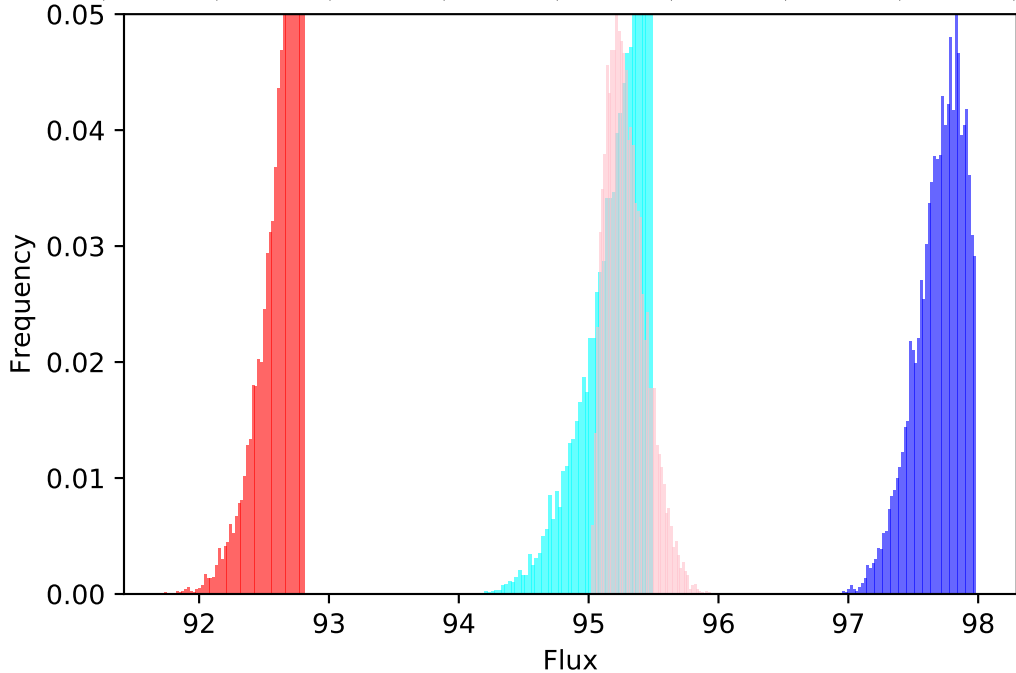
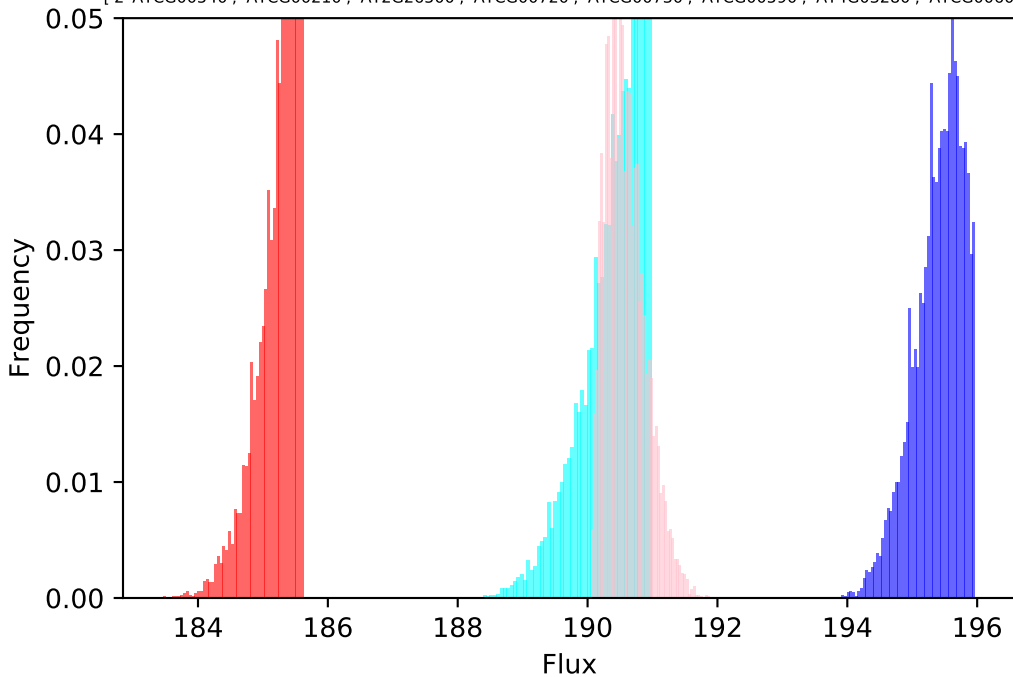
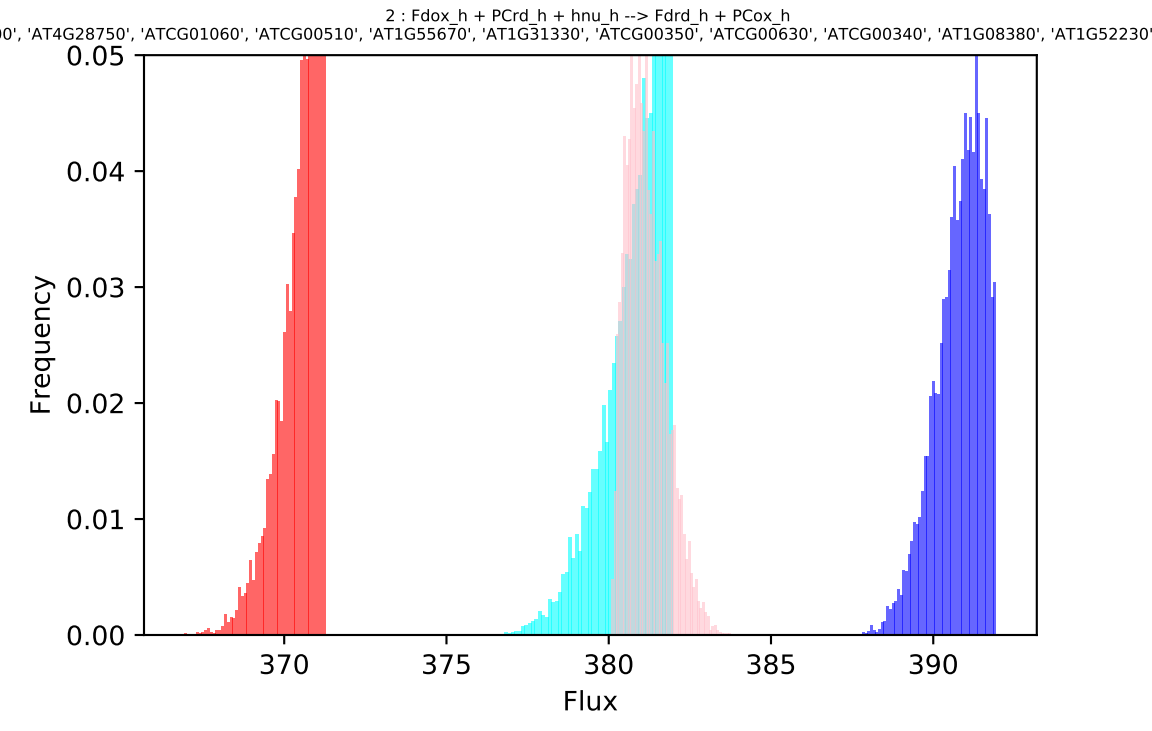


0 : 2.0 H2O\_h + 4.0 H\_h + 2.0 PQ\_h + 4.0 hnu\_h --> 4.0 H\_l + O2\_h + 2.0 PQH2\_h  
, 'AT5G66570', 'AT4G05180', 'AT1G79040', 'ATCG00560', 'AT3G21055', 'ATCG00270', 'ATCG00580', 'ATCG00680', 'ATCG00570', 'ATCG00690',

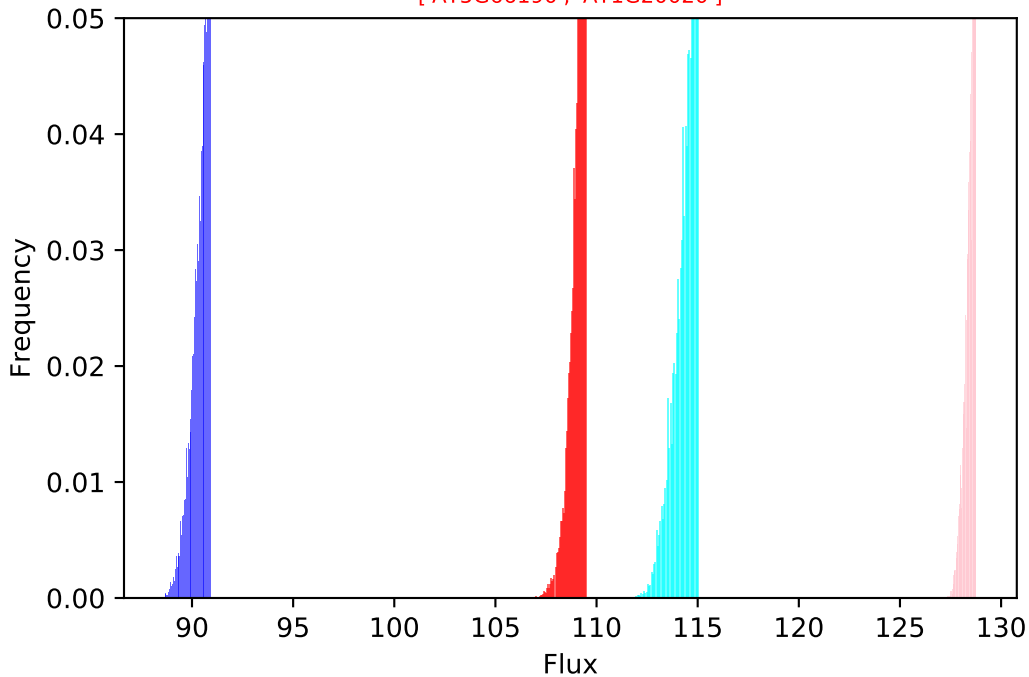


1 : 2.0 H\_h + 2.0 PCox\_h + PQH2\_h --> 4.0 H I + 2.0 PCrd\_h + PQ\_h  
['2\*ATCG00540', 'ATCG00210', 'AT2G26500', 'ATCG00720', 'ATCG00730', 'ATCG00590', 'AT4G03280', 'ATCG00600']

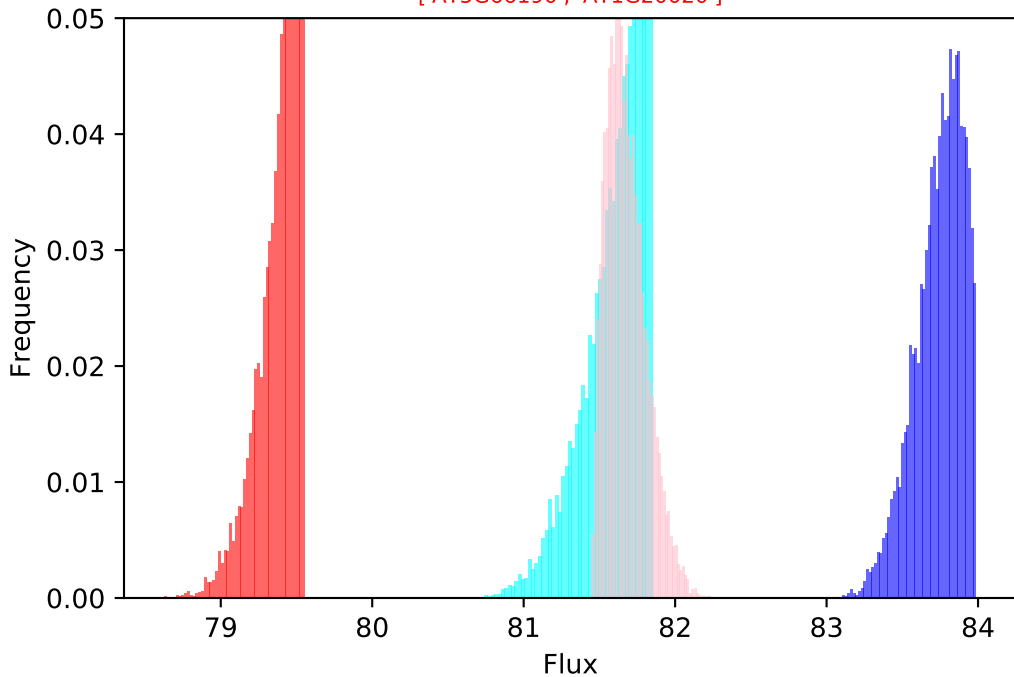




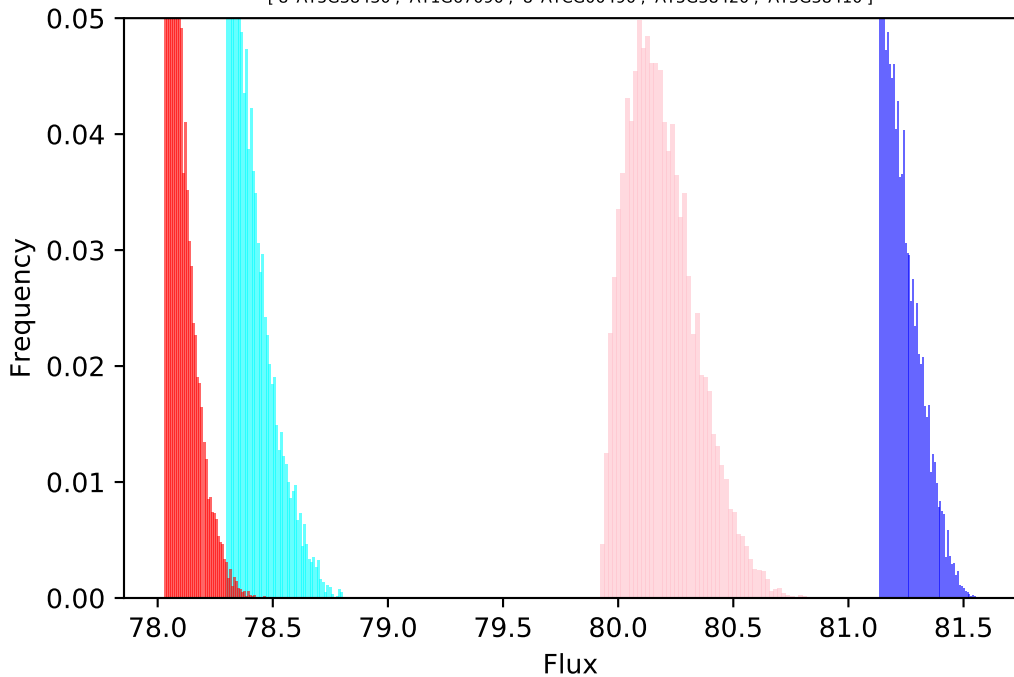
3 : 2.0 Fdrd\_h + H\_h + NADP\_h --> 2.0 Fdox\_h + NADPH\_h  
['AT5G66190', 'AT1G20020']



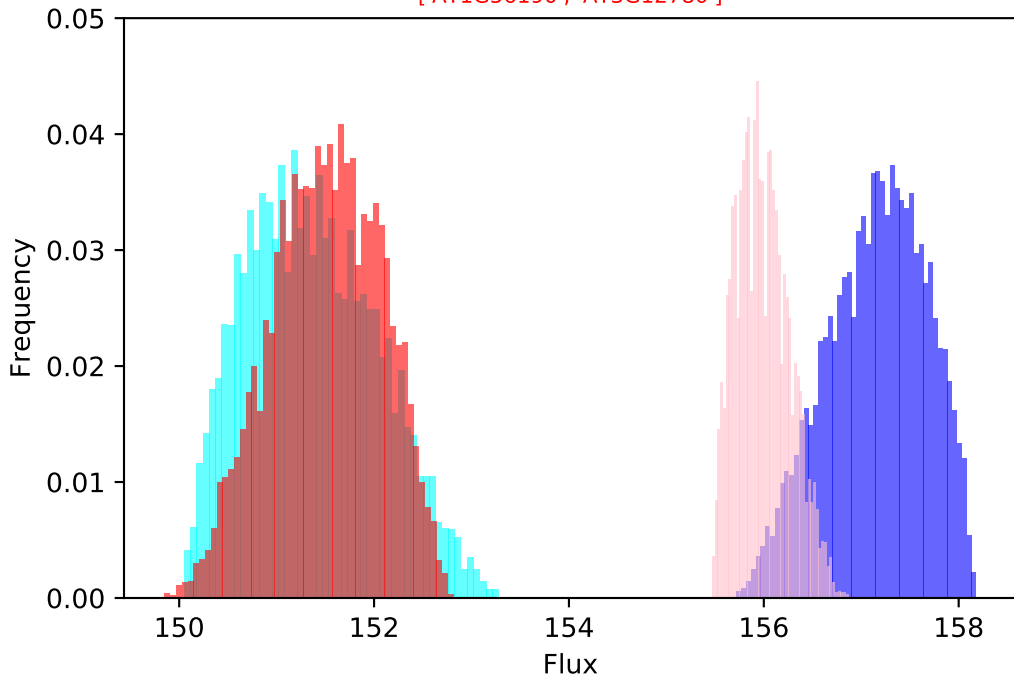
4 : 3.0 ADP\_h + 14.0 H\_l + 3.0 Pi\_h --> 3.0 ATP\_h + 3.0 H2O\_h + 11.0 H\_h  
['AT5G66190', 'AT1G20020']



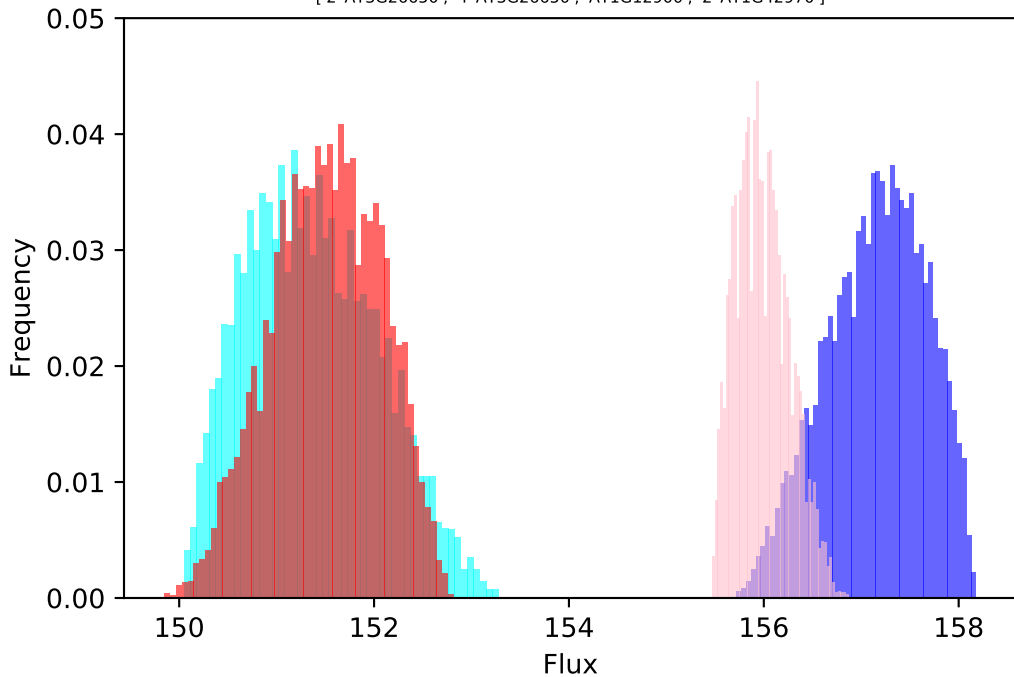
5 : CO2\_h + H2O\_h + RuBP\_h --> 2.0 H\_h + 2.0 PGA\_h  
['8\*AT5G38430', 'AT1G67090', '8\*ATCG00490', 'AT5G38420', 'AT5G38410']



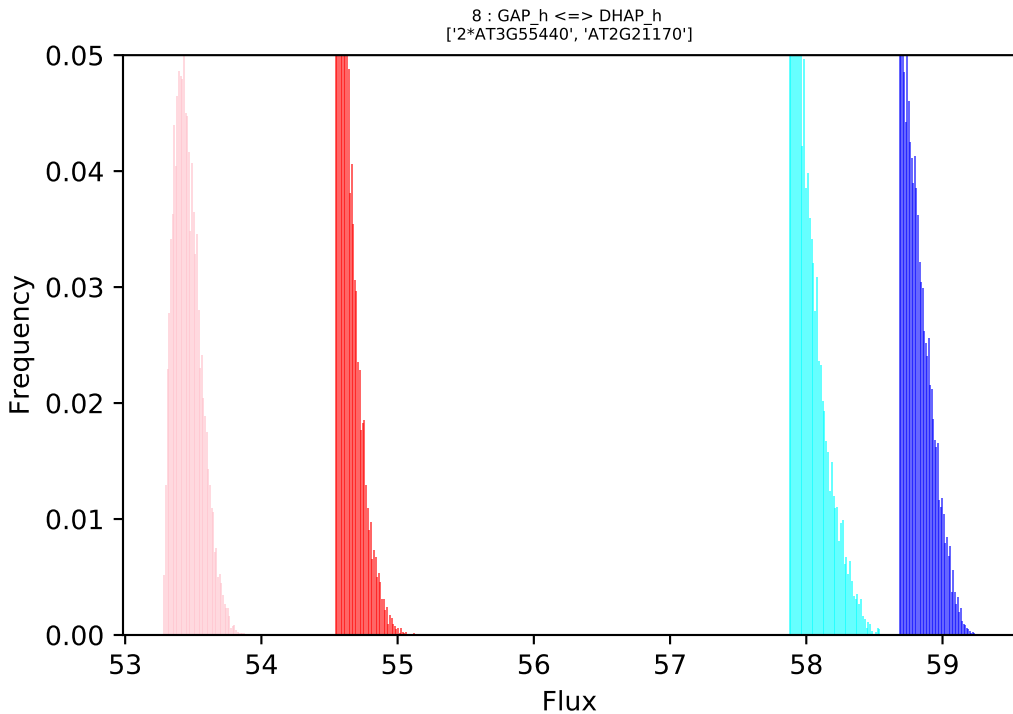
6 : ATP\_h + PGA\_h <=> ADP\_h + DPGA\_h  
['AT1G56190', 'AT3G12780']

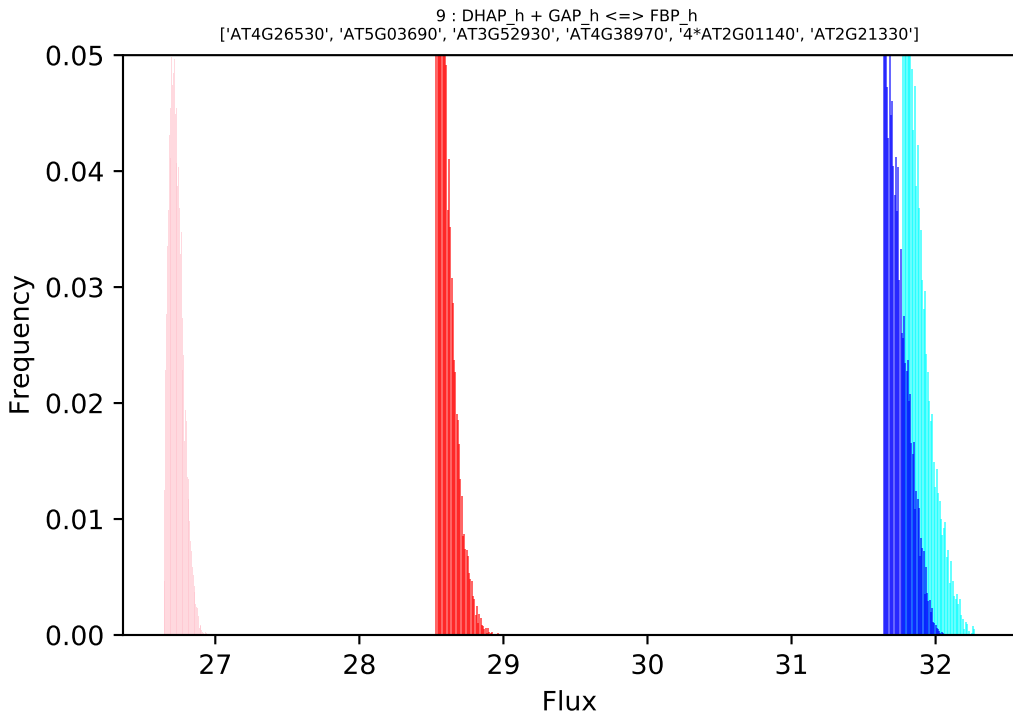


7 : DPGA\_h + H\_h + NADPH\_h --> GAP\_h + NADP\_h + Pi\_h  
['2\*AT3G26650', '4\*AT3G26650', 'AT1G12900', '2\*AT1G42970']

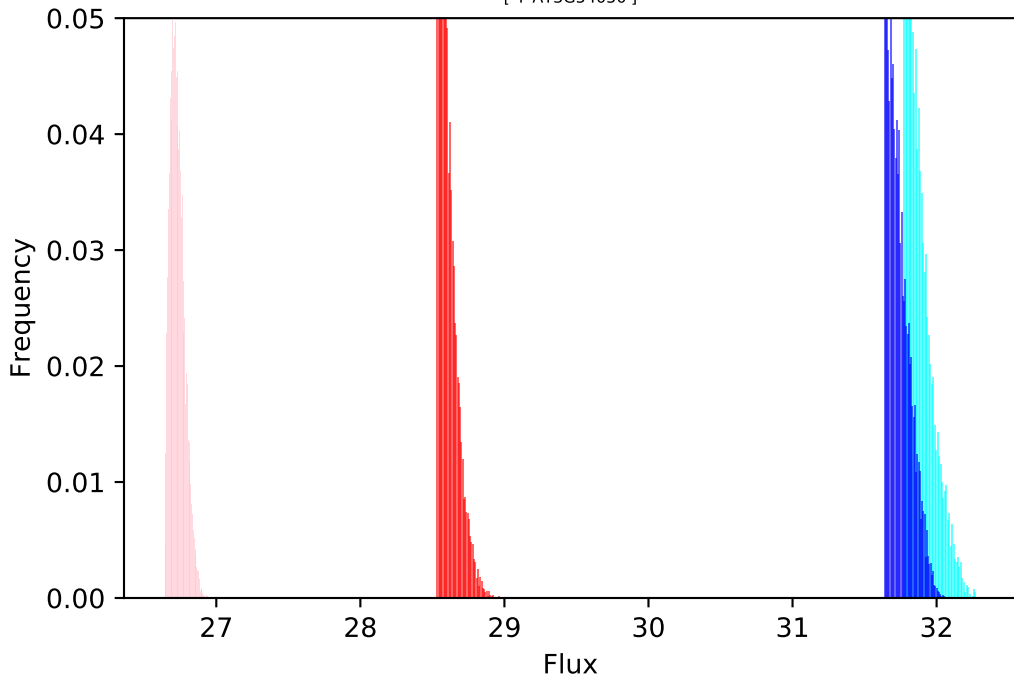




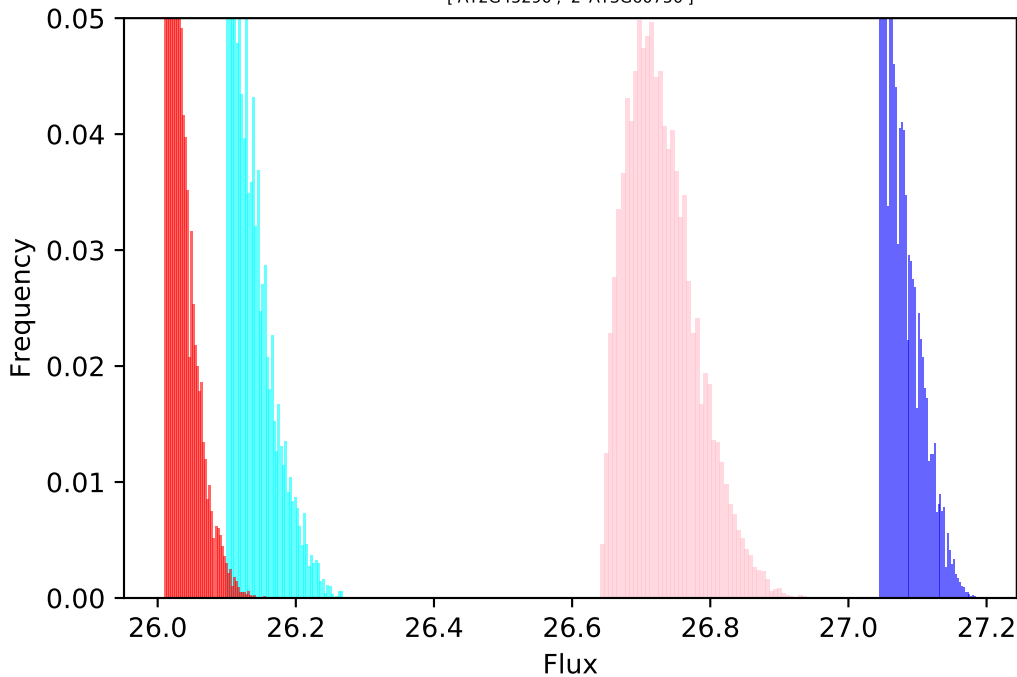




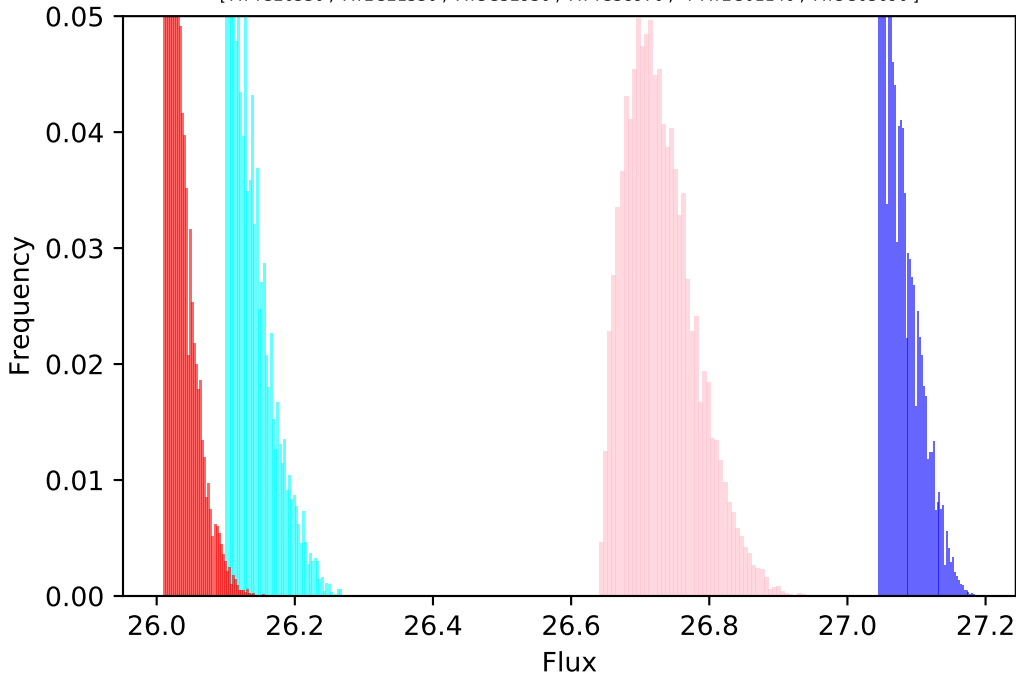
10 : FBP\_h + H2O\_h --> F6P\_h + Pi\_h  
['4\*AT3G54050']



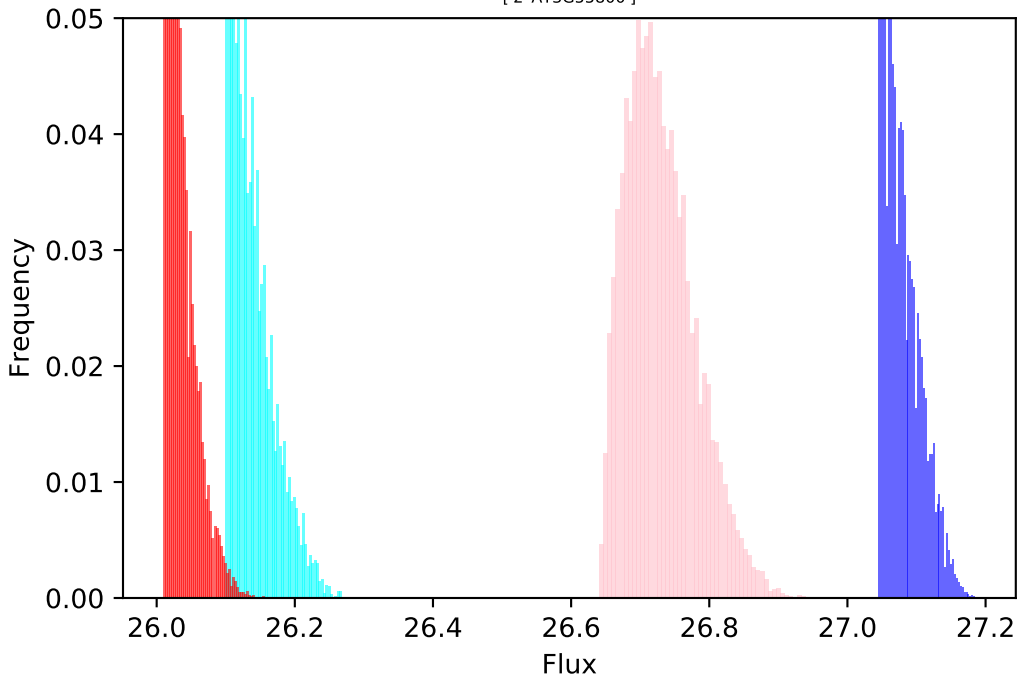
11 : F6P\_h + GAP\_h <=> E4P\_h + X5P\_h  
['AT2G45290', '2\*AT3G60750']



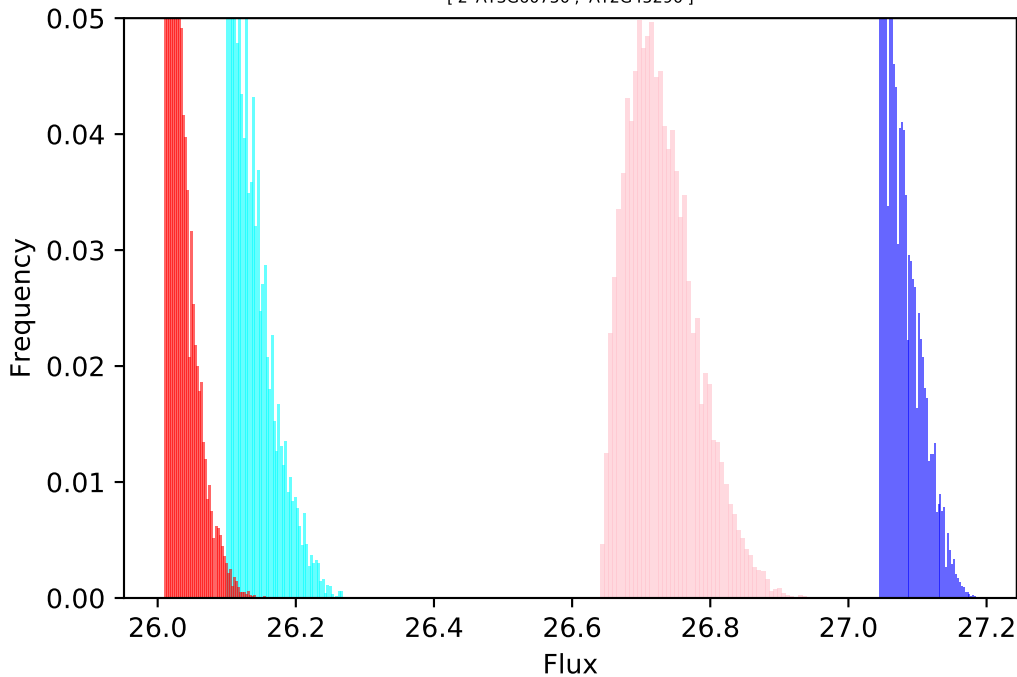
12 : DHAP\_h + E4P\_h --> SBP\_h  
['AT4G26530', 'AT2G21330', 'AT3G52930', 'AT4G38970', '4\*AT2G01140', 'AT5G03690']



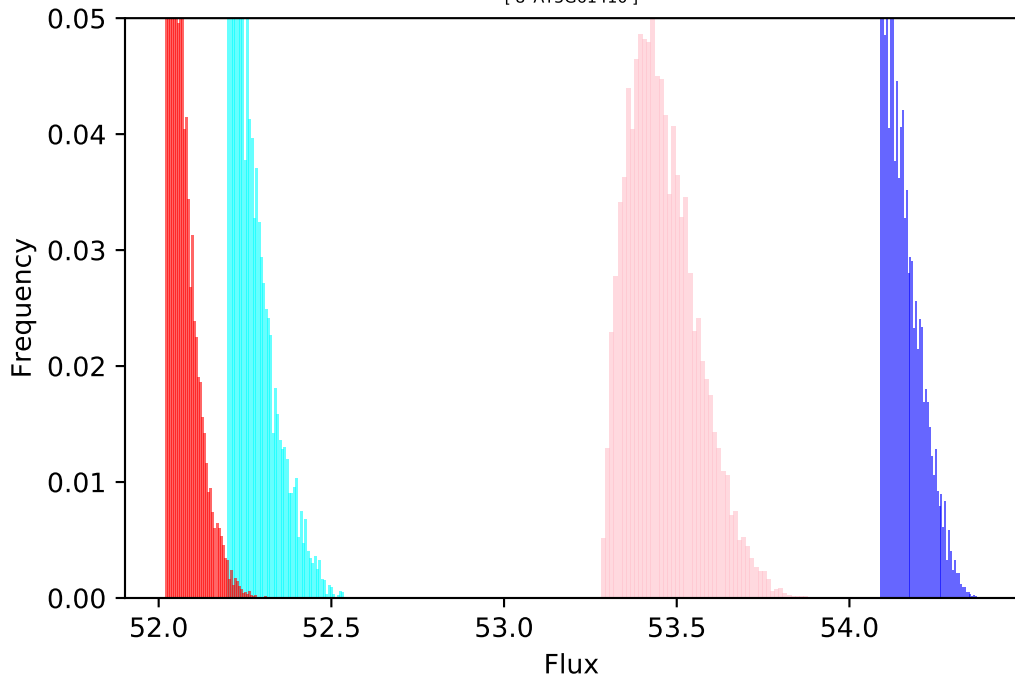
13 : H2O\_h + SBP\_h --> Pi\_h + S7P\_h  
['2\*AT3G55800']



14 : GAP\_h + S7P\_h <=> R5P\_h + X5P\_h  
['2\*AT3G60750', 'AT2G45290']

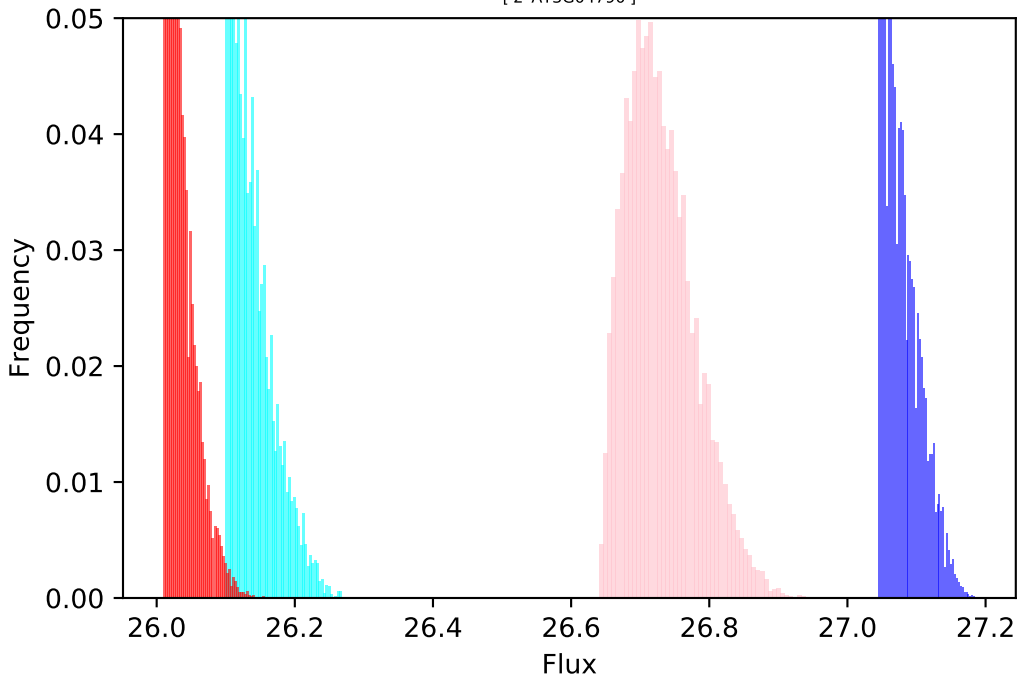


15 : X5P\_h <=> Ru5P\_h  
['8\*AT5G61410']

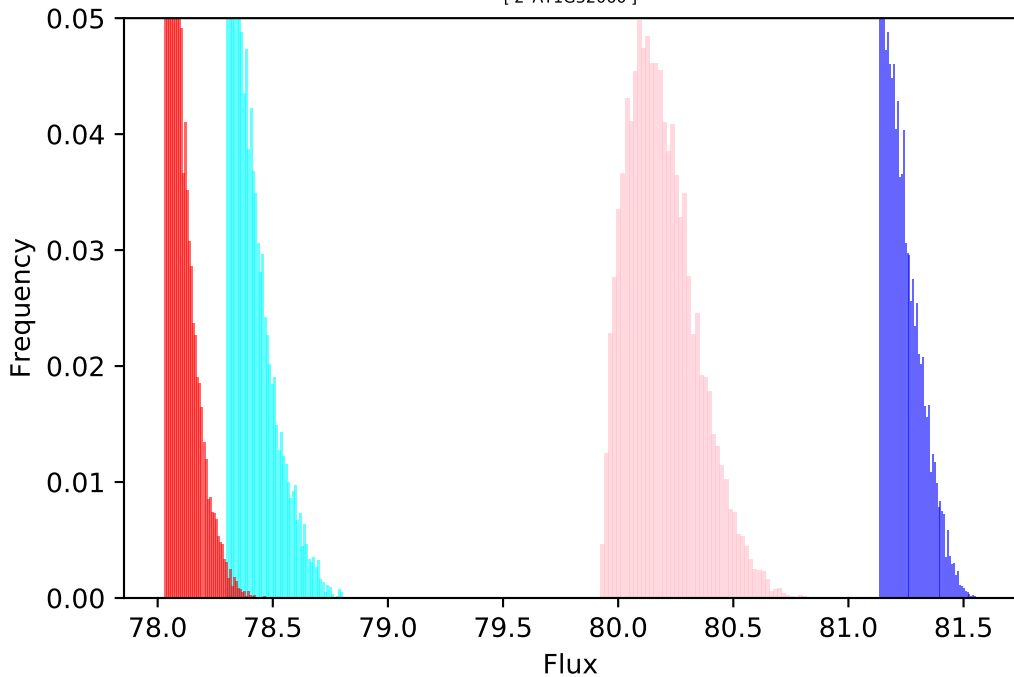




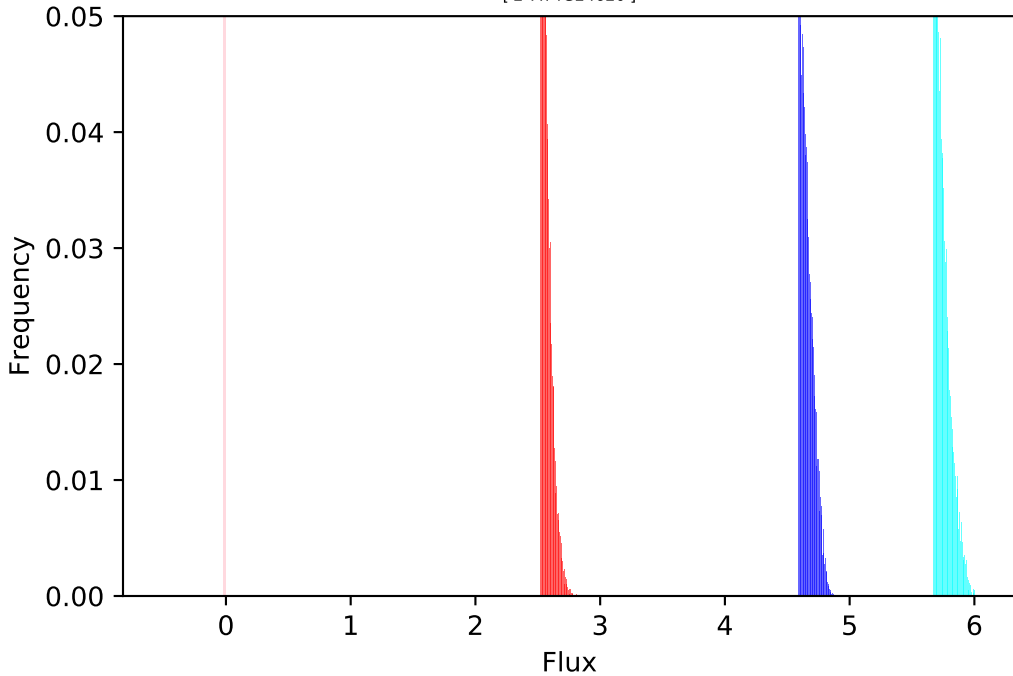
16 : R5P\_h <=> Ru5P\_h  
['2\*AT3G04790']



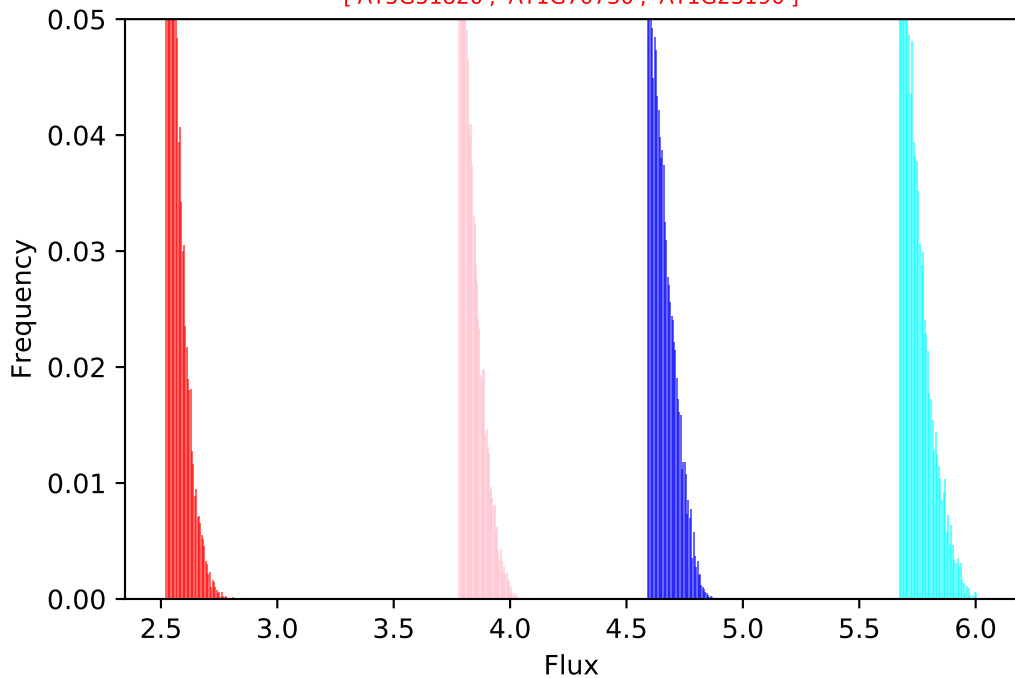
17 : ATP\_h + Ru5P\_h --> ADP\_h + H\_h + RuBP\_h  
['2\*AT1G32060']



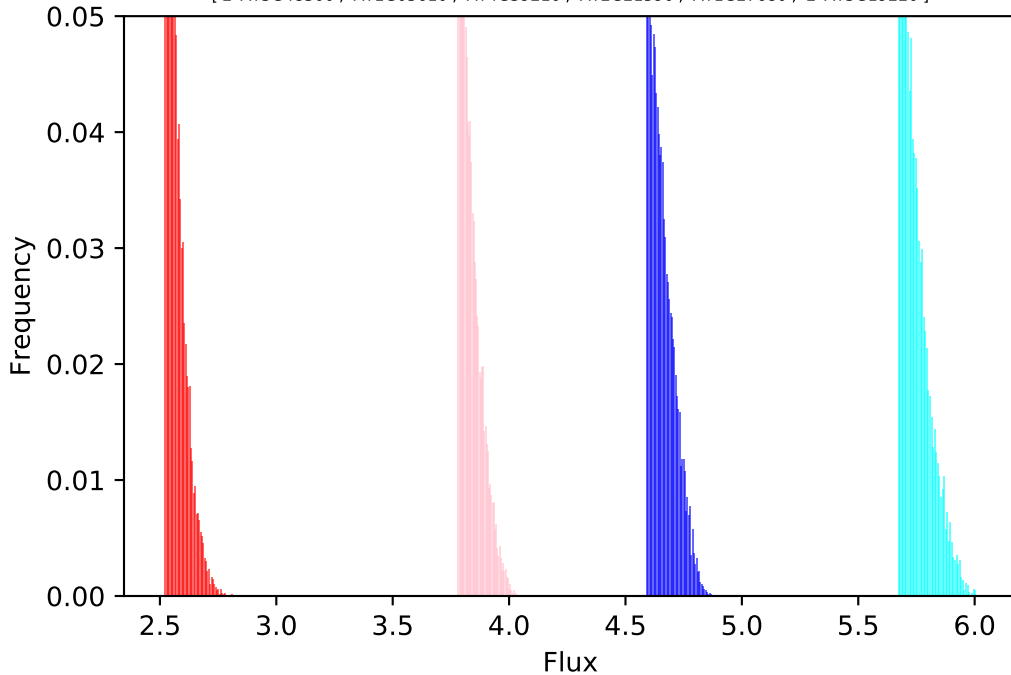
18 : F6P\_h <=> G6P\_h  
['2\*AT4G24620']



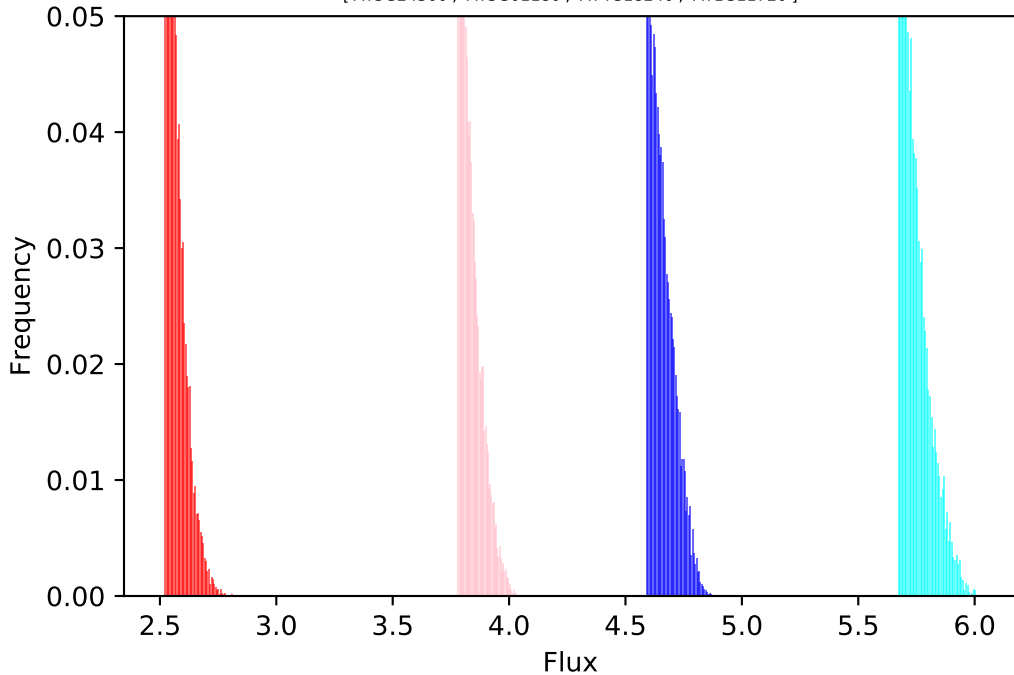
19 : G6P\_h <=> G1P\_h  
['AT5G51820', 'AT1G70730', 'AT1G23190']



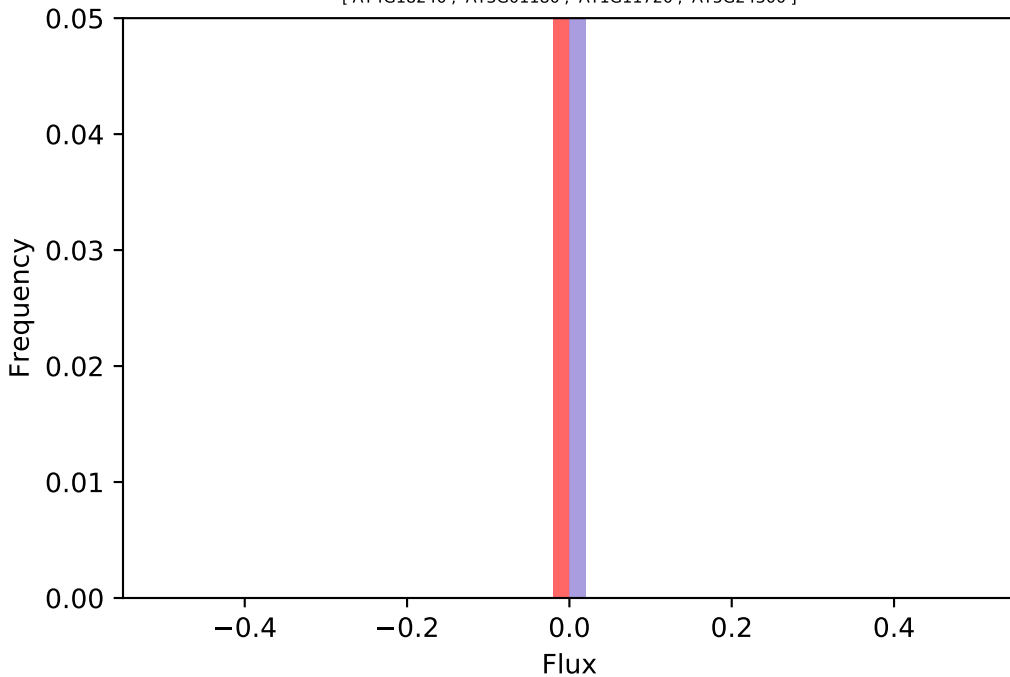
20 : ATP\_h + G1P\_h --> ADPG\_h + PPi\_h  
['2\*AT5G48300', 'AT1G05610', 'AT4G39210', 'AT2G21590', 'AT1G27680', '2\*AT5G19220']



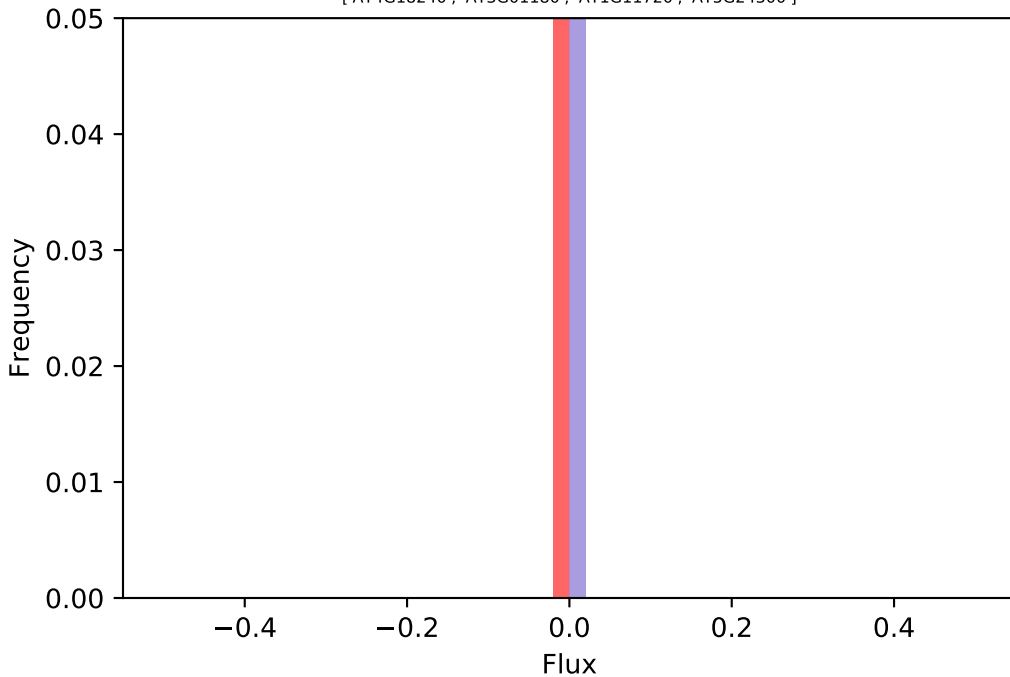
21 : ADPG\_h + H2O\_h --> ADP\_h + H\_h + starch1\_h  
['AT5G24300', 'AT3G01180', 'AT4G18240', 'AT1G11720']



22 : ADPG\_h + starch1\_h --> ADP\_h + H\_h + starch2\_h  
['AT4G18240', 'AT3G01180', 'AT1G11720', 'AT5G24300']

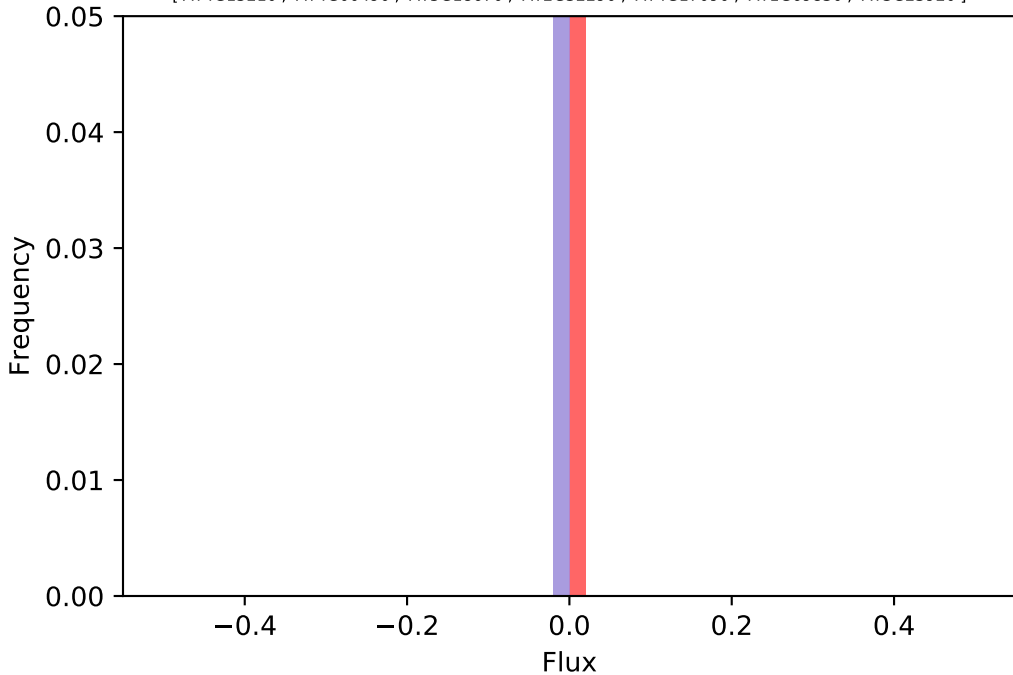


23 : ADPG\_h + starch2\_h --> ADP\_h + H\_h + starch3\_h  
['AT4G18240', 'AT3G01180', 'AT1G11720', 'AT5G24300']

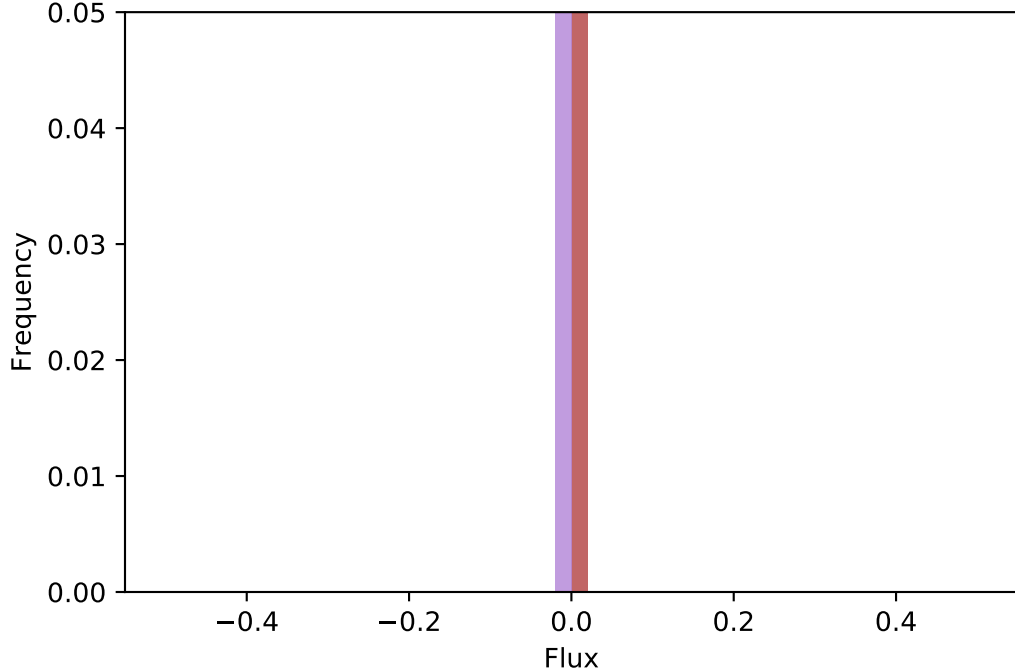




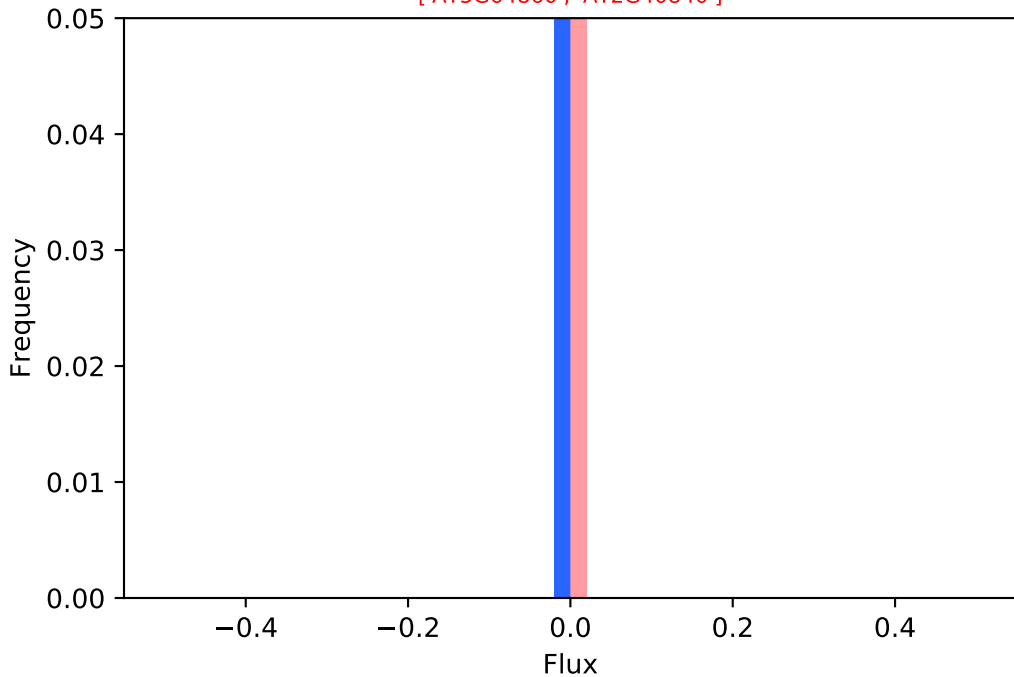
24 : H2O\_h + starch5\_h --> Mas\_h + starch3\_h  
['AT4G15210', 'AT4G00490', 'AT5G18670', 'AT2G32290', 'AT4G17090', 'AT1G69830', 'AT3G23920']



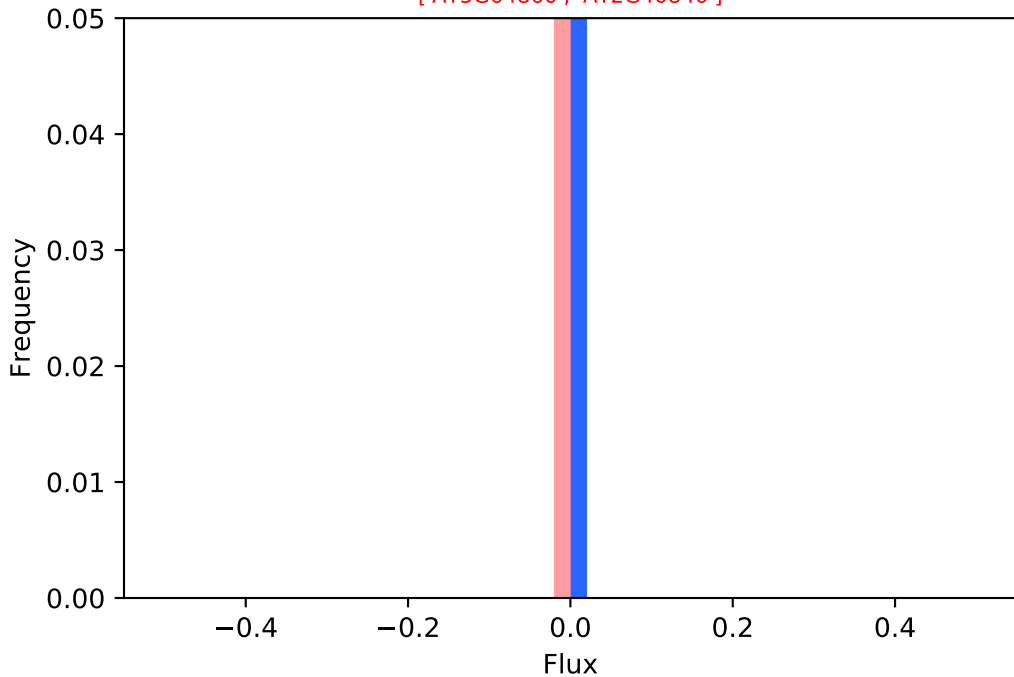
25 : H2O\_h + starch3\_h --> Mas\_h + starch1\_h  
['AT5G18670', 'AT4G00490', 'AT3G23920', 'AT4G15210', 'AT1G69830', 'AT4G17090', 'AT2G32290']



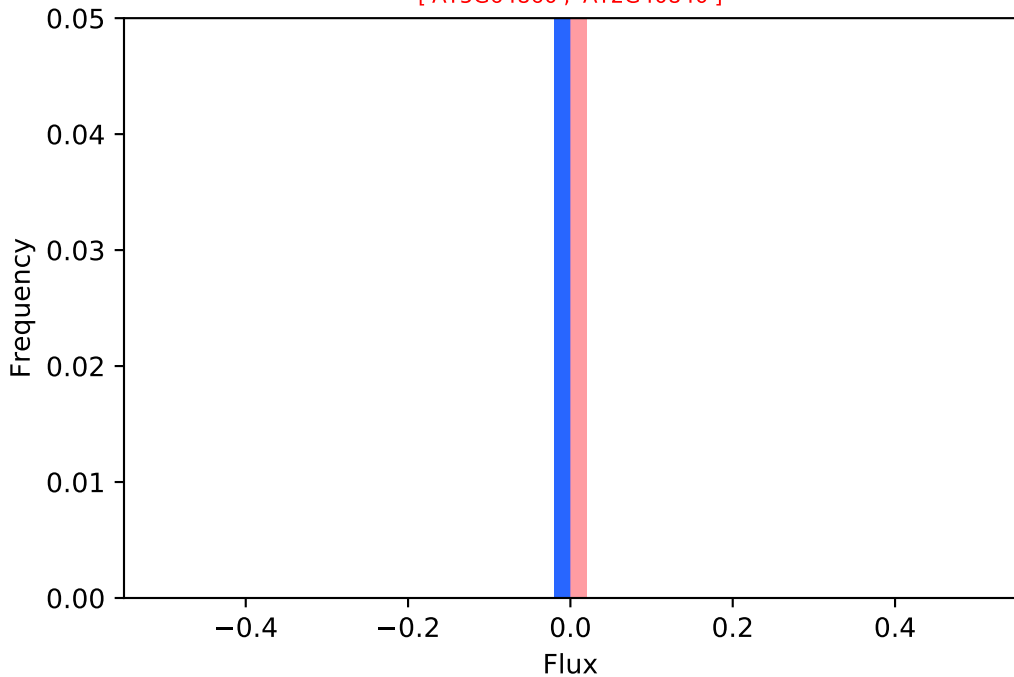
26 : 2.0 starch3\_h --> Glc\_h + starch5\_h  
['AT5G64860', 'AT2G40840']



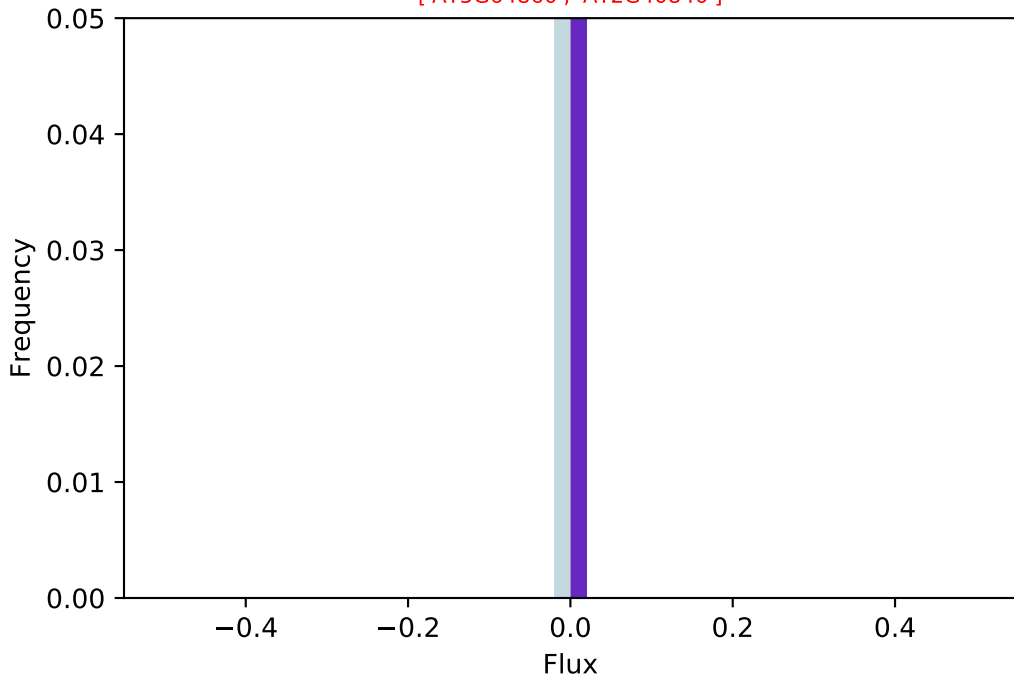
27 : Mas\_h + starch1\_h --> Glc\_h + starch2\_h  
['AT5G64860', 'AT2G40840']



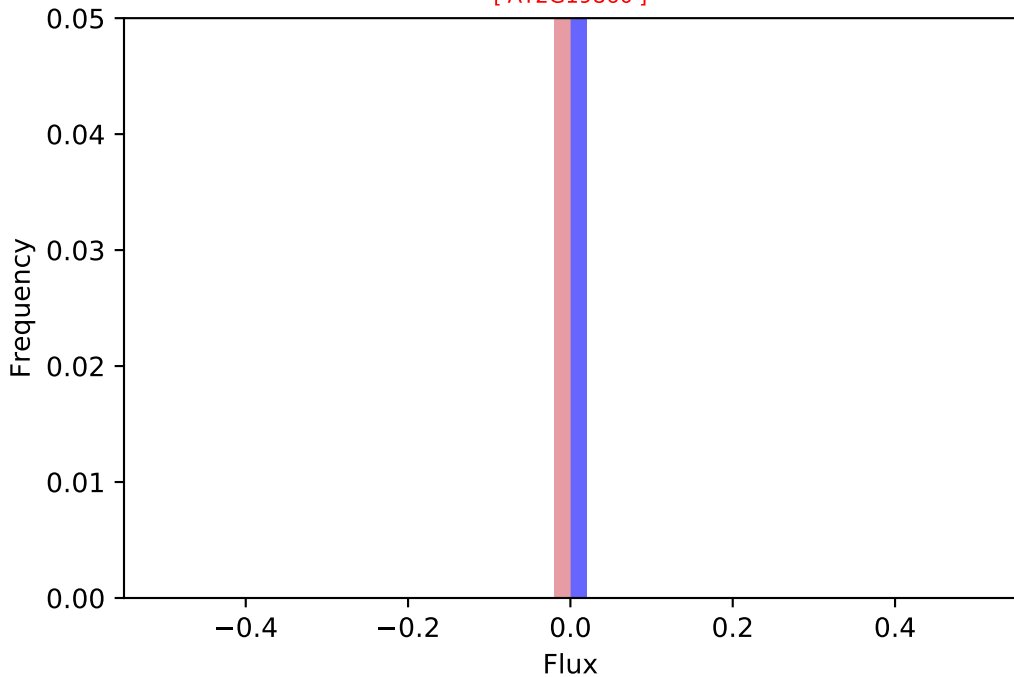
28 : Mas\_h + starch2\_h --> Glc\_h + starch3\_h  
['AT5G64860', 'AT2G40840']



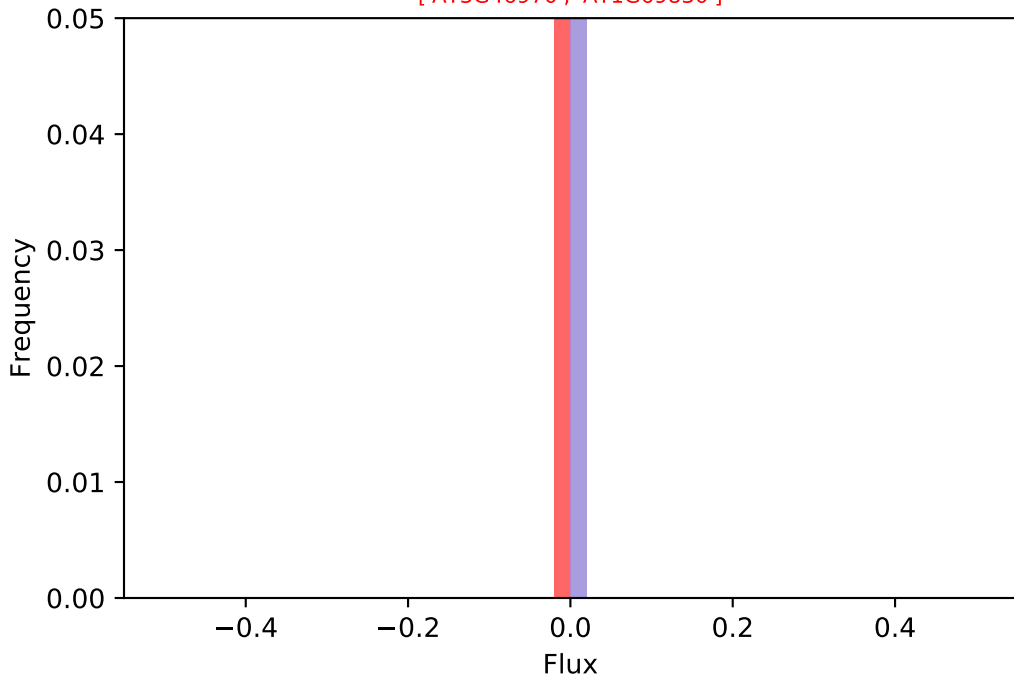
29 : Mas\_c + starch1\_c --> Glc\_c + starch2\_c  
['AT5G64860', 'AT2G40840']



30 : ATP\_c + Glc\_c --> ADP\_c + G6P\_c + H\_c  
['AT2G19860']

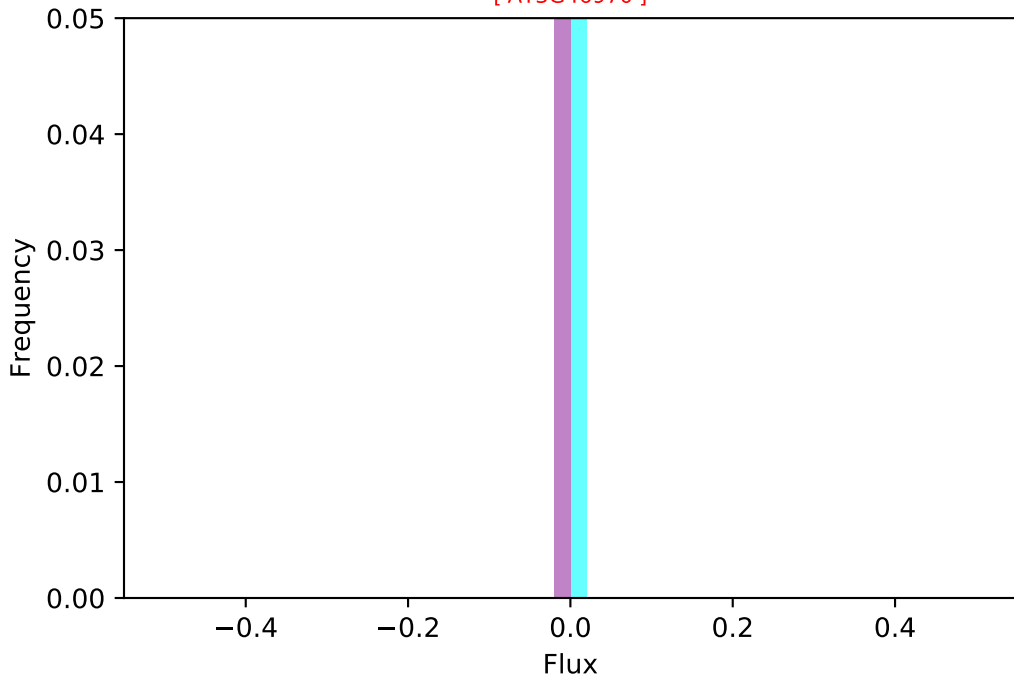


31 : Pi\_h + starch2\_h --> G1P\_h + starch1\_h  
['AT3G46970', 'AT1G69830']

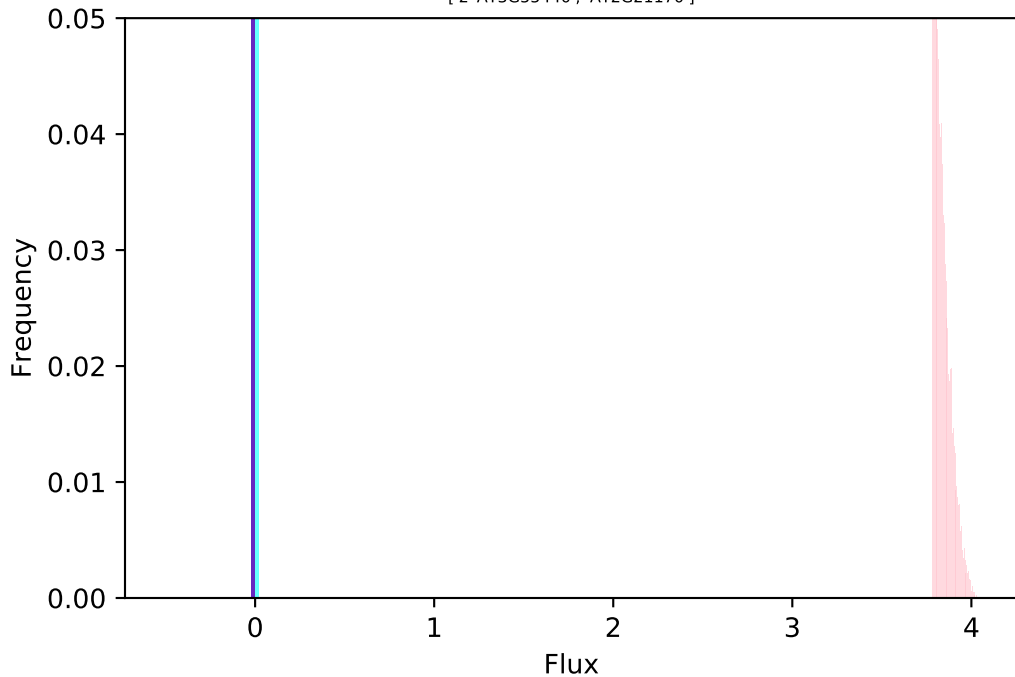




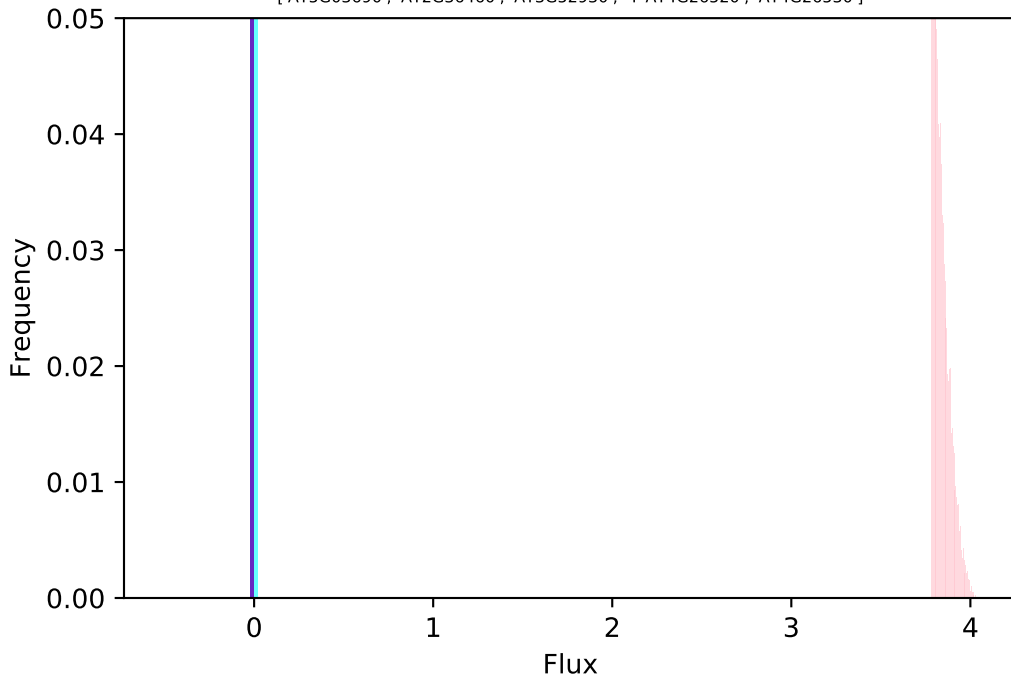
32 : Pi\_c + starch2\_c --> G1P\_c + starch1\_c  
['AT3G46970']



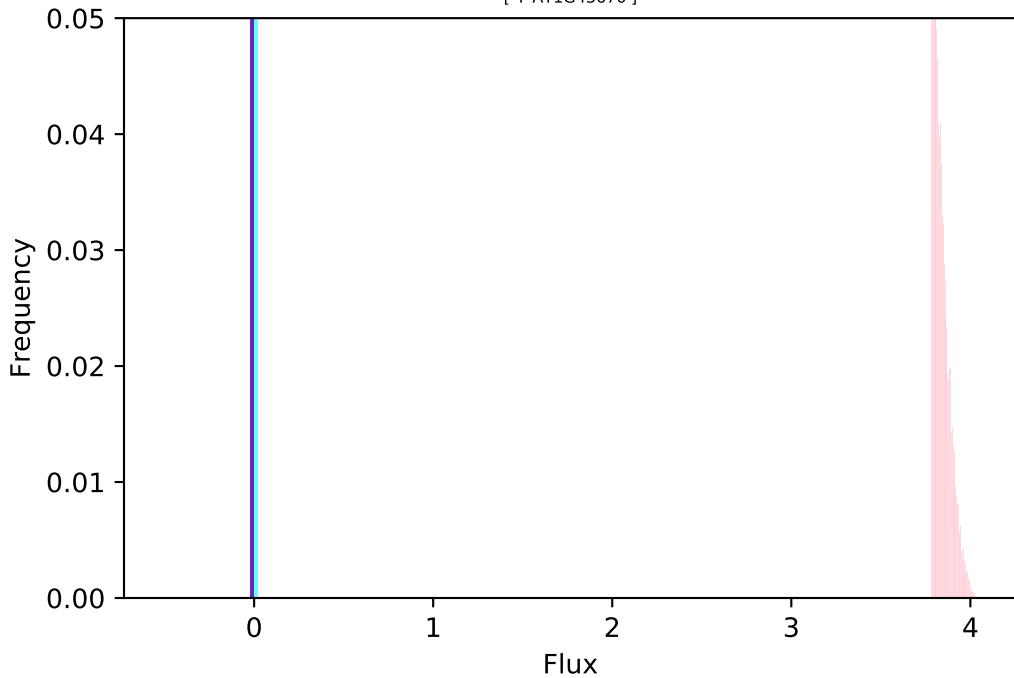
33 : GAP\_c --> DHAP\_c  
['2\*AT3G55440', 'AT2G21170']



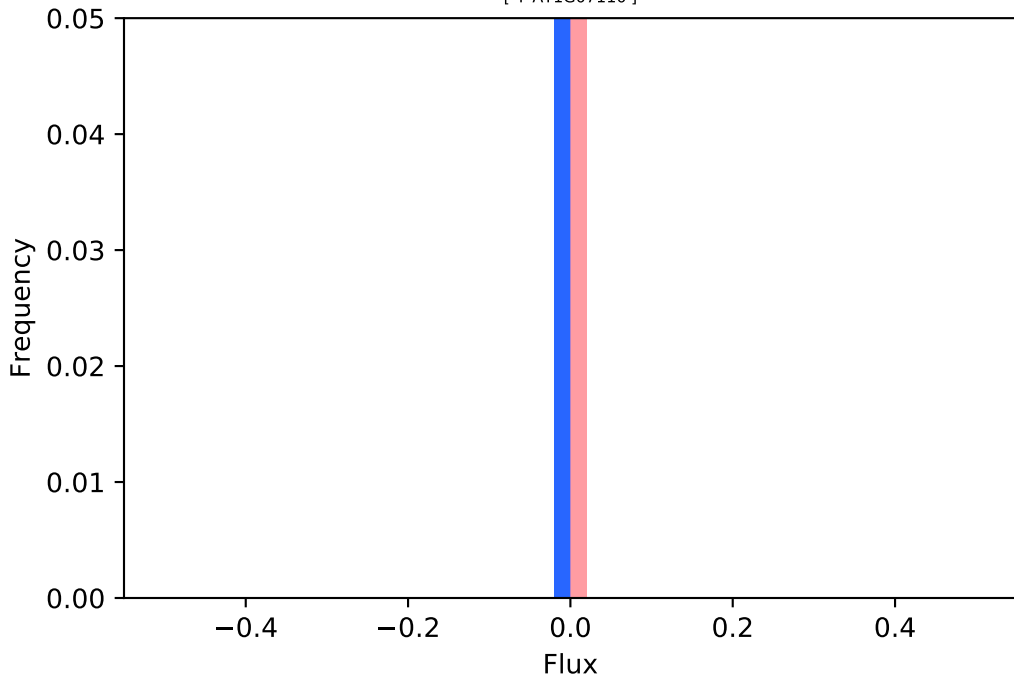
34 : DHAP\_c + GAP\_c --> FBP\_c  
['AT5G03690', 'AT2G36460', 'AT3G52930', '4\*AT4G26520', 'AT4G26530']



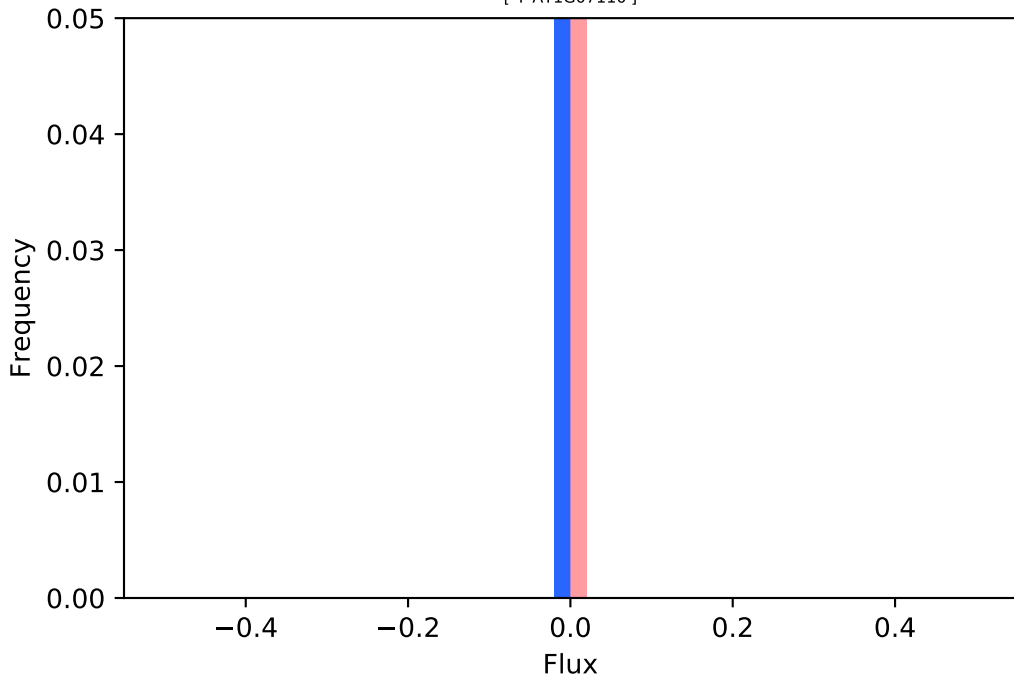
35 : FBP\_c + H2O\_c --> F6P\_c + Pi\_c  
['4\*AT1G43670']



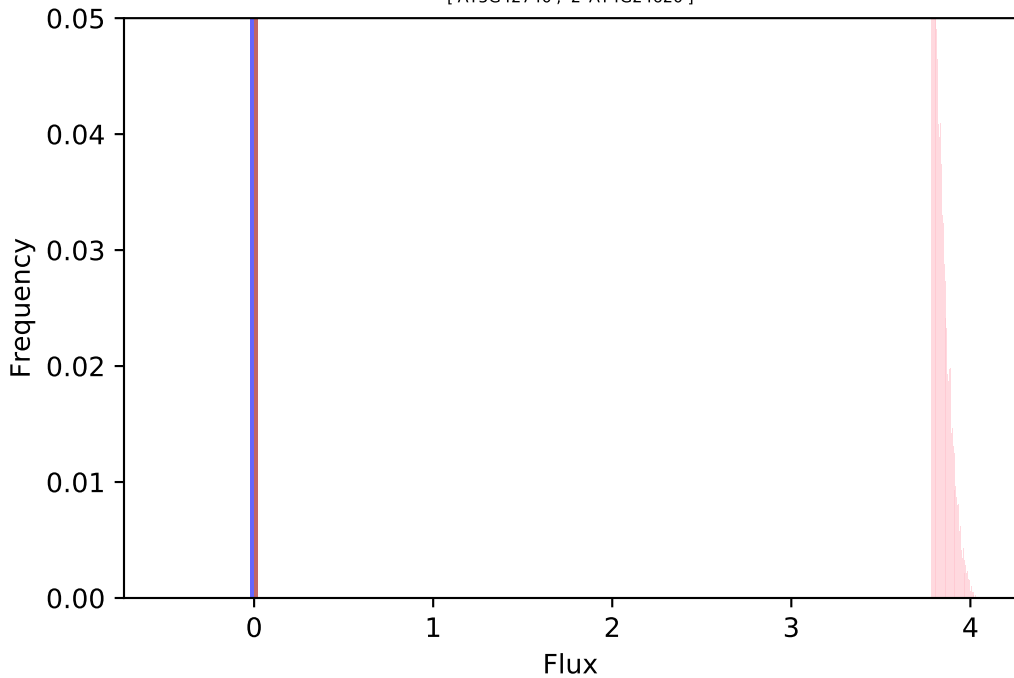
36 : ATP\_c + F6P\_c --> ADP\_c + F26BP\_c + H\_c  
['4\*AT1G07110']



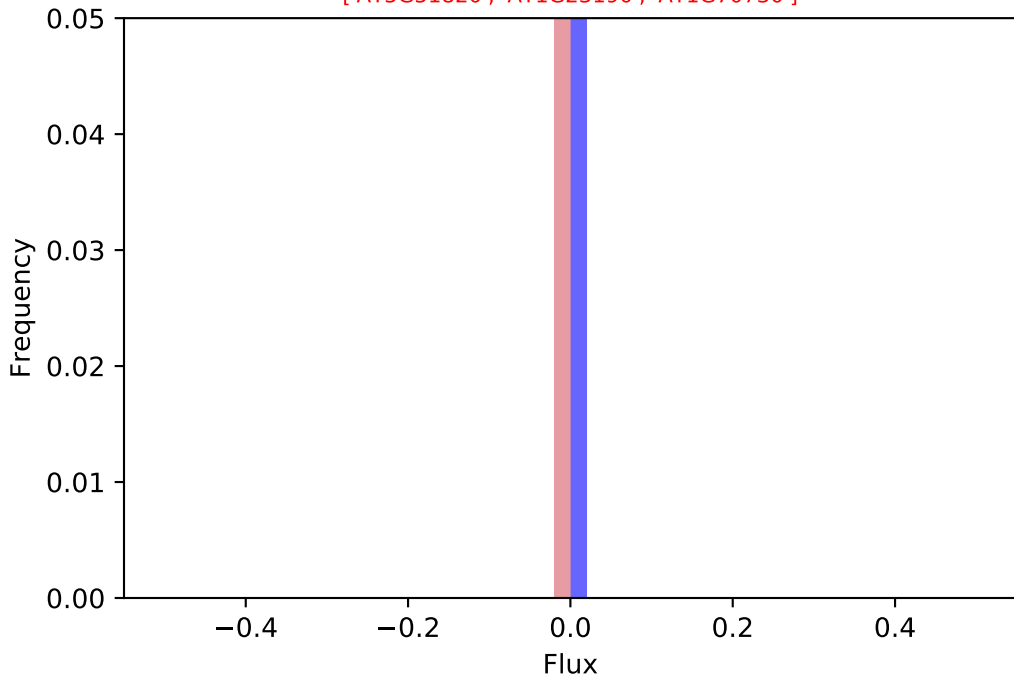
37 : F26BP\_c + H2O\_c --> F6P\_c + Pi\_c  
['4\*AT1G07110']



38 : F6P\_c <=> G6P\_c  
['AT5G42740', '2\*AT4G24620']

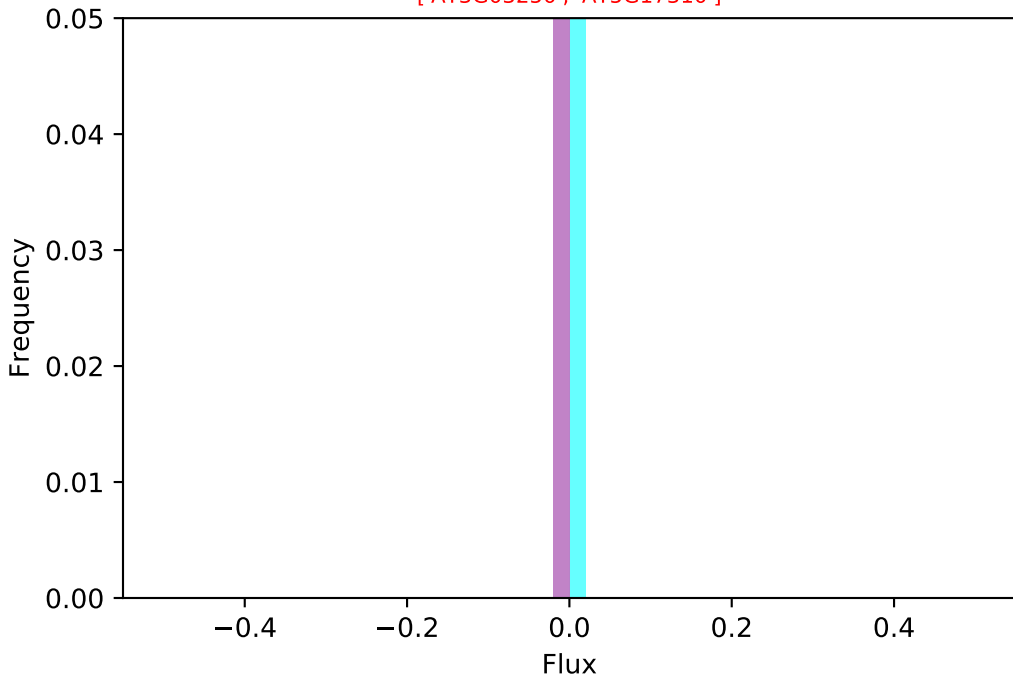


39 : G6P\_c <=> G1P\_c  
['AT5G51820', 'AT1G23190', 'AT1G70730']

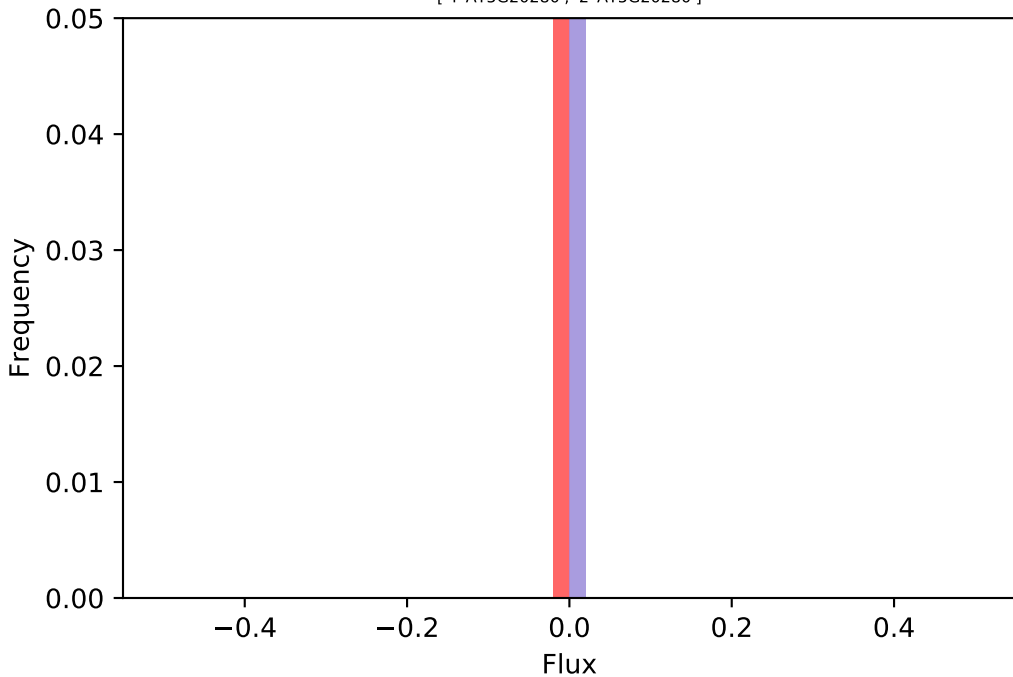




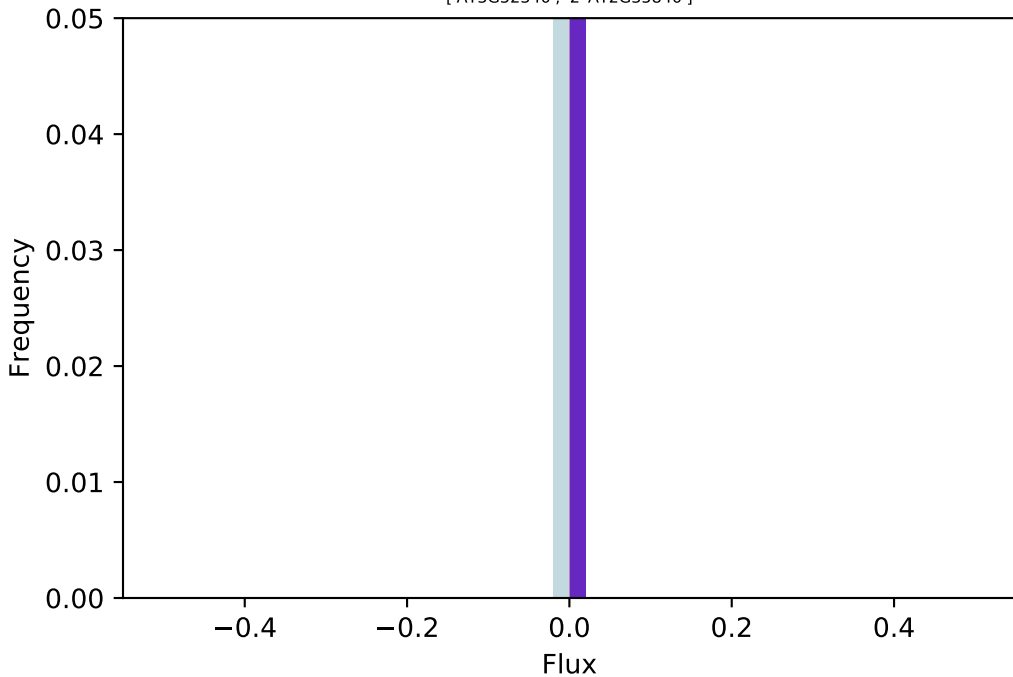
40 : G1P\_c + H\_c + UTP\_c <=> PPI\_c + UDPG\_c  
['AT3G03250', 'AT5G17310']



