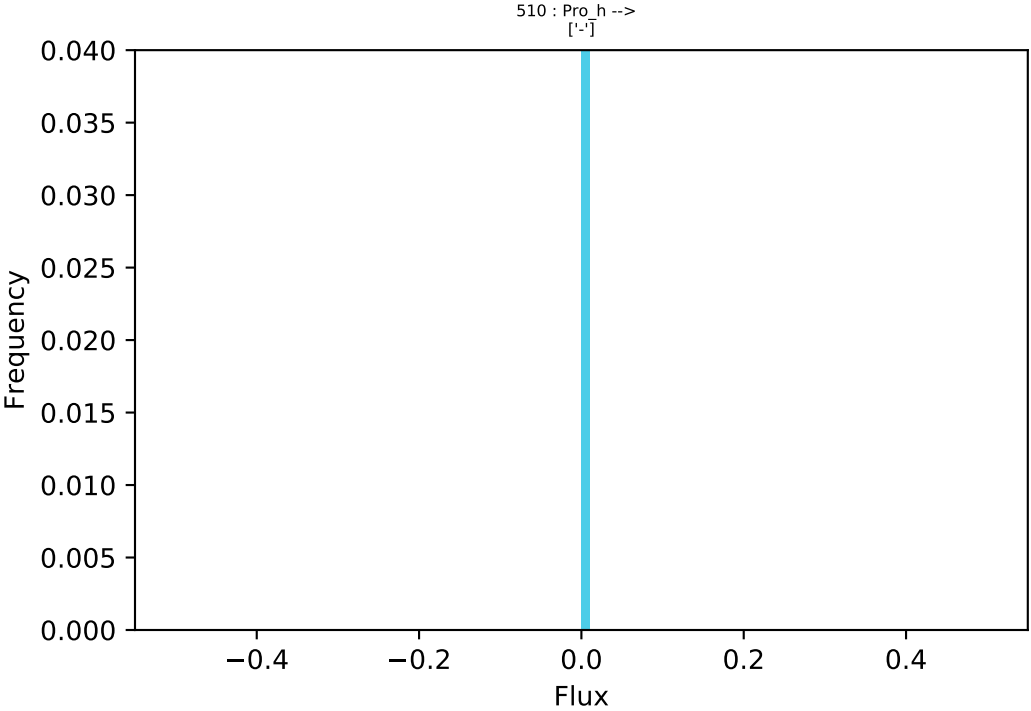
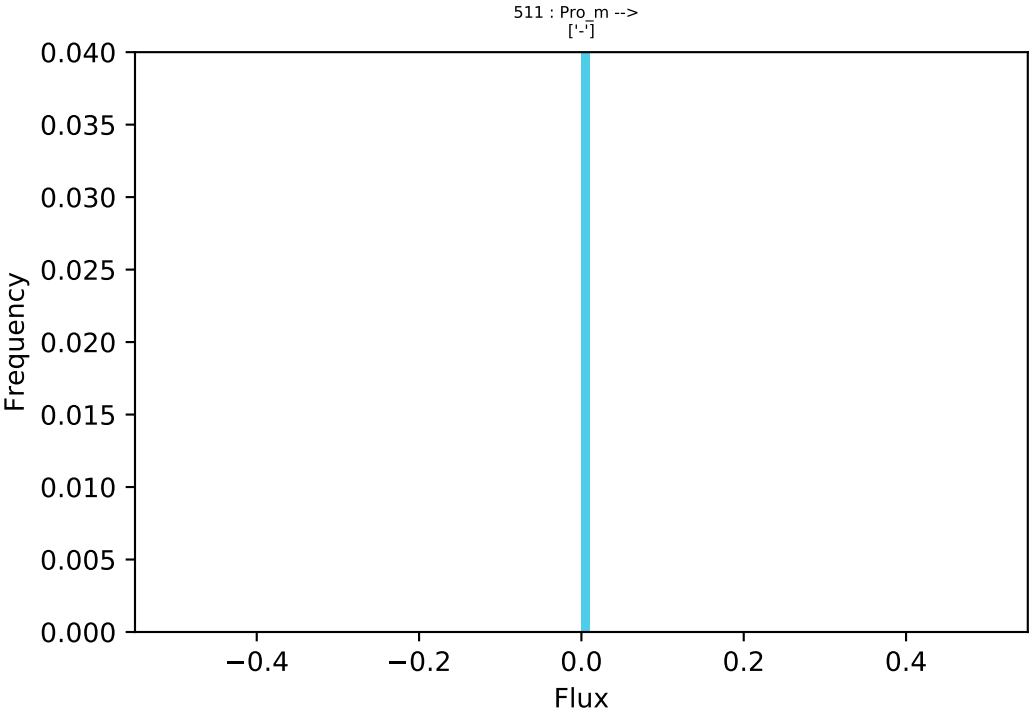
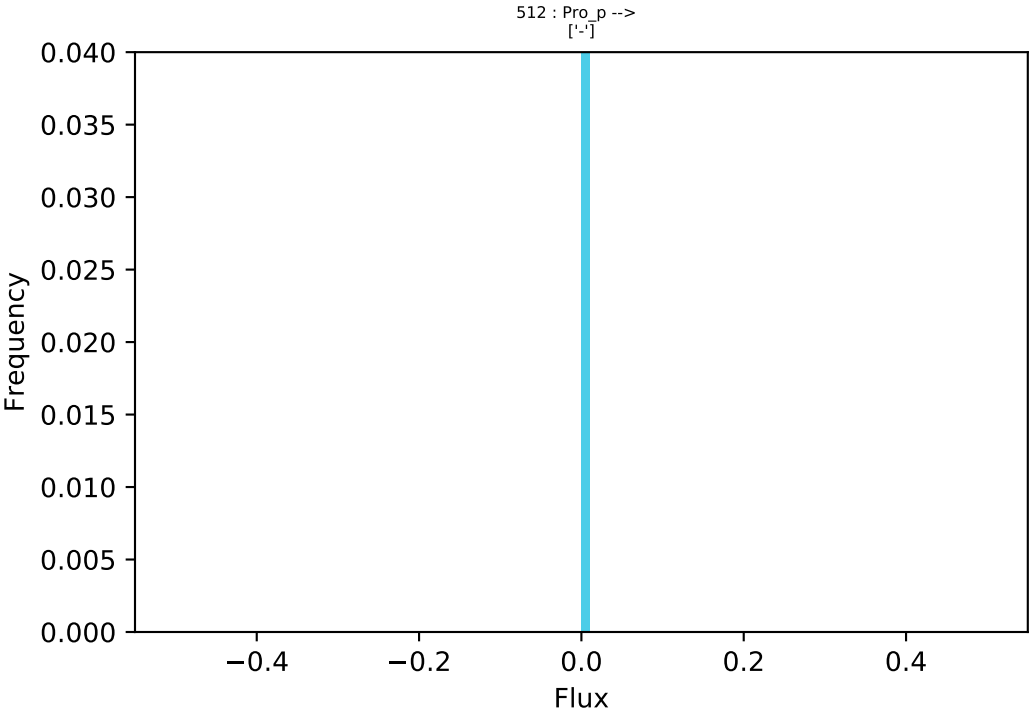
0.2
0.4
Flux