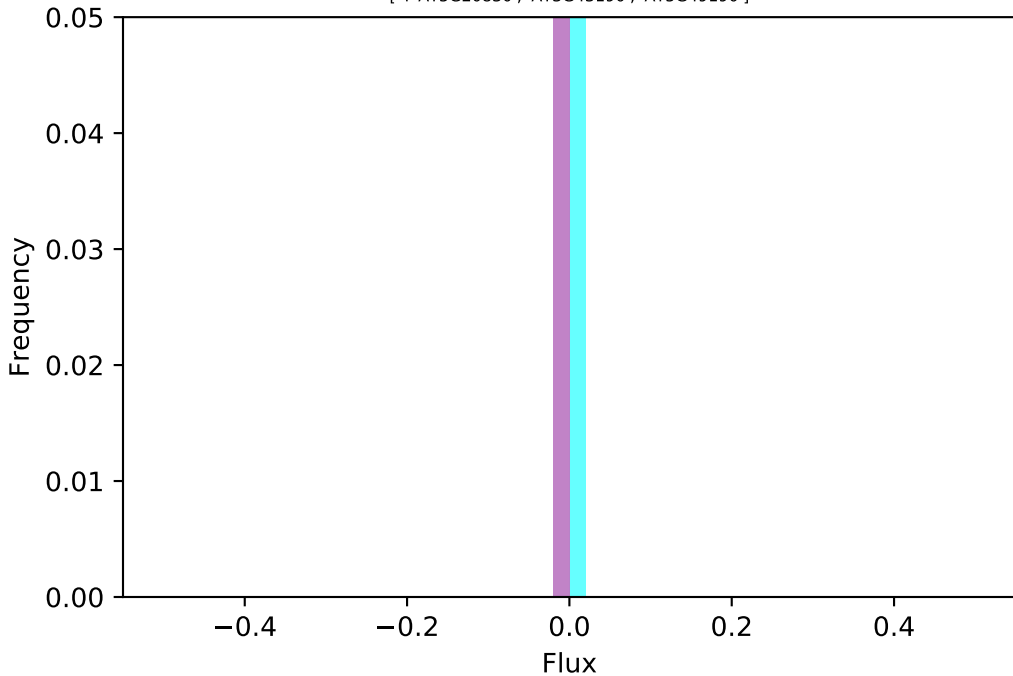
41 : F6P\_c + UDPG\_c --> S6P\_c + UDP\_c  
['4\*AT5G20280', '2\*AT5G20280']



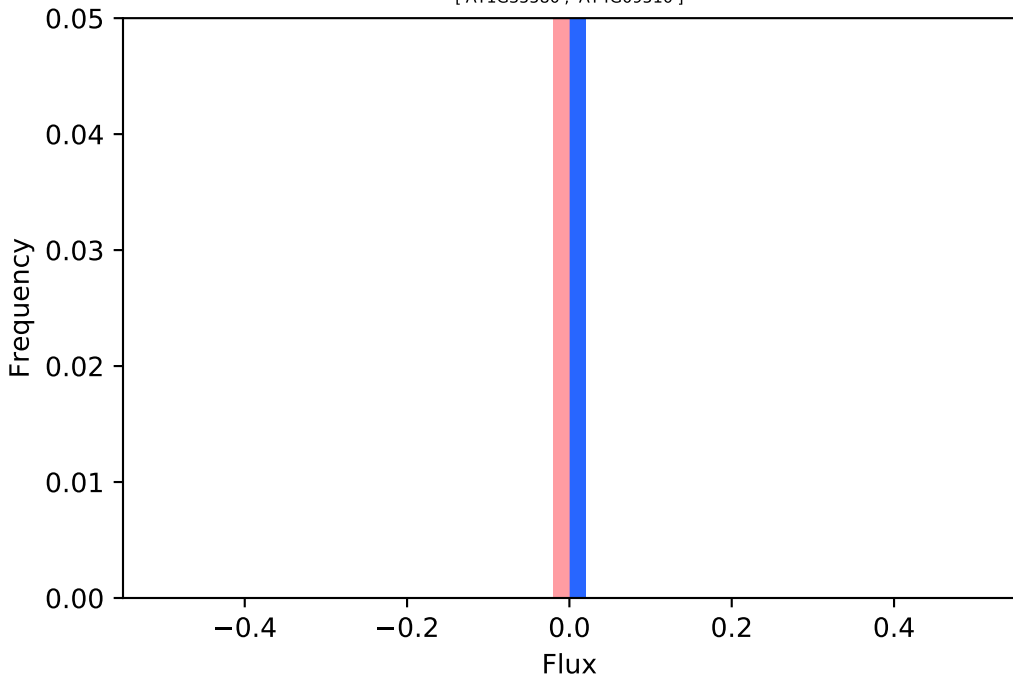
42 : H2O\_c + S6P\_c --> Pi\_c + Suc\_c  
['AT3G52340', '2\*AT2G35840']



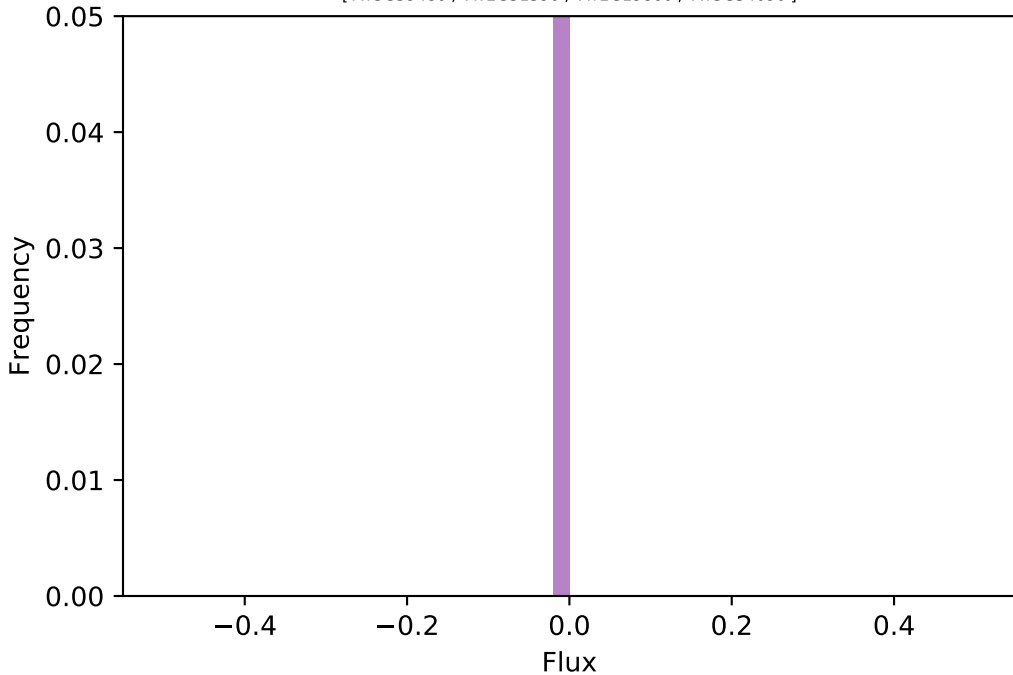
43 : Suc\_c + UDP\_c <=> Frc\_c + UDPG\_c  
['4\*AT5G20830', 'AT3G43190', 'AT5G49190']



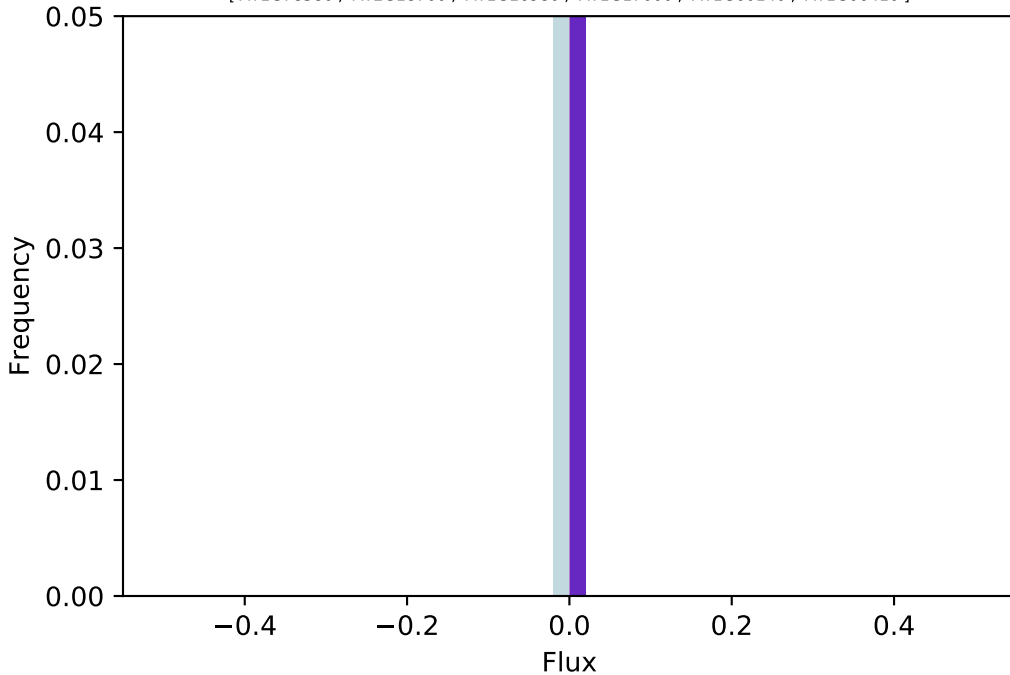
44 : H2O\_c + Suc\_c --> Frc\_c + Glc\_c  
['AT1G35580', 'AT4G09510']



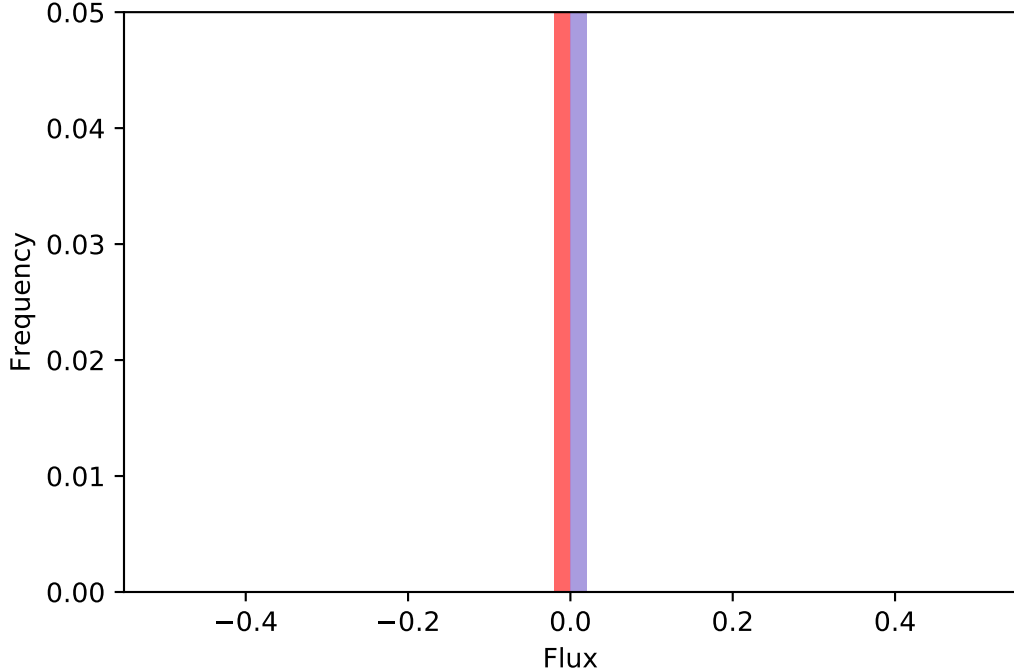
45 : ATP\_c + Frc\_c --> ADP\_c + F6P\_c + H\_c  
['AT3G59480', 'AT2G31390', 'AT2G19860', 'AT3G54090']



46 : G6P\_c + UDPG\_c --> T6P\_c + UDP\_c  
['AT1G78580', 'AT2G18700', 'AT1G16980', 'AT1G17000', 'AT1G60140', 'AT1G06410']



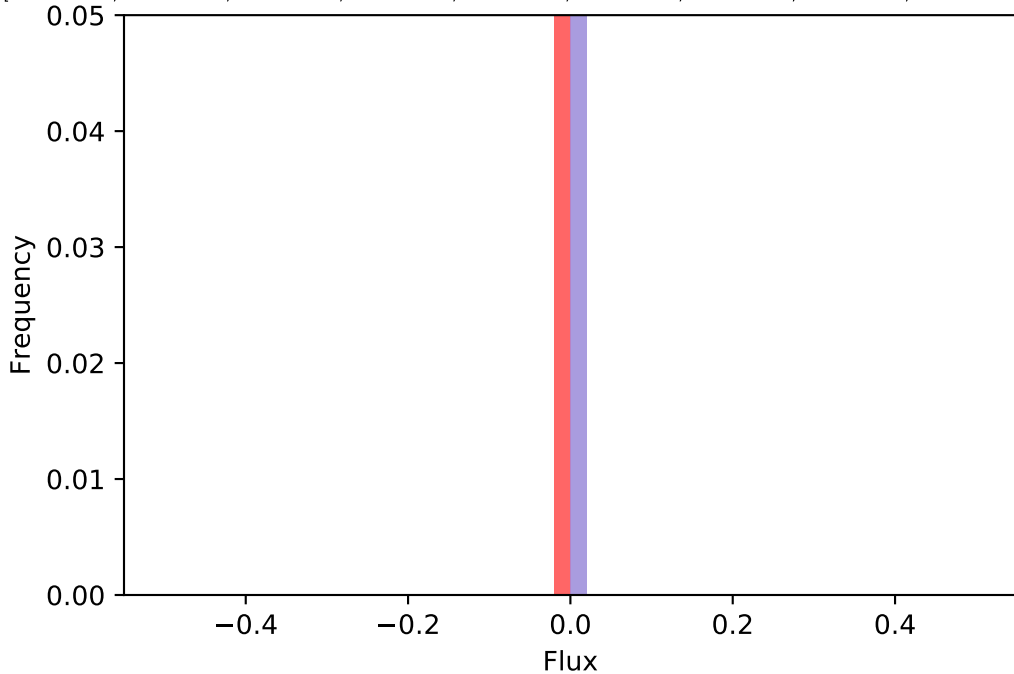
47 : H2O\_c + T6P\_c --> Pi\_c + Tre\_c  
['AT1G22210', 'AT4G12430', 'AT4G39770', 'AT5G65140', 'AT1G35910', 'AT2G22190', 'AT4G22590']





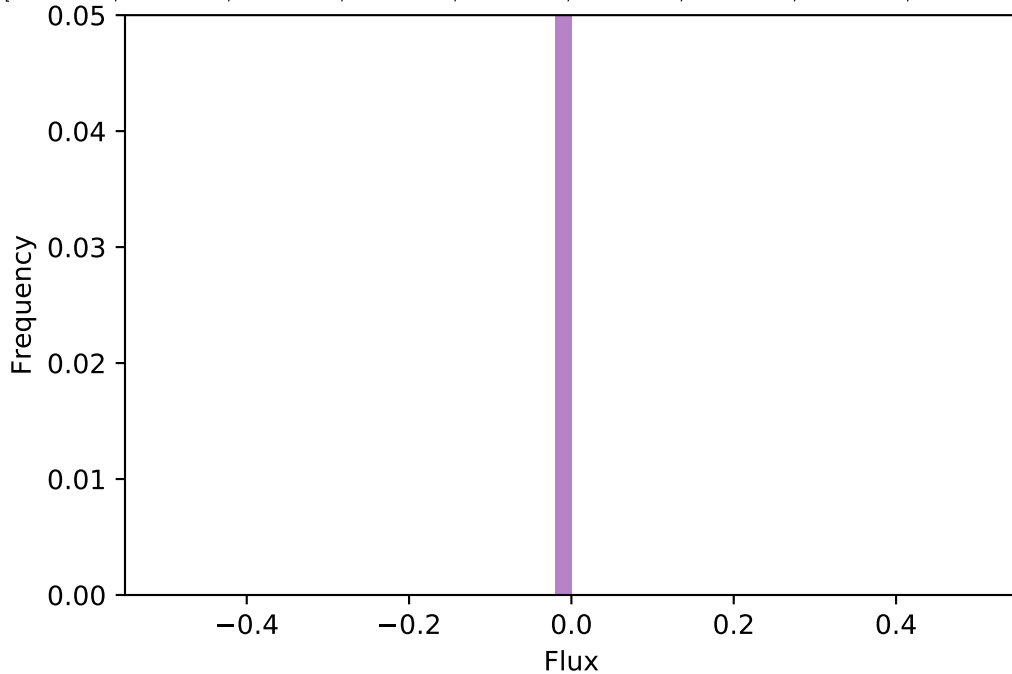
48 : H2O\_c + UDPG\_c --> UDP\_c + cellulose1\_c

['AT2G25540', 'AT4G18780', 'AT5G05170', 'AT4G39350', 'AT5G17420', 'AT5G44030', 'AT2G21770', 'AT5G09870', 'AT5G64740', 'AT4G32410']



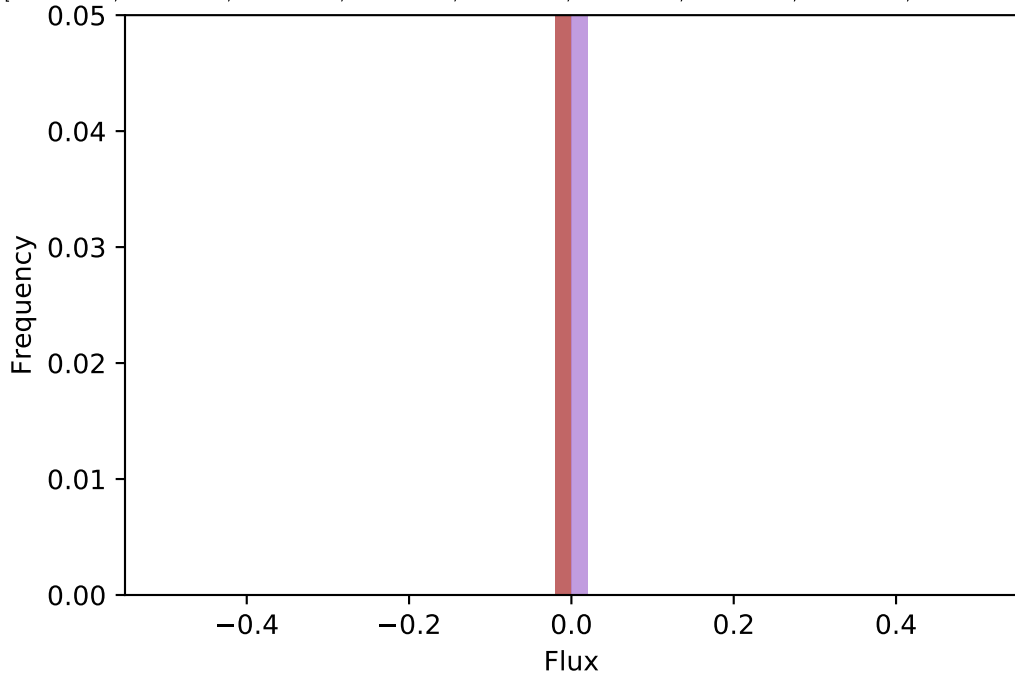
49 : UDPG\_c + cellulose1\_c --> UDP\_c + cellulose2\_c

['AT2G25540', 'AT4G18780', 'AT2G21770', 'AT4G39350', 'AT5G17420', 'AT5G44030', 'AT5G05170', 'AT5G09870', 'AT5G64740', 'AT4G32410']

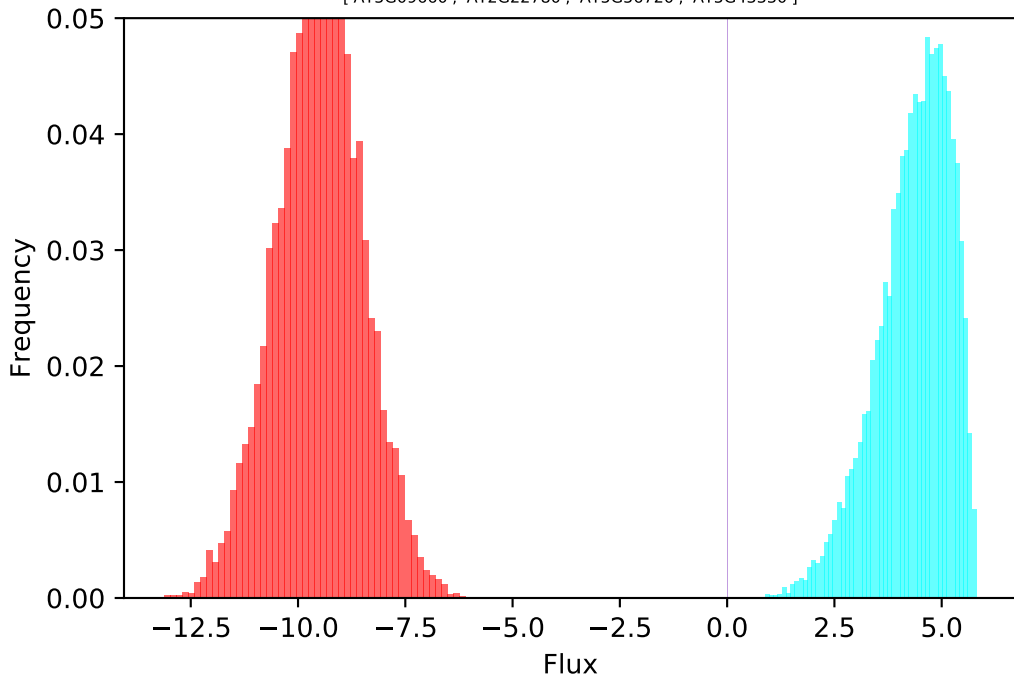


50 : UDPG\_c + cellulose2\_c --> UDP\_c + cellulose3\_c

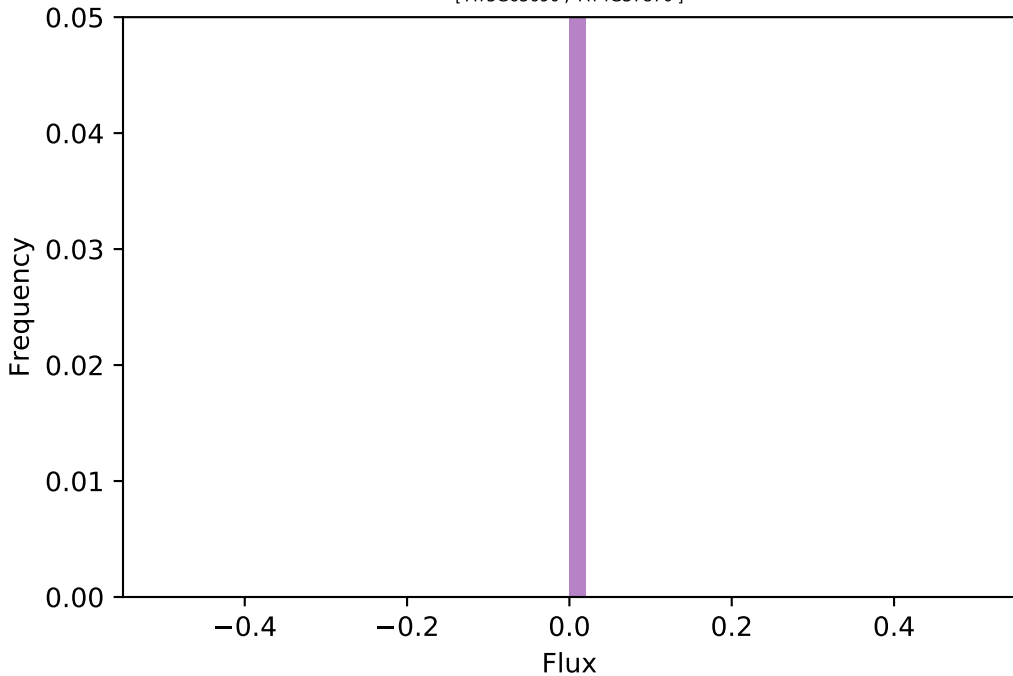
['AT2G25540', 'AT5G05170', 'AT4G39350', 'AT2G21770', 'AT5G17420', 'AT5G44030', 'AT4G18780', 'AT5G09870', 'AT5G64740', 'AT4G32410']



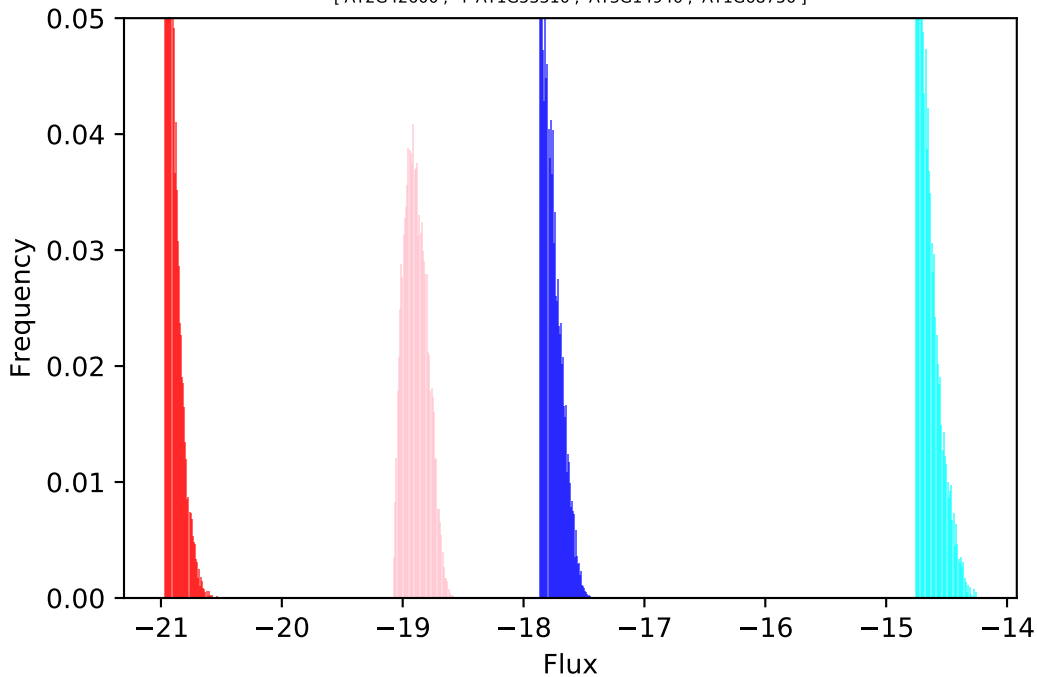
51 : Mal\_c + NAD\_c <=> NADH\_c + OAA\_c  
['AT5G09660', 'AT2G22780', 'AT5G56720', 'AT5G43330']



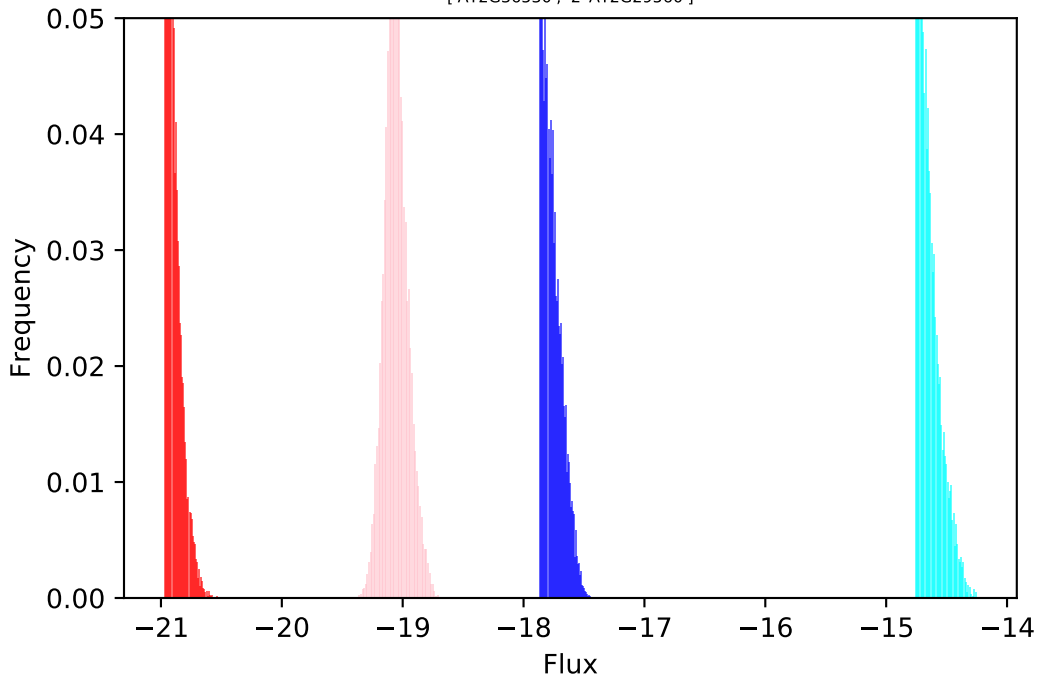
52 : ATP\_c + OAA\_c --> ADP\_c + CO2\_c + PEP\_c  
['AT5G65690', 'AT4G37870']



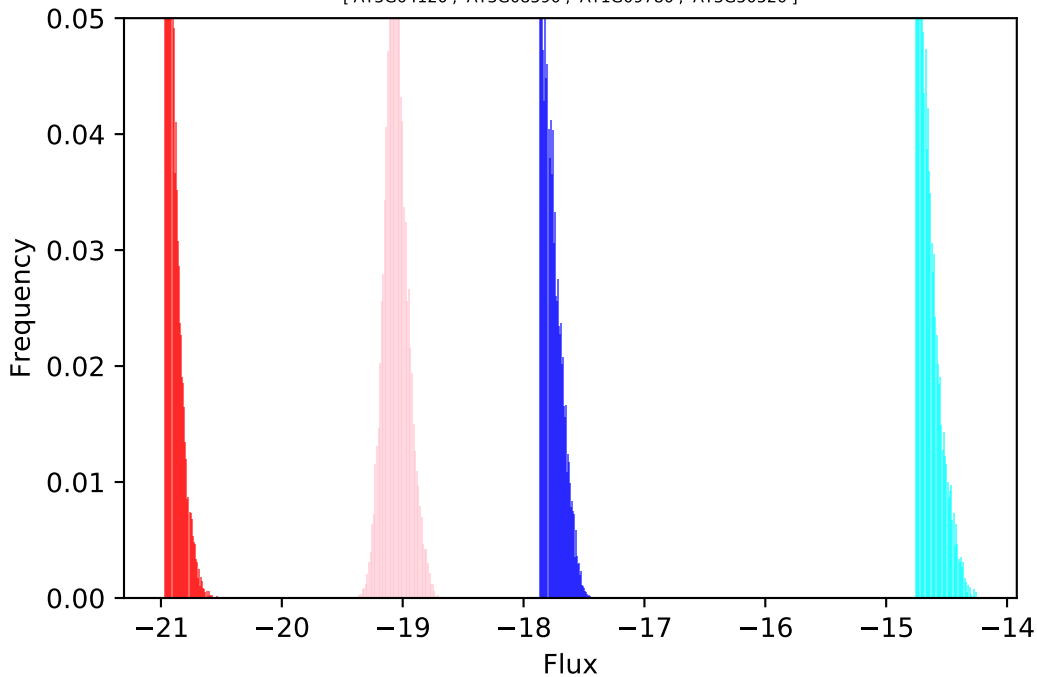
53 : OAA\_c + Pi\_c <=> HCO3\_c + PEP\_c  
['AT2G42600', '4\*AT1G53310', 'AT3G14940', 'AT1G68750']



54 : H2O\_c + PEP\_c <=> 2PGA\_c  
['AT2G36530', '2\*AT2G29560']

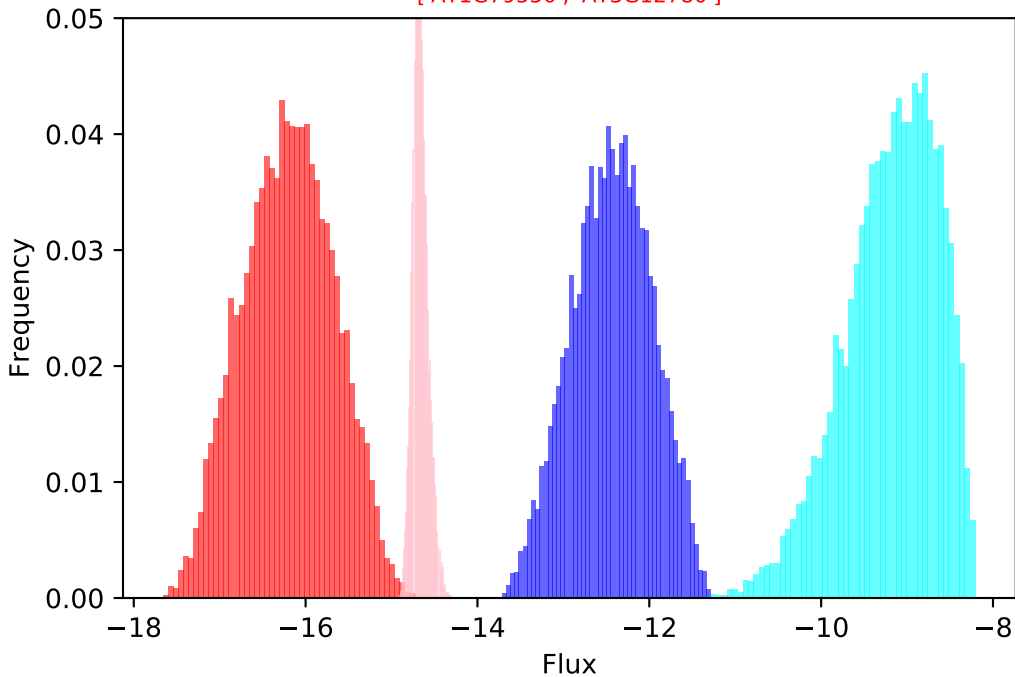


55 : 2PGA\_c <=> PGA\_c  
['AT5G04120', 'AT3G08590', 'AT1G09780', 'AT3G50520']

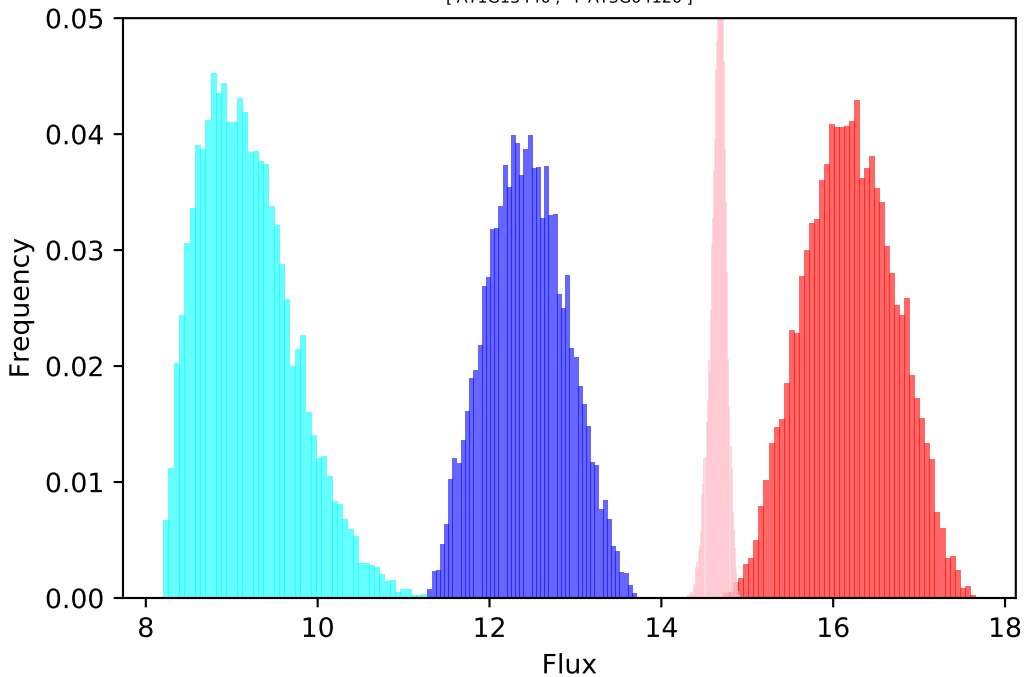




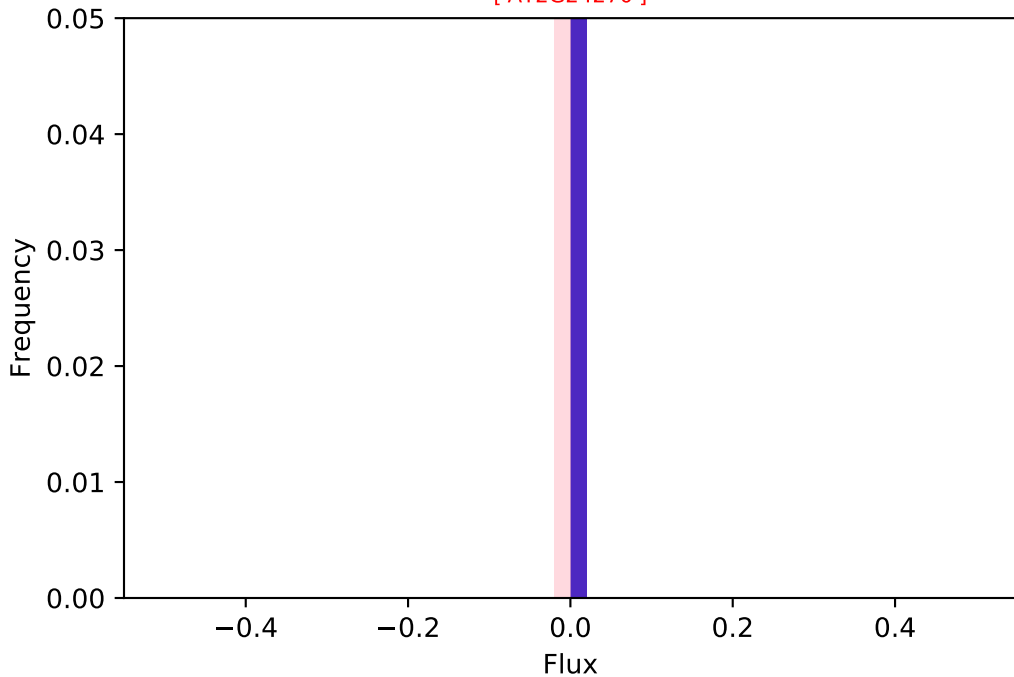
56 :  $\text{ATP}_c + \text{PGA}_c \rightleftharpoons \text{ADP}_c + \text{DPGA}_c$   
['AT1G79550', 'AT3G12780']



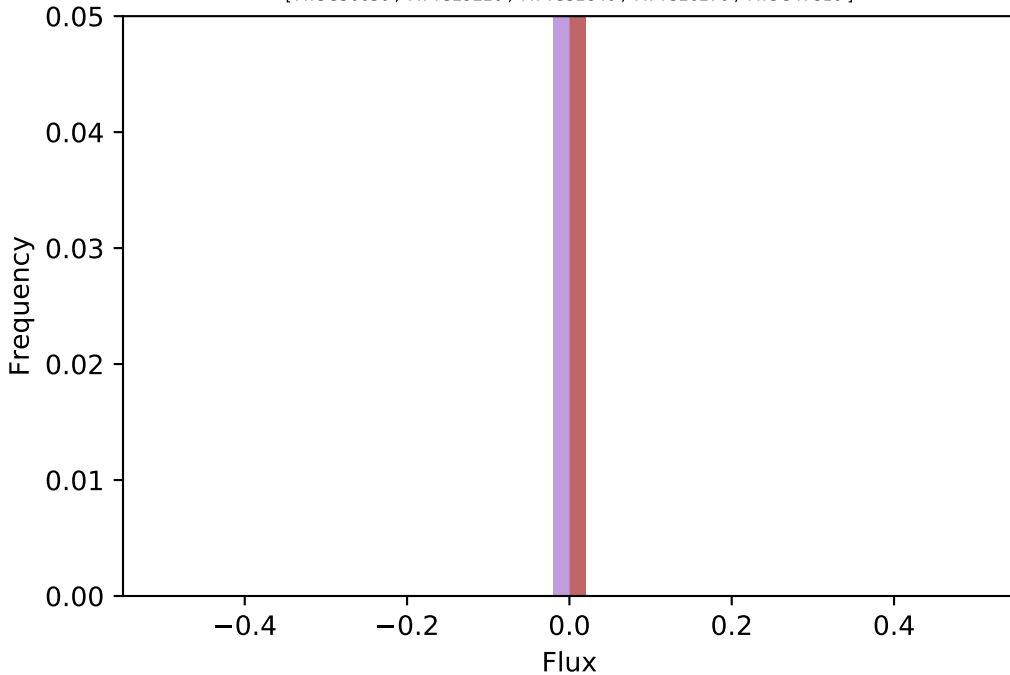
57 : GAP\_c + NAD\_c + Pi\_c <=> DPGA\_c + NADH\_c  
['AT1G13440', '4\*AT3G04120']



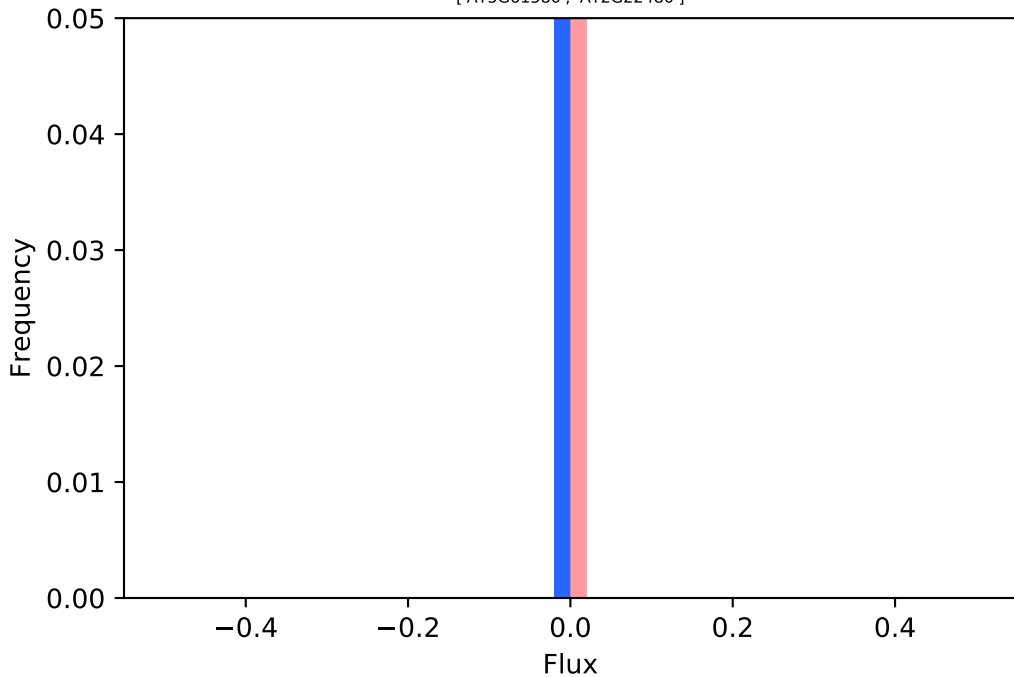
58 : GAP\_c + H2O\_c + NADP\_c --> H\_c + NADPH\_c + PGA\_c  
['AT2G24270']



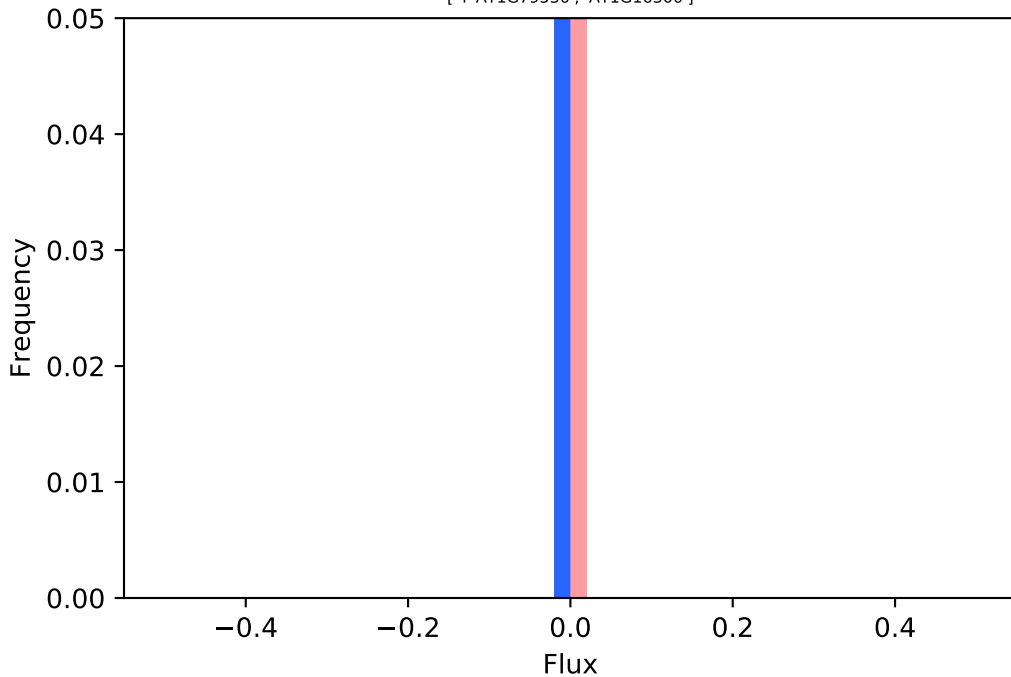
59 : ATP\_c + F6P\_c --> ADP\_c + FBP\_c + H\_c  
['AT5G56630', 'AT4G29220', 'AT4G32840', 'AT4G26270', 'AT5G47810']



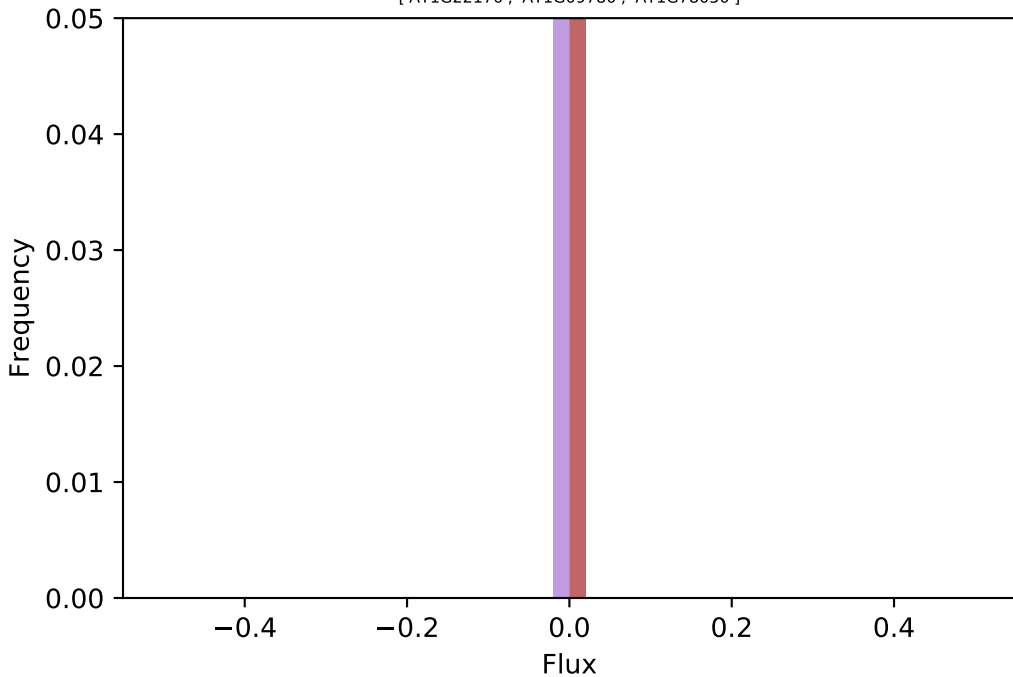
60 : ATP\_h + F6P\_h --> ADP\_h + FBP\_h + H\_h  
[ 'AT5G61580', 'AT2G22480' ]



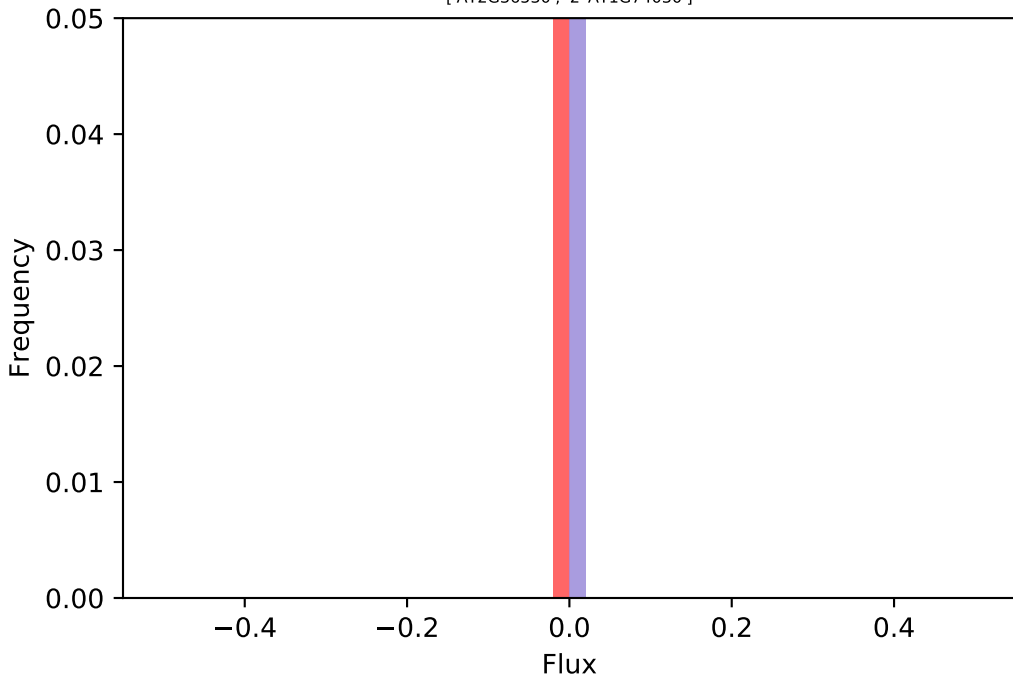
61 : GAP\_h + NAD\_h + Pi\_h --> DPGA\_h + H\_h + NADH\_h  
['4\*AT1G79530', 'AT1G16300']



62 : PGA\_h <=> 2PGA\_h  
['AT1G22170', 'AT1G09780', 'AT1G78050']

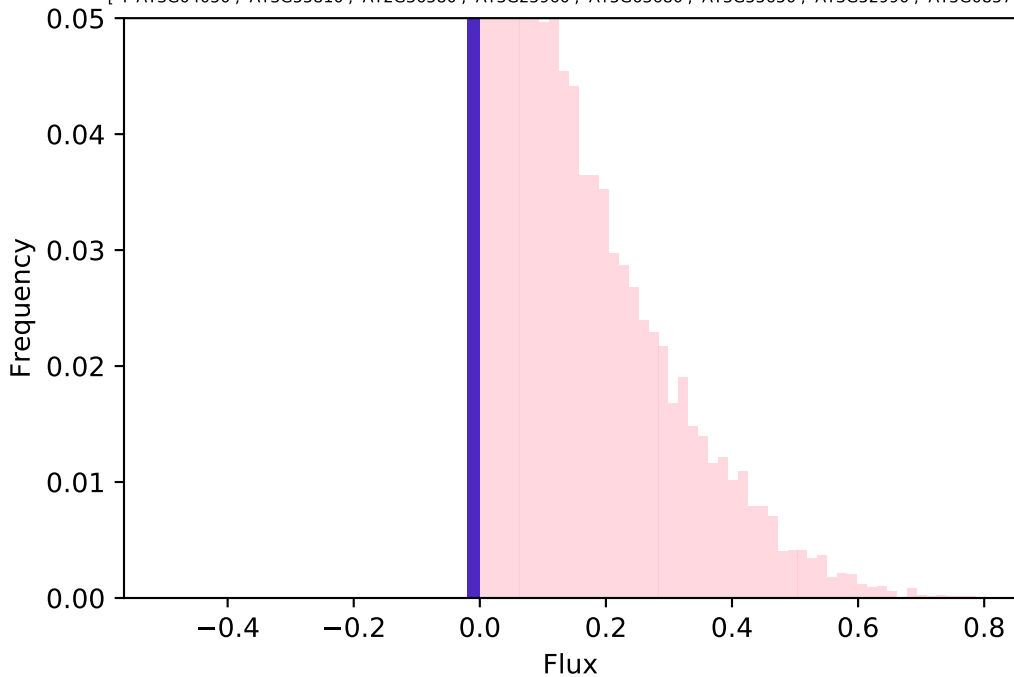


63 : 2PGA\_h <=> H2O\_h + PEP\_h  
['AT2G36530', '2\*AT1G74030']

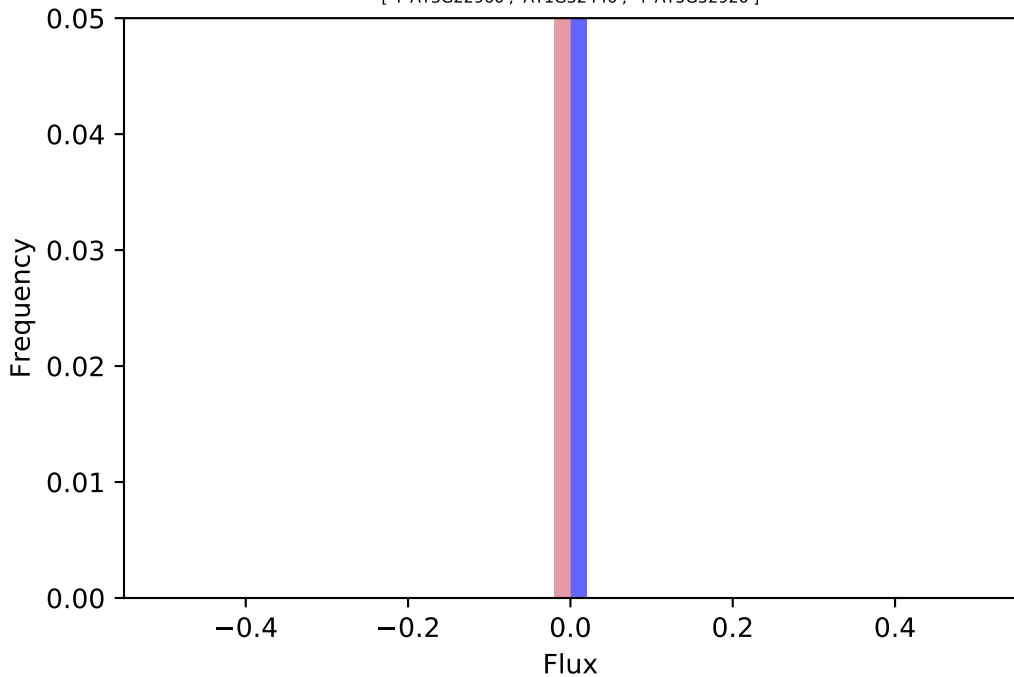




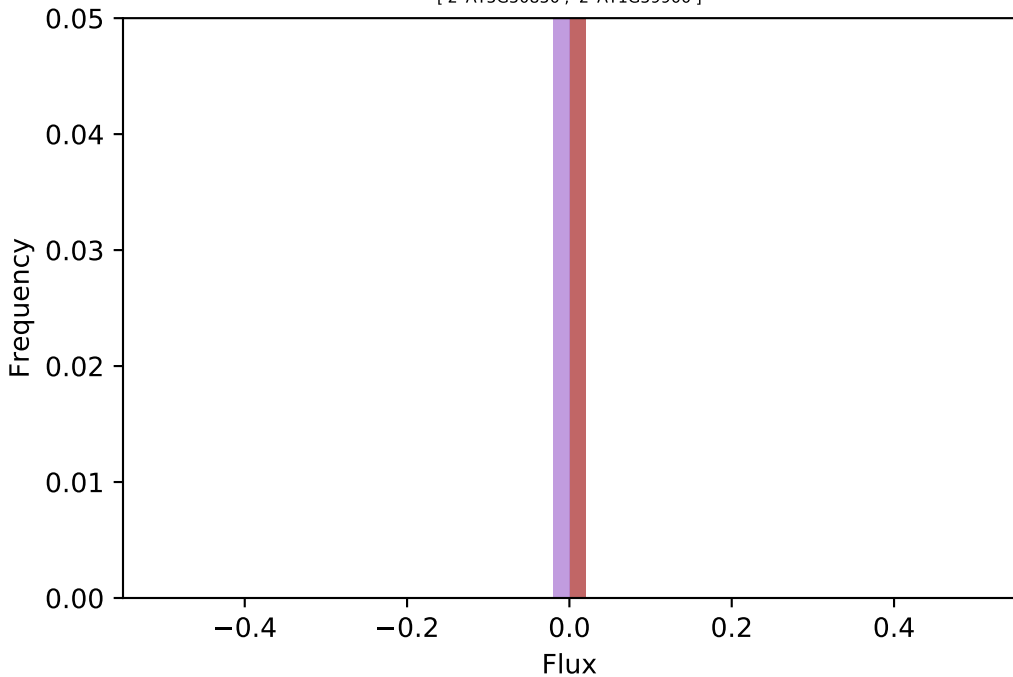
64 : ADP\_c + H\_c + PEP\_c --> ATP\_c + Pyr\_c  
['4\*AT3G04050', 'AT3G55810', 'AT2G36580', 'AT3G25960', 'AT5G63680', 'AT3G55650', 'AT3G52990', 'AT5G08570']



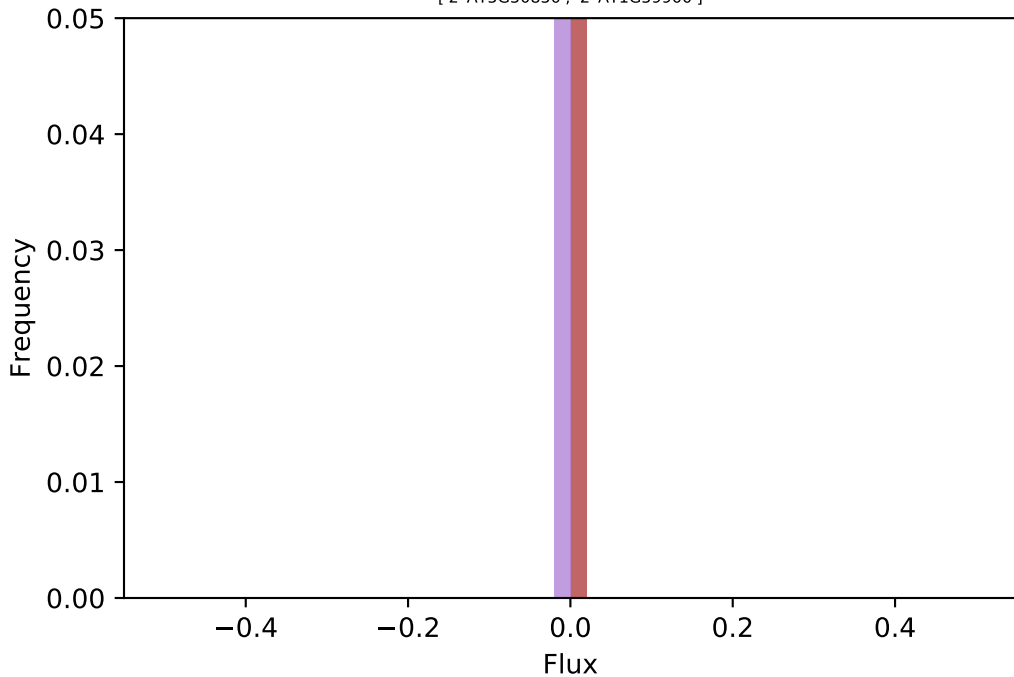
65 : ADP\_h + H\_h + PEP\_h --> ATP\_h + Pyr\_h  
['4\*AT3G22960', 'AT1G32440', '4\*AT5G52920']



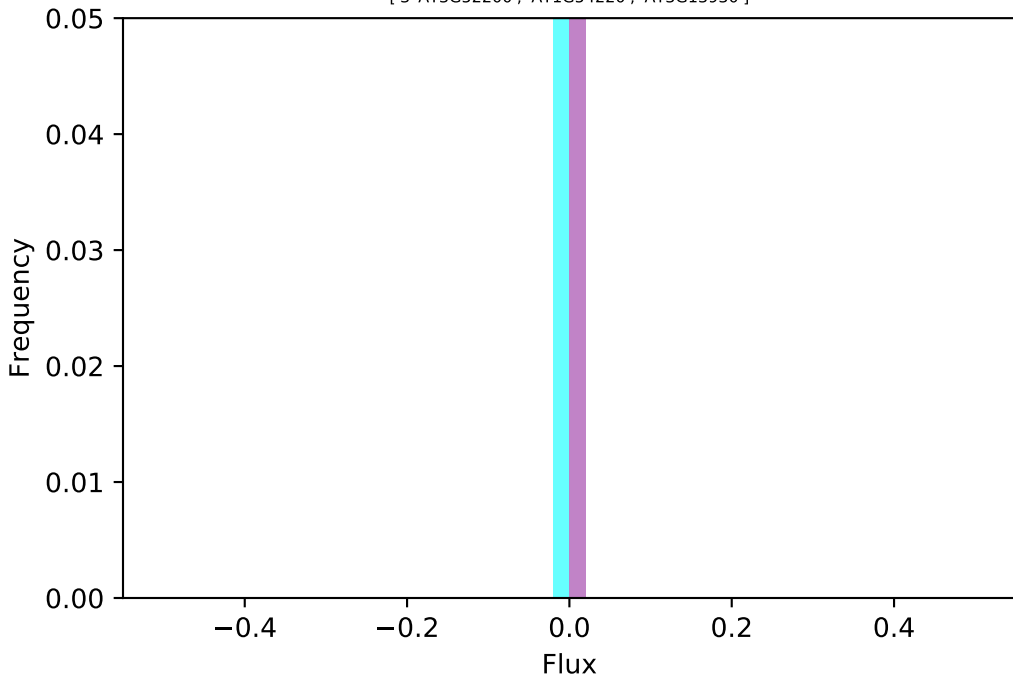
66 : H\_m + Pyr\_m + ThPP\_m --> CO2\_m + H\_DASH\_Eth\_DASH\_ThPP\_m  
['2\*AT5G50850', '2\*AT1G59900']



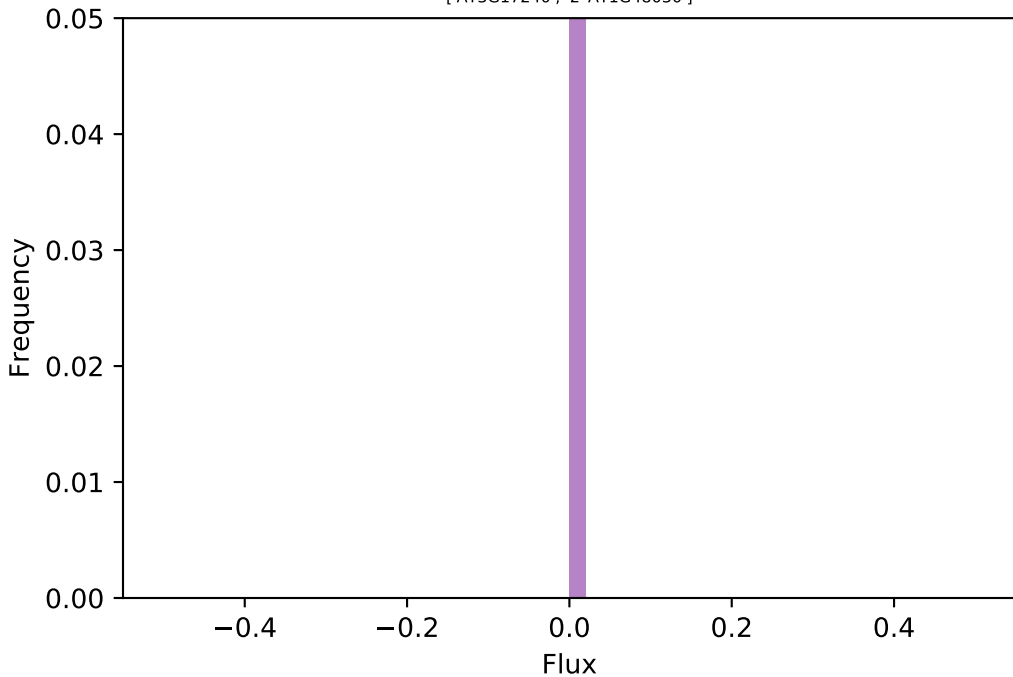
67 : H\_DASH\_Eth\_DASH\_ThPP\_m + LPA\_m --> A\_DASH\_DHL\_m + ThPP\_m  
['2\*AT5G50850', '2\*AT1G59900']



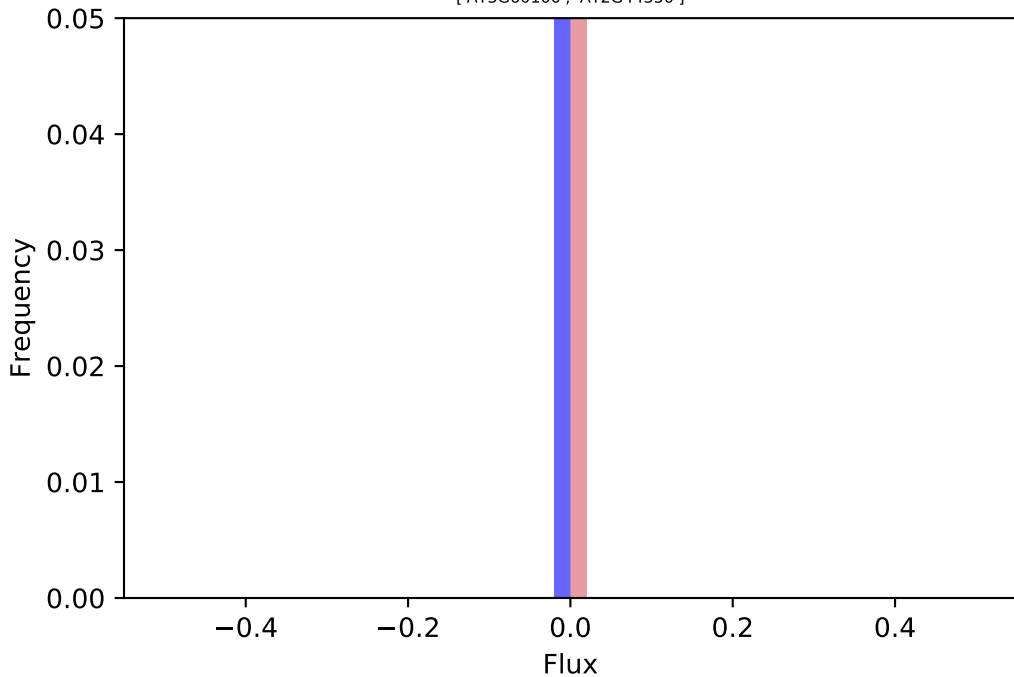
68 : A\_DASH\_DHL\_m + CoA\_m --> A\_DASH\_CoA\_m + DHL\_m  
['3\*AT3G52200', 'AT1G54220', 'AT3G13930']



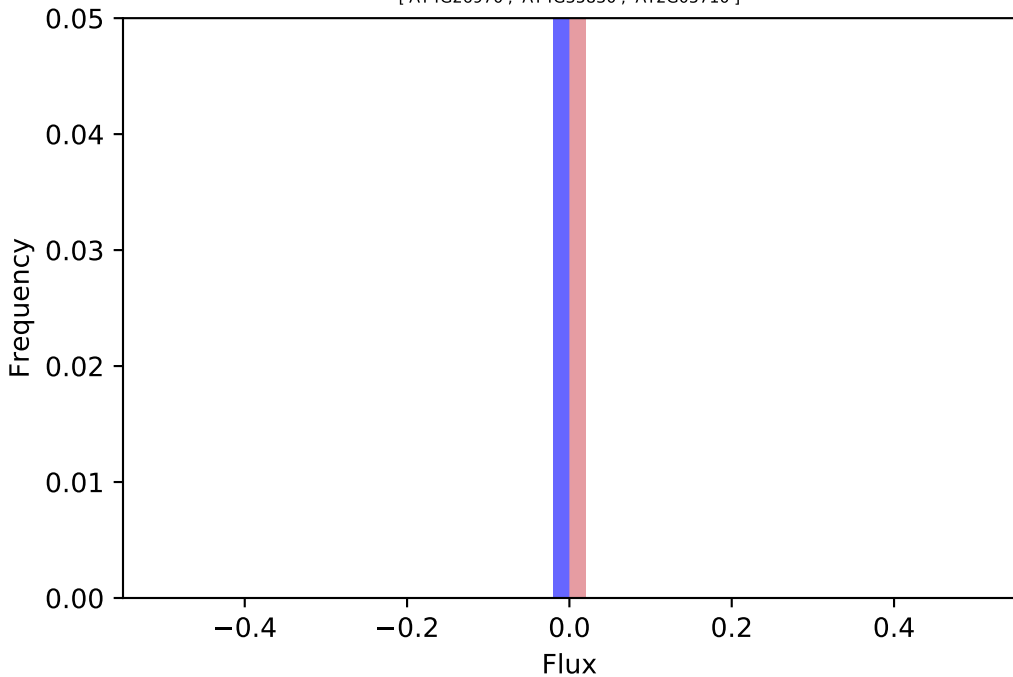
69 : DHL\_m + NAD\_m --> H\_m + LPA\_m + NADH\_m  
['AT3G17240', '2\*AT1G48030']



70 : A\_DASH\_CoA\_m + H2O\_m + OAA\_m --> Cit\_m + CoA\_m + H\_m  
['AT3G60100', 'AT2G44350']

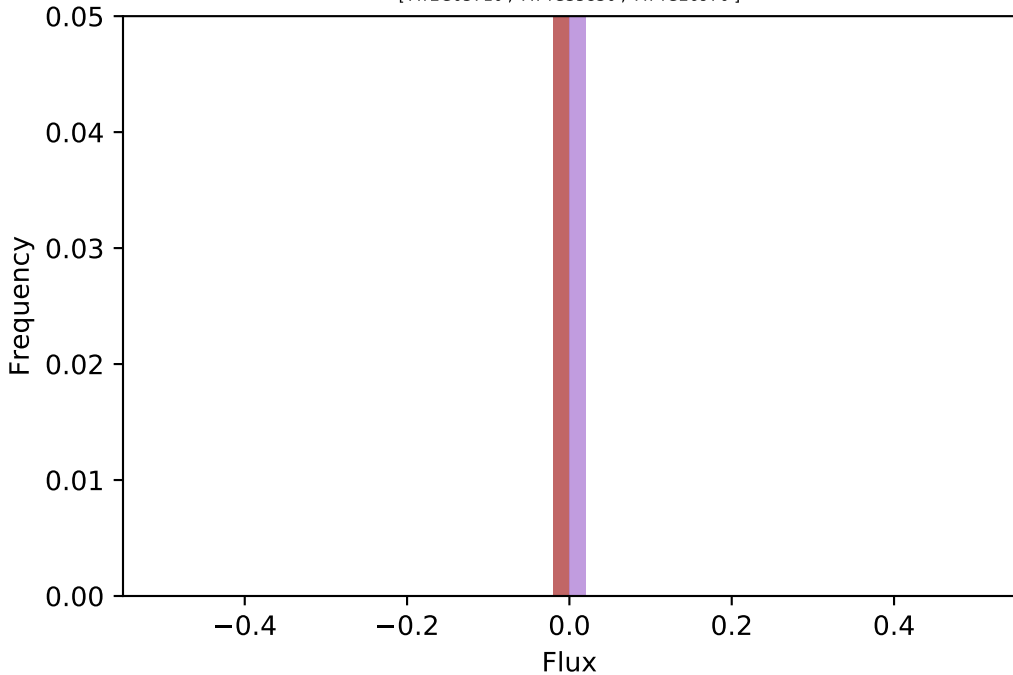


71 : Cit\_m --> H2O\_m + cACN\_m  
['AT4G26970', 'AT4G35830', 'AT2G05710']

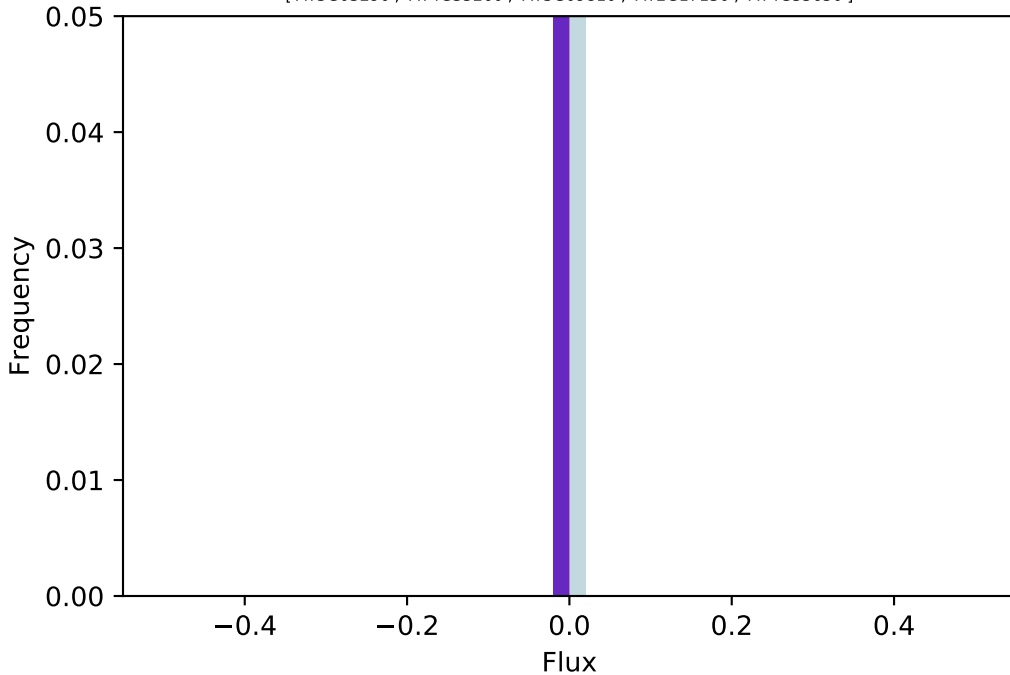




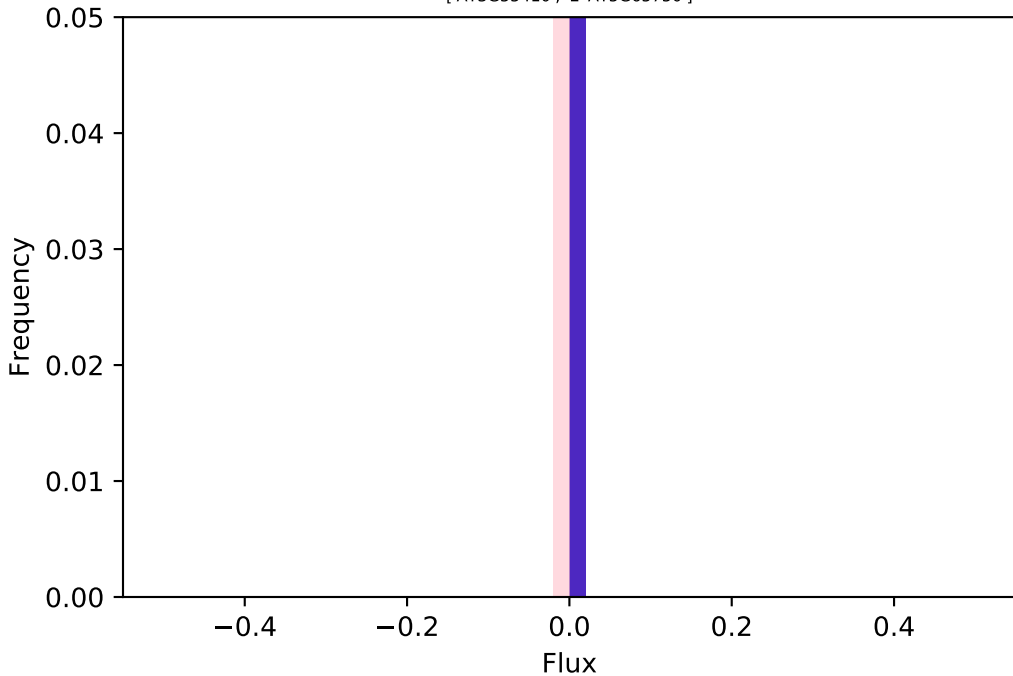
72 : H2O\_m + cACN\_m --> iCit\_m  
['AT2G05710', 'AT4G35830', 'AT4G26970']



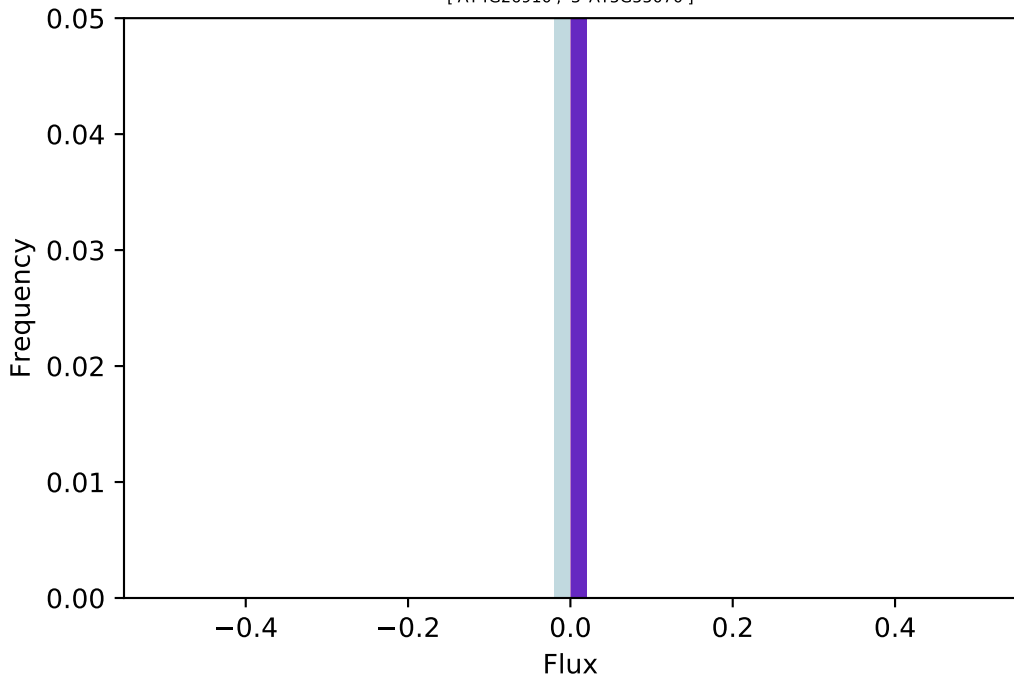
73 : NAD\_m + iCit\_m --> CO2\_m + KG\_m + NADH\_m  
['AT5G03290', 'AT4G35260', 'AT3G09810', 'AT2G17130', 'AT4G35650']



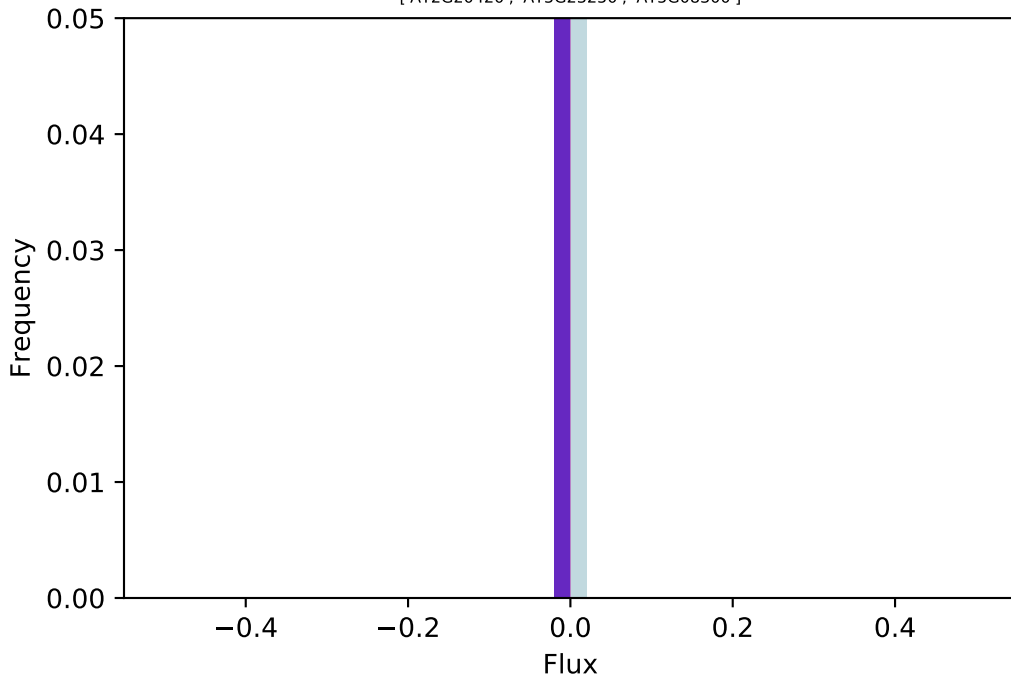
74 : H\_m + KG\_m + LPA\_m --> CO2\_m + S\_DASH\_DHL\_m  
[AT3G55410, '2\*AT5G65750']

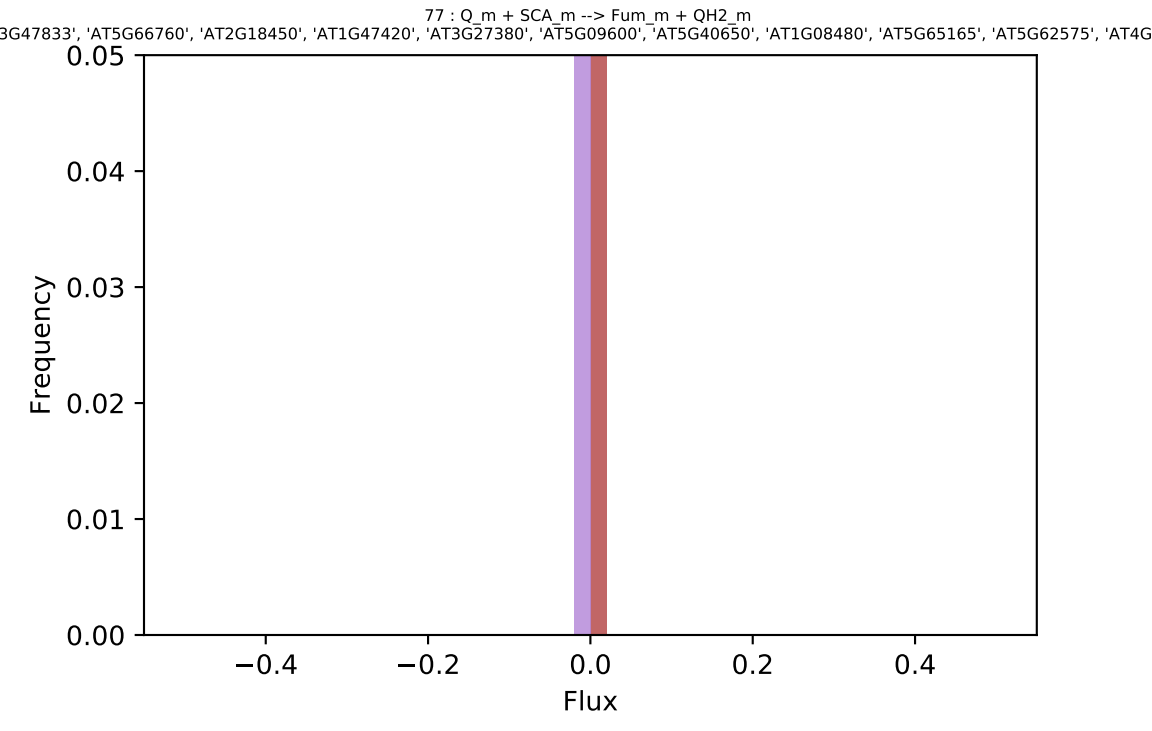


75 : CoA\_m + S\_DASH\_DHL\_m --> DHL\_m + S\_DASH\_CoA\_m  
[<sup>1</sup>AT4G26910', '3\*AT5G55070']

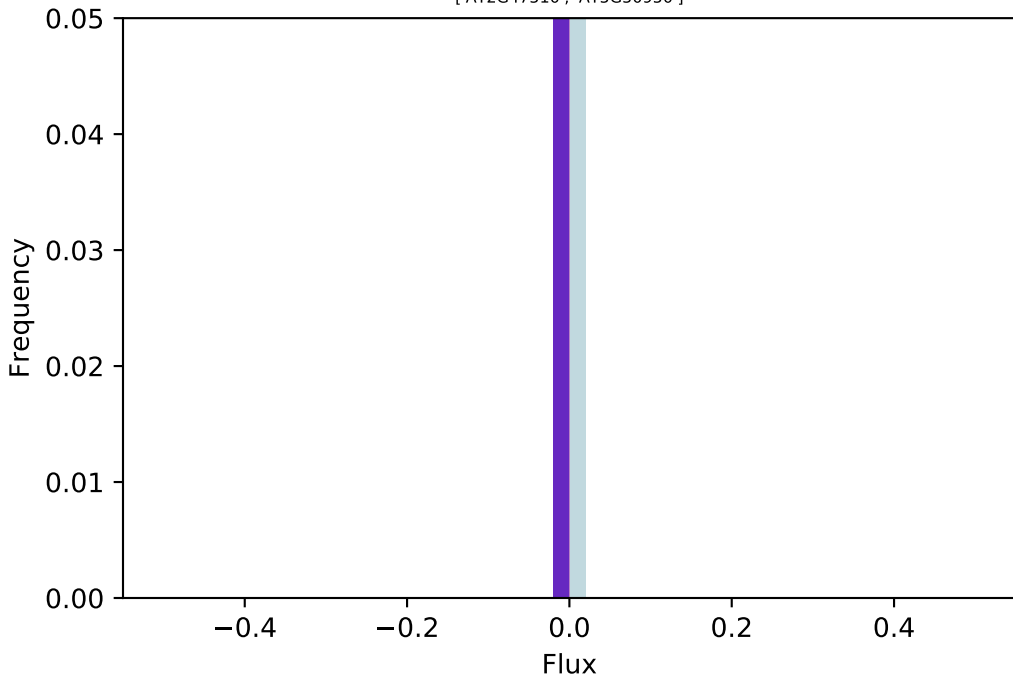


76 : ADP\_m + Pi\_m + S\_DASH\_CoA\_m --> ATP\_m + CoA\_m + SCA\_m  
['AT2G20420', 'AT5G23250', 'AT5G08300']

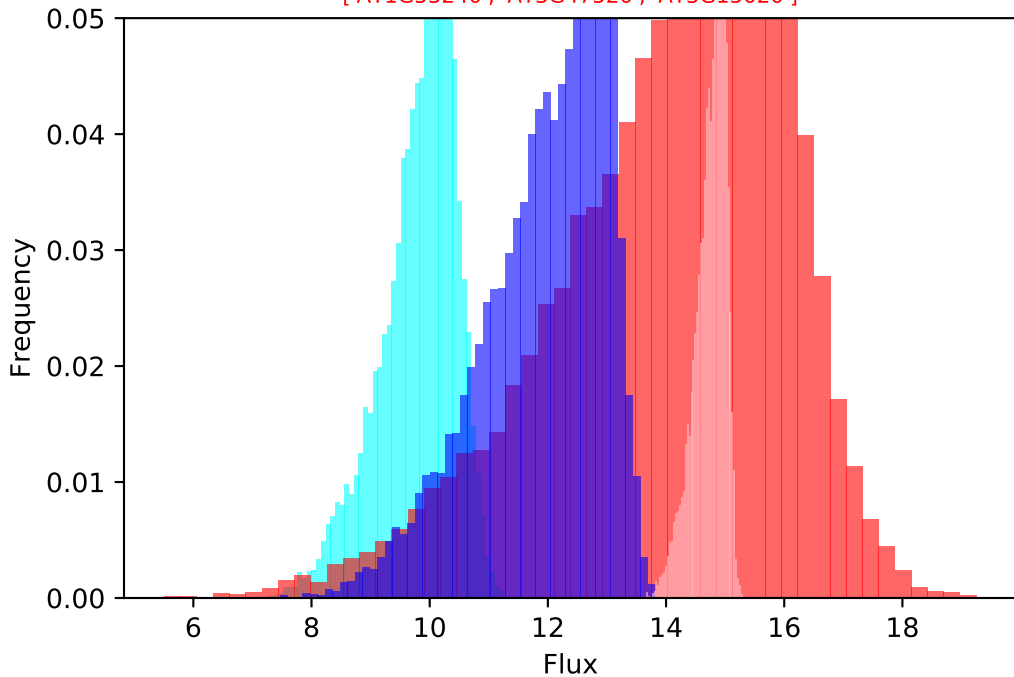




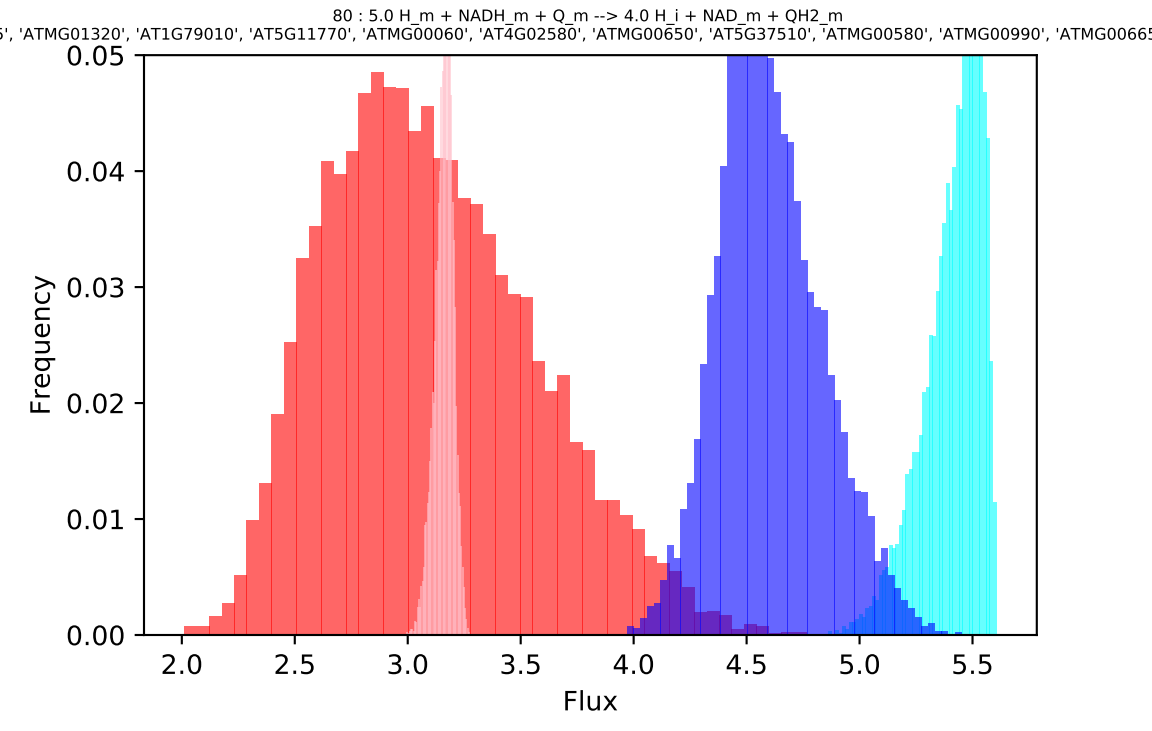
78 : Fum\_m + H2O\_m --> Mal\_m  
['AT2G47510', 'AT5G50950']

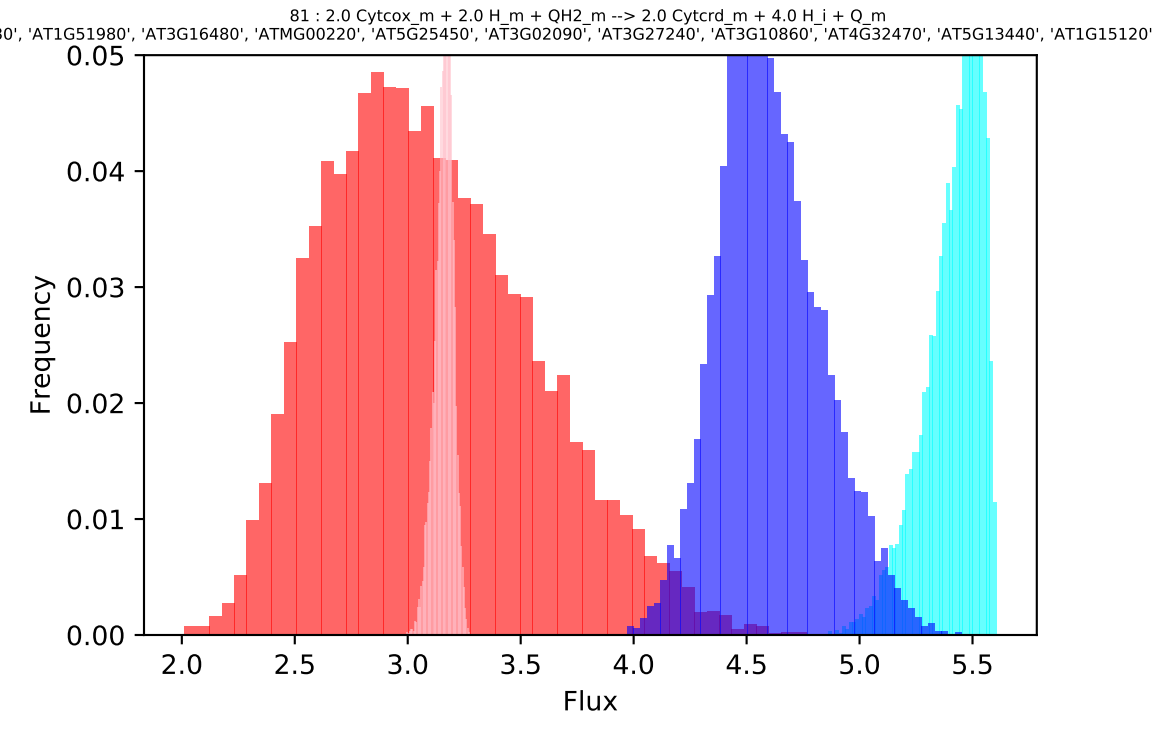


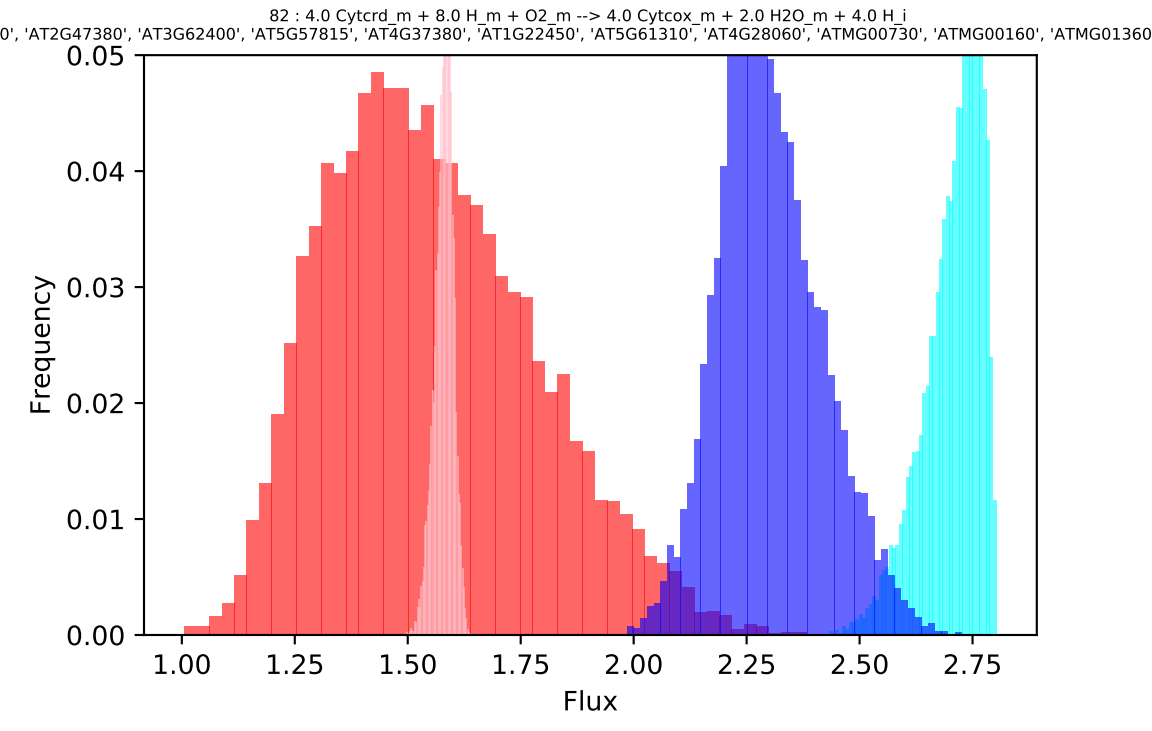
79 : Mal\_m + NAD\_m <=> H\_m + NADH\_m + OAA\_m  
['AT1G53240', 'AT3G47520', 'AT3G15020']

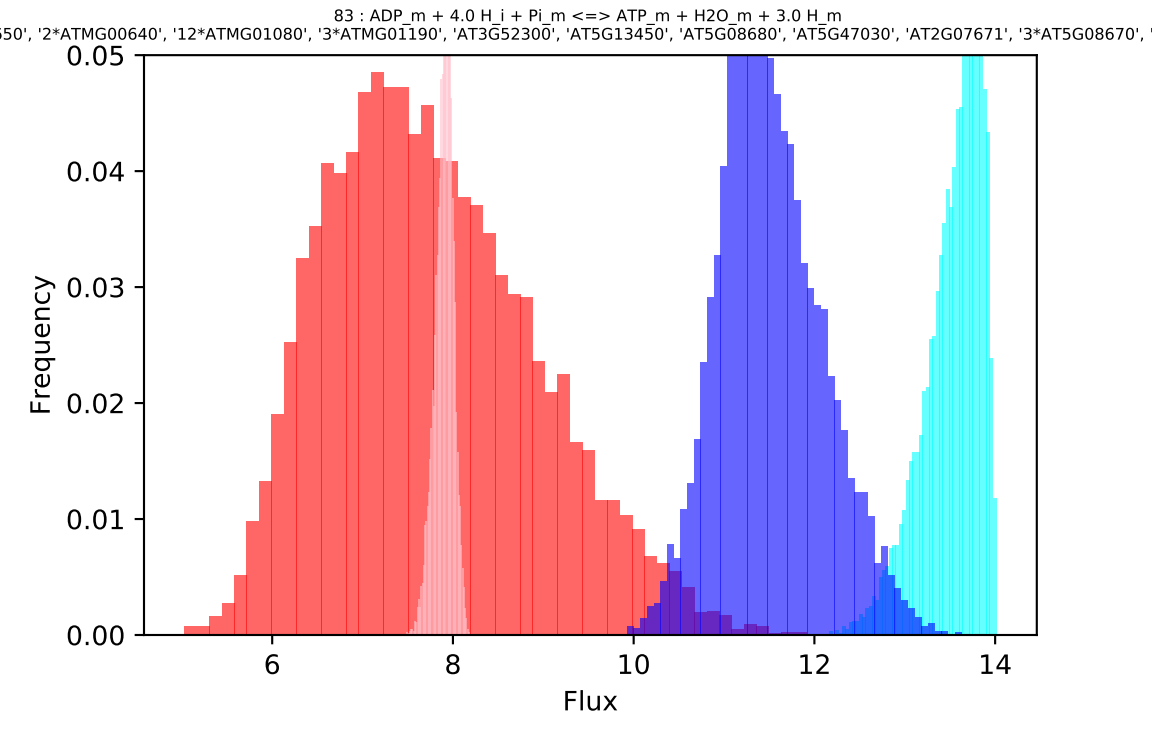




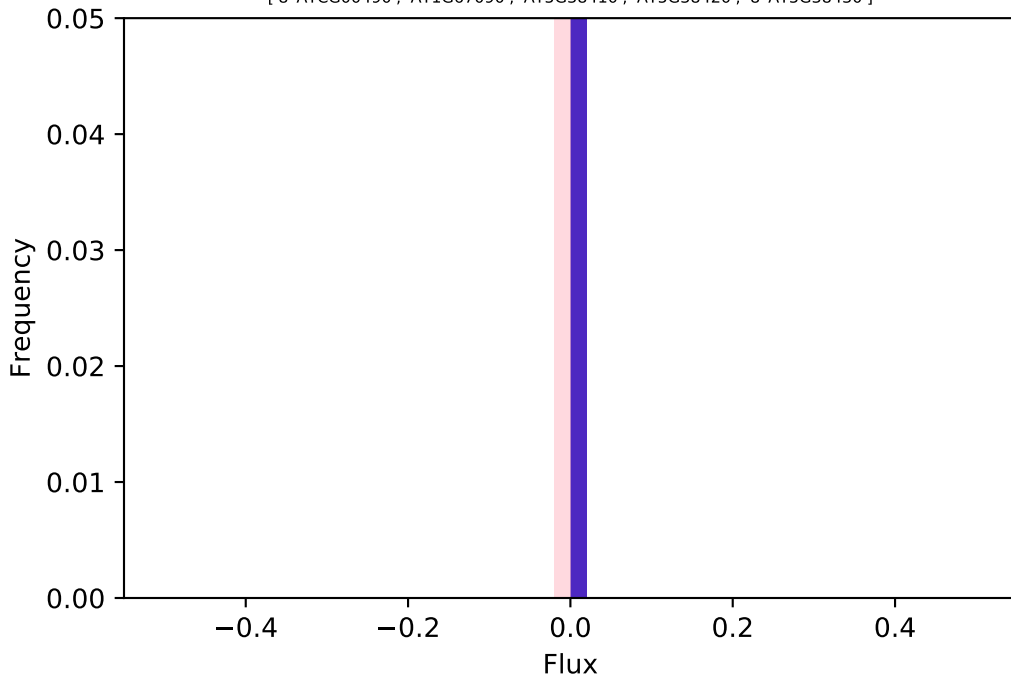




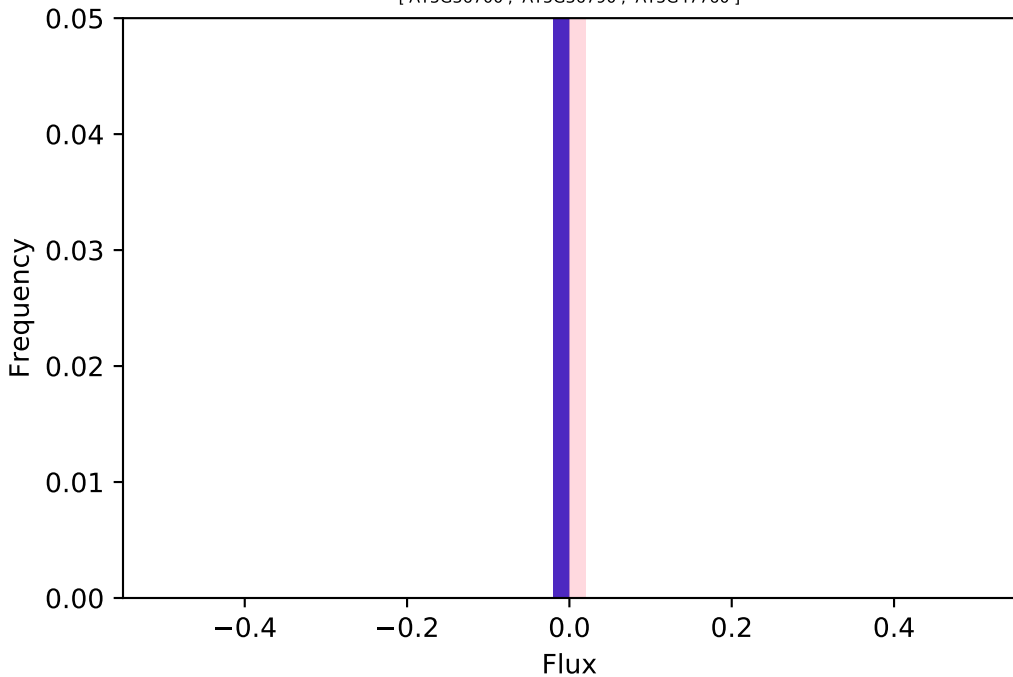




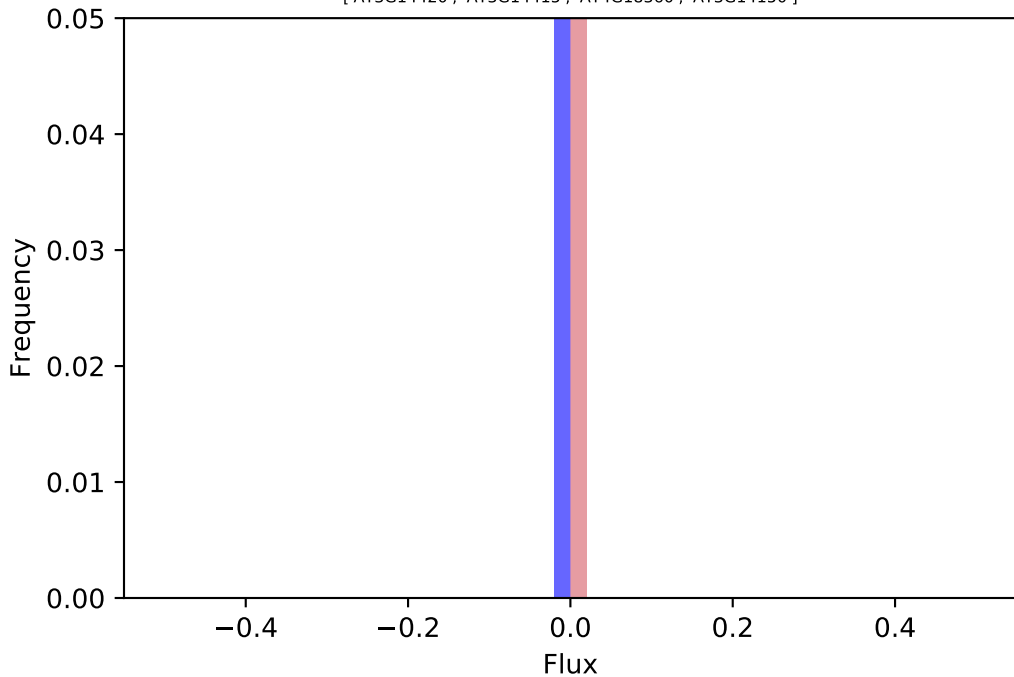
84 : O2\_h + RuBP\_h --> 2.0 H\_h + PGA\_h + PGCA\_h  
['8\*ATCG00490', 'AT1G67090', 'AT5G38410', 'AT5G38420', '8\*AT5G38430']



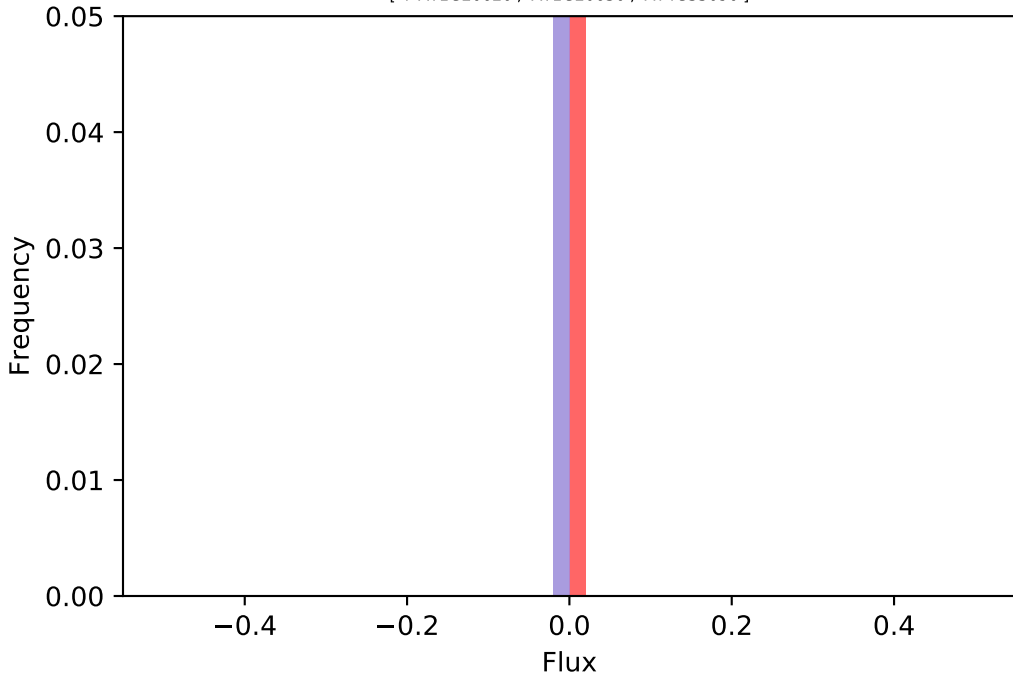
85 : H2O\_h + PGCA\_h --> GCA\_h + Pi\_h  
['AT5G36700', 'AT5G36790', 'AT5G47760']



86 : GCA\_p + O2\_p --> GLX\_p + H2O2\_p  
['AT3G14420', 'AT3G14415', 'AT4G18360', 'AT3G14150']

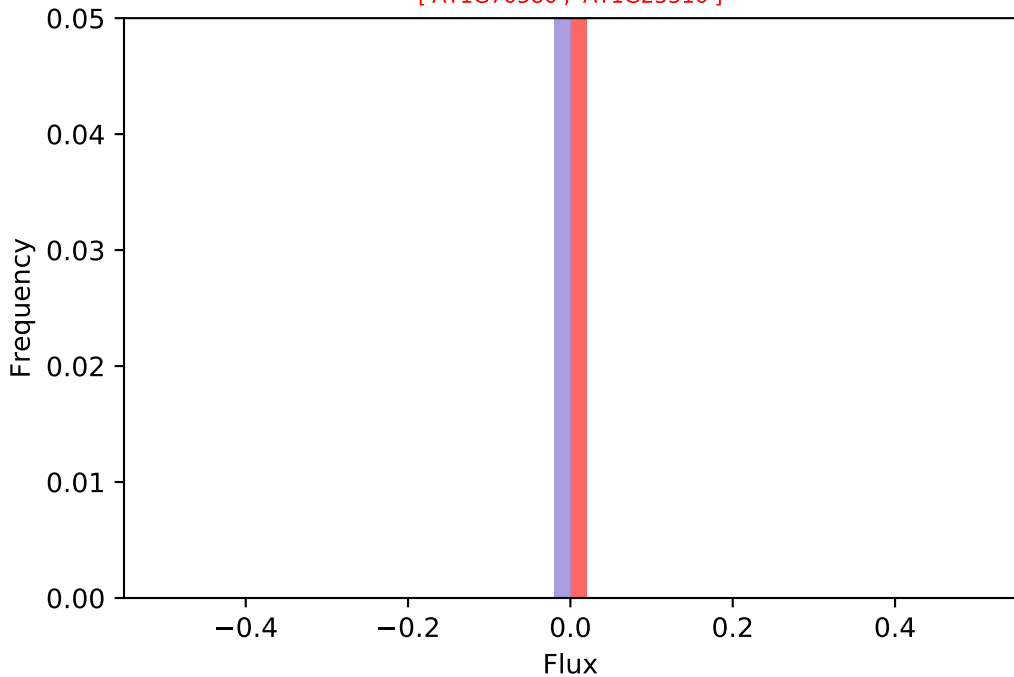


87 : 2.0 H2O2\_p --> 2.0 H2O\_p + O2\_p  
['4\*AT1G20620', 'AT1G20630', 'AT4G35090']

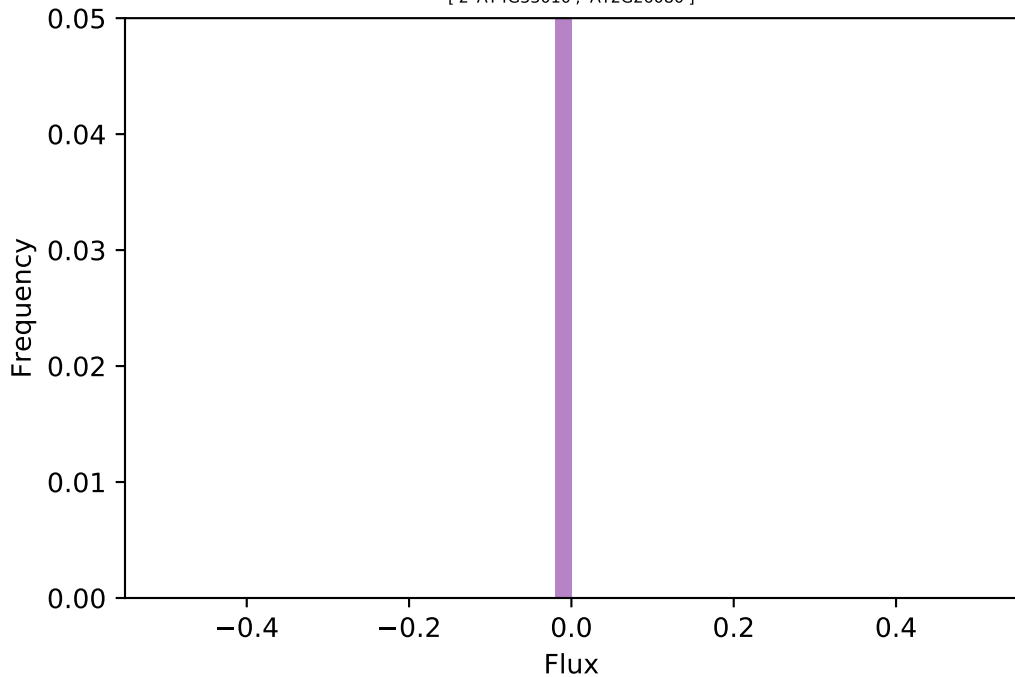




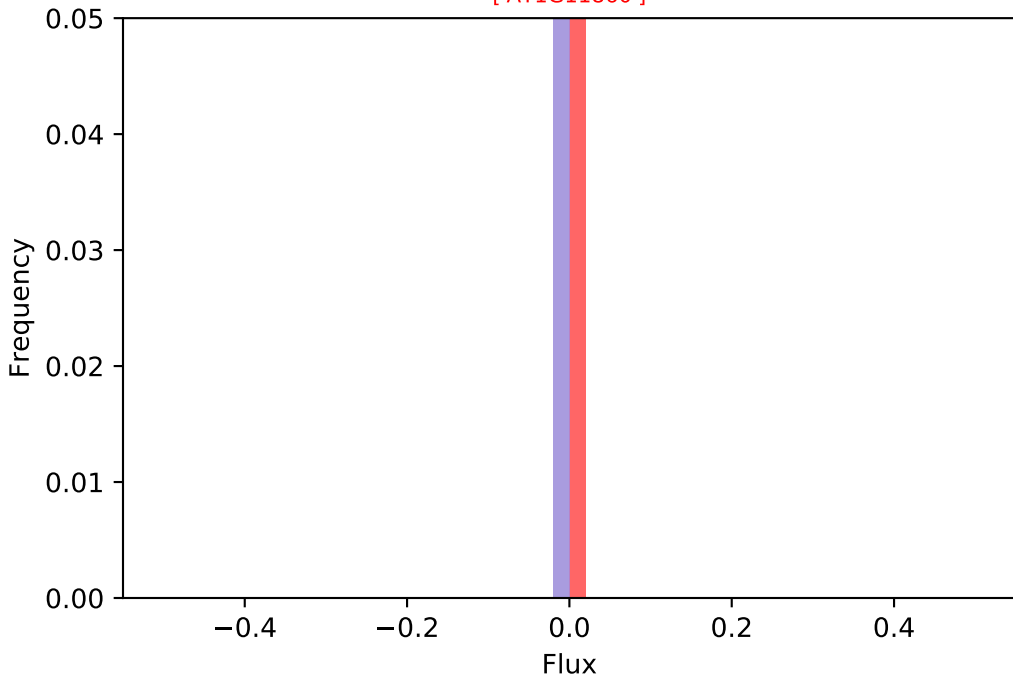
88 : GLX\_p + Glu\_p --> Gly\_p + KG\_p  
['AT1G70580', 'AT1G23310']



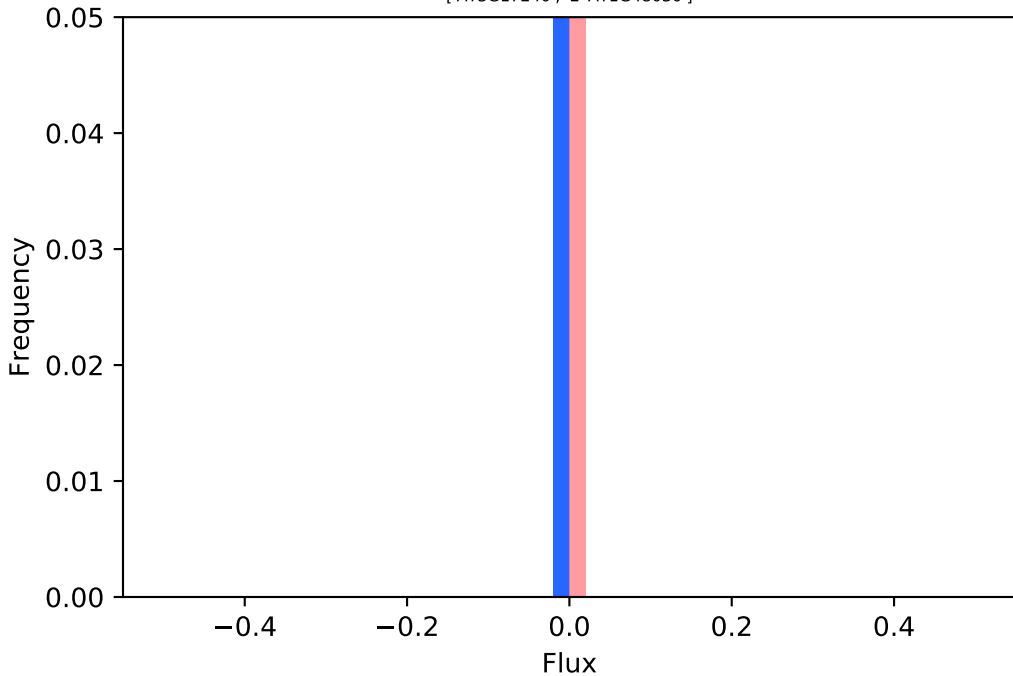
89 : Gly\_m + H\_m + LPL\_m --> CO2\_m + amDHP\_m  
['2\*AT4G33010', 'AT2G26080']



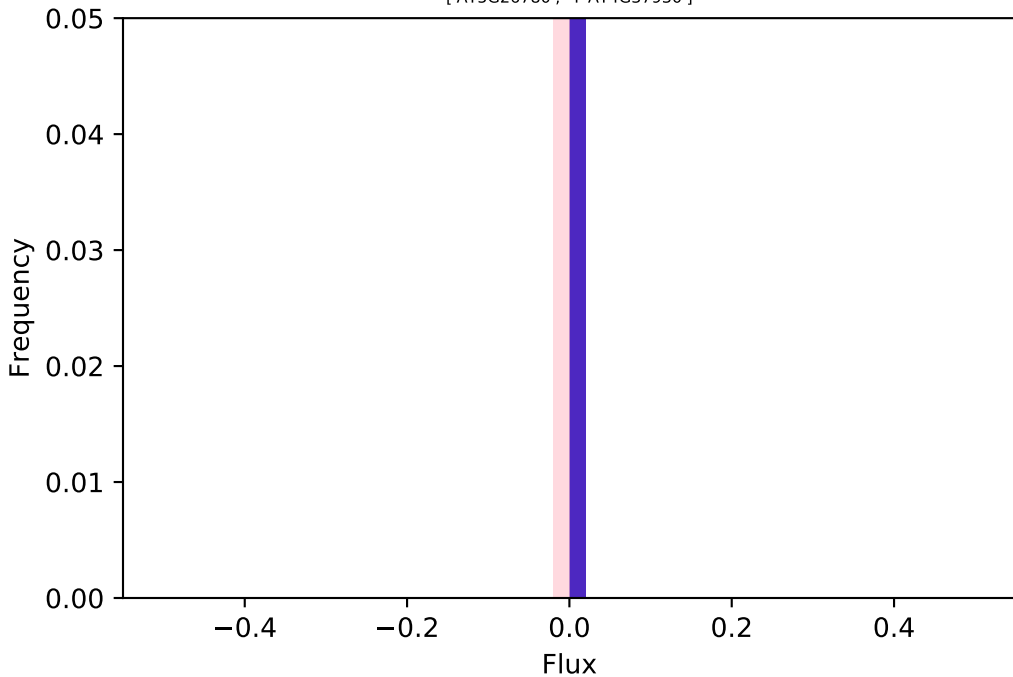
90 : THF\_m + amDHP\_m --> DHP\_m + M\_DASH\_THF\_m + NH4\_m  
['AT1G11860']



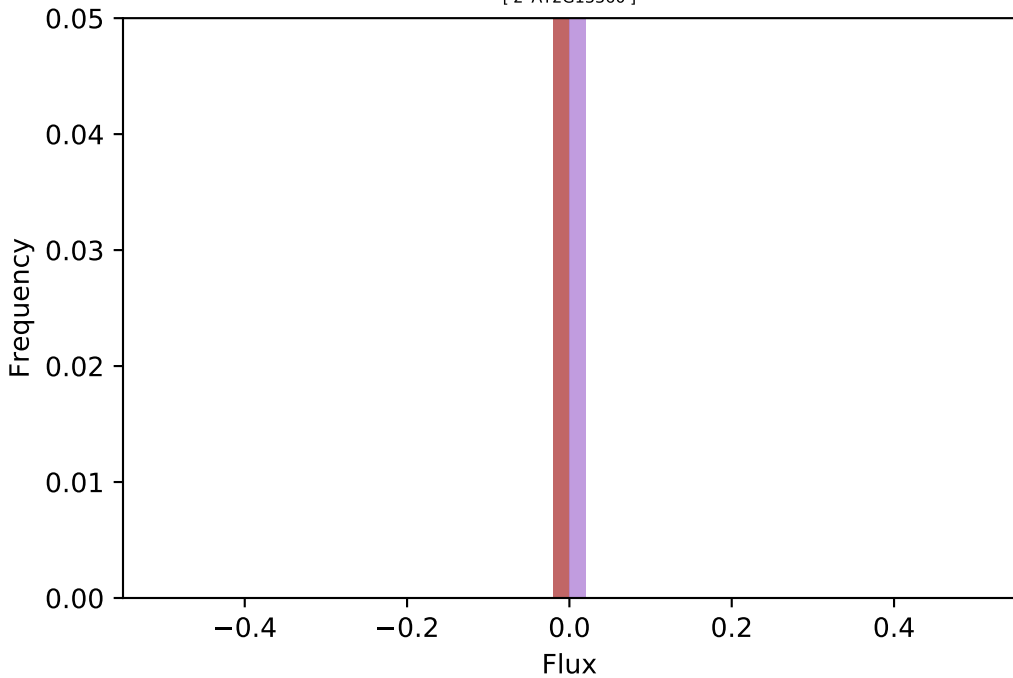
91 : DHP\_m + NAD\_m --> H\_m + LPL\_m + NADH\_m  
['AT3G17240', '2\*AT1G48030']



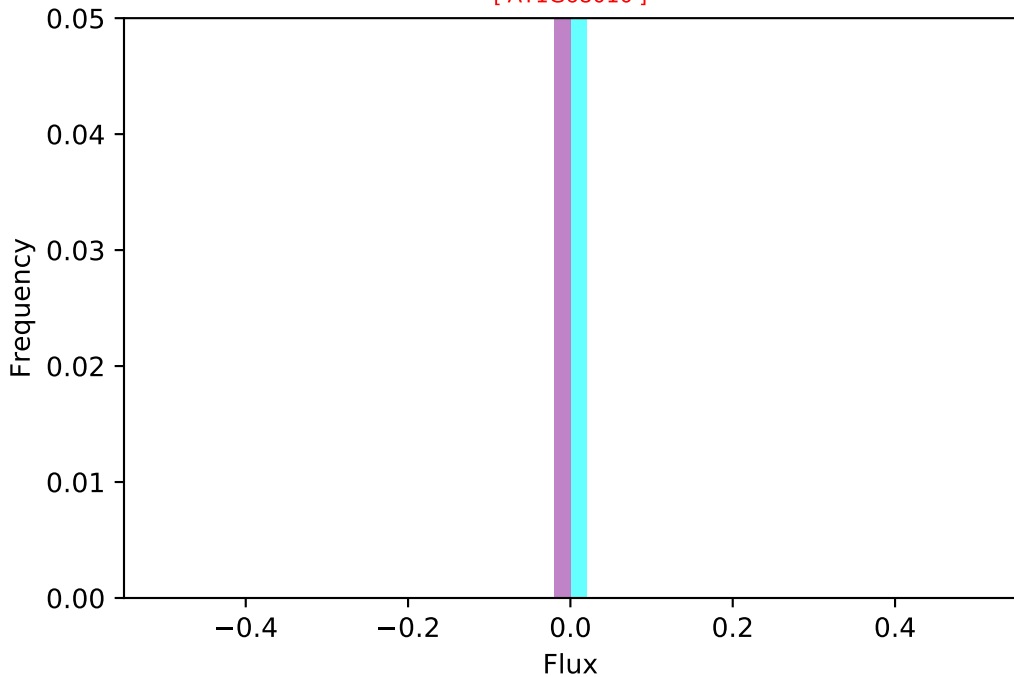
92 : Gly\_m + H2O\_m + M\_DASH\_THF\_m --> Ser\_m + THF\_m  
['AT5G26780', '4\*AT4G37930']



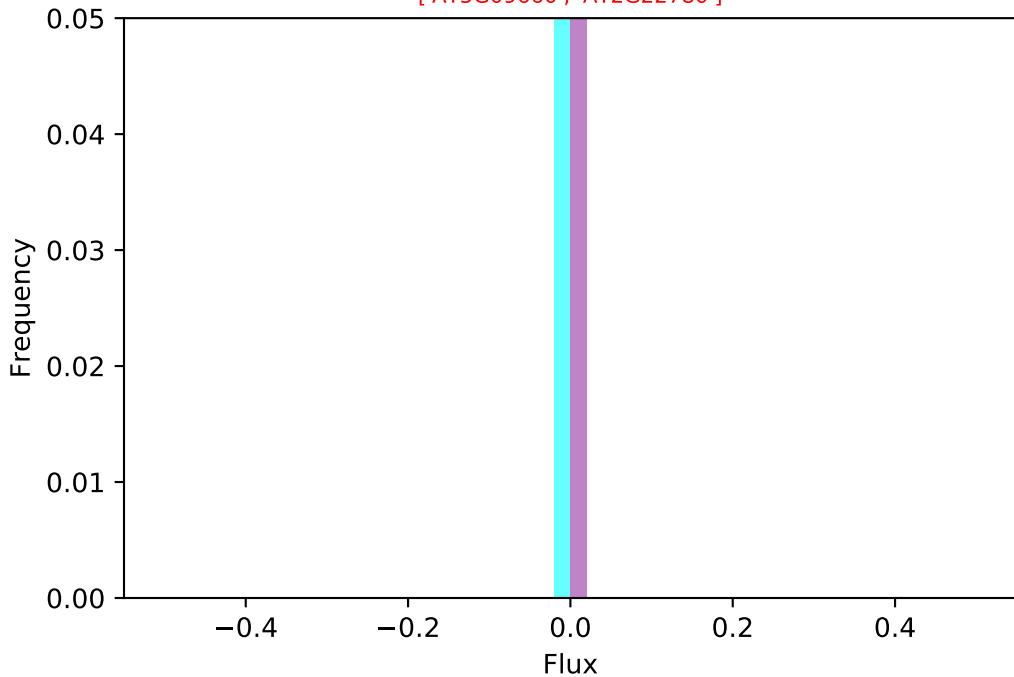
93 : GLX\_p + Ser\_p --> Gly\_p + HPR\_p  
['2\*AT2G13360']



94 : HPR\_p + H\_p + NADH\_p --> GCEA\_p + NAD\_p  
['AT1G68010']

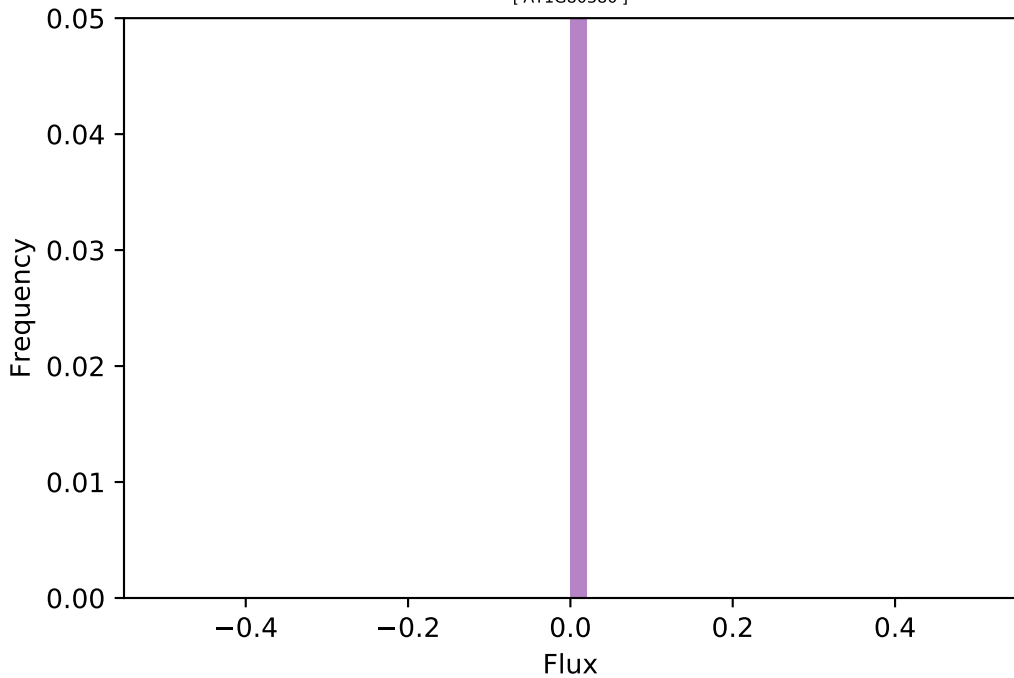


95 : Mal\_p + NAD\_p --> H\_p + NADH\_p + OAA\_p  
['AT5G09660', 'AT2G22780']

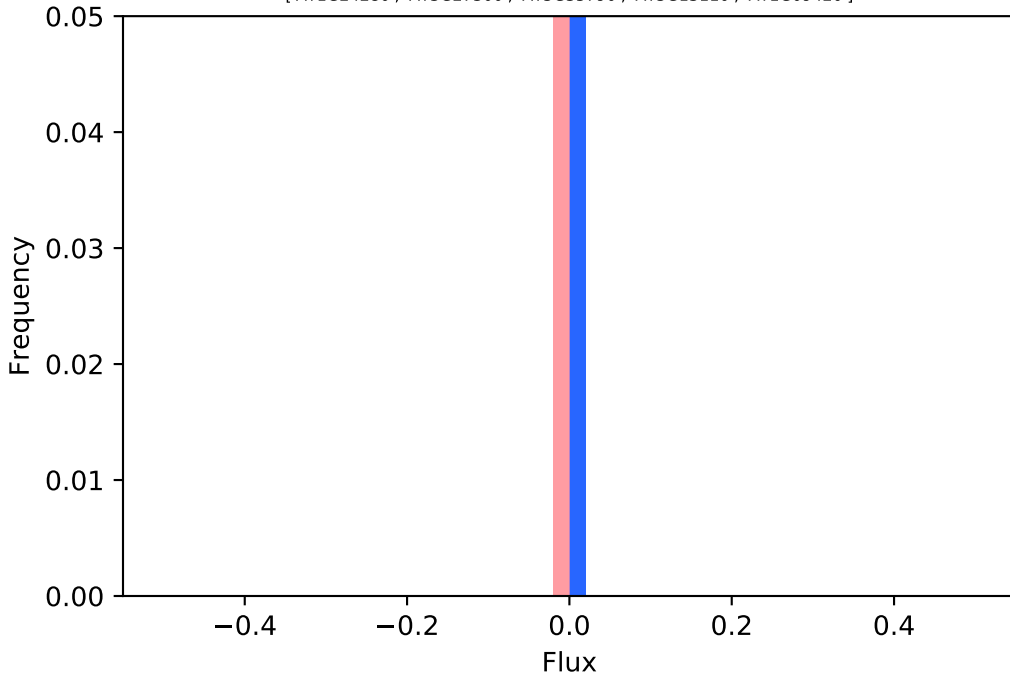




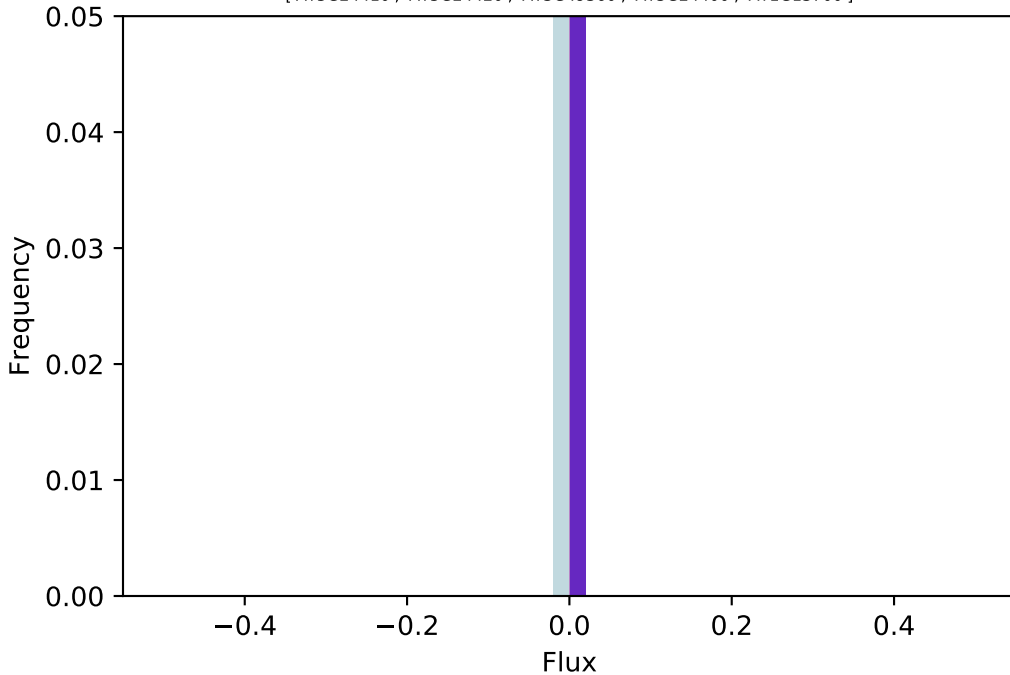
96 : ATP\_h + GCEA\_h --> ADP\_h + H\_h + PGA\_h  
['AT1G80380']



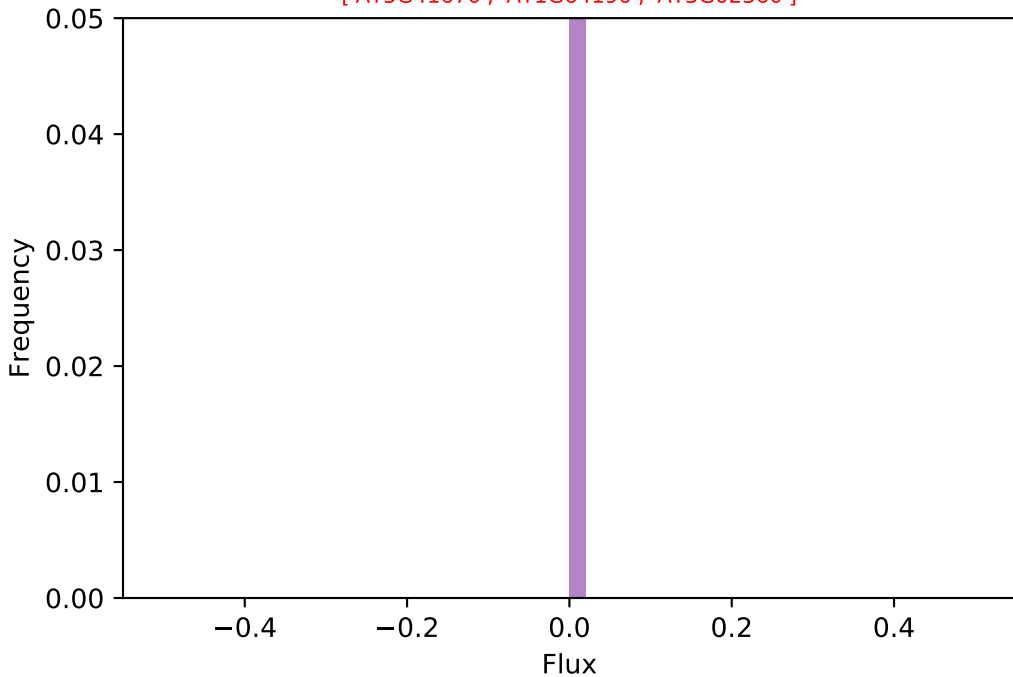
97 : G6P\_h + NADP\_h --> GLP\_h + H\_h + NADPH\_h  
['AT1G24280', 'AT3G27300', 'AT5G35790', 'AT5G13110', 'AT1G09420']



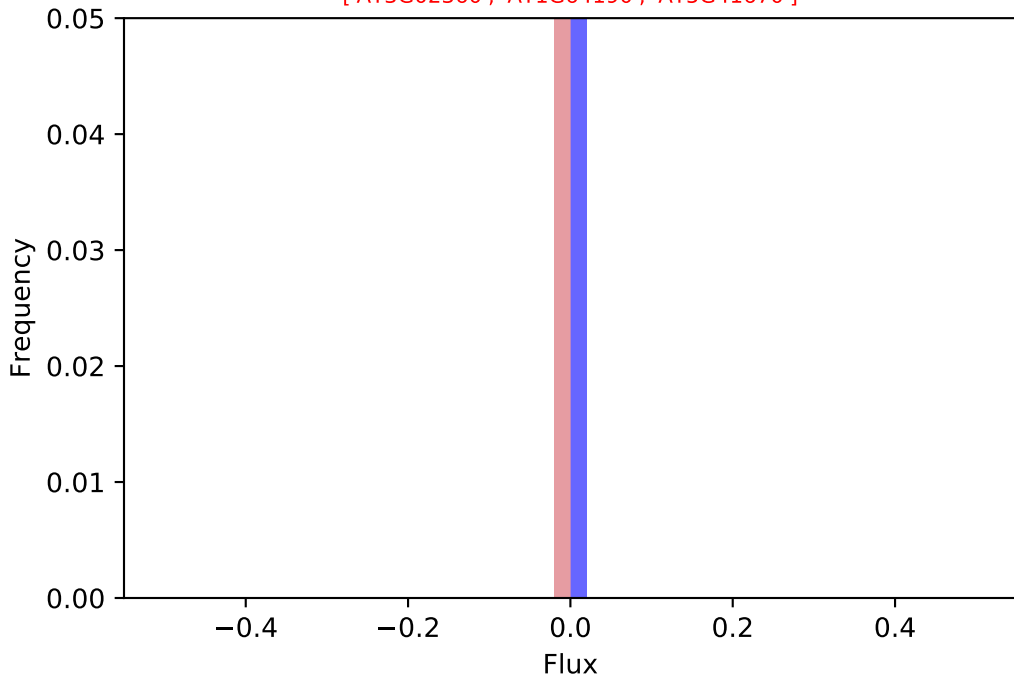
98 : GLP\_h + H2O\_h --> 6PG\_h + H\_h  
['AT5G24410', 'AT5G24420', 'AT3G49360', 'AT5G24400', 'AT1G13700']



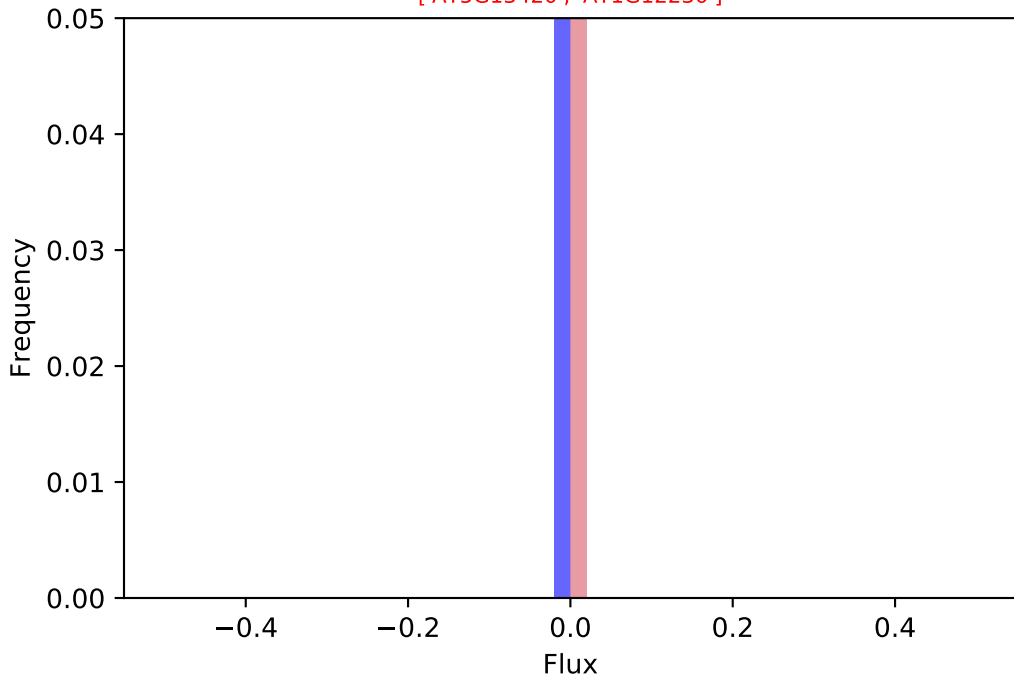
99 : 6PG\_h + NAD\_h --> CO2\_h + NADH\_h + Ru5P\_h  
['AT5G41670', 'AT1G64190', 'AT3G02360']



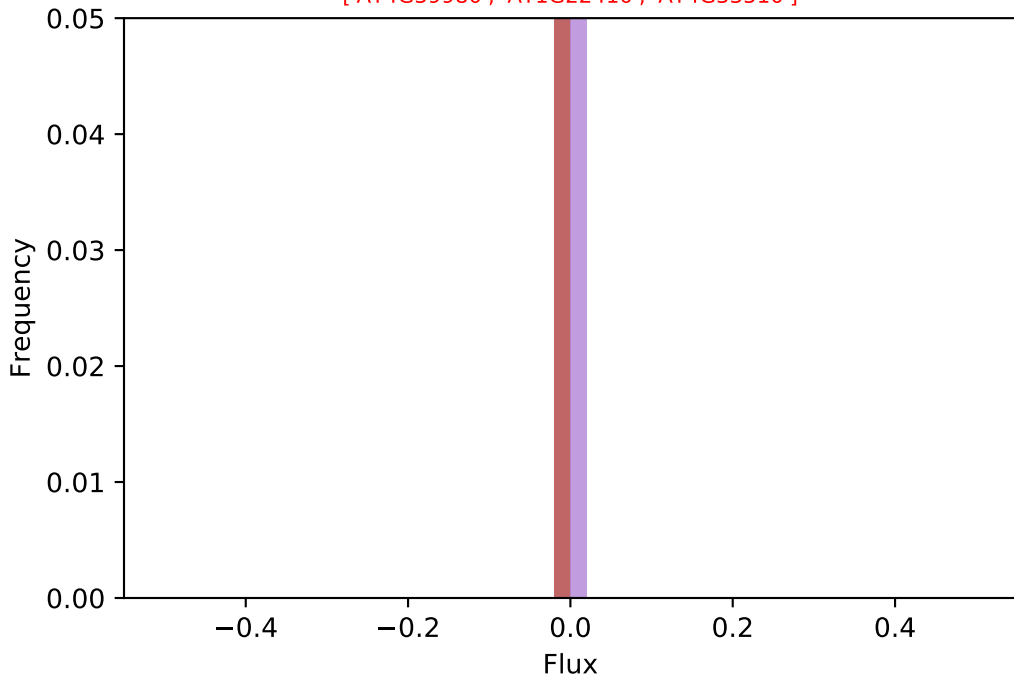
100 : 6PG\_h + NADP\_h --> CO2\_h + NADPH\_h + Ru5P\_h  
['AT3G02360', 'AT1G64190', 'AT5G41670']



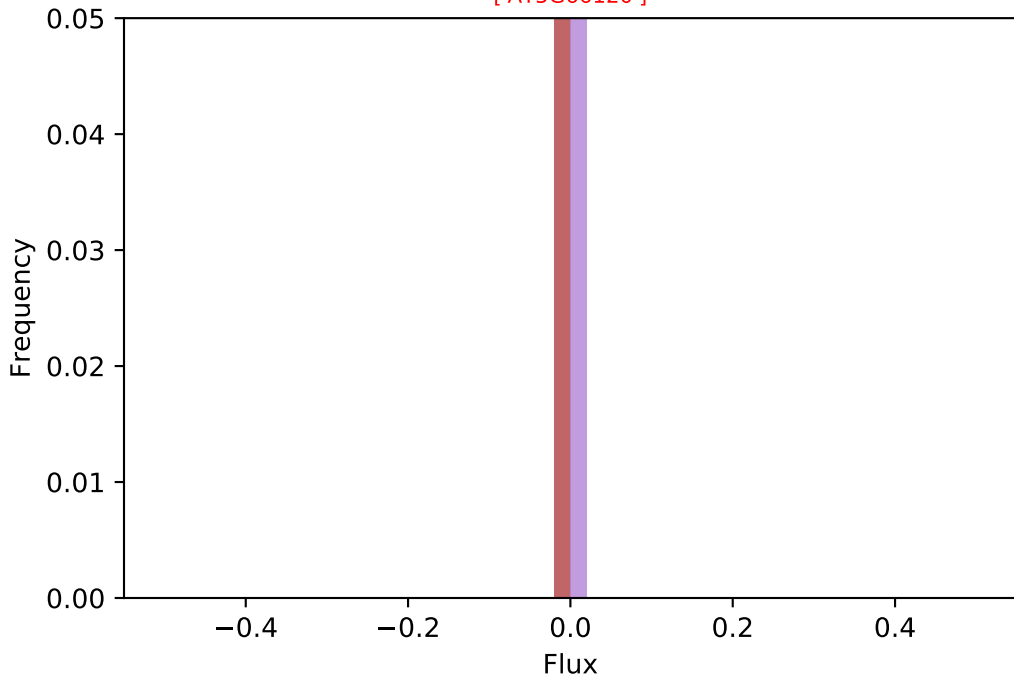
101 : GAP\_h + S7P\_h --> E4P\_h + F6P\_h  
['AT5G13420', 'AT1G12230']



102 : E4P\_h + H2O\_h + PEP\_h --> DAHP\_h + Pi\_h  
['AT4G39980', 'AT1G22410', 'AT4G33510']

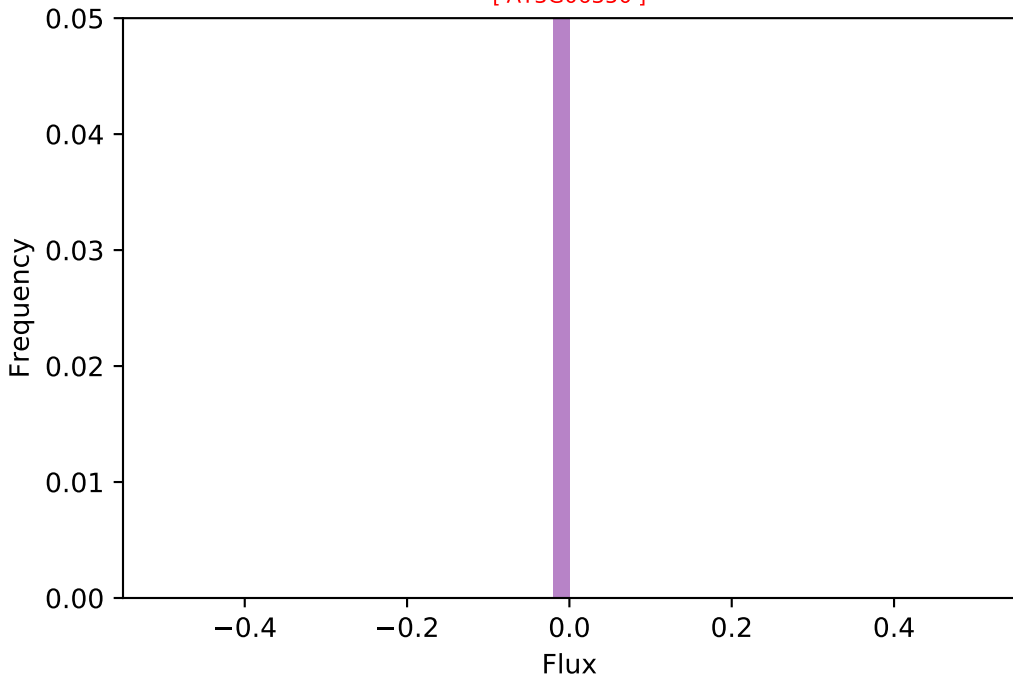


103 : DAHP\_h --> DHQ\_h + Pi\_h  
['AT5G66120']

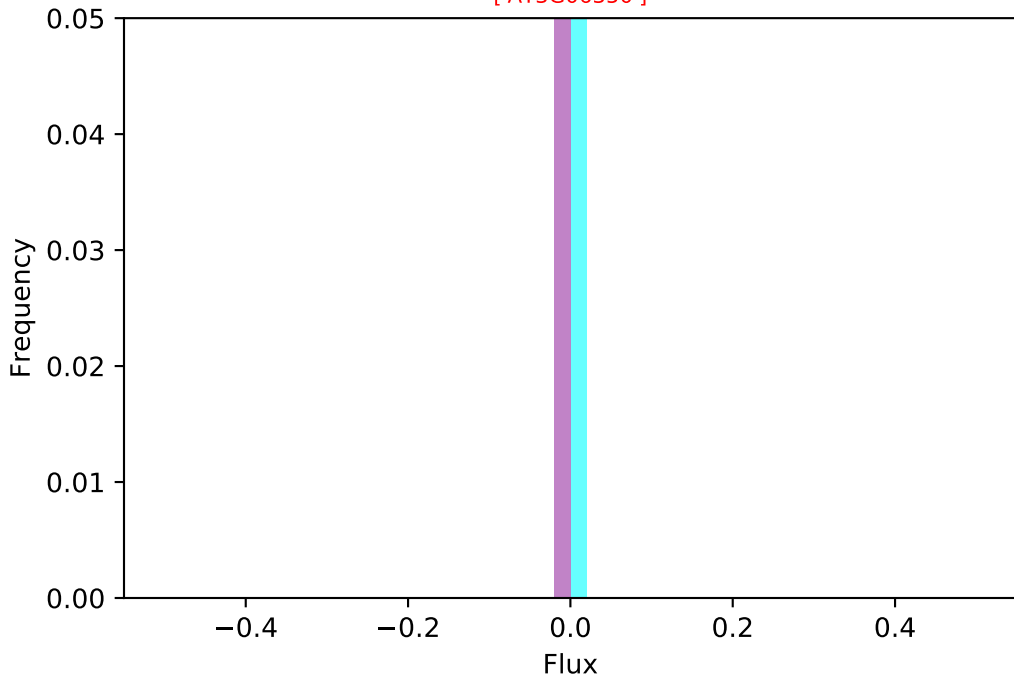




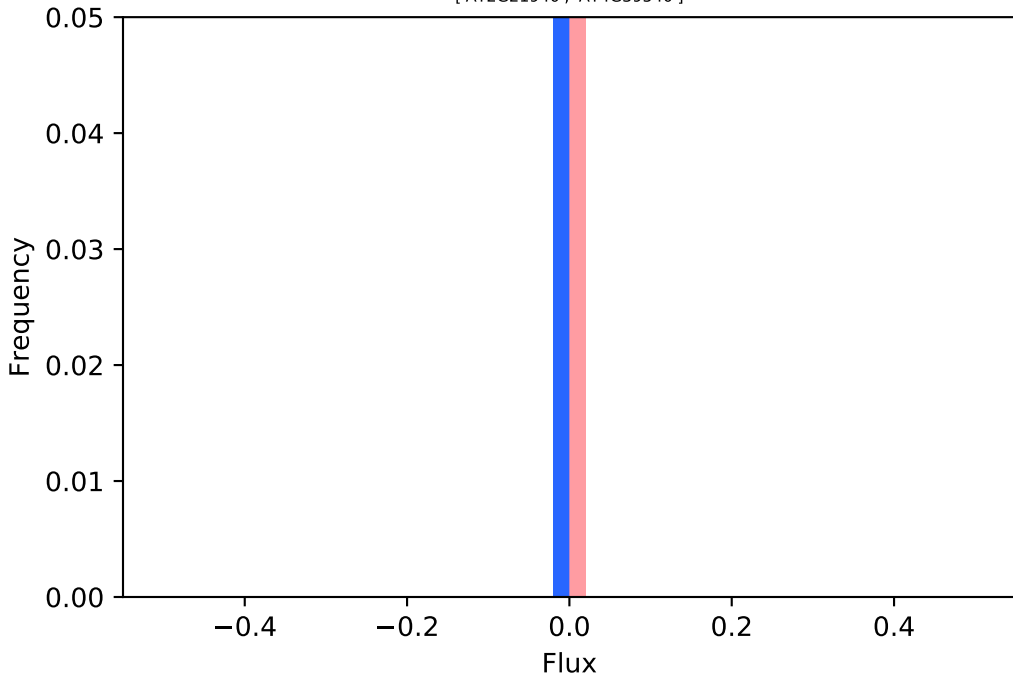
104 : DHQ\_h --> DHS\_h + H2O\_h  
['AT3G06350']



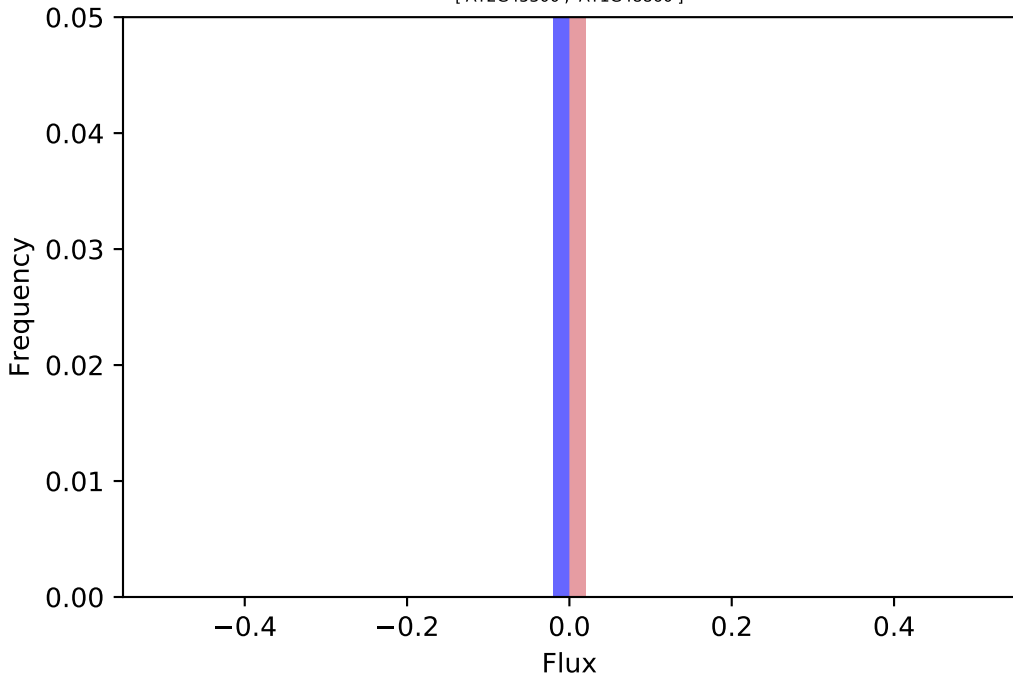
105 : DHS\_h + H\_h + NADPH\_h --> NADP\_h + SA\_h  
['AT3G06350']



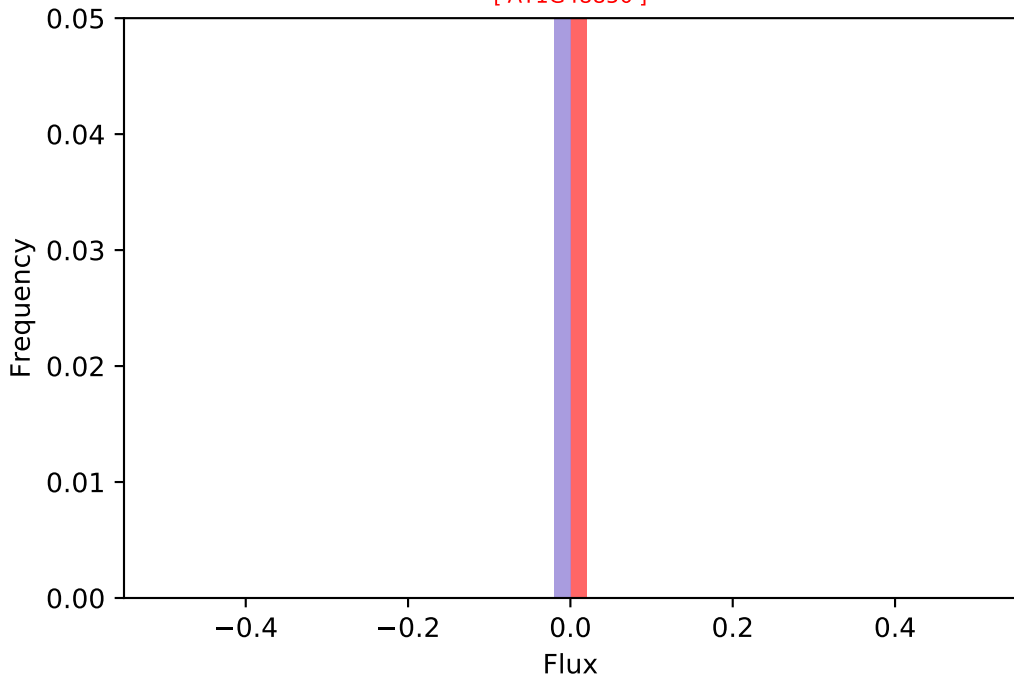
106 : ATP\_h + SA\_h --> ADP\_h + H\_h + S3P\_h  
['AT2G21940', 'AT4G39540']



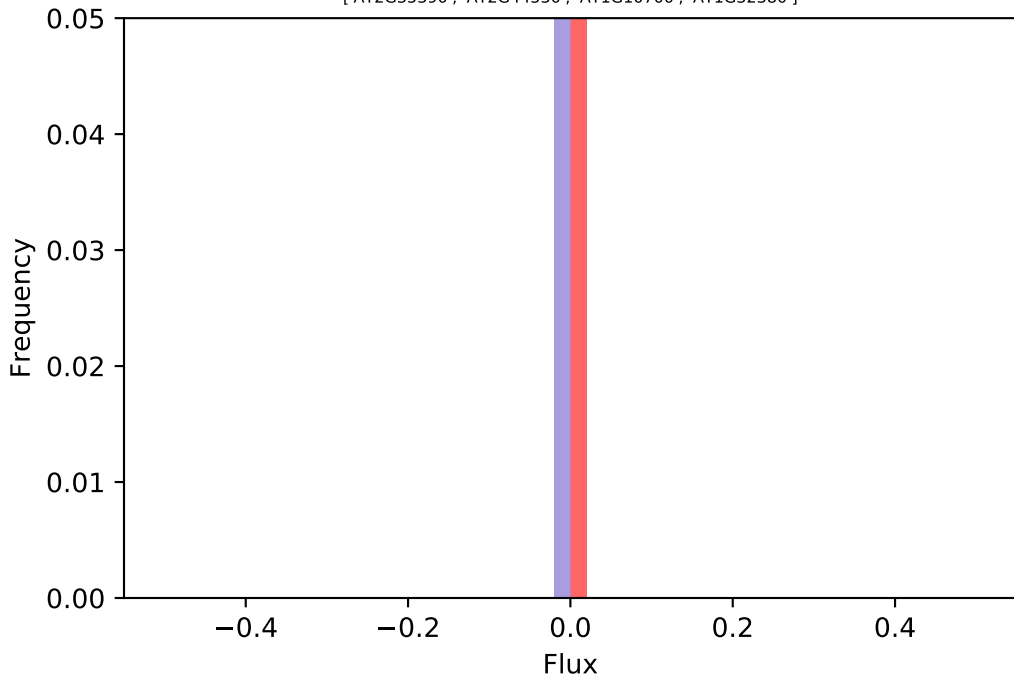
107 : PEP\_h + S3P\_h --> EPSP\_h + Pi\_h  
['AT2G45300', 'AT1G48860']



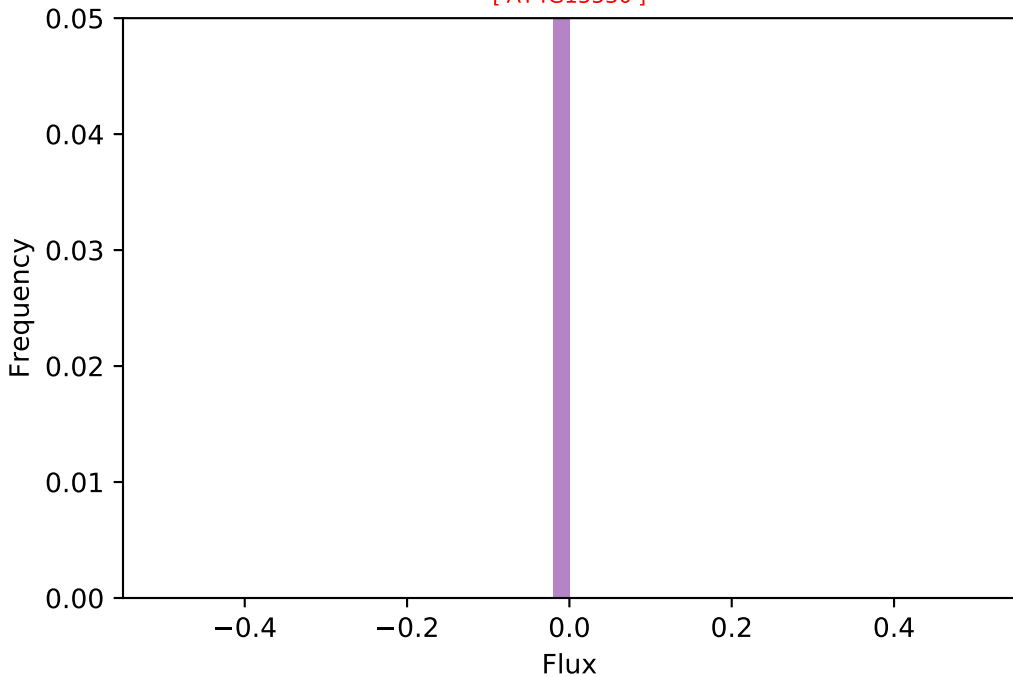
108 : EPSP\_h --> CHR\_h + Pi\_h  
['AT1G48850']



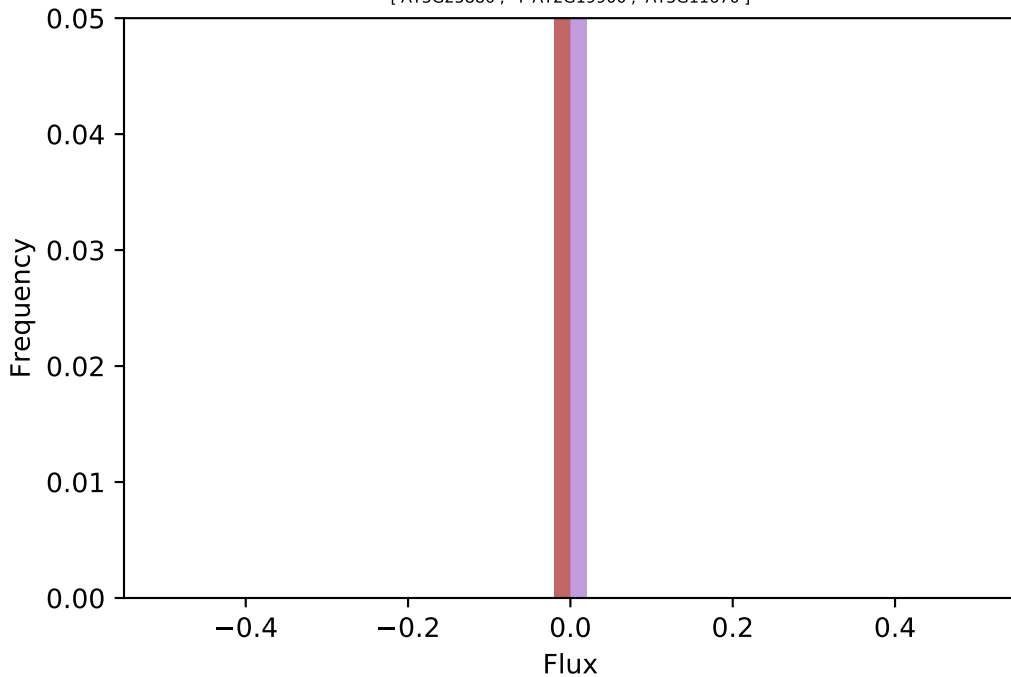
109 : ATP\_h + R5P\_h --> AMP\_h + H\_h + PRPP\_h  
['AT2G35390', 'AT2G44530', 'AT1G10700', 'AT1G32380']



110 : ATP\_h + Pi\_h + Pyr\_h <=> AMP\_h + 2.0 H\_h + PEP\_h + PPi\_h  
[AT4G15530']

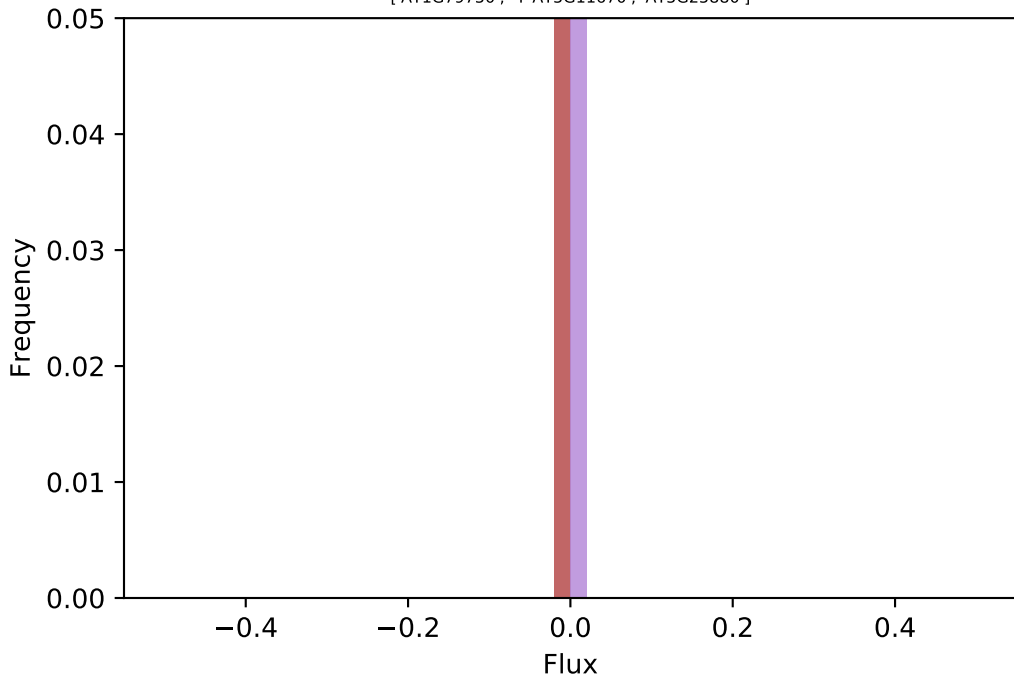


111 : H<sub>c</sub> + Mal<sub>c</sub> + NADP<sub>c</sub> --> CO2<sub>c</sub> + NADPH<sub>c</sub> + Pyr<sub>c</sub>  
['AT5G25880', '4\*AT2G19900', 'AT5G11670']

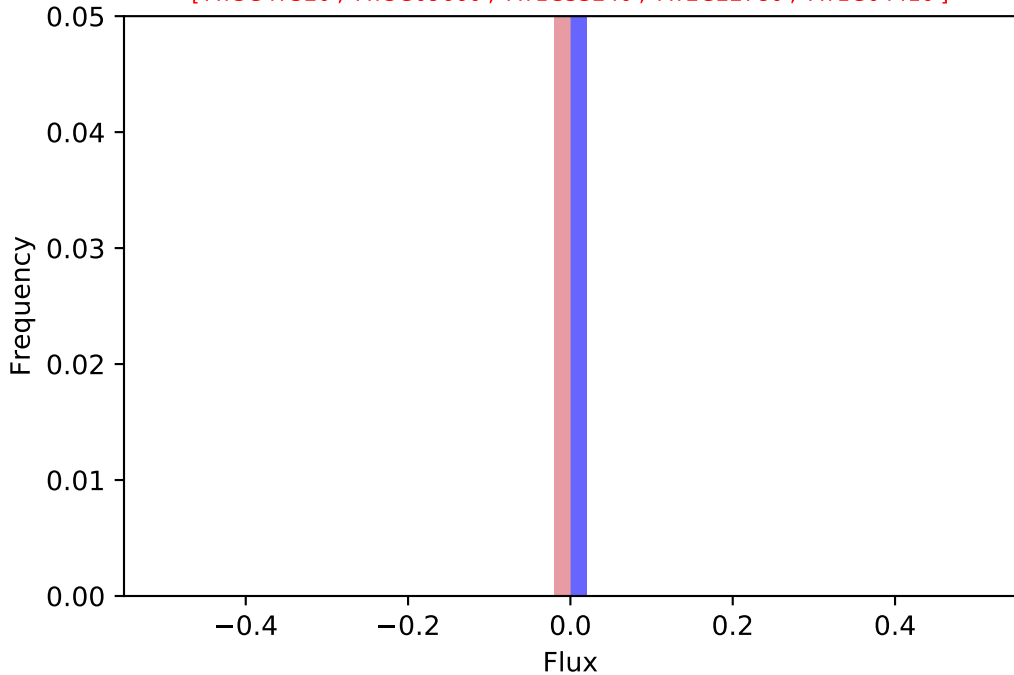




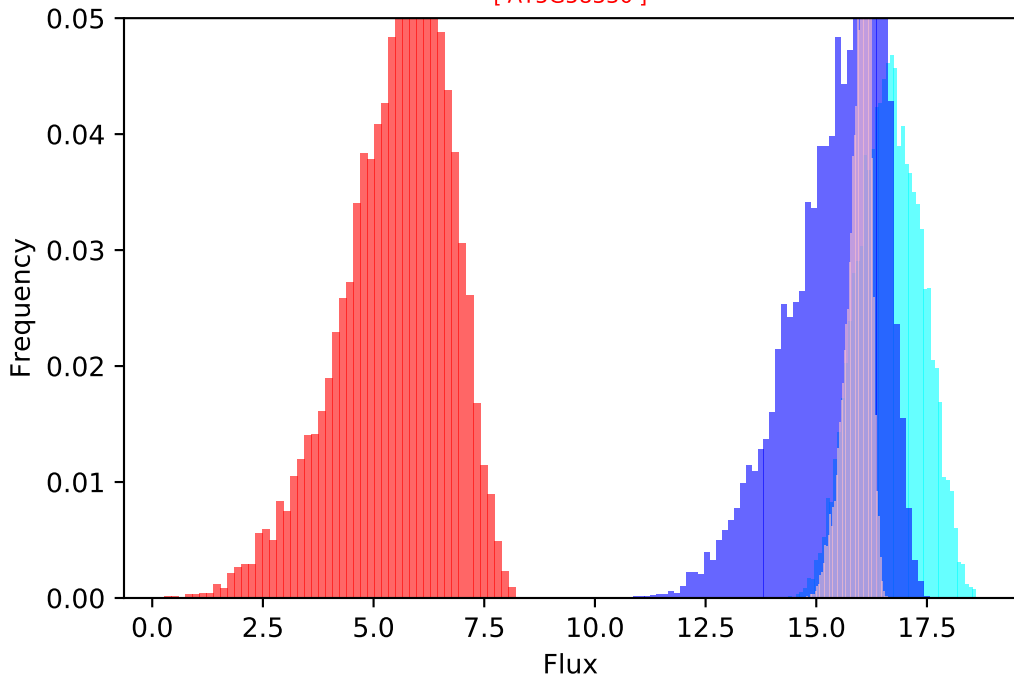
112 : Mal\_h + NADP\_h --> CO2\_h + NADPH\_h + Pyr\_h  
['AT1G79750', '4\*AT5G11670', 'AT5G25880']



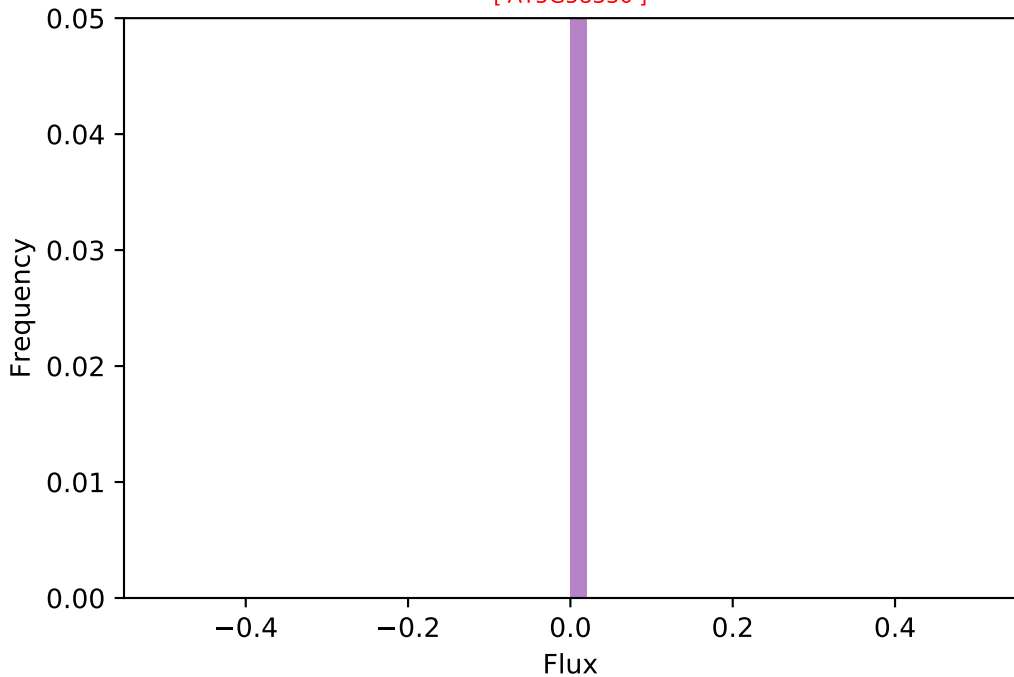
113 : Mal\_h + NAD\_h --> H\_h + NADH\_h + OAA\_h  
['AT3G47520', 'AT5G09660', 'AT1G53240', 'AT2G22780', 'AT1G04410']



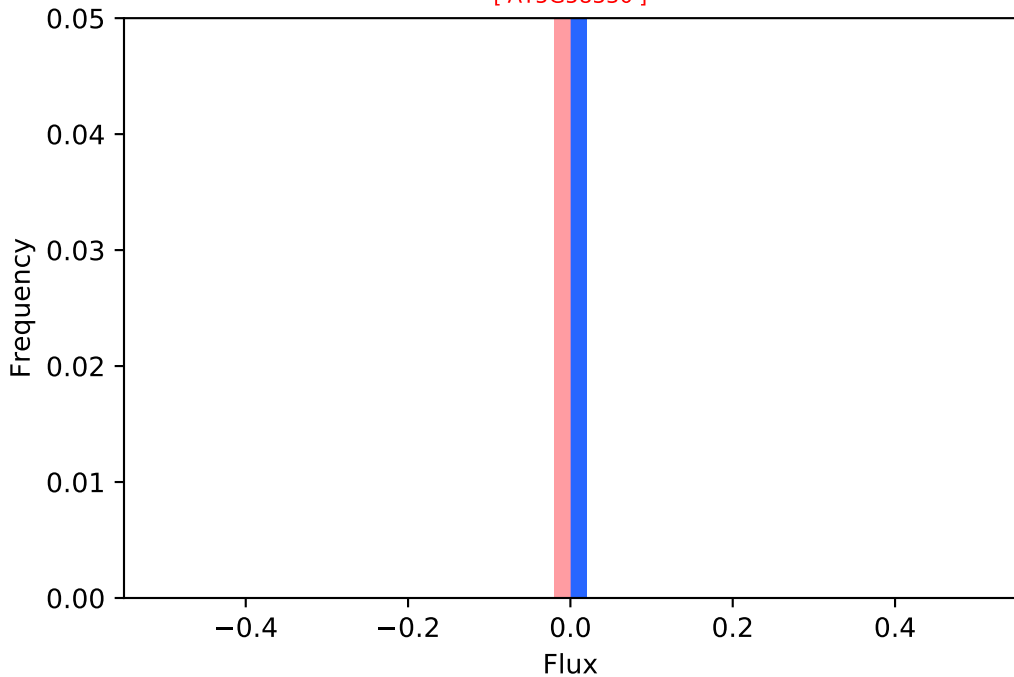
114 : NADPH\_c + OAA\_c --> Mal\_c + NADP\_c  
['AT5G58330']



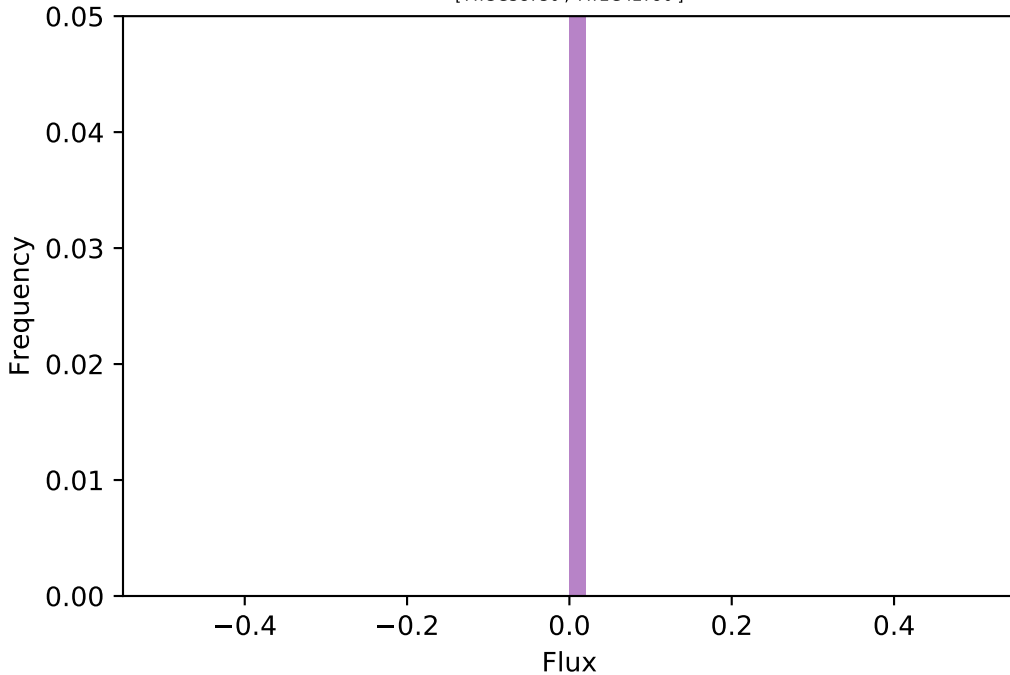
115 : H\_h + NADPH\_h + OAA\_h --> Mal\_h + NADP\_h  
['AT5G58330']



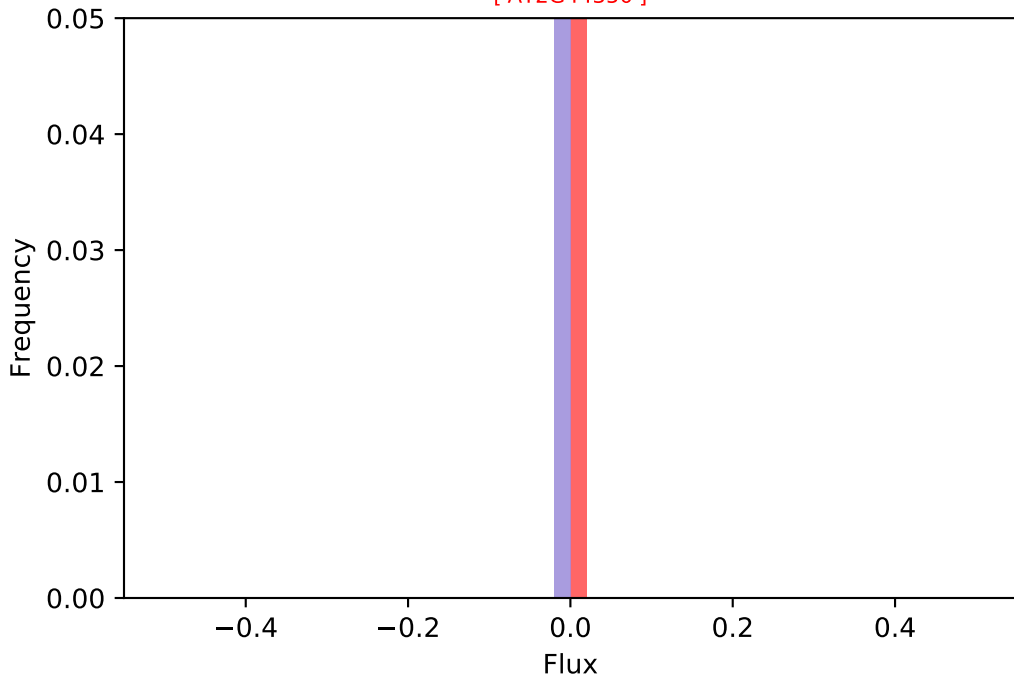
116 : H<sub>m</sub> + NADPH<sub>m</sub> + OAA<sub>m</sub> --> Mal<sub>m</sub> + NADP<sub>m</sub>  
['AT5G58330']



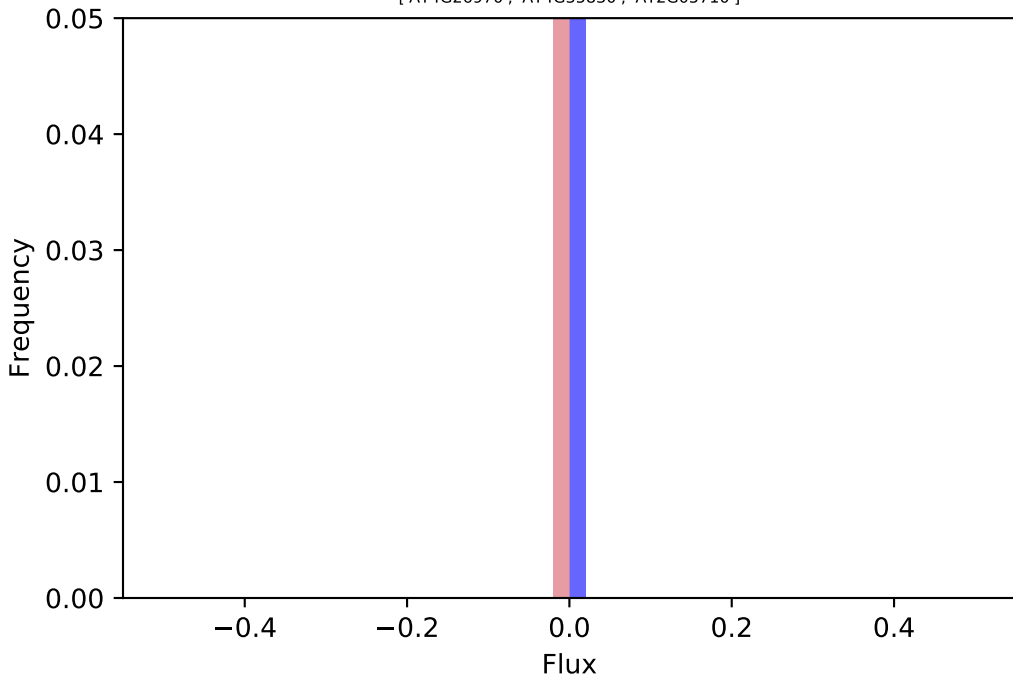
117 : A\_DASH\_CoA\_c + H2O\_c + OAA\_c --> Cit\_c + CoA\_c + H\_c  
['AT3G58750', 'AT2G42790']



118 : A\_DASH\_CoA\_h + H2O\_h + OAA\_h --> Cit\_h + CoA\_h + H\_h  
['AT2G44350']

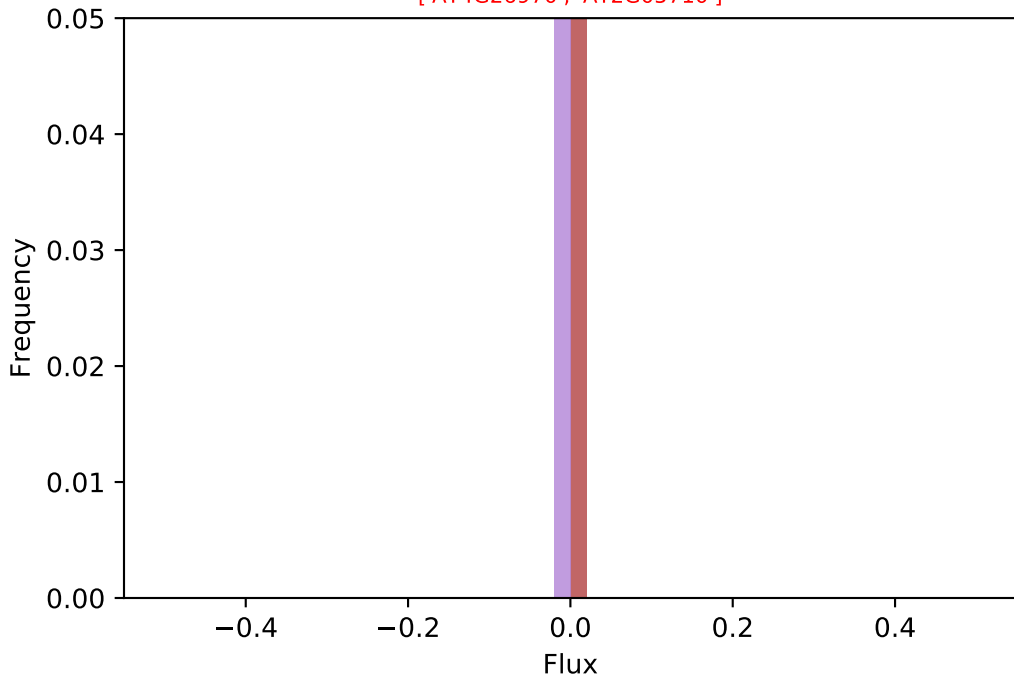


119 : Cit\_c --> H2O\_c + cACN\_c  
['AT4G26970', 'AT4G35830', 'AT2G05710']

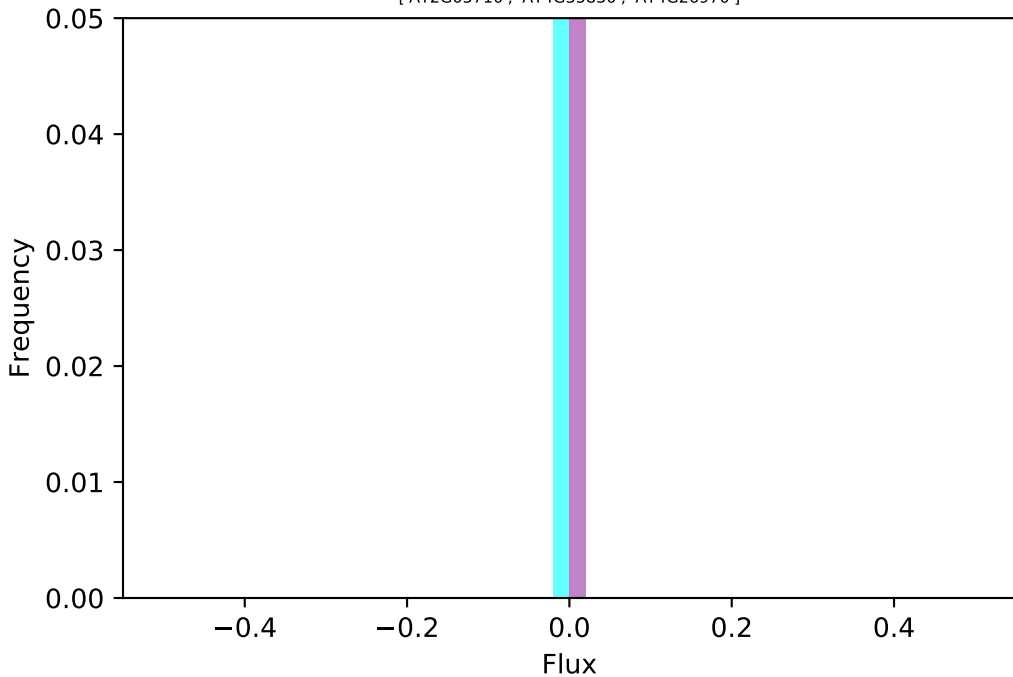




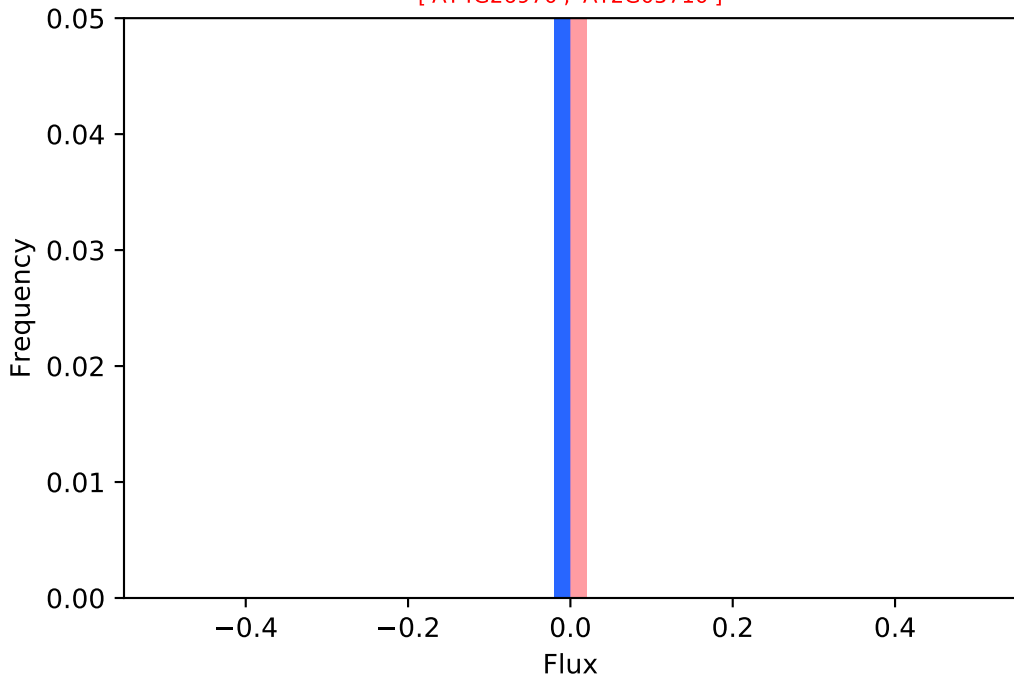
120 : Cit<sub>h</sub> --> H<sub>2</sub>O<sub>h</sub> + cACN<sub>h</sub>  
['AT4G26970', 'AT2G05710']



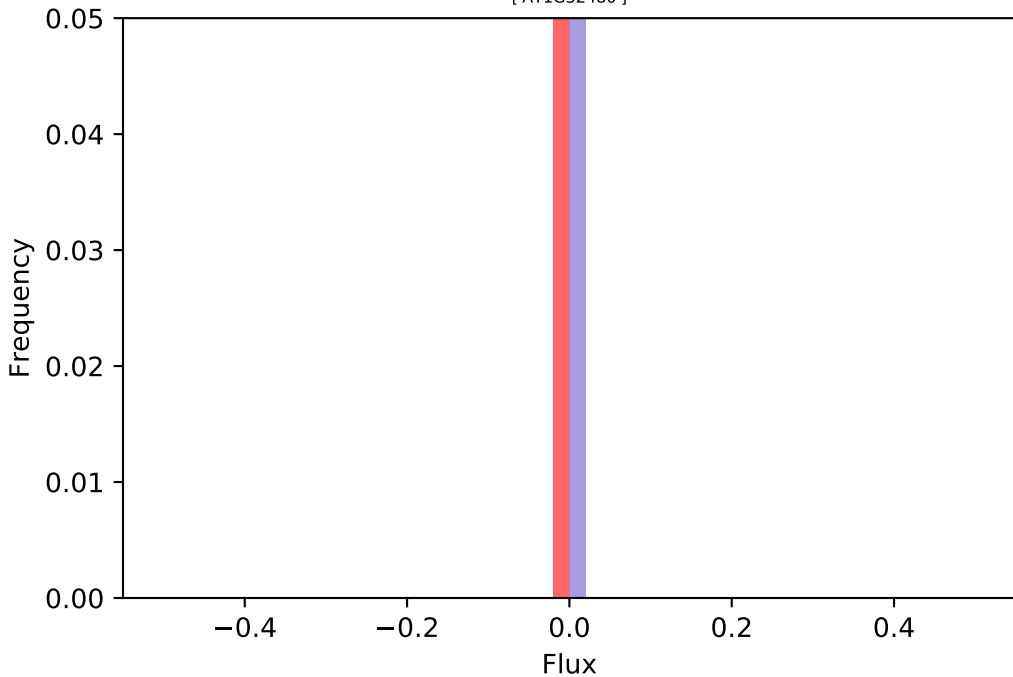
121 : H2O\_c + cACN\_c --> iCit\_c  
['AT2G05710', 'AT4G35830', 'AT4G26970']



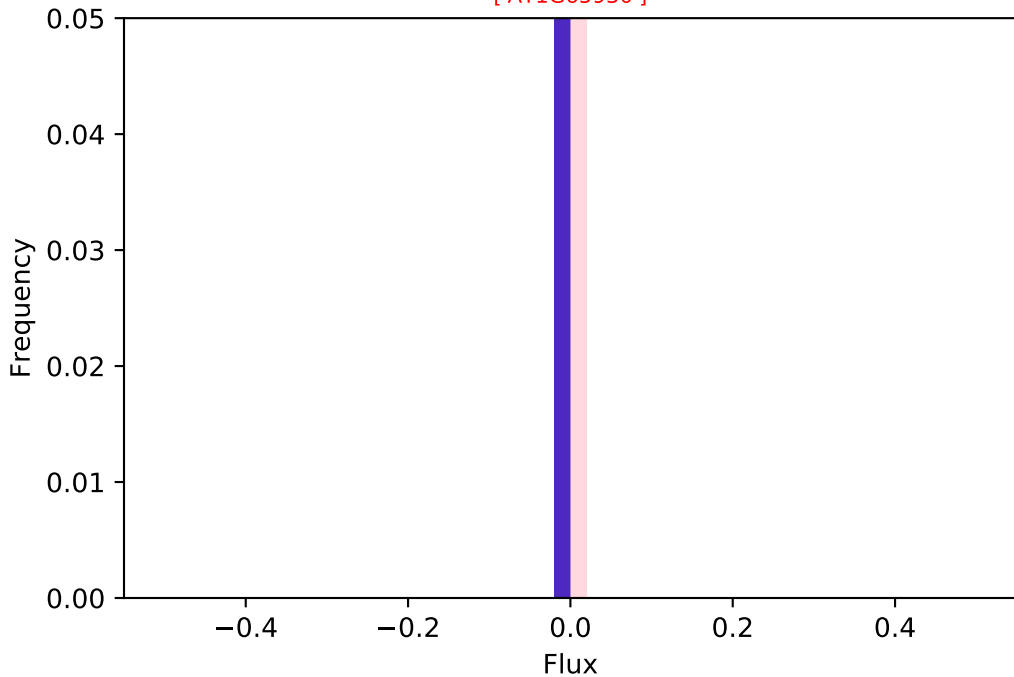
122 : H2O\_h + cACN\_h --> iCit\_h  
['AT4G26970', 'AT2G05710']



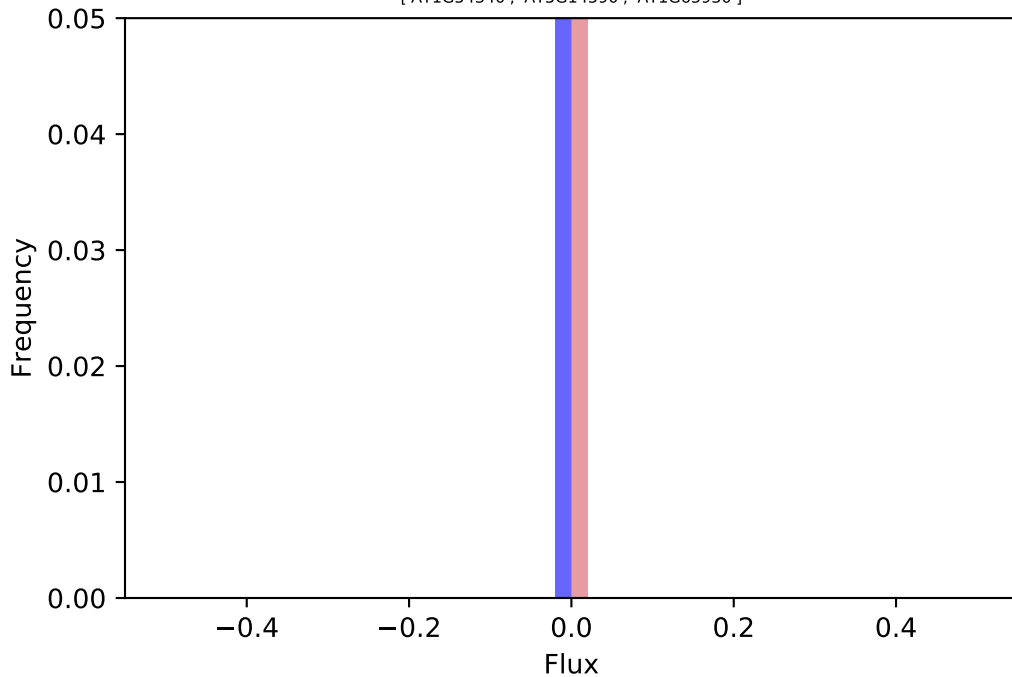
123 : H<sub>c</sub> + NAD<sub>c</sub> + iCit<sub>c</sub> --> CO<sub>2</sub><sub>c</sub> + KG<sub>c</sub> + NADH<sub>c</sub>  
['AT1G32480']