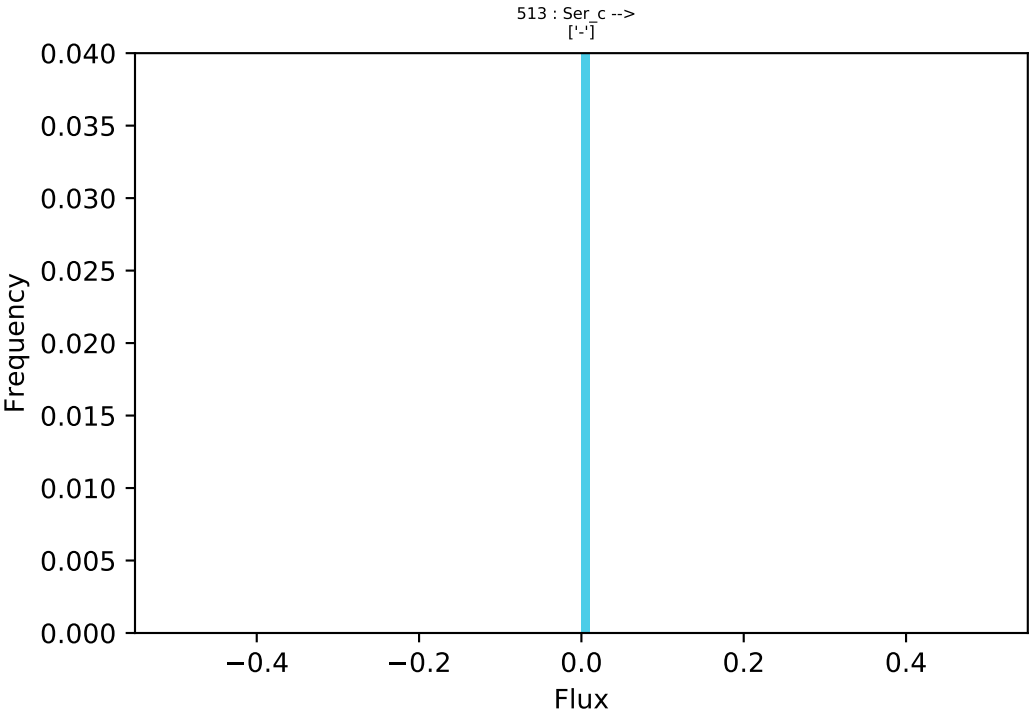

508 : Phe_p -->
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

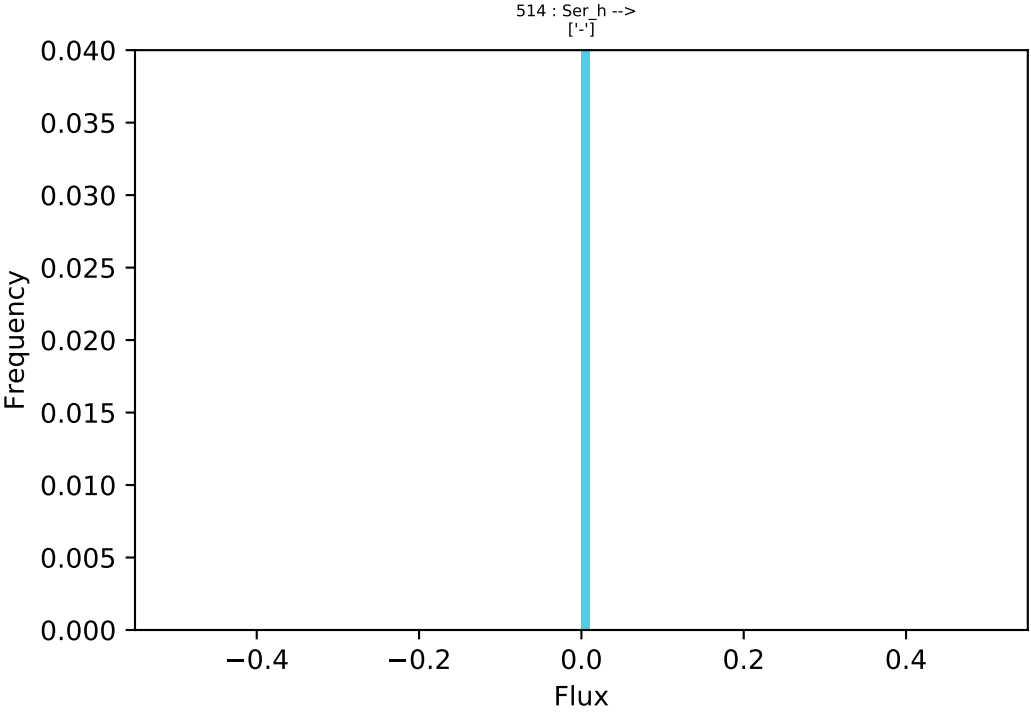

509 : Pro_c -->
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

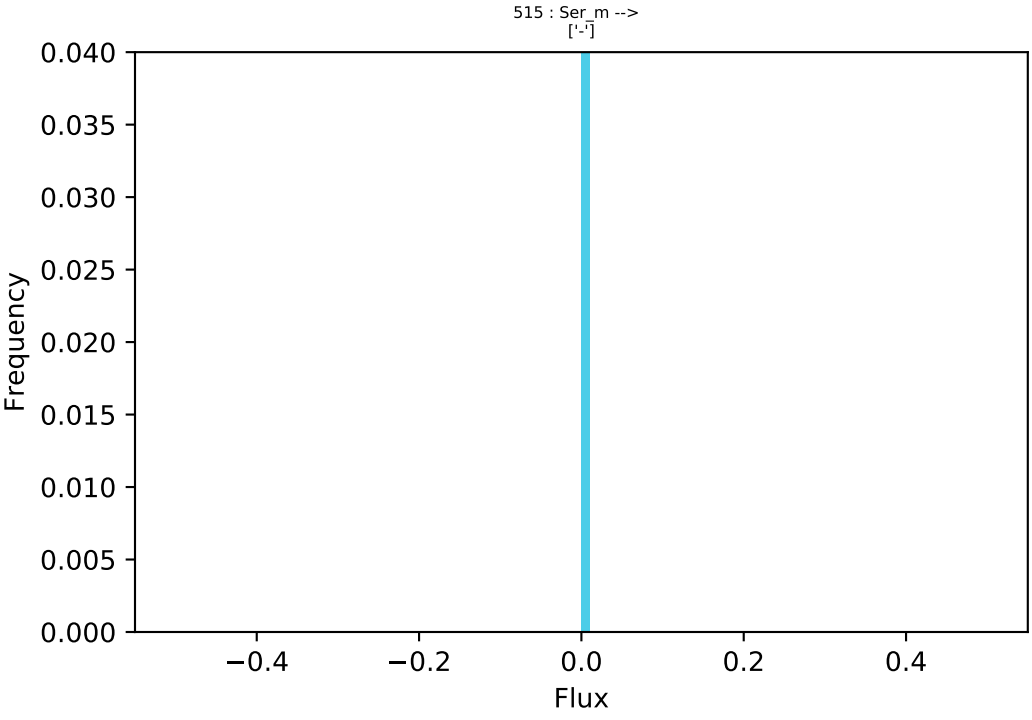

510 : Pro_h -->
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

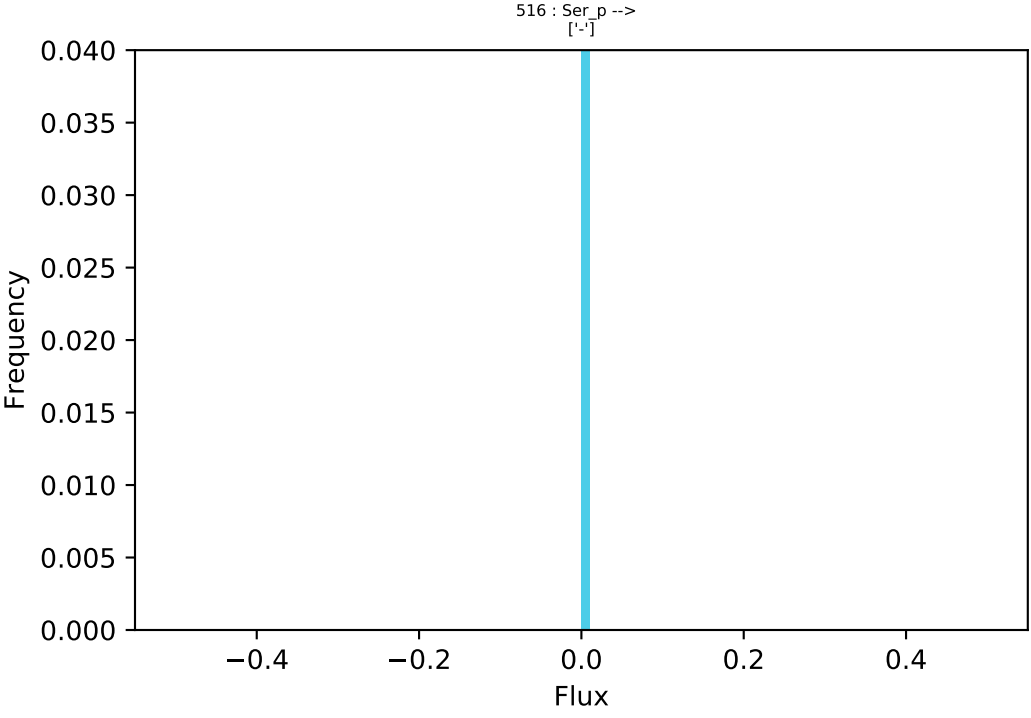

511 : Pro_m -->
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

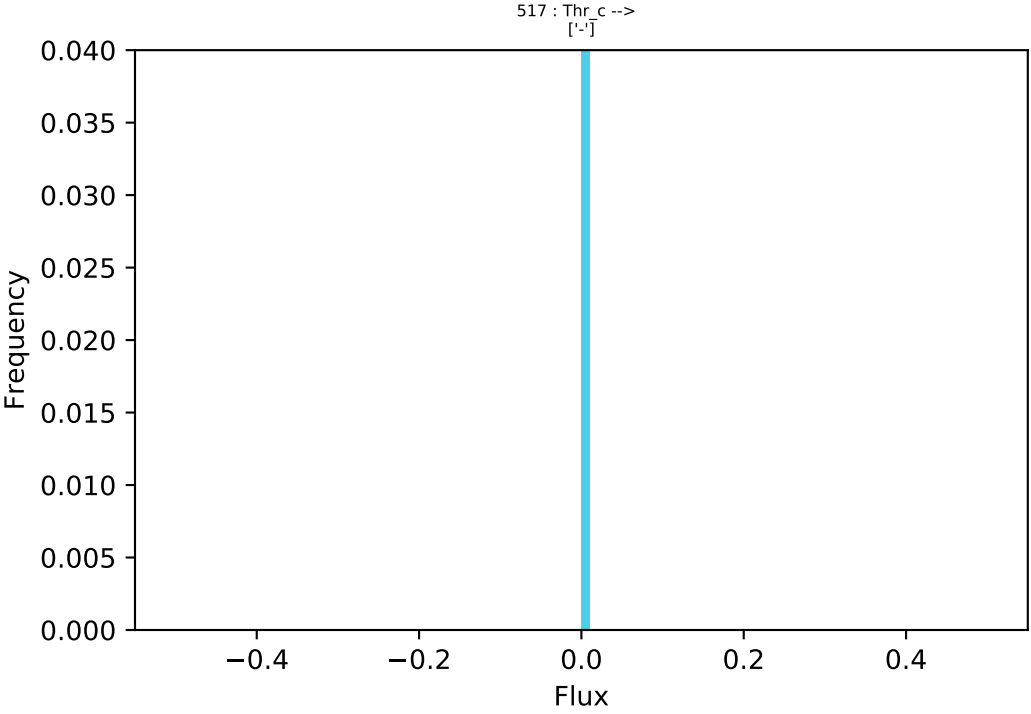

512 : Pro_p -->
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

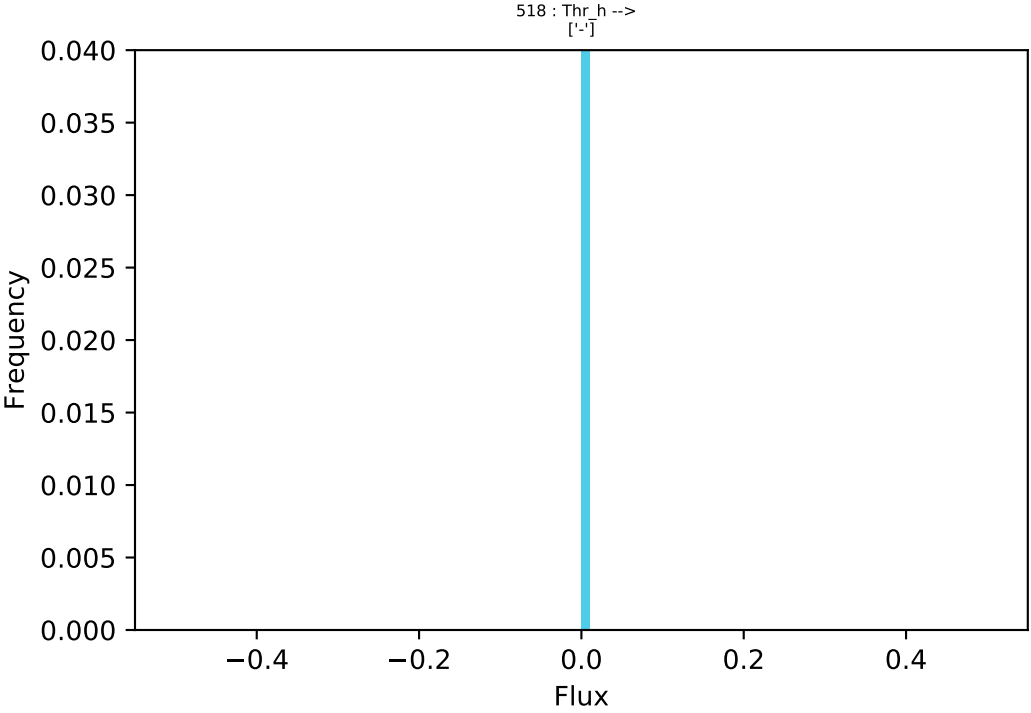

513 : Ser_c -->
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