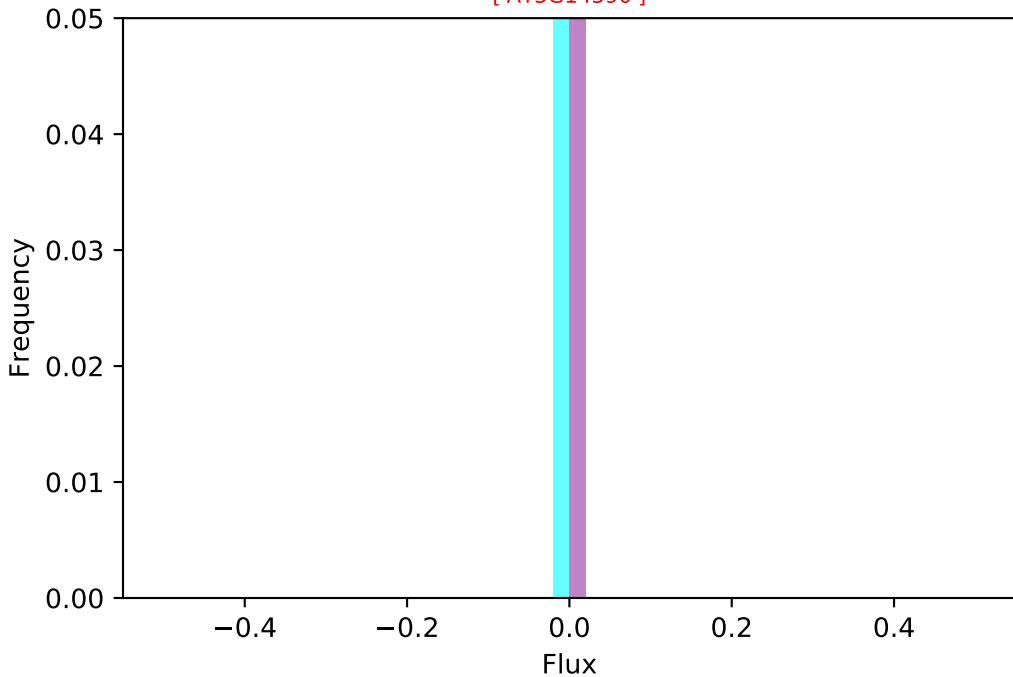
124 : H\_c + NADP\_c + iCit\_c --> CO2\_c + KG\_c + NADPH\_c  
['AT1G65930']

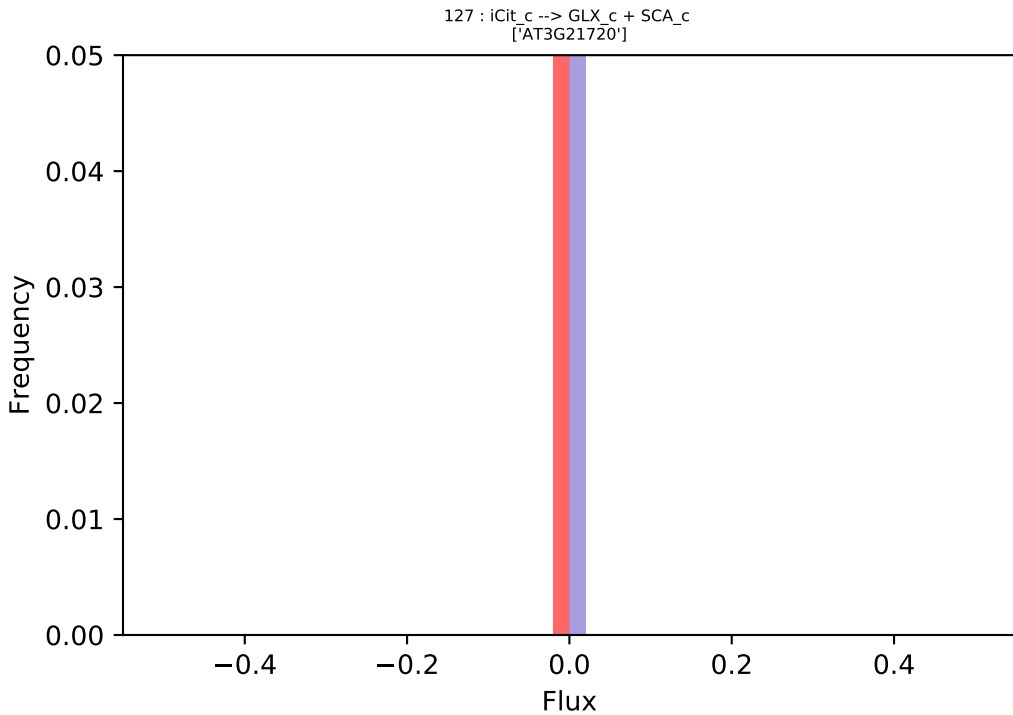


125 : NADP\_h + iCit\_h --> CO2\_h + KG\_h + NADPH\_h  
['AT1G54340', 'AT5G14590', 'AT1G65930']



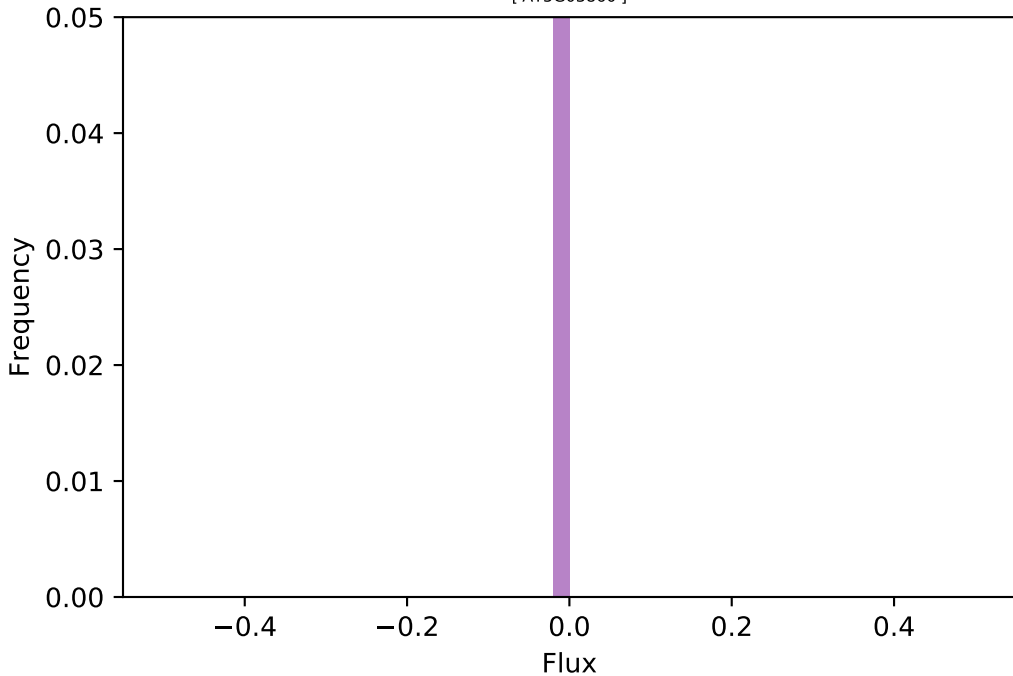
126 : NADP\_m + iCit\_m --> CO2\_m + KG\_m + NADPH\_m  
['AT5G14590']



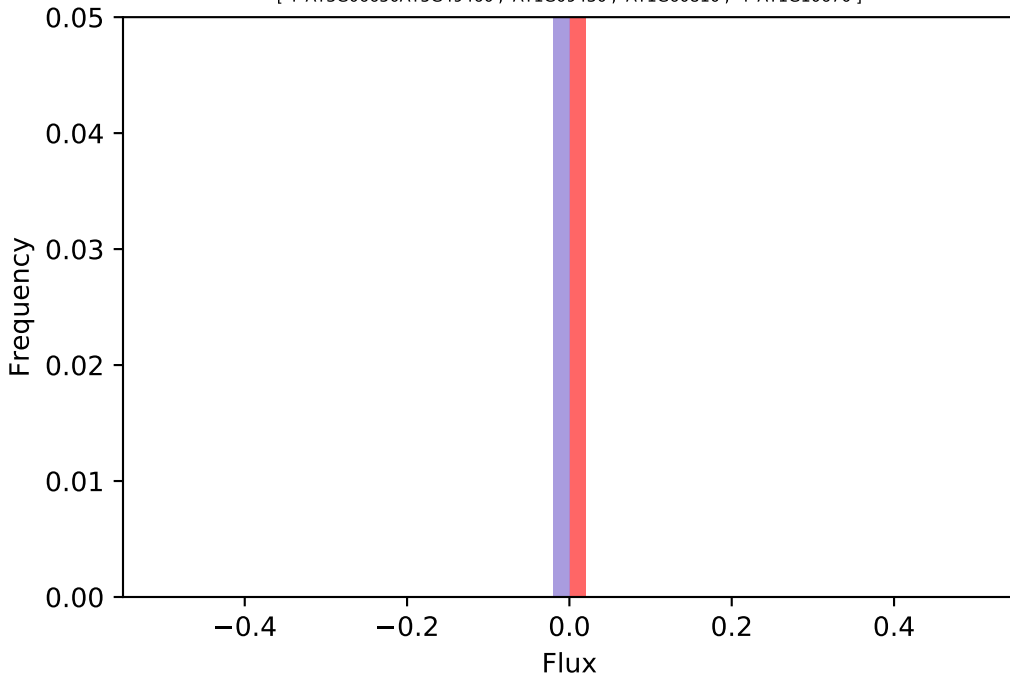




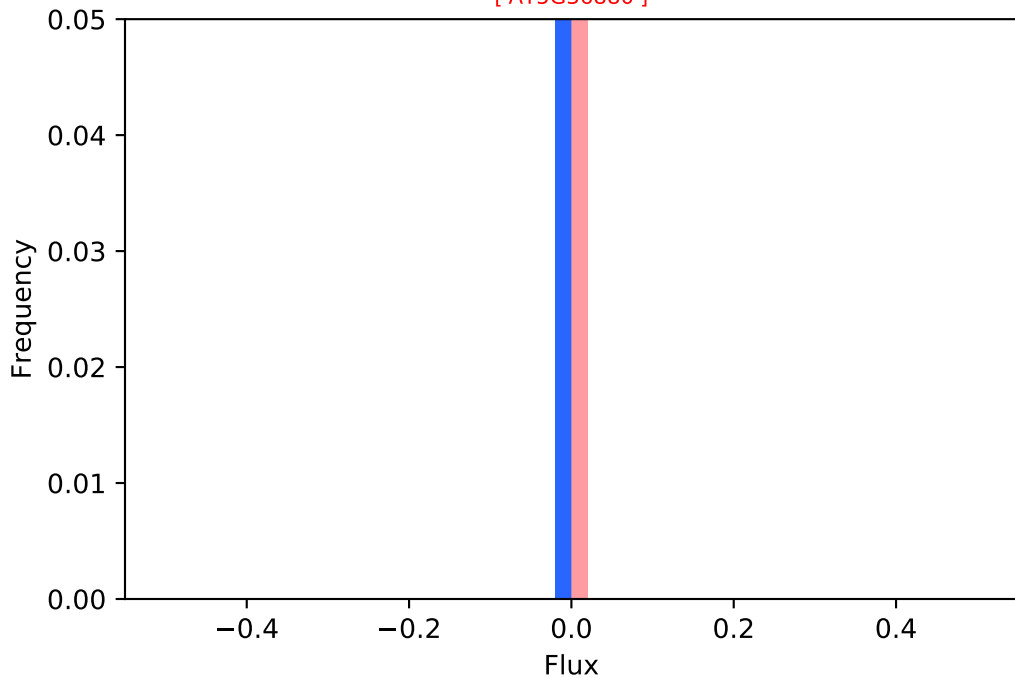
128 : A\_DASH\_CoA\_c + GLX\_c + H2O\_c --> CoA\_c + H\_c + Mal\_c  
['AT5G03860']



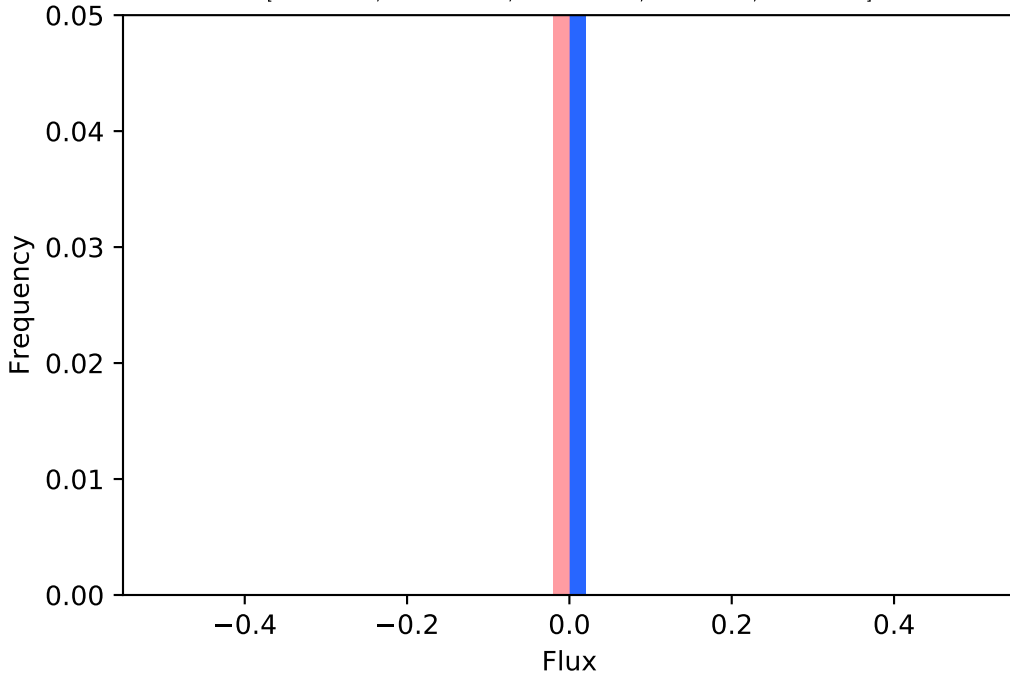
129 : ATP\_c + Cit\_c + CoA\_c --> ADP\_c + A\_DASH\_CoA\_c + OAA\_c + Pi\_c  
['4\*AT3G06650AT5G49460', 'AT1G09430', 'AT1G60810', '4\*AT1G10670']



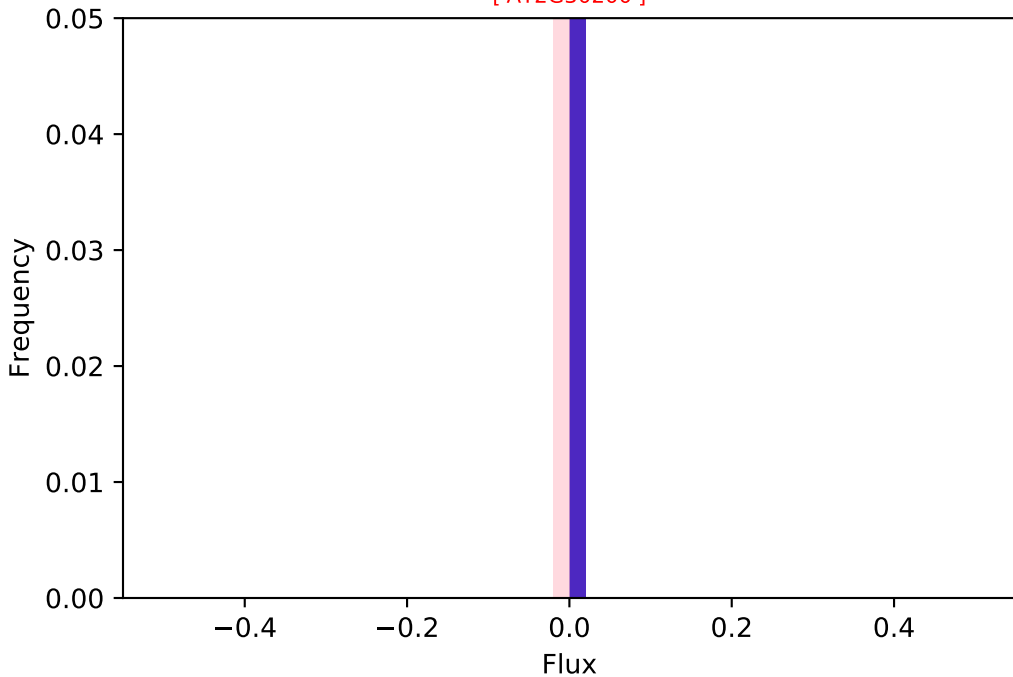
130 : AC\_h + ATP\_h + CoA\_h --> AMP\_h + A\_DASH\_CoA\_h + H\_h + PPi\_h  
['AT5G36880']



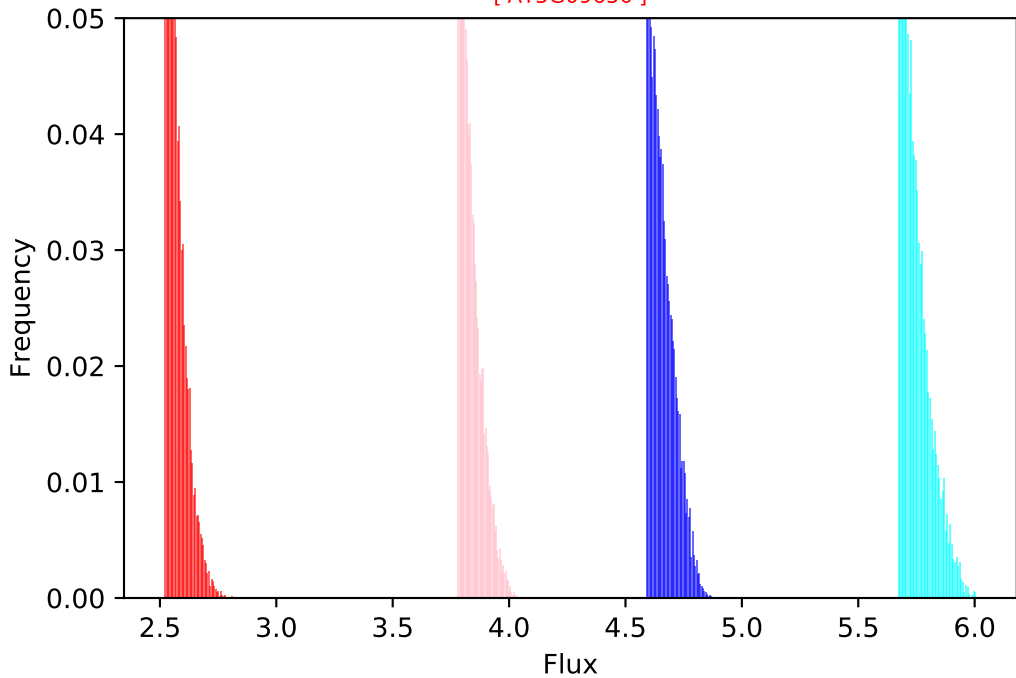
131 : ATP\_h + A\_DASH\_CoA\_h + HCO3\_h --> ADP\_h + H\_h + M\_DASH\_CoA\_h + Pi\_h  
['AT5G35360', '2\*ATCG00500', '2\*AT2G38040', 'AT5G16390', 'AT5G15530']



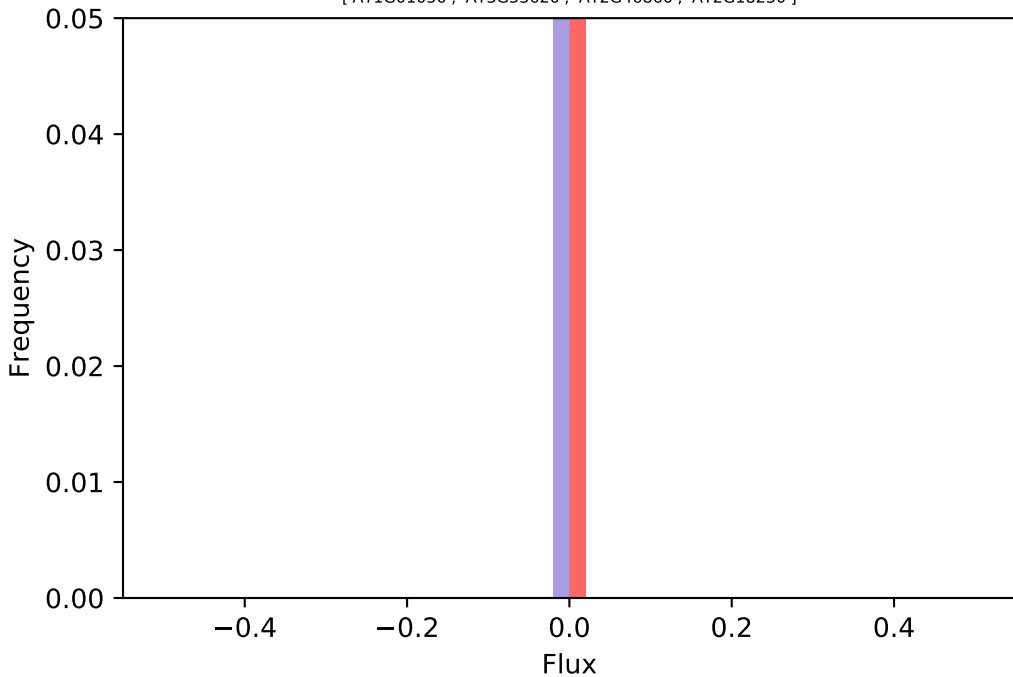
132 : ACP\_h + M\_DASH\_CoA\_h --> CoA\_h + M\_DASH\_ACP\_h  
['AT2G30200']



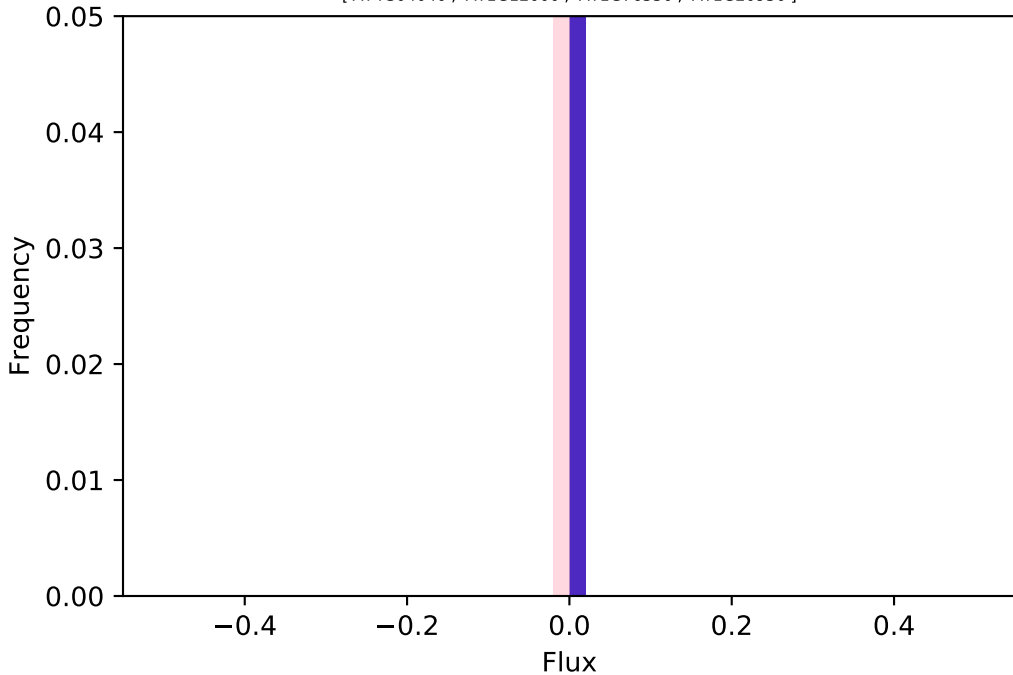
133 : H2O\_h + PPi\_h --> 2.0 Pi\_h  
['AT5G09650']



134 : H<sub>2</sub>O\_c + P Pi\_c --> H\_c + 2.0 Pi\_c  
['AT1G01050', 'AT3G53620', 'AT2G46860', 'AT2G18230']

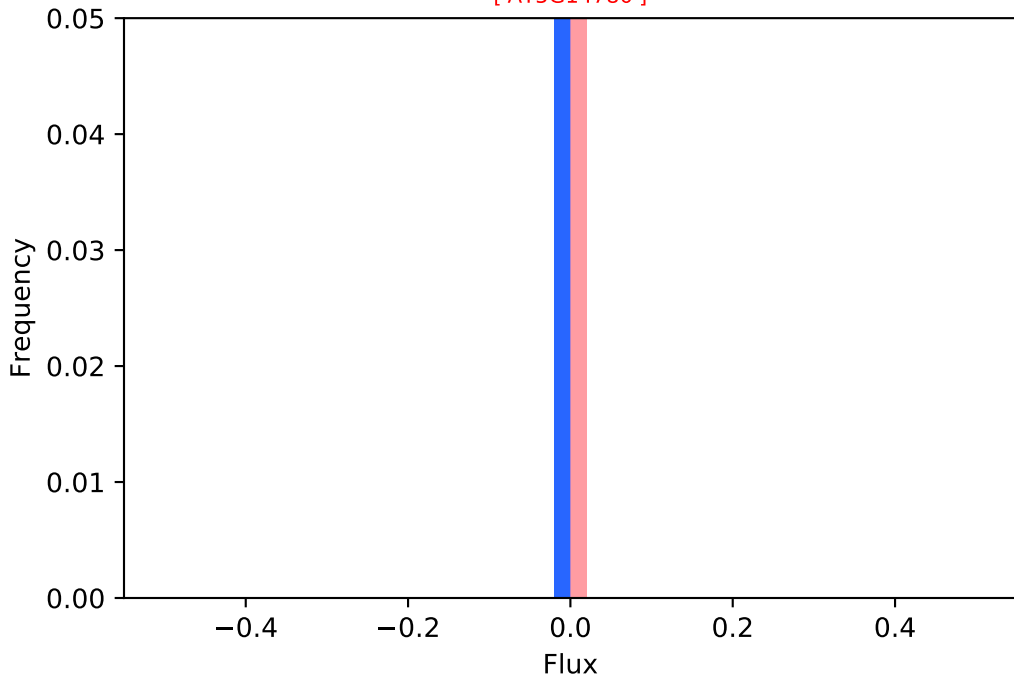


135 : F6P\_c + PPi\_c <=> FBP\_c + H\_c + Pi\_c  
['AT4G04040', 'AT1G12000', 'AT1G76550', 'AT1G20950']

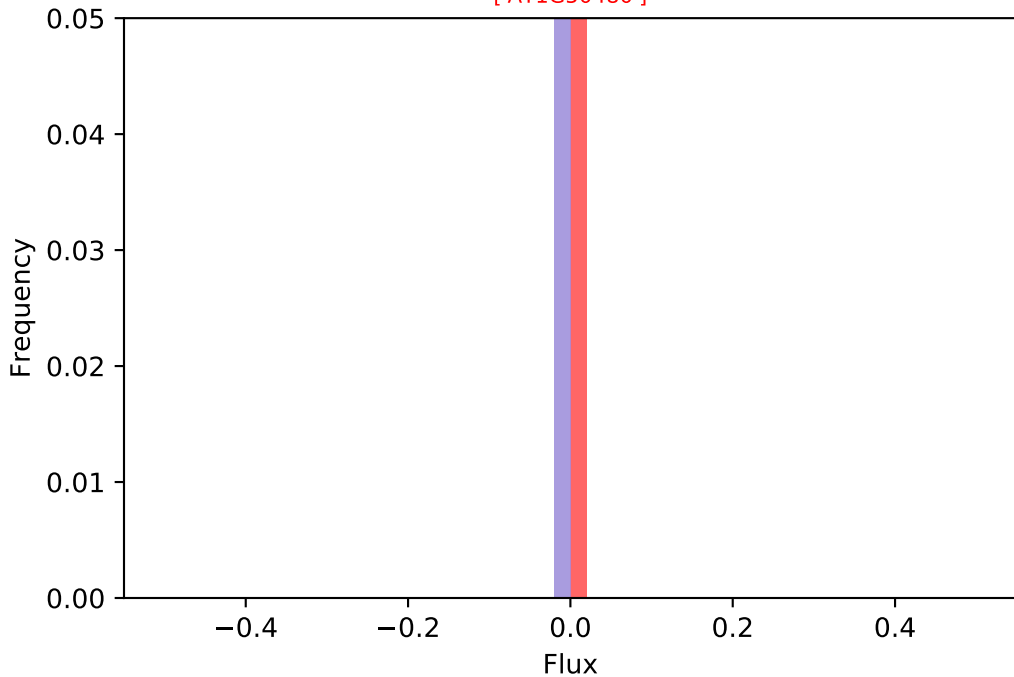




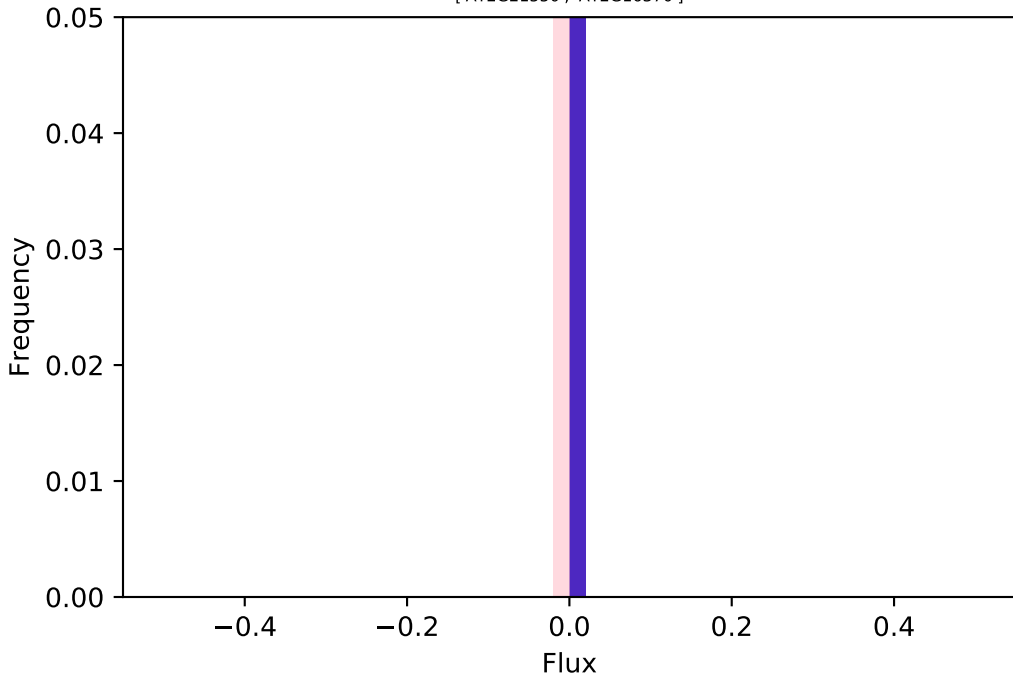
136 : CO2\_h + NADH\_h --> For\_h + NAD\_h  
['AT5G14780']



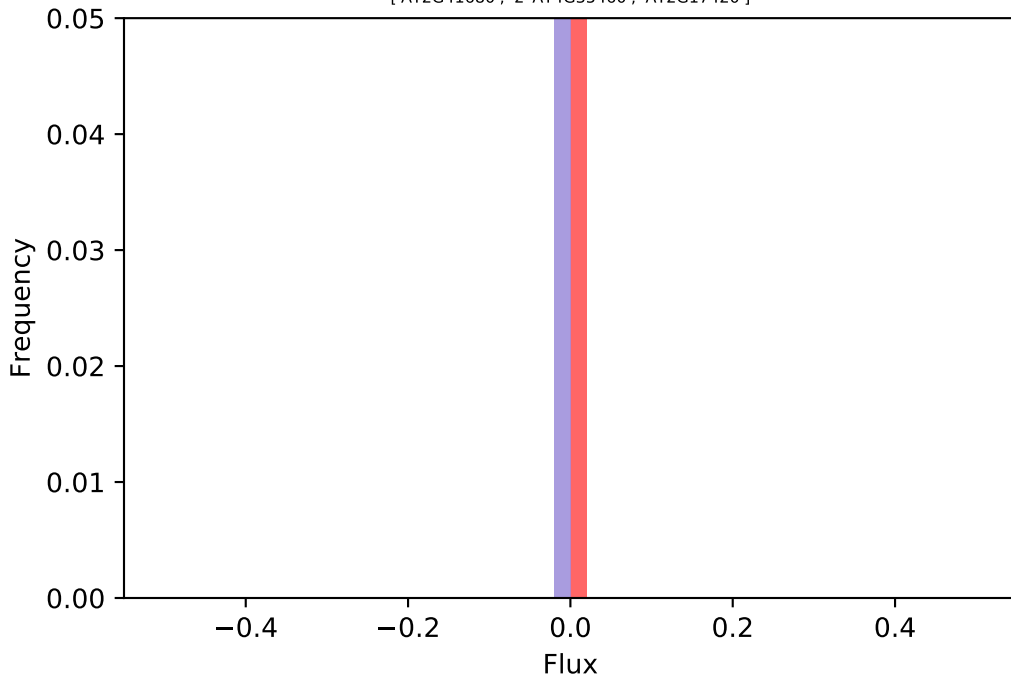
137 : ATP\_h + For\_h + H\_h + THF\_h --> ADP\_h + F\_DASH\_THF\_h + Pi\_h  
['AT1G50480']



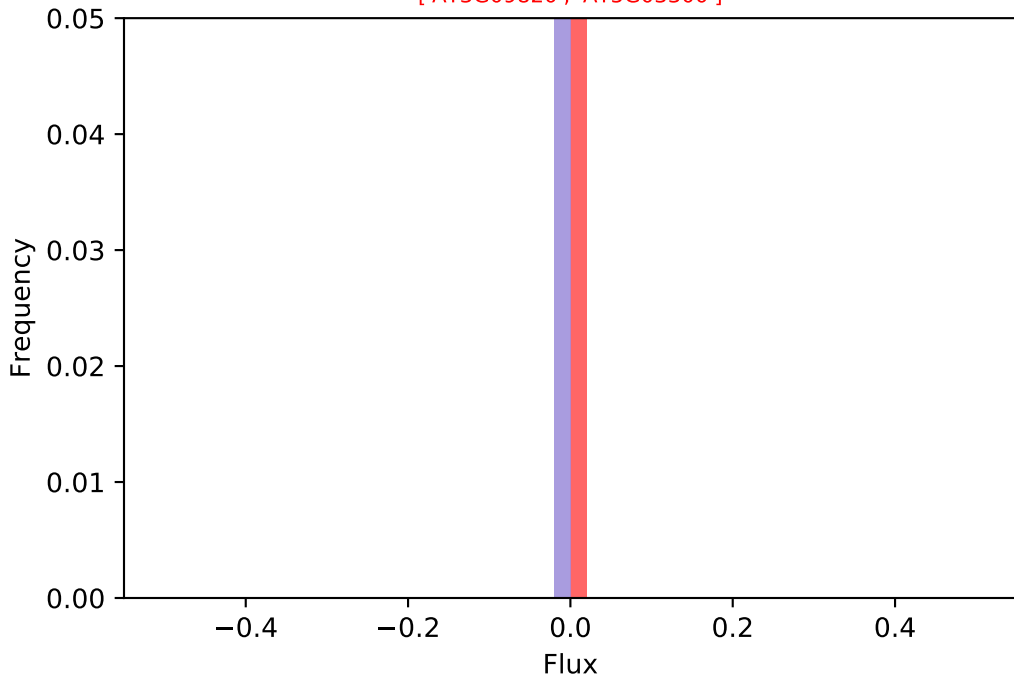
138 : DHF\_c + NADPH\_c --> NADP\_c + THF\_c  
['AT2G21550', 'AT2G16370']



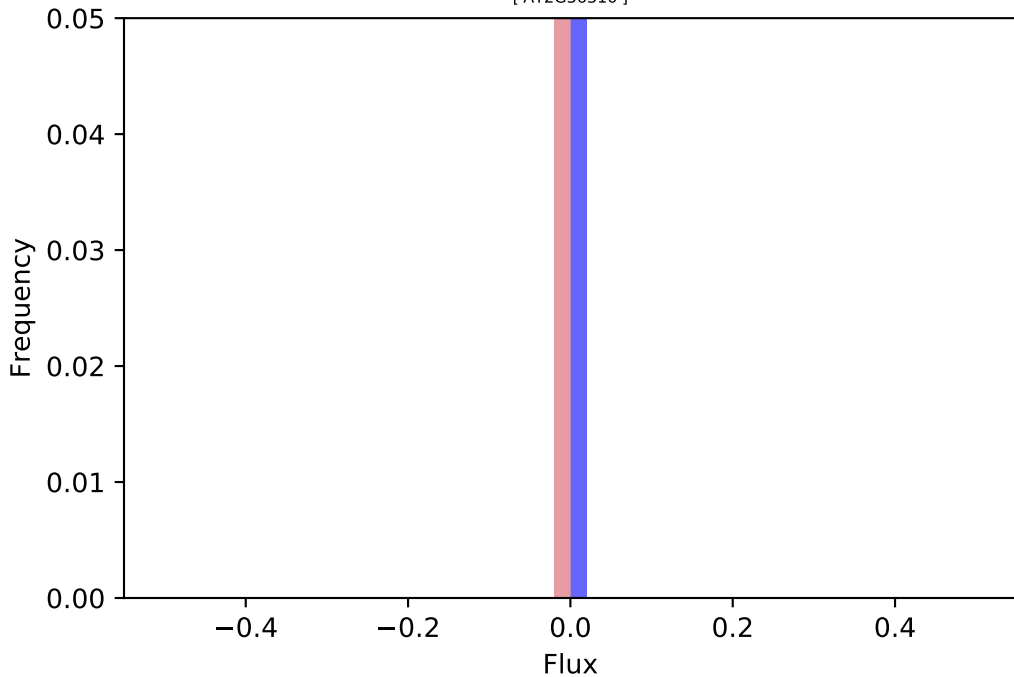
139 : NADPH\_c + TRXox\_c --> NADP\_c + TRXrd\_c  
['AT2G41680', '2\*AT4G35460', 'AT2G17420']



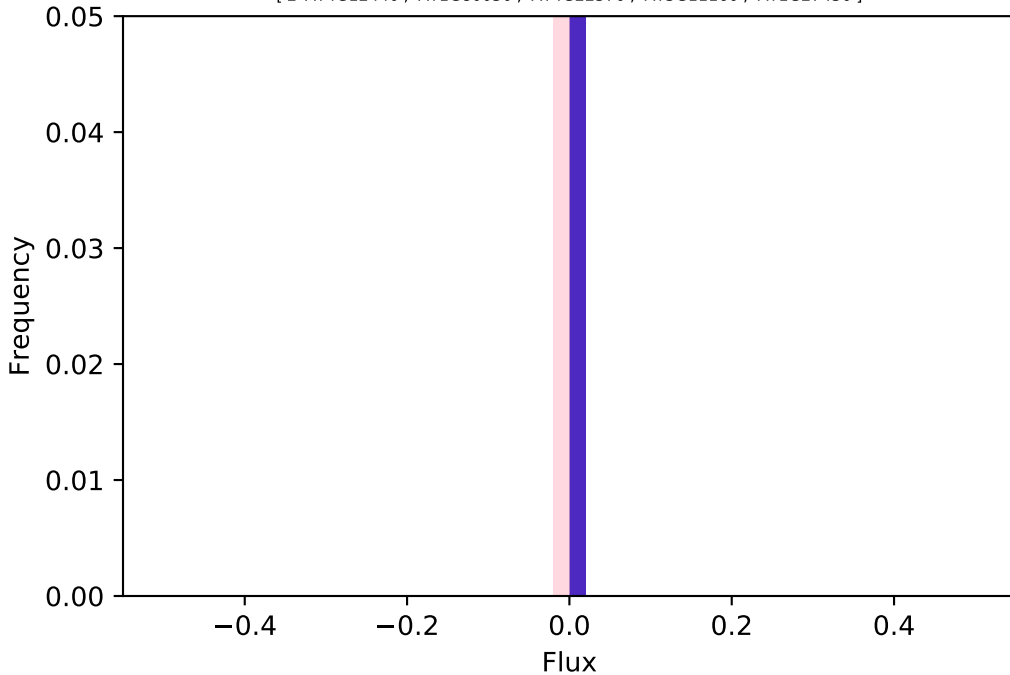
140 : ADN\_c + ATP\_c --> ADP\_c + AMP\_c + H\_c  
['AT3G09820', 'AT5G03300']



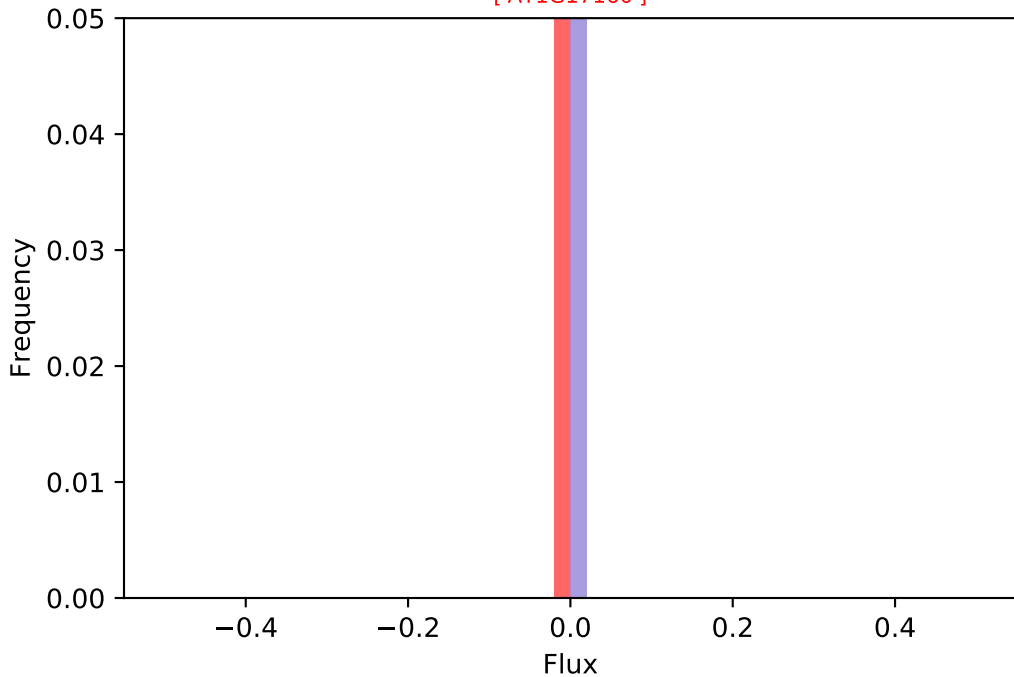
141 : ADN\_c + H2O\_c --> AD\_c + H\_c + Rib\_c  
['AT2G36310']



142 : AD\_c + PRPP\_c --> AMP\_c + PPi\_c  
['2\*AT4G12440', 'AT1G80050', 'AT4G22570', 'AT5G11160', 'AT1G27450']

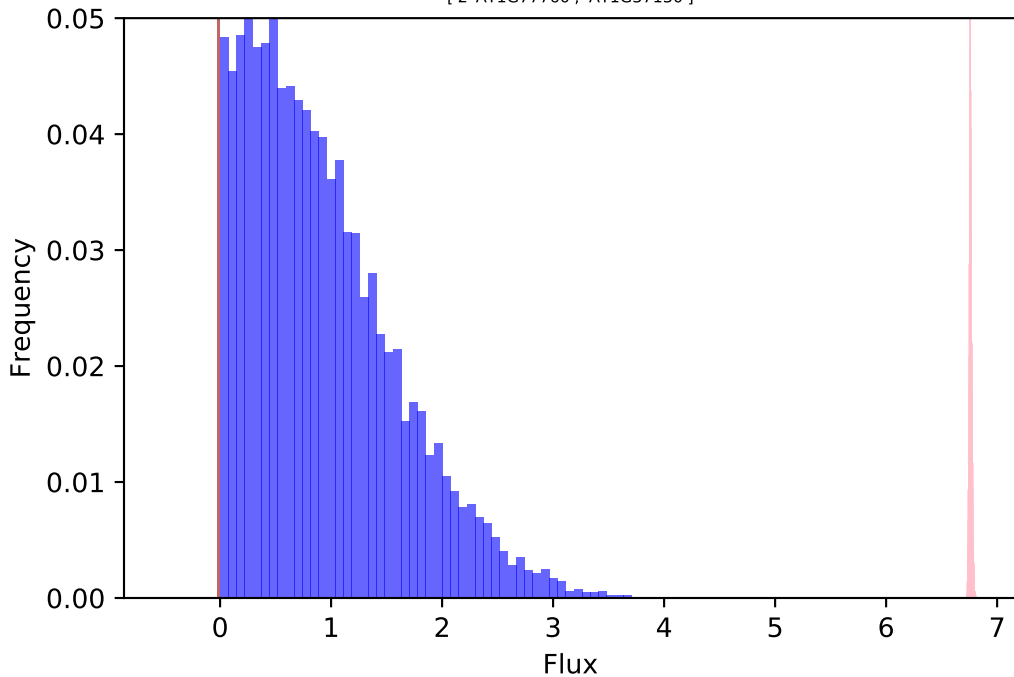


143 : ATP\_h + Rib\_h --> ADP\_h + H\_h + R5P\_h  
['AT1G17160']

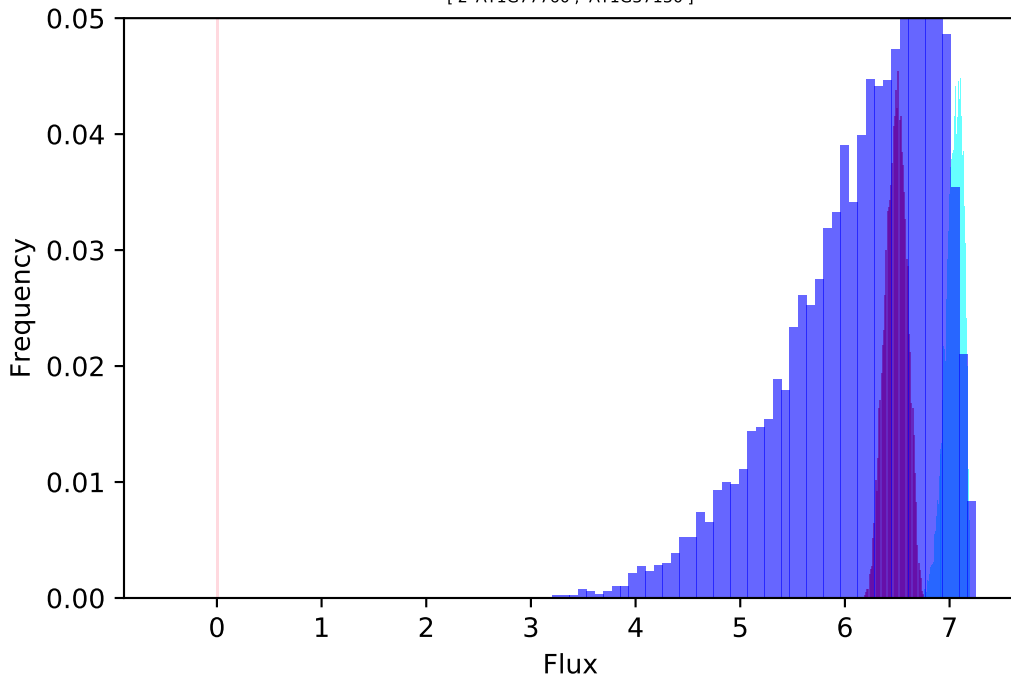




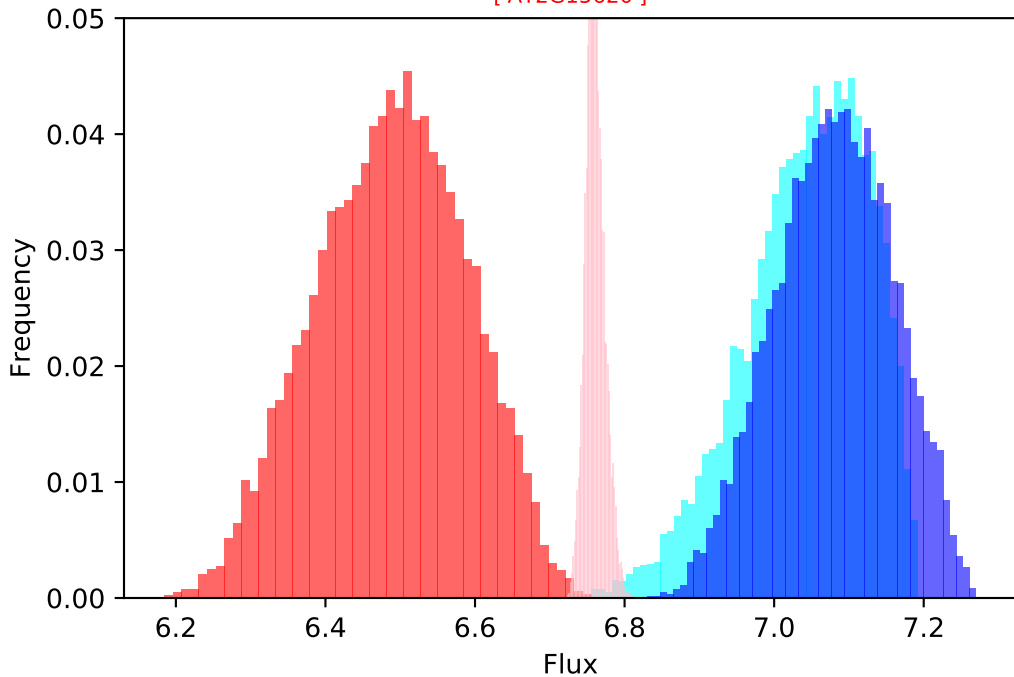
144 : NADH\_c + NO3\_c --> H2O\_c + NAD\_c + NO2\_c  
['2\*AT1G77760', 'AT1G37130']



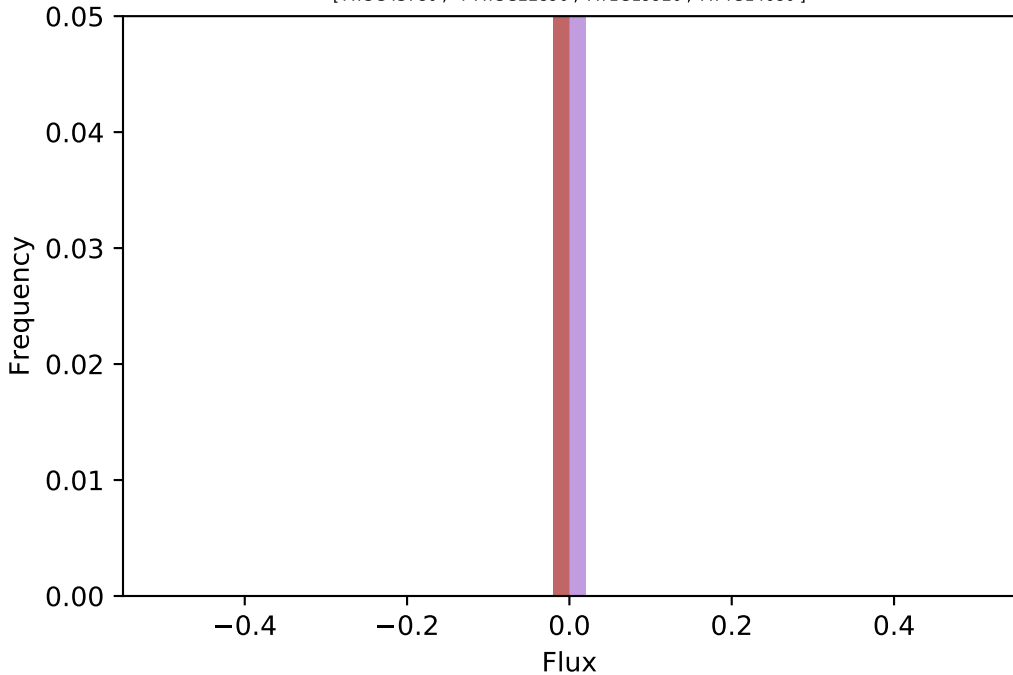
145 :  $\text{NADPH}_c + \text{NO3}_c \rightleftharpoons \text{H2O}_c + \text{NADP}_c + \text{NO2}_c$   
['2\*AT1G77760', 'AT1G37130']



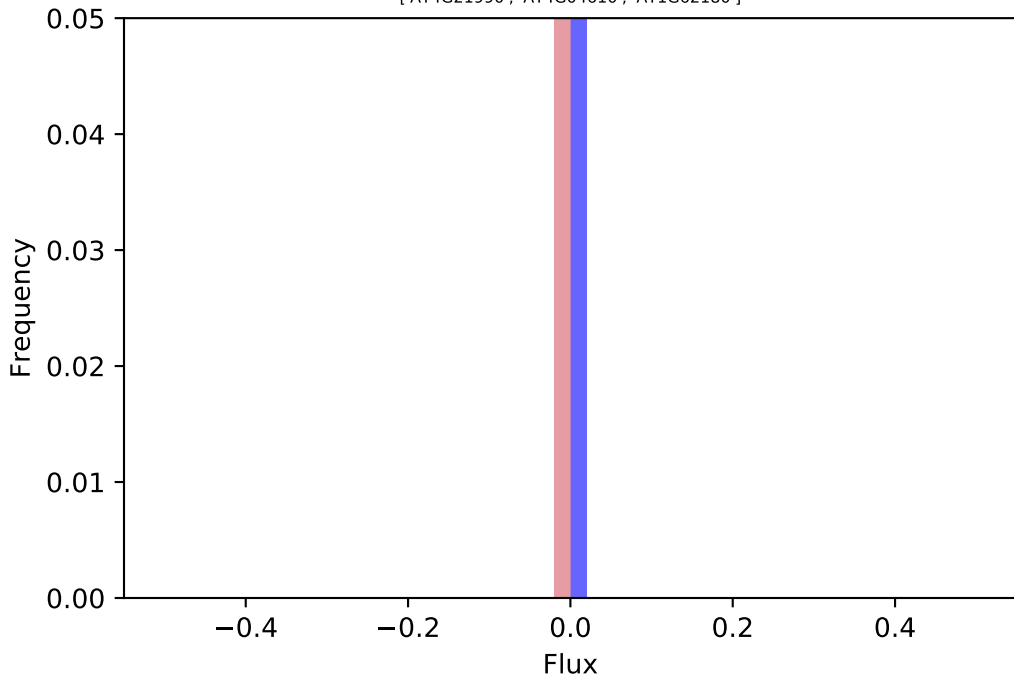
146 : 6.0 Fdrd\_h + 8.0 H\_h + NO2\_h --> 6.0 Fdox\_h + 2.0 H2O\_h + NH4\_h  
[AT2G15620']



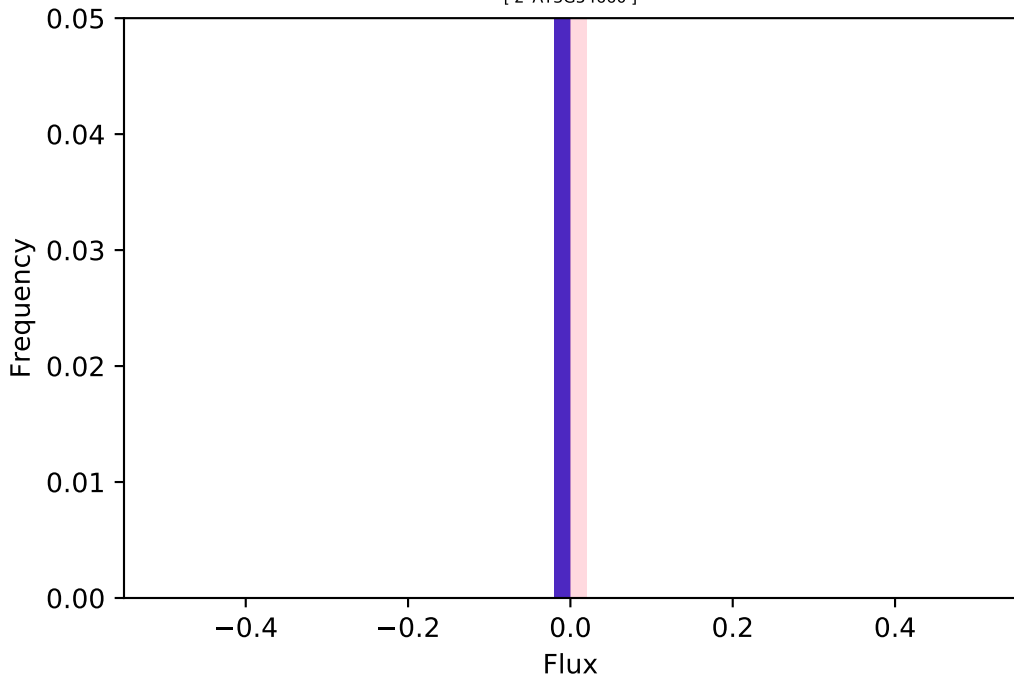
147 : ATP\_h + SO4\_h --> APS\_h + PPi\_h  
['AT5G43780', '4\*AT3G22890', 'AT1G19920', 'AT4G14680']



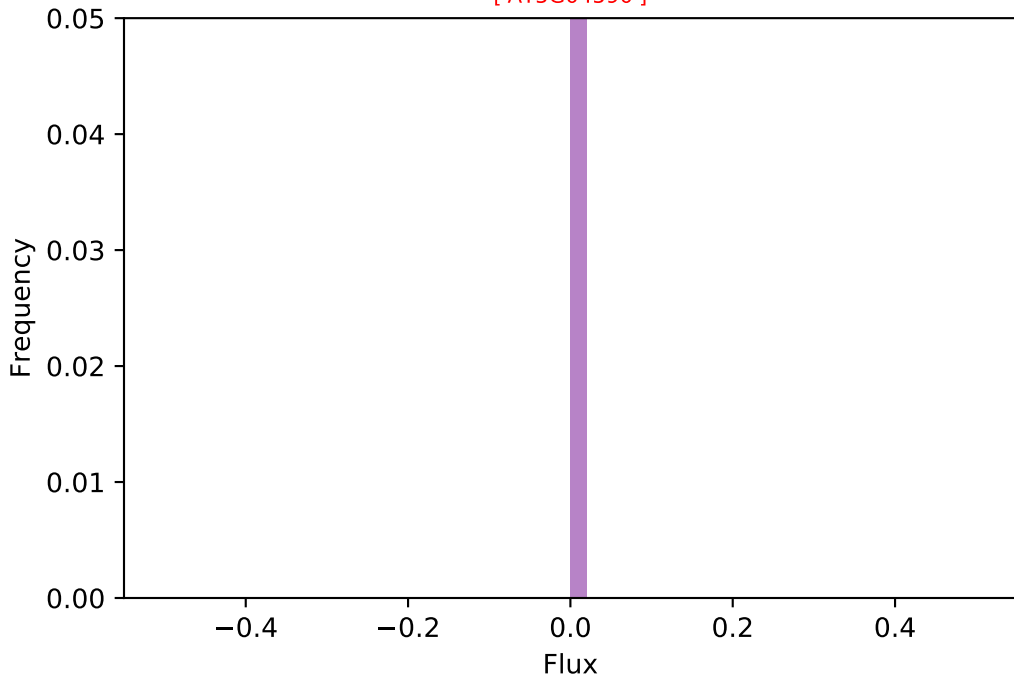
148 : APS\_h + 2.0 GSH\_h --> AMP\_h + GSSG\_h + H\_h + SO3\_h  
['AT4G21990', 'AT4G04610', 'AT1G62180']



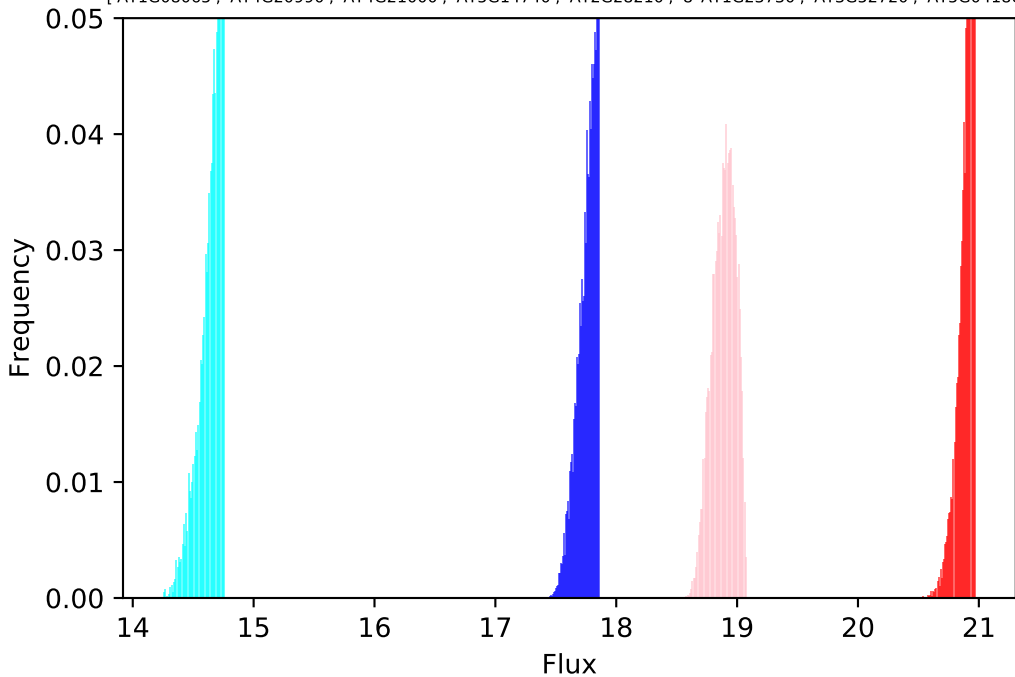
149 : GSSG\_h + H\_h + NADPH\_h --> 2.0 GSH\_h + NADP\_h  
['2\*AT3G54660']



150 : 3.0 Fdrd\_h + 7.0 H\_h + SO3\_h --> 3.0 Fdox\_h + 3.0 H2O\_h + H2S\_h  
['AT5G04590']



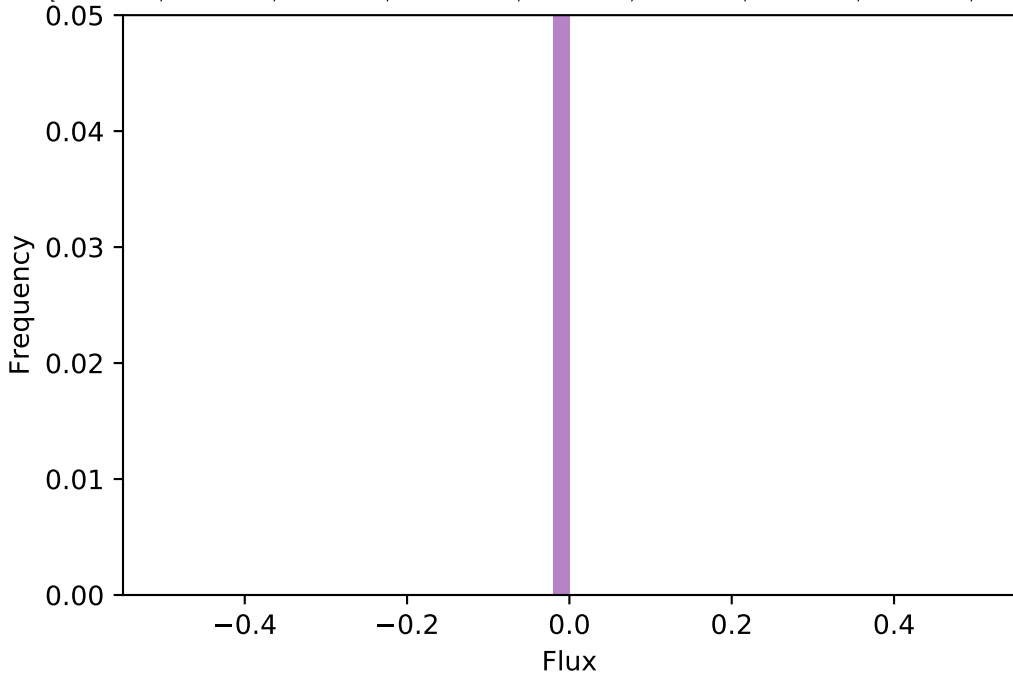
151 : CO<sub>2</sub>\_c + H<sub>2</sub>O\_c --> HCO<sub>3</sub>\_c + H\_c  
['AT1G08065', 'AT4G20990', 'AT4G21000', 'AT5G14740', 'AT2G28210', '8\*AT1G23730', 'AT3G52720', 'AT5G04180']



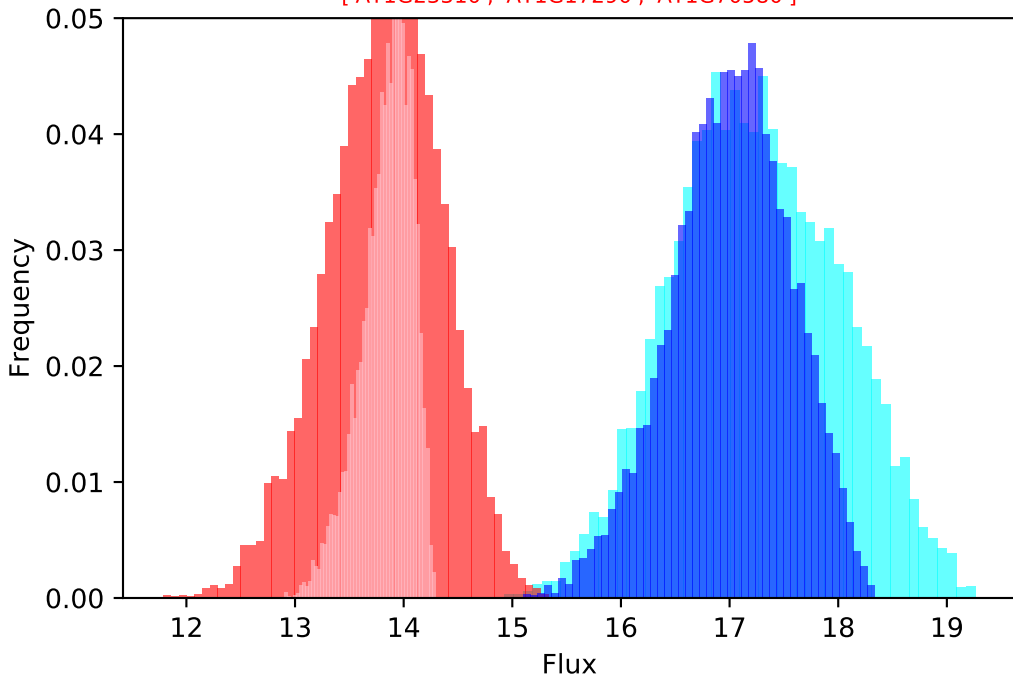


152 : CO2\_h + H2O\_h --> HCO3\_h + H\_h

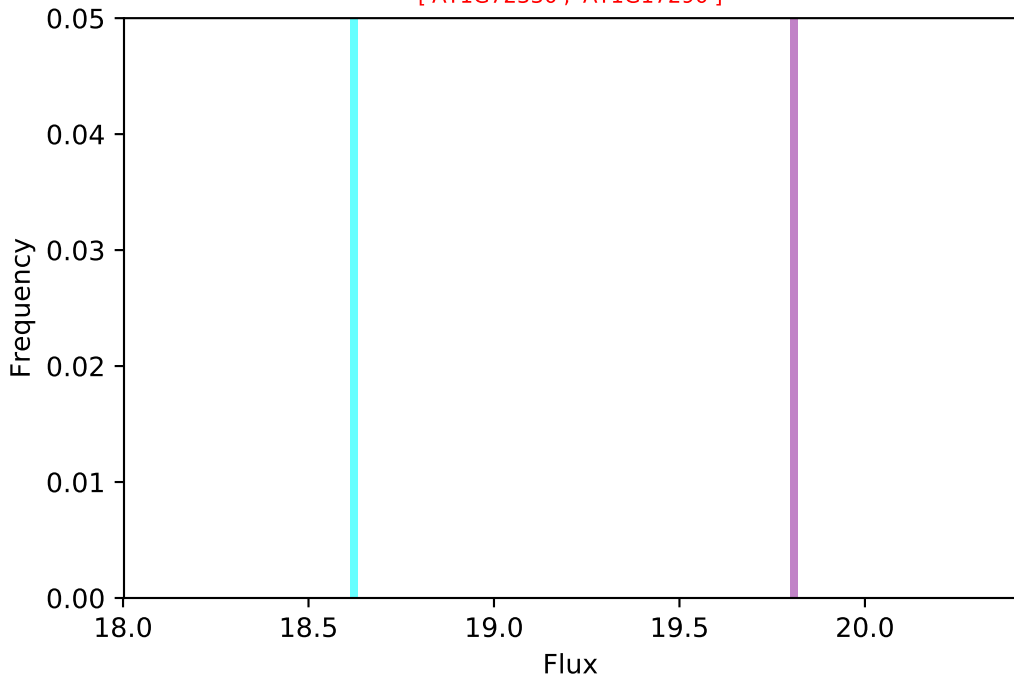
['AT1G70410', 'AT4G20990', 'AT1G58180', '8\*AT1G23730', 'AT1G08080', 'AT3G01500', 'AT4G33580', 'AT5G14740', 'AT3G52720']



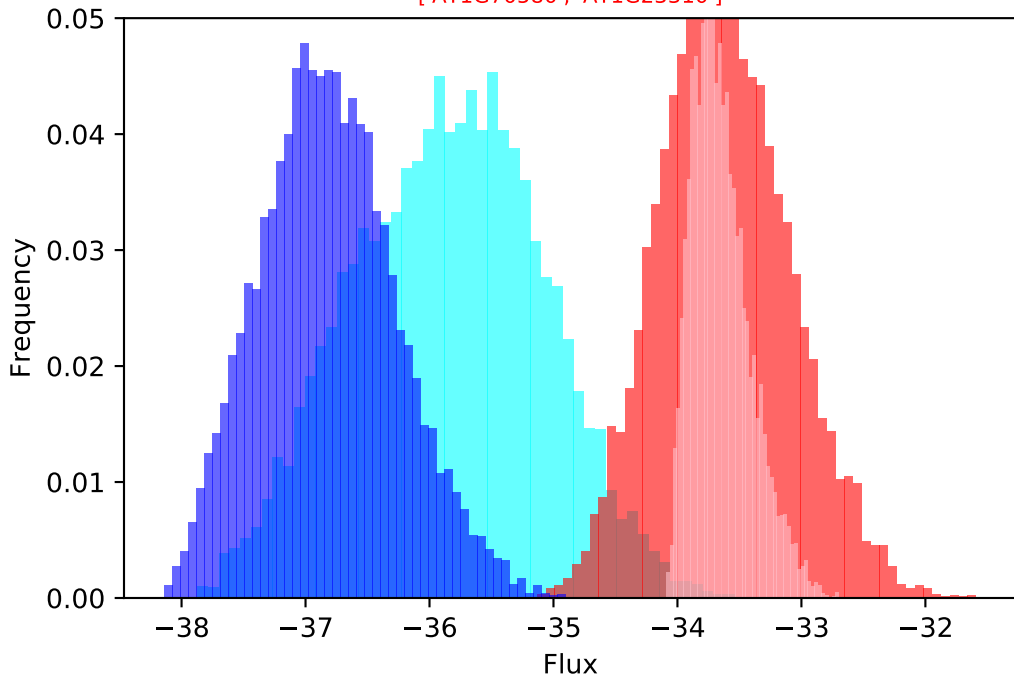
153 : Glu\_h + Pyr\_h <=> Ala\_h + KG\_h  
['AT1G23310', 'AT1G17290', 'AT1G70580']



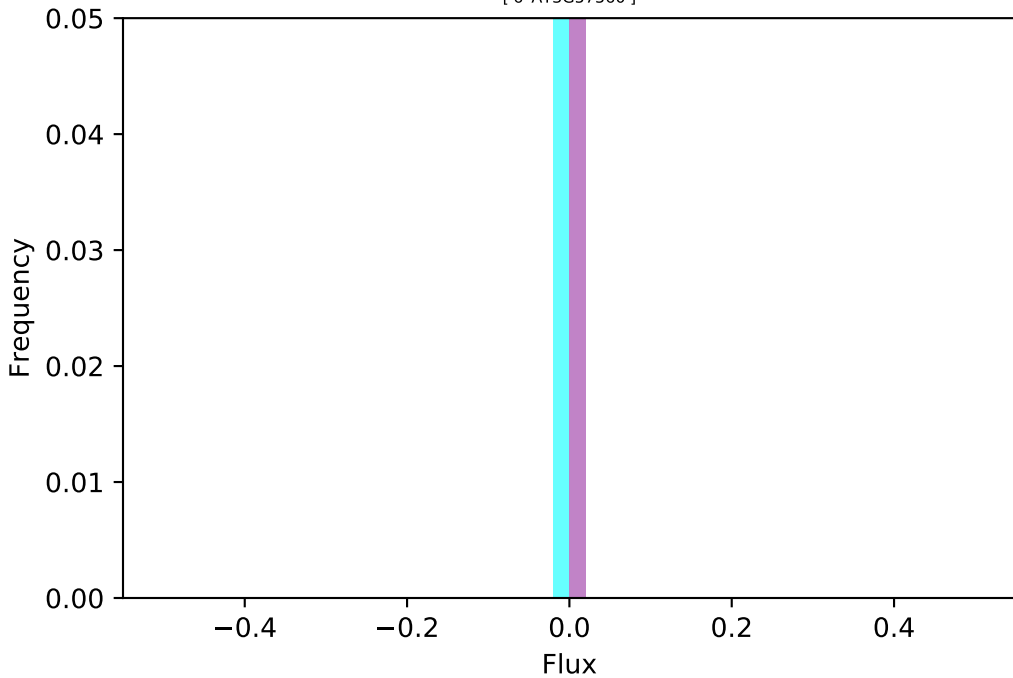
154 : Glu\_m + Pyr\_m <=> Ala\_m + KG\_m  
['AT1G72330', 'AT1G17290']



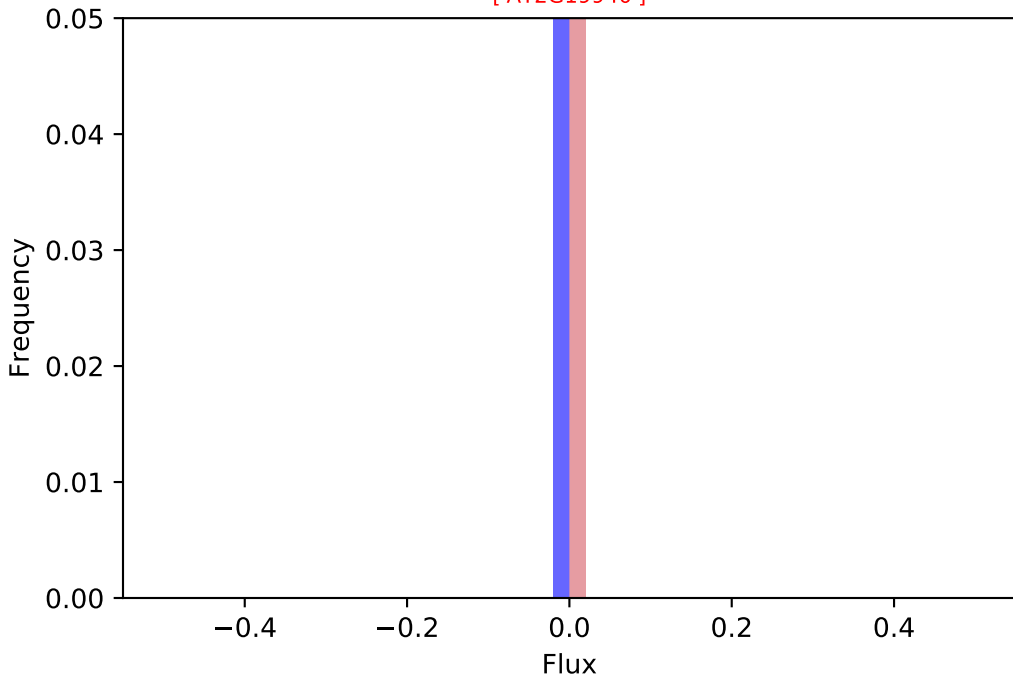
155 : Glu\_p + Pyr\_p <=> Ala\_p + KG\_p  
['AT1G70580', 'AT1G23310']



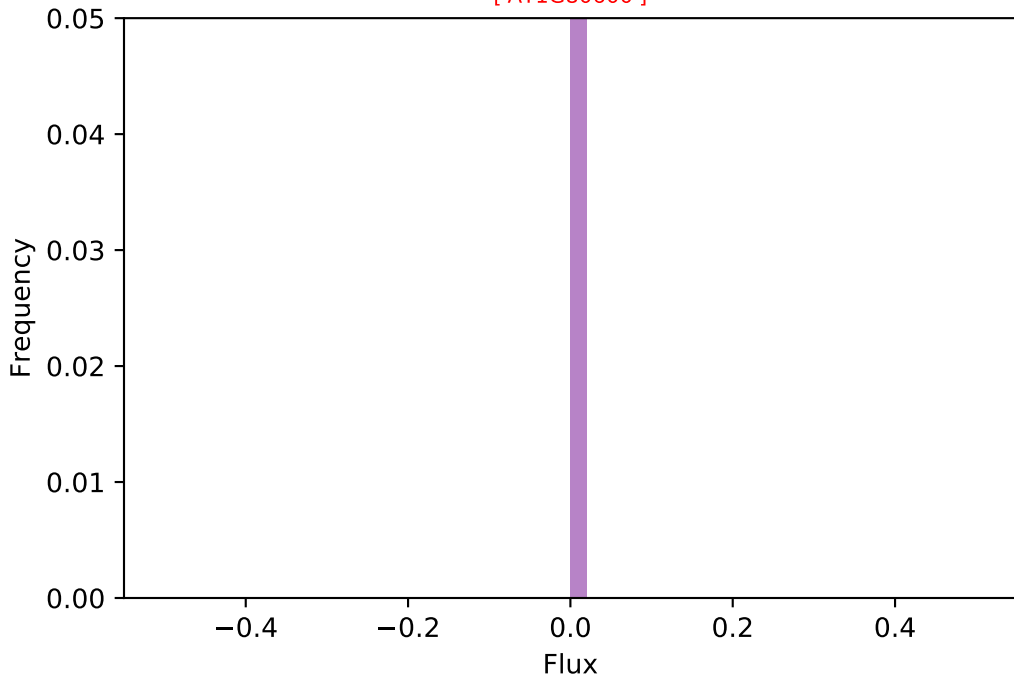
156 : ATP\_h + A\_DASH\_Glu\_h --> ADP\_h + A\_DASH\_GluP\_h  
['6\*AT3G57560']



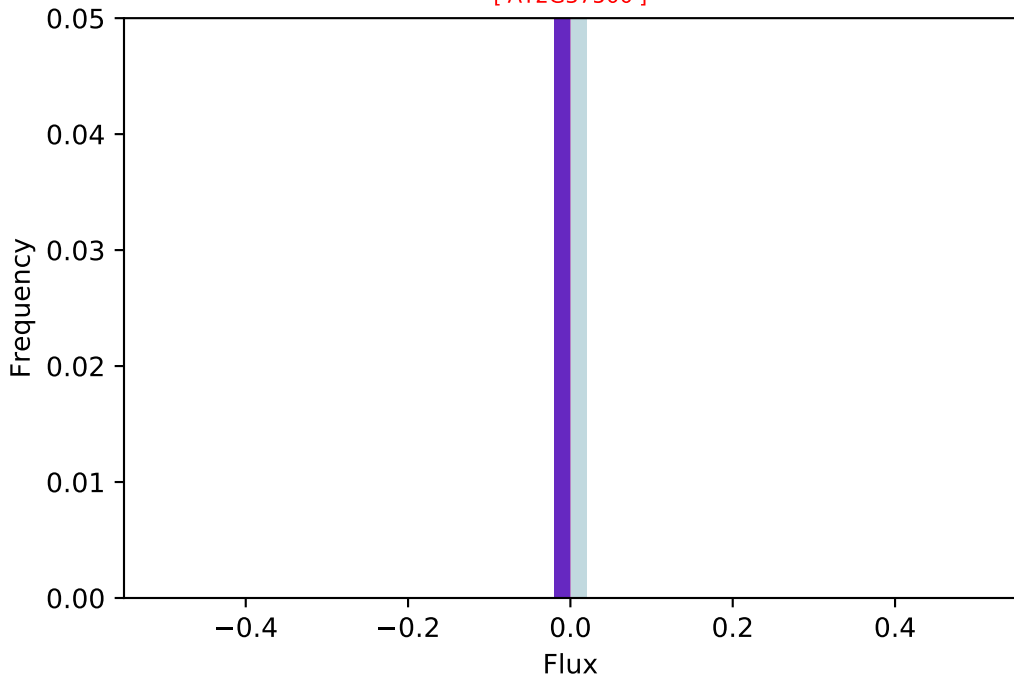
157 : A\_DASH\_GluP\_h + H\_h + NADPH\_h --> A\_DASH\_Glu\_DASH\_SeA\_h + NADP\_h + Pi\_h  
['AT2G19940']



158 : A\_DASH\_Glu\_DASH\_SeA\_h + Glu\_h --> A\_DASH\_Orn\_h + KG\_h  
['AT1G80600']

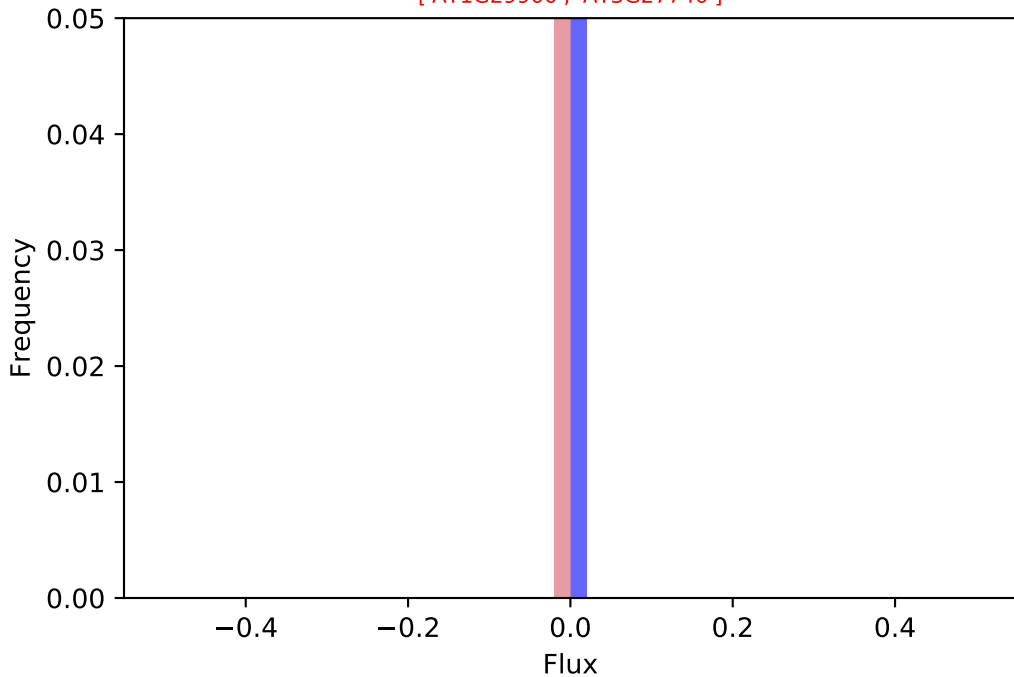


159 : A\_DASH\_Orn\_h + Glu\_h --> A\_DASH\_Glu\_h + Orn\_h  
['AT2G37500']

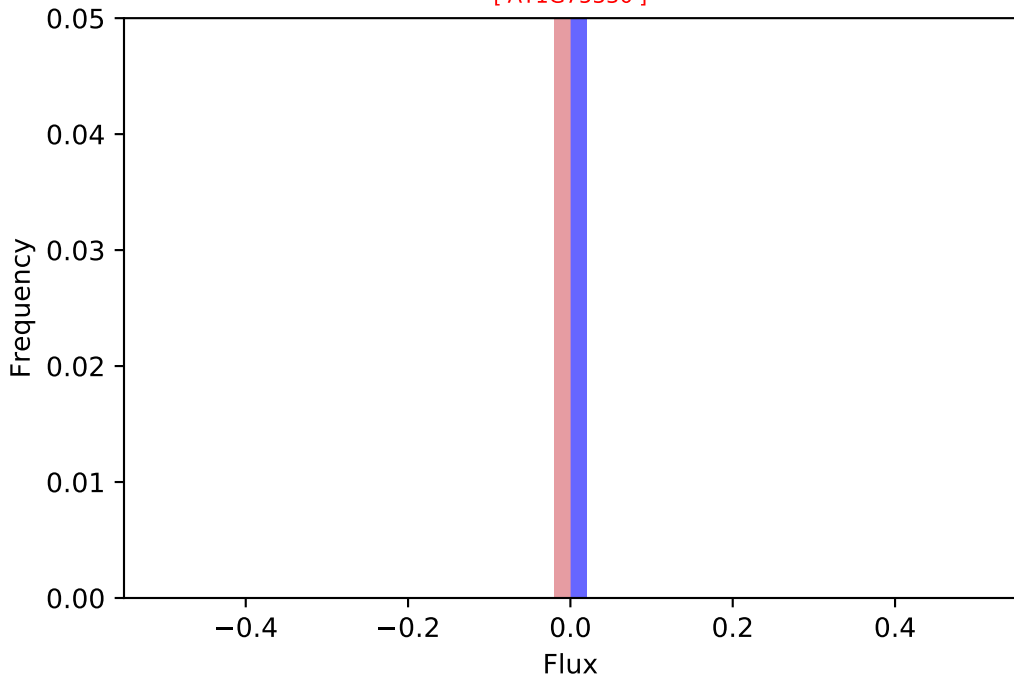




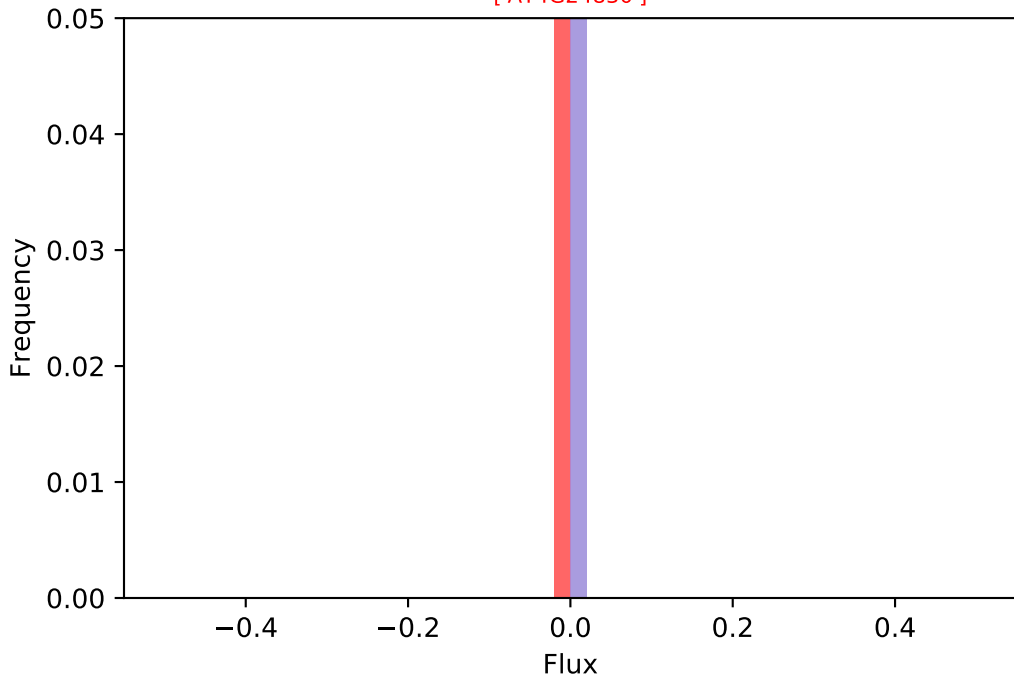
160 : 2.0 ATP\_h + Gln\_h + H2O\_h + HCO3\_h --> 2.0 ADP\_h + CBP\_h + Glu\_h + 3.0 H\_h + Pi\_h  
['AT1G29900', 'AT3G27740']



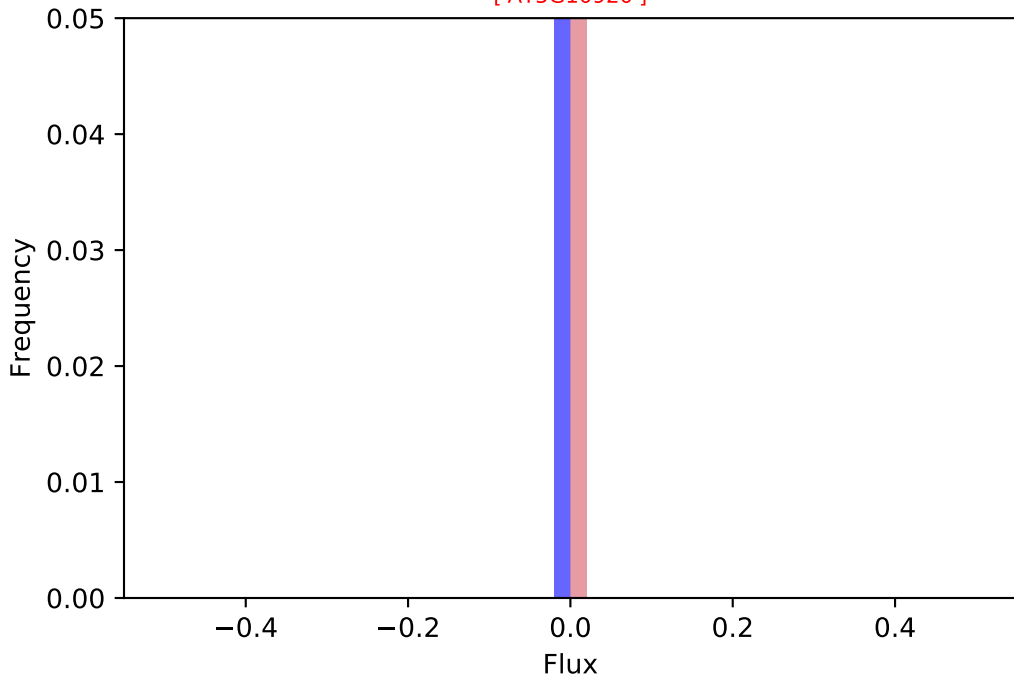
161 : CBP\_h + H\_h + Orn\_h <=> CTL\_h + Pi\_h  
['AT1G75330']



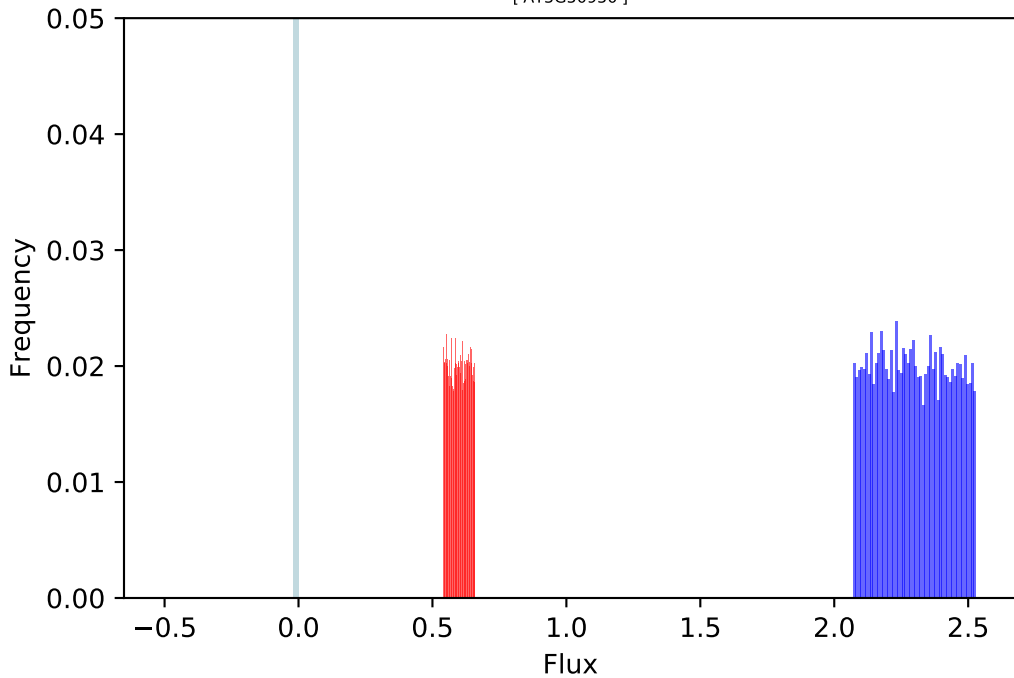
162 : ATP\_h + Asp\_h + CTL\_h --> AMP\_h + Arg\_DASH\_SCA\_h + 3.0 H\_h + PPI\_h  
['AT4G24830']



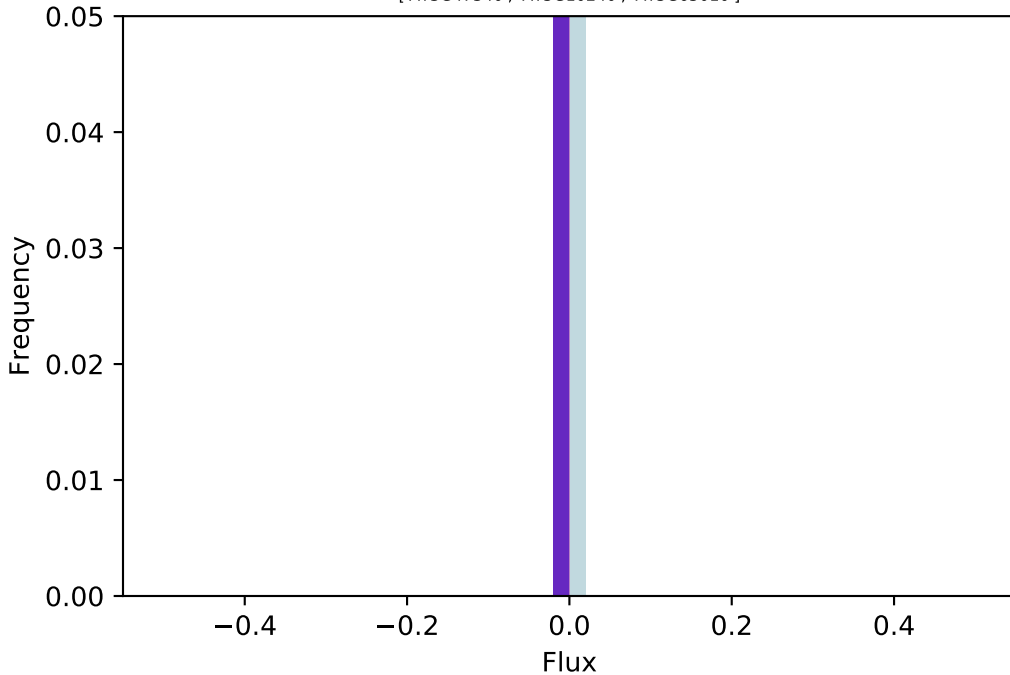
163 : Arg\_DASH\_SCA\_h --> Arg\_h + Fum\_h  
['AT5G10920']



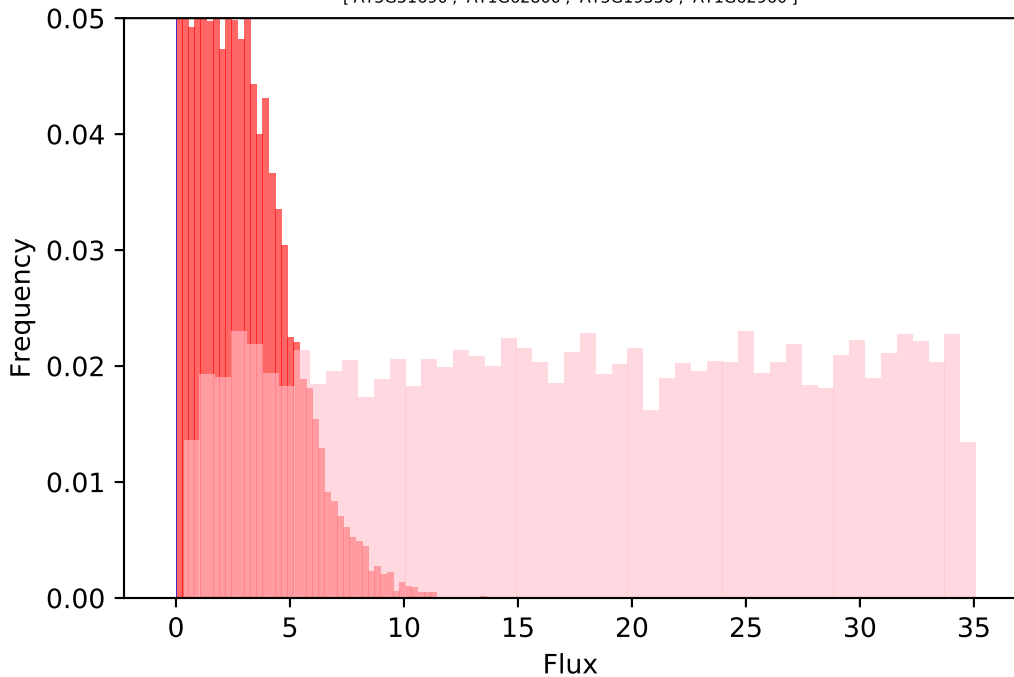
164 : Mal\_c --> Fum\_c + H2O\_c  
['AT5G50950']



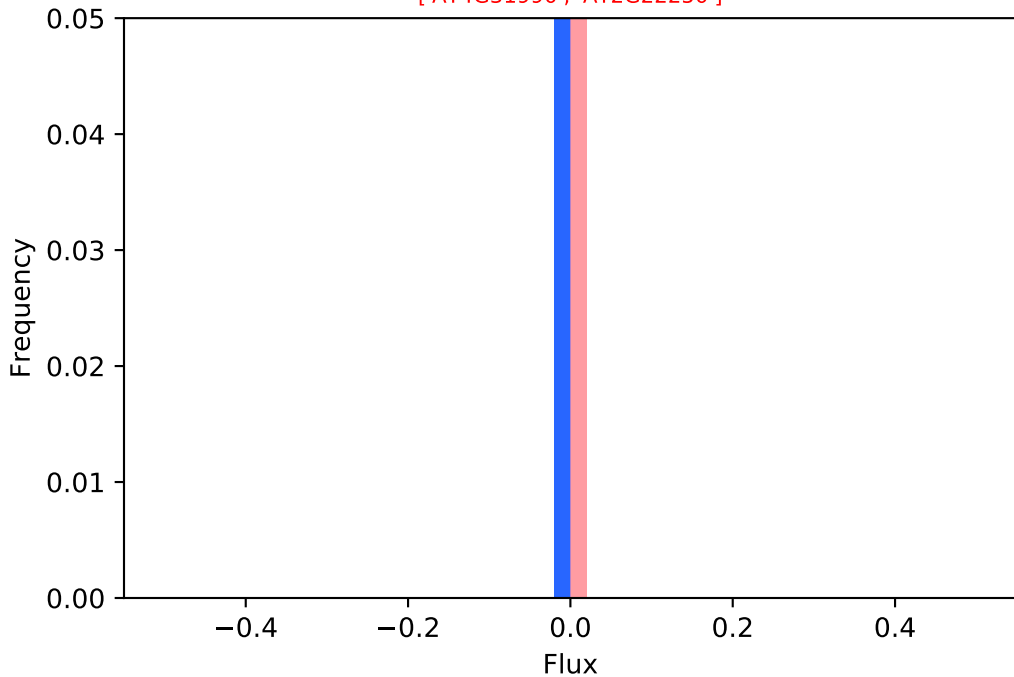
165 : ATP\_c + Asp\_c + Gln\_c + H2O\_c --> AMP\_c + Asn\_c + Glu\_c + H\_c + PPi\_c  
['AT3G47340', 'AT5G10240', 'AT5G65010']



166 : Glu\_c + OAA\_c <=> Asp\_c + KG\_c  
['AT5G51690', 'AT1G62800', 'AT5G19550', 'AT1G62960']

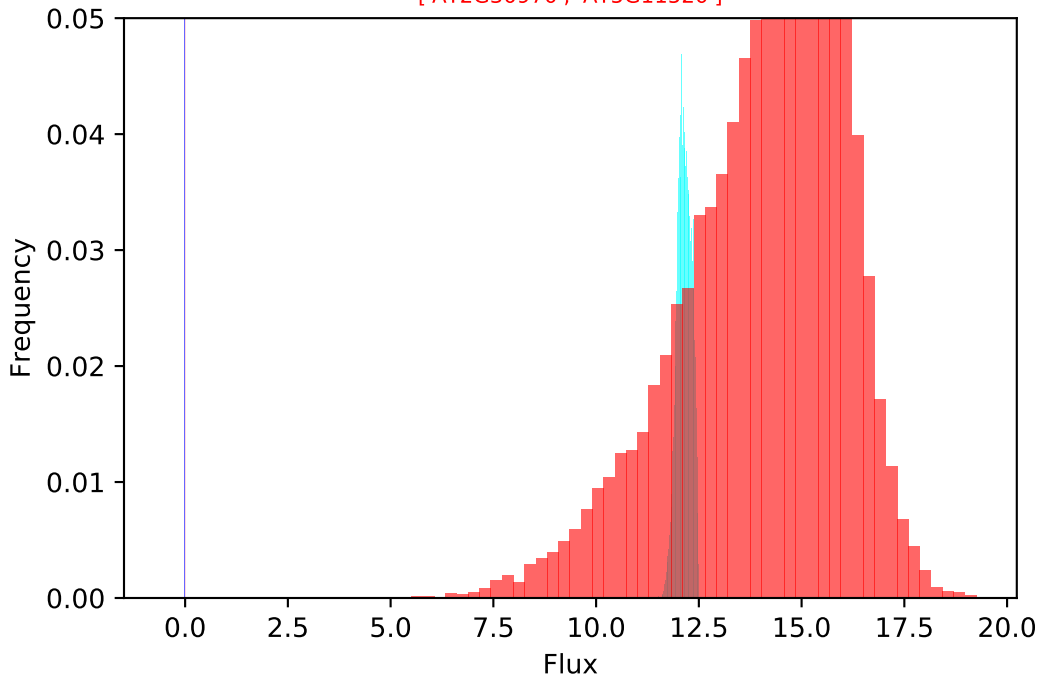


167 : Glu\_h + OAA\_h --> Asp\_h + KG\_h  
['AT4G31990', 'AT2G22250']