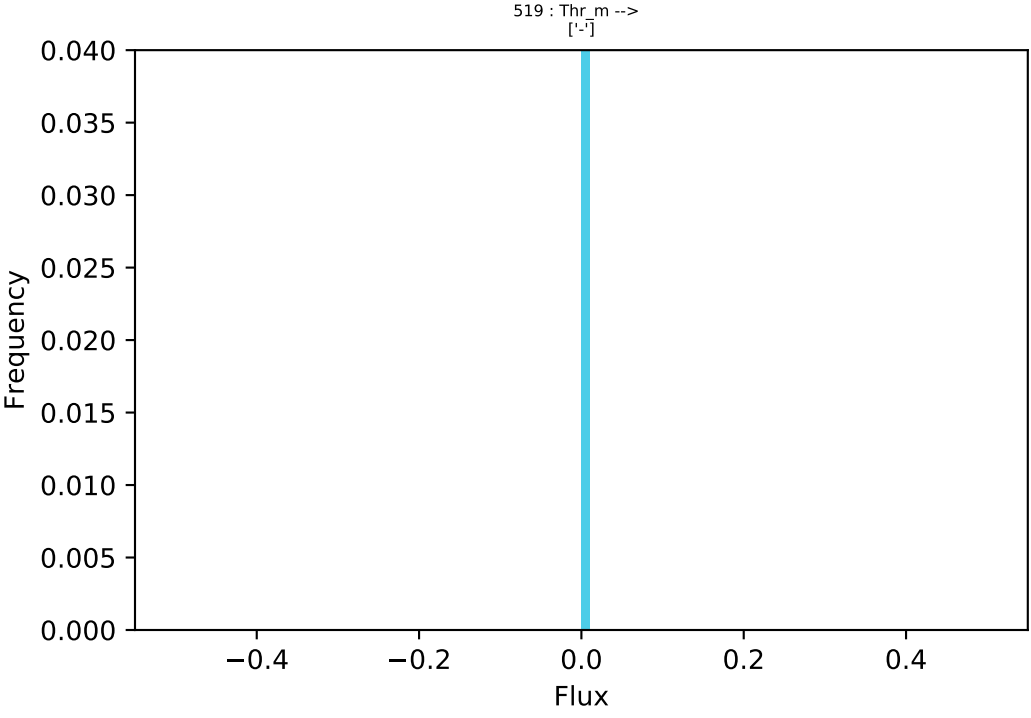

514 : Ser_h -->
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

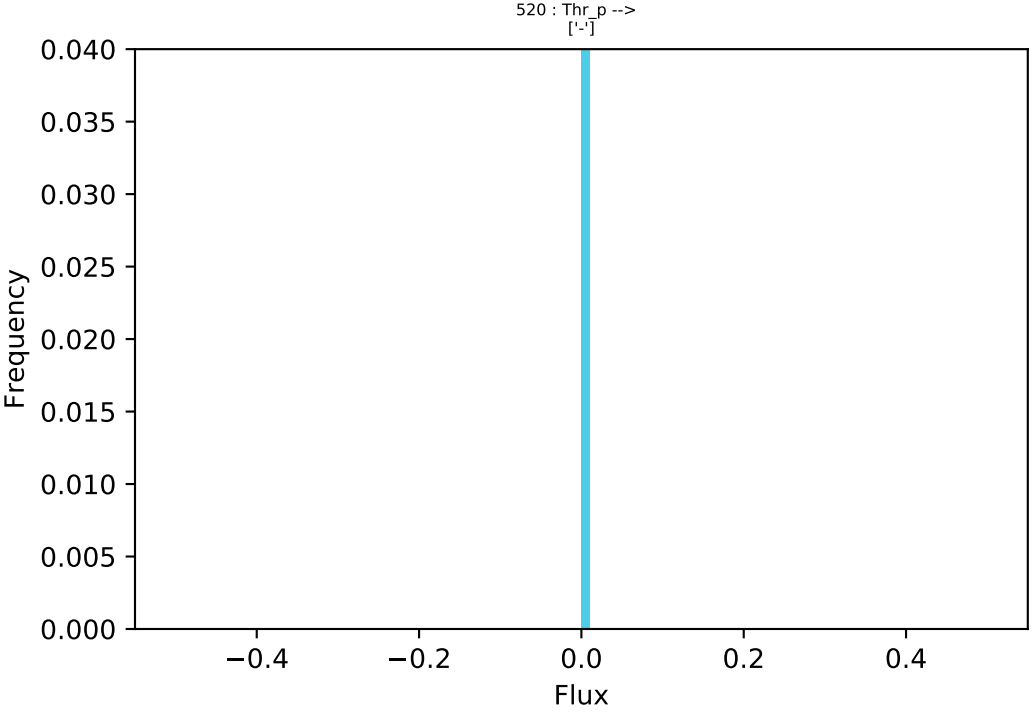

515 : Ser_m -->
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

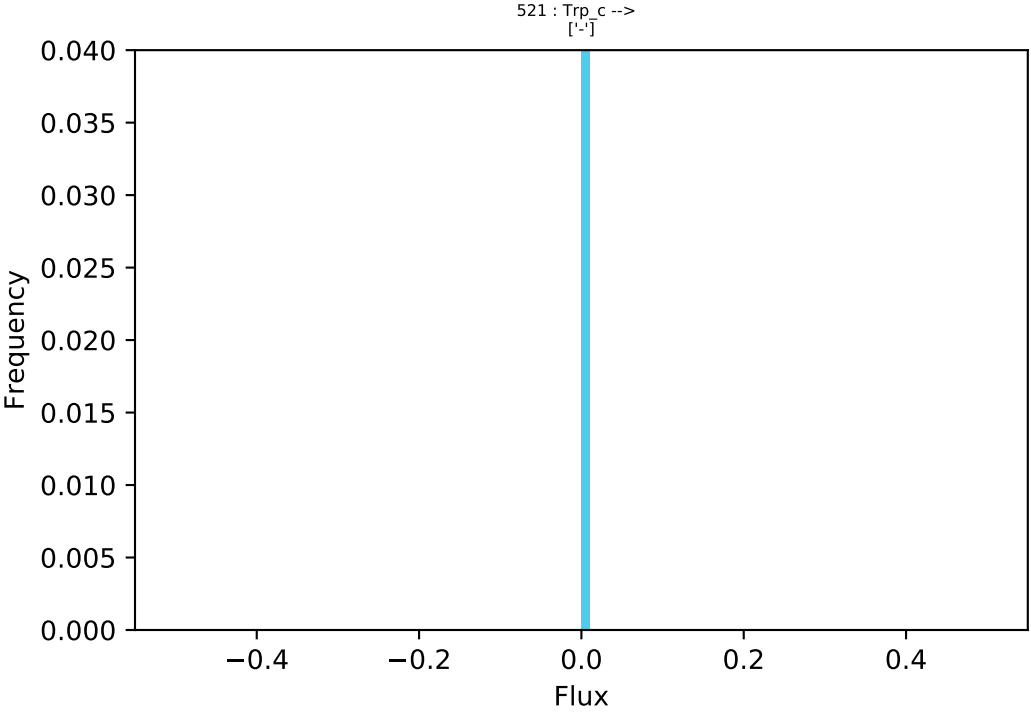

516 : Ser_p -->
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

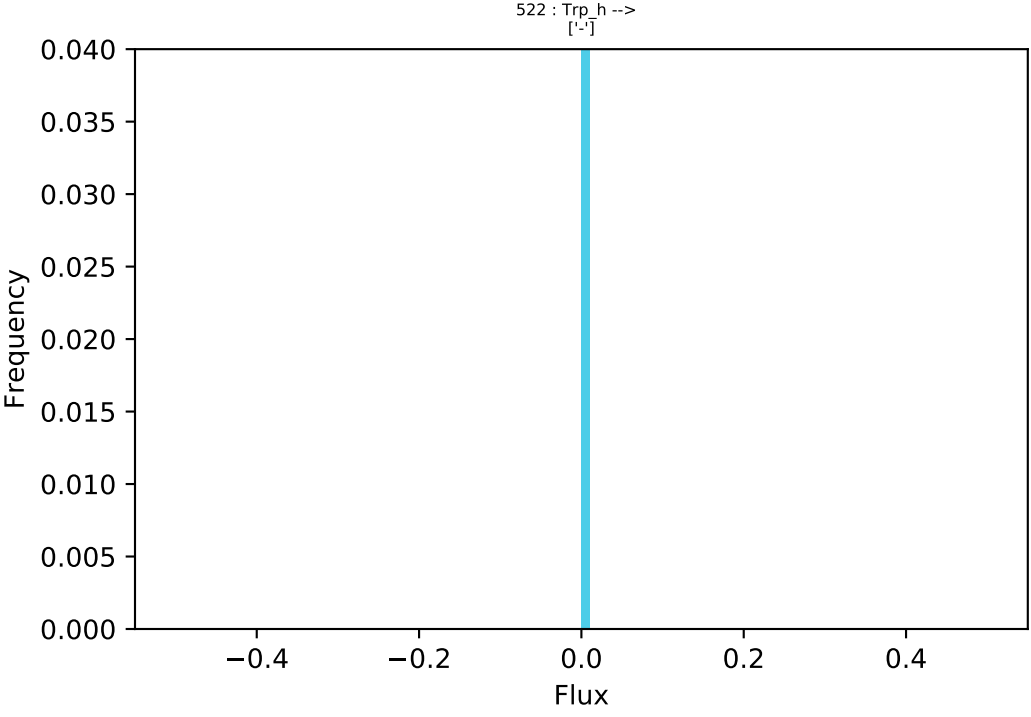

517 : Thr_c -->
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

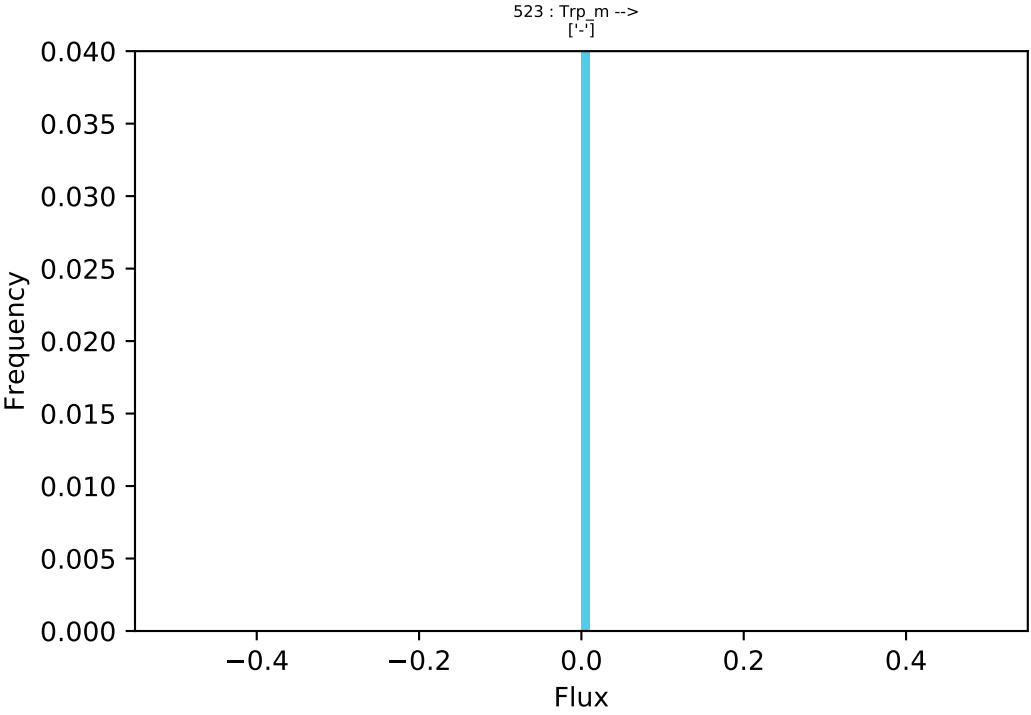

518 : Thr_h -->
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

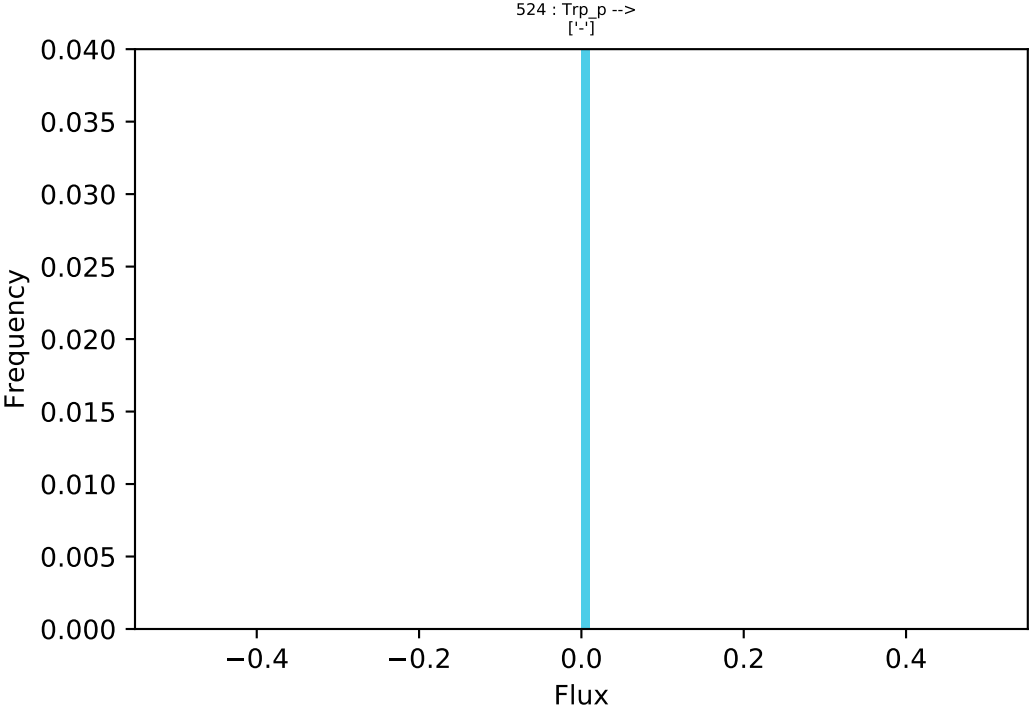

519 : Thr_m -->