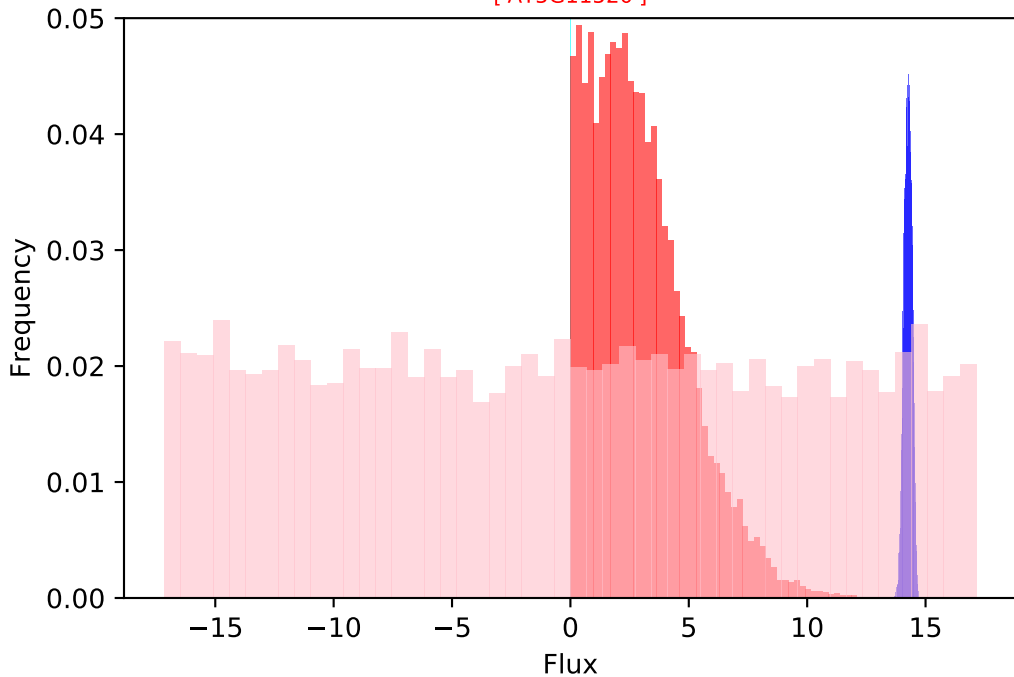




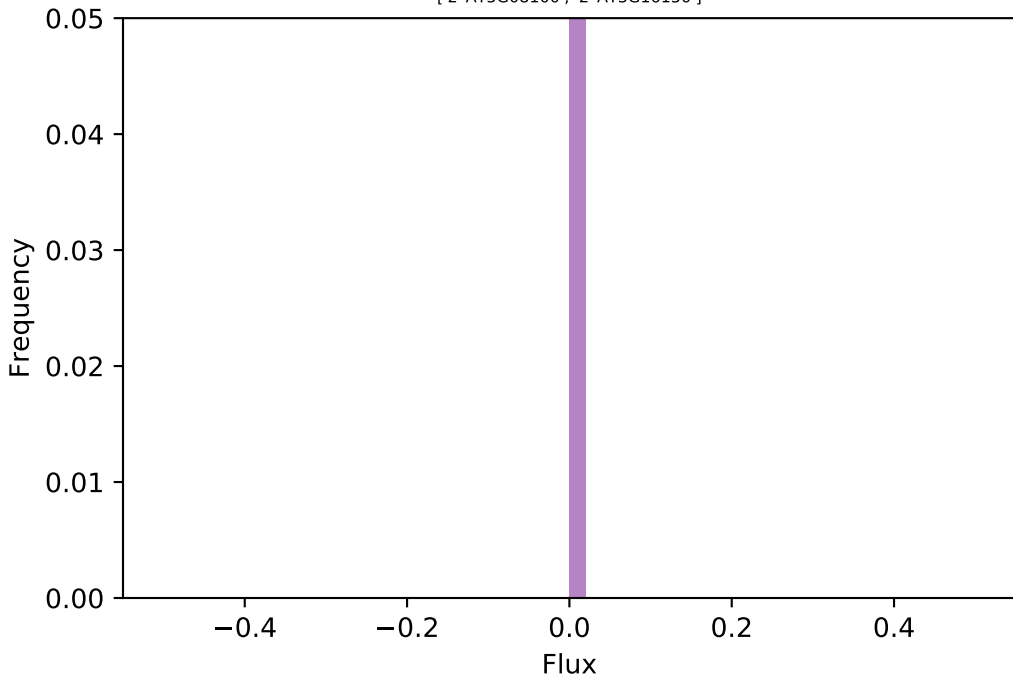
168 : Glu\_m + OAA\_m <=> Asp\_m + KG\_m  
['AT2G30970', 'AT5G11520']



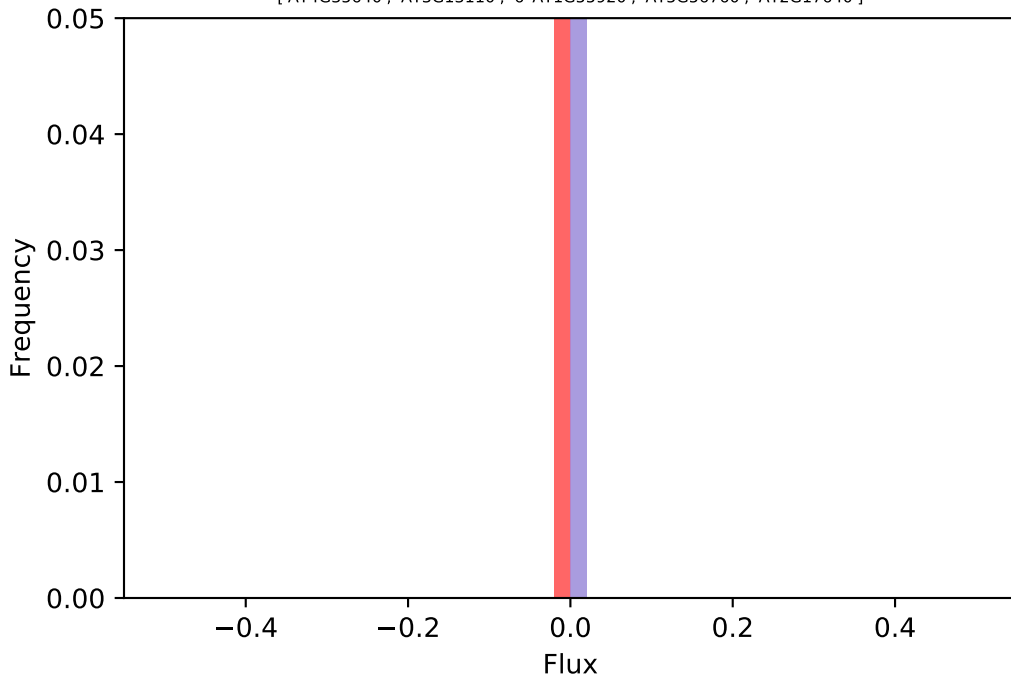
169 : Glu\_p + OAA\_p  $\rightleftharpoons$  Asp\_p + KG\_p  
['AT5G11520']



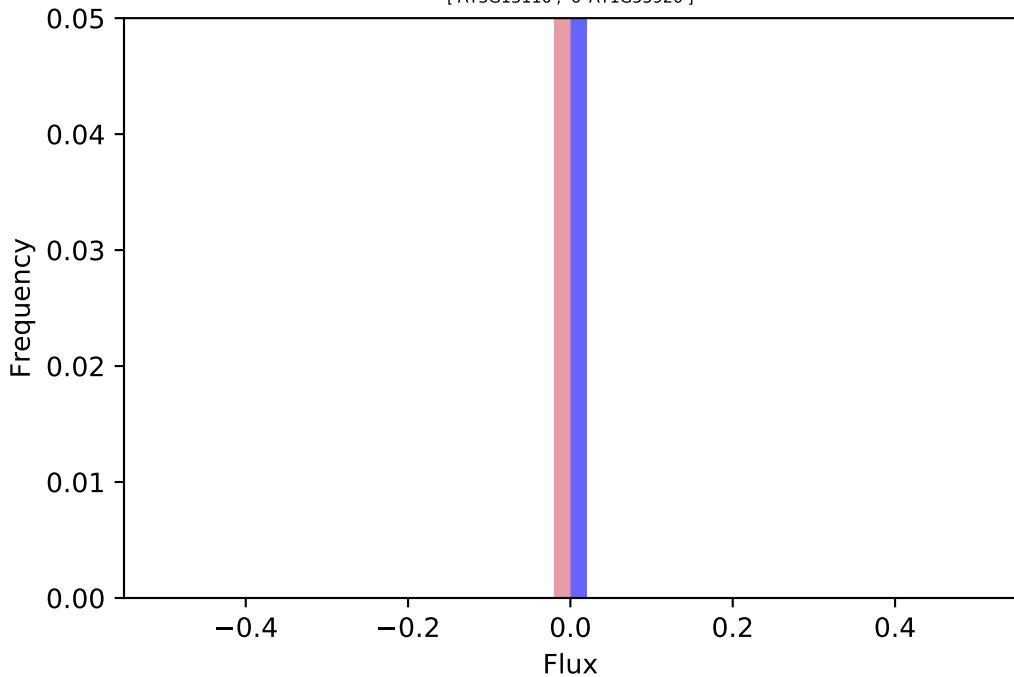
170 : Asn\_c + H2O\_c --> Asp\_c + NH4\_c  
['2\*AT5G08100', '2\*AT3G16150']



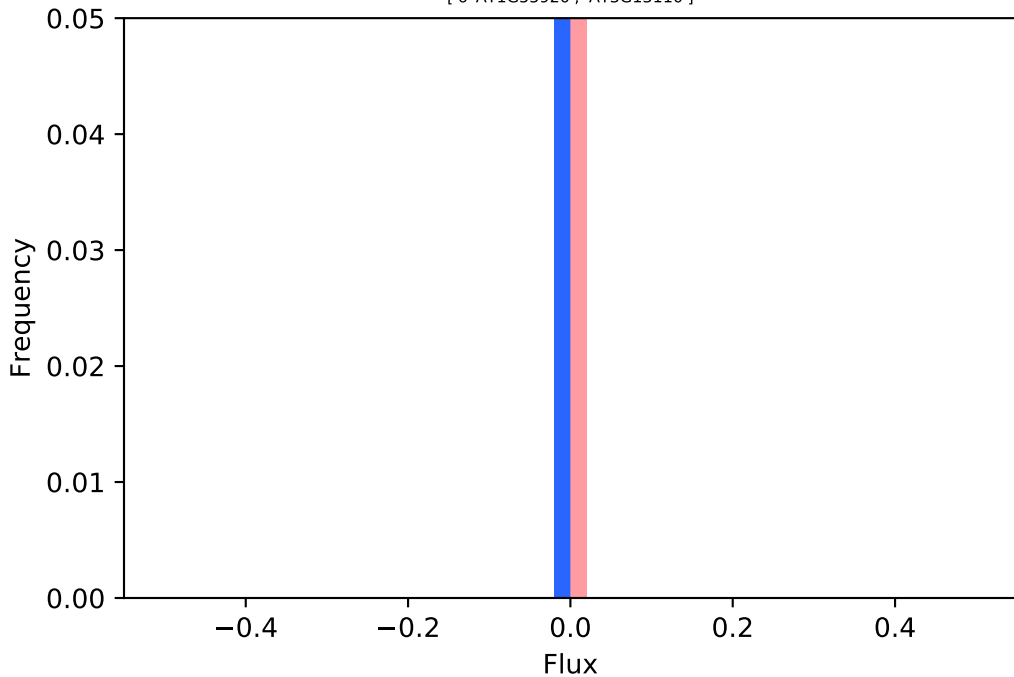
171 : A\_DASH\_CoA\_c + Ser\_c --> A\_DASH\_Ser\_c + CoA\_c  
['AT4G35640', 'AT3G13110', '6\*AT1G55920', 'AT5G56760', 'AT2G17640']



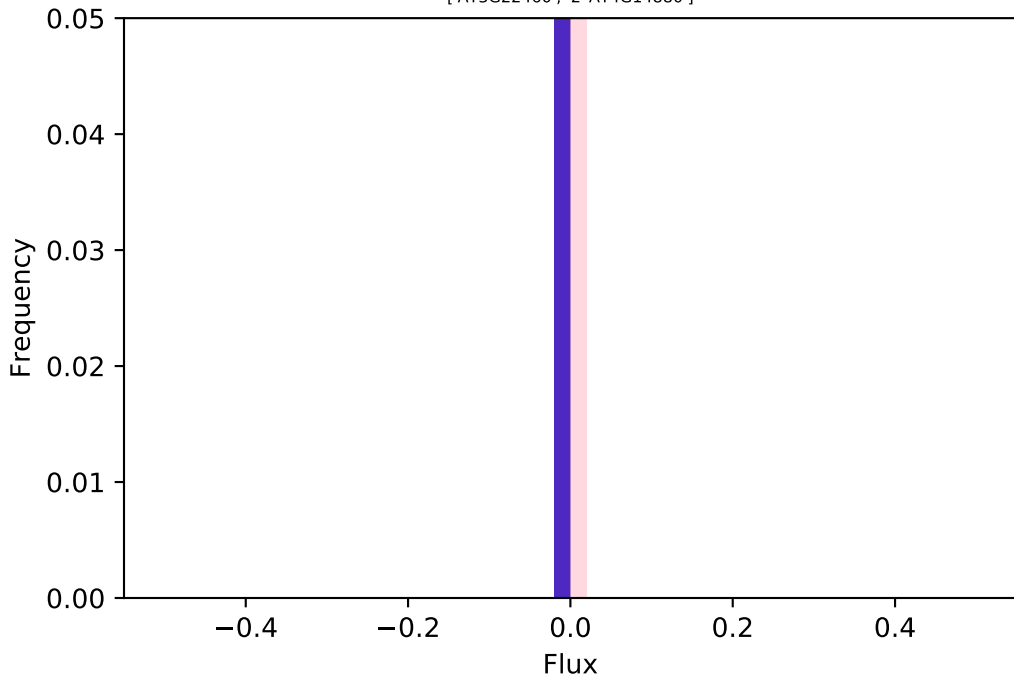
172 : A\_DASH\_CoA\_h + Ser\_h --> A\_DASH\_Ser\_h + CoA\_h  
['AT3G13110', '6\*AT1G55920']



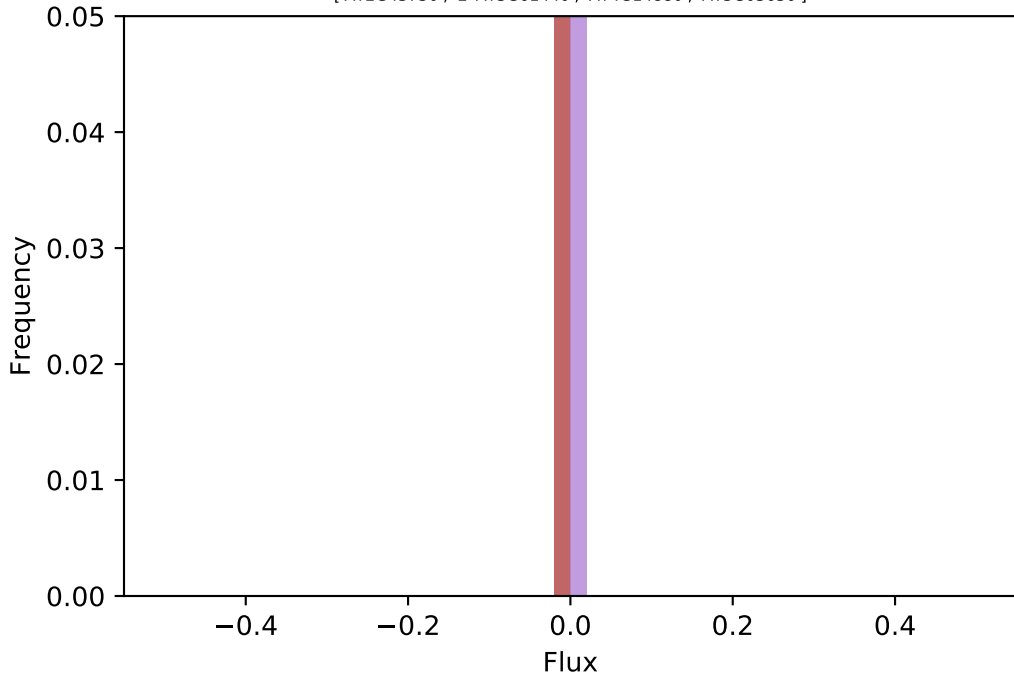
173 : A\_DASH\_CoA\_m + Ser\_m --> A\_DASH\_Ser\_m + CoA\_m  
['6\*AT1G55920', 'AT3G13110']



174 : A\_DASH\_Ser\_c + H2S\_c --> AC\_c + Cys\_c + H\_c  
['AT3G22460', '2\*AT4G14880']

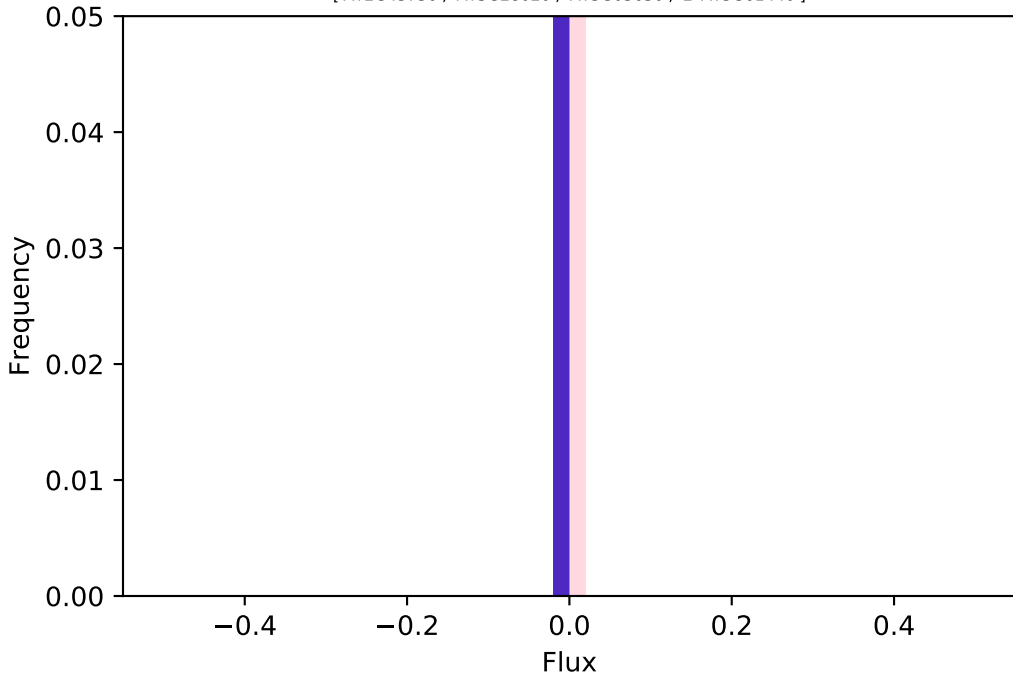


175 : A\_DASH\_Ser\_h + H2S\_h --> AC\_h + Cys\_h + H\_h  
['AT2G43750', '2\*AT3G61440', 'AT4G14880', 'AT3G03630']

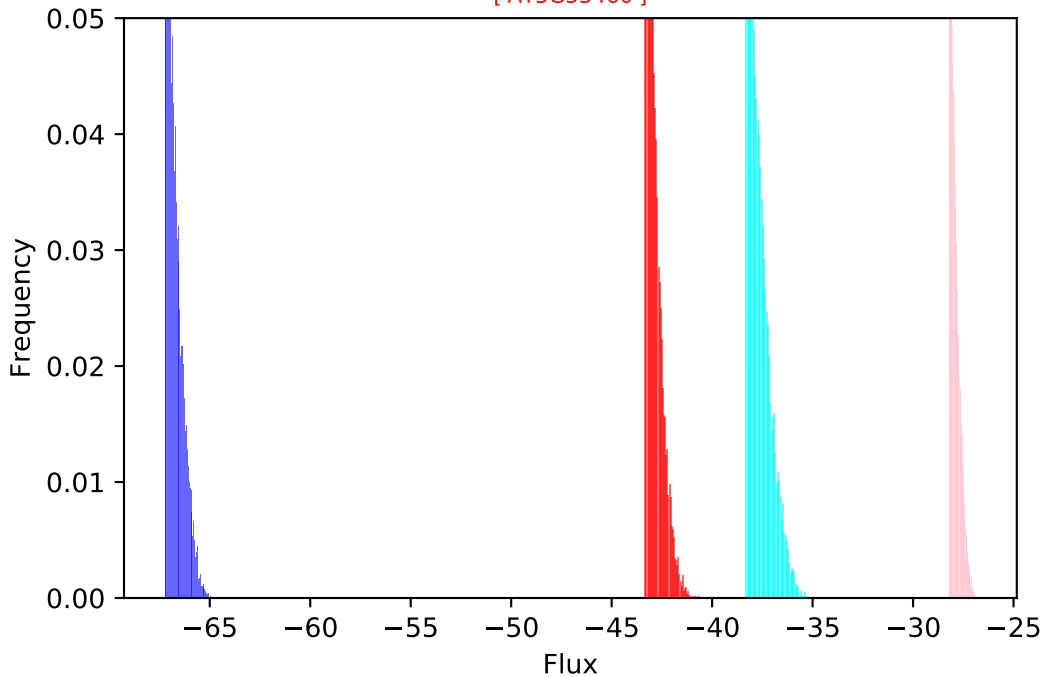




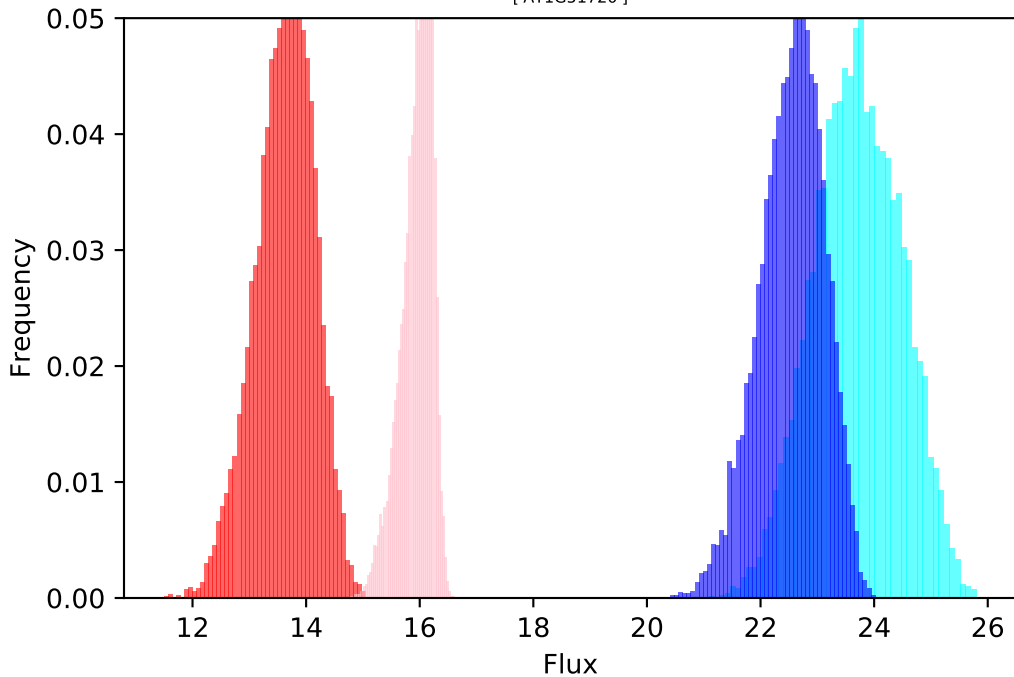
176 : A\_DASH\_Ser\_m + H2S\_m --> AC\_m + Cys\_m + H\_m  
['AT2G43750', 'AT5G28020', 'AT3G03630', '2\*AT3G61440']



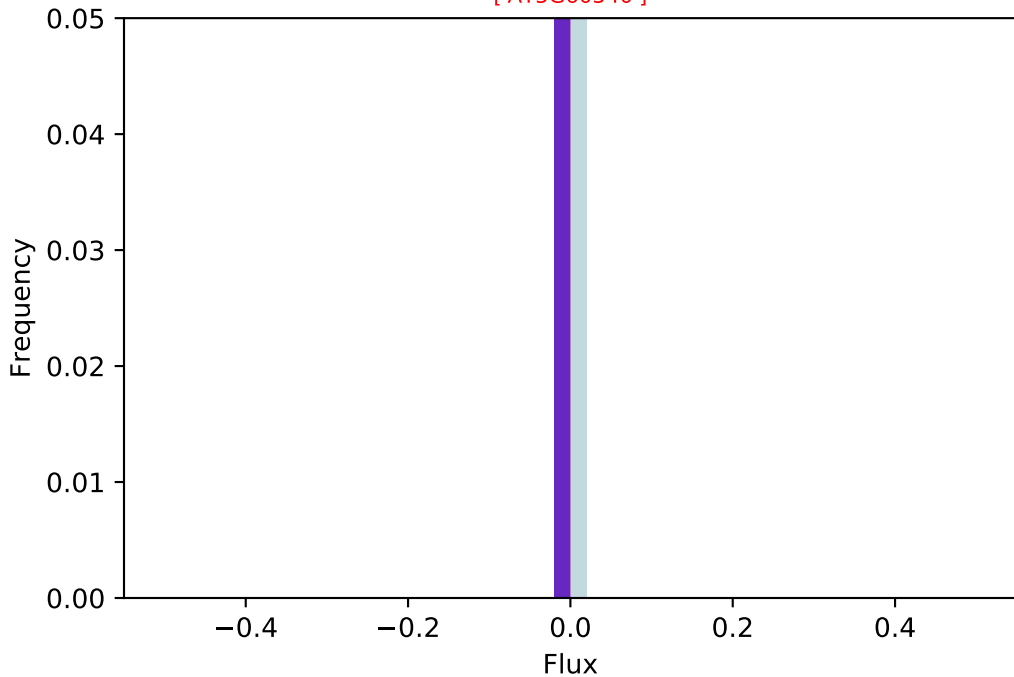
177 : Gln\_h + H\_h + KG\_h + NADPH\_h <=> 2.0 Glu\_h + NADP\_h  
[AT5G53460]



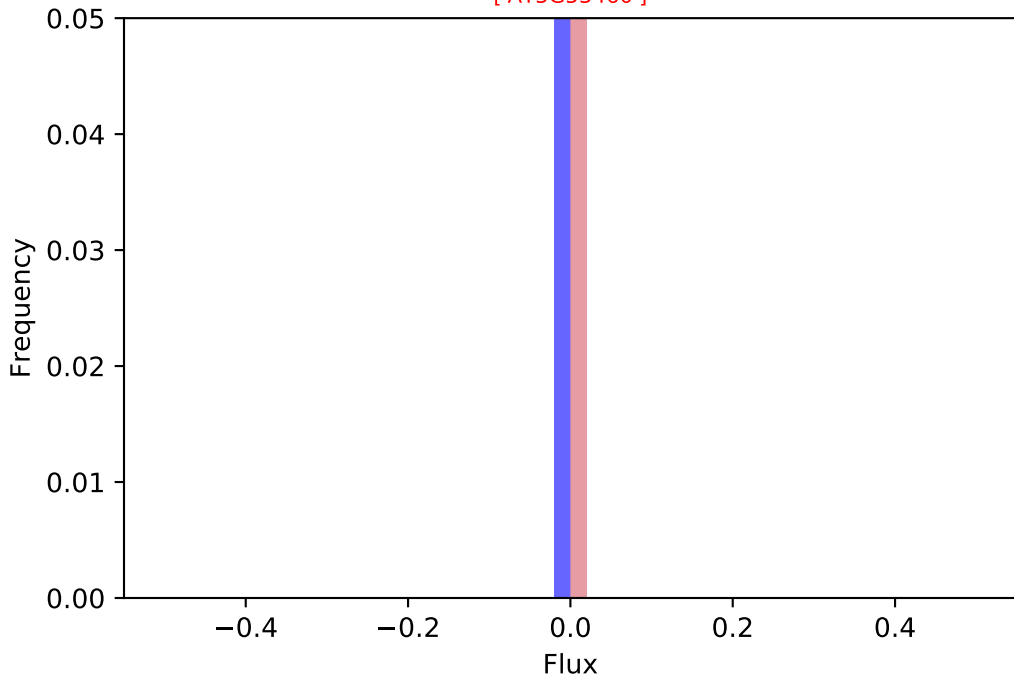
178 : Glu\_c + H2O\_c + NADP\_c <=> KG\_c + NADPH\_c + NH4\_c  
['AT1G51720']



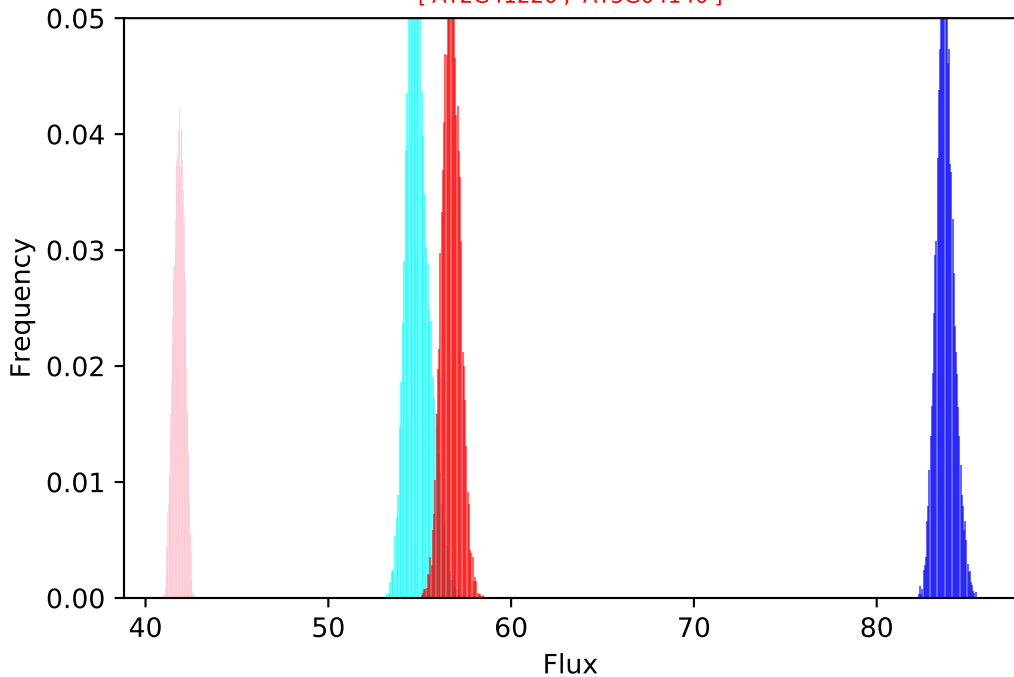
179 : Gln\_c + H2O\_c --> Glu\_c + NH4\_c  
['AT5G60540']



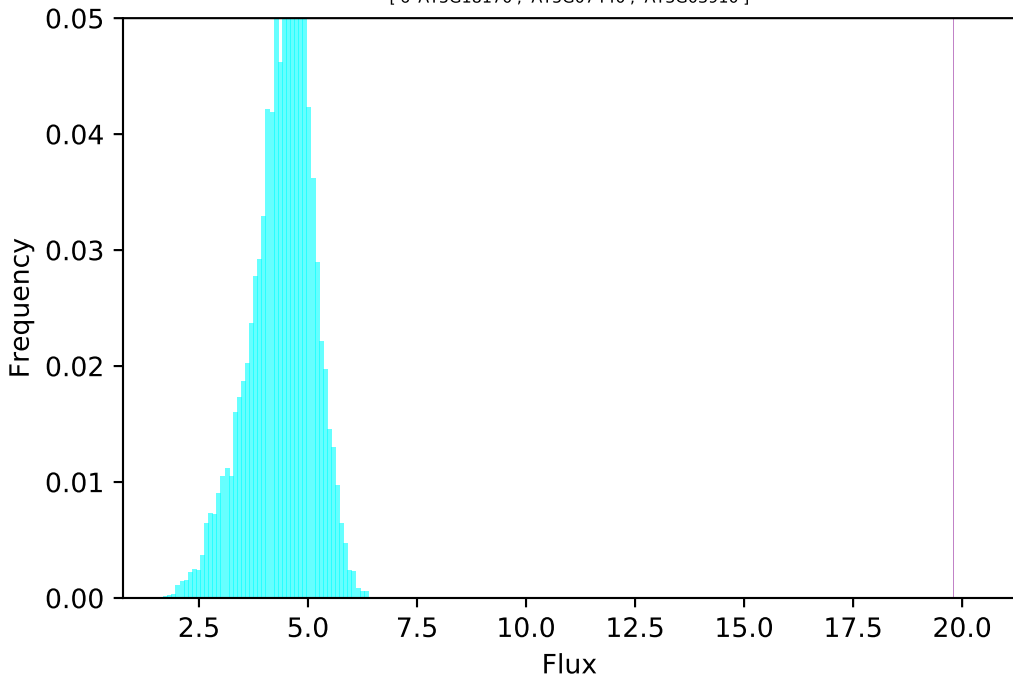
180 : Gln\_h + H\_h + KG\_h + NADH\_h --> 2.0 Glu\_h + NAD\_h  
['AT5G53460']



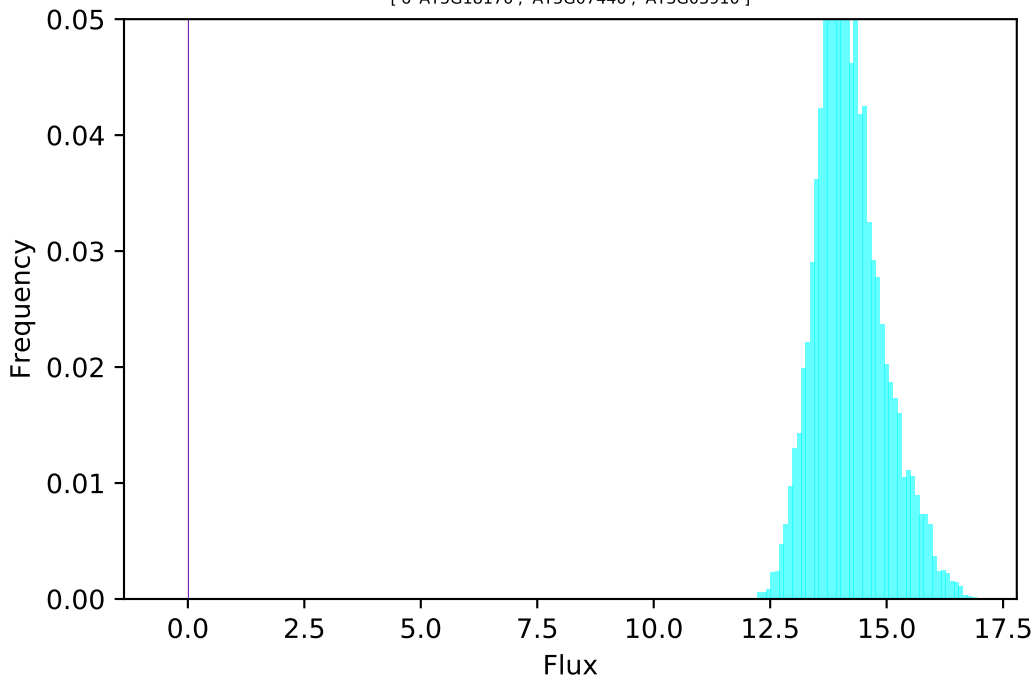
181 : 2.0 Fdrd\_h + Gln\_h + 2.0 H\_h + KG\_h --> 2.0 Fdox\_h + 2.0 Glu\_h  
['AT2G41220', 'AT5G04140']



182 : H\_m + KG\_m + NADH\_m + NH4\_m --> Glu\_m + H2O\_m + NAD\_m  
['6\*AT5G18170', 'AT5G07440', 'AT3G03910']

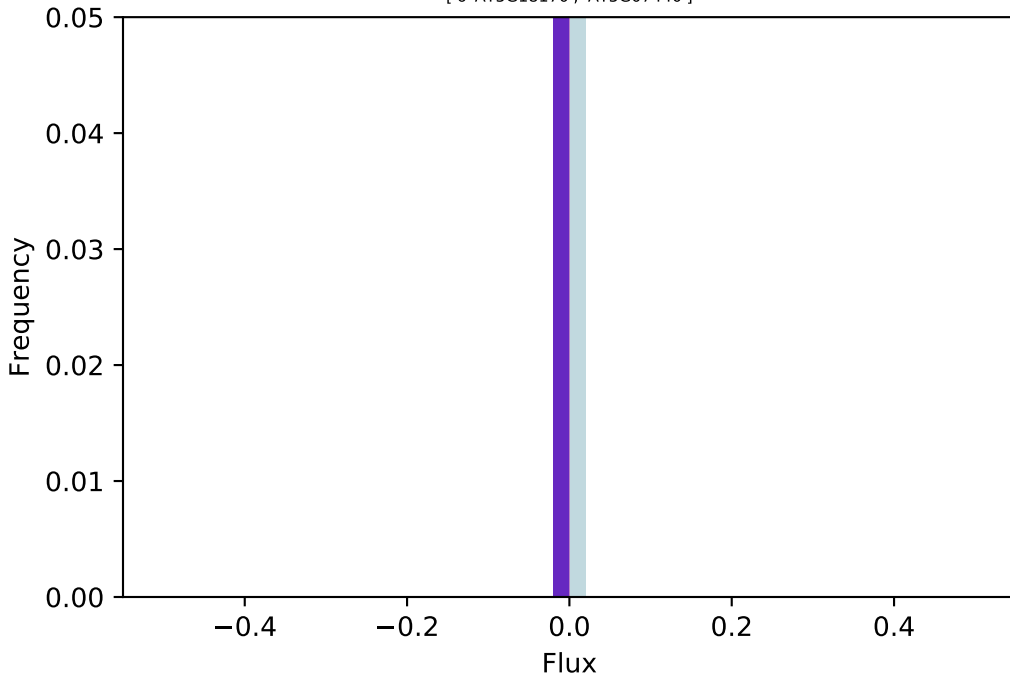


183 : H\_m + KG\_m + NADPH\_m + NH4\_m --> Glu\_m + H2O\_m + NADP\_m  
['6\*AT5G18170', 'AT5G07440', 'AT3G03910']

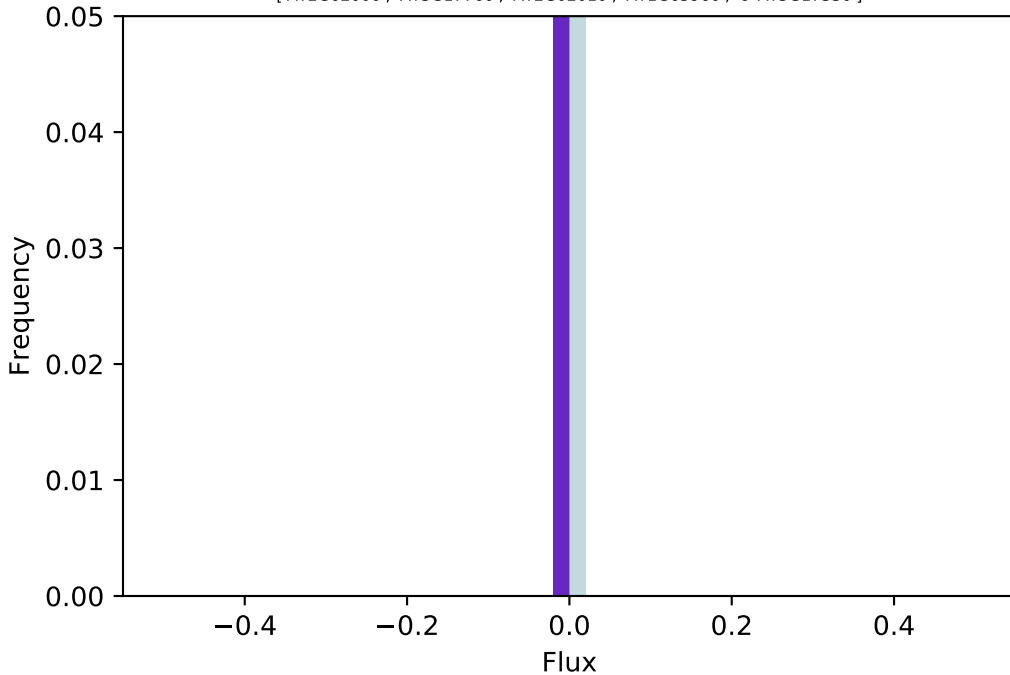




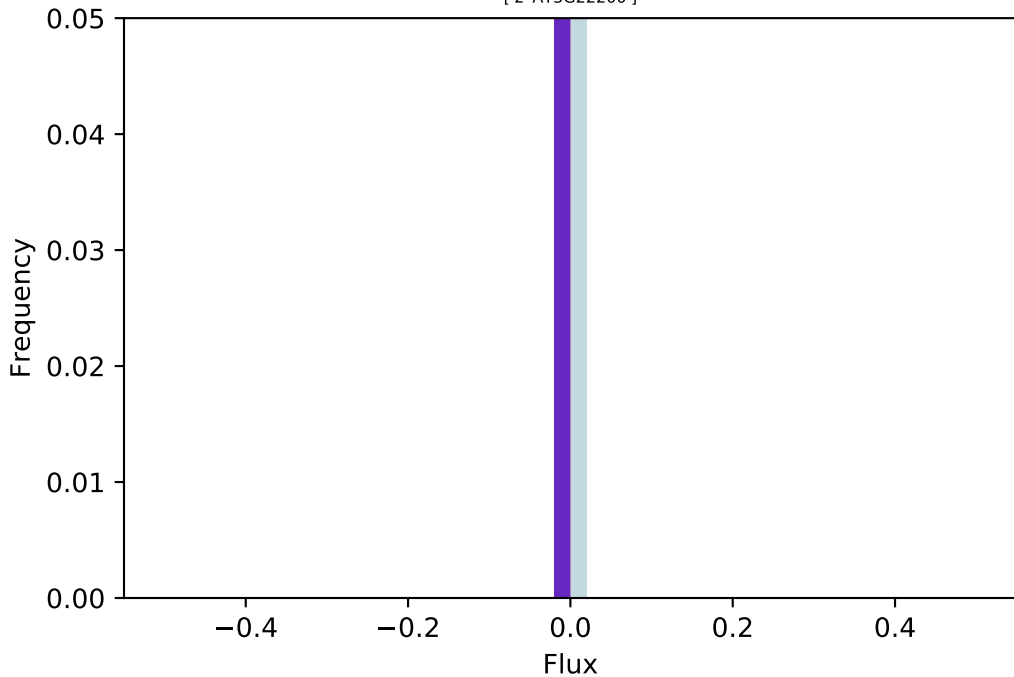
184 : Glu\_m + H2O\_m + NAD\_m --> H\_m + KG\_m + NADH\_m + NH4\_m  
['6\*AT5G18170', 'AT5G07440']



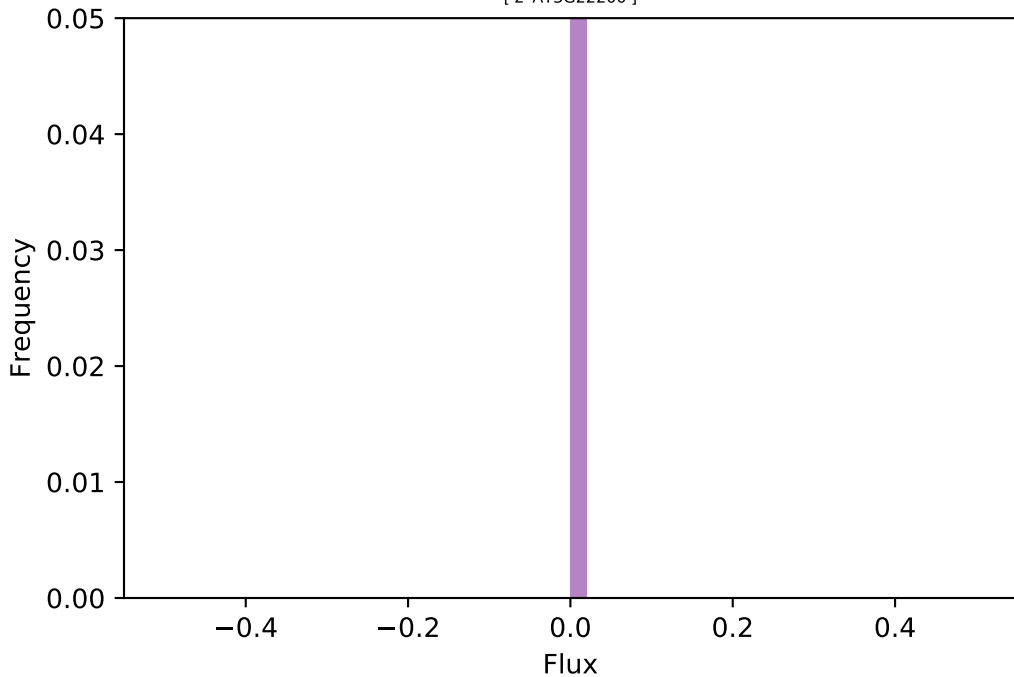
185 : Glu\_c + H\_c --> CO2\_c + GABA\_c  
['AT2G02000', 'AT3G17760', 'AT2G02010', 'AT1G65960', '6\*AT5G17330']



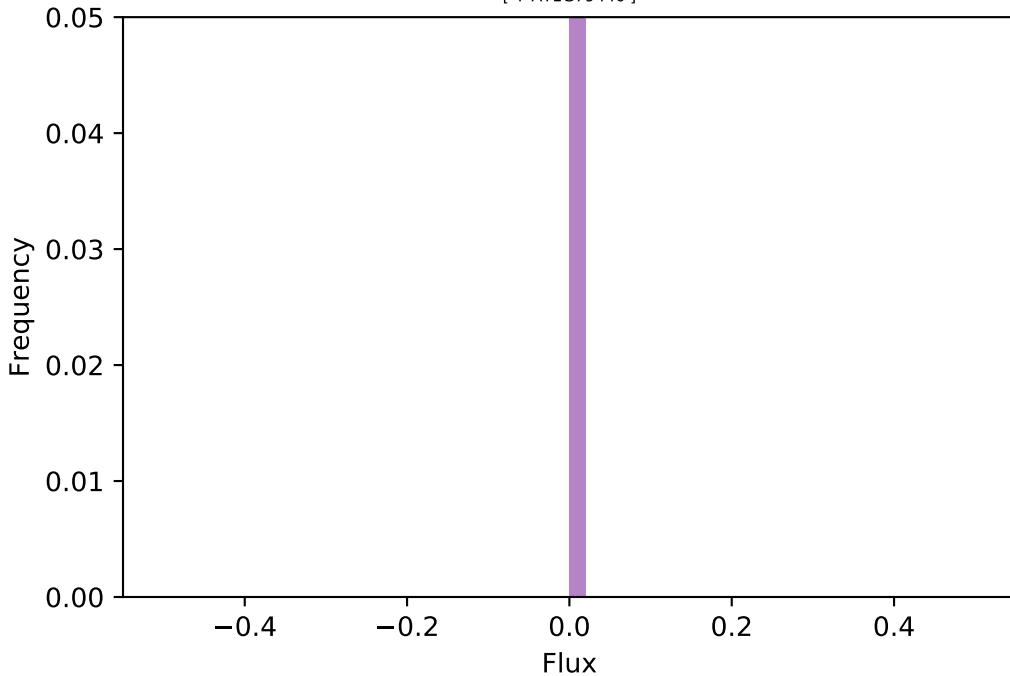
186 : GABA\_m + Pyr\_m <=> Ala\_m + SCA\_DASH\_SeA\_m  
['2\*AT3G22200']



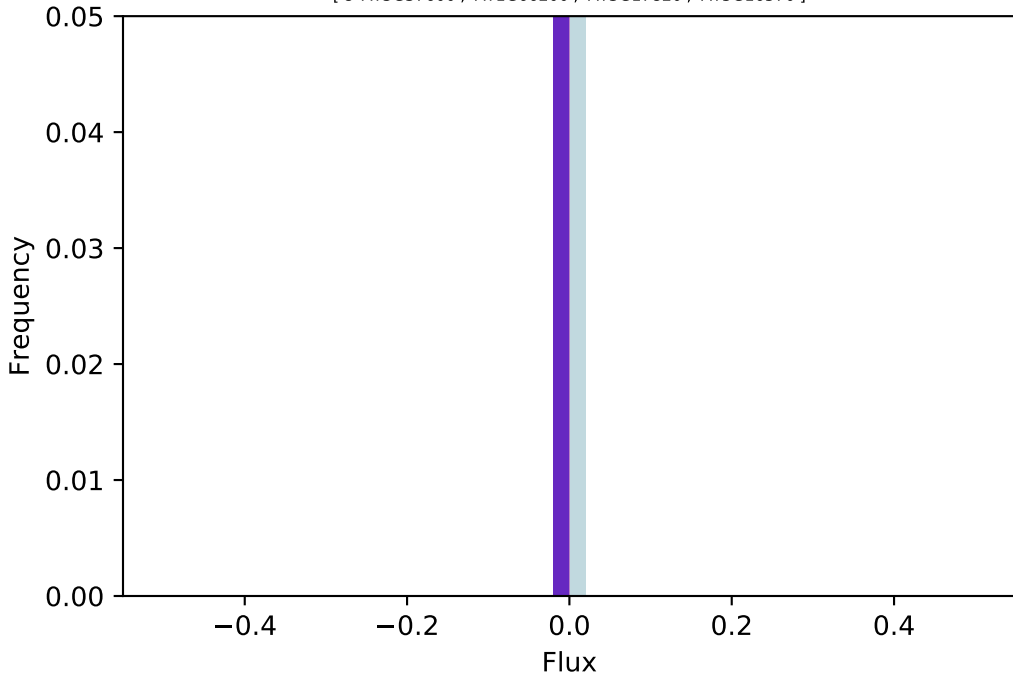
187 : GABA\_m + KG\_m --> Glu\_m + SCA\_DASH\_SeA\_m  
[<sup>12</sup>\*AT3G22200']



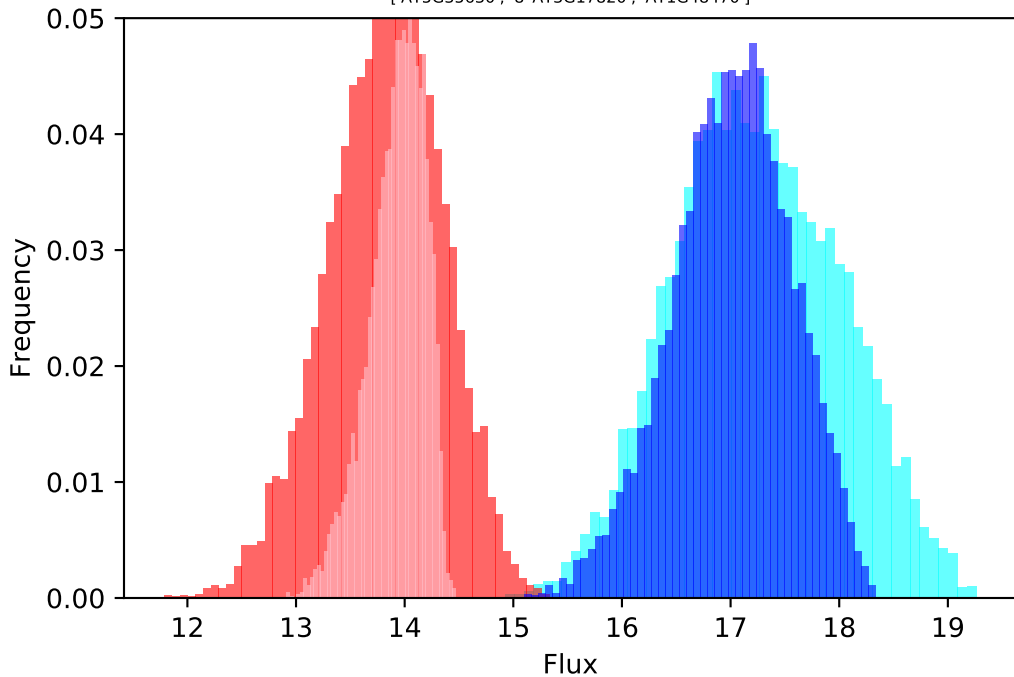
188 : H<sub>2</sub>O<sub>m</sub> + NAD<sub>m</sub> + SCA\_DASH\_SeA<sub>m</sub> --> 2.0 H<sub>m</sub> + NADH<sub>m</sub> + SCA<sub>m</sub>  
['4\*AT1G79440']



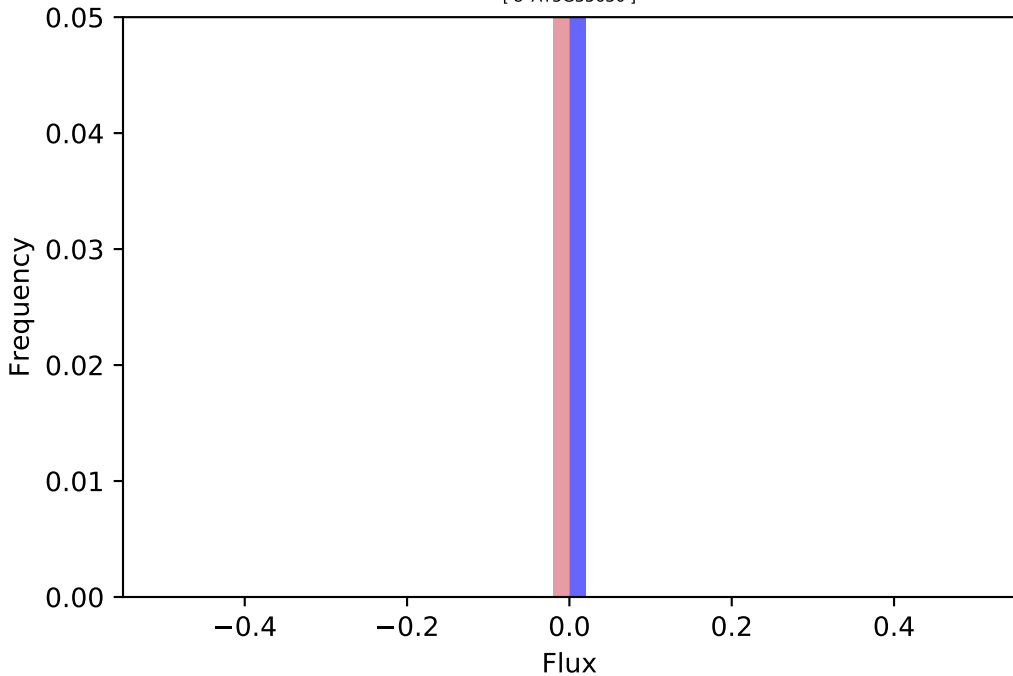
189 : ATP\_c + Glu\_c + NH4\_c --> ADP\_c + Gln\_c + H\_c + Pi\_c  
['8\*AT5G37600', 'AT1G66200', 'AT3G17820', 'AT5G16570']



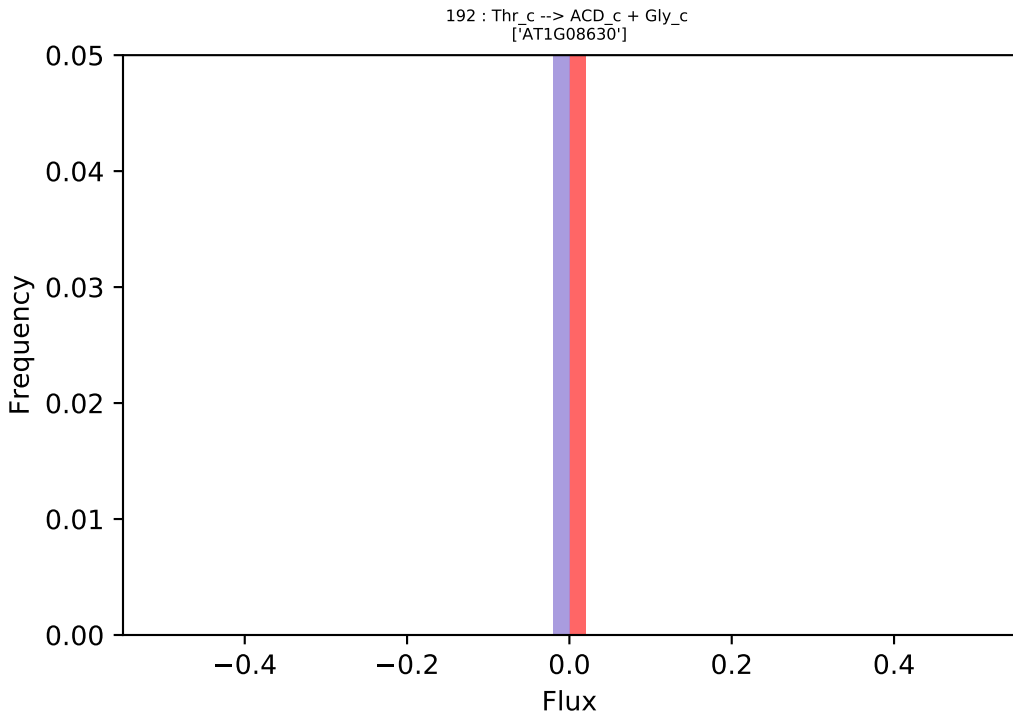
190 : ATP\_h + Glu\_h + NH4\_h --> ADP\_h + Gln\_h + H\_h + Pi\_h  
['AT5G35630', '8\*AT3G17820', 'AT1G48470']



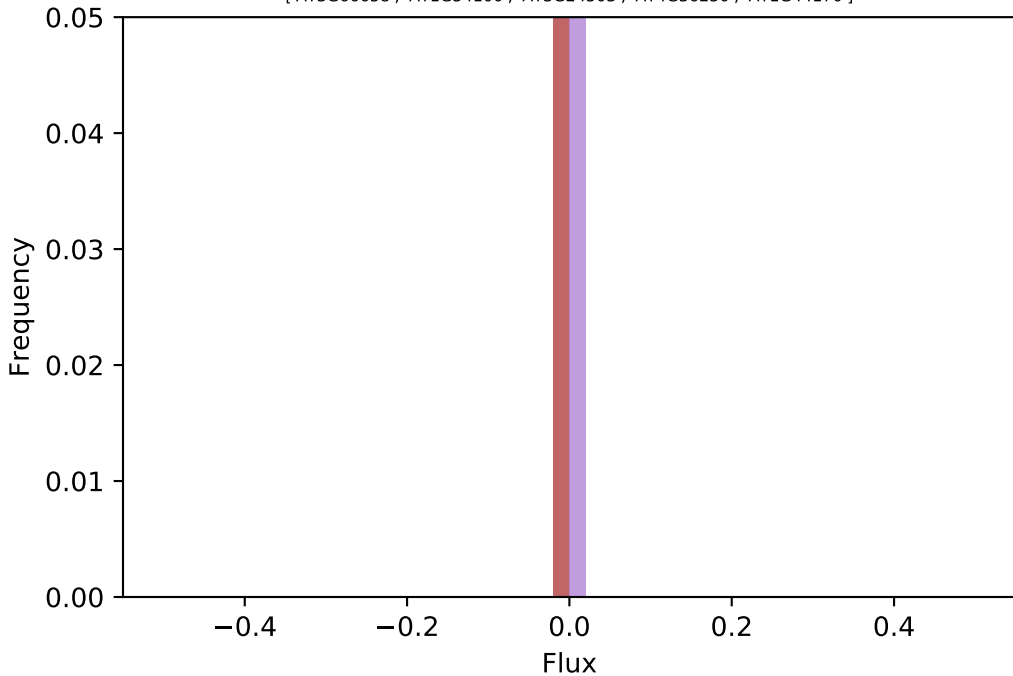
191 : ATP\_m + Glu\_m + NH4\_m --> ADP\_m + Gln\_m + H\_m + Pi\_m  
['8\*AT5G35630']



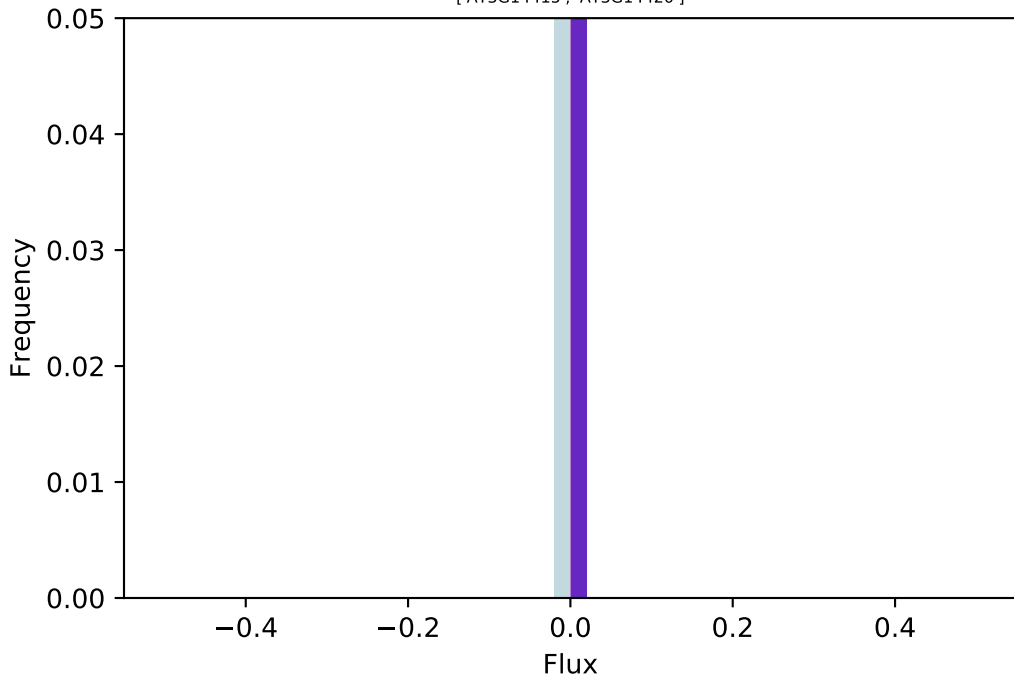




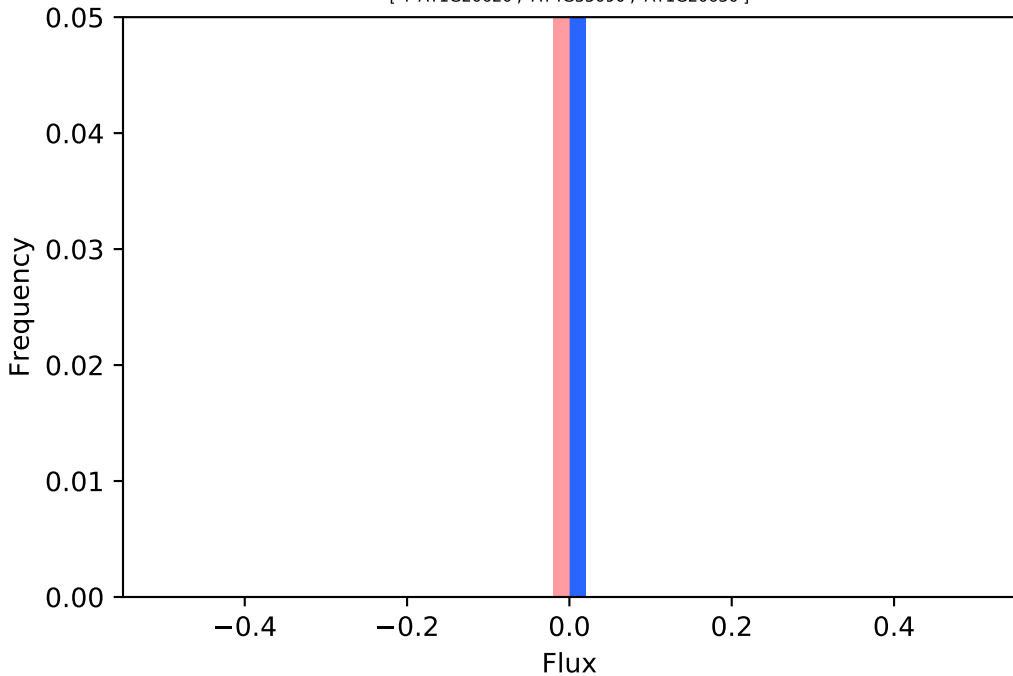
193 : ACD\_c + H2O\_c + NAD\_c --> AC\_c + H\_c + NADH\_c  
['AT3G66658', 'AT1G54100', 'AT3G24503', 'AT4G36250', 'AT1G44170']



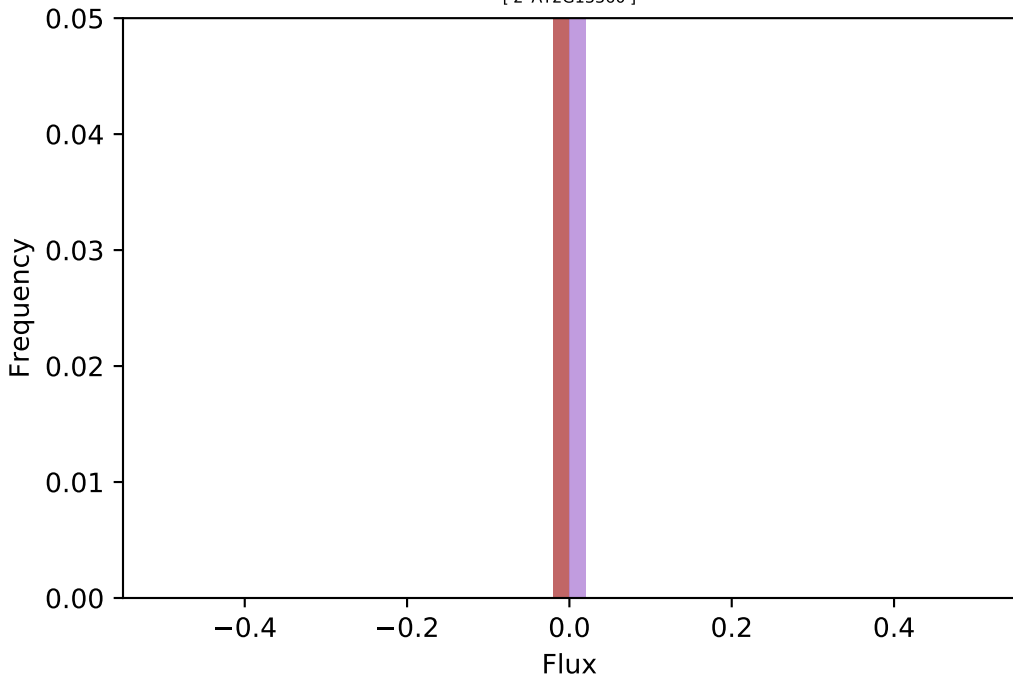
194 : GCA\_h + O2\_h --> GLX\_h + H2O2\_h  
['AT3G14415', 'AT3G14420']



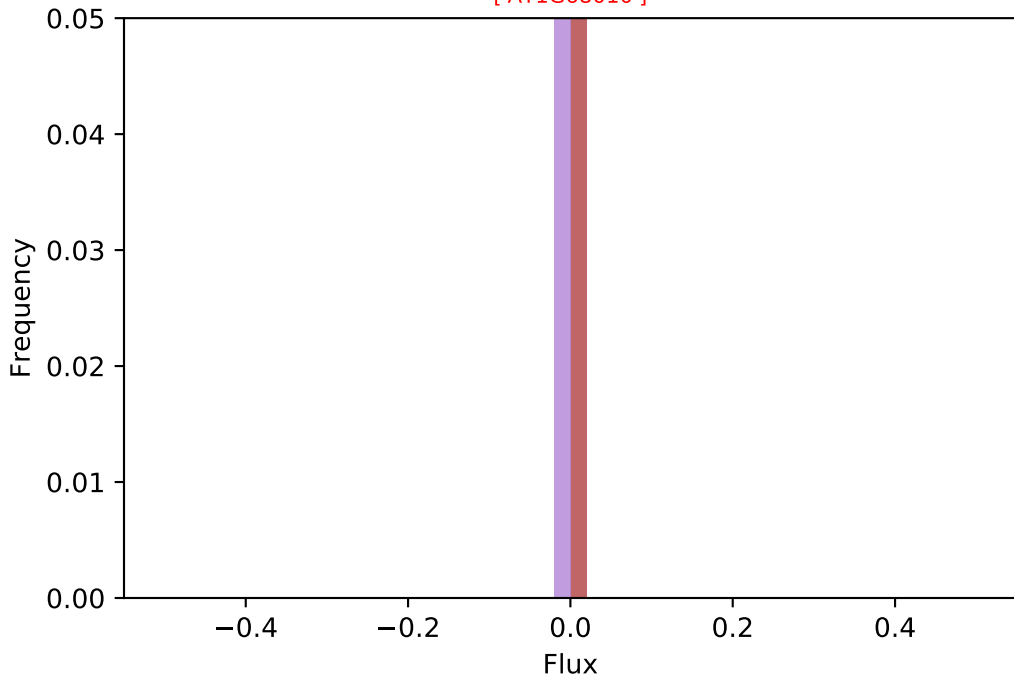
195 : 2.0 H2O2\_h --> 2.0 H2O\_h + O2\_h  
['4\*AT1G20620', 'AT4G35090', 'AT1G20630']



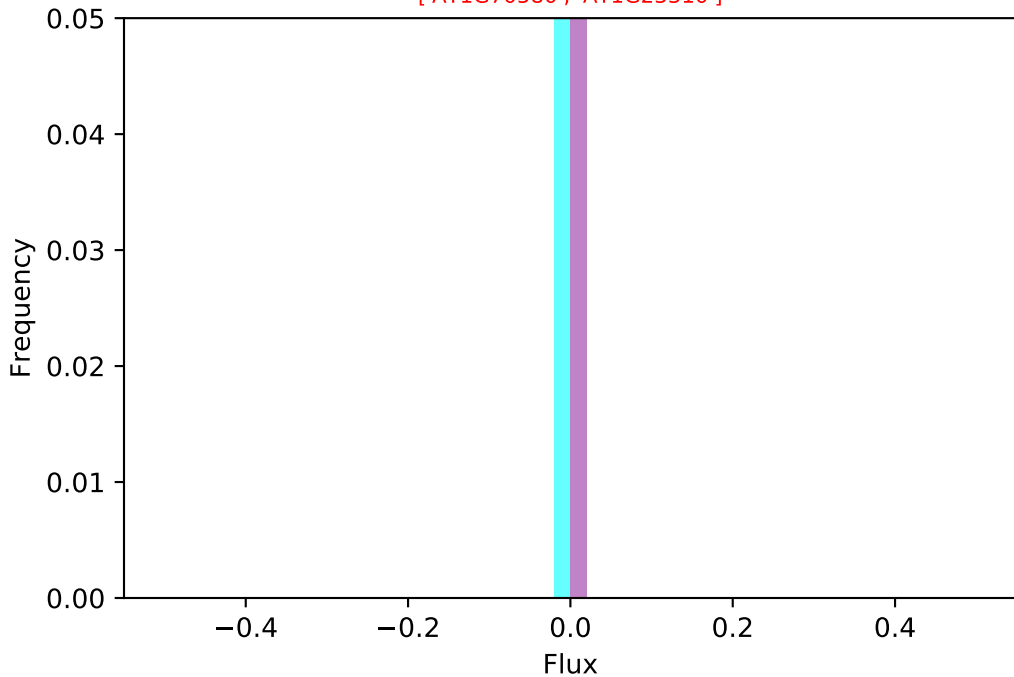
196 : GLX\_h + Ser\_h --> Gly\_h + HPR\_h  
['2\*AT2G13360']



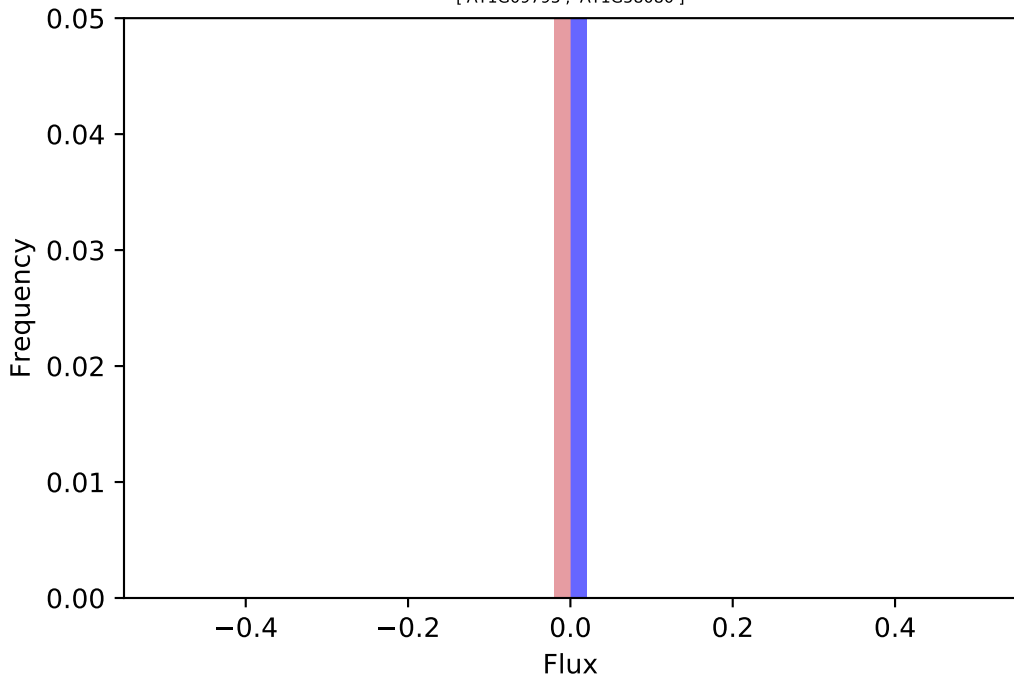
197 : HPR\_h + H\_h + NADH\_h --> GCEA\_h + NAD\_h  
['AT1G68010']



198 : GLX\_h + Glu\_h --> Gly\_h + KG\_h  
['AT1G70580', 'AT1G23310']

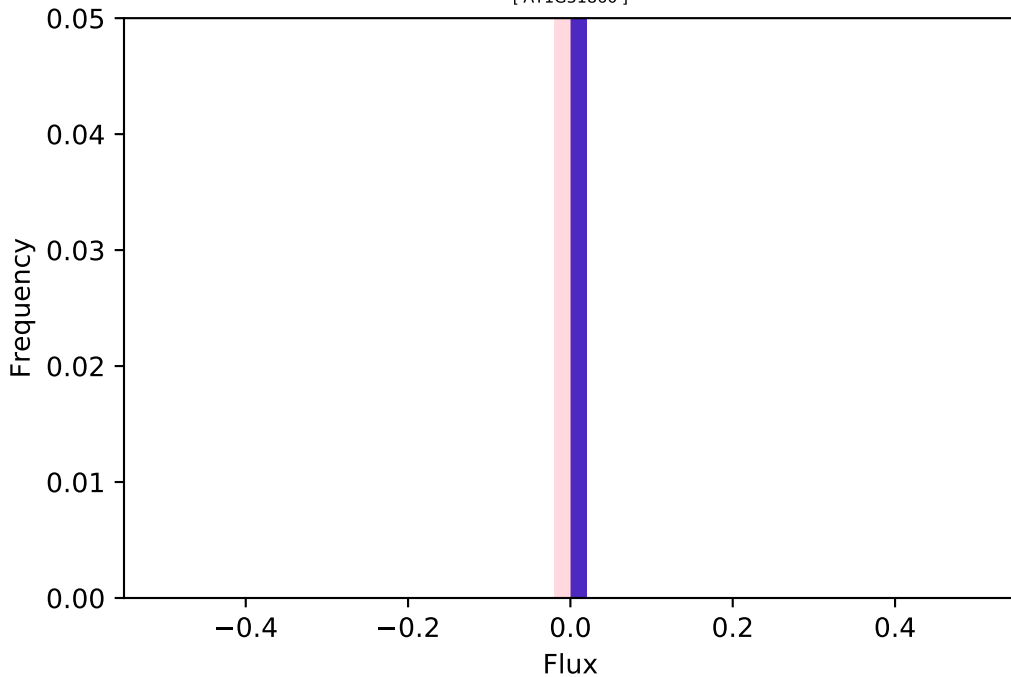


199 : ATP\_h + PRPP\_h --> H\_h + PPi\_h + PR\_DASH\_ATP\_h  
['AT1G09795', 'AT1G58080']

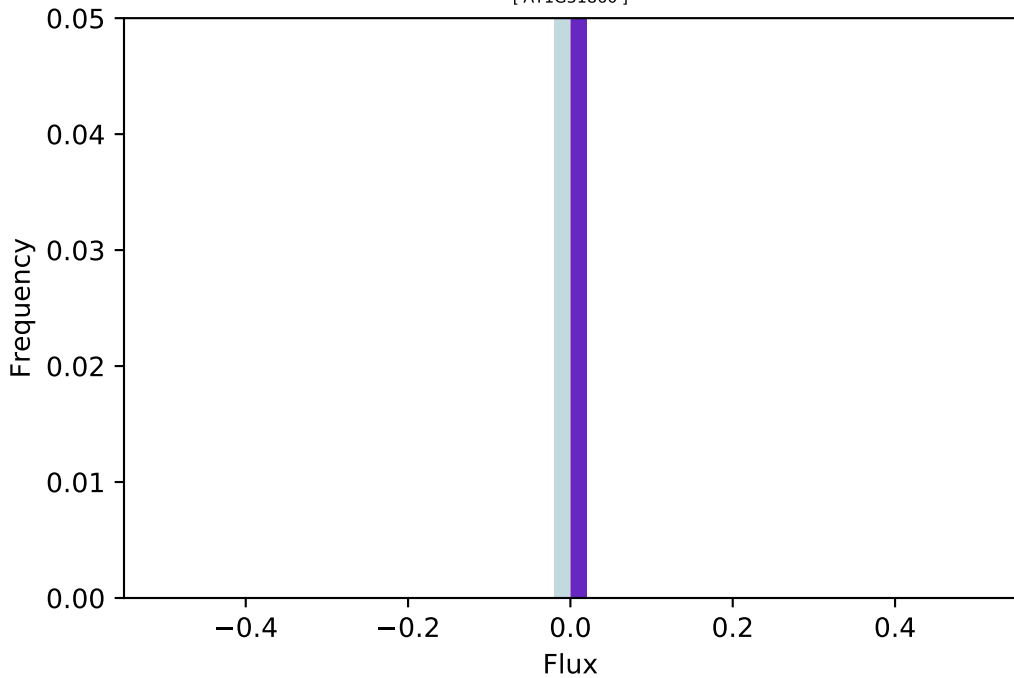




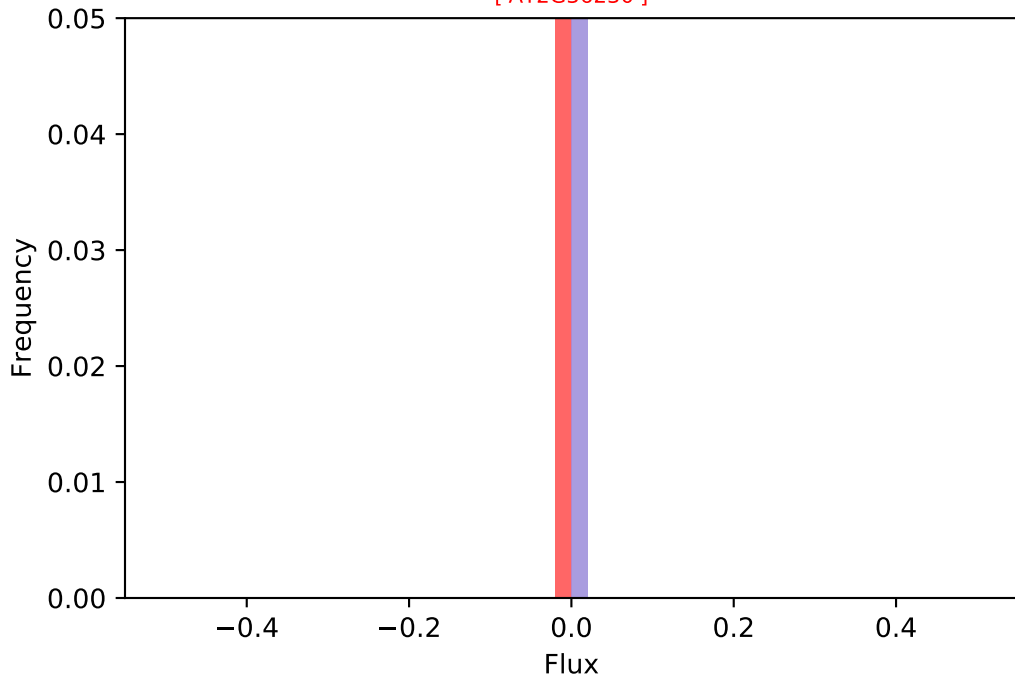
200 : H<sub>2</sub>O<sub>h</sub> + PR\_DASH\_ATP<sub>h</sub> --> 2.0 H<sub>h</sub> + PPi<sub>h</sub> + PR\_DASH\_AMP<sub>h</sub>  
[<sup>1</sup>AT1G31860<sup>1</sup>]



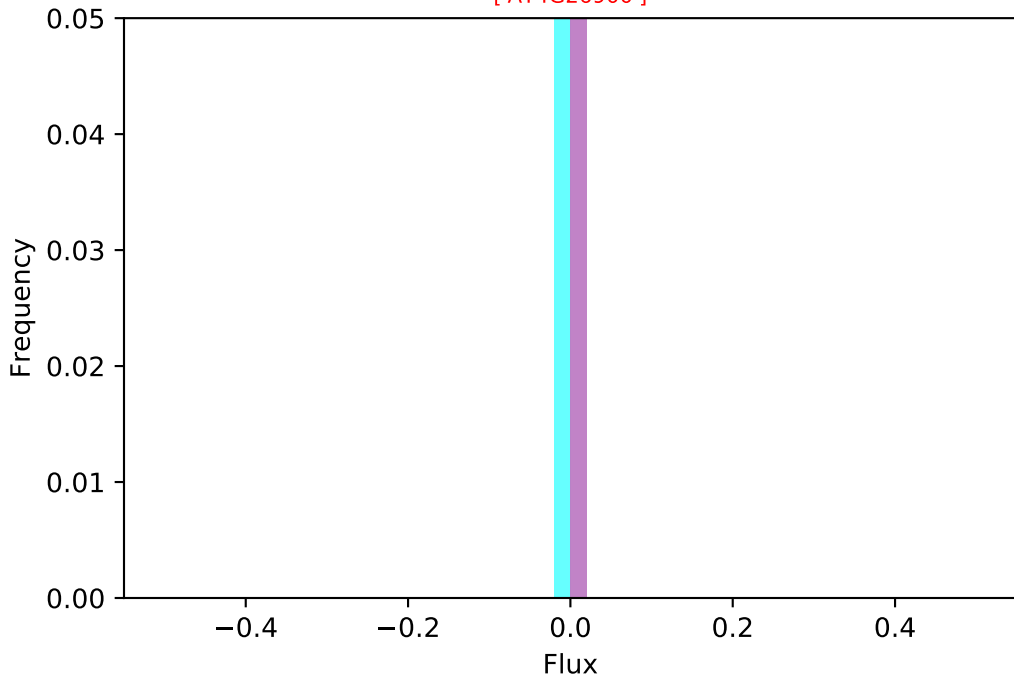
201 : H2O\_h + PR\_DASH\_AMP\_h --> P\_DASH\_AICAR\_DASH\_P\_h  
[AT1G31860]



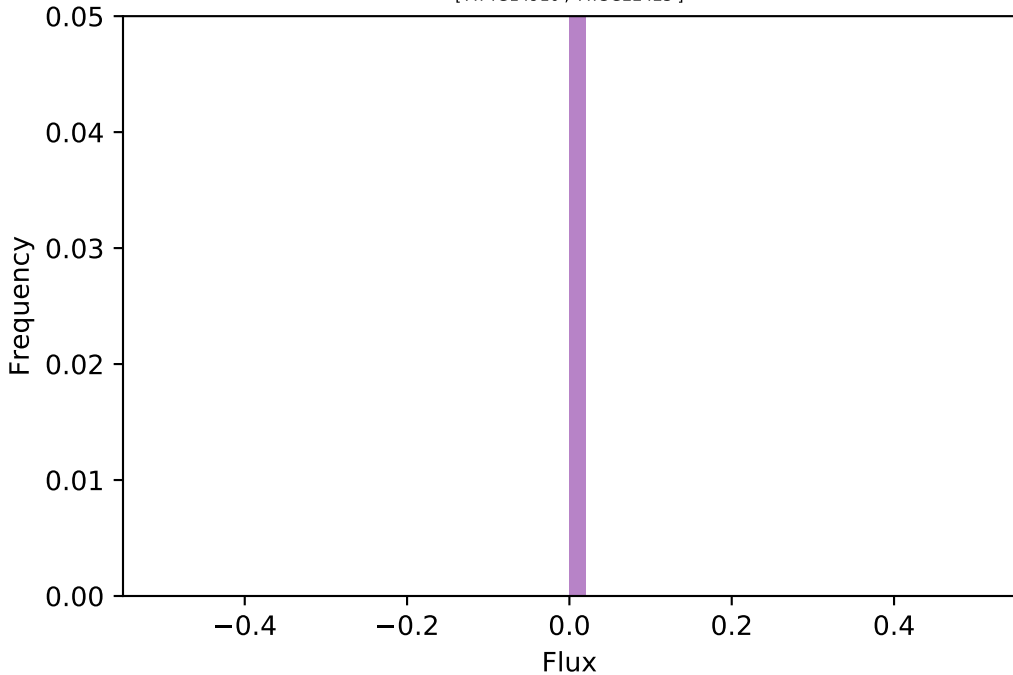
202 : P\_DASH\_AICAR\_DASH\_P\_h --> Pu\_DASH\_AICAR\_DASH\_P\_h  
['AT2G36230']



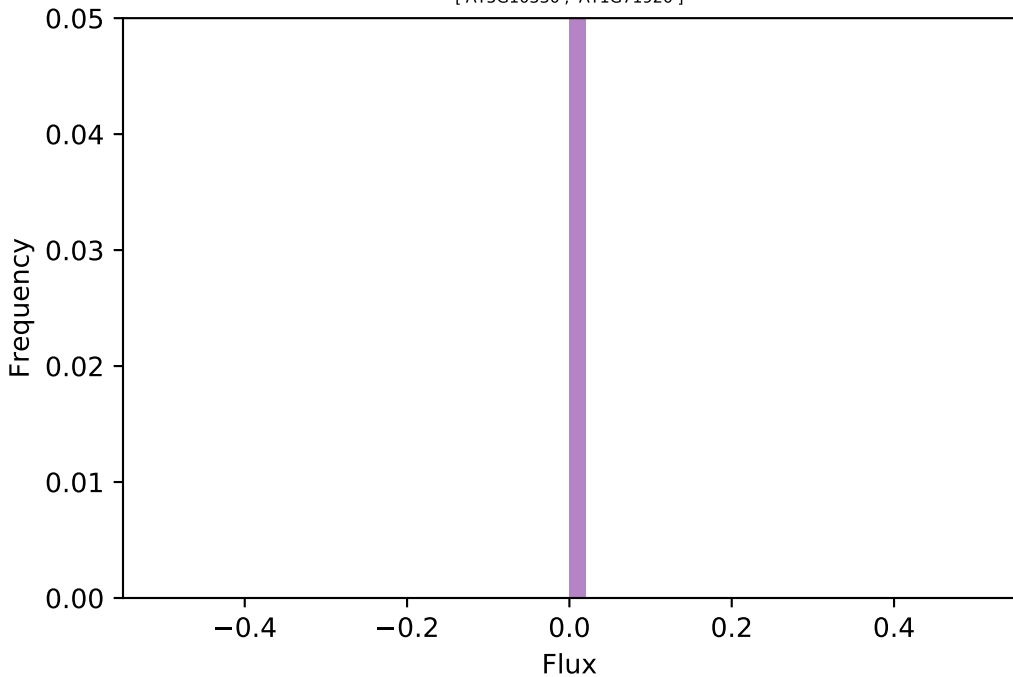
203 : Gln\_h + Pu\_DASH\_AICAR\_DASH\_P\_h --> AICAR\_h + EIGP\_h + Glu\_h  
['AT4G26900']



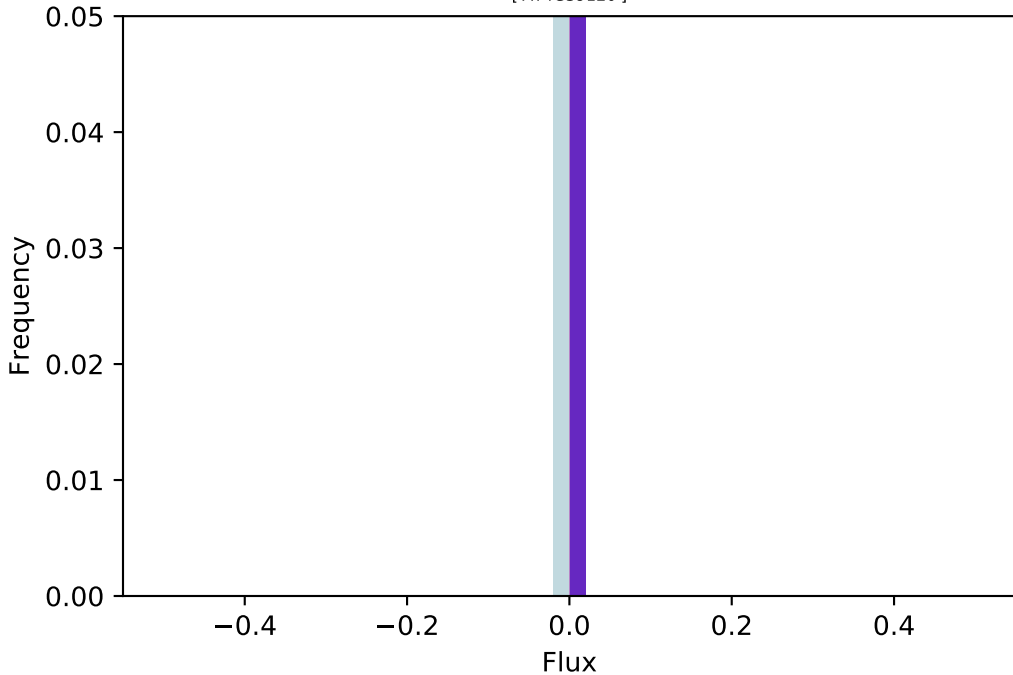
204 : EIGP\_h --> H2O\_h + IA\_DASH\_P\_h  
['AT4G14910', 'AT3G22425']



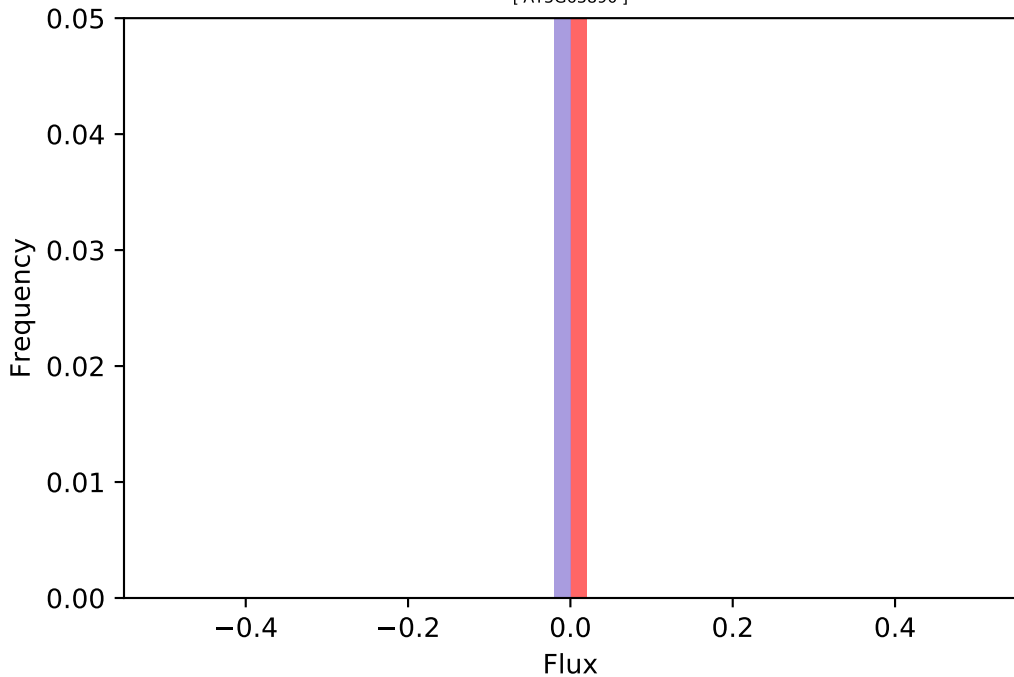
205 : Glu\_h + IA\_DASH\_P\_h --> Hisol\_DASH\_P\_h + KG\_h  
['AT5G10330', 'AT1G71920']



206 : H2O\_h + Hisol\_DASH\_P\_h --> Hisol\_h + Pi\_h  
['AT4G39120']

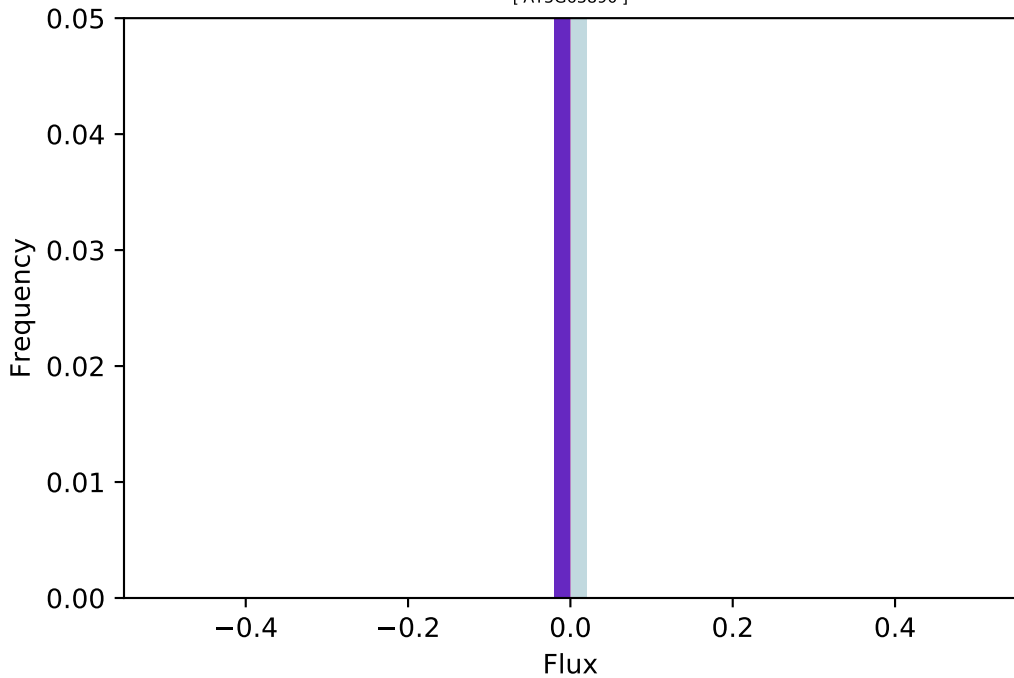


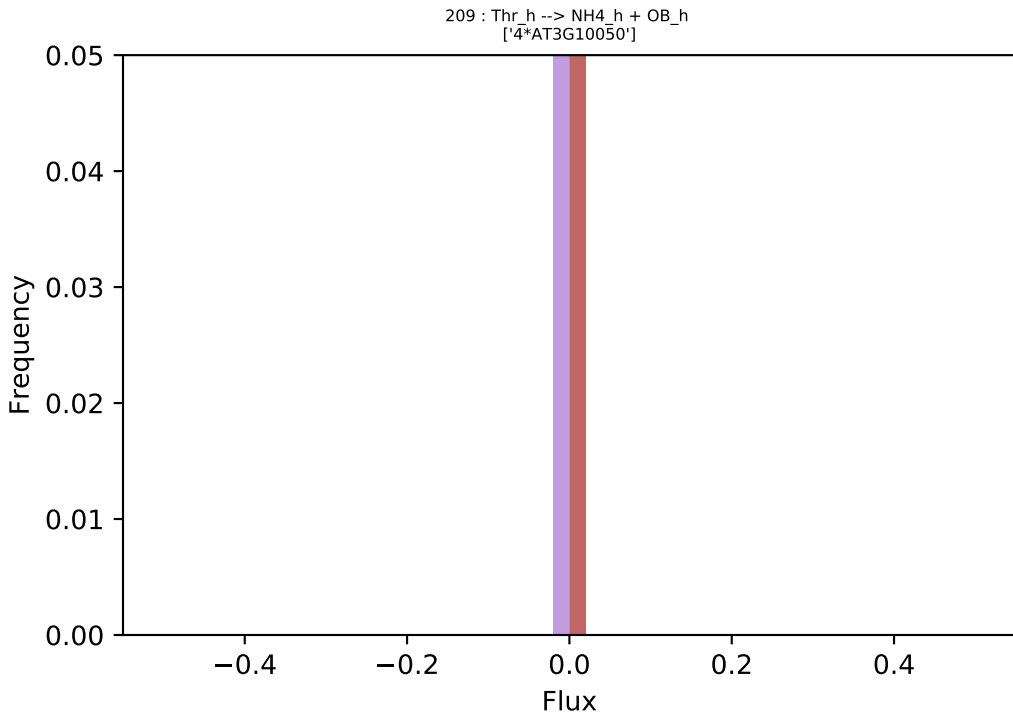
207 : Hisol\_h + NAD\_h --> 2.0 H\_h + Hisal\_h + NADH\_h  
['AT5G63890']



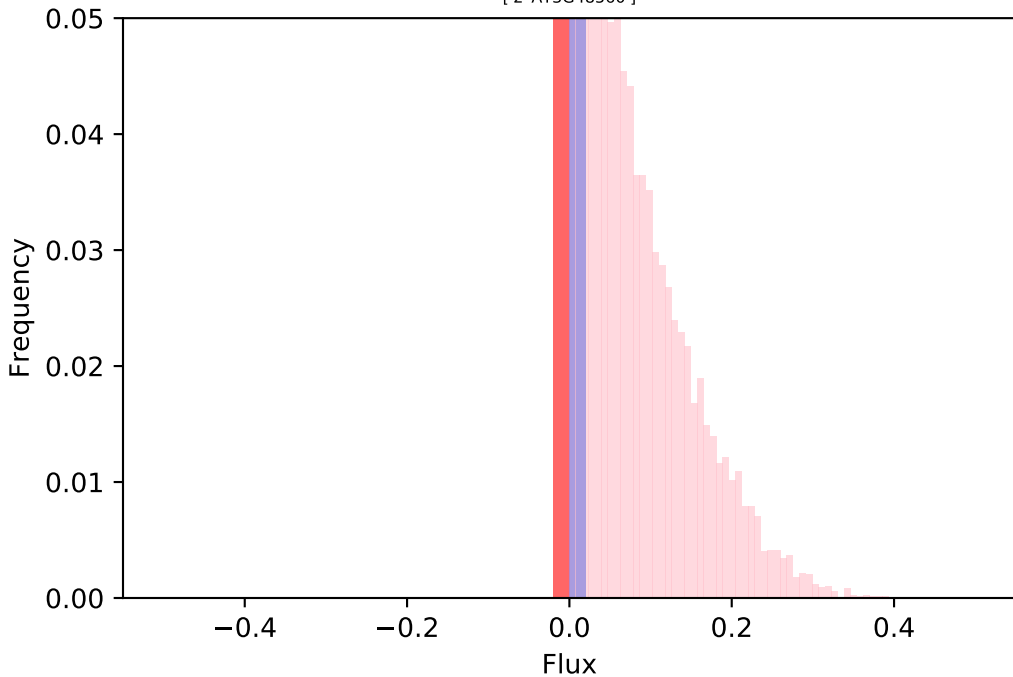


208 : H<sub>2</sub>O<sub>h</sub> + His<sub>al\_h</sub> + NAD<sub>h</sub> --> H<sub>h</sub> + His<sub>h</sub> + NADH<sub>h</sub>  
['AT5G63890']

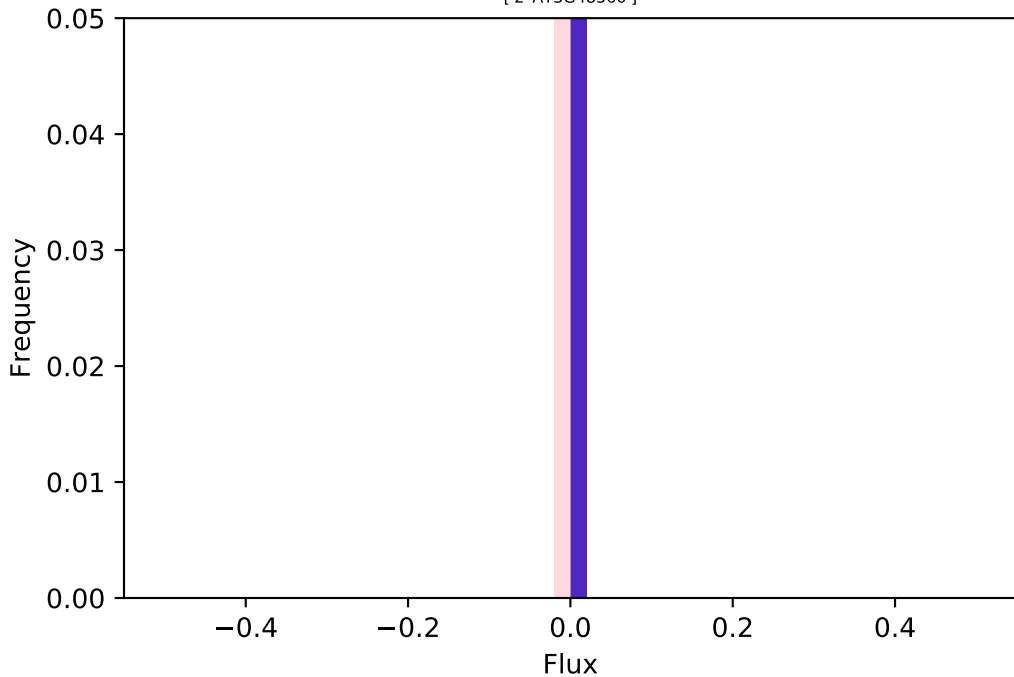




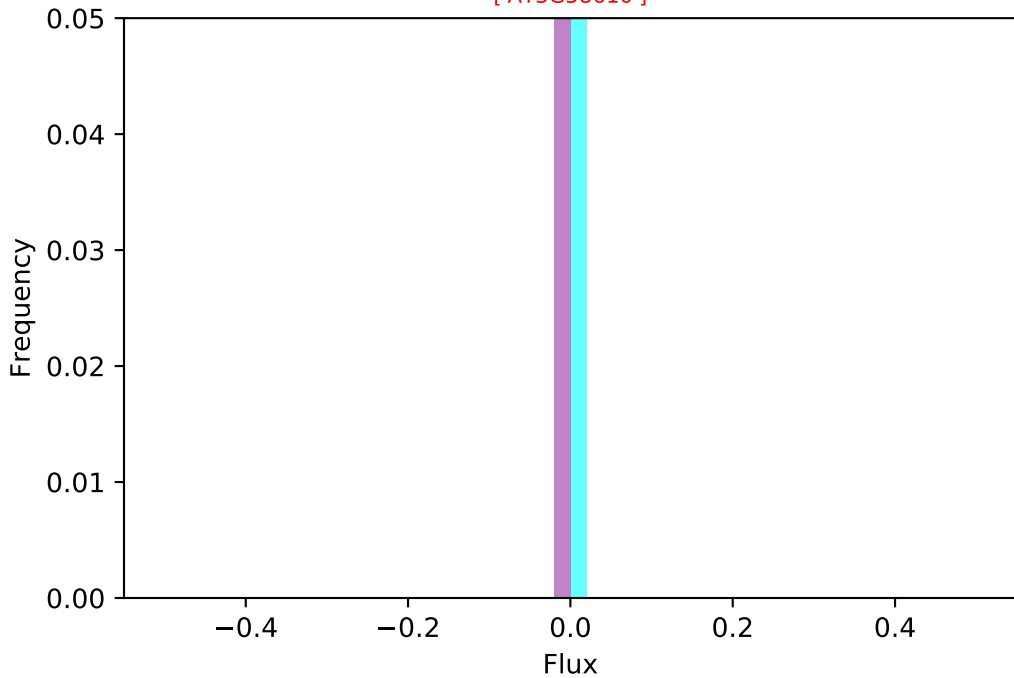
210 : H\_h + Pyr\_h + ThPP\_h --> CO2\_h + H\_DASH\_Eth\_DASH\_ThPP\_h  
['2\*AT3G48560']



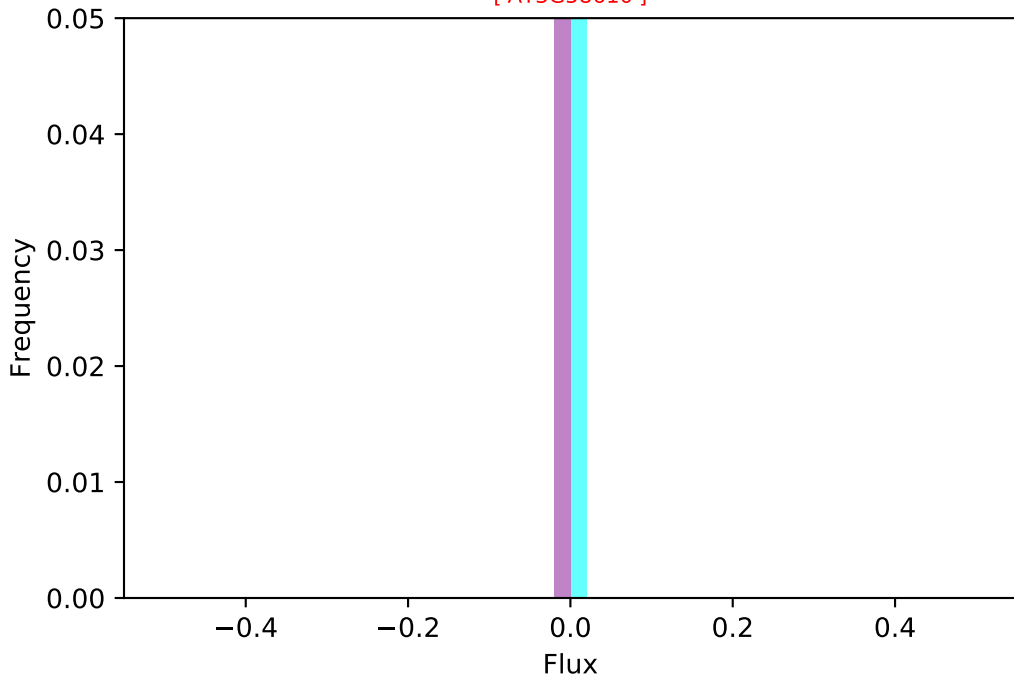
211 : H\_DASH\_Eth\_DASH\_ThPP\_h + OB\_h --> AHB\_h + ThPP\_h  
['2\*AT3G48560']



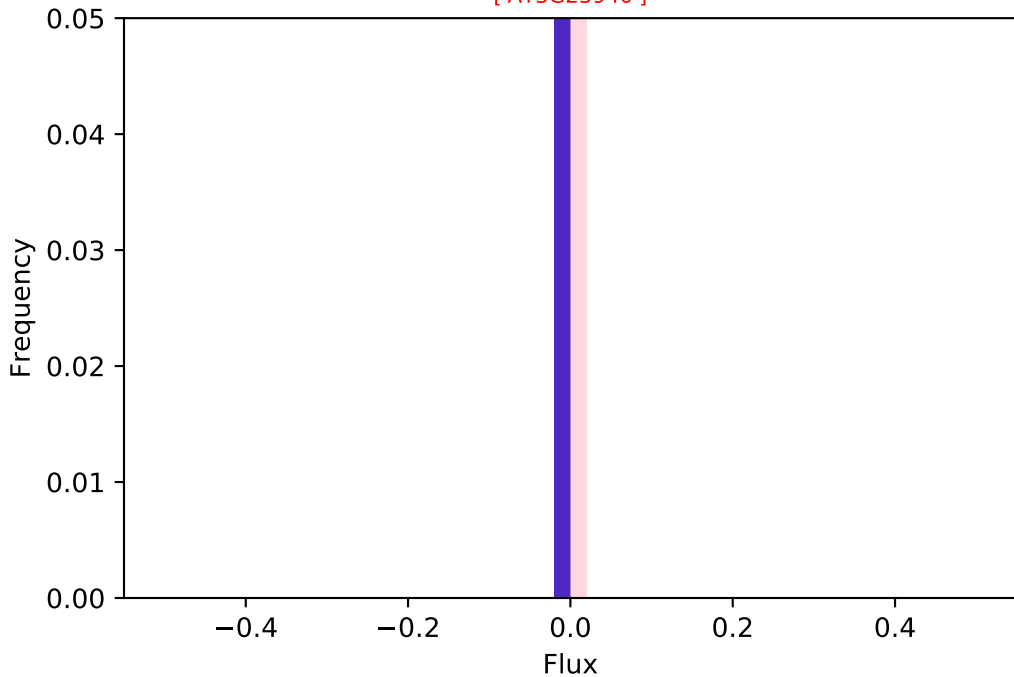
212 : AHB\_h --> HMOP\_h  
['AT3G58610']



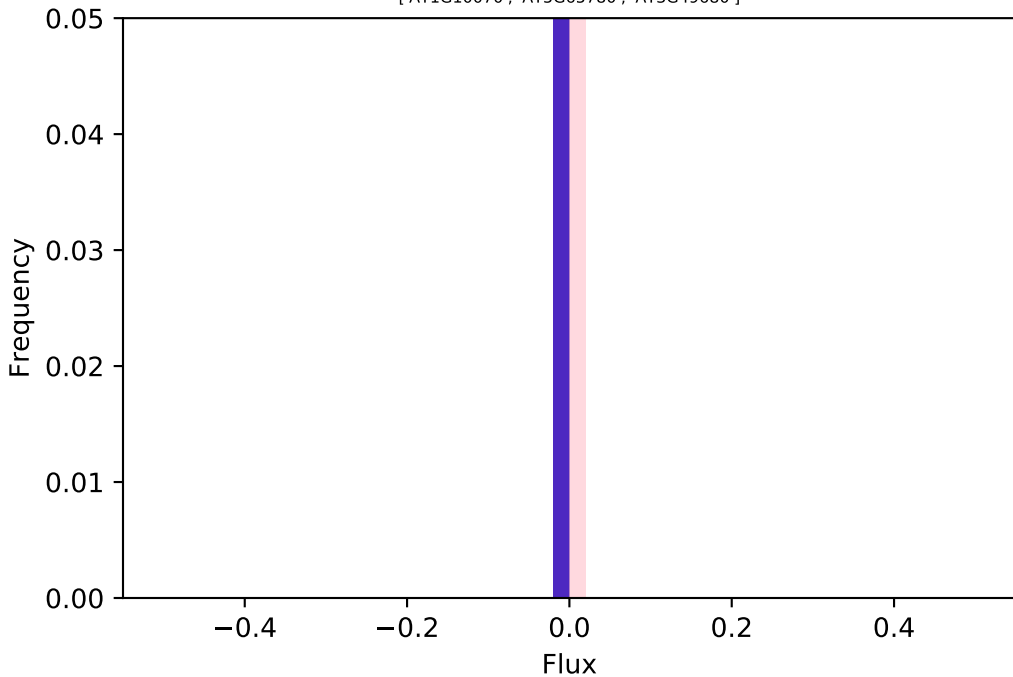
213 : HMOP\_h + H\_h + NADPH\_h --> DHMP\_h + NADP\_h  
['AT3G58610']



214 : DHMP\_h --> H2O\_h + MOP\_h  
['AT3G23940']

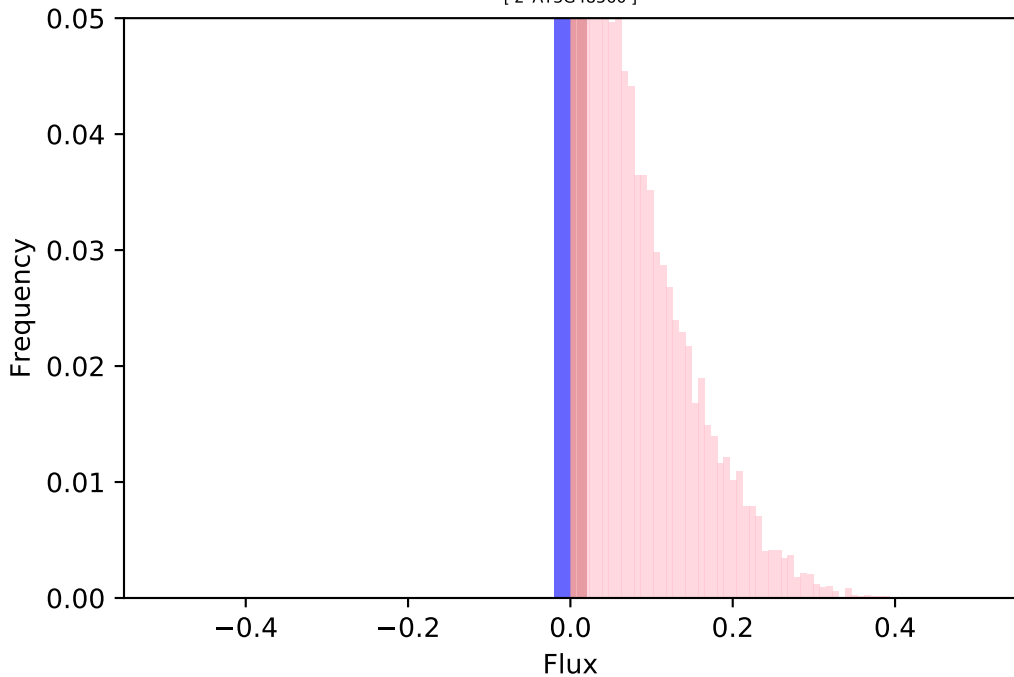


215 : Glu\_h + MOP\_h --> Ile\_h + KG\_h  
['AT1G10070', 'AT5G65780', 'AT3G49680']

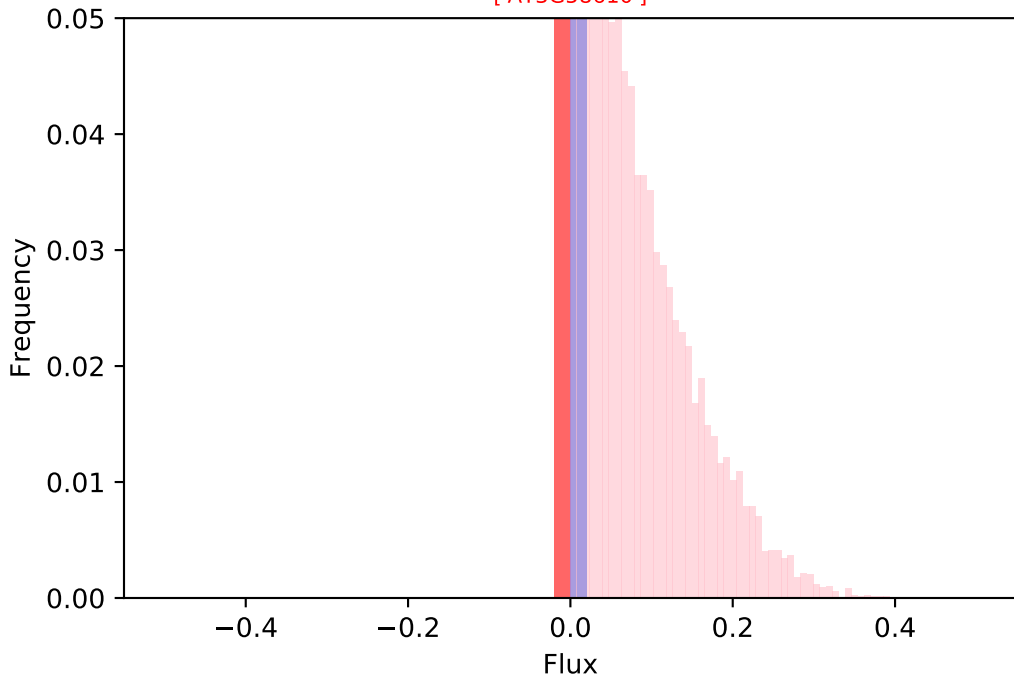




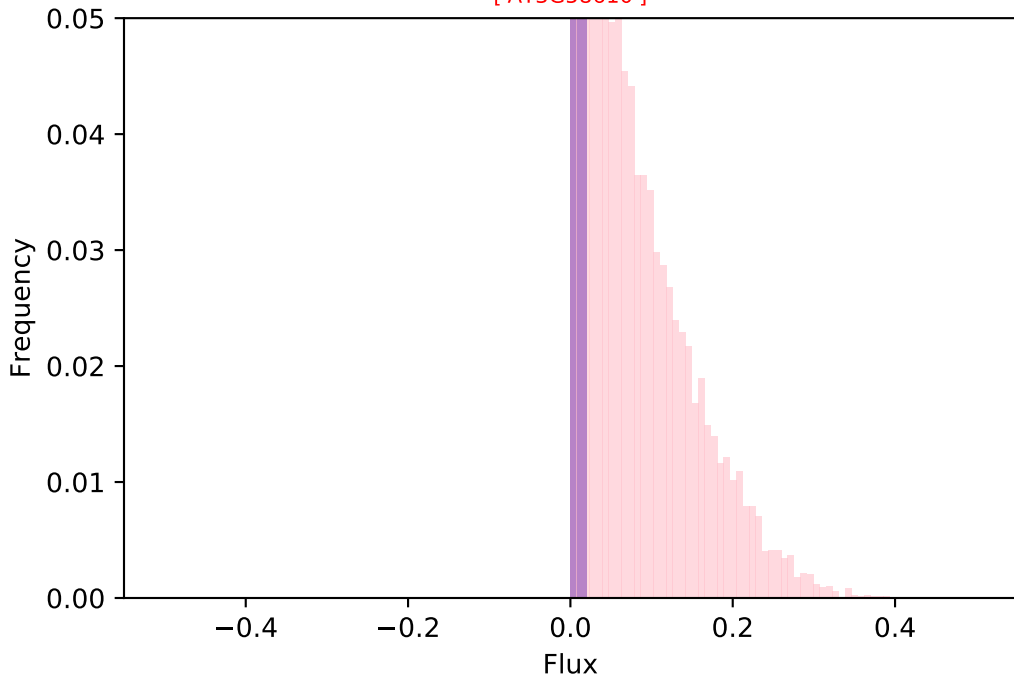
216 : H\_DASH\_Eth\_DASH\_ThPP\_h + Pyr\_h --> AL\_h + ThPP\_h  
['2\*AT3G48560']



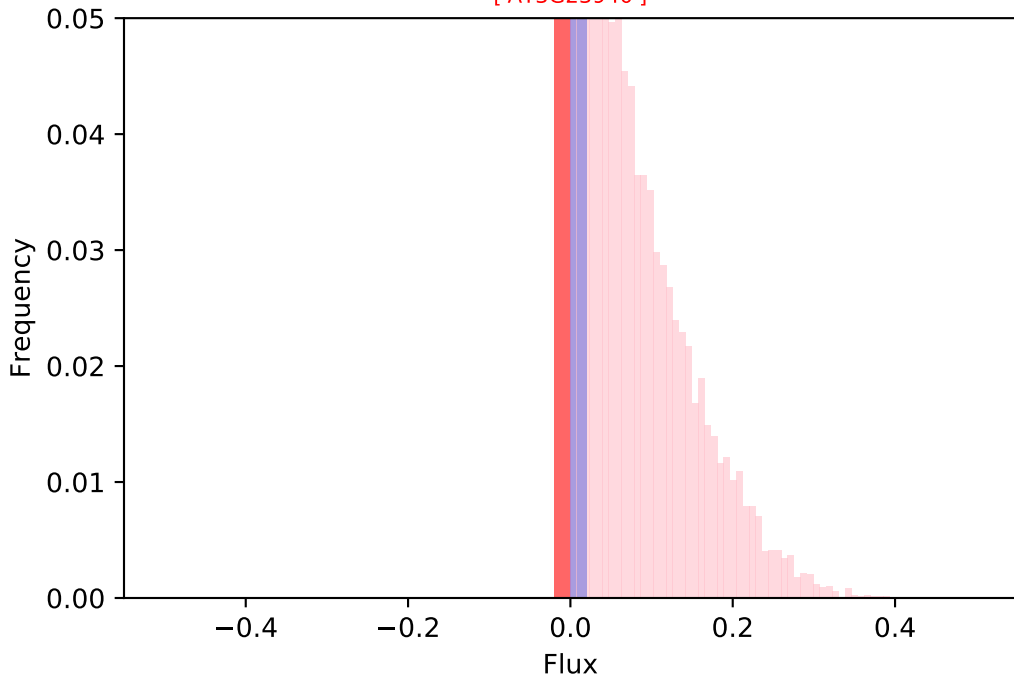
217 : AL\_h --> HMOB\_h  
['AT3G58610']



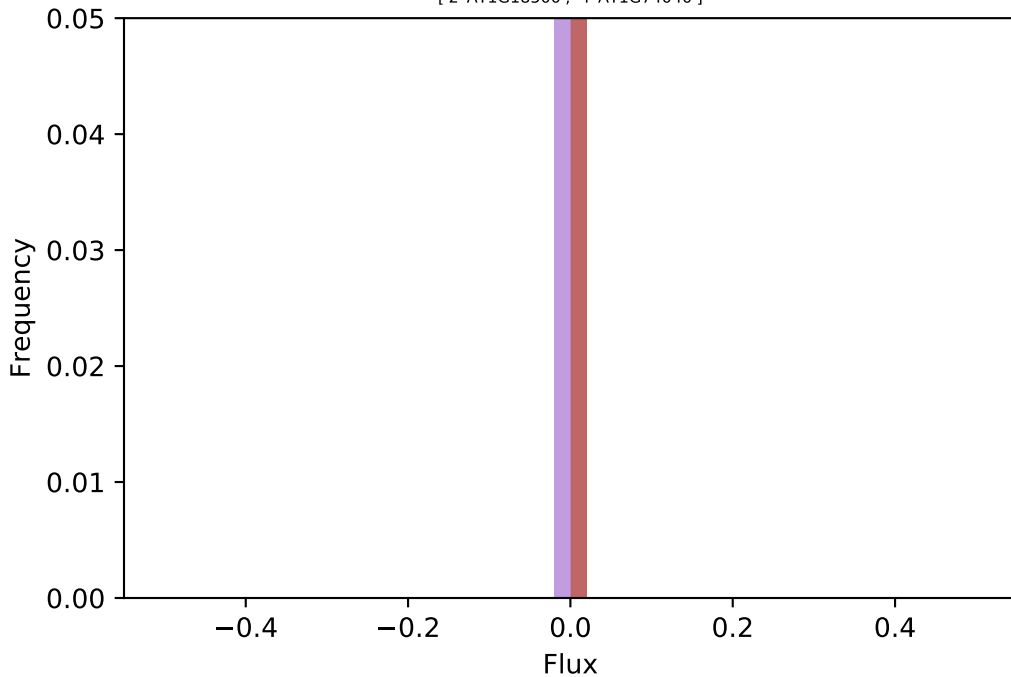
218 : HMOB\_h + H\_h + NADPH\_h --> DHMB\_h + NADP\_h  
[ 'AT3G58610' ]



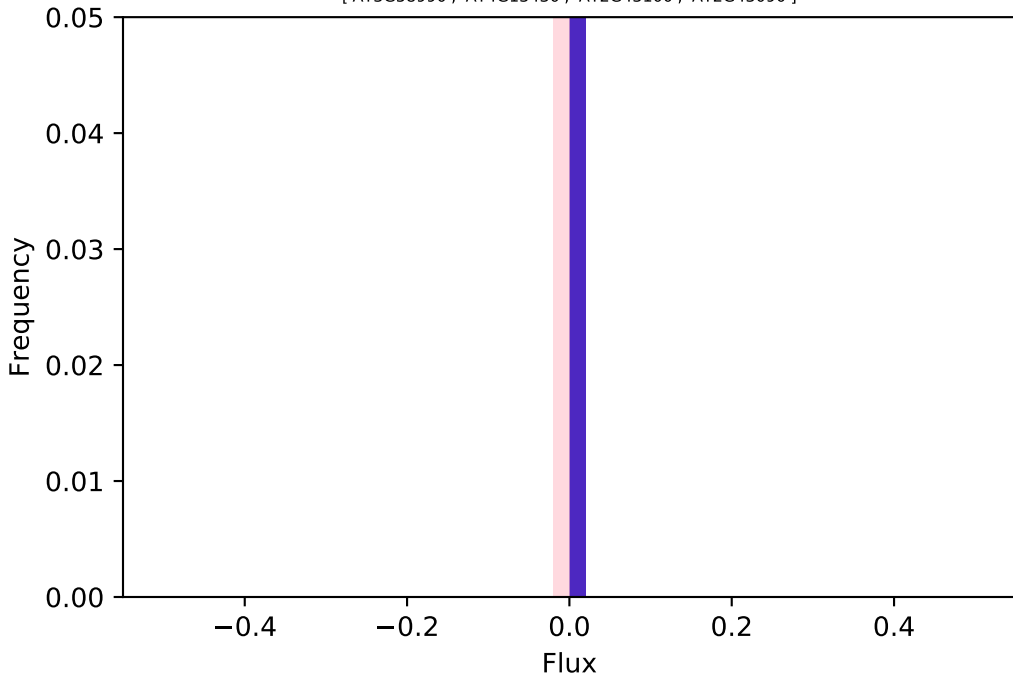
219 : DHMB\_h --> H2O\_h + MOB\_h  
['AT3G23940']



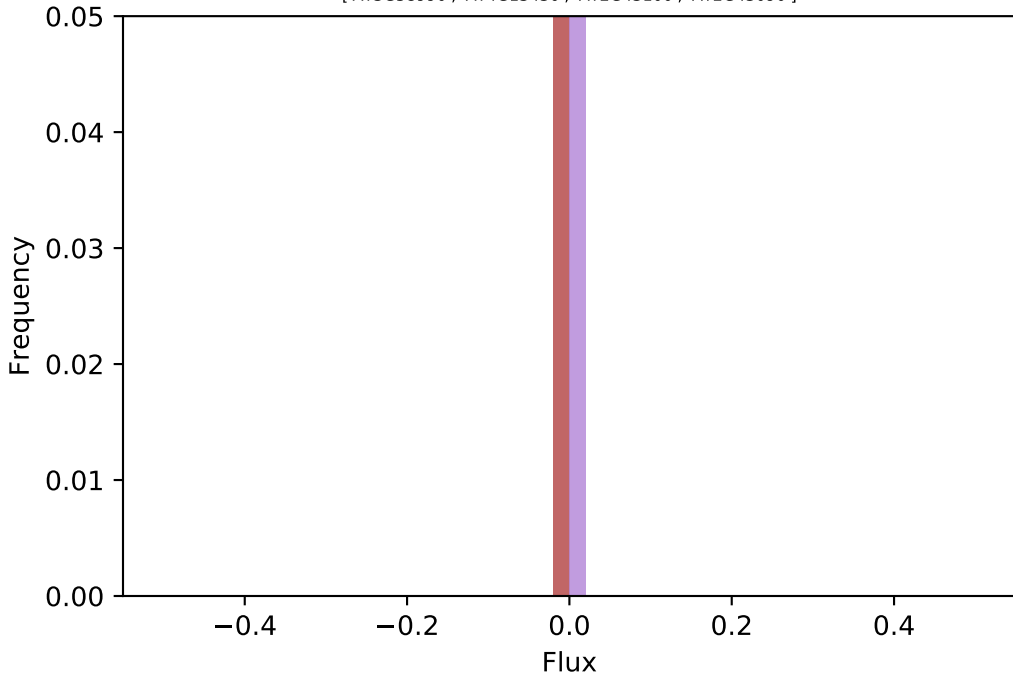
220 : A\_DASH\_CoA\_h + H2O\_h + MOB\_h --> 2IPM\_h + CoA\_h + H\_h  
['2\*AT1G18500', '4\*AT1G74040']



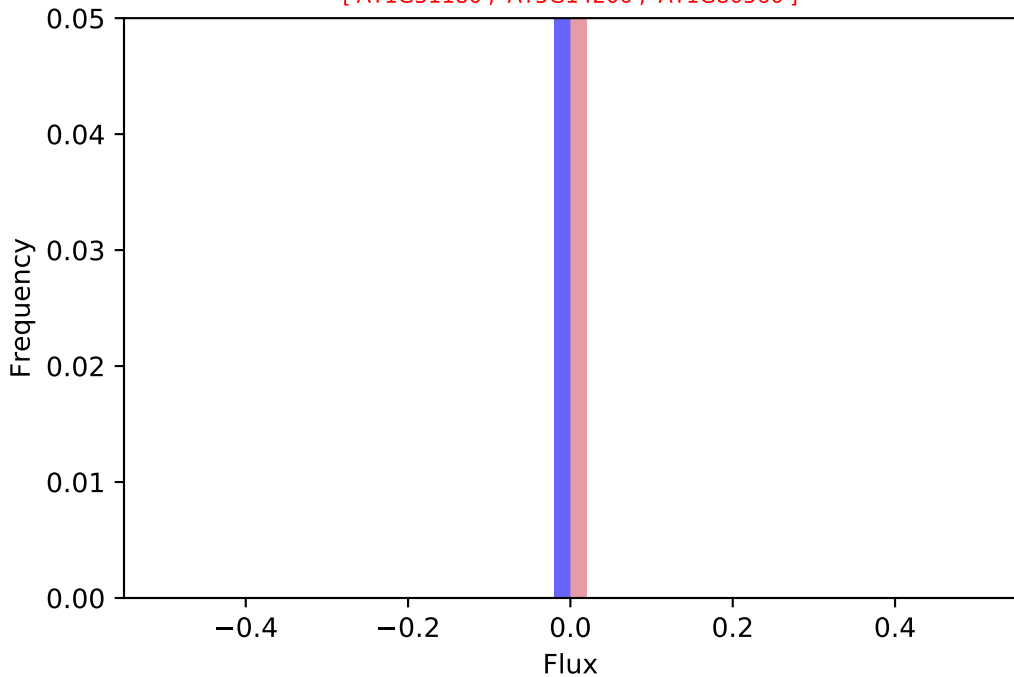
221 : 2IPM\_h --> H2O\_h + IPM\_h  
['AT3G58990', 'AT4G13430', 'AT2G43100', 'AT2G43090']



222 : H2O\_h + IPM\_h --> 3IPM\_h  
['AT3G58990', 'AT4G13430', 'AT2G43100', 'AT2G43090']

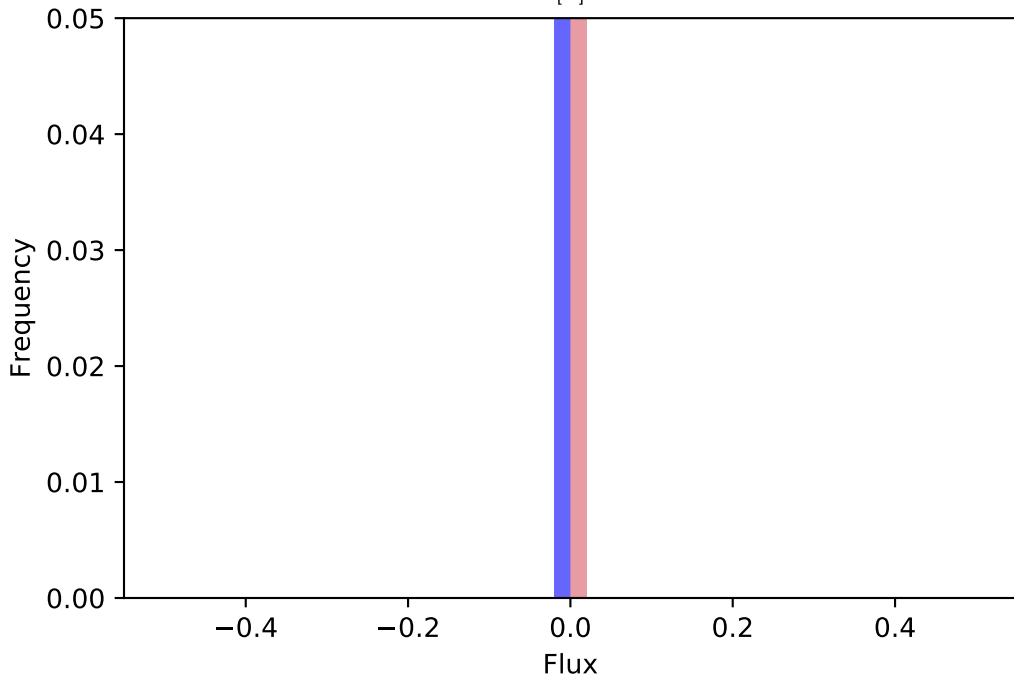


223 : 3IPM\_h + NAD\_h --> H\_h + IPO\_h + NADH\_h  
['AT1G31180', 'AT5G14200', 'AT1G80560']

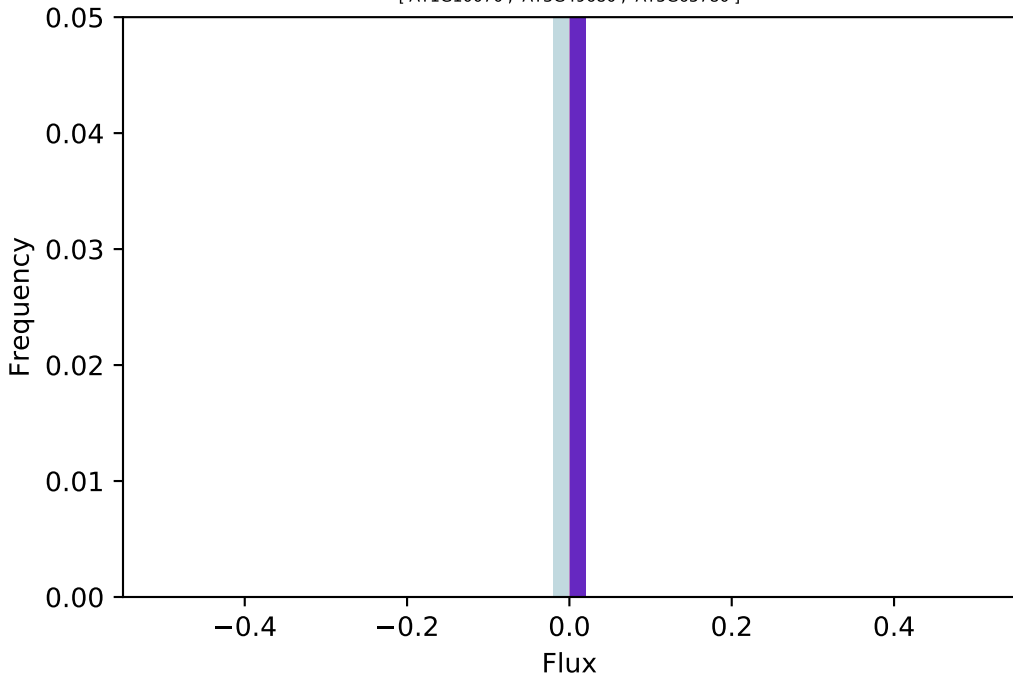




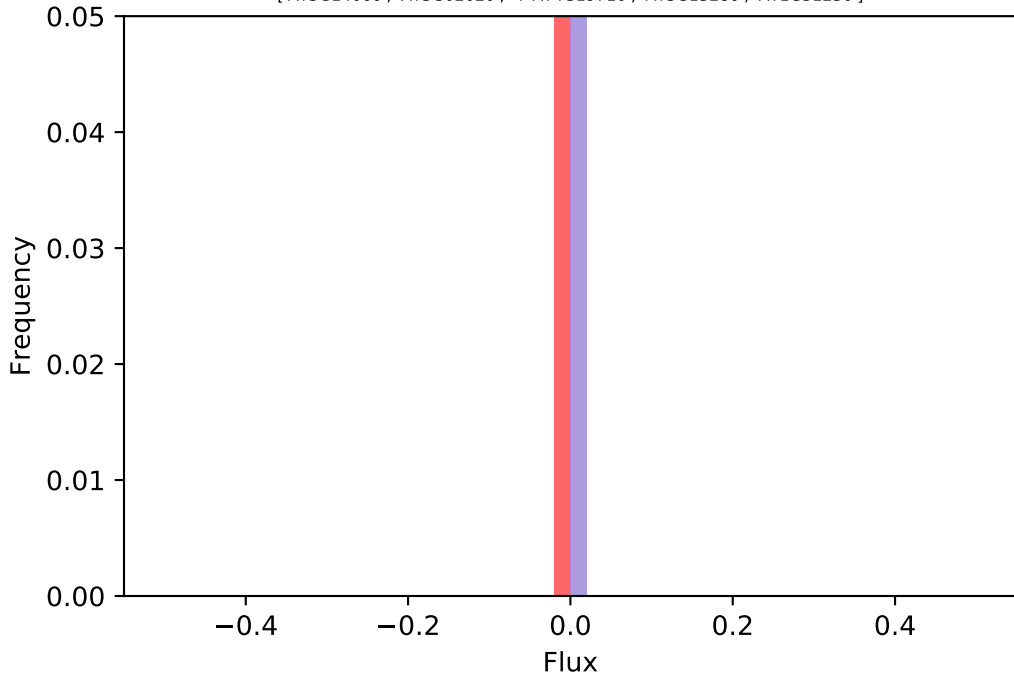
224 : H\_h + IPO\_h --> 4MOP\_h + CO2\_h  
['-']



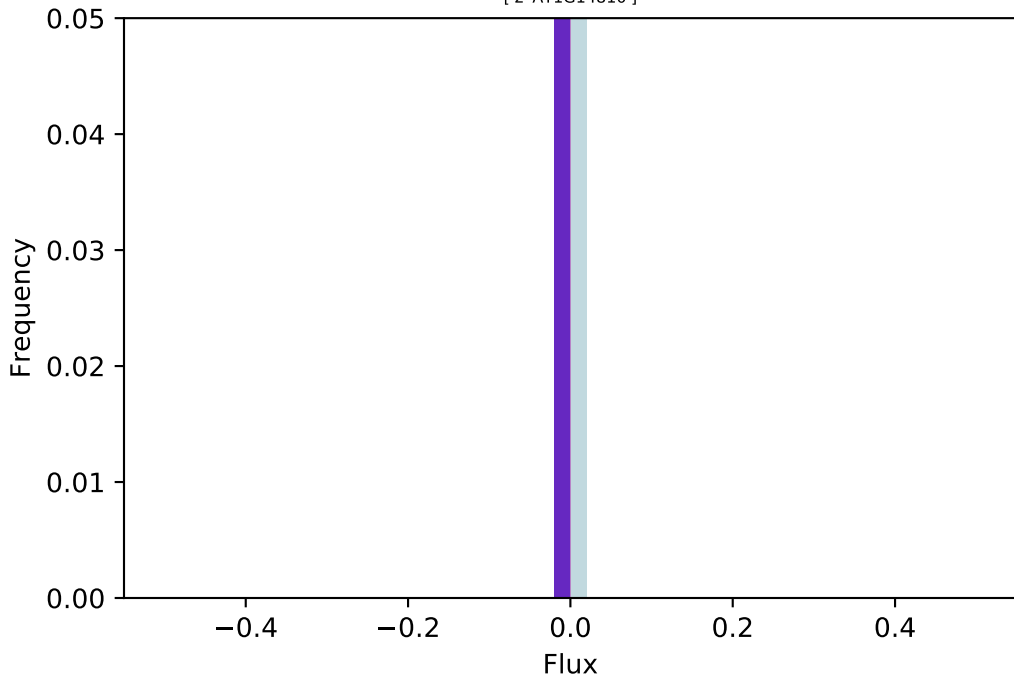
225 : 4MOP\_h + Glu\_h --> KG\_h + Leu\_h  
['AT1G10070', 'AT3G49680', 'AT5G65780']



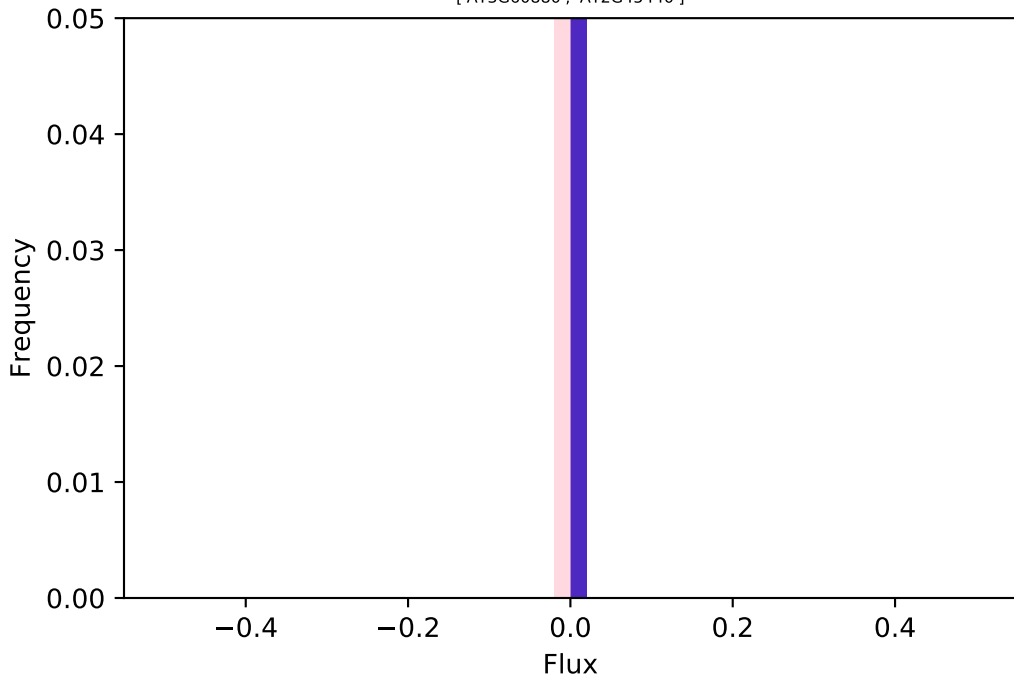
226 : ATP\_h + Asp\_h --> ADP\_h + AspP\_h  
['AT5G14060', 'AT3G02020', '4\*AT4G19710', 'AT5G13280', 'AT1G31230']



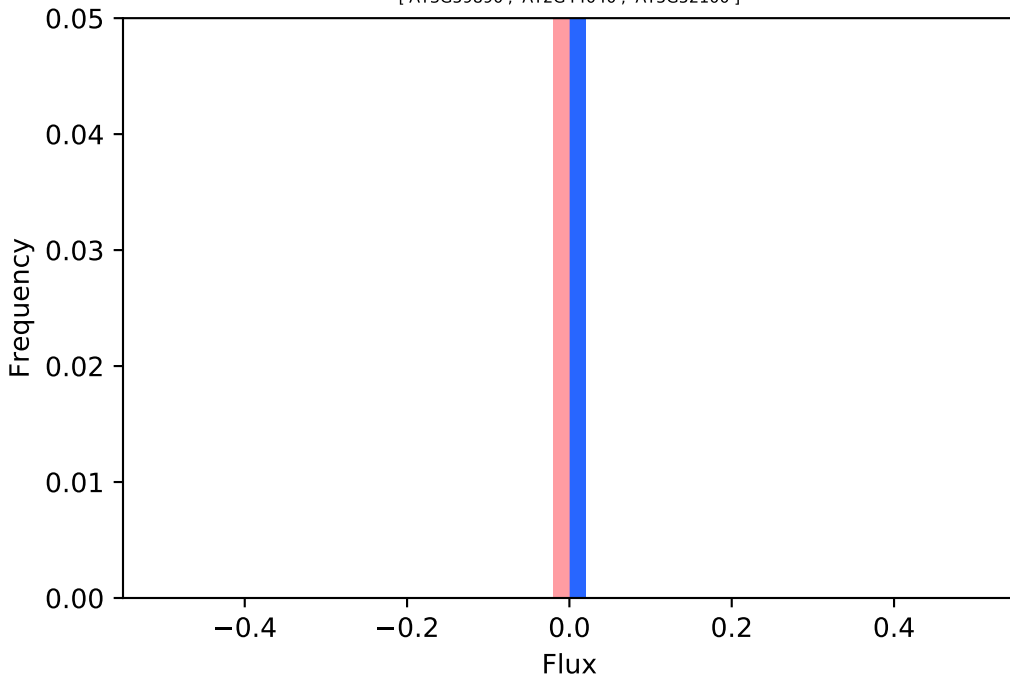
227 : AspP\_h + H\_h + NADPH\_h --> Asp\_DASH\_SeA\_h + NADP\_h + Pi\_h  
['2\*AT1G14810']



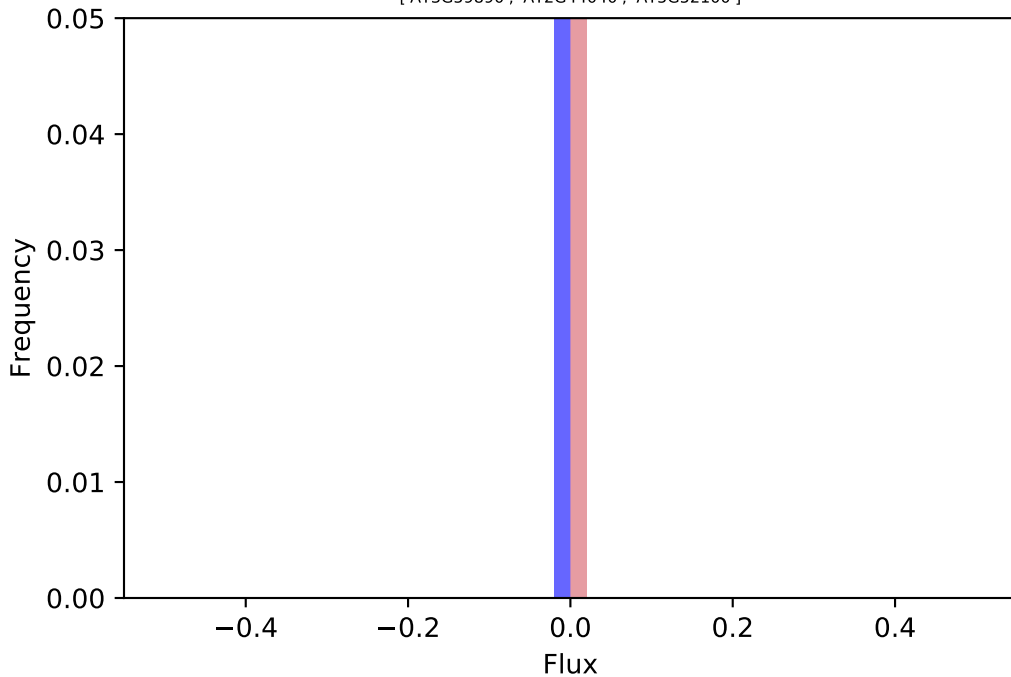
228 : Asp\_DASH\_SeA\_h + Pyr\_h --> DHD\_h + 2.0 H2O\_h + H\_h  
['AT3G60880', 'AT2G45440']



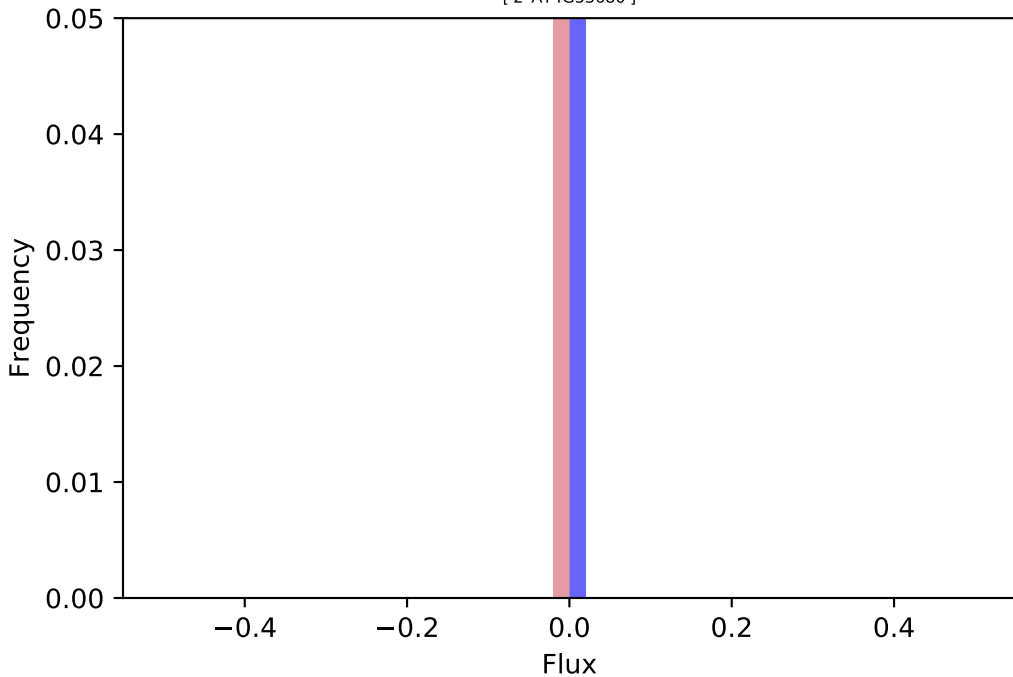
229 : DHD\_h + H\_h + NADH\_h --> NAD\_h + THD\_h  
['AT3G59890', 'AT2G44040', 'AT5G52100']



230 : DHD\_h + H\_h + NADPH\_h --> NADP\_h + THD\_h  
['AT3G59890', 'AT2G44040', 'AT5G52100']

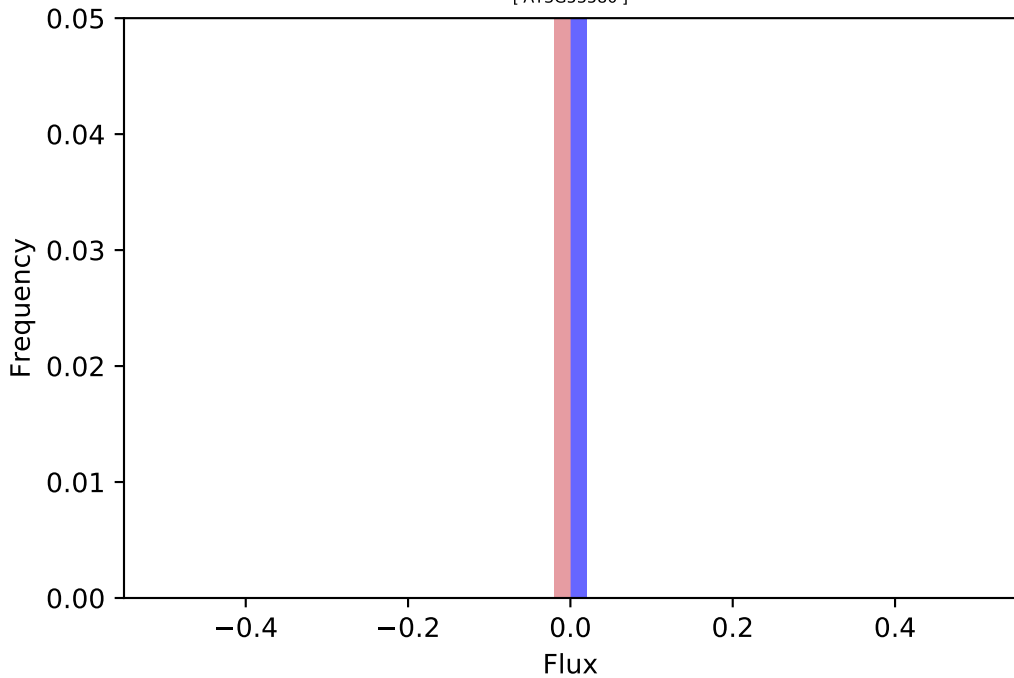


231 : Glu\_h + H2O\_h + H\_h + THD\_h --> DAP\_h + KG\_h  
['2\*AT4G33680']

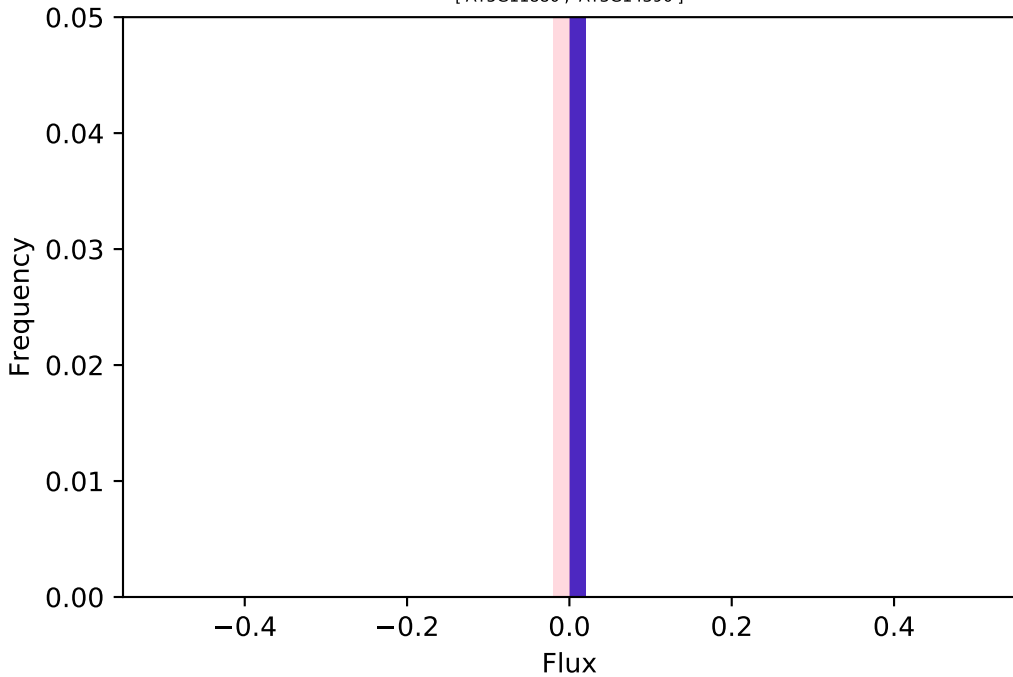




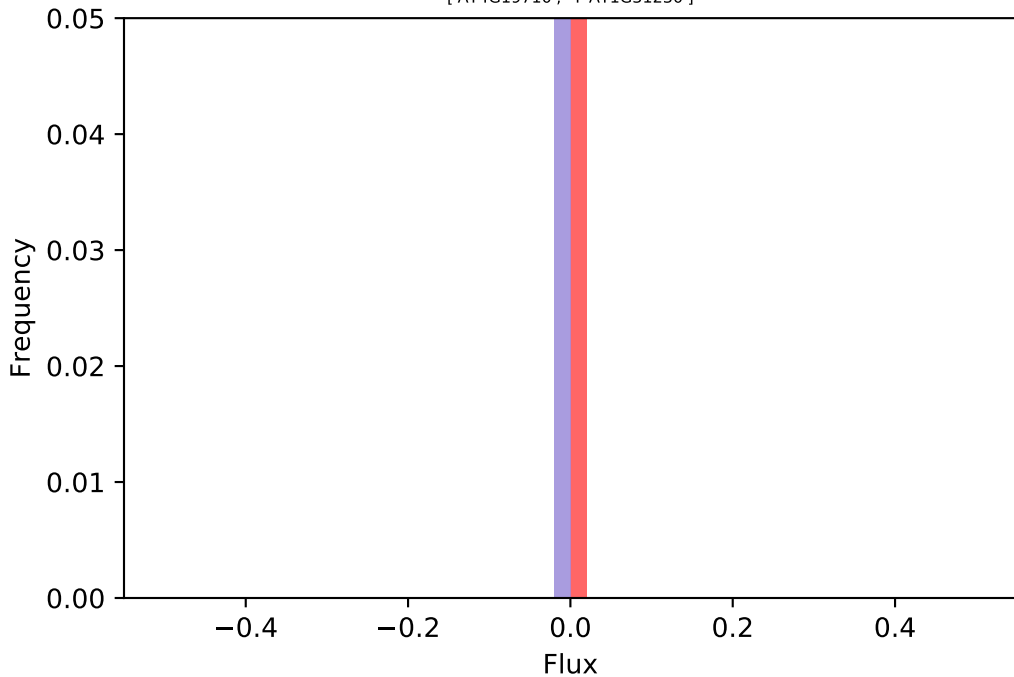
232 : DAP\_h --> mDAP\_h  
['AT3G53580']



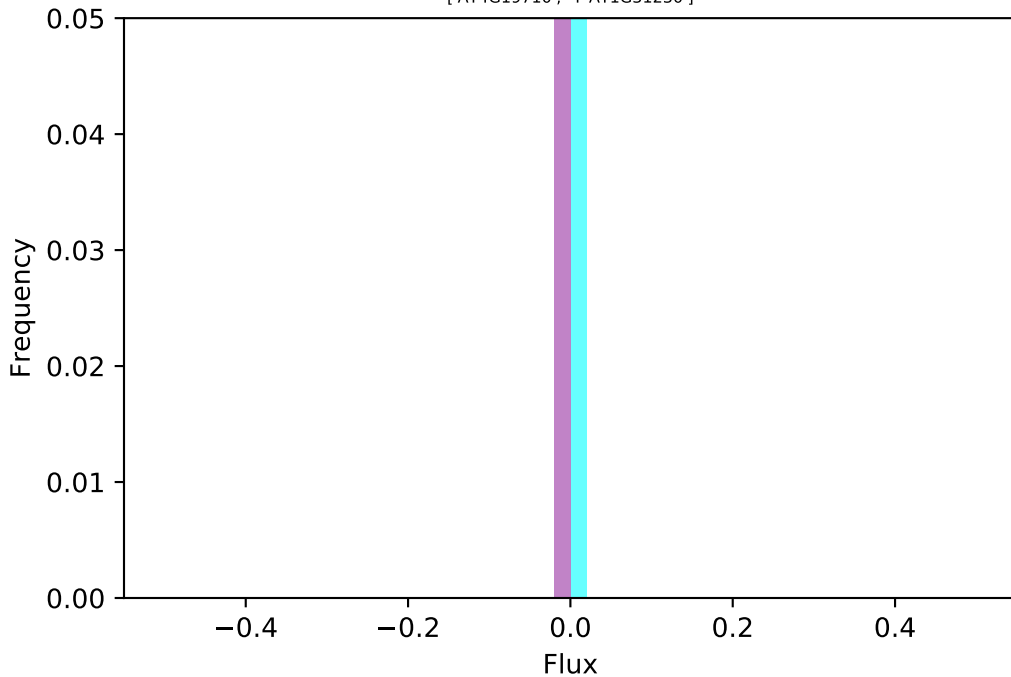
233 : H\_h + mDAP\_h --> CO2\_h + Lys\_h  
['AT5G11880', 'AT3G14390']



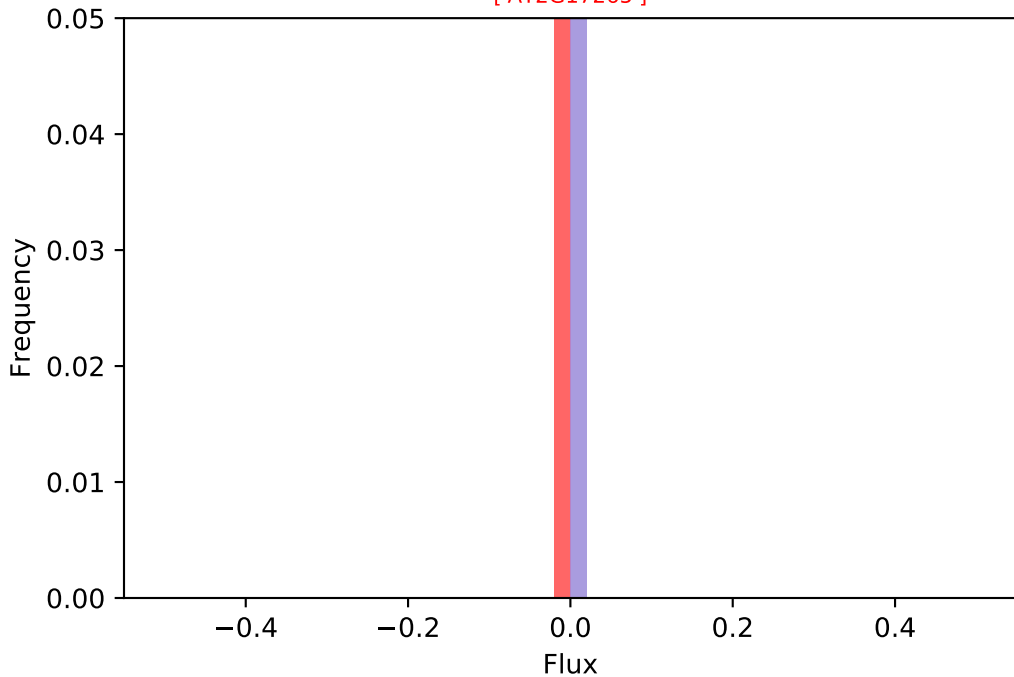
234 : Asp\_DASH\_SeA\_h + H\_h + NADPH\_h --> H\_DASH\_Ser\_h + NADP\_h  
['AT4G19710', '4\*AT1G31230']



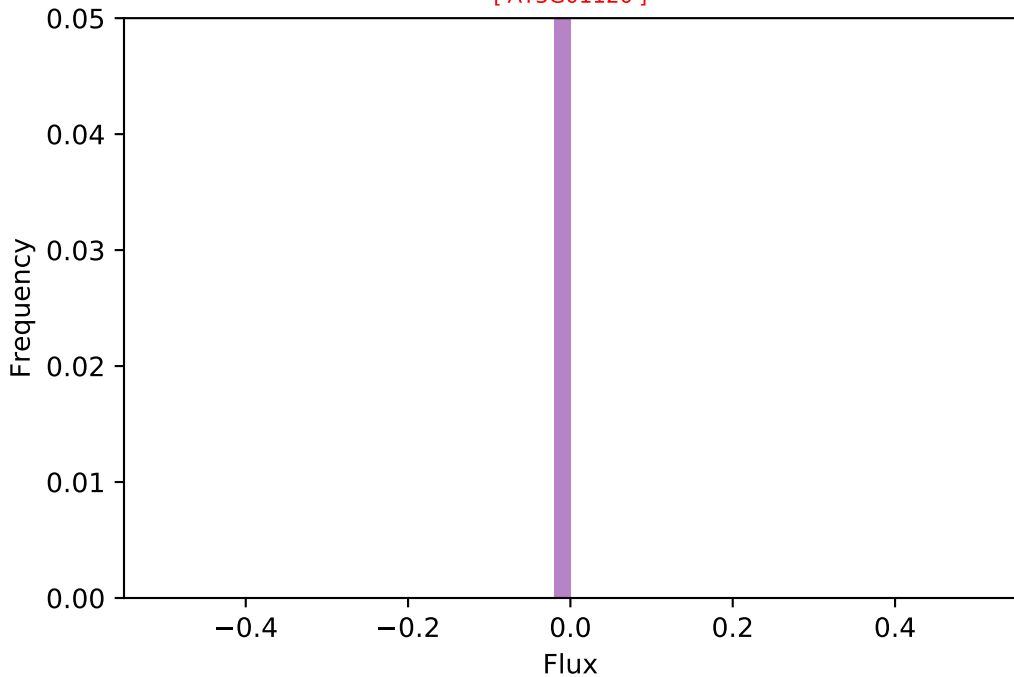
235 : Asp\_DASH\_SeA\_h + H\_h + NADH\_h --> H\_DASH\_Ser\_h + NAD\_h  
['AT4G19710', '4\*AT1G31230']



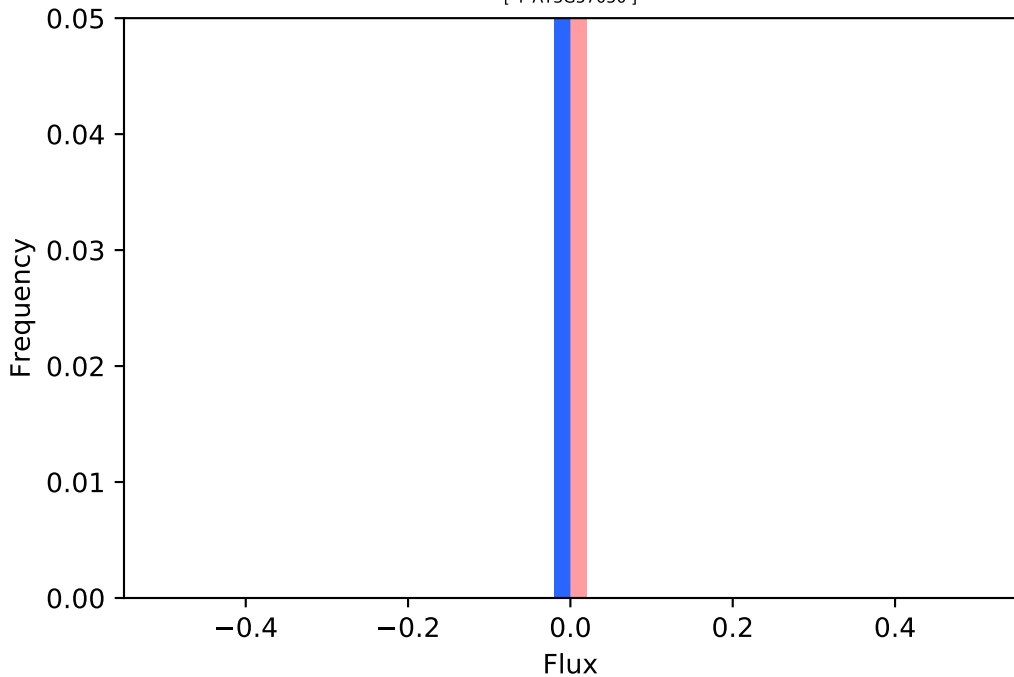
236 : ATP\_h + H\_DASH\_Ser\_h --> ADP\_h + H\_h + PH\_DASH\_Ser\_h  
['AT2G17265']



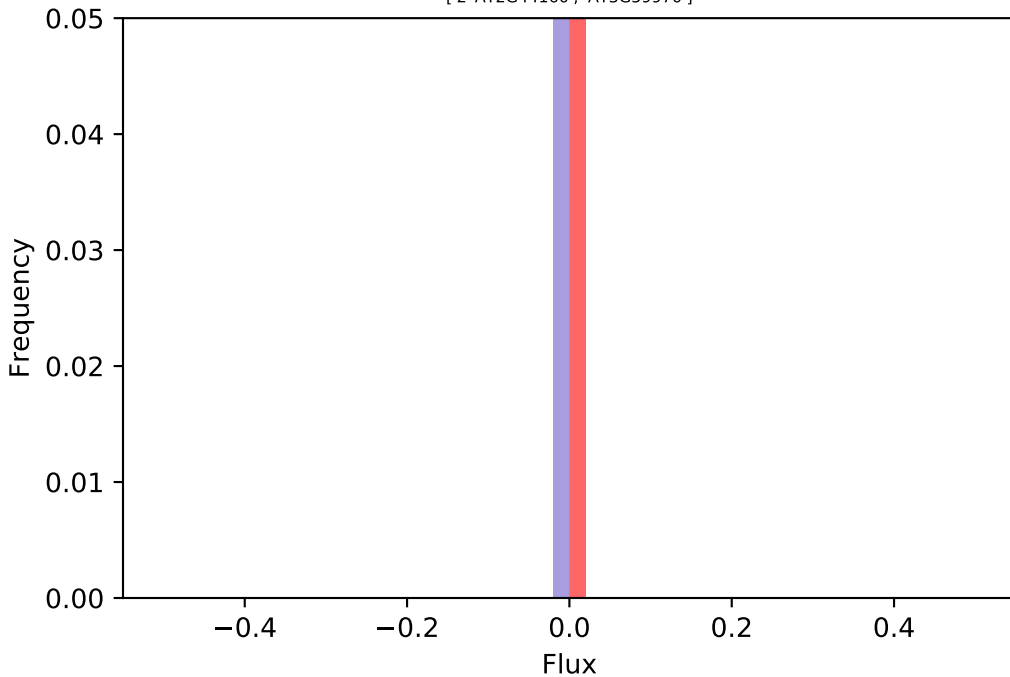
237 : Cys\_h + PH\_DASH\_Ser\_h --> CTH\_h + Pi\_h  
['AT3G01120']



238 : CTH\_h + H2O\_h --> H\_DASH\_Cys\_h + NH4\_h + Pyr\_h  
['4\*AT3G57050']

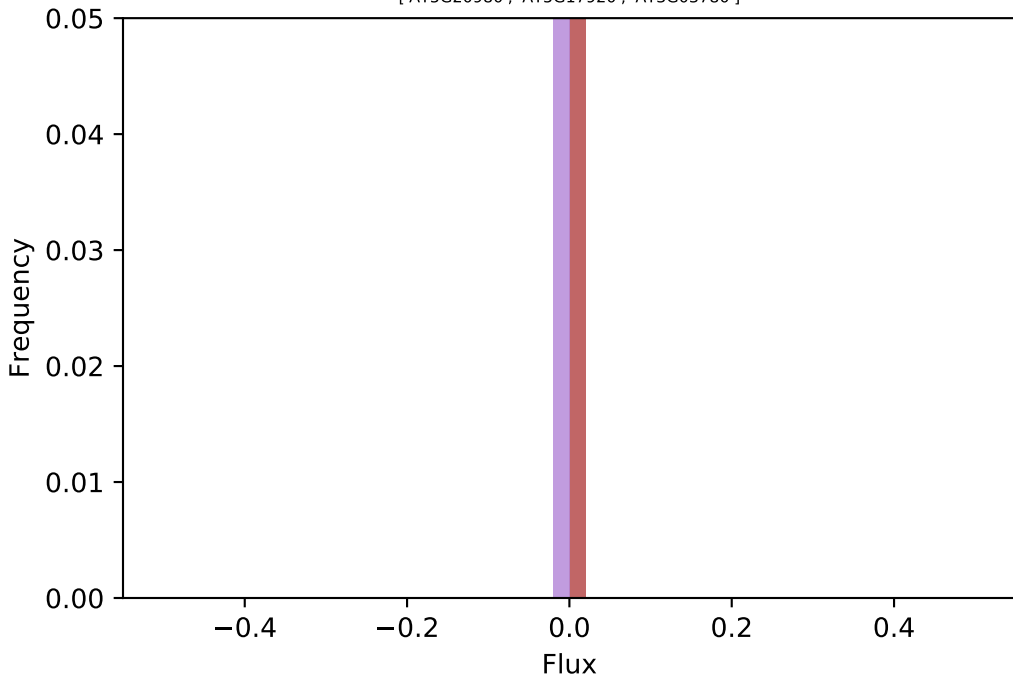


239 : M\_DASH\_THF\_c + NADH\_c --> 5M\_DASH\_THF\_c + NAD\_c  
['2\*AT2G44160', 'AT3G59970']

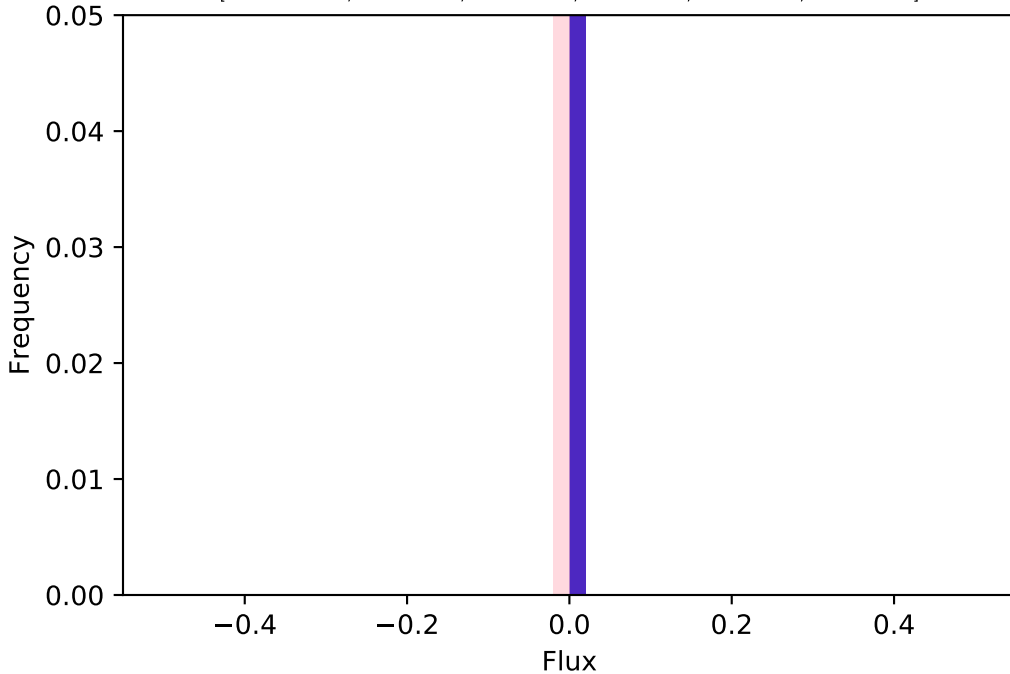




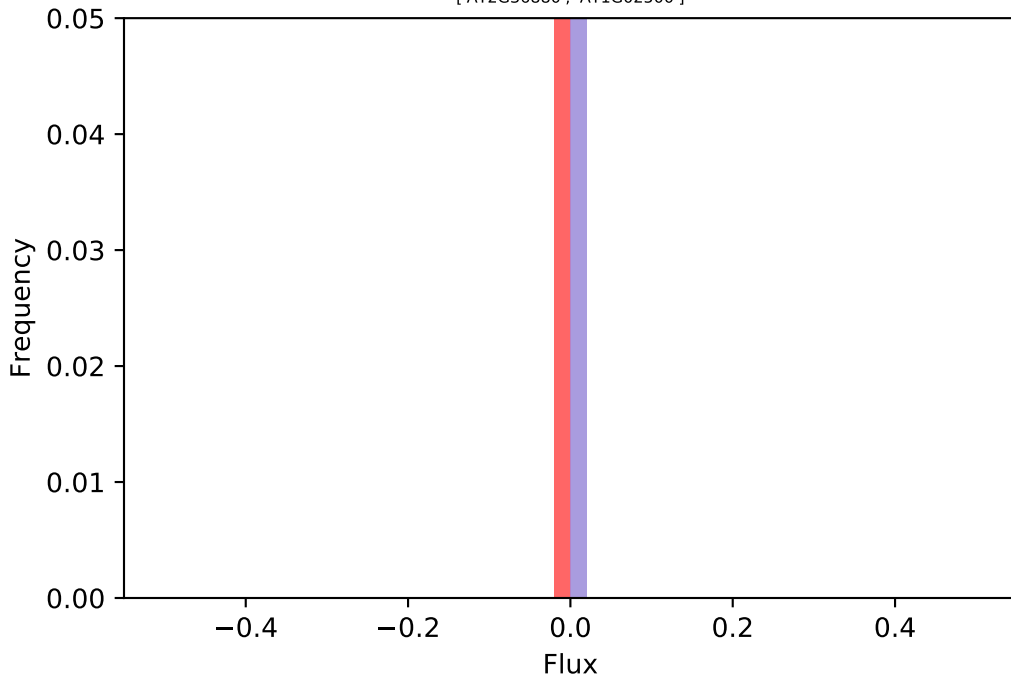
240 : 5M\_DASH\_THF\_c + H\_DASH\_Cys\_c --> Met\_c + THF\_c  
['AT5G20980', 'AT5G17920', 'AT3G03780']



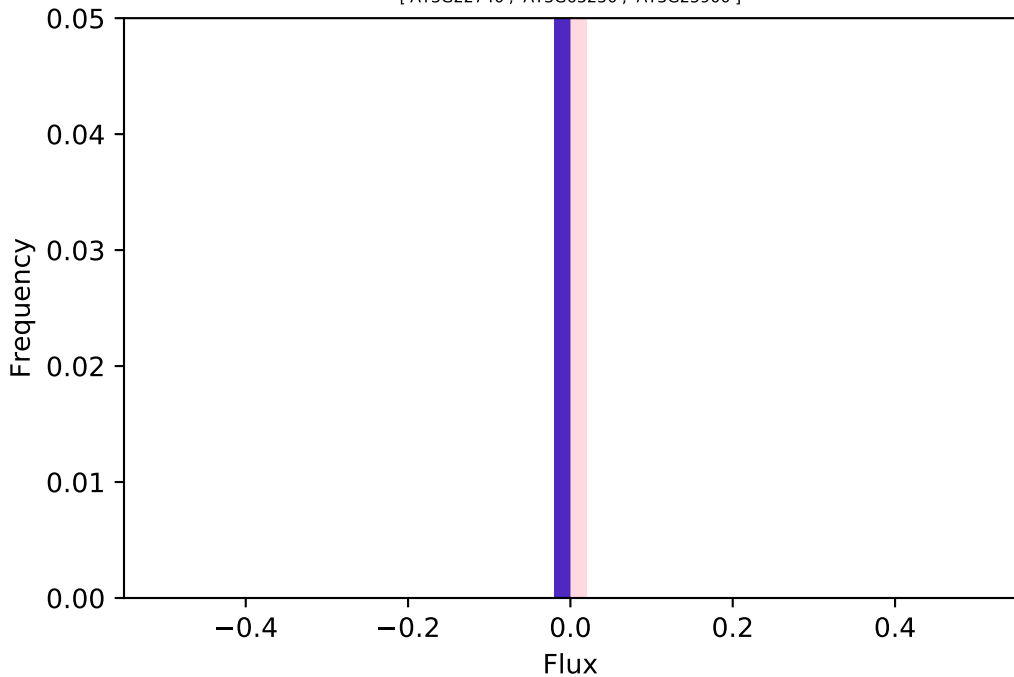
241 : Gly\_c + H2O\_c + M\_DASH\_THF\_c <=> Ser\_c + THF\_c  
['4\*AT4G13930', 'AT1G22020', 'AT1G36370', 'AT5G26780', 'AT4G13890', 'AT4G37930']



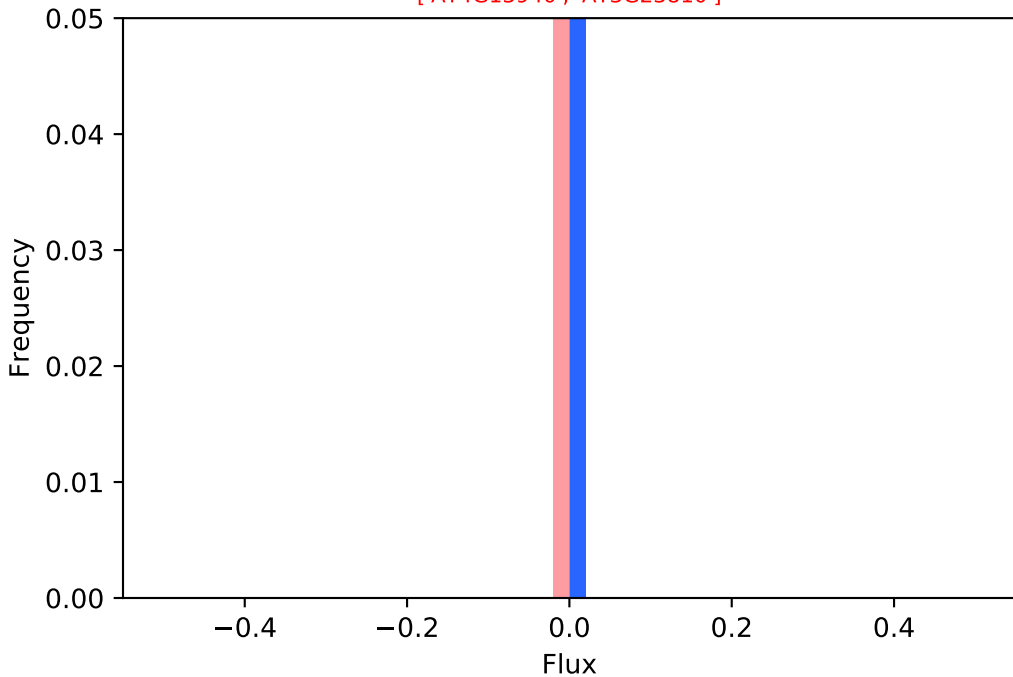
242 : ATP\_c + H2O\_c + Met\_c --> H\_c + PPi\_c + Pi\_c + aMet\_c  
['AT2G36880', 'AT1G02500']



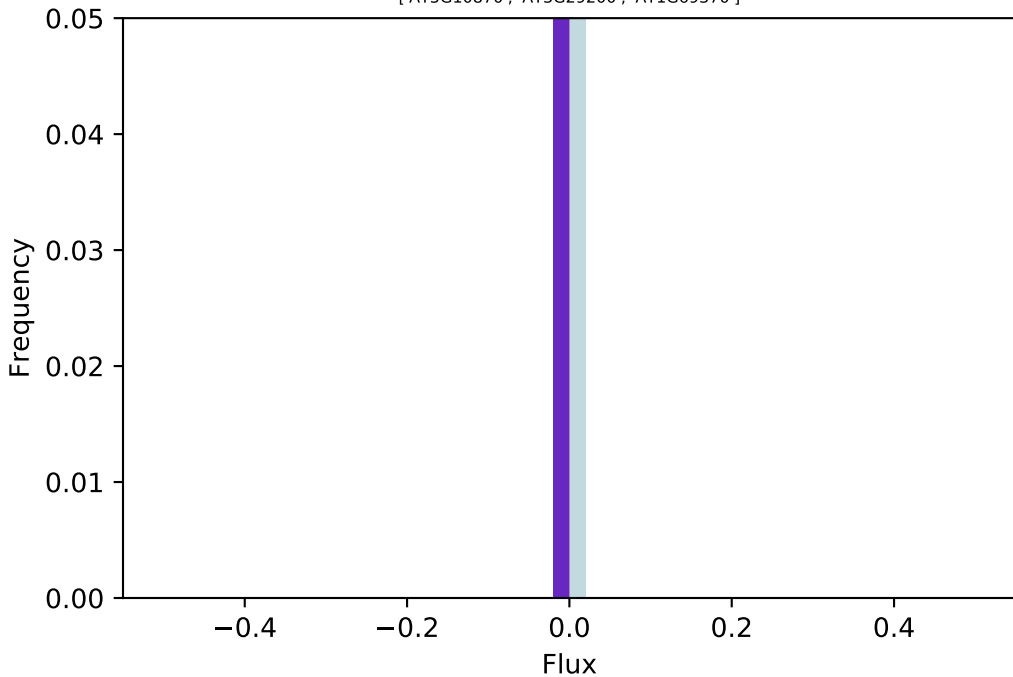
243 : H\_DASH\_Cys\_c + aMet\_c --> Met\_c + aH\_DASH\_Cys\_c  
['AT3G22740', 'AT3G63250', 'AT3G25900']



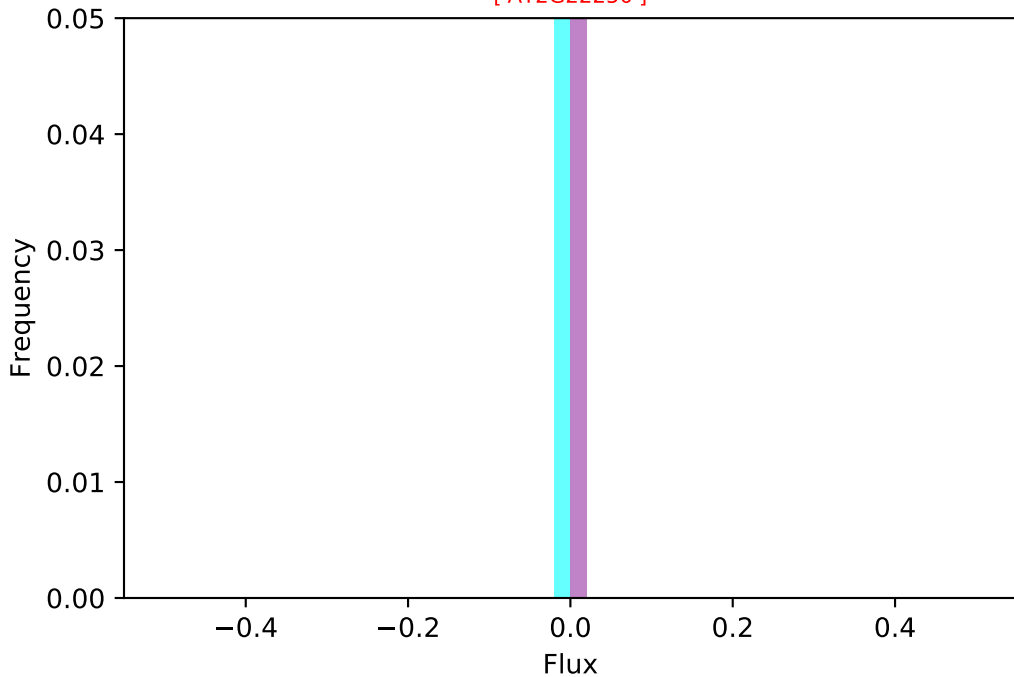
244 : H<sub>2</sub>O\_c + aH\_DASH\_Cys\_c <=> ADN\_c + H\_DASH\_Cys\_c  
['AT4G13940', 'AT3G23810']



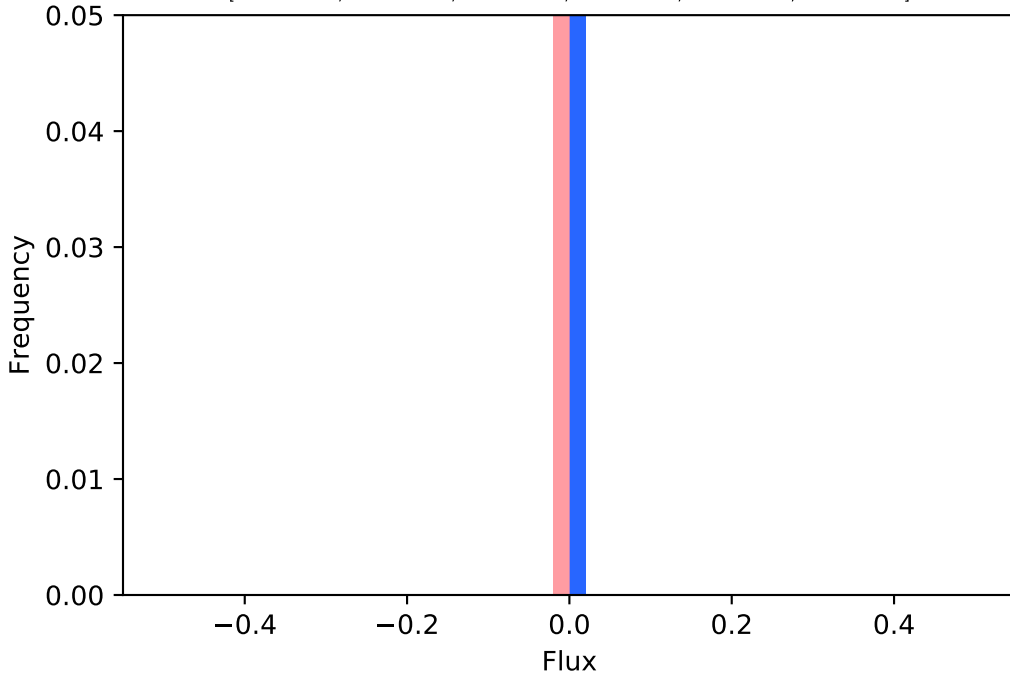
245 : CHR\_h --> PRE\_h  
['AT5G10870', 'AT3G29200', 'AT1G69370']



246 : Glu\_h + PRE\_h <=> AGN\_h + KG\_h  
['AT2G22250']

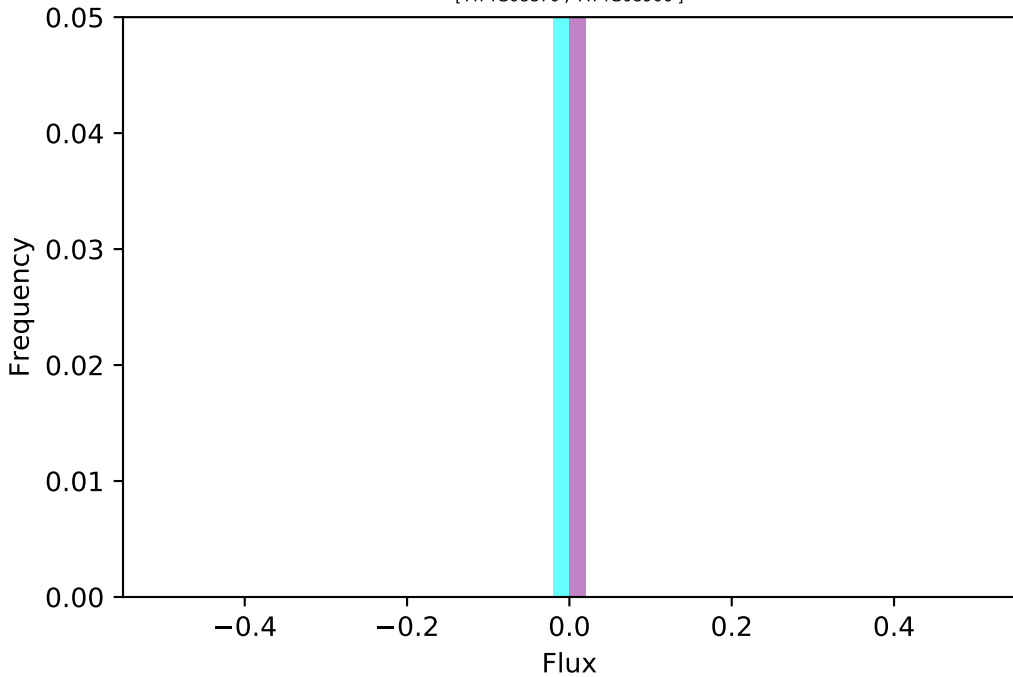


247 : AGN\_h + H\_h --> CO2\_h + H2O\_h + Phe\_h  
['AT3G07630', 'AT5G22630', 'AT1G08250', 'AT2G27820', 'AT1G11790', 'AT3G44720']

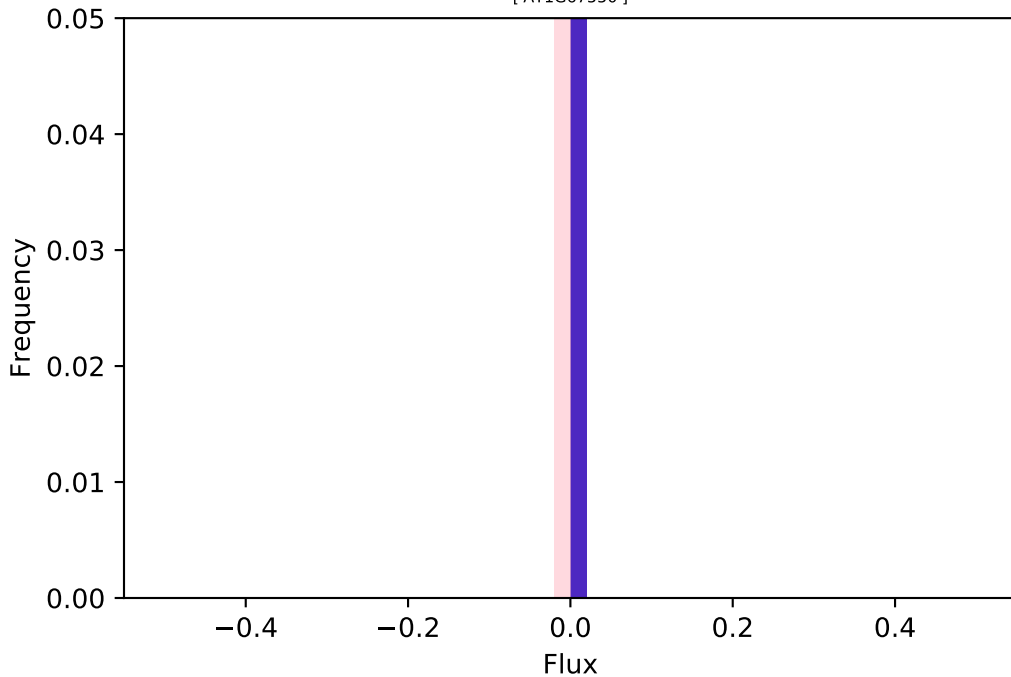




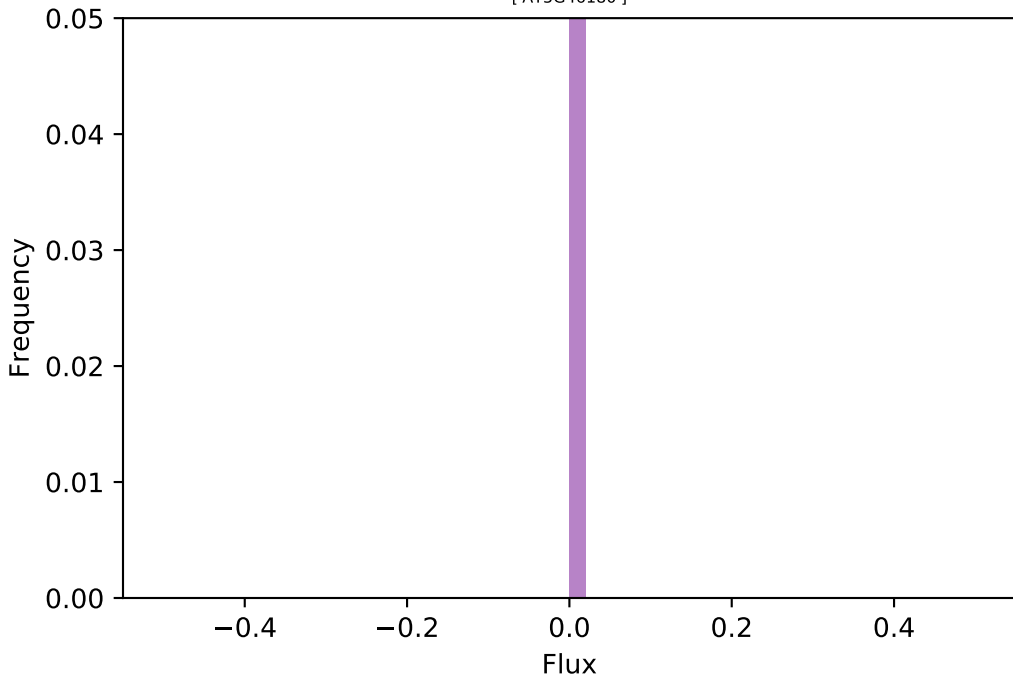
248 : Arg\_m + H2O\_m + H\_m --> Orn\_m + urea\_m  
['AT4G08870', 'AT4G08900']



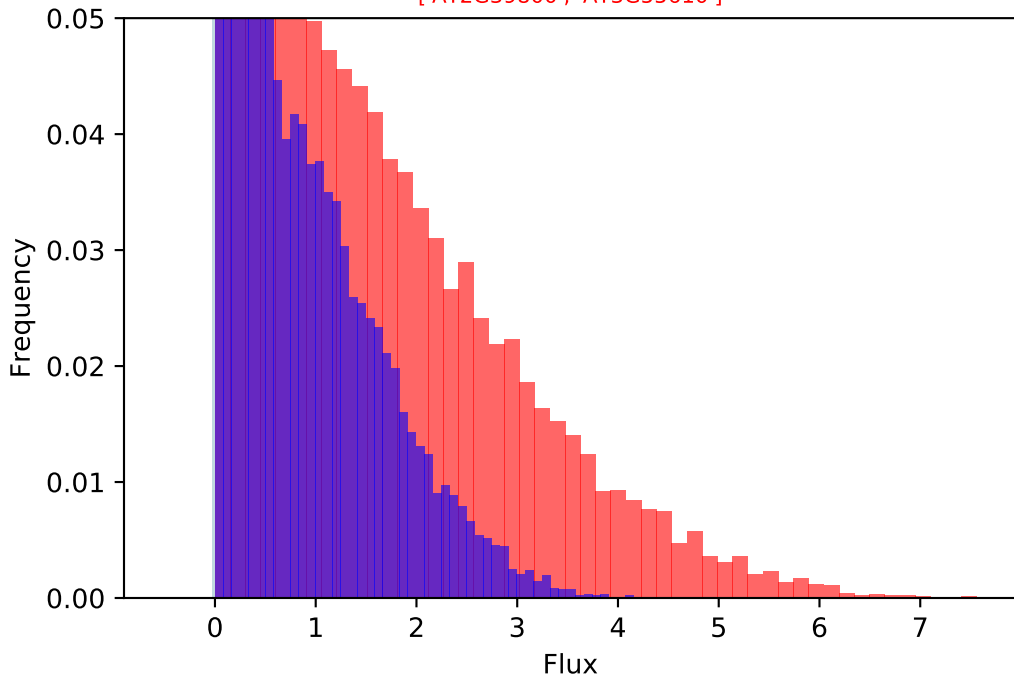
249 : H2O\_m + H\_m + urea\_m --> CO2\_m + 2.0 NH4\_m  
['AT1G67550']



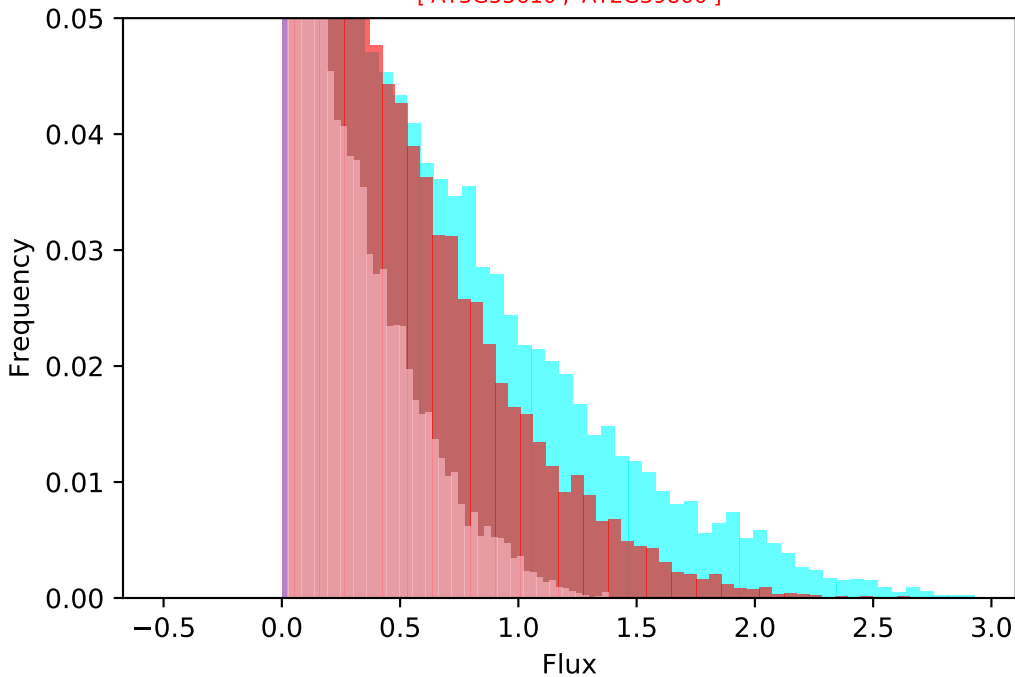
250 : KG\_m + Orn\_m <=> Glu\_DASH\_SeA\_m + Glu\_m  
['AT5G46180']