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

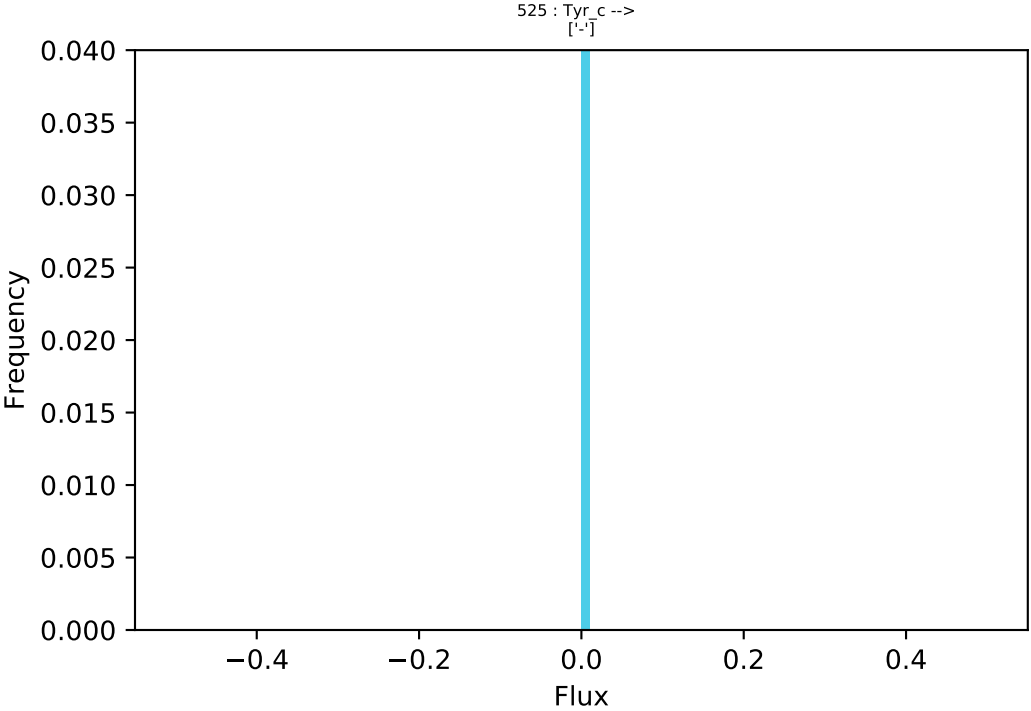

520 : Thr_p -->
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

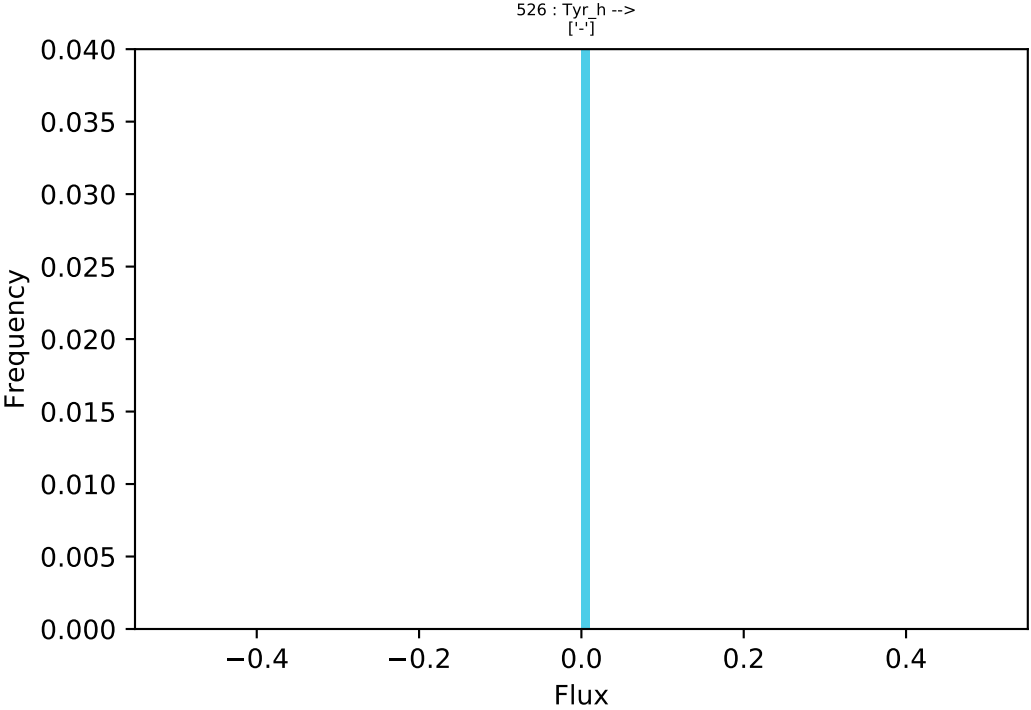

521 : Trp_c -->
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

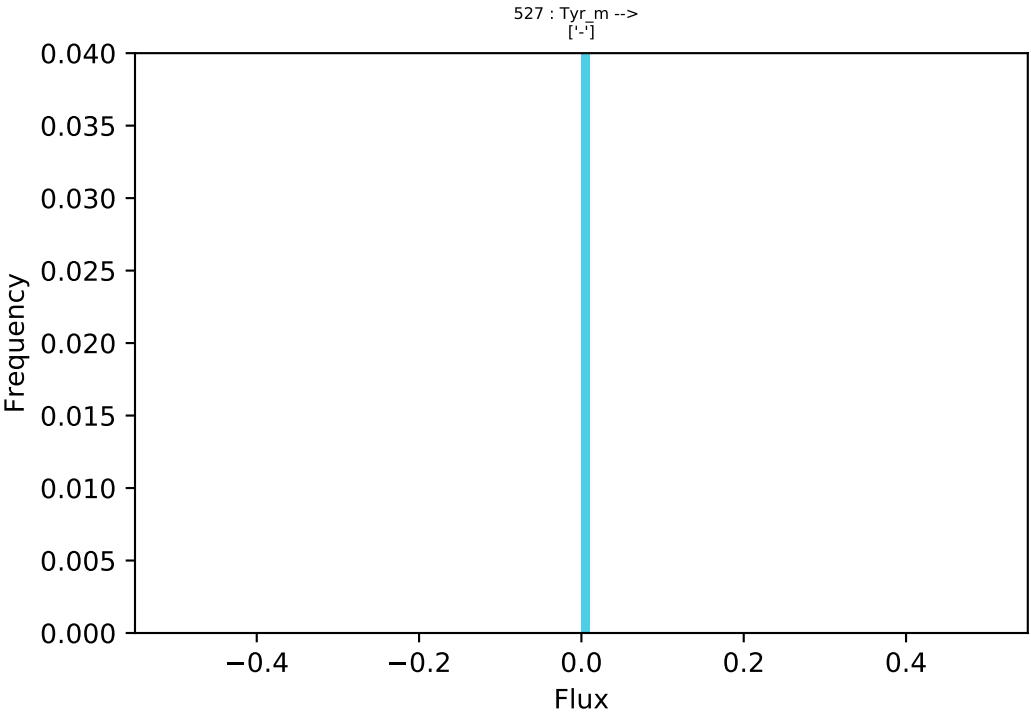

522 : Trp_h -->
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

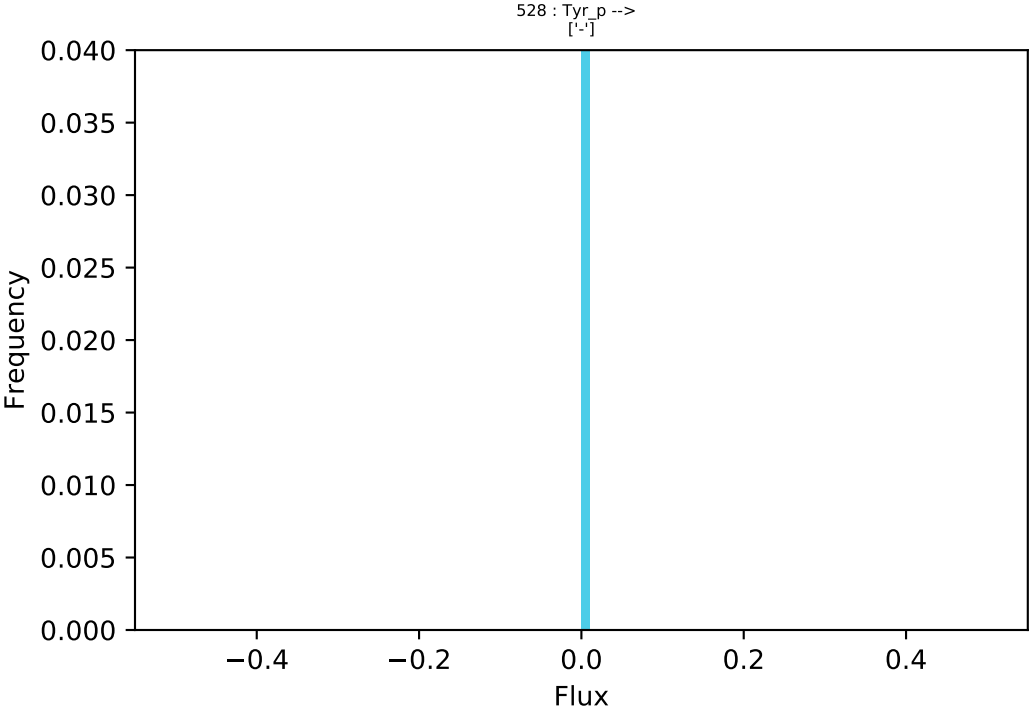

523 : Trp_m -->
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

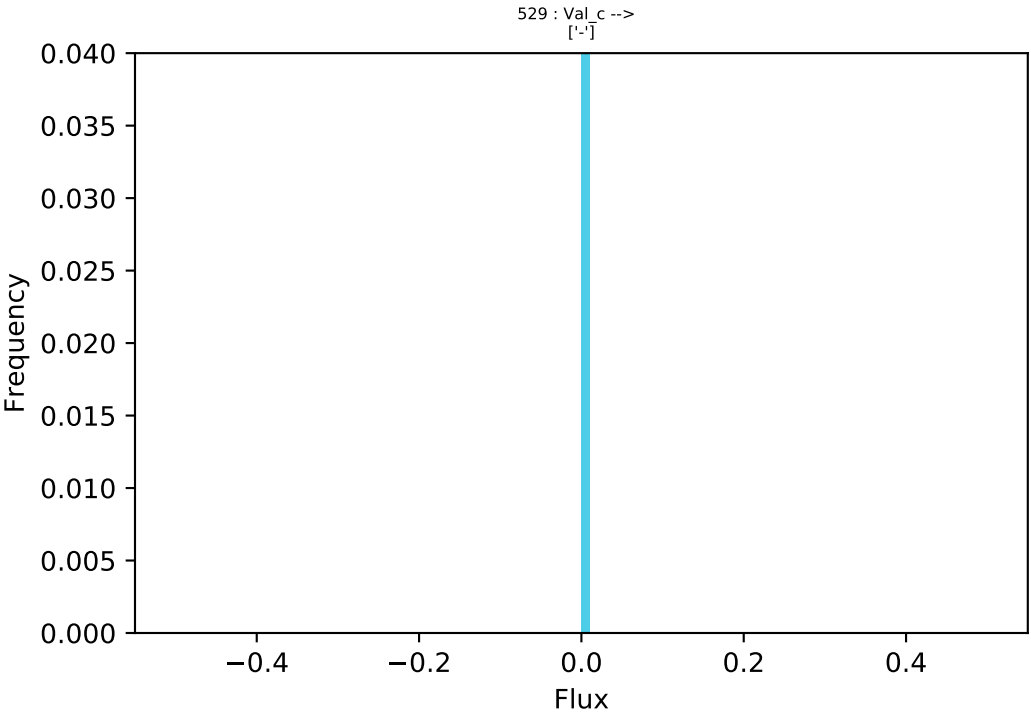

524 : Trp_p -->
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

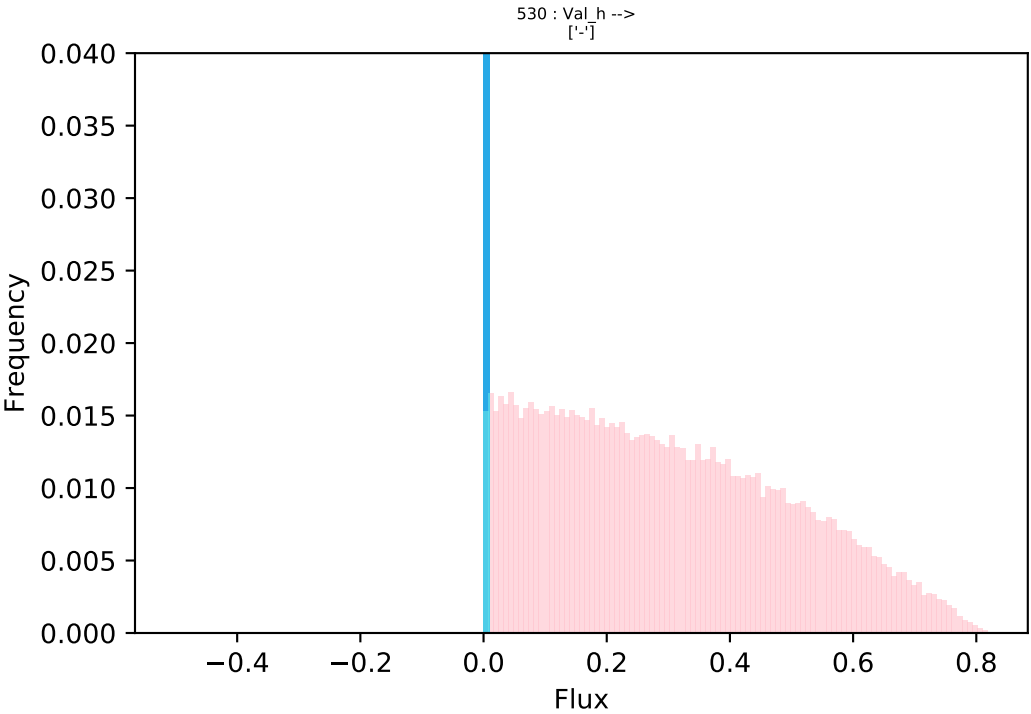