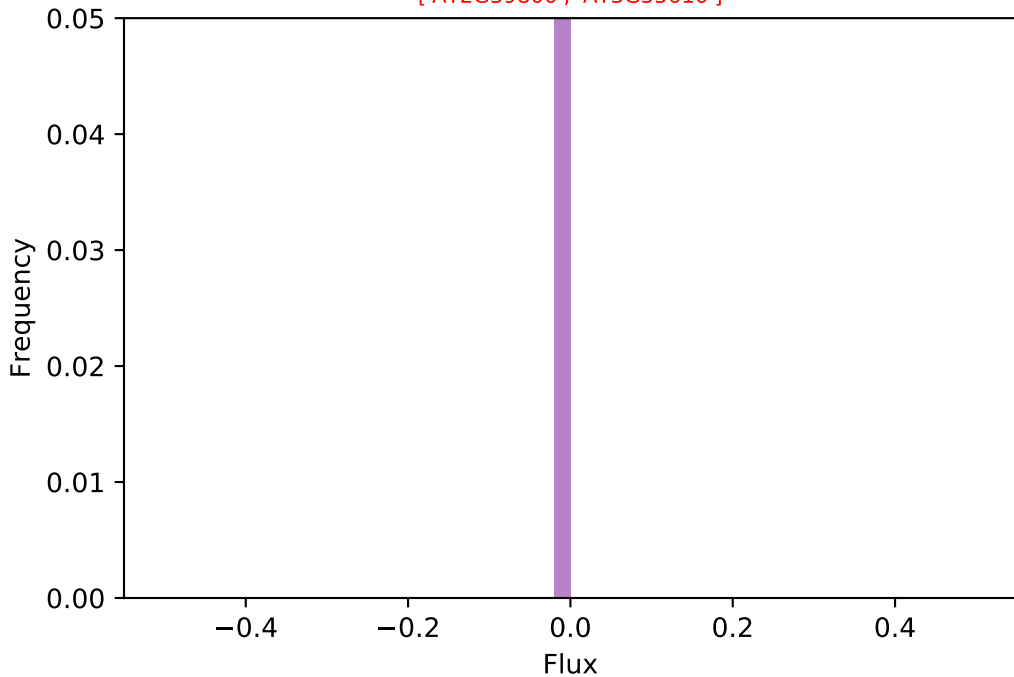
251 : ATP\_c + Glu\_c --> ADP\_c + GluP\_c  
['AT2G39800', 'AT3G55610']



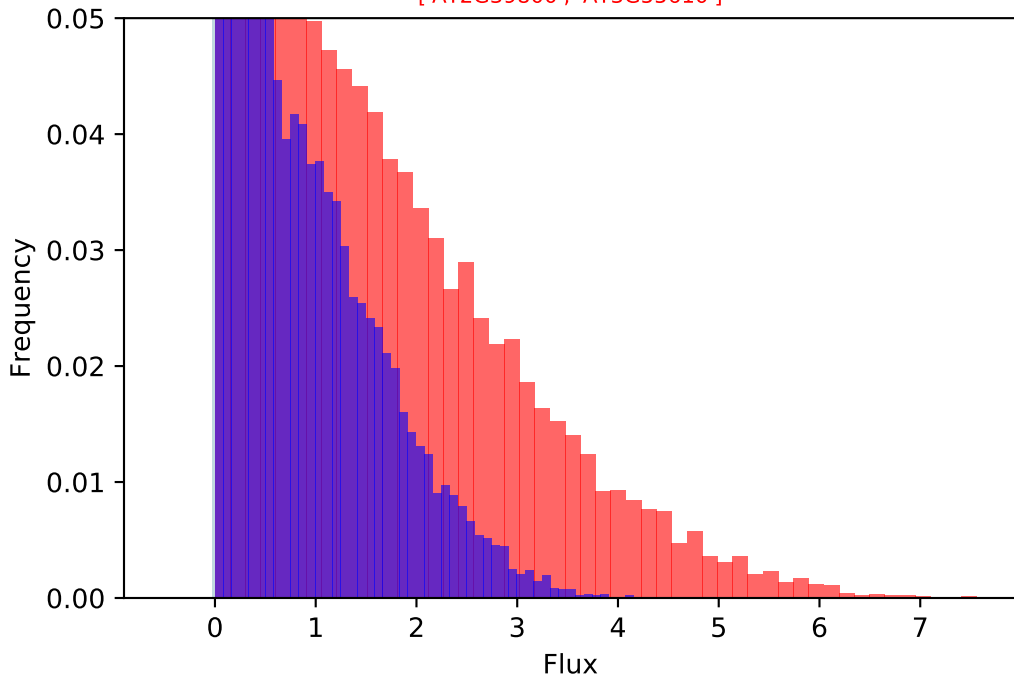
252 : ATP\_h + Glu\_h --> ADP\_h + GluP\_h  
['AT3G55610', 'AT2G39800']



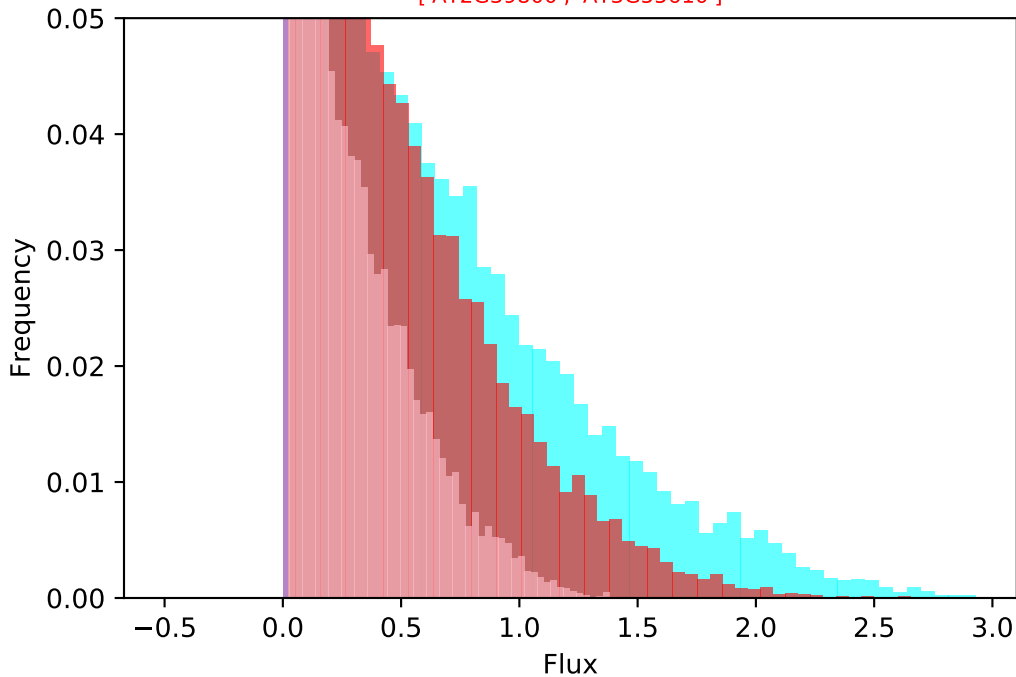
253 : ATP\_m + Glu\_m --> ADP\_m + GluP\_m  
['AT2G39800', 'AT3G55610']



254 : GluP\_c + NADPH\_c --> Glu\_DASH\_SeA\_c + NADP\_c + Pi\_c  
['AT2G39800', 'AT3G55610']

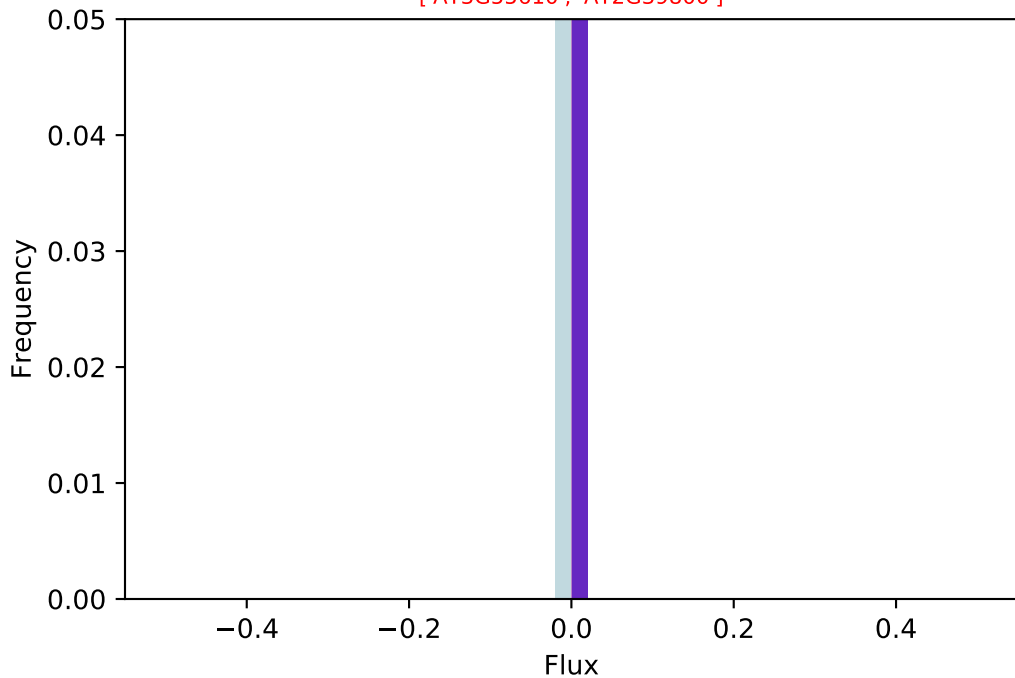


255 : GluP\_h + H\_h + NADPH\_h --> Glu\_DASH\_SeA\_h + NADP\_h + Pi\_h  
['AT2G39800', 'AT3G55610']

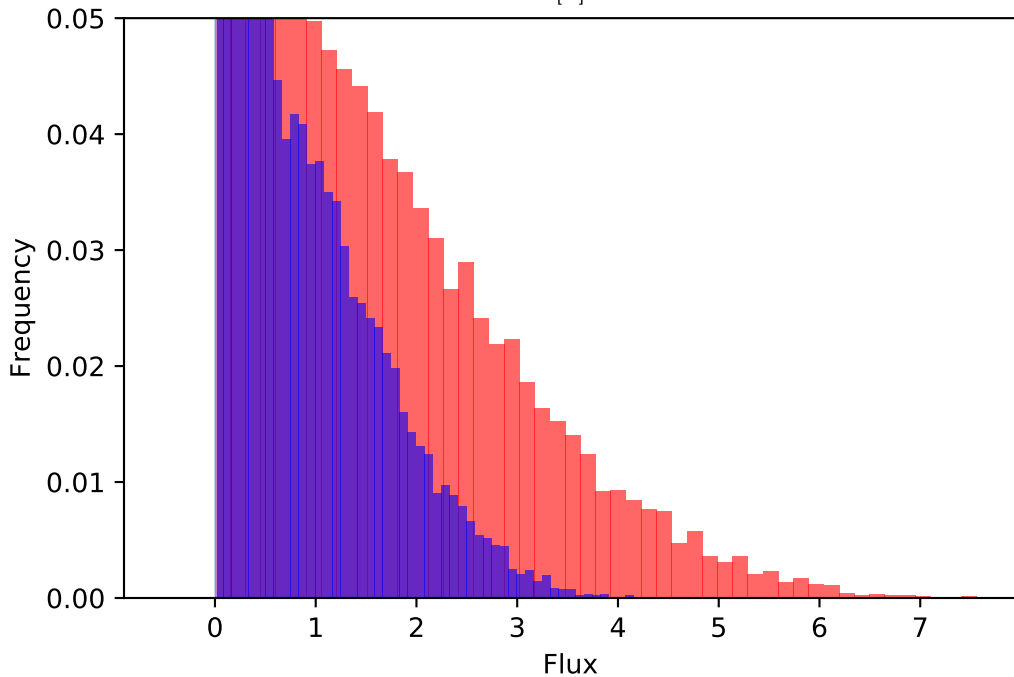




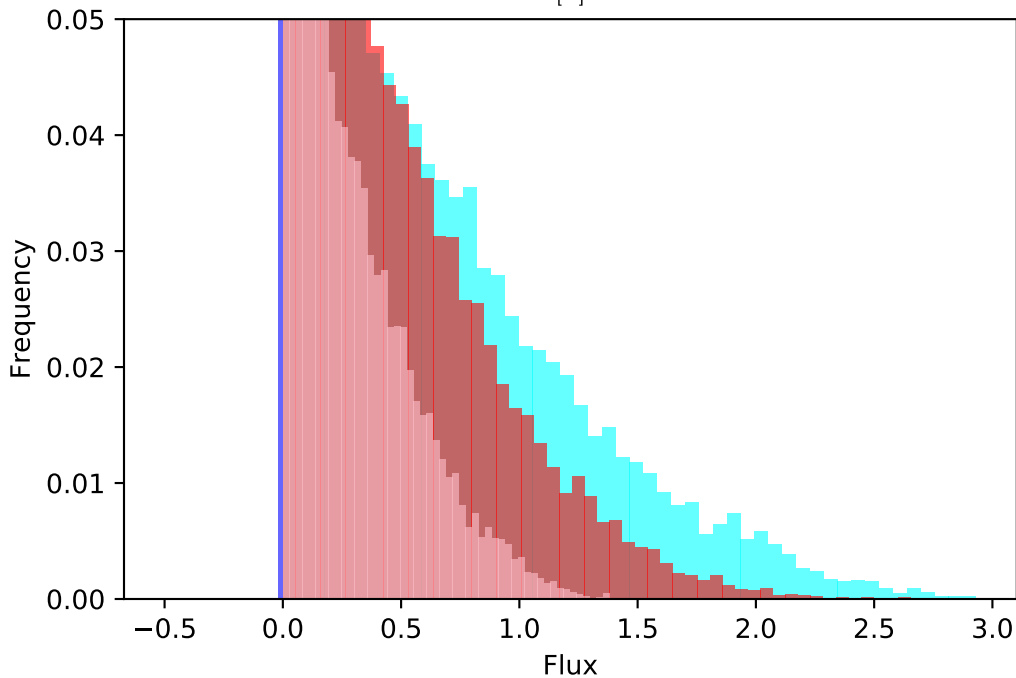
256 : GluP\_m + H\_m + NADPH\_m --> Glu\_DASH\_SeA\_m + NADP\_m + Pi\_m  
['AT3G55610', 'AT2G39800']



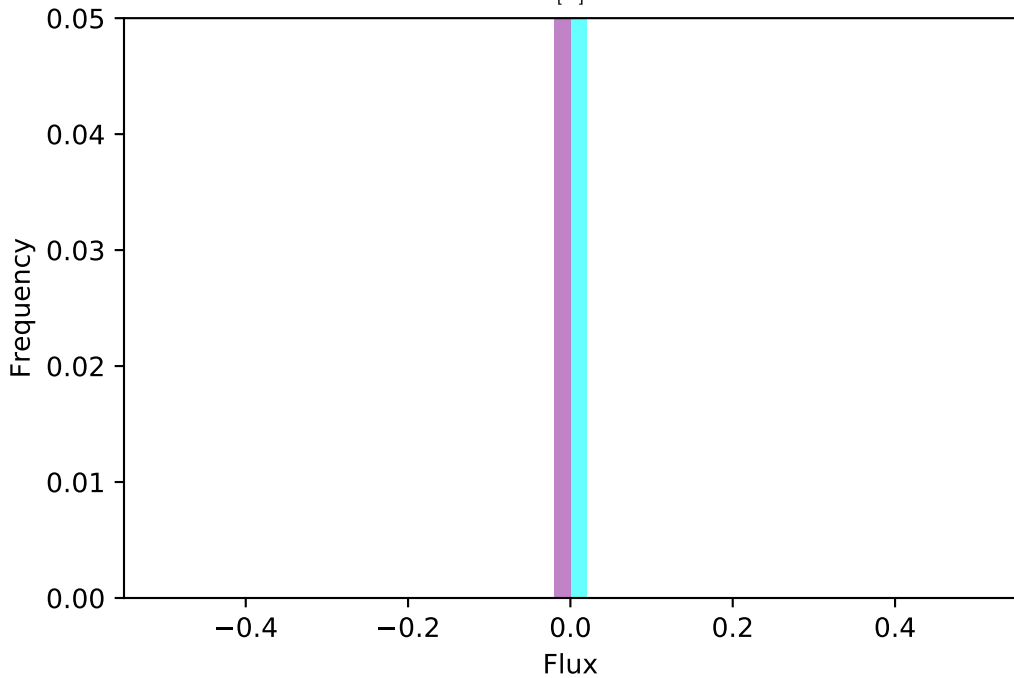
257 : Glu\_DASH\_SeA\_c --> H2O\_c + H\_c + P5C\_c  
['-']



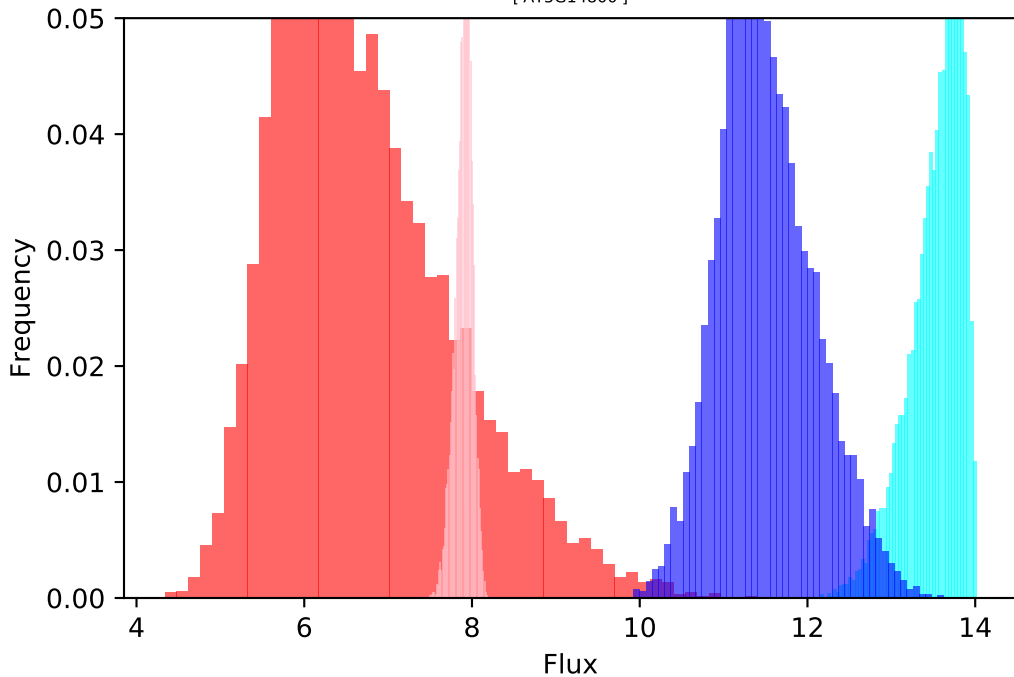
258 : Glu\_DASH\_SeA\_h --> H2O\_h + H\_h + P5C\_h  
['-']



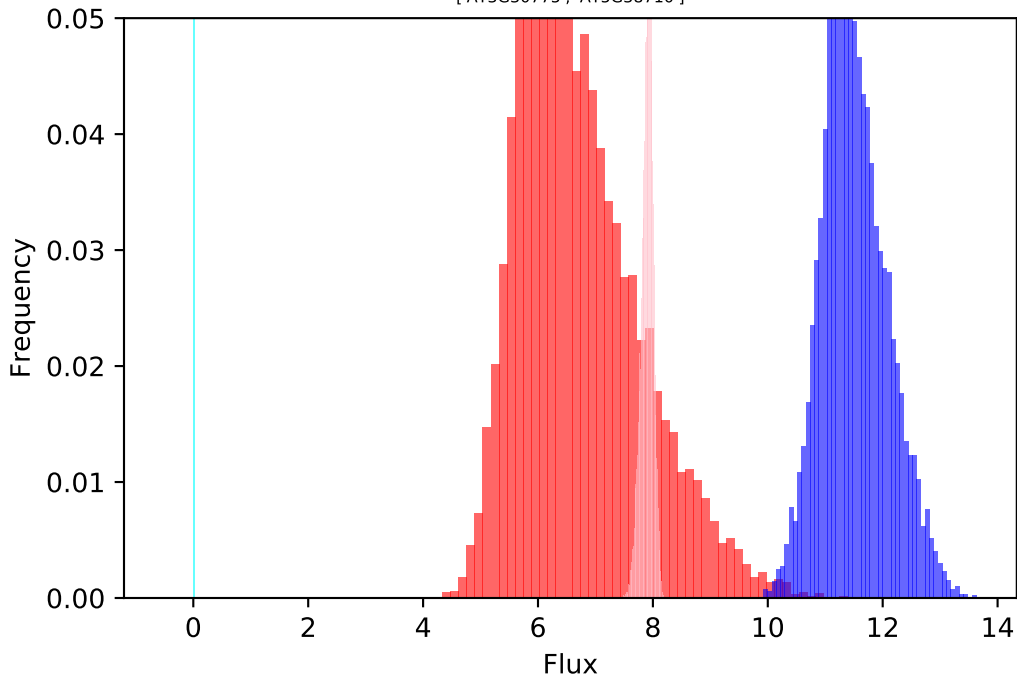
259 : Glu\_DASH\_SeA\_m --> H2O\_m + H\_m + P5C\_m  
['-']



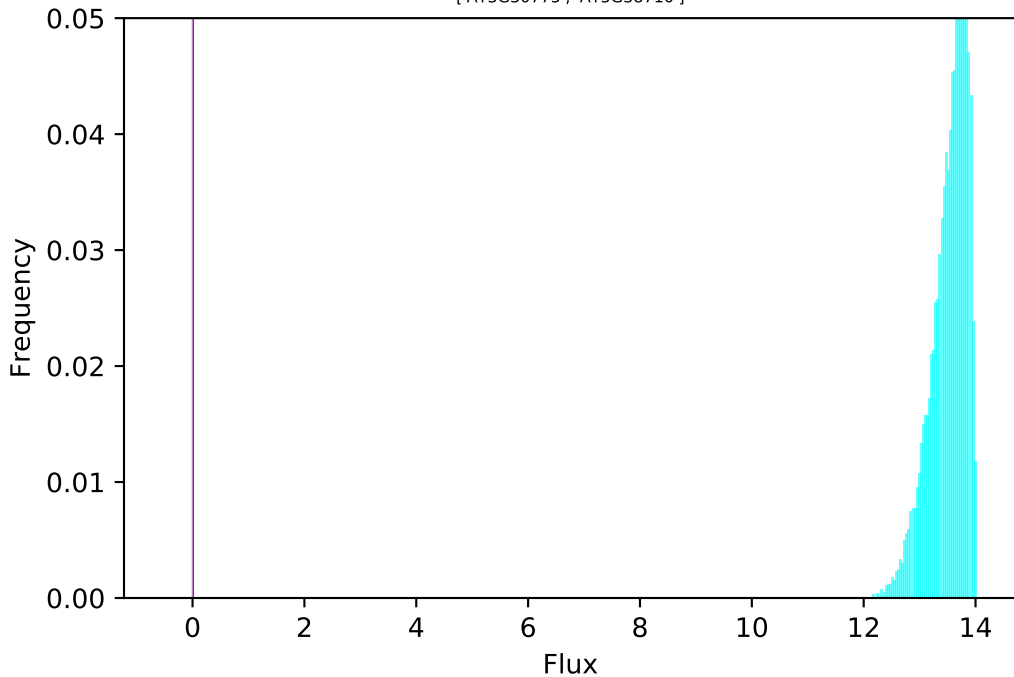
260 : H\_c + NADH\_c + P5C\_c --> NAD\_c + Pro\_c  
['AT5G14800']



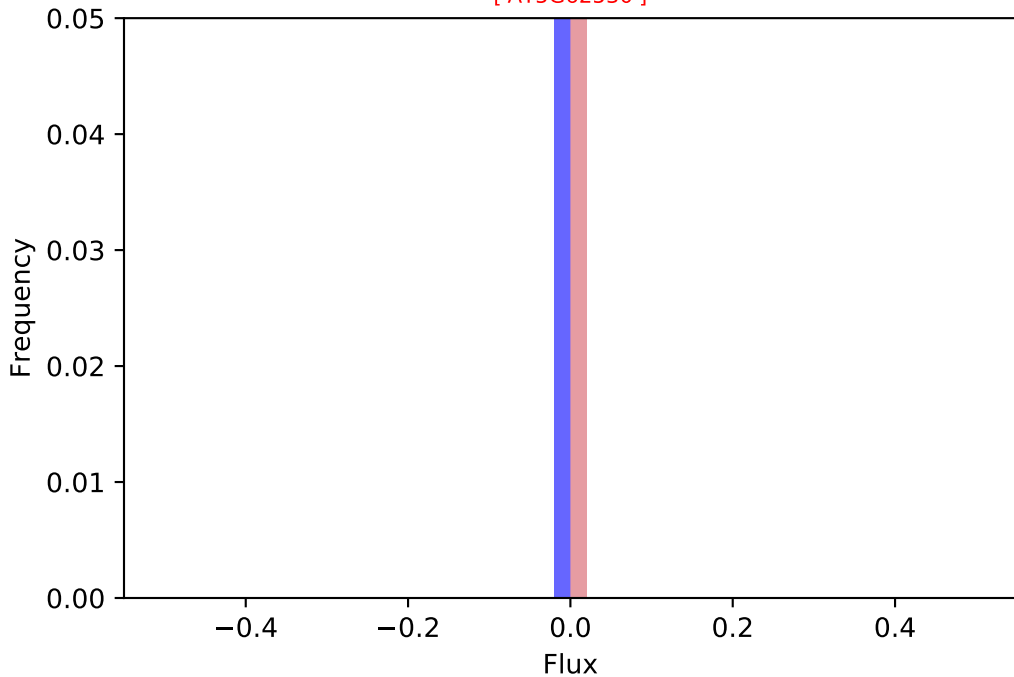
261 : NAD\_m + Pro\_m --> 2.0 H\_m + NADH\_m + P5C\_m  
['AT3G30775', 'AT5G38710']



262 : NADP\_m + Pro\_m --> 2.0 H\_m + NADPH\_m + P5C\_m  
['AT3G30775', 'AT5G38710']

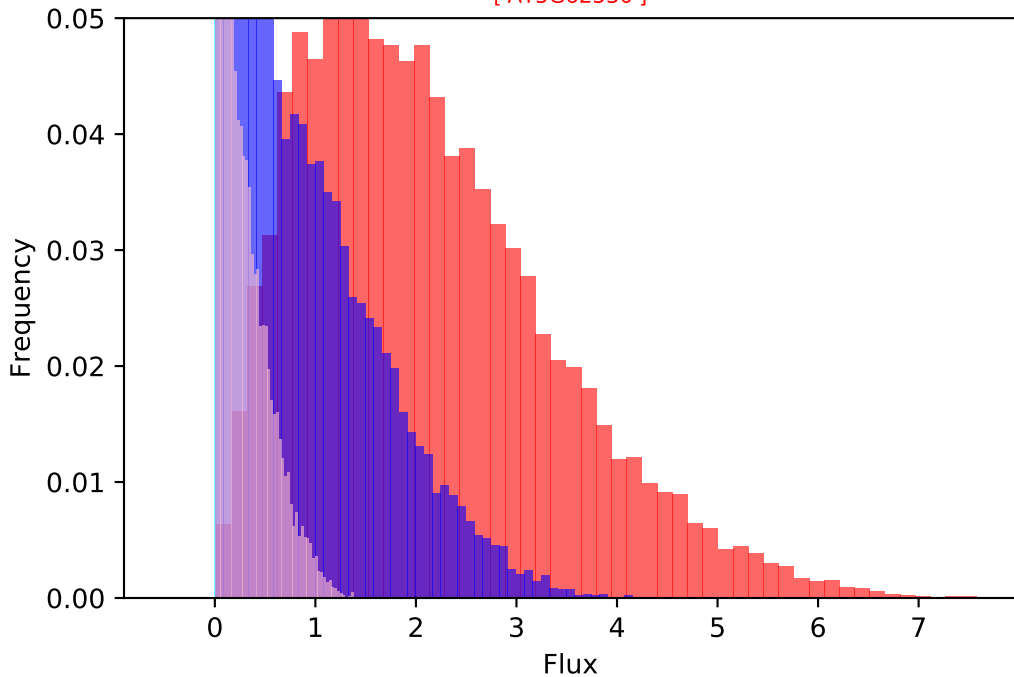


263 : 2.0 H<sub>2</sub>O<sub>h</sub> + NAD<sub>h</sub> + P5C<sub>h</sub> --> Glu<sub>h</sub> + H<sub>h</sub> + NADH<sub>h</sub>  
['AT5G62530']

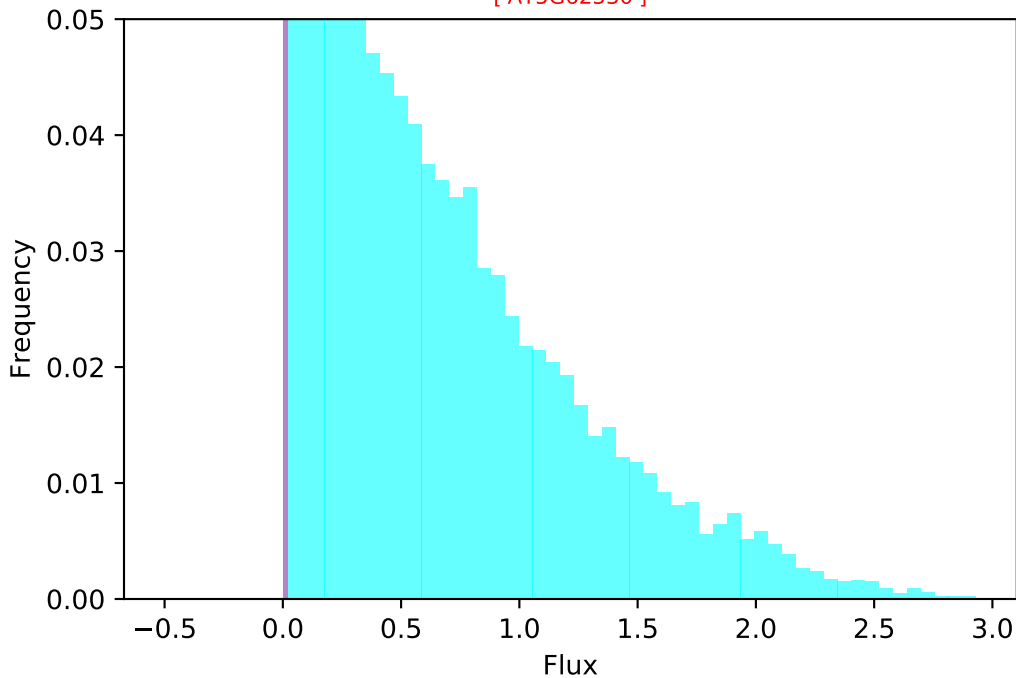




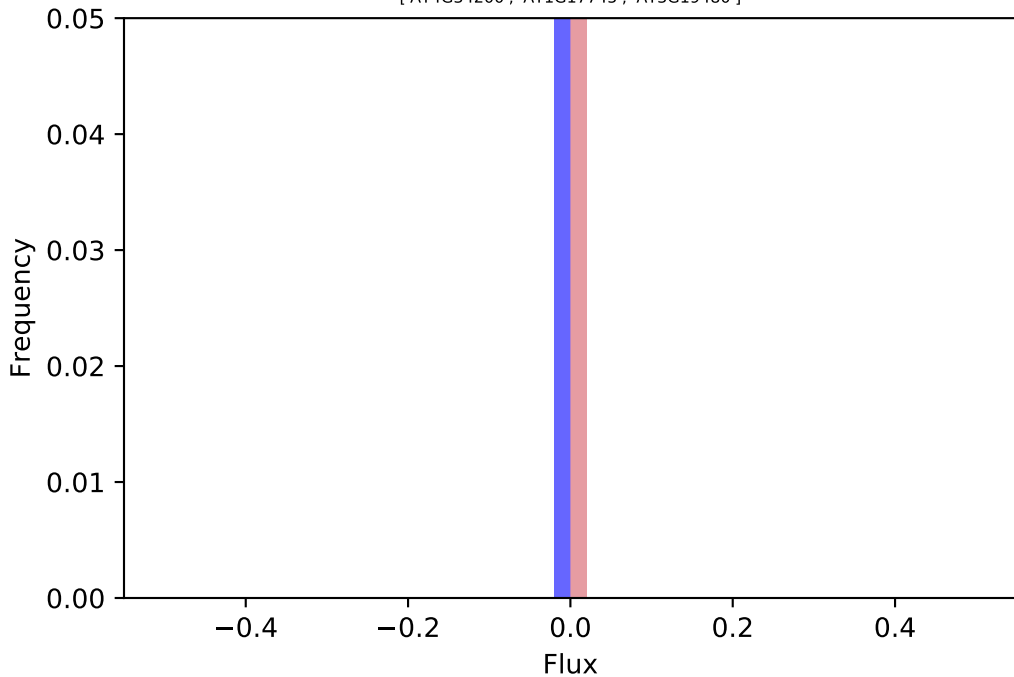
264 : 2.0 H2O\_m + NAD\_m + P5C\_m --> Glu\_m + H\_m + NADH\_m  
['AT5G62530']



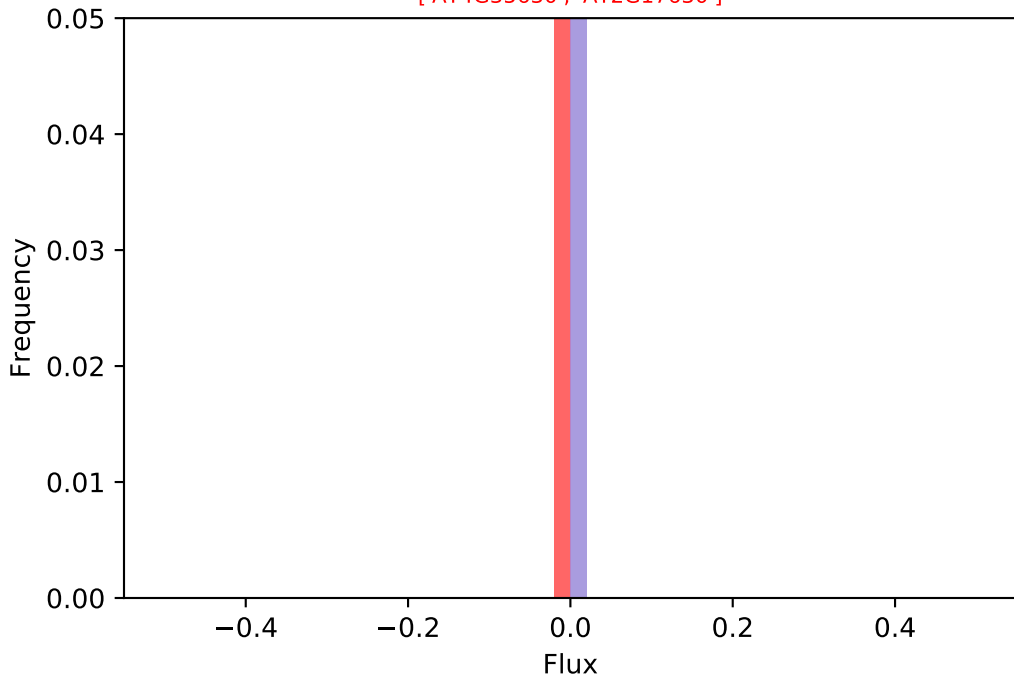
265 : 2.0 H2O\_m + NADP\_m + P5C\_m --> Glu\_m + H\_m + NADPH\_m  
['AT5G62530']



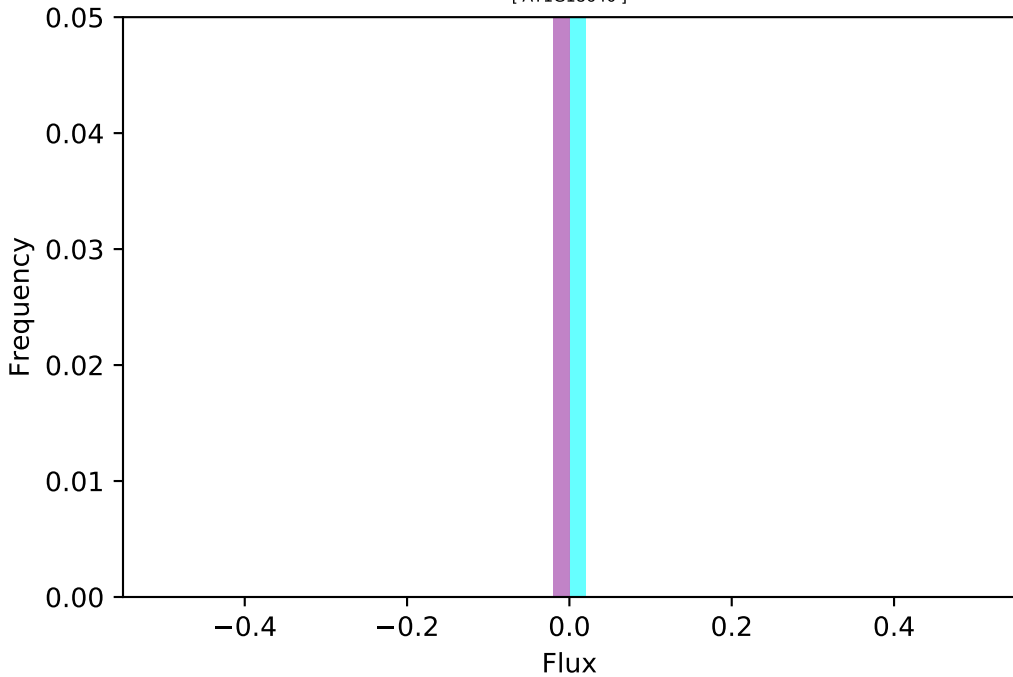
266 : NAD\_h + PGA\_h --> H\_h + NADH\_h + P\_DASH\_HPR\_h  
['AT4G34200', 'AT1G17745', 'AT3G19480']

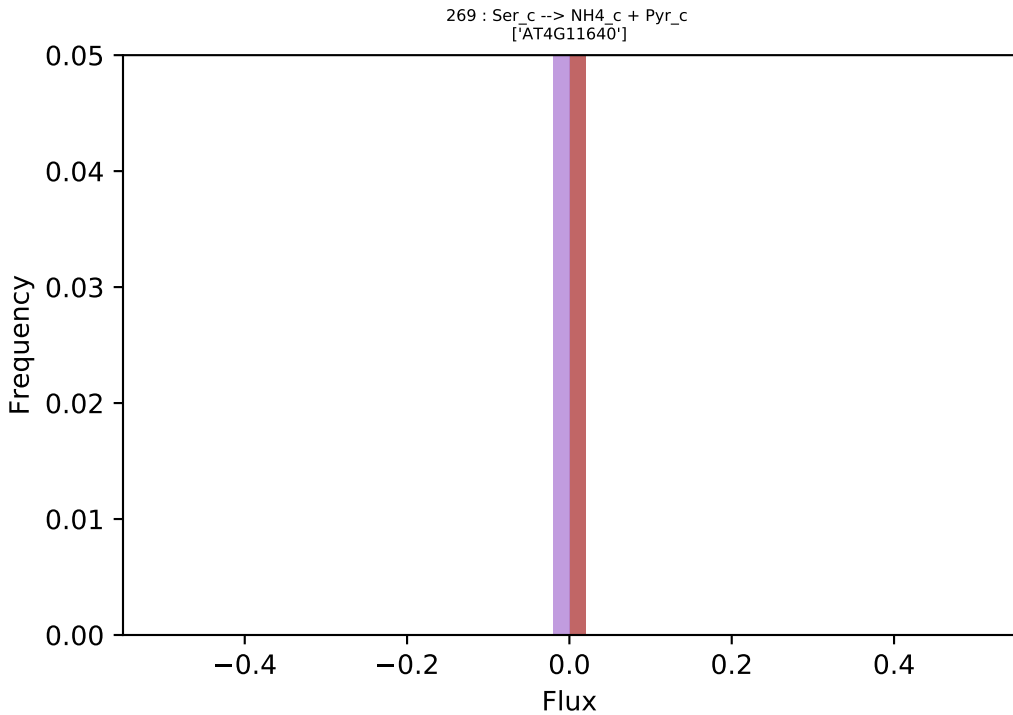


267 : Glu\_h + P\_DASH\_HPR\_h --> KG\_h + PSer\_h  
['AT4G35630', 'AT2G17630']

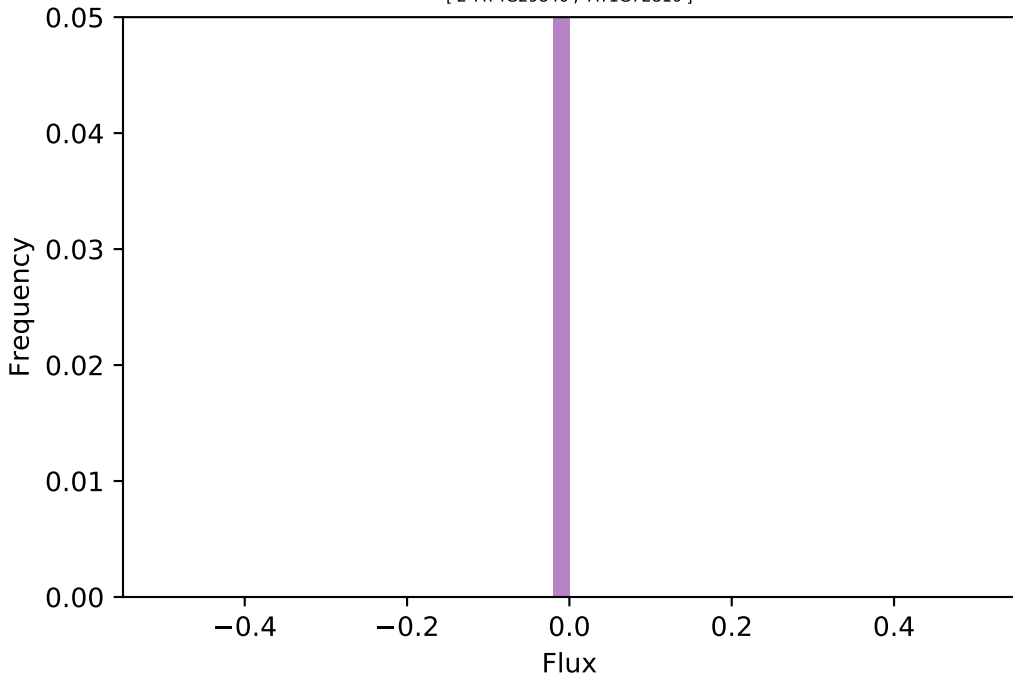


268 : H2O\_h + PSer\_h --> Pi\_h + Ser\_h  
['AT1G18640']

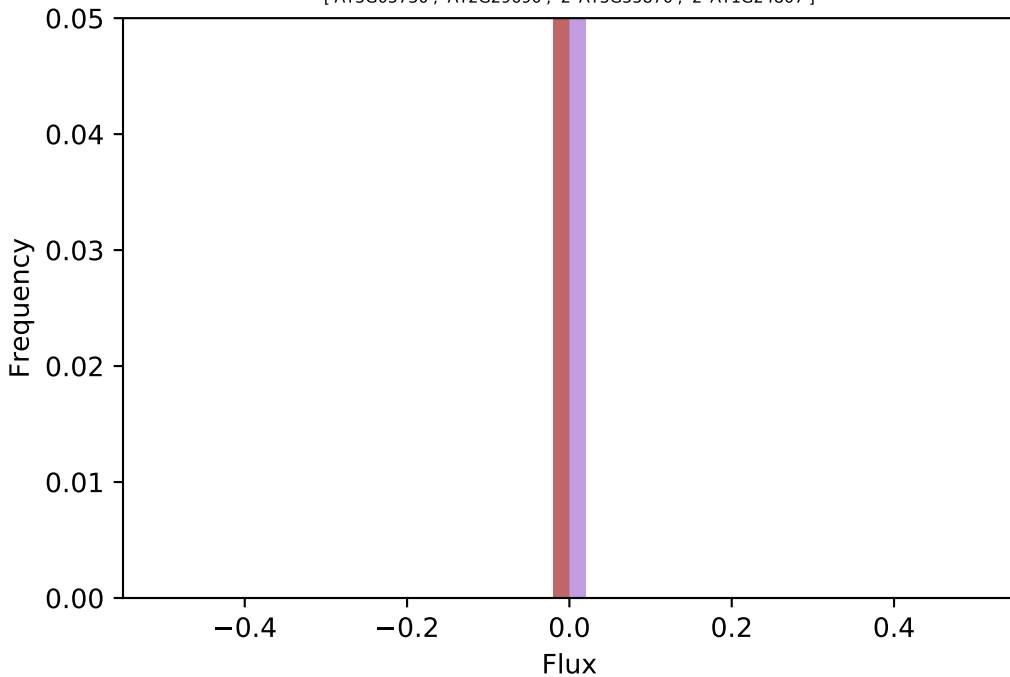




270 : H2O\_h + PH\_DASH\_Ser\_h --> Pi\_h + Thr\_h  
['2\*AT4G29840', 'AT1G72810']

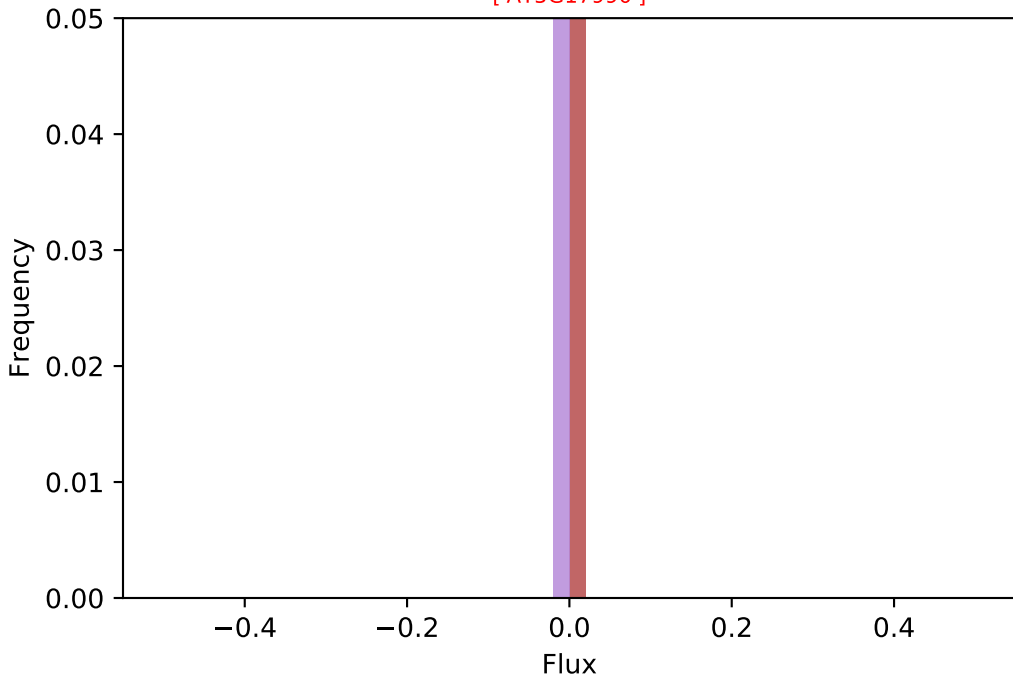


271 : CHR\_h + Gln\_h --> ANT\_h + Glu\_h + H\_h + Pyr\_h  
['AT5G05730', 'AT2G29690', '2\*AT3G55870', '2\*AT1G24807']

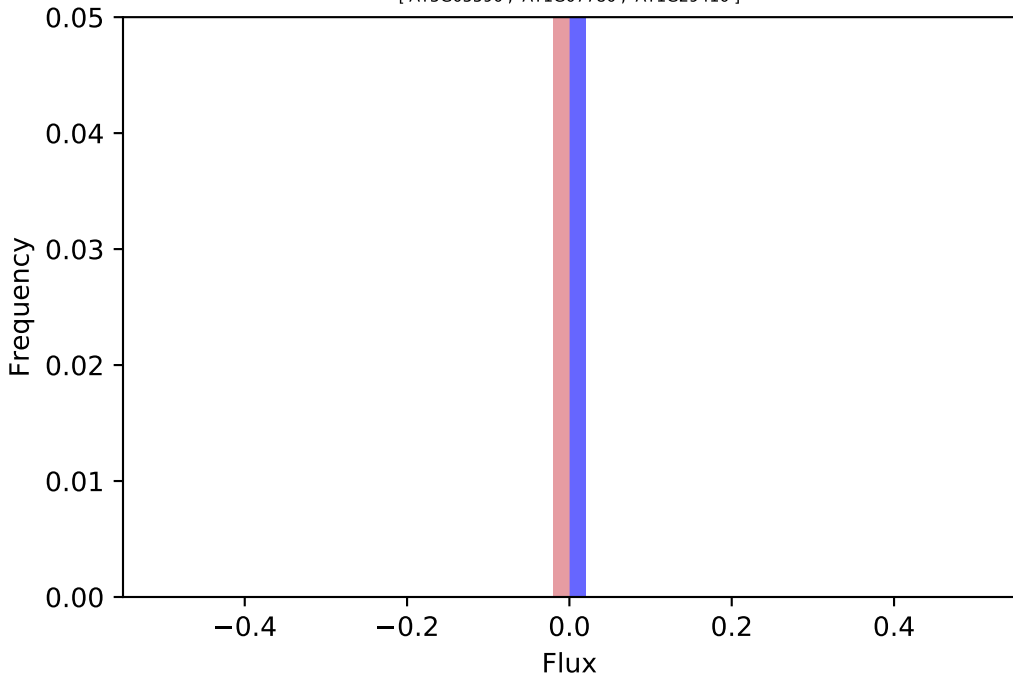




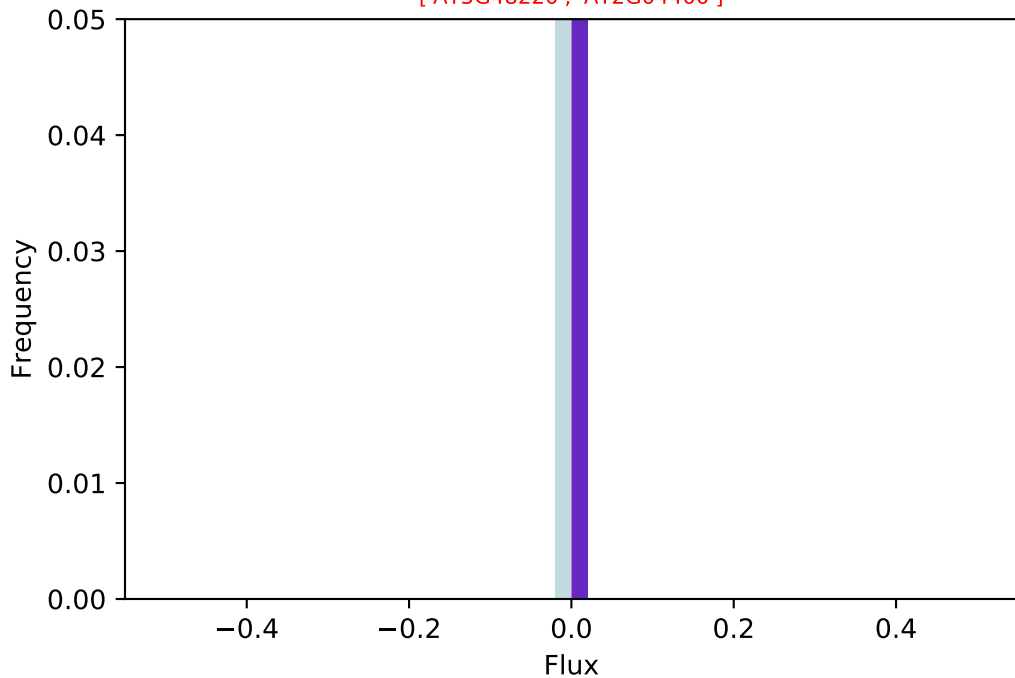
272 : ANT\_h + PRPP\_h --> H\_h + PPI\_h + PR\_DASH\_ANT\_h  
['AT5G17990']



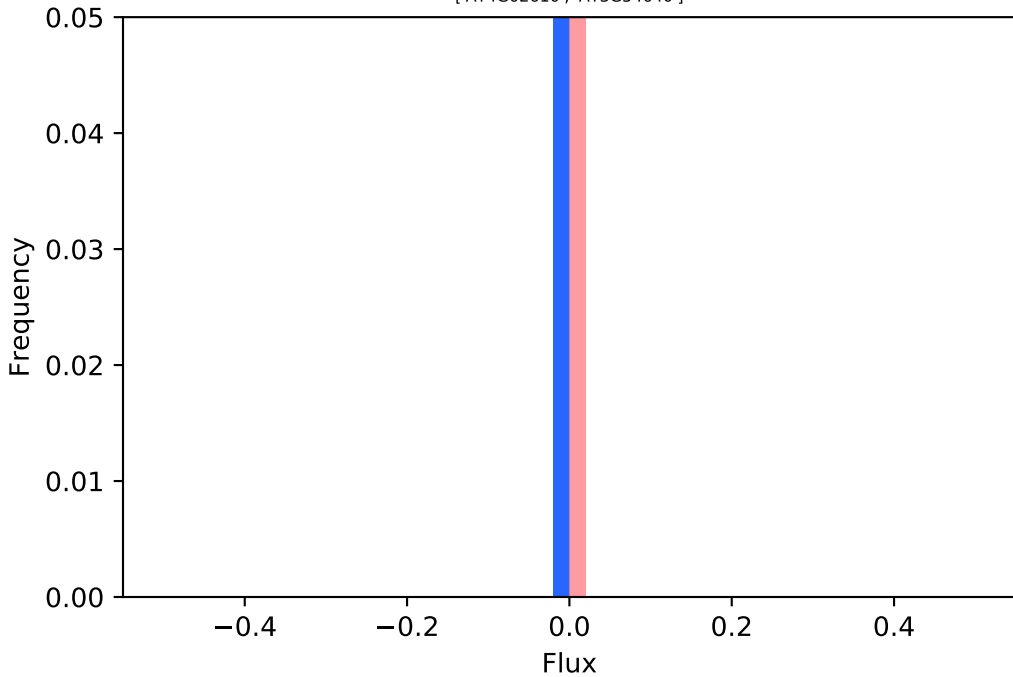
273 : PR\_DASH\_ANT\_h --> CPD\_DASH\_Ru5P\_h  
['AT5G05590', 'AT1G07780', 'AT1G29410']



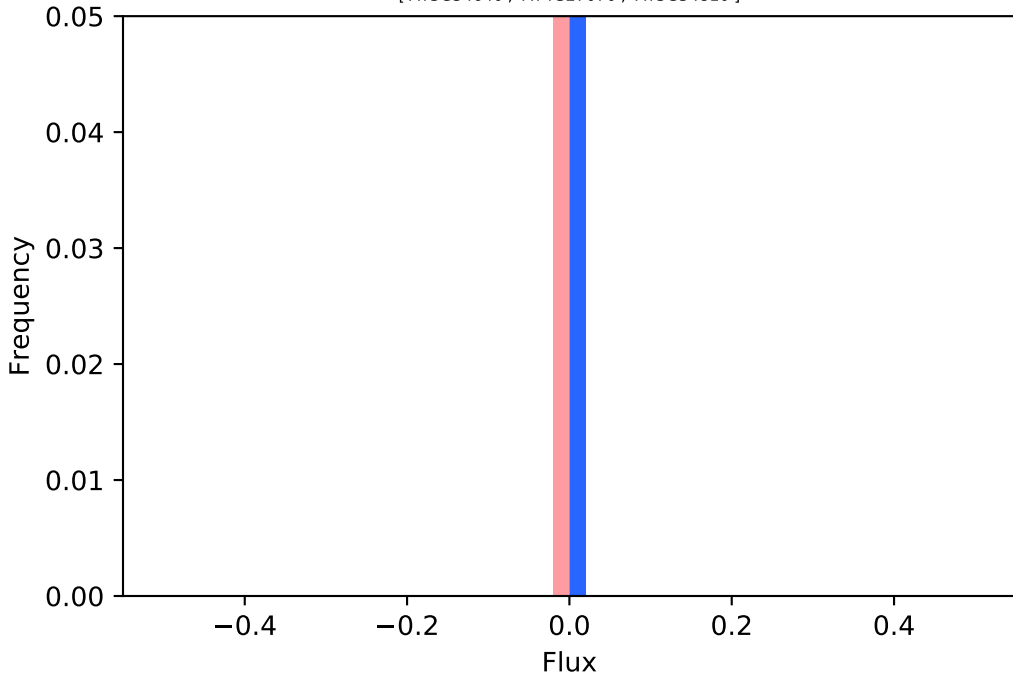
274 : CPD\_DASH\_Ru5P\_h + H\_h --> CO2\_h + H2O\_h + Ind\_DASH\_GP\_h  
['AT5G48220', 'AT2G04400']



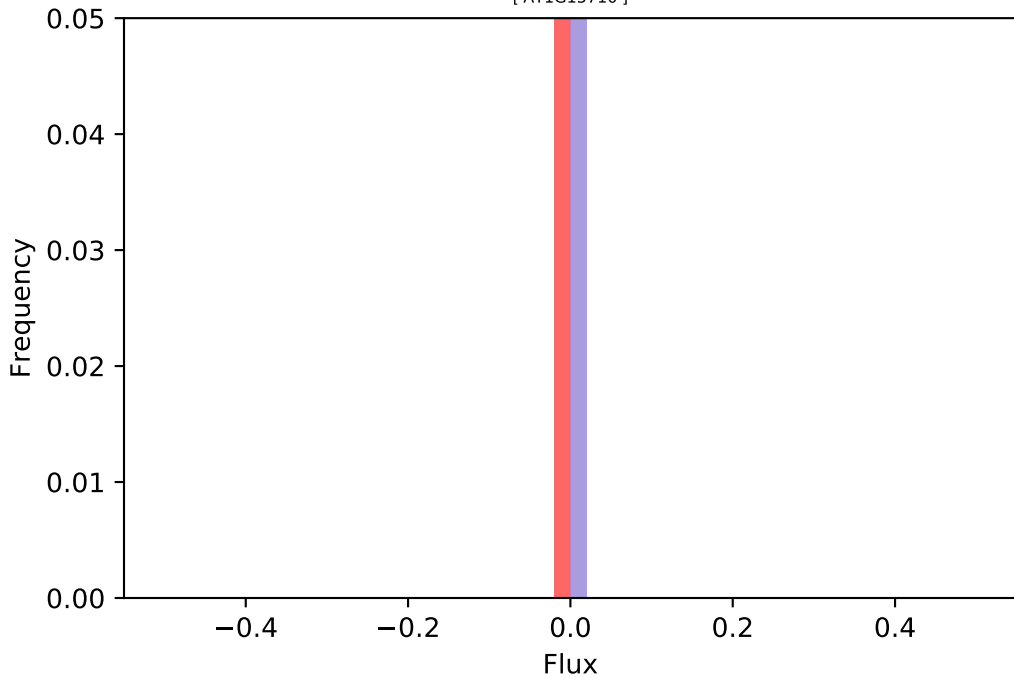
275 : Ind\_DASH\_GP\_h --> GAP\_h + Ind\_h  
['AT4G02610', 'AT3G54640']



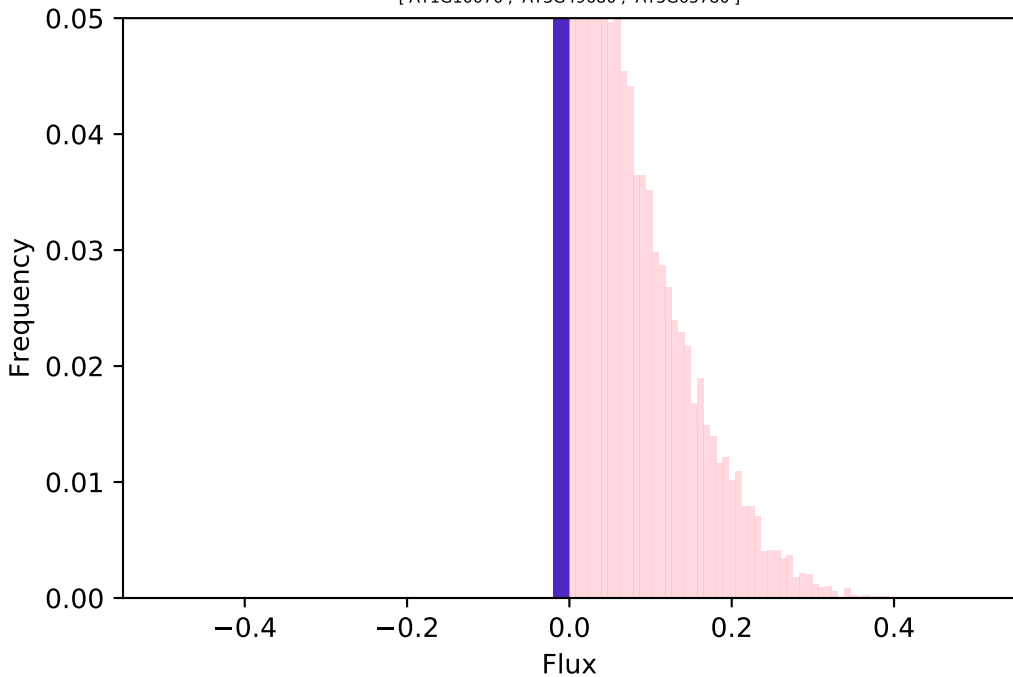
276 : Ind\_h + Ser\_h --> H2O\_h + Trp\_h  
['AT3G54640', 'AT4G27070', 'AT5G54810']



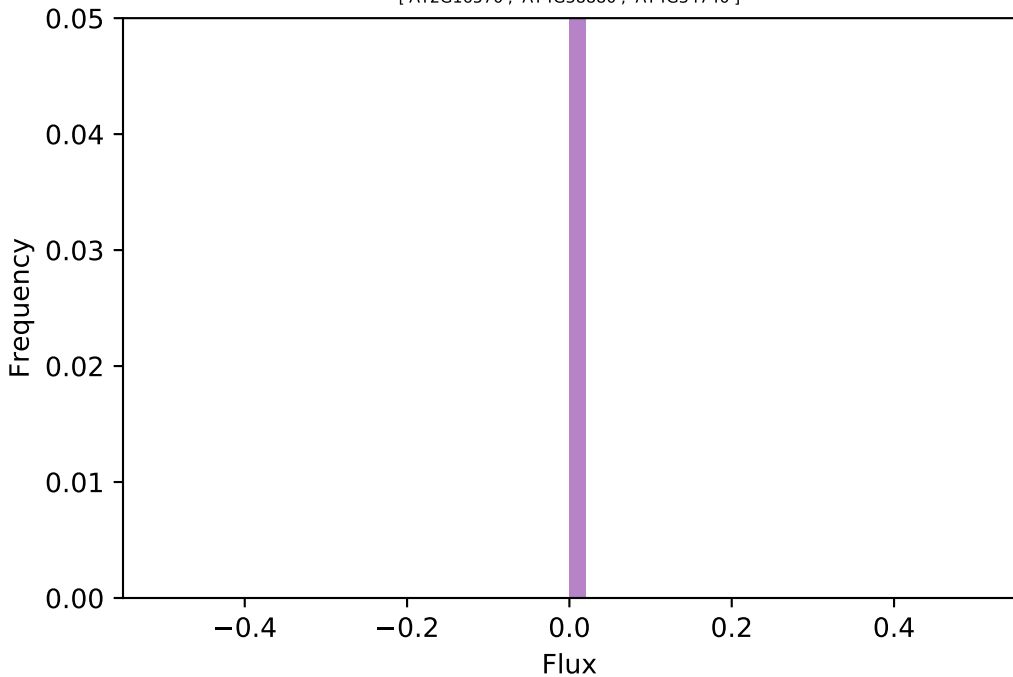
277 : AGN\_h + NADP\_h --> CO2\_h + NADPH\_h + Tyr\_h  
['AT1G15710']



278 : Glu\_h + MOB\_h --> KG\_h + Val\_h  
['AT1G10070', 'AT3G49680', 'AT5G65780']

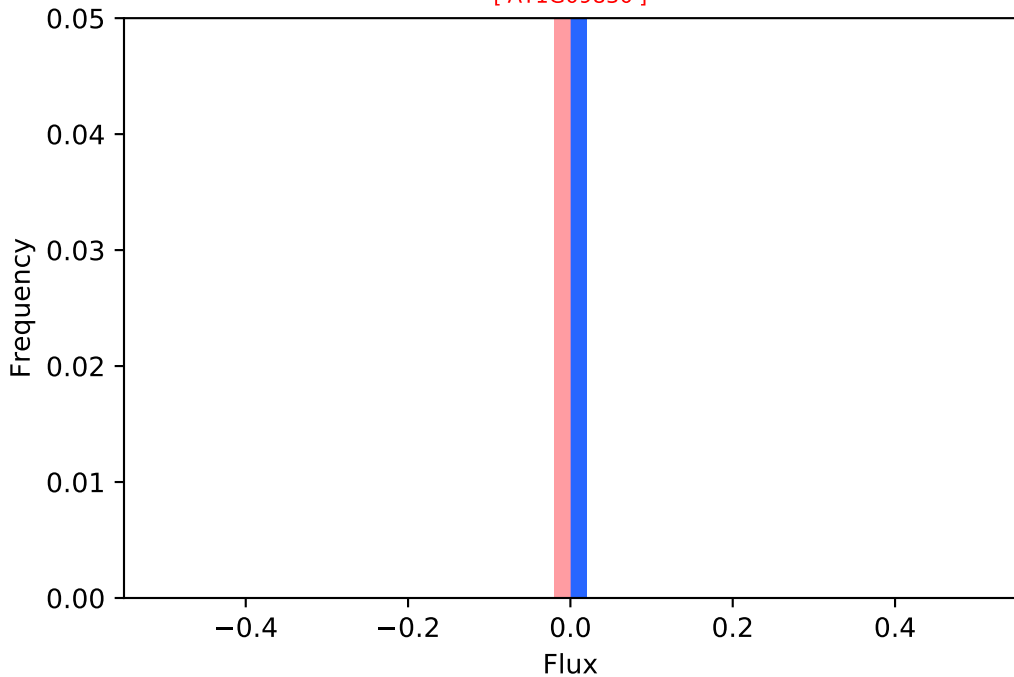


279 : Gln\_h + H2O\_h + PRPP\_h --> Glu\_h + H\_h + PPi\_h + PRA\_h  
['AT2G16570', 'AT4G38880', 'AT4G34740']

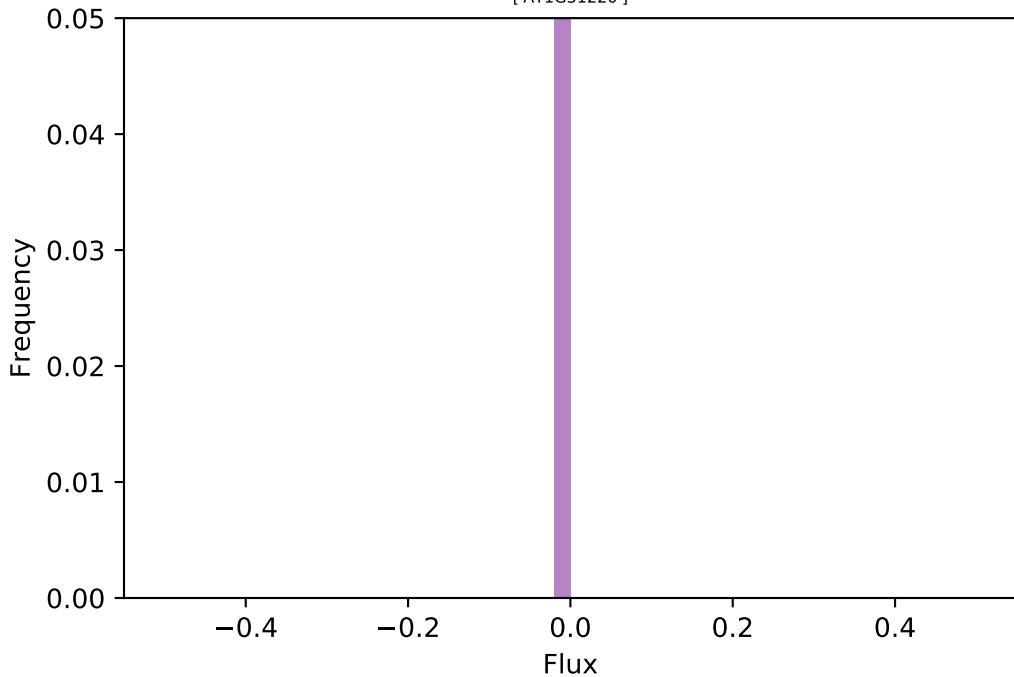




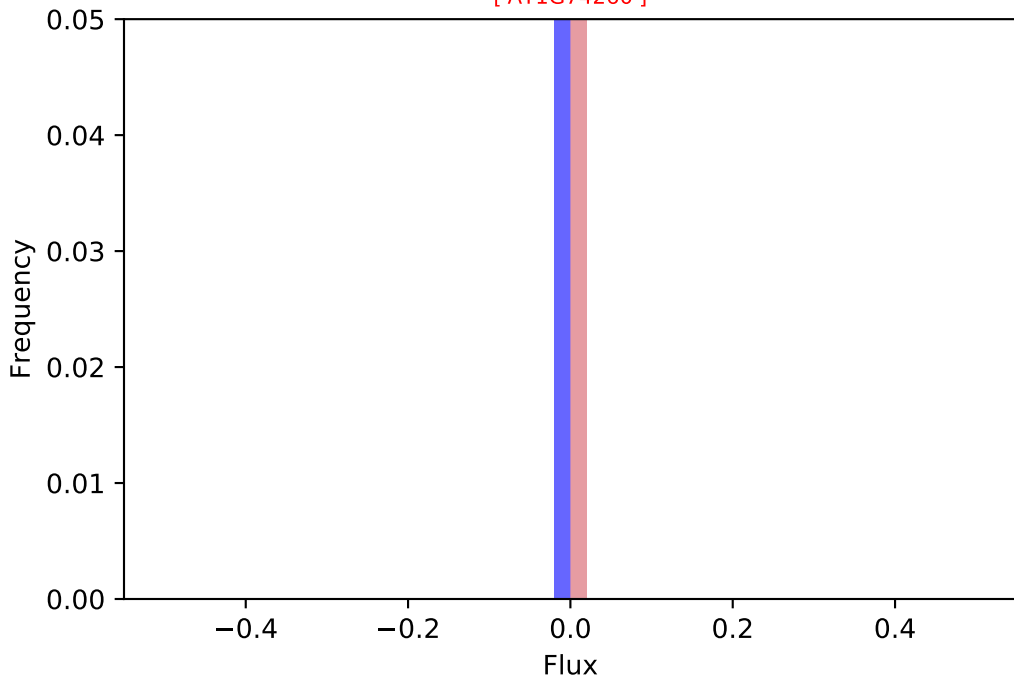
280 : ATP\_h + Gly\_h + PRA\_h --> ADP\_h + GAR\_h + H\_h + Pi\_h  
['AT1G09830']



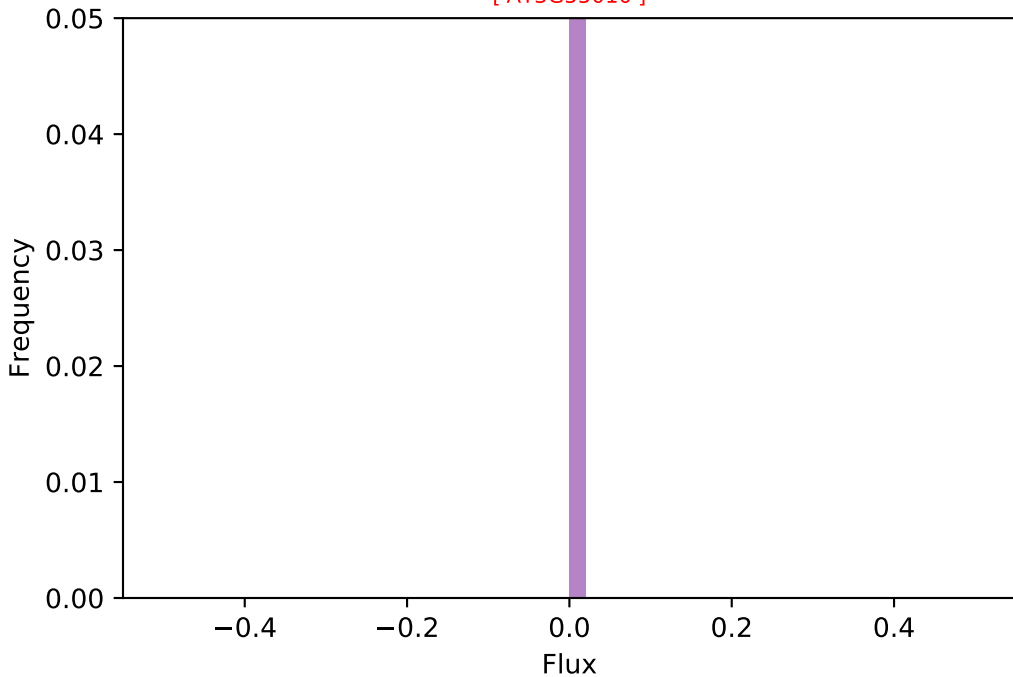
281 : F\_DASH\_THF\_h + GAR\_h --> FGAR\_h + 2.0 H\_h + THF\_h  
['AT1G31220']



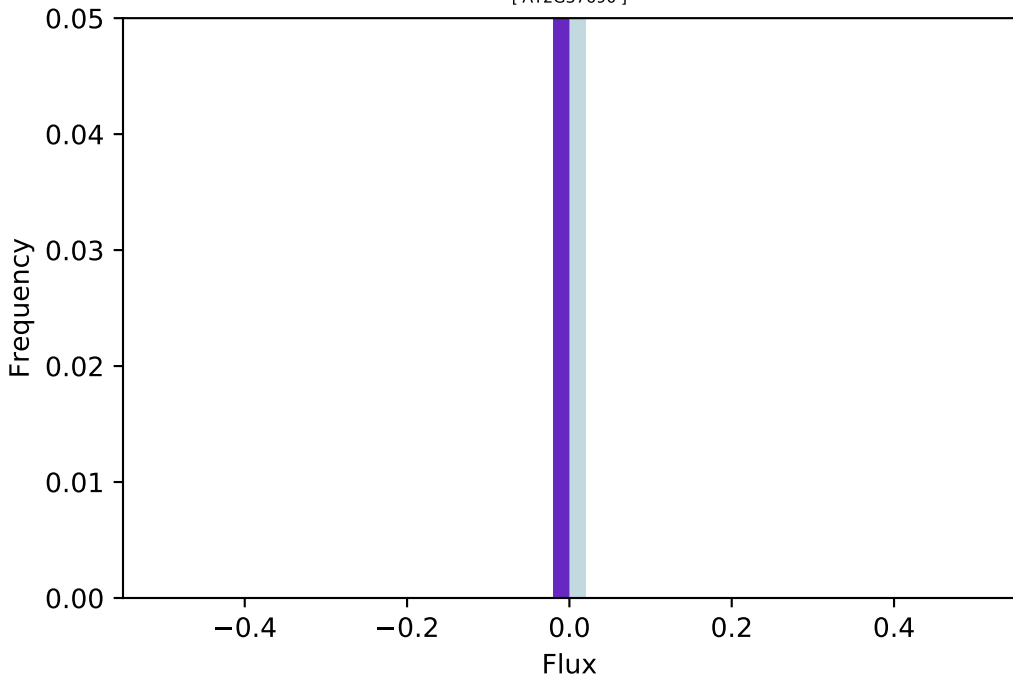
282 : ATP\_h + FGAR\_h + Gln\_h + H2O\_h --> ADP\_h + FGAM\_h + Glu\_h + 2.0 H\_h + Pi\_h  
['AT1G74260']



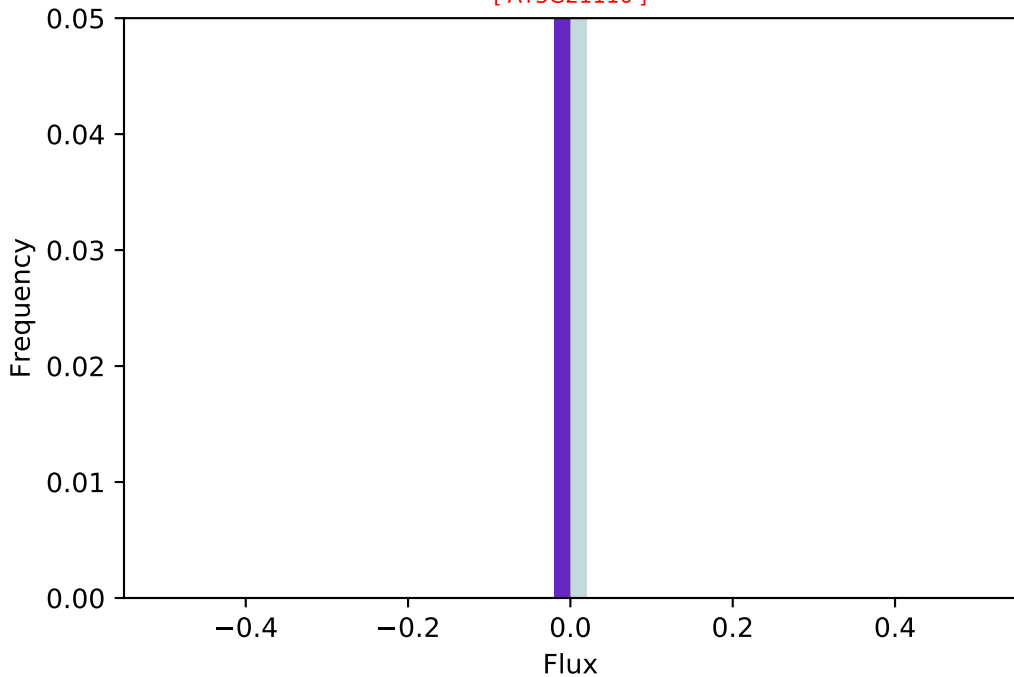
283 : ATP\_h + FGAM\_h --> ADP\_h + AIR\_h + H\_h + Pi\_h  
['AT3G55010']



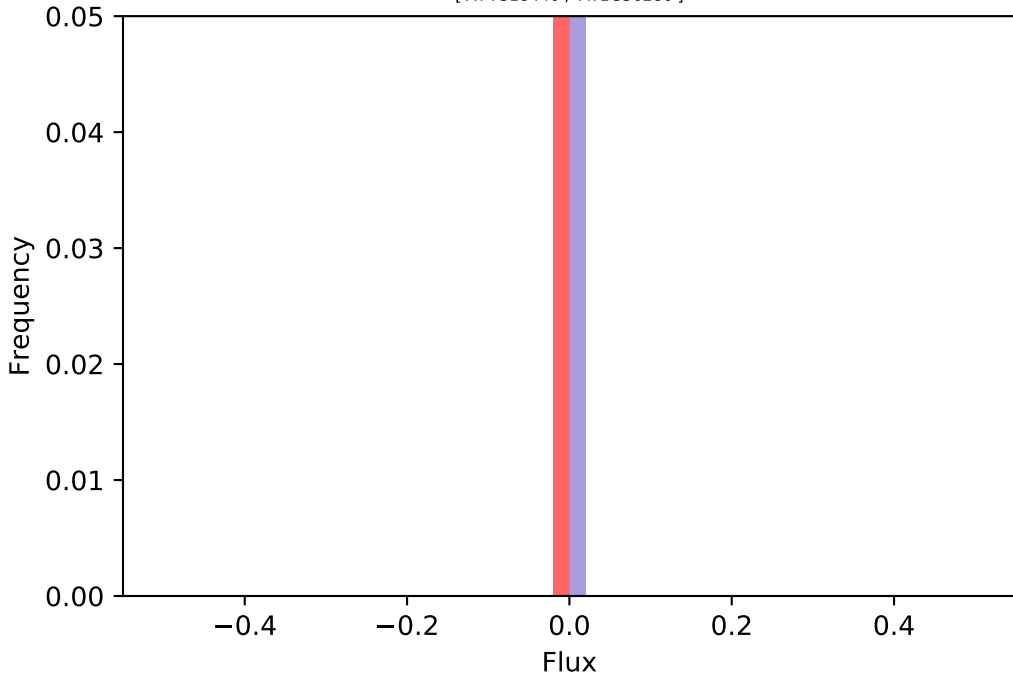
284 : AIR\_h + CO2\_h --> CAIR\_h + H\_h  
['AT2G37690']



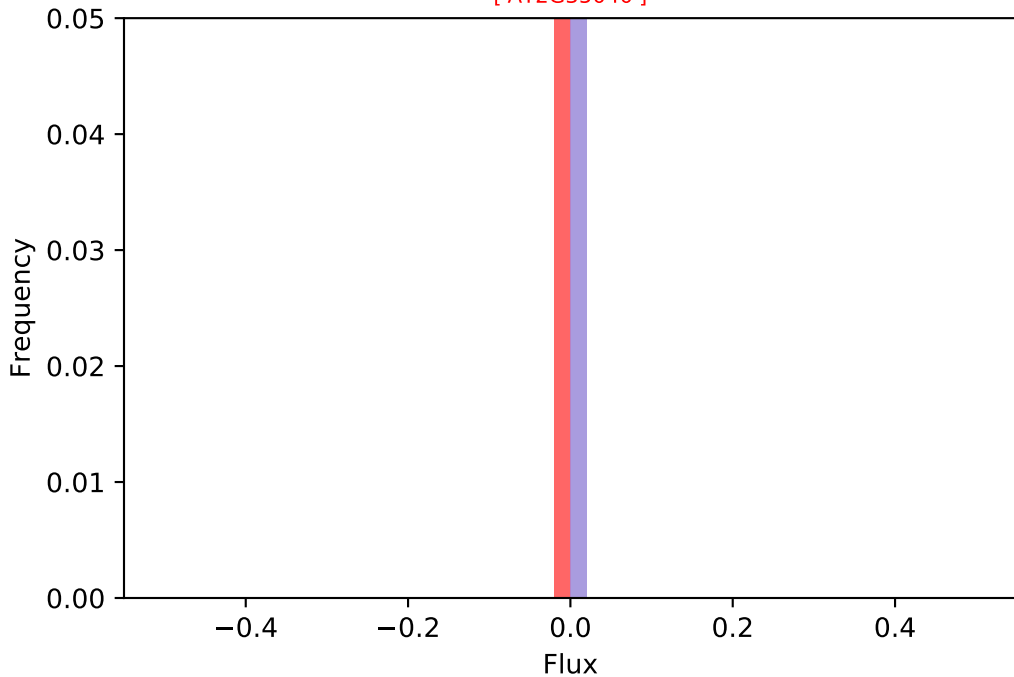
285 : ATP\_h + Asp\_h + CAIR\_h --> ADP\_h + H\_h + Pi\_h + SAICAR\_h  
['AT3G21110']



286 : H\_h + SAICAR\_h --> AICAR\_h + Fum\_h  
['AT4G18440', 'AT1G36280']

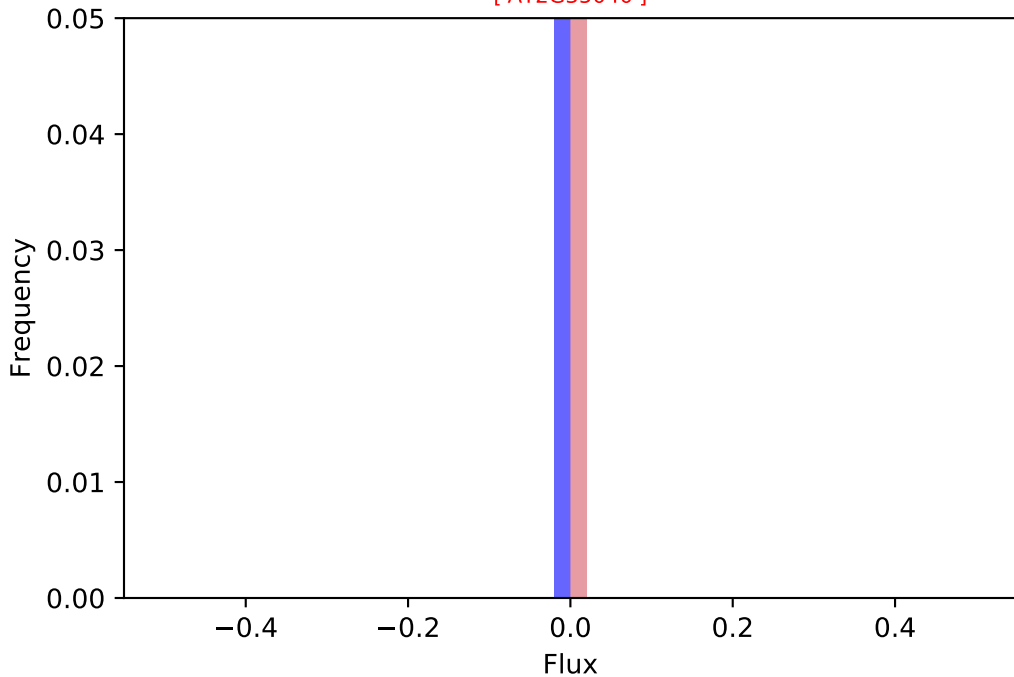


287 : AICAR\_h + F\_DASH\_THF\_h --> FAICAR\_h + 2.0 H\_h + THF\_h  
['AT2G35040']

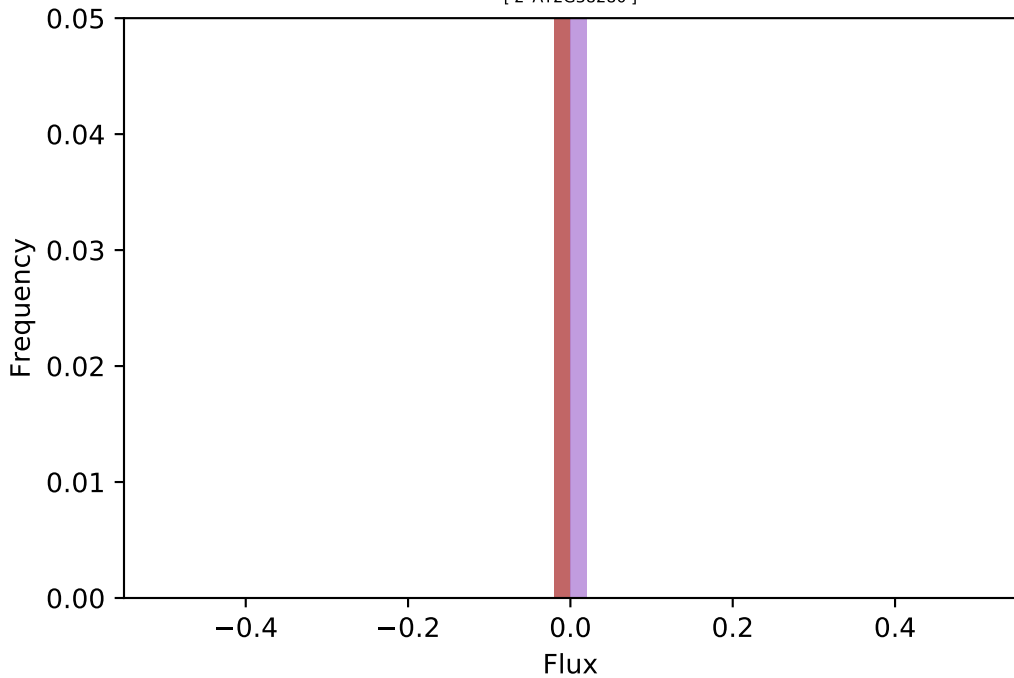




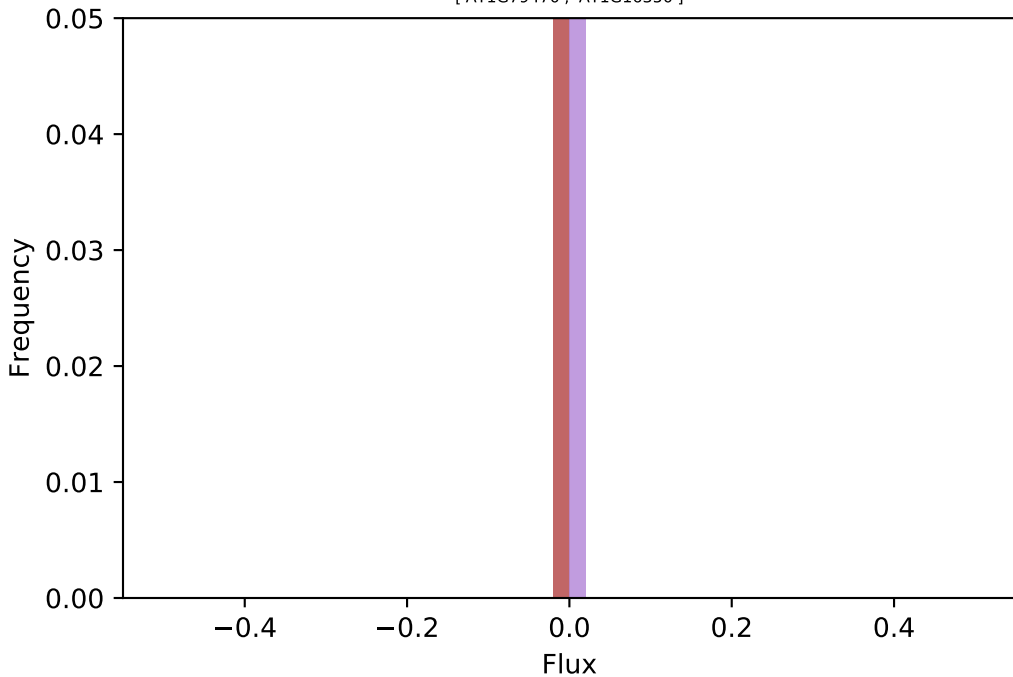
288 : FAICAR\_h --> H2O\_h + IMP\_h  
['AT2G35040']



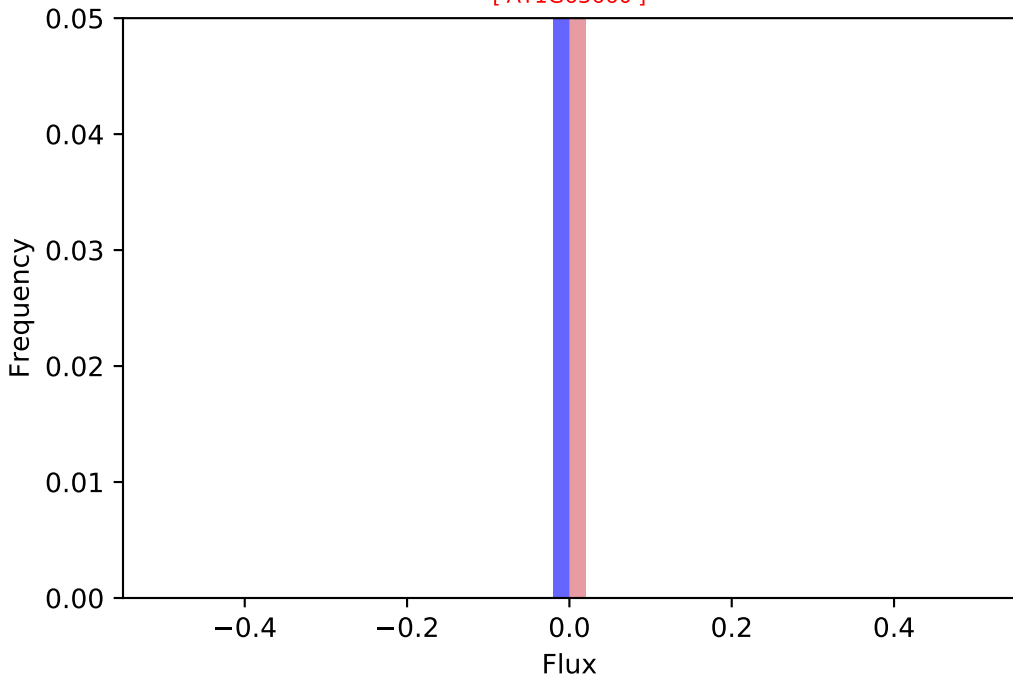
289 : AMP\_c + H2O\_c + H\_c --> IMP\_c + NH4\_c  
['2\*AT2G38280']



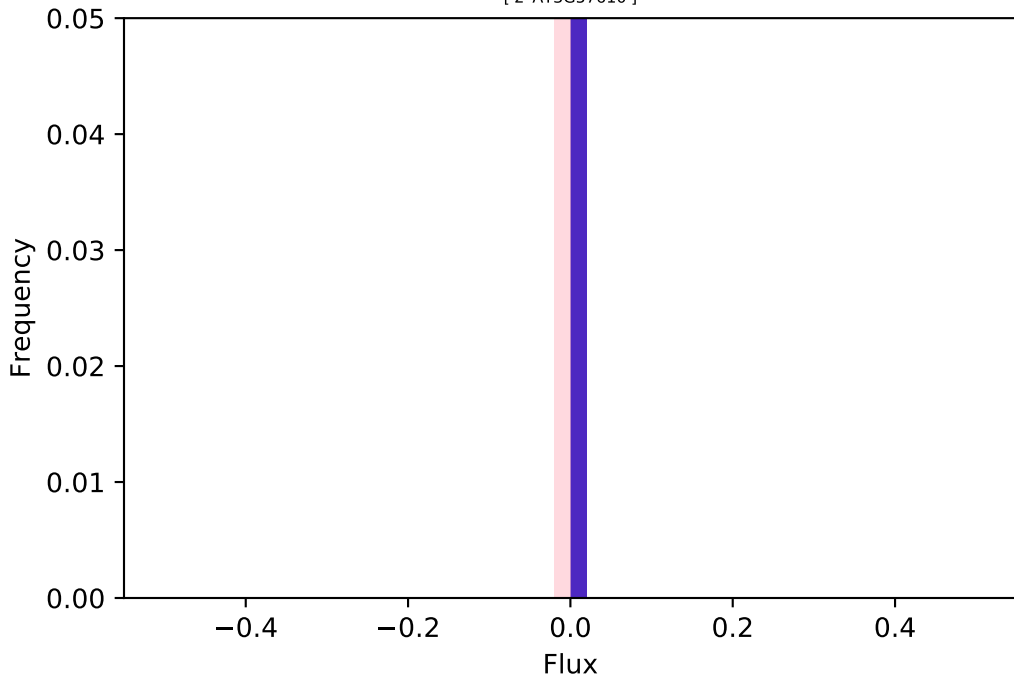
290 : H2O\_c + IMP\_c + NAD\_c --> NADH\_c + XMP\_c  
['AT1G79470', 'AT1G16350']



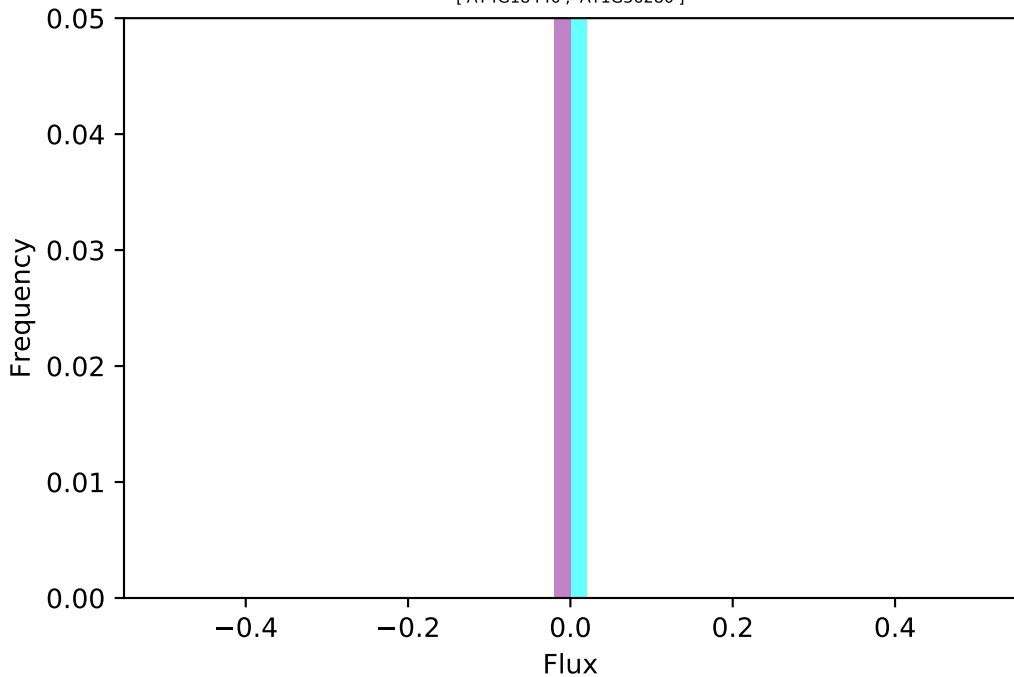
291 : ATP\_c + Gln\_c + H2O\_c + XMP\_c --> AMP\_c + GMP\_c + Glu\_c + H\_c + PPi\_c  
[AT1G63660]



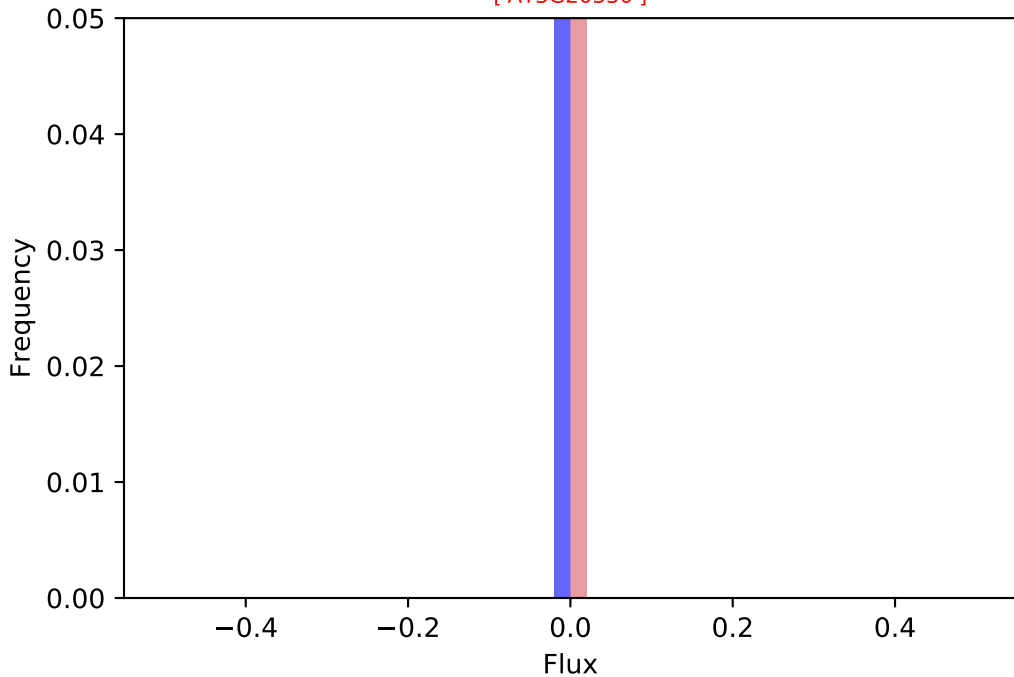
292 : Asp\_h + GTP\_h + IMP\_h --> DC\_DASH\_AMP\_h + GDP\_h + H\_h + Pi\_h  
['2\*AT3G57610']



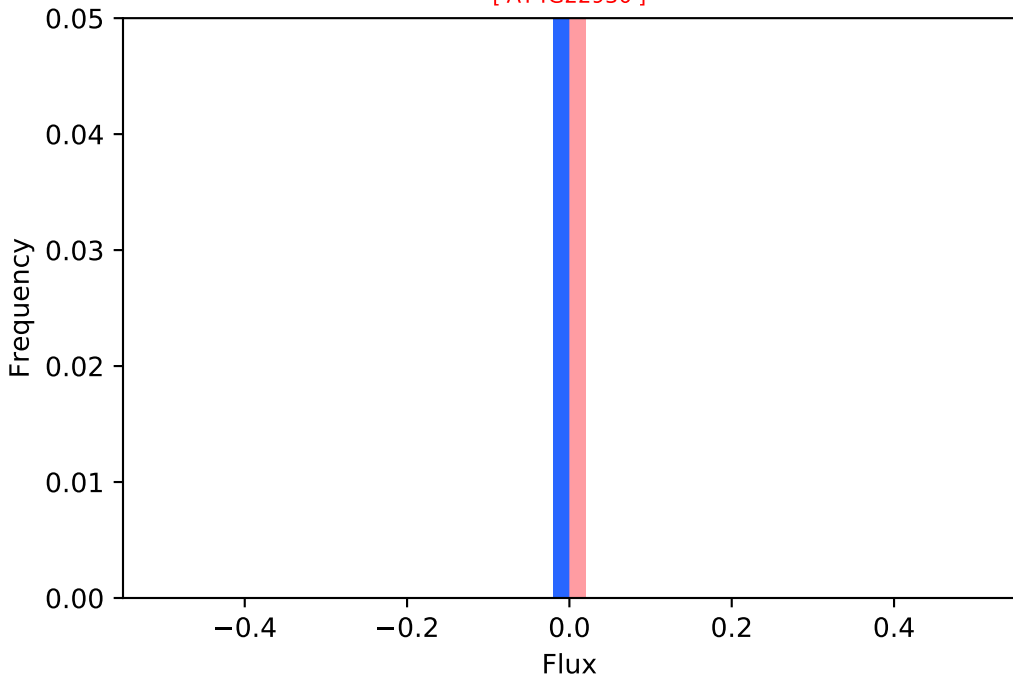
293 : DC\_DASH\_AMP\_h --> AMP\_h + Fum\_h  
['AT4G18440', 'AT1G36280']