525 : Tyr_c -->
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

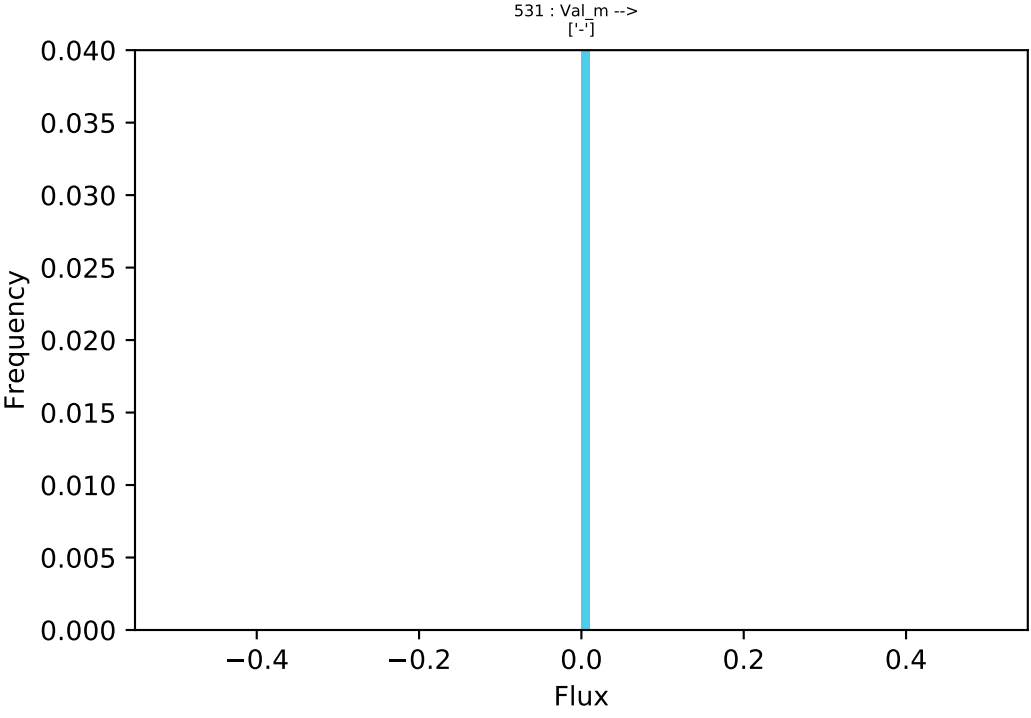

526 : Tyr_h -->
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

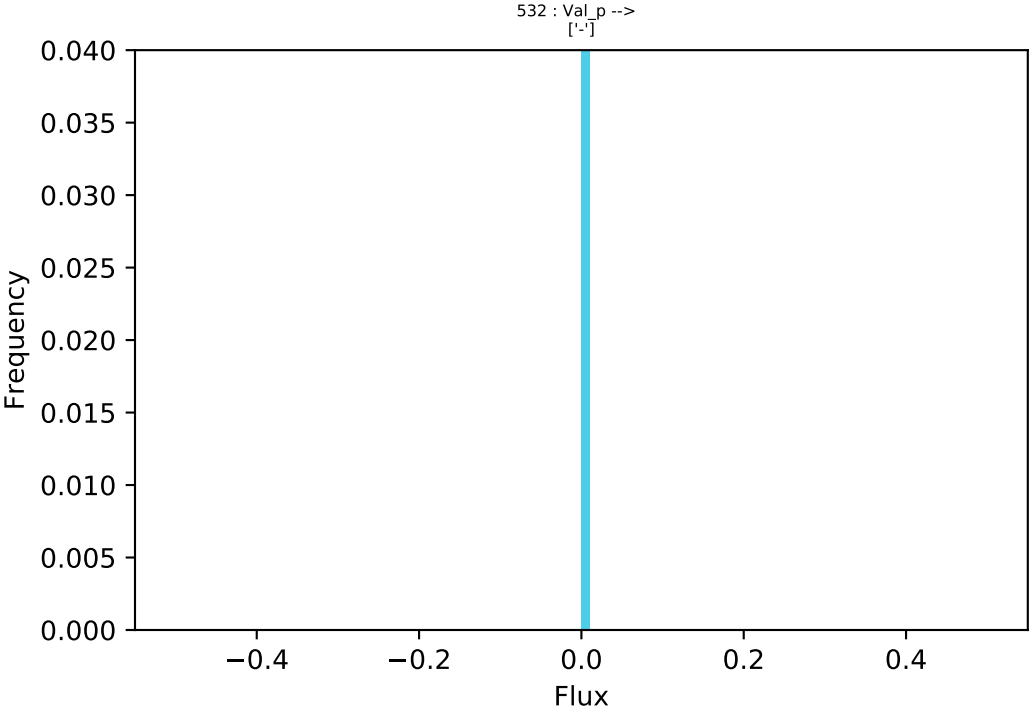

527 : Tyr_m -->
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

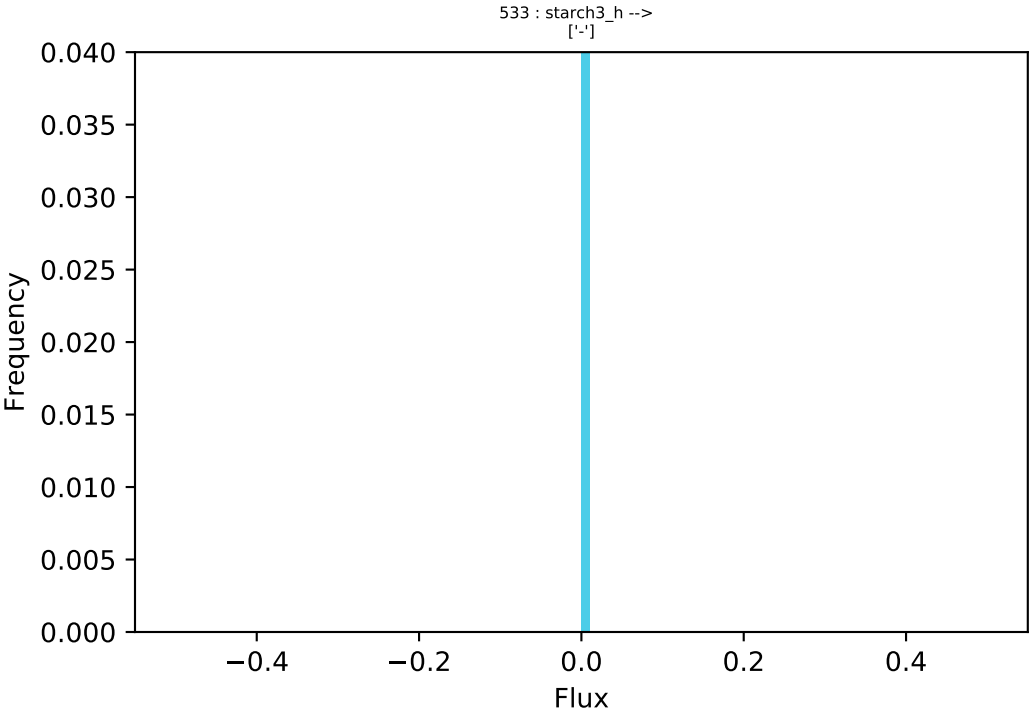

528 : Tyr_p -->
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

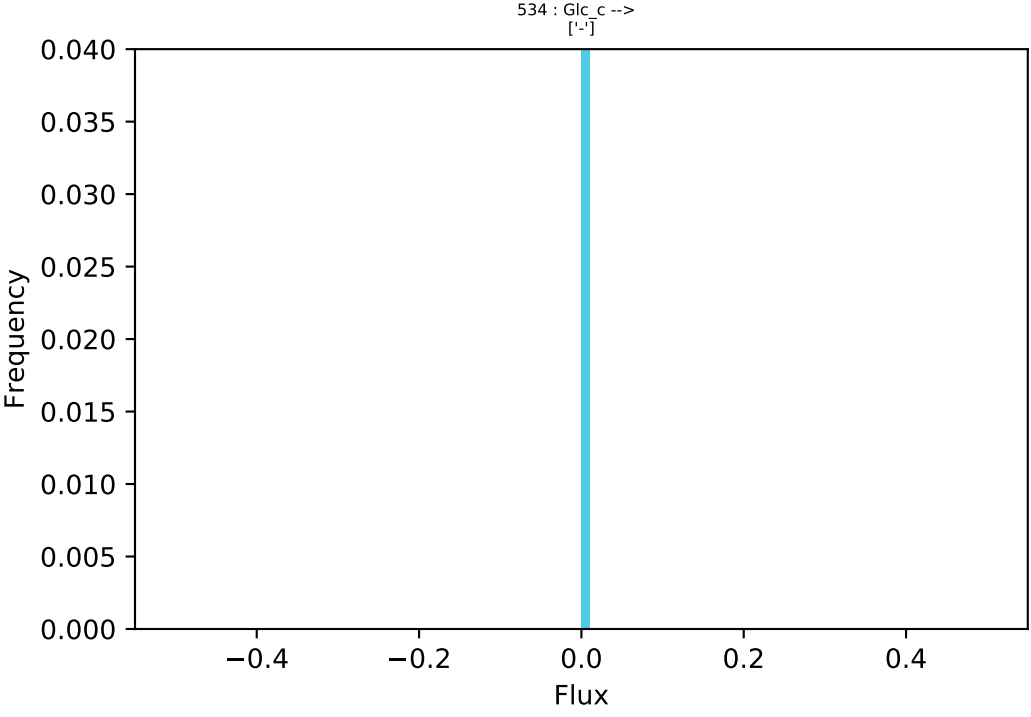

529 : Val_c -->
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

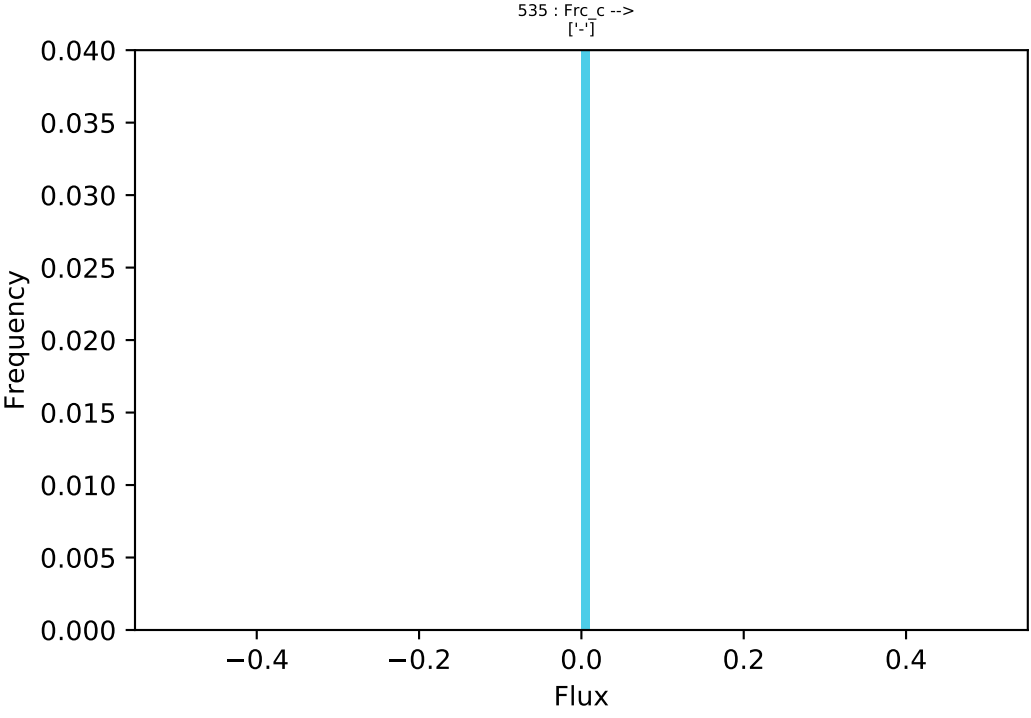

530 : Val_h -->
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
0.6
0.8
Flux

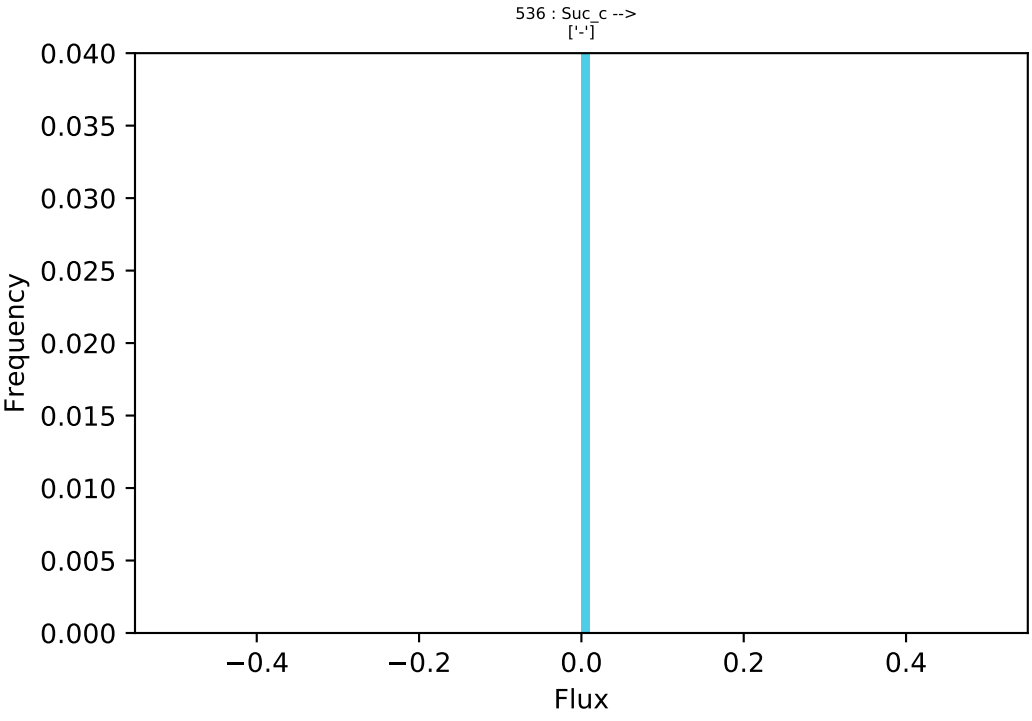

531 : Val_m -->
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

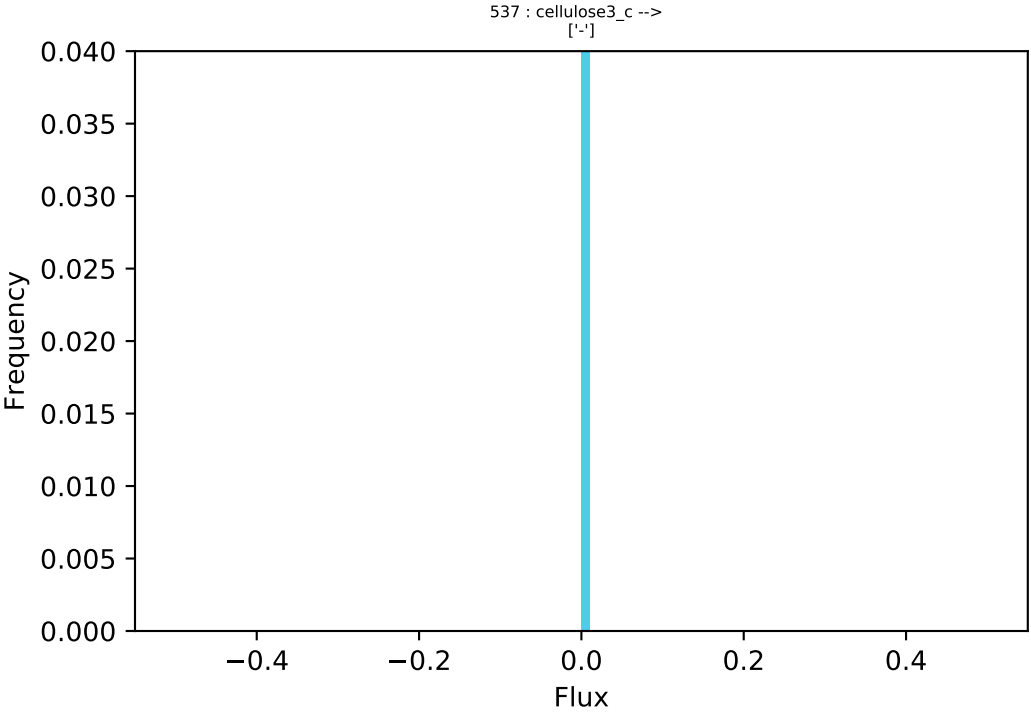

532 : Val_p -->
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

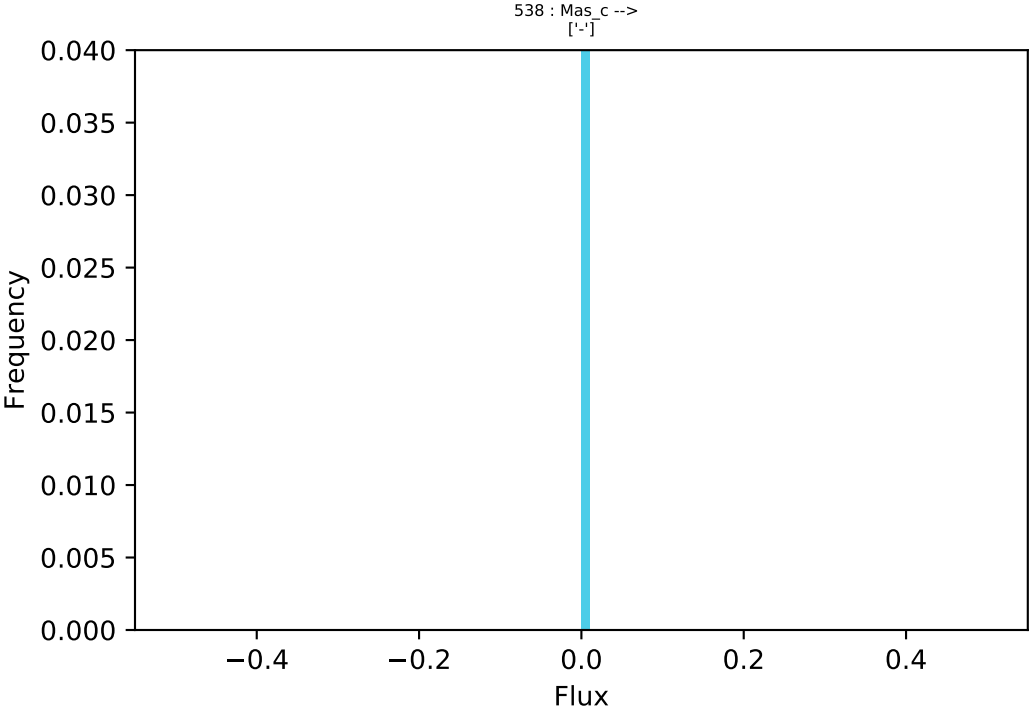

533 : starch3_h -->
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

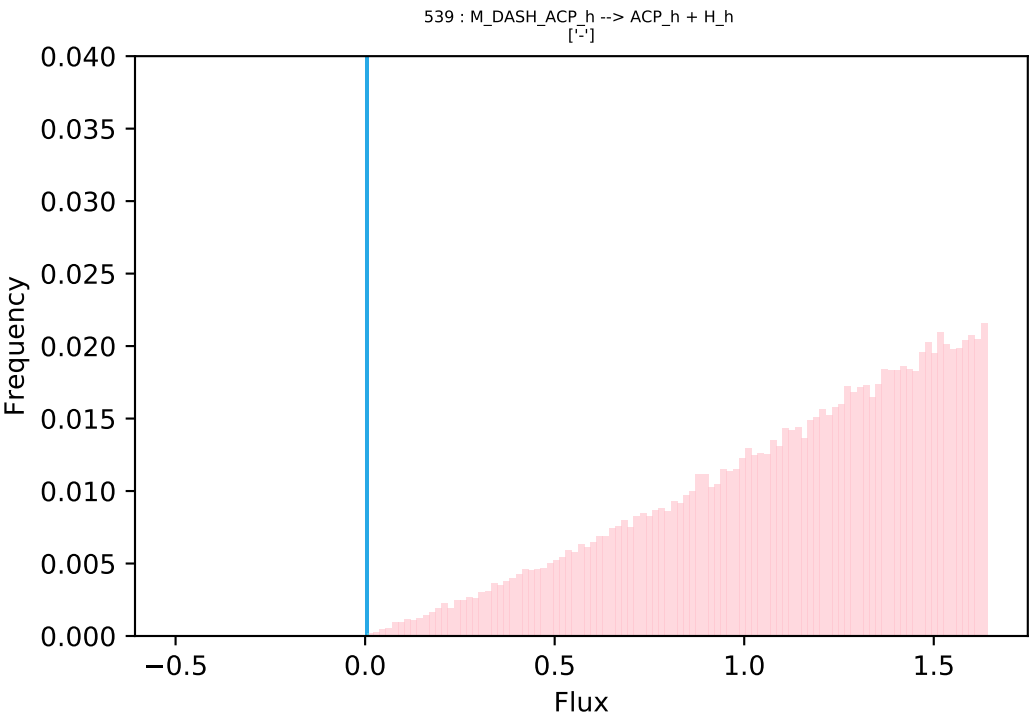

534 : Glc_c -->
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

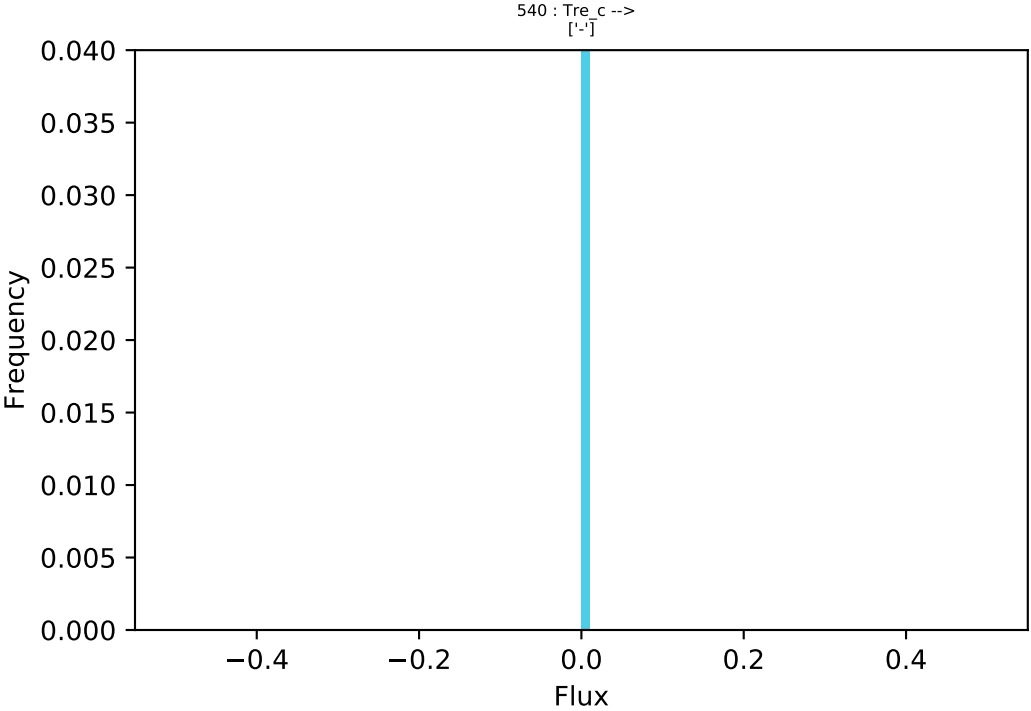

535 : Frc_c -->
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

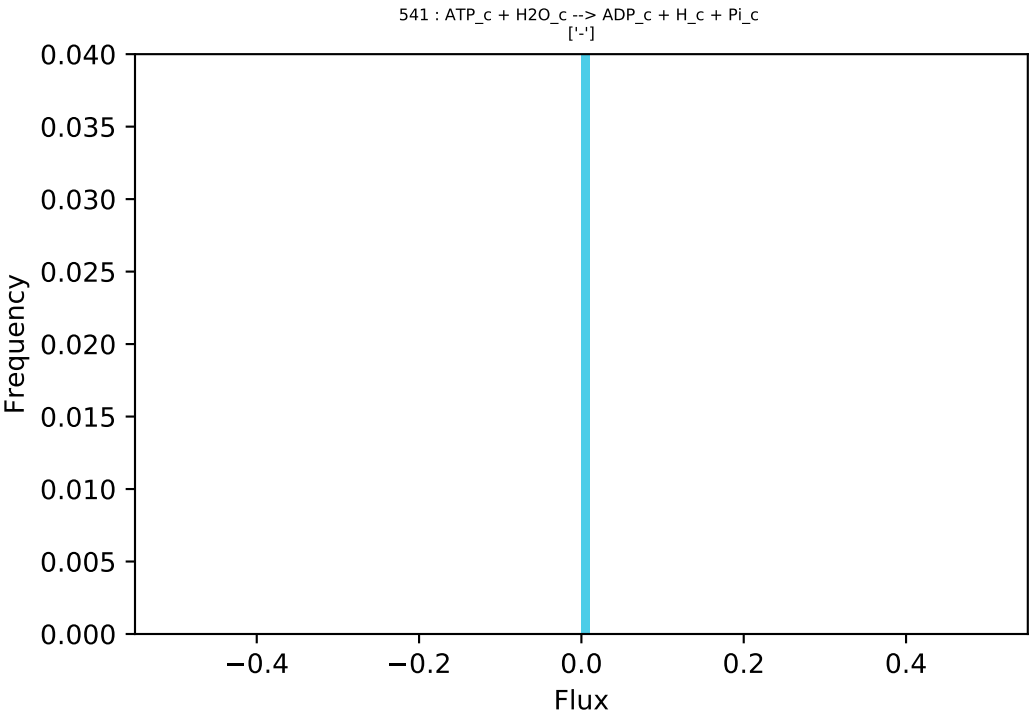

536 : Suc_c -->
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

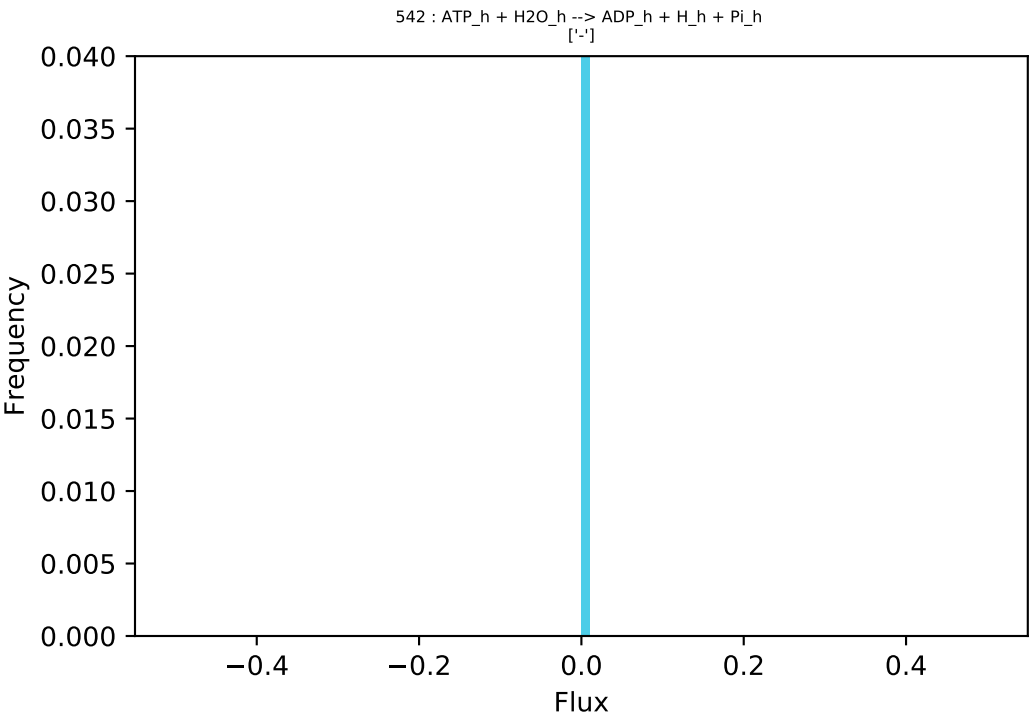

537 : cellulose3_c -->
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

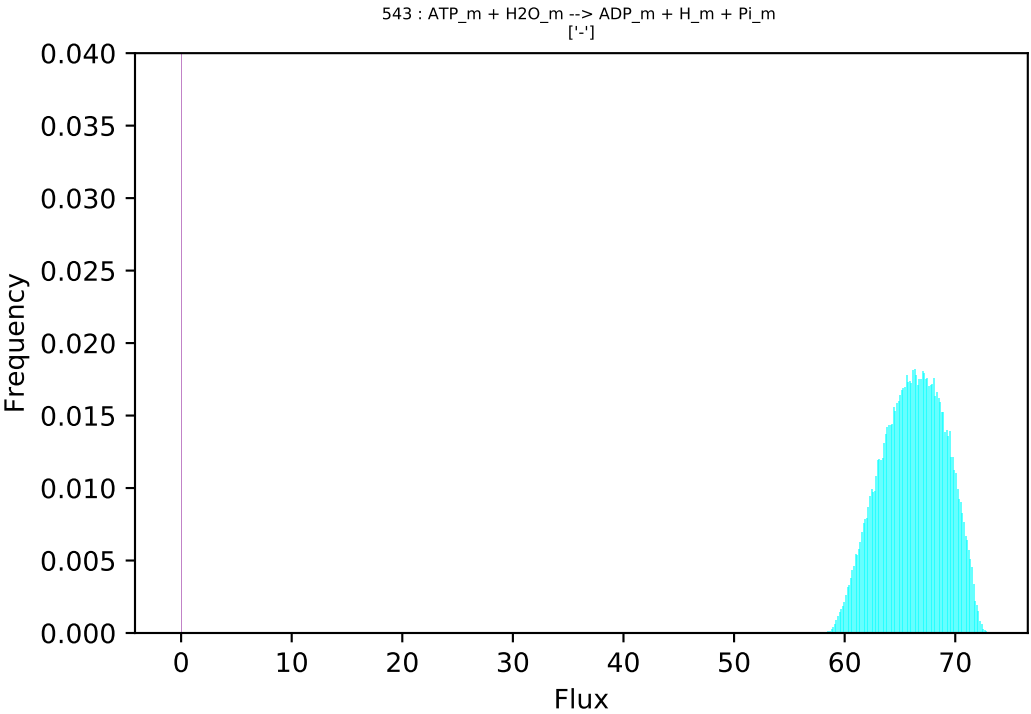

538 : Mas_c -->
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

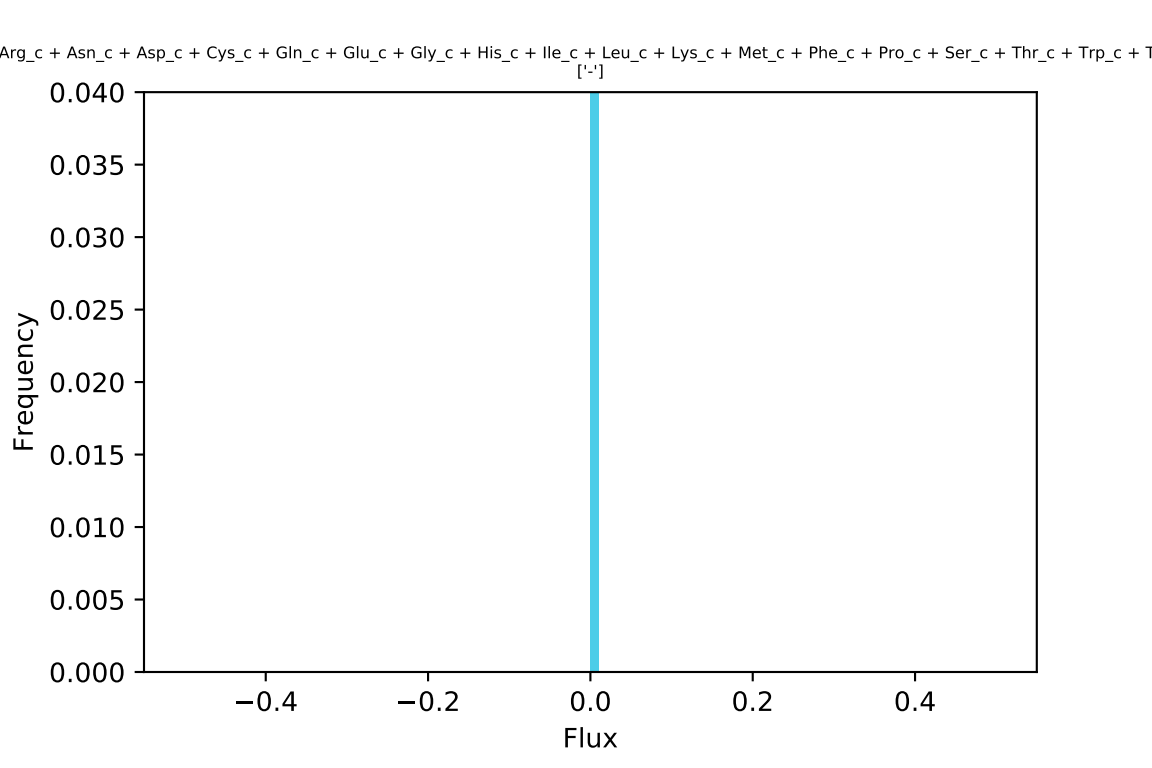

539 : M_DASH_ACP_h --> ACP_h + H_h
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.5
0.0
0.5
1.0
1.5
Flux

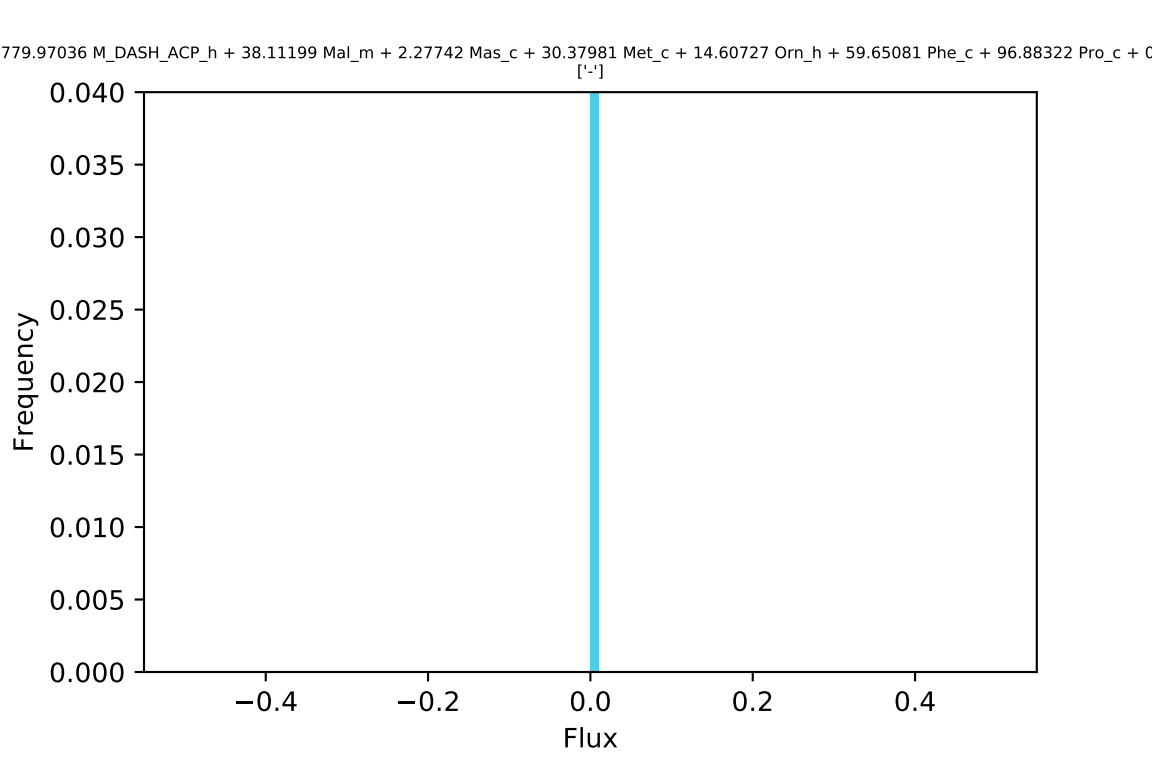

540 : Tre_c -->
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

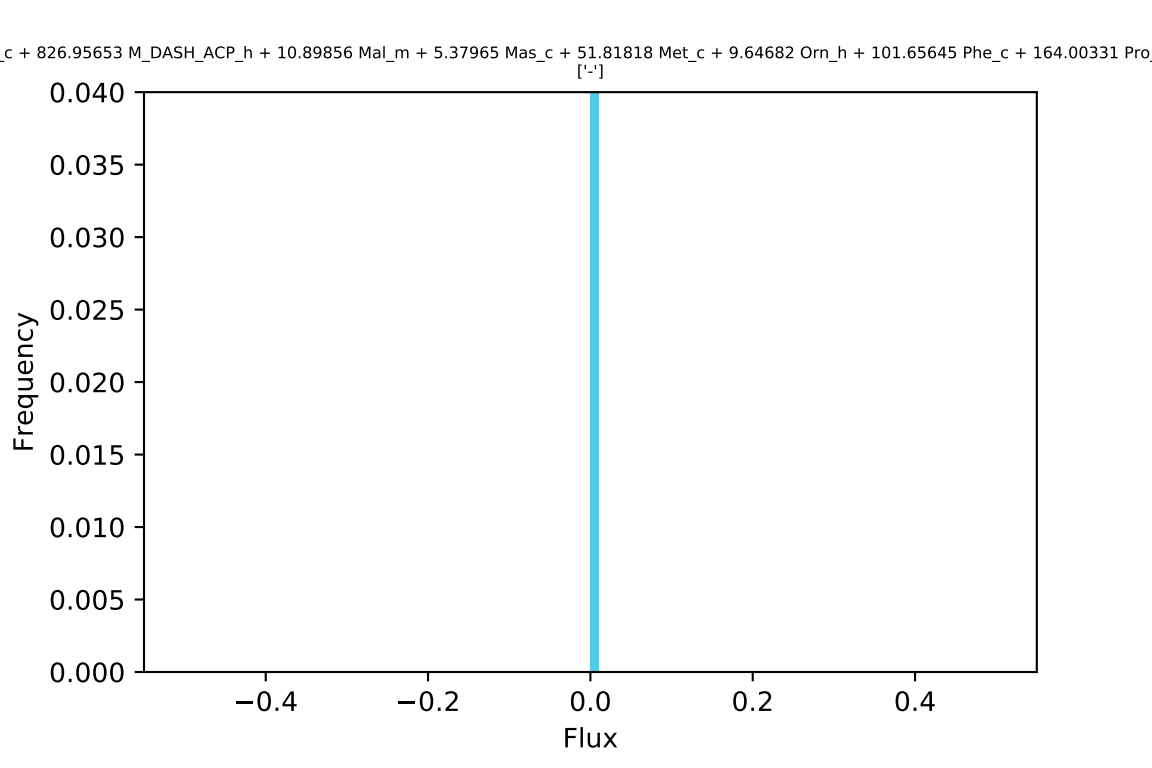

541 : ATP_c + H2O_c --> ADP_c + H_c + Pi_c
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

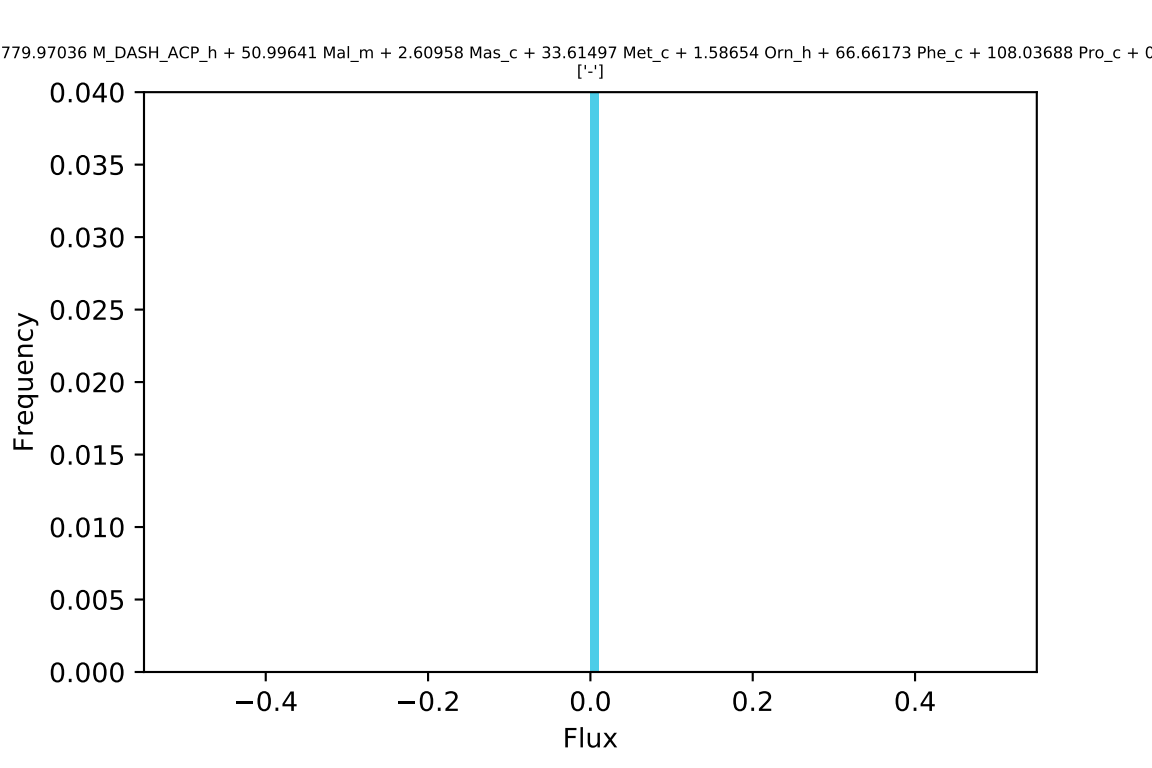

542 : ATP_h + H2O_h --> ADP_h + H_h + Pi_h
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

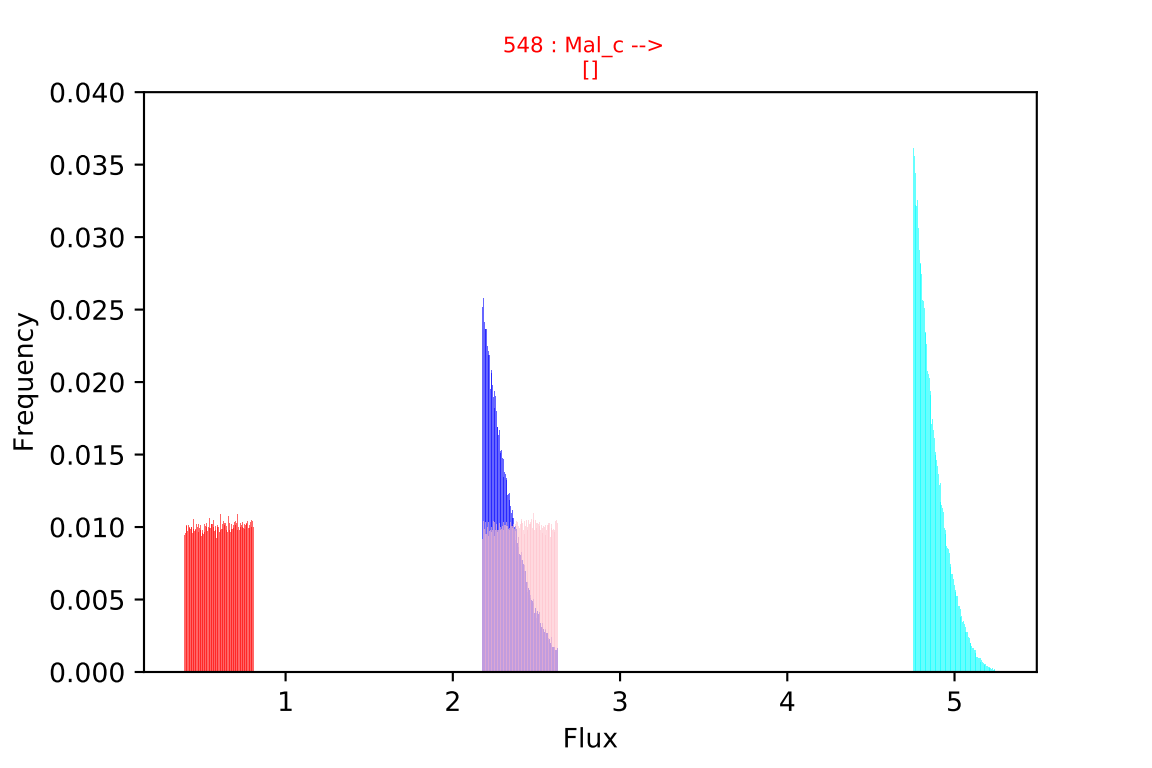

543 : ATP_m + H2O_m --> ADP_m + H_m + Pi_m
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0
10
20
30
40
50
60
70
Flux

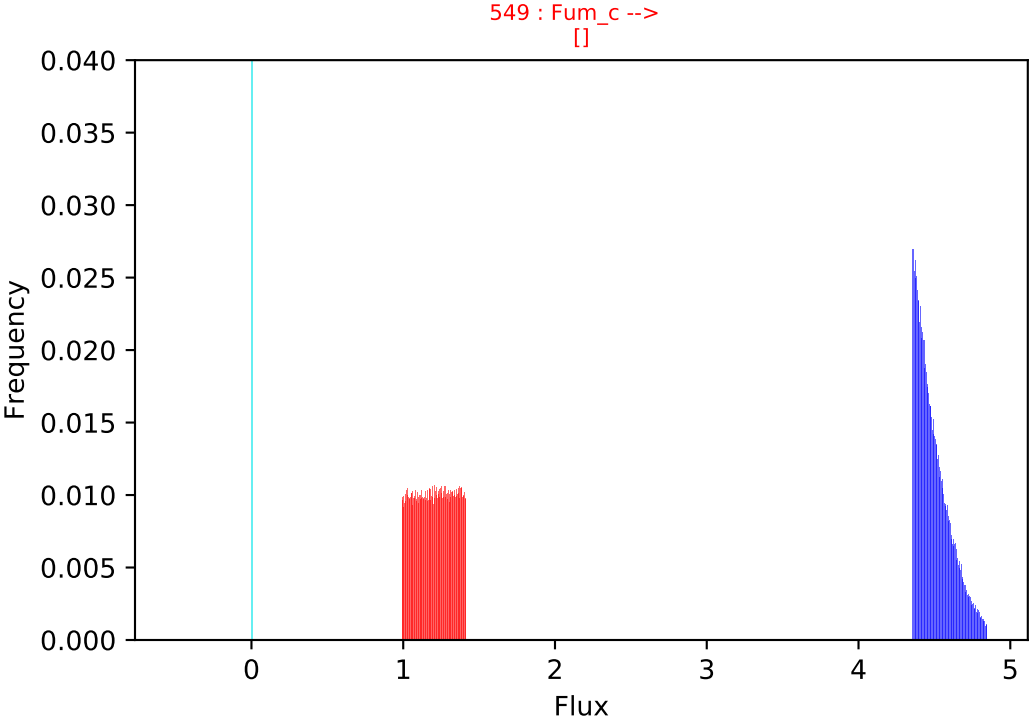

Arg_c + Asn_c + Asp_c + Cys_c + Gln_c + Glu_c + Gly_c + His_c + Ile_c + Leu_c + Lys_c + Met_c + Phe_c + Pro_c + Ser_c + Thr_c + Trp_c + T
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

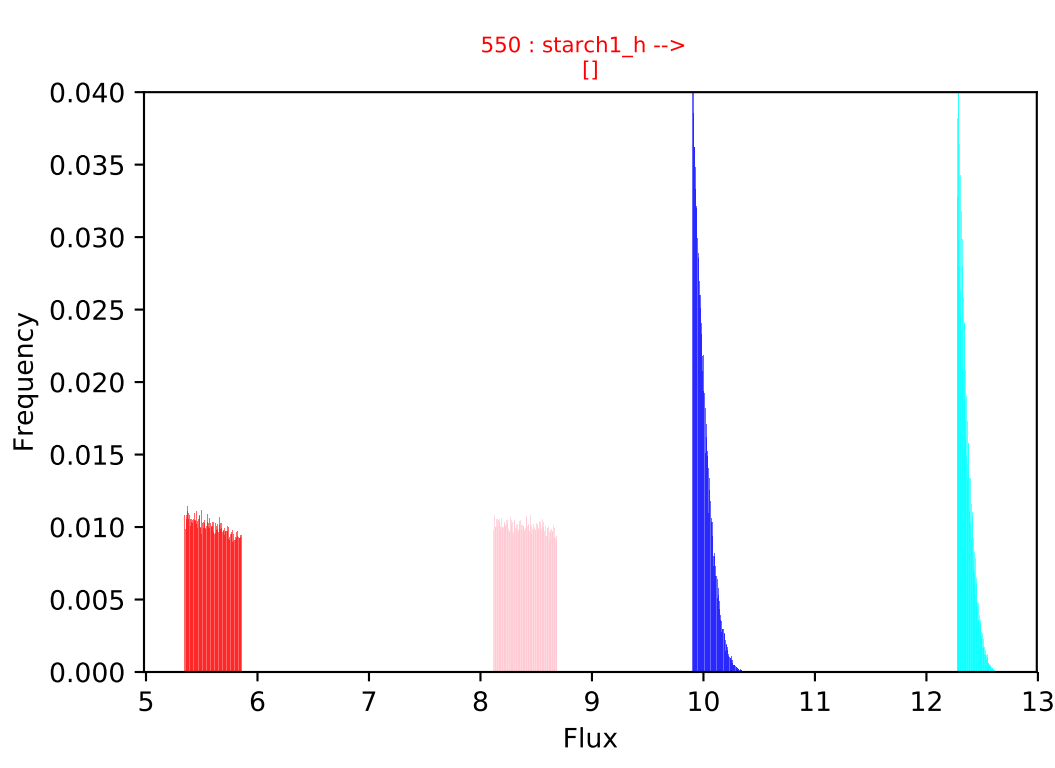

779.97036 M_DASH_ACP_h + 38.11199 Mal_m + 2.27742 Mas_c + 30.37981 Met_c + 14.60727 Orn_h + 59.65081 Phe_c + 96.88322 Pro_c + 0
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux


_c + 826.95653 M_DASH_ACP_h + 10.89856 Mal_m + 5.37965 Mas_c + 51.81818 Met_c + 9.64682 Orn_h + 101.65645 Phe_c + 164.00331 Pro_
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux


779.97036 M_DASH_ACP_h + 50.99641 Mal_m + 2.60958 Mas_c + 33.61497 Met_c + 1.58654 Orn_h + 66.66173 Phe_c + 108.03688 Pro_c + 0
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux


548 : Mal_c -->
[]
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
1
2
3
4
5
Flux


549 : Fum_c -->
[]
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0
1
2
3
4
5
Flux


550 : starch1_h -->
[]
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
5
6
7
8
9
10
11
12
13
Flux