294 : Asp\_h + CBP\_h --> CB\_DASH\_Asp\_h + Pi\_h  
['AT3G20330']

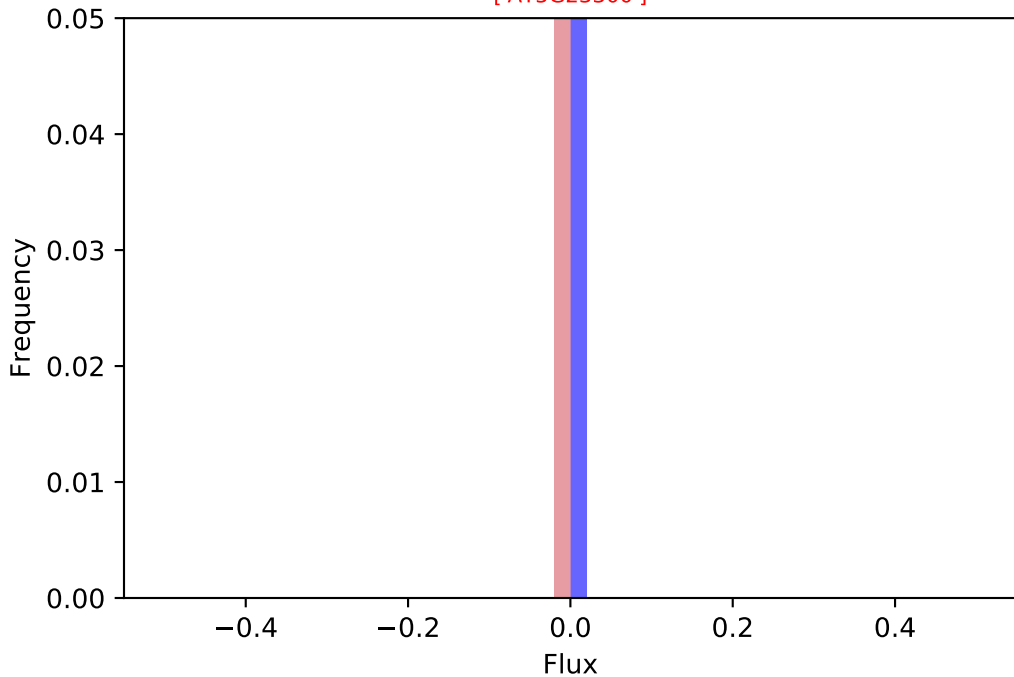


295 : CB\_DASH\_Asp\_h --> DHO\_h + H2O\_h  
['AT4G22930']

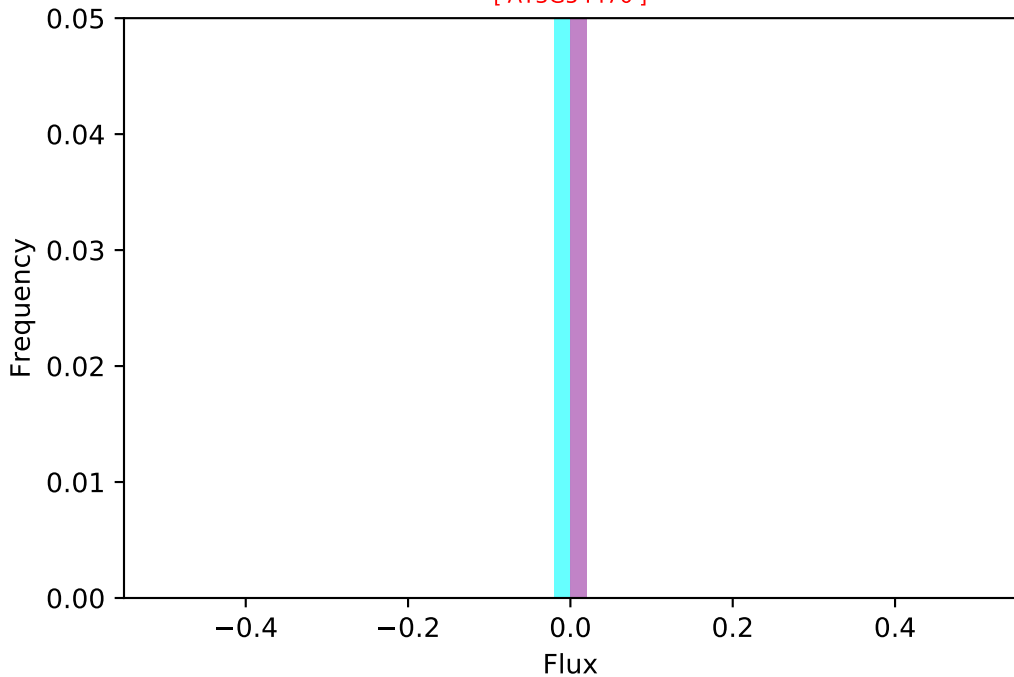




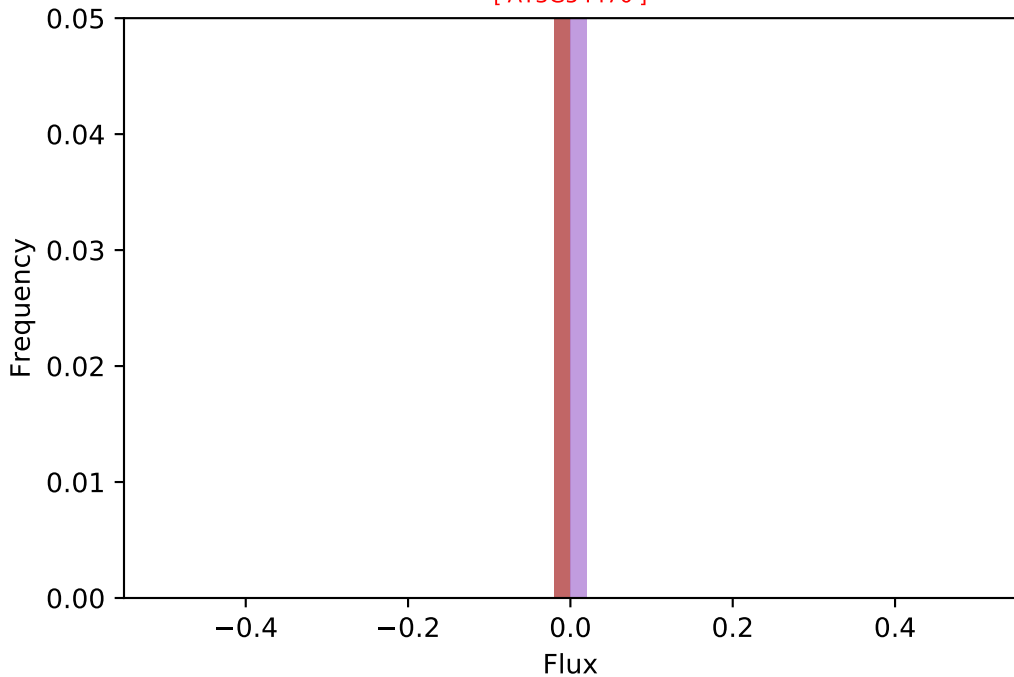
296 : DHO\_m + H\_m + Q\_m --> QH2\_m + orO\_m  
['AT5G23300']



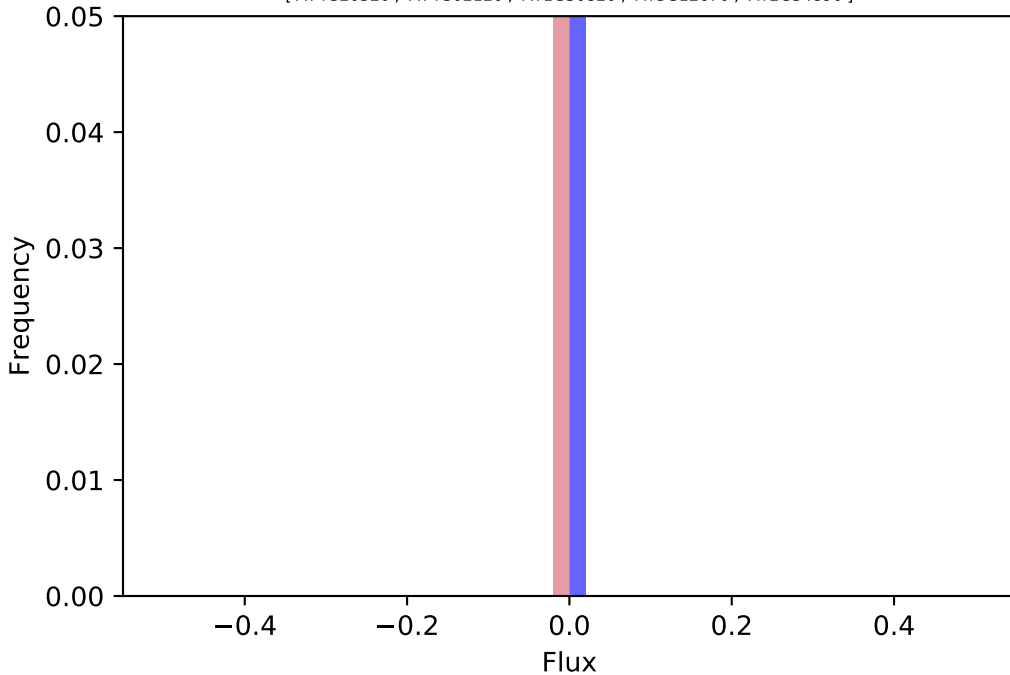
297 : PRPP\_c + orO\_c --> H\_c + OMP\_c + PPI\_c  
['AT3G54470']



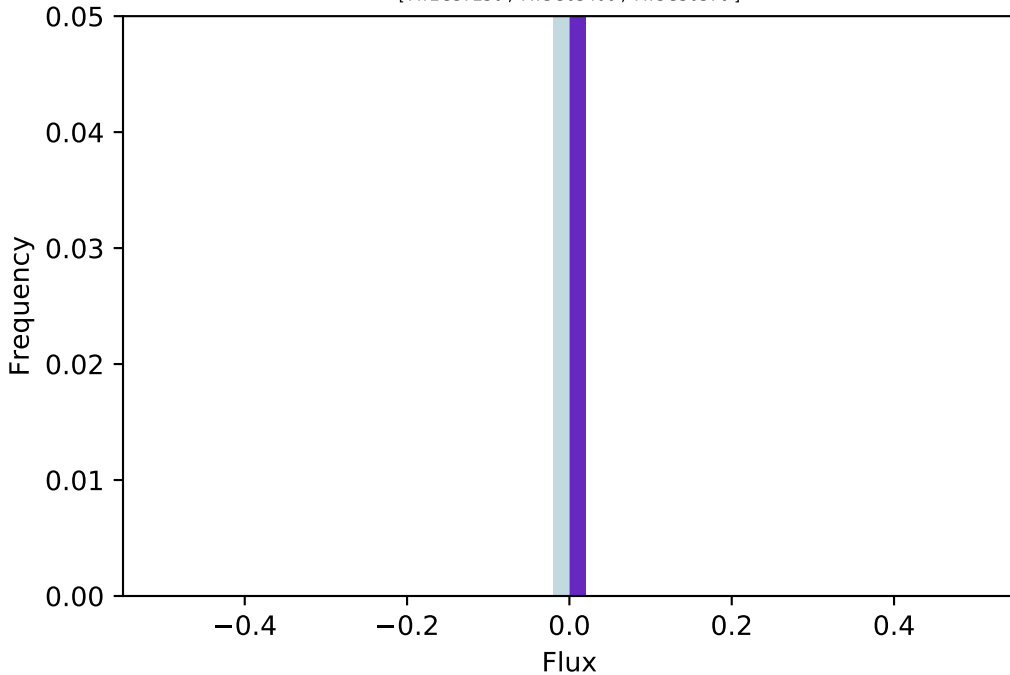
298 : H\_c + OMP\_c --> CO2\_c + UMP\_c  
['AT3G54470']



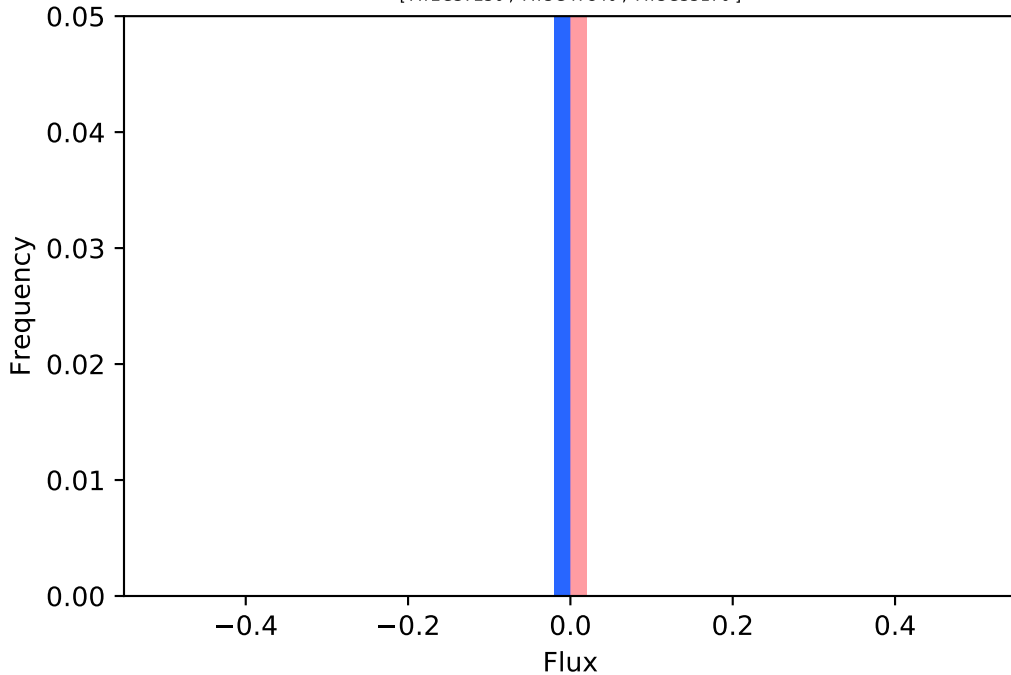
299 : ATP\_c + Gln\_c + H2O\_c + UTP\_c --> ADP\_c + CTP\_c + Glu\_c + 2.0 H\_c + Pi\_c  
['AT4G20320', 'AT4G02120', 'AT1G30820', 'AT3G12670', 'AT2G34890']



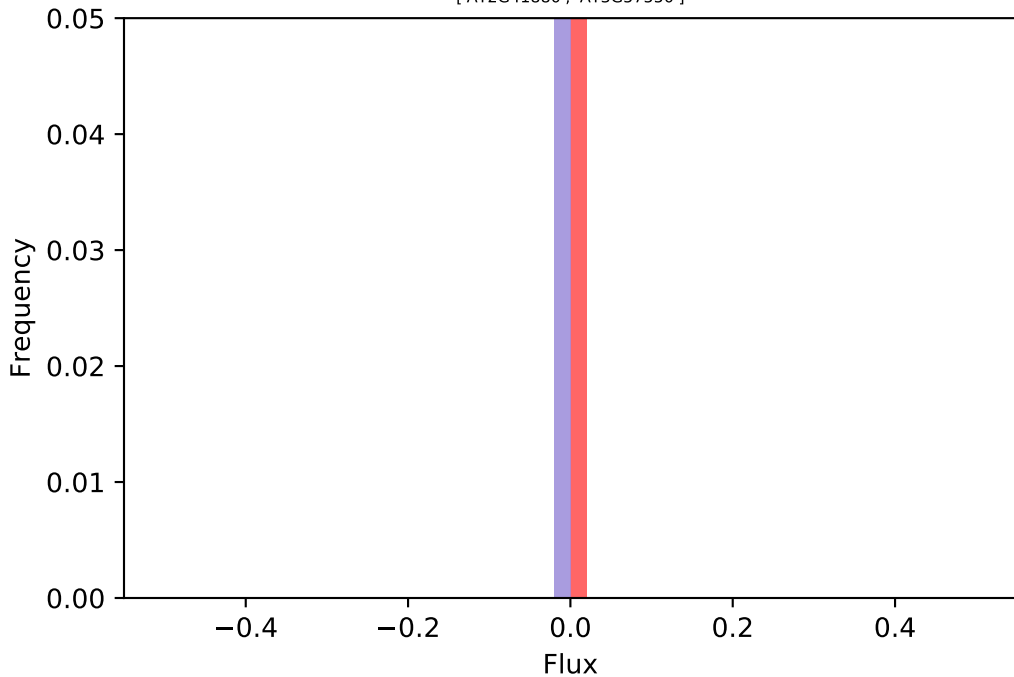
300 : AMP\_c + ATP\_c --> 2.0 ADP\_c  
['AT2G37250', 'AT5G63400', 'AT5G50370']



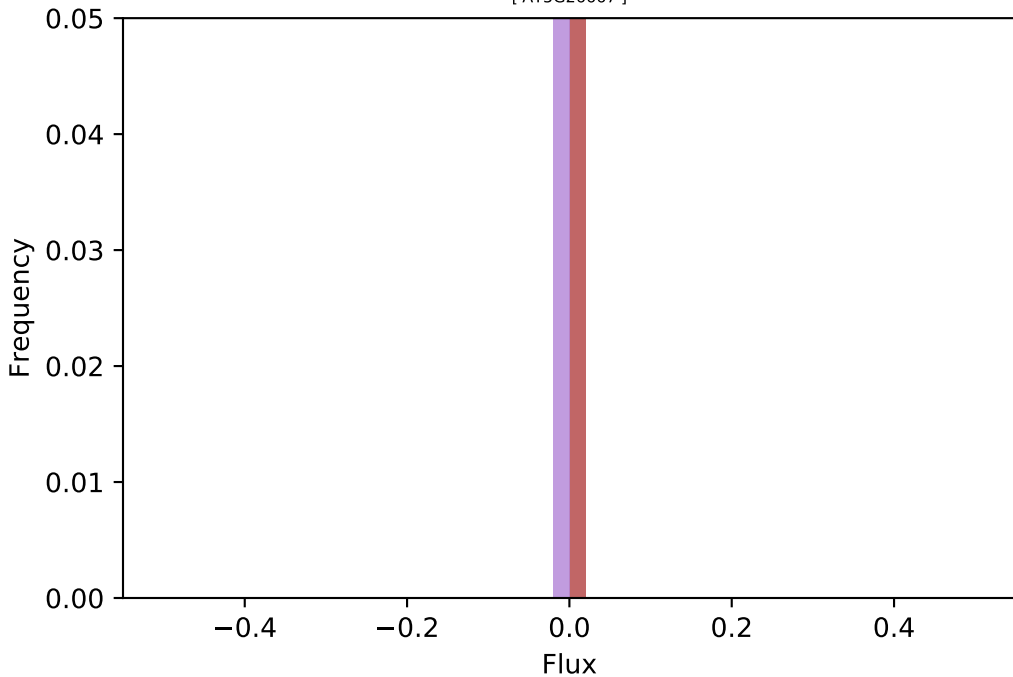
301 : AMP\_h + ATP\_h --> 2.0 ADP\_h  
['AT2G37250', 'AT5G47840', 'AT5G35170']



302 : ATP\_c + GMP\_c + H\_c --> ADP\_c + GDP\_c  
['AT2G41880', 'AT3G57550']

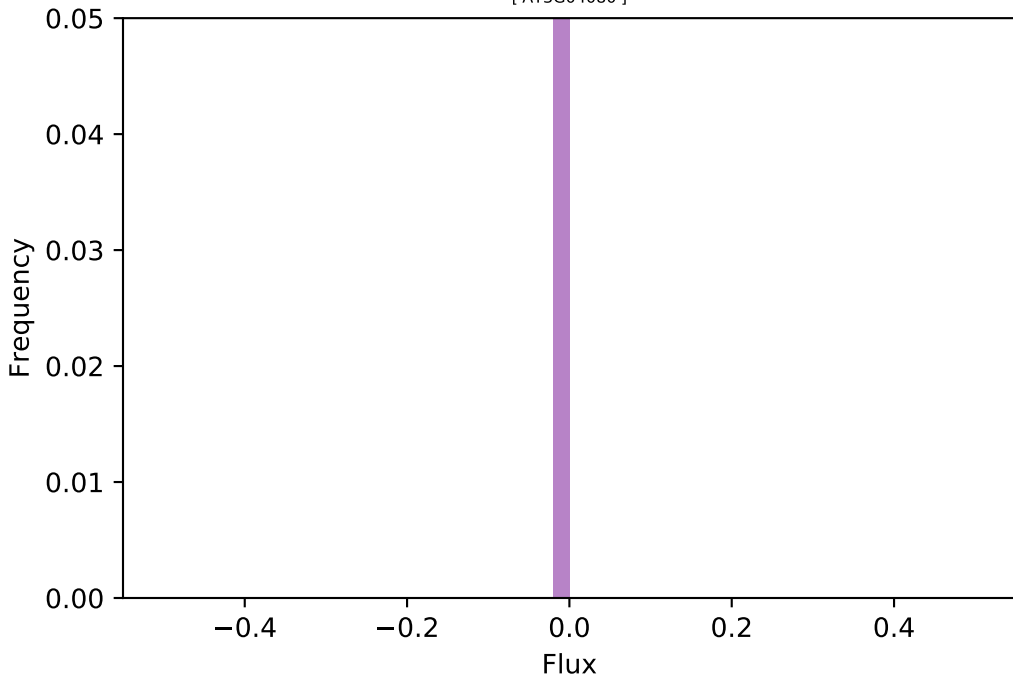


303 : ATP\_c + H\_c + UMP\_c --> ADP\_c + UDP\_c  
['AT5G26667']

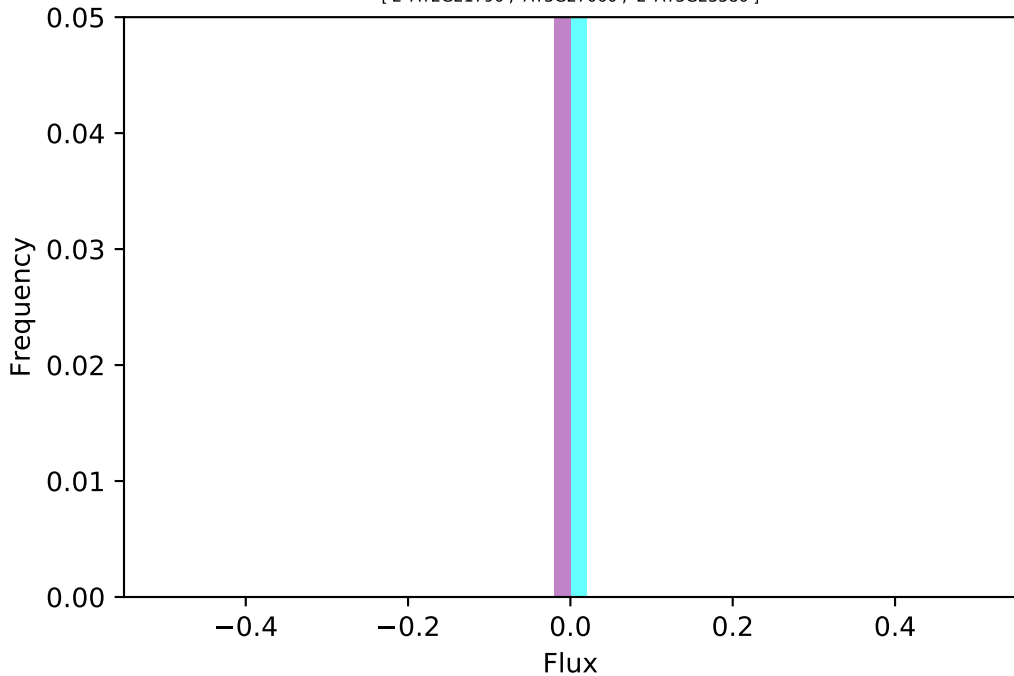




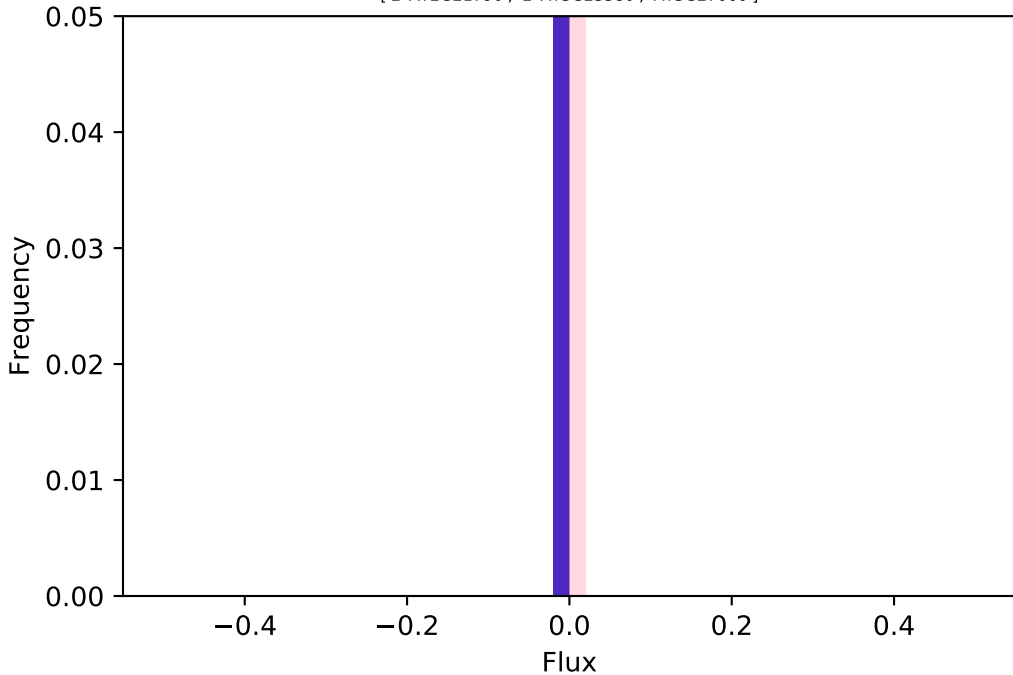
304 : CTP\_c + H2O\_c --> CDP\_c + Pi\_c  
['AT3G04080']



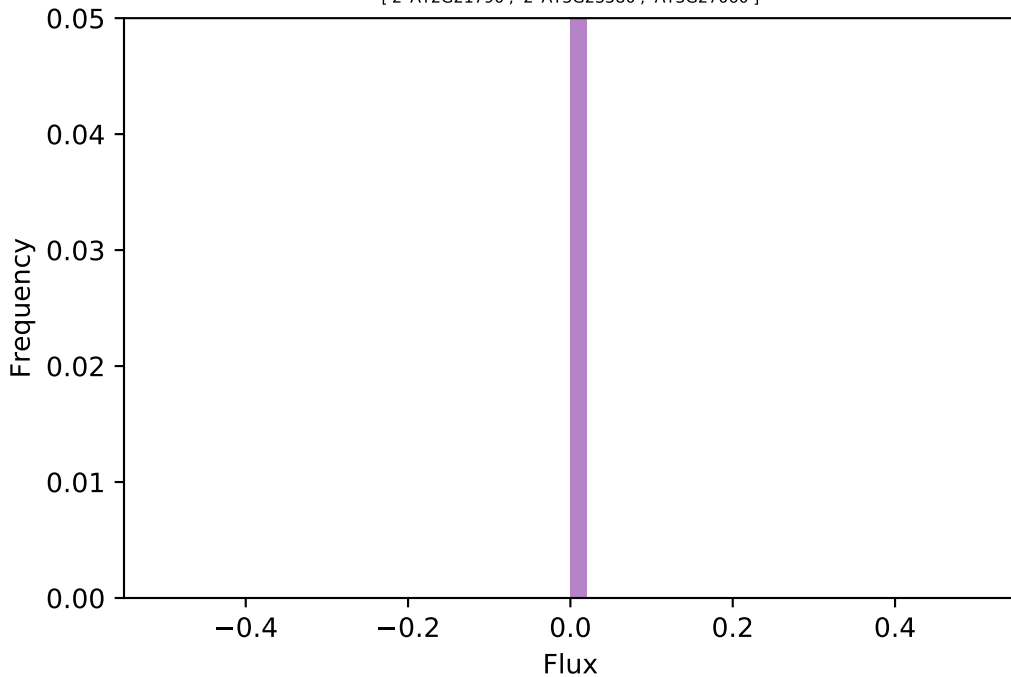
305 : ADP\_c + H\_c + TRXrd\_c --> H2O\_c + TRXox\_c + dADP\_c  
['2\*AT2G21790', 'AT3G27060', '2\*AT3G23580']



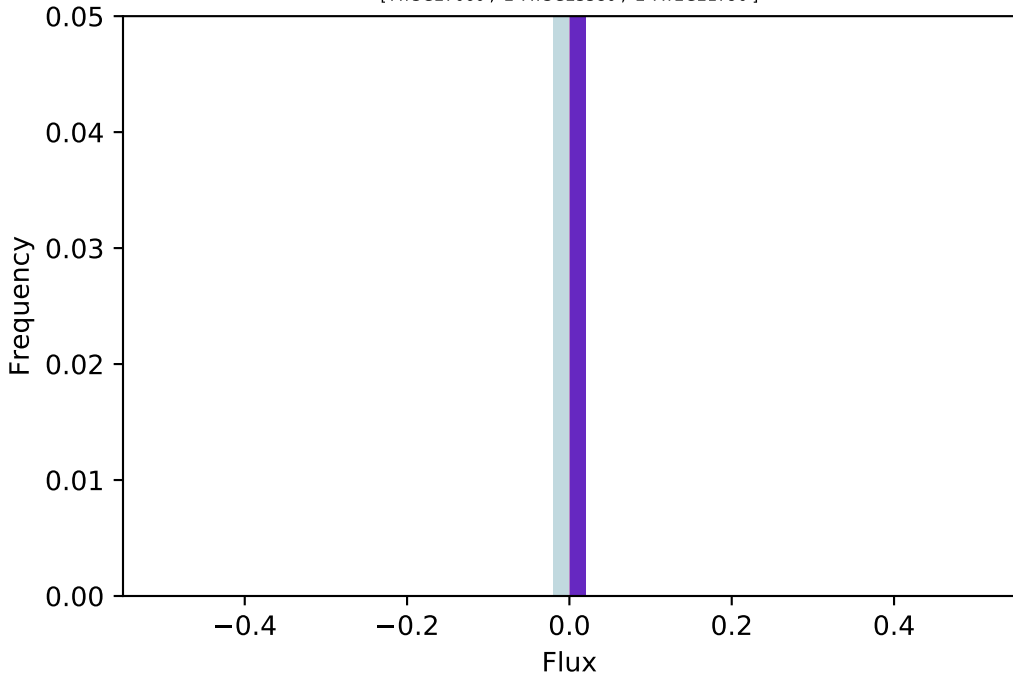
306 : CDP\_c + TRXrd\_c --> H2O\_c + TRXox\_c + dCDP\_c  
['2\*AT2G21790', '2\*AT3G23580', 'AT3G27060']



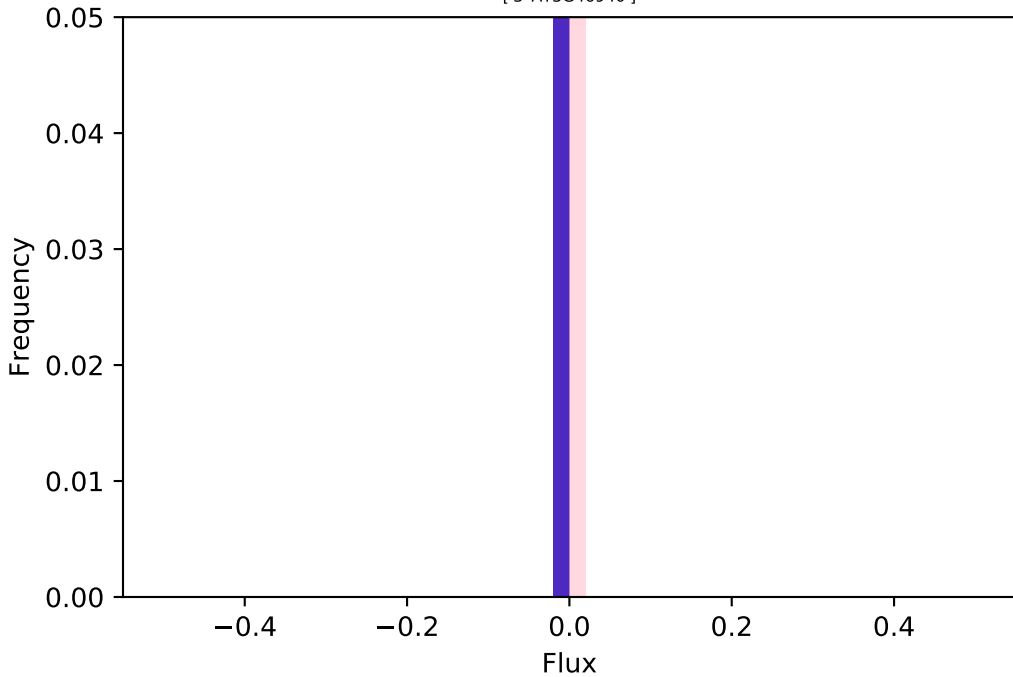
307 : GDP\_c + TRXrd\_c --> H2O\_c + TRXox\_c + dGDP\_c  
['2\*AT2G21790', '2\*AT3G23580', 'AT3G27060']



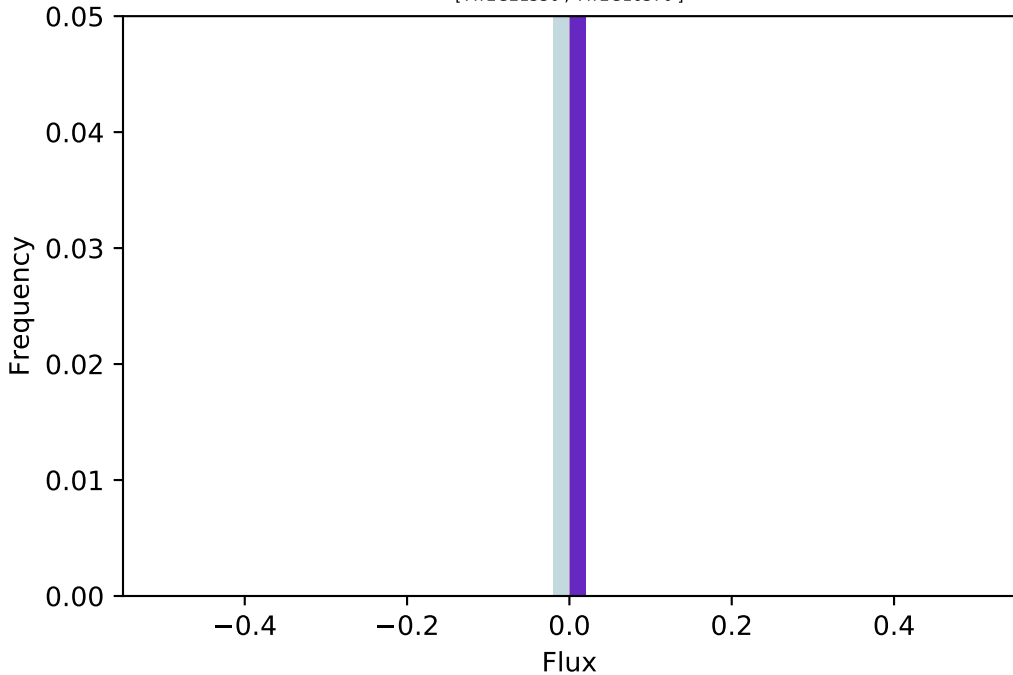
308 : TRXrd\_c + UDP\_c --> H2O\_c + TRXox\_c + dUDP\_c  
['AT3G27060', '2\*AT3G23580', '2\*AT2G21790']



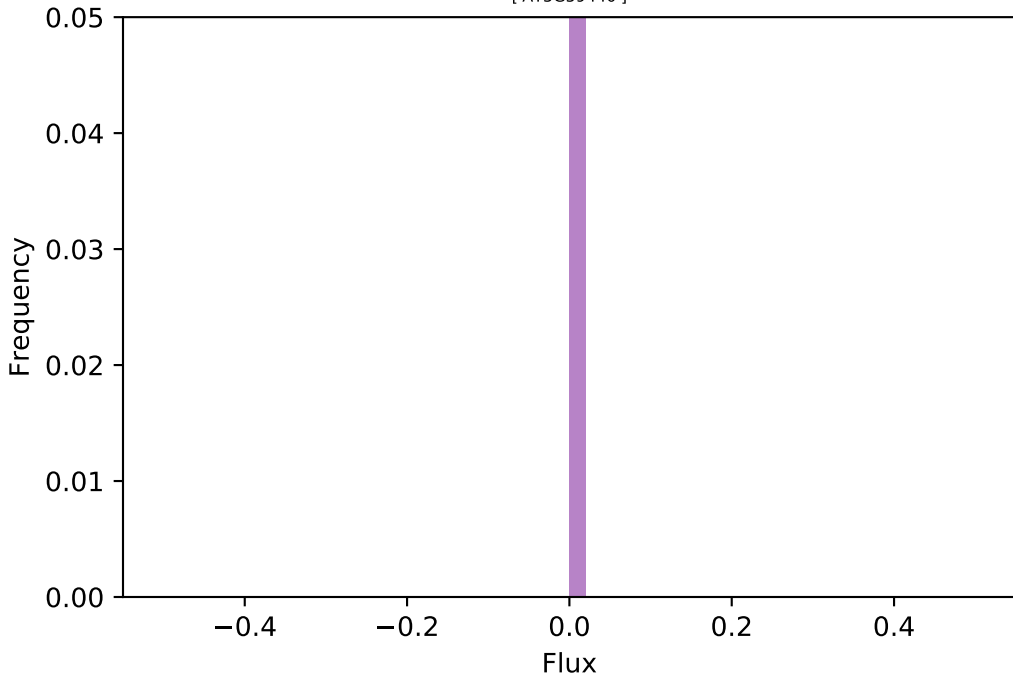
309 : H<sub>2</sub>O\_c + dUTP\_c --> 2.0 H\_c + PPi\_c + dUMP\_c  
['3\*AT3G46940']



310 : M\_DASH\_THF\_c + dUMP\_c --> DHF\_c + dTMP\_c  
['AT2G21550', 'AT2G16370']

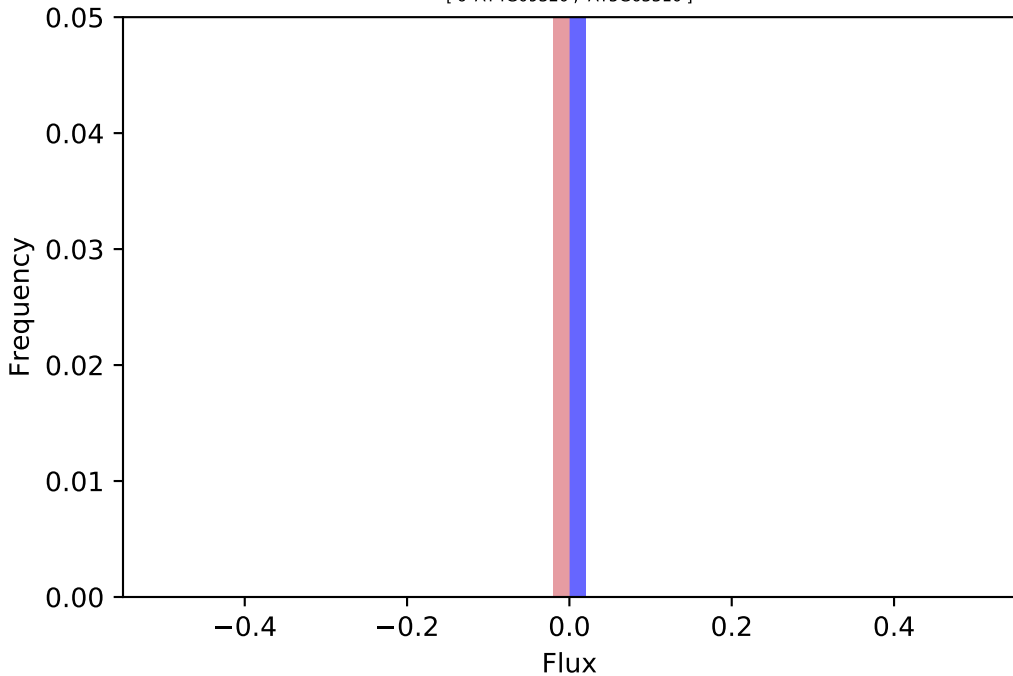


311 : ATP\_c + H\_c + dTMP\_c --> ADP\_c + dTDP\_c  
['AT5G59440']

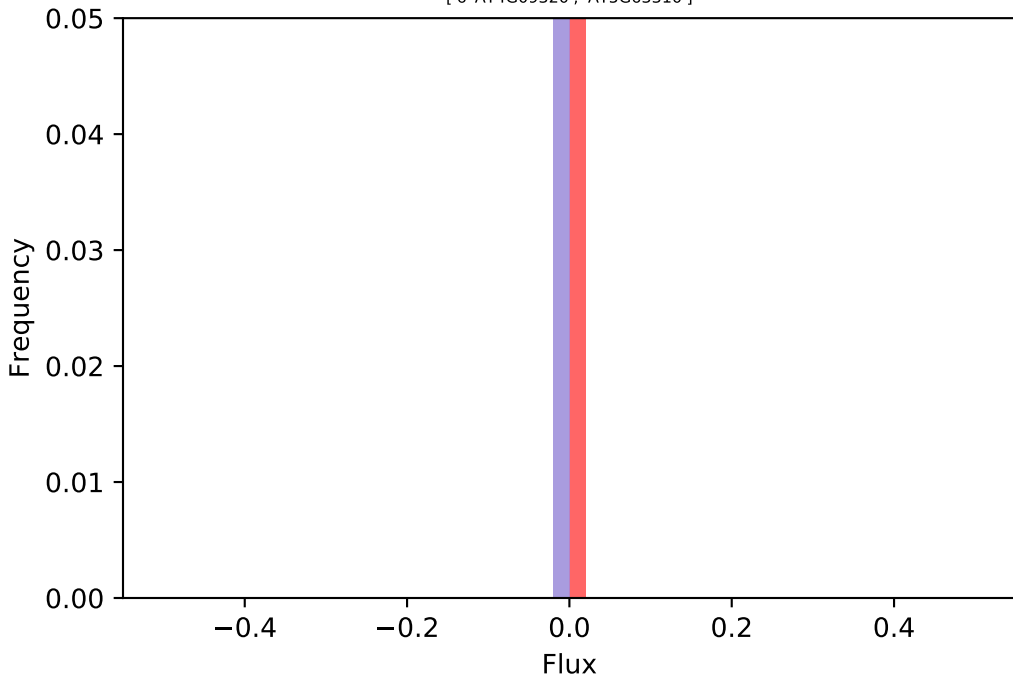




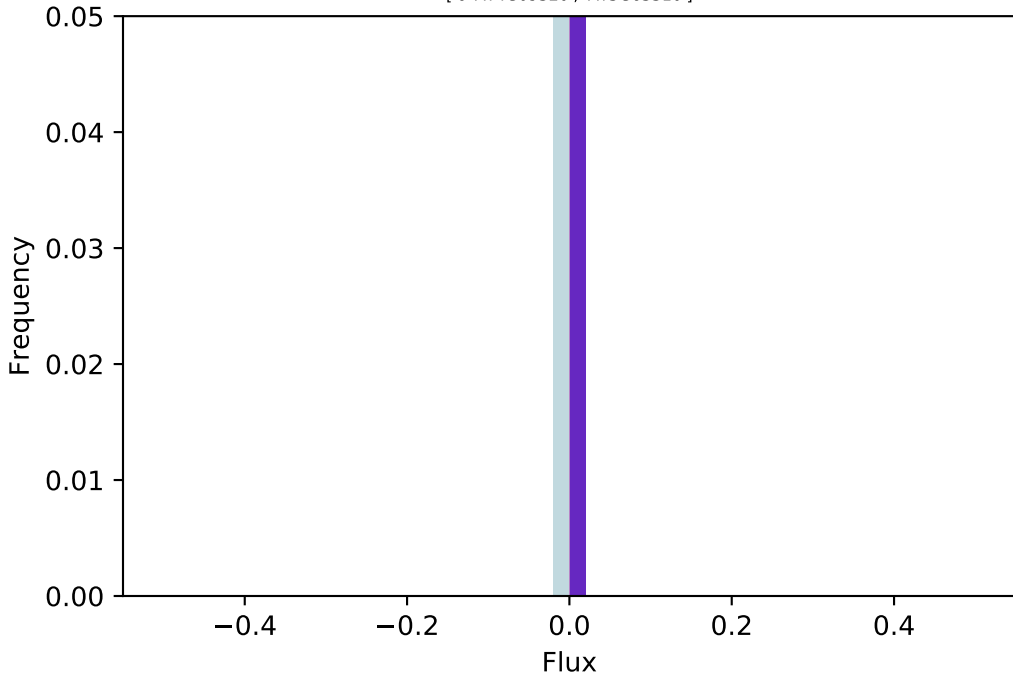
312 : ATP\_c + GDP\_c --> ADP\_c + GTP\_c + H\_c  
['6\*AT4G09320', 'AT5G63310']



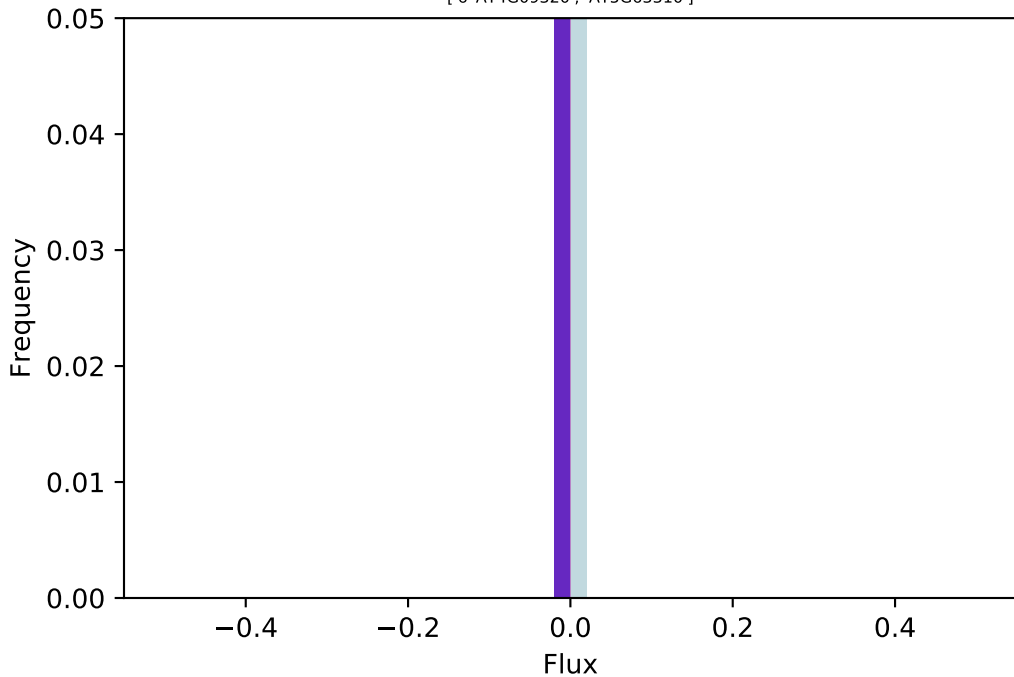
313 : ATP\_h + GDP\_h --> ADP\_h + GTP\_h + H\_h  
['6\*AT4G09320', 'AT5G63310']



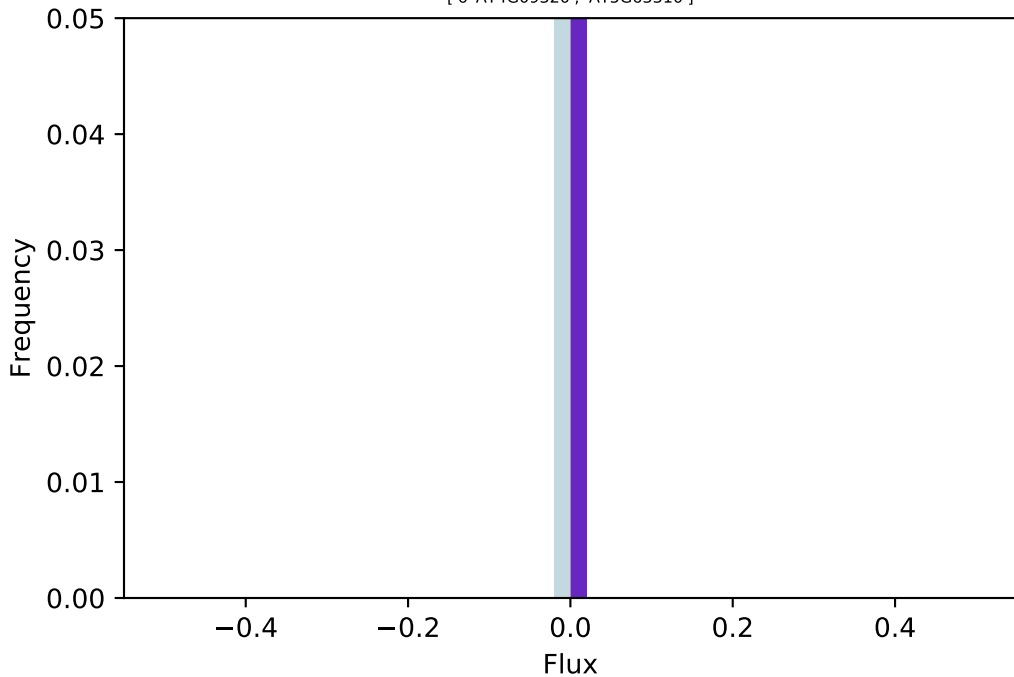
314 : ATP\_c + UDP\_c --> ADP\_c + H\_c + UTP\_c  
['6\*AT4G09320', 'AT5G63310']



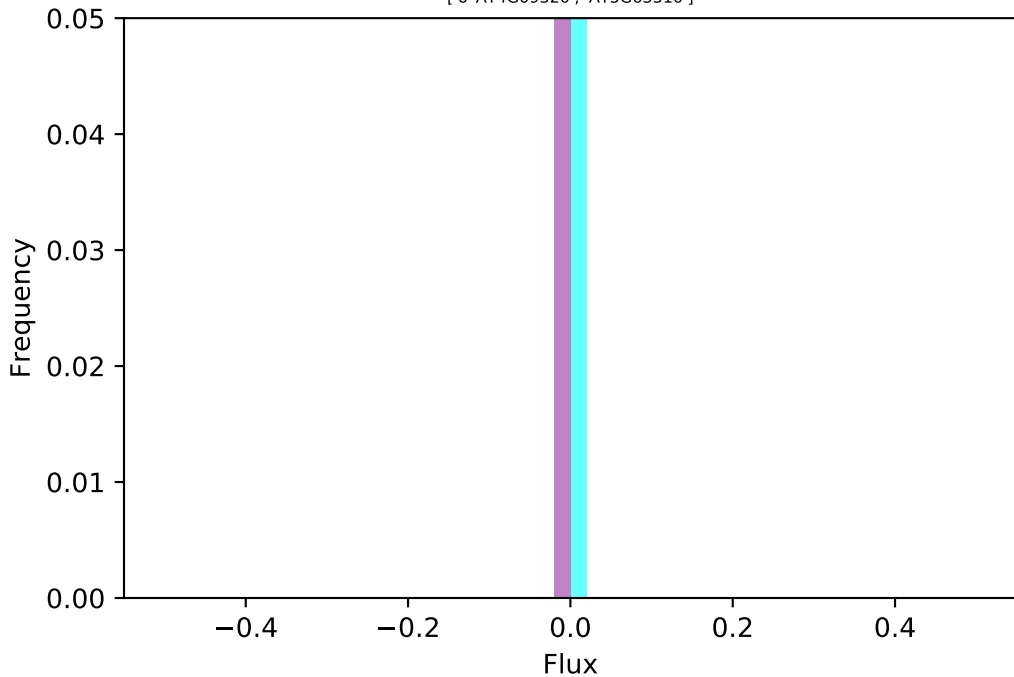
315 : ATP\_c + dADP\_c --> ADP\_c + dATP\_c  
['6\*AT4G09320', 'AT5G63310']



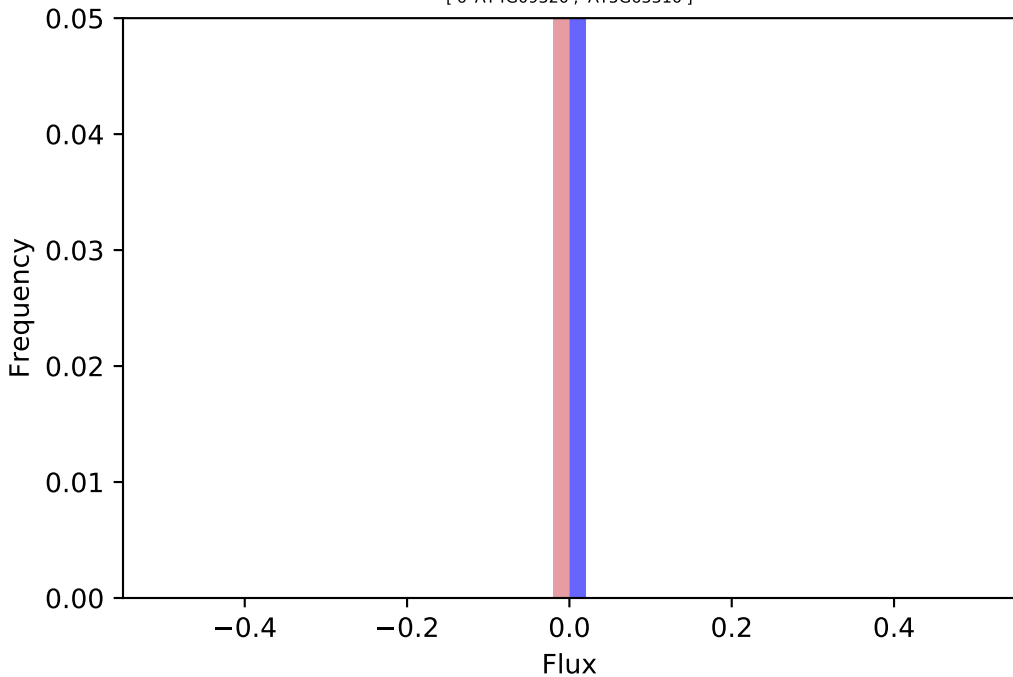
316 : ATP\_c + dCDP\_c --> ADP\_c + dCTP\_c  
['6\*AT4G09320', 'AT5G63310']



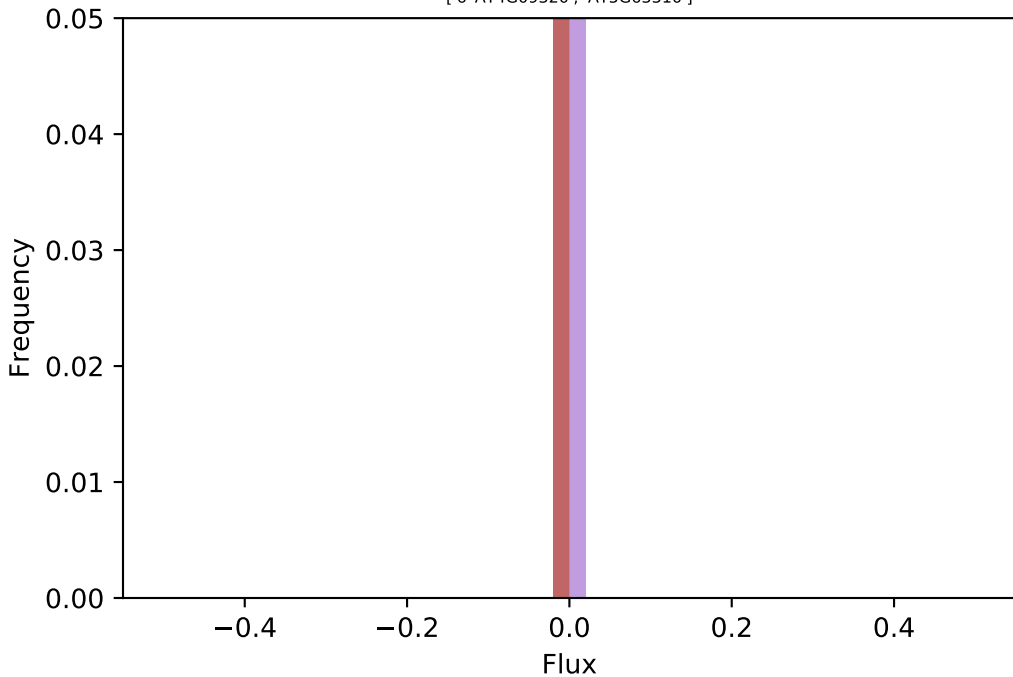
317 : ATP\_c + dGDP\_c --> ADP\_c + dGTP\_c  
['6\*AT4G09320', 'AT5G63310']



318 : ATP\_c + dTDP\_c --> ADP\_c + dTTP\_c  
['6\*AT4G09320', 'AT5G63310']

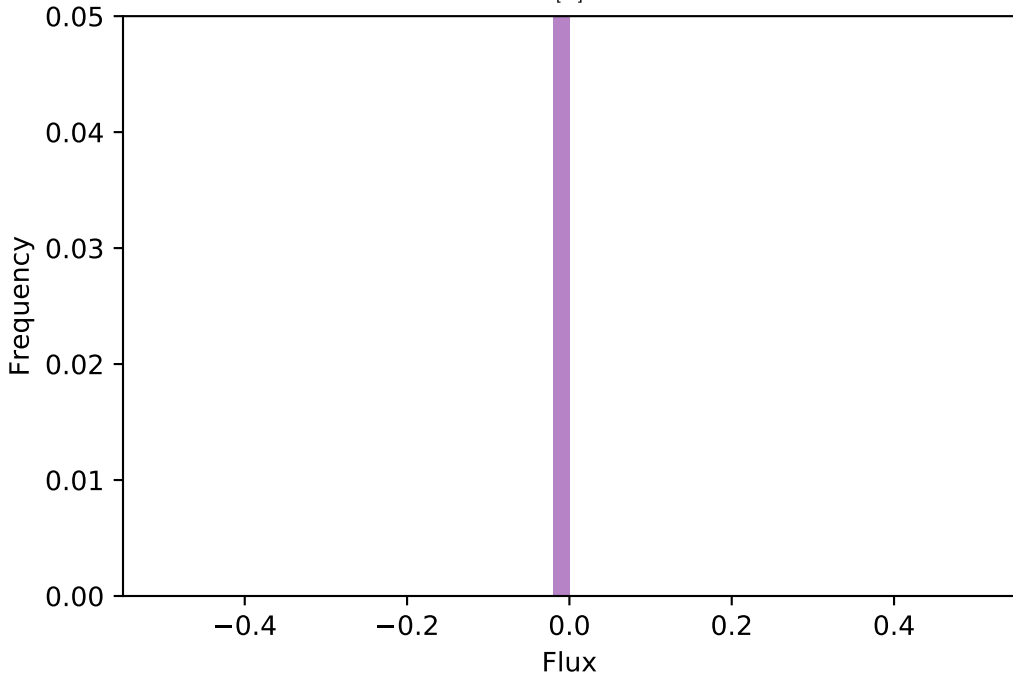


319 : ATP\_c + dUDP\_c --> ADP\_c + dUTP\_c  
['6\*AT4G09320', 'AT5G63310']

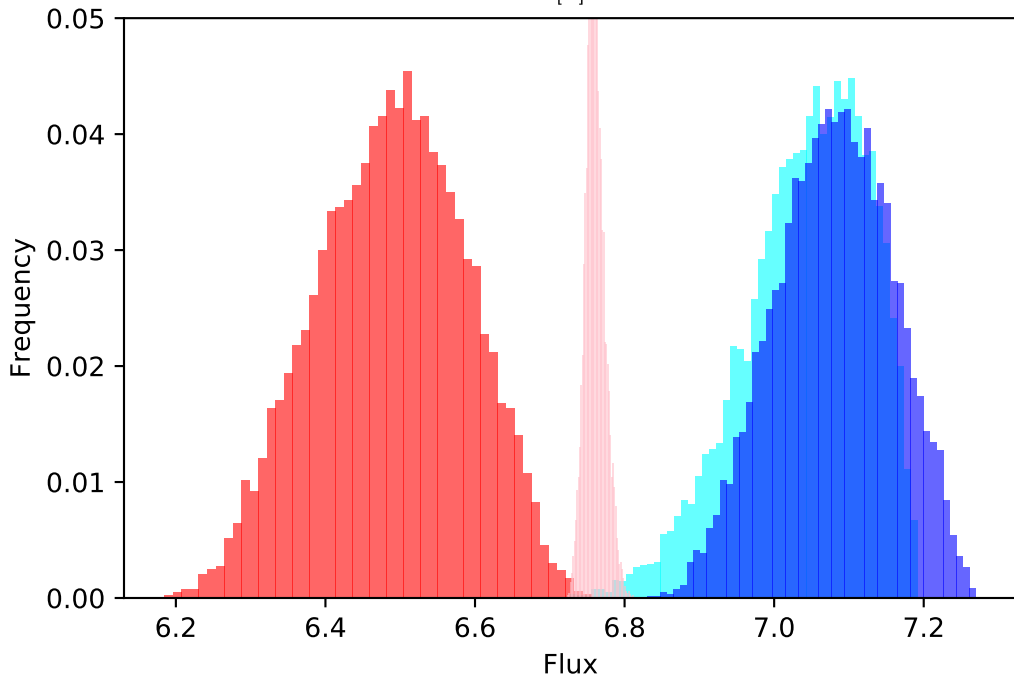


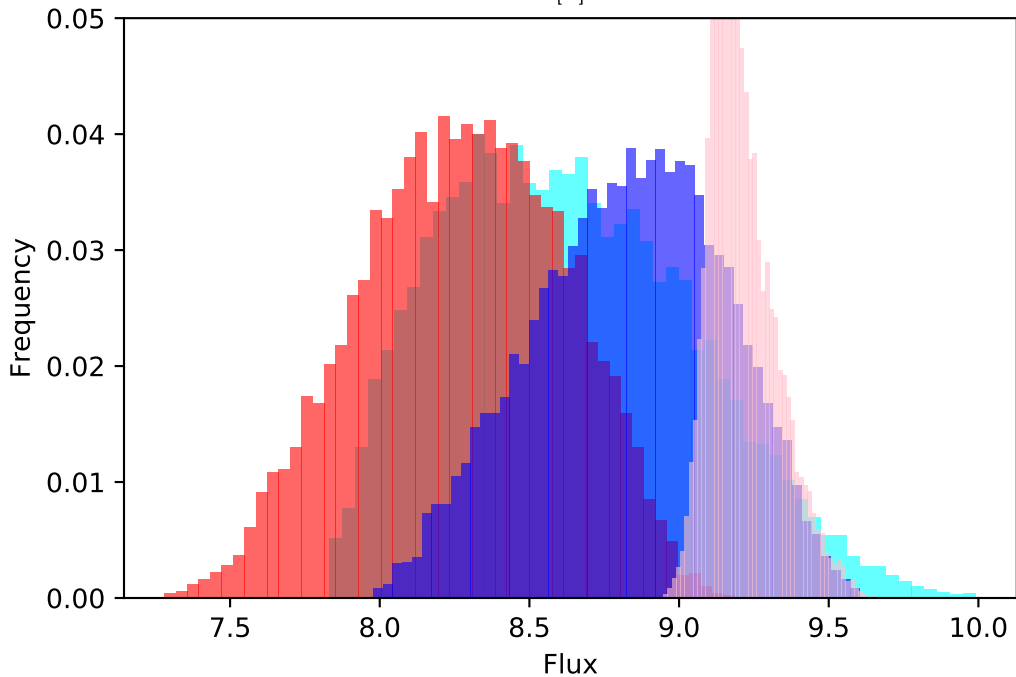
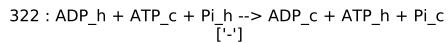


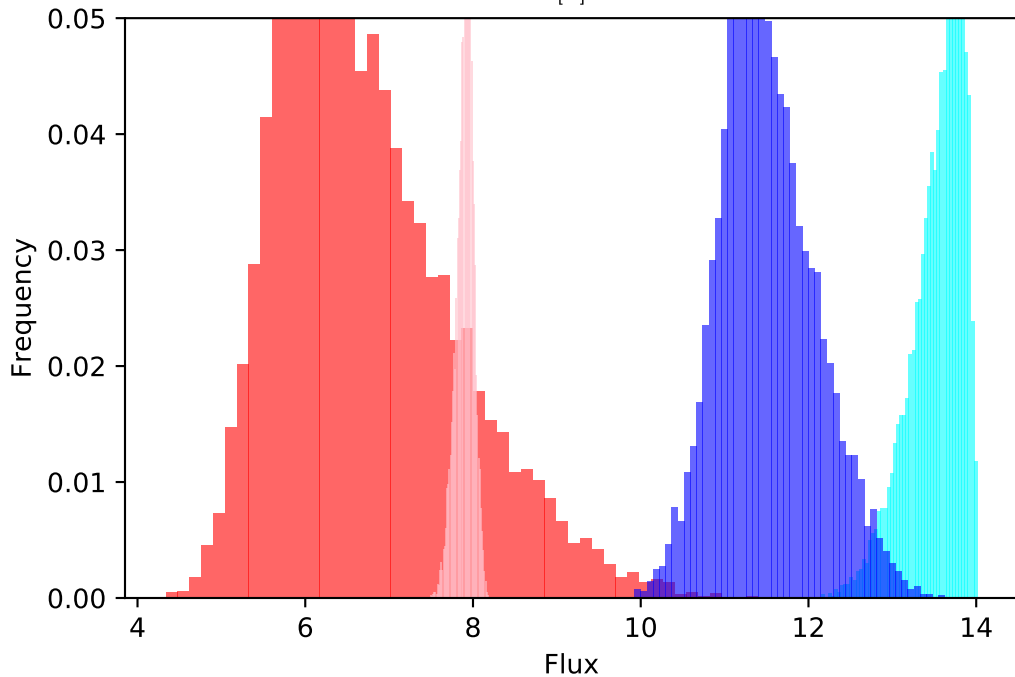
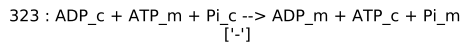
320 : SO4\_c --> SO4\_h  
[<sup>+</sup>-<sup>+</sup>]



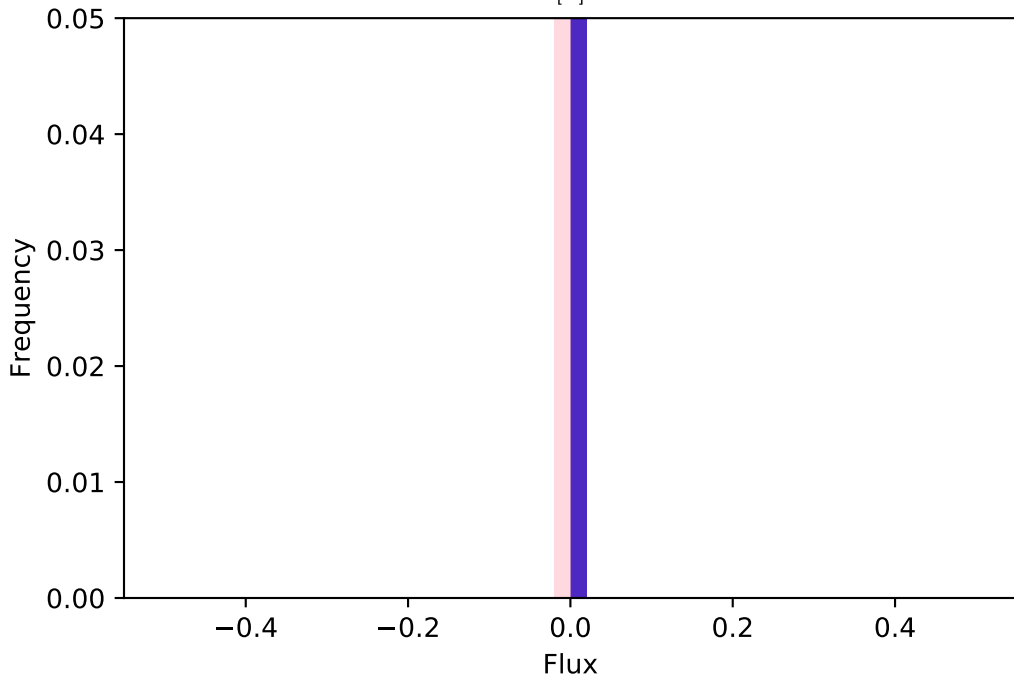
321 : NO2\_c --> NO2\_h  
[<sup>-1</sup>]



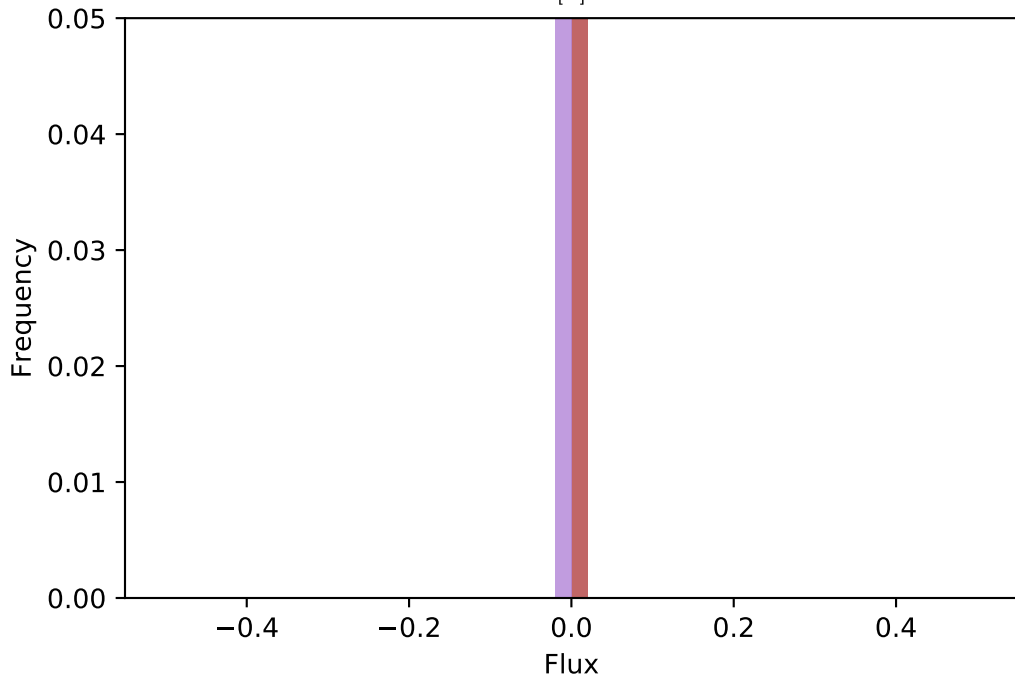




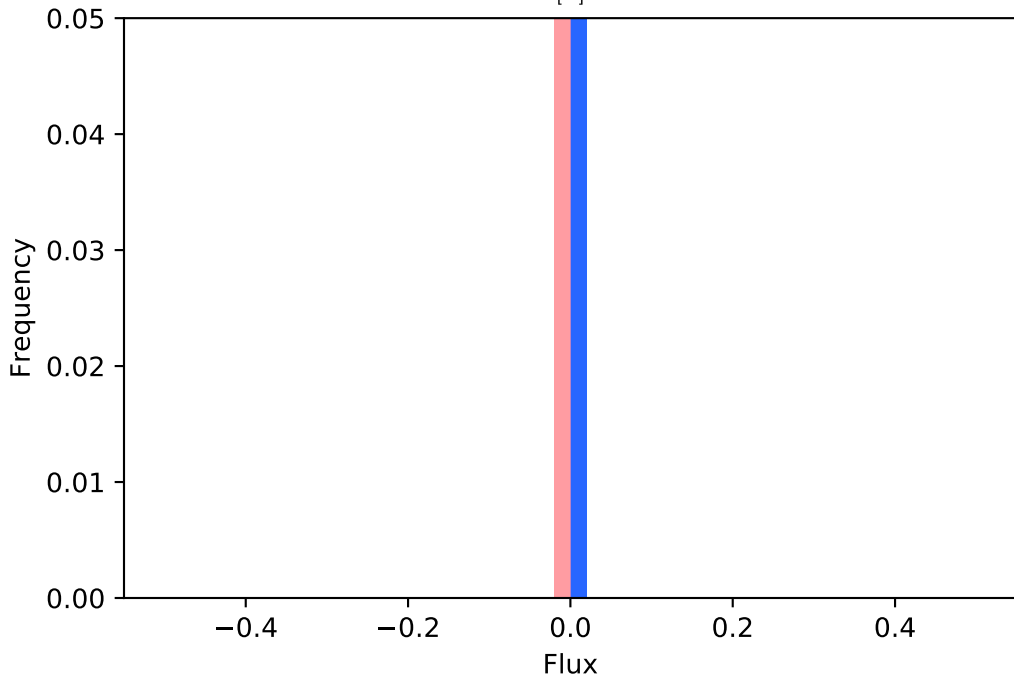
324 : AMP\_h --> AMP\_c  
[<sup>-1</sup>]



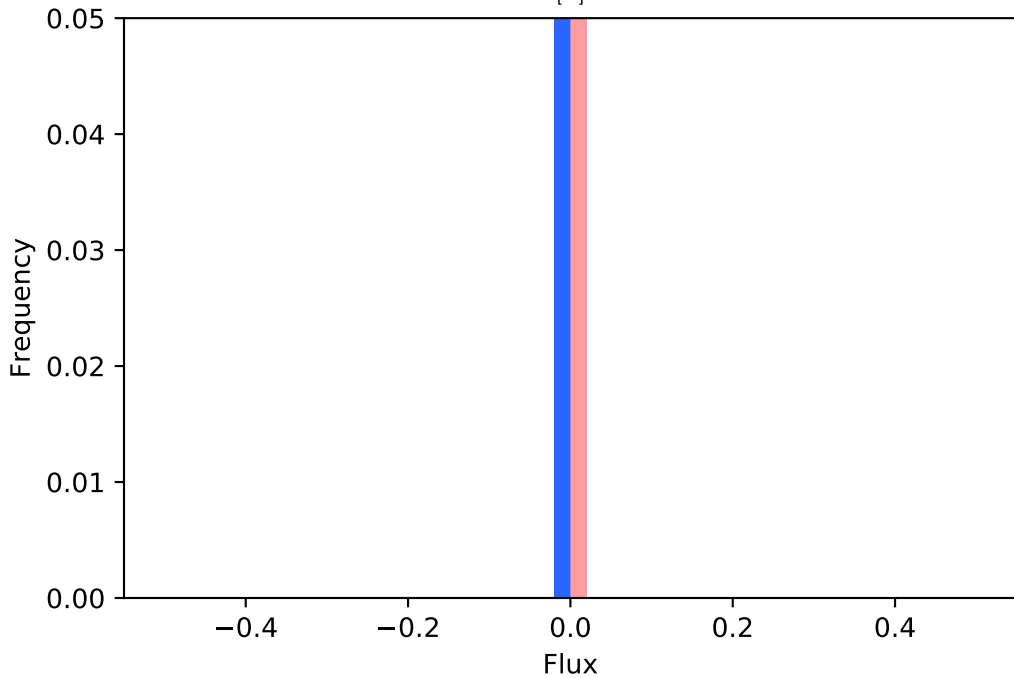
325 : ADP<sub>h</sub> --> ADP<sub>c</sub>  
[<sup>-1</sup>]



326 : ATP\_h --> ATP\_c  
[<sup>-1</sup>]

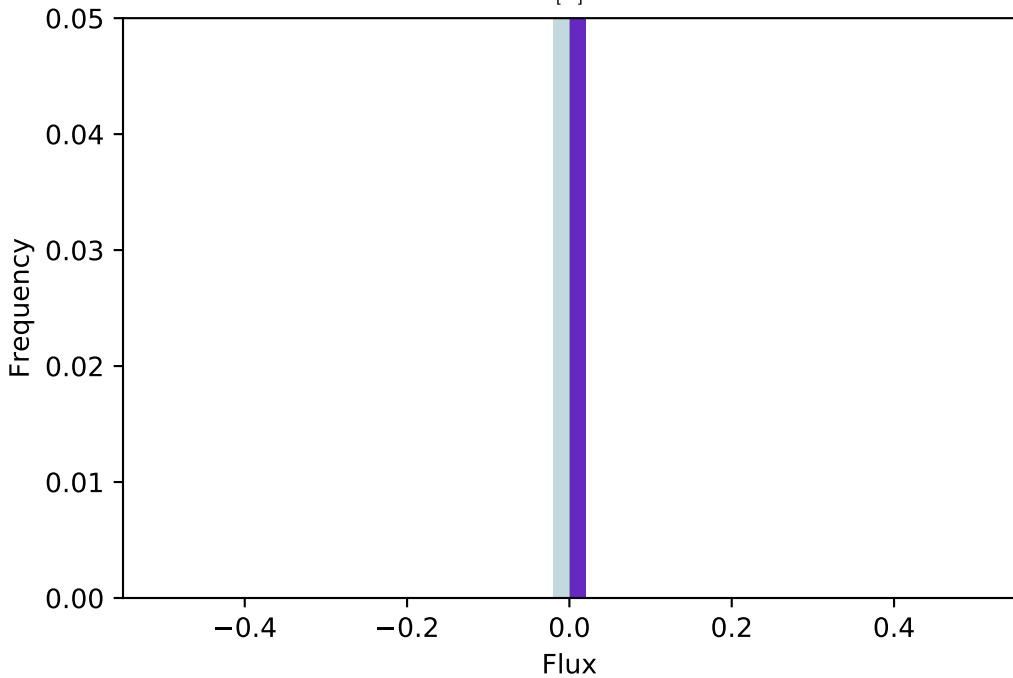


327 : AMP\_h + NAD\_c <=> AMP\_c + NAD\_h  
['-']

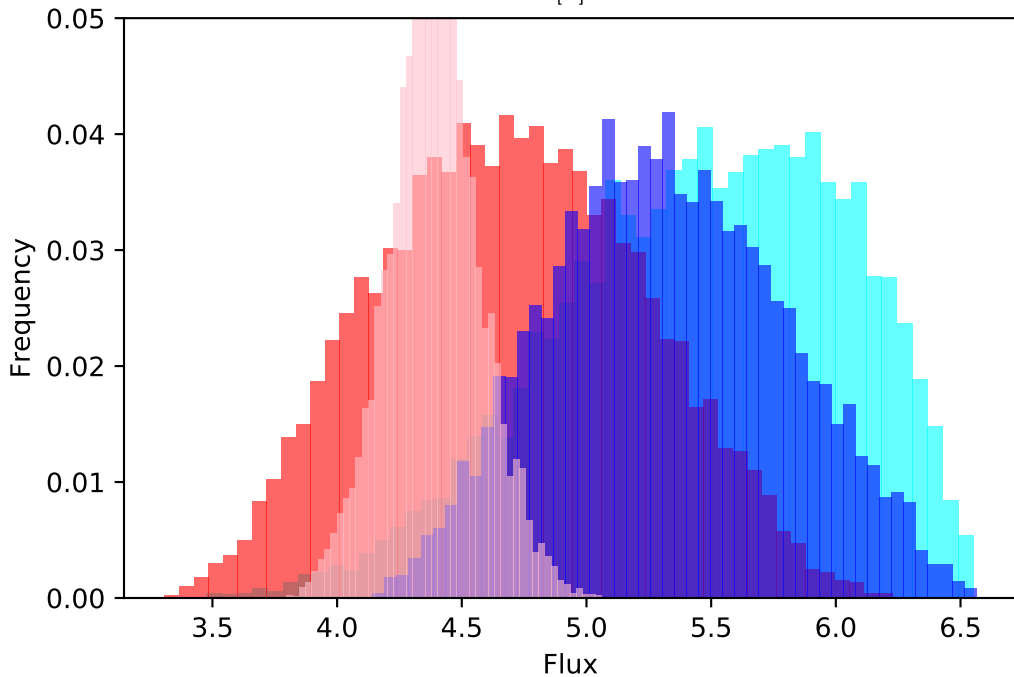




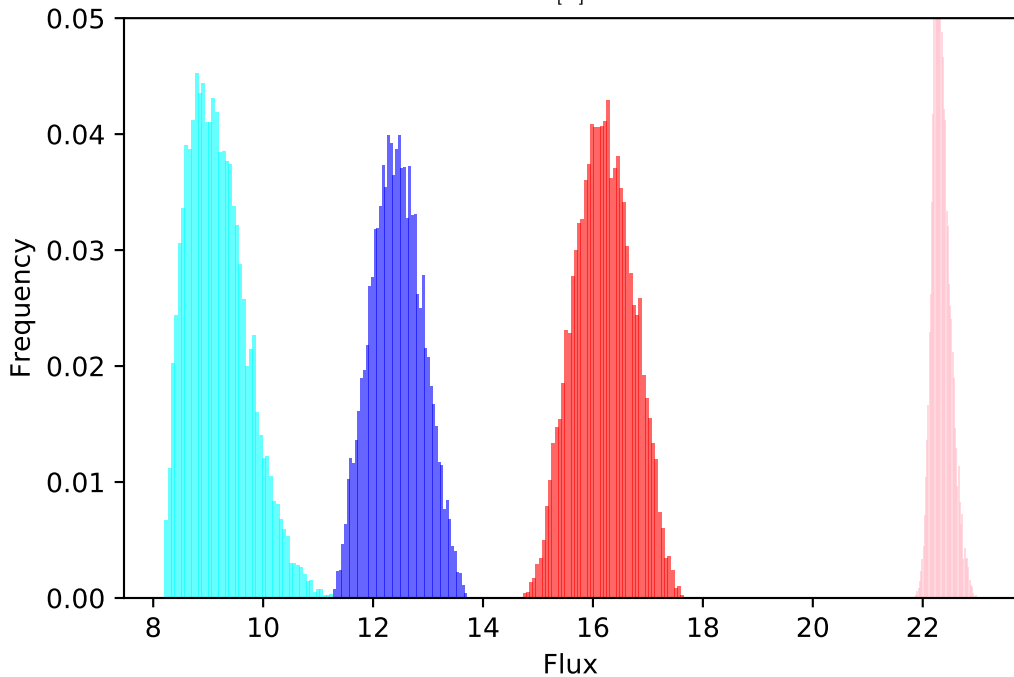
328 : ADP\_h + NAD\_c <=> ADP\_c + NAD\_h  
['-']



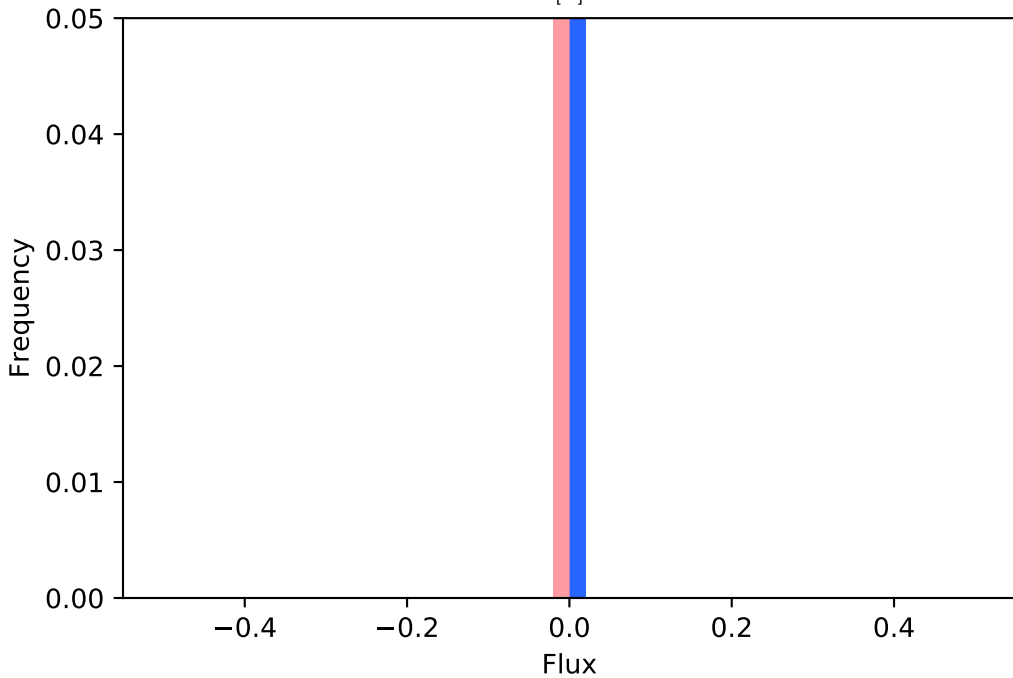
329 :  $\text{PGA}_h + \text{Pi}_c \rightarrow \text{PGA}_c + \text{Pi}_h$   
[ $^{-1}$ ]



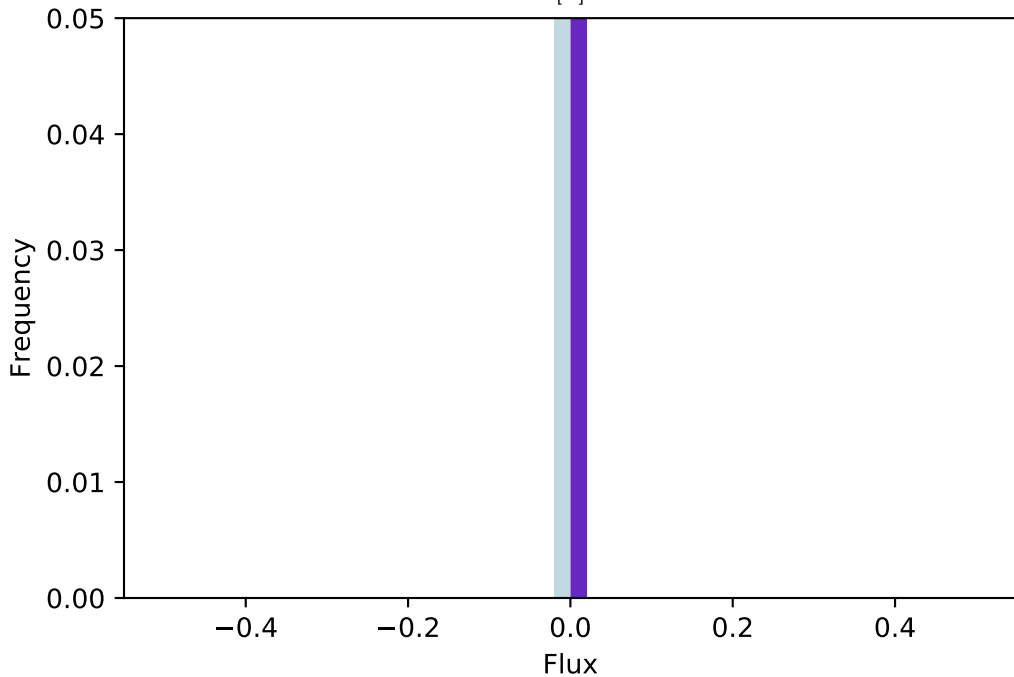
330 : GAP\_h + Pi\_c --> GAP\_c + Pi\_h  
[<sup>-1</sup>]



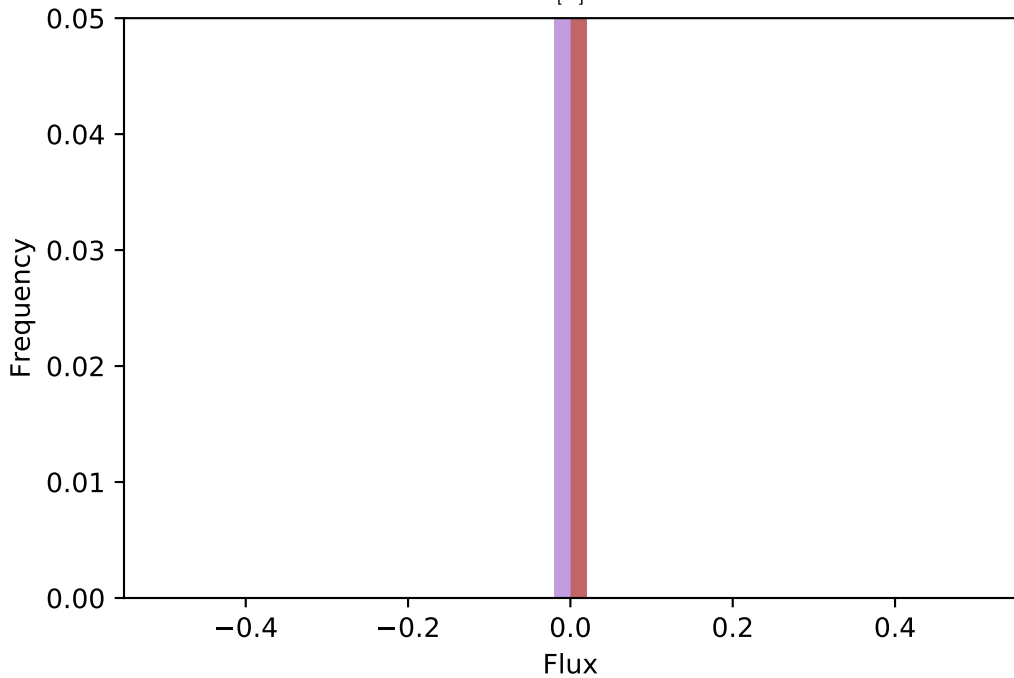
331 : DHAP\_h + Pi\_c --> DHAP\_c + Pi\_h  
[<sup>-1</sup>]



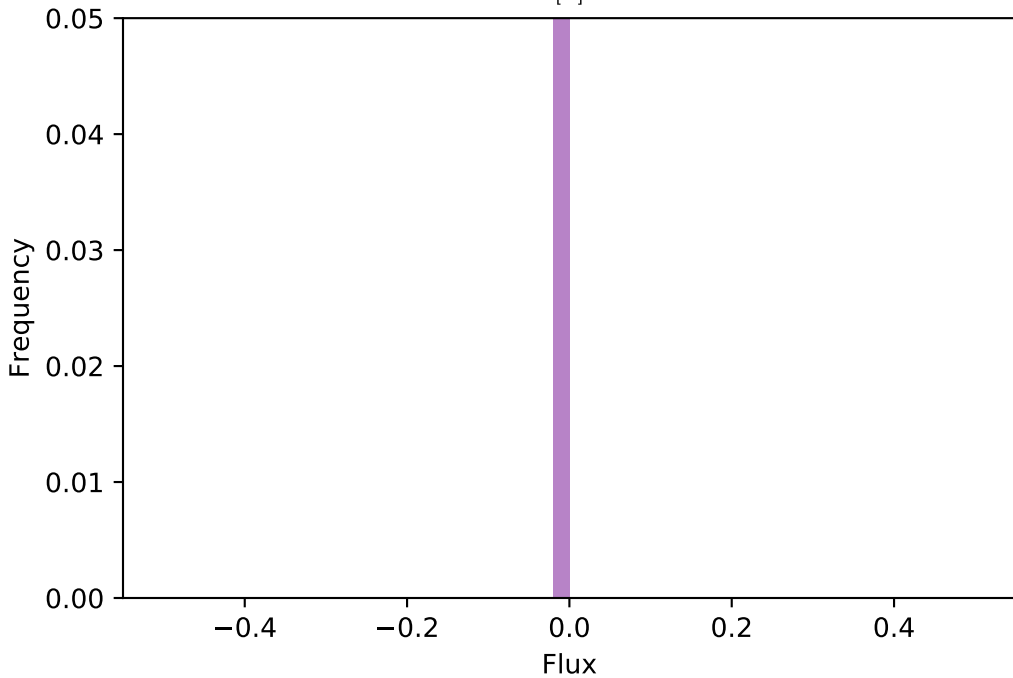
332 : PEP\_c + Pi\_h --> PEP\_h + Pi\_c  
[<sup>-1</sup>]



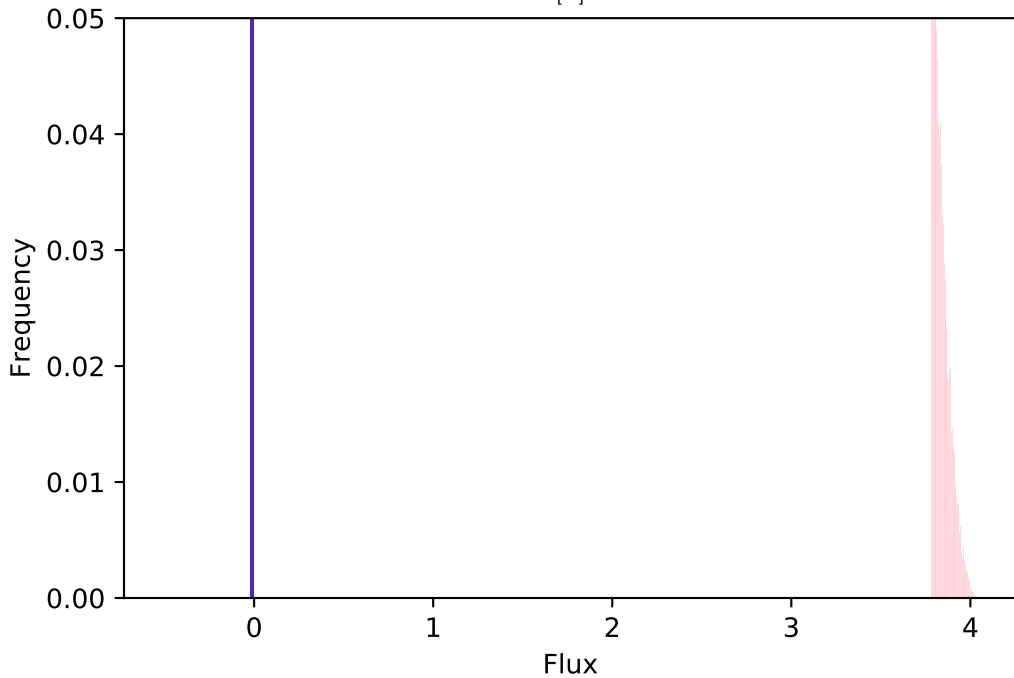
333 : GCA\_h --> GCA\_c  
[<sup>-1</sup>]



334 : GCEA\_c --> GCEA\_h  
[1-1]

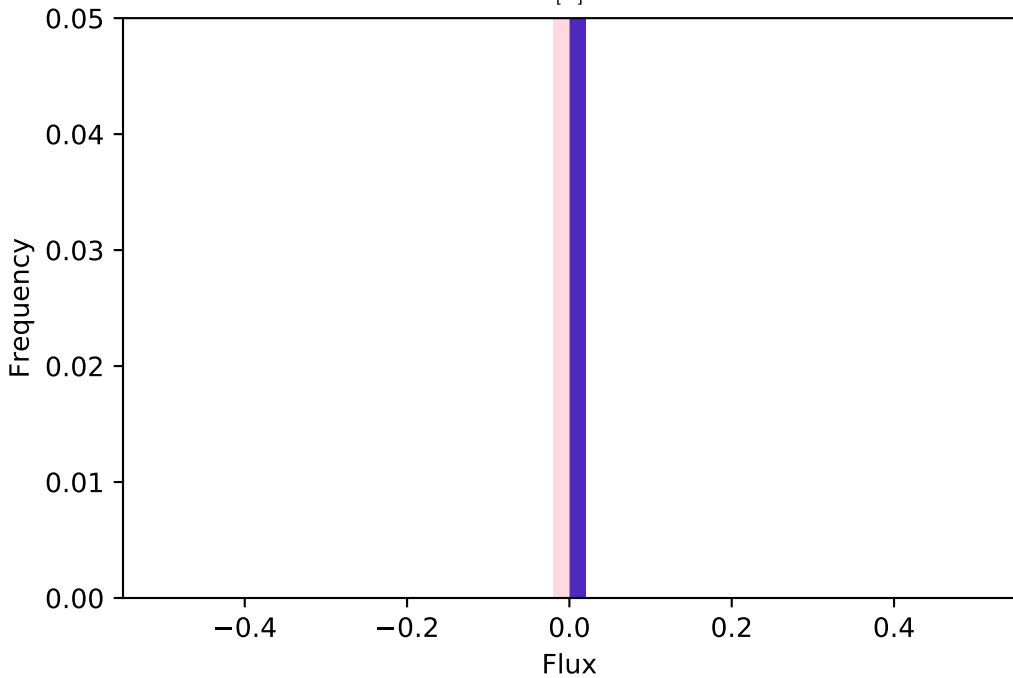


335 : G6P\_c + Pi\_h <=> G6P\_h + Pi\_c  
['-']

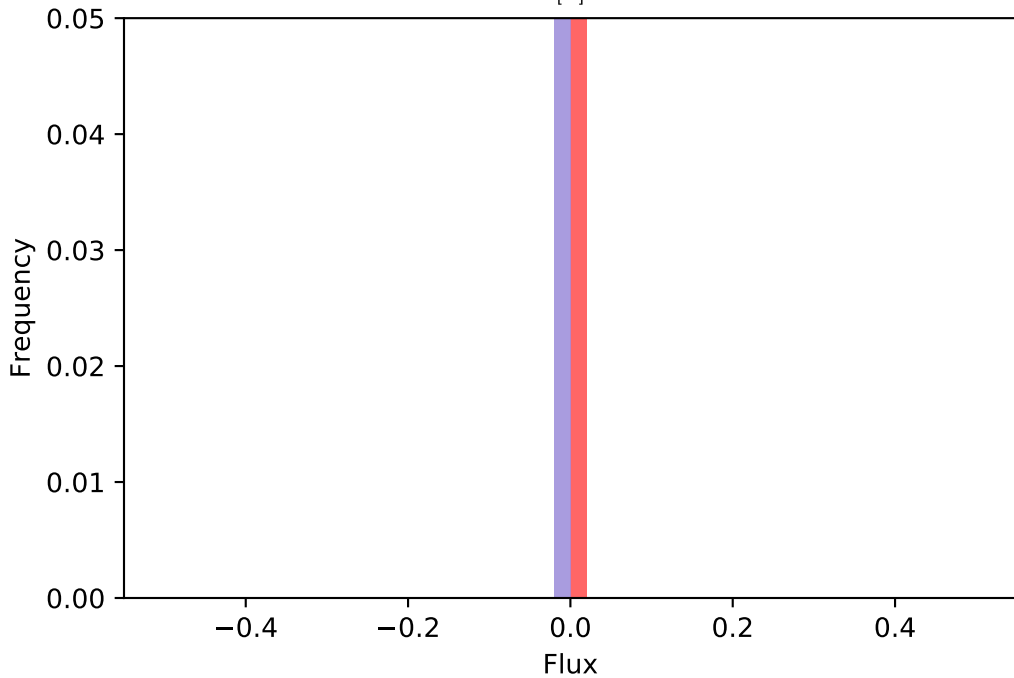




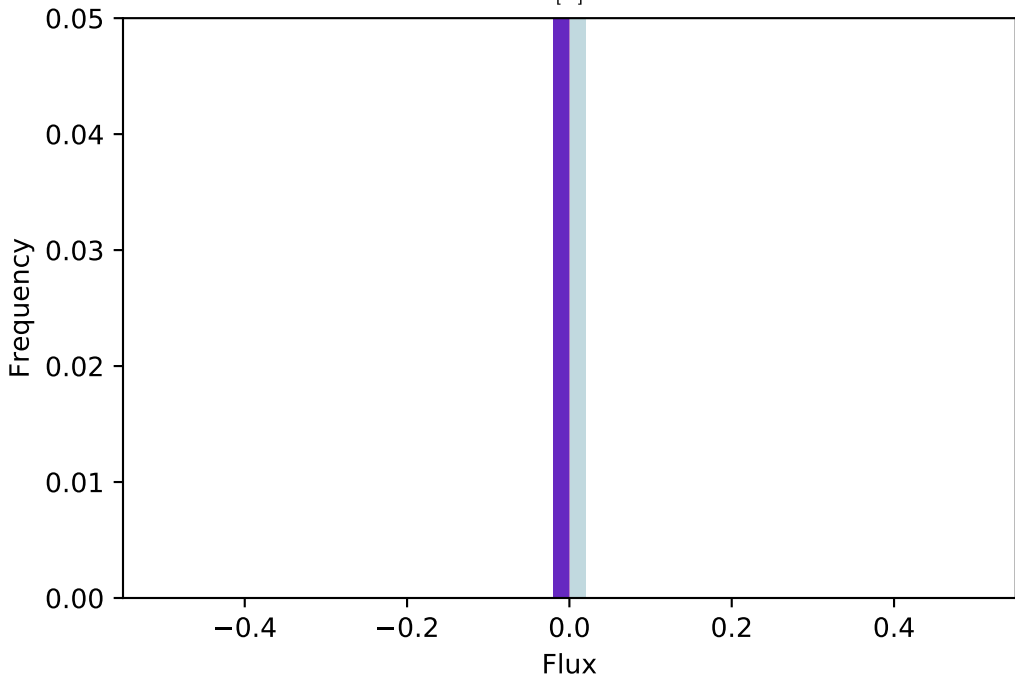
336 : Glc\_h --> Glc\_c  
[<sup>-1</sup>]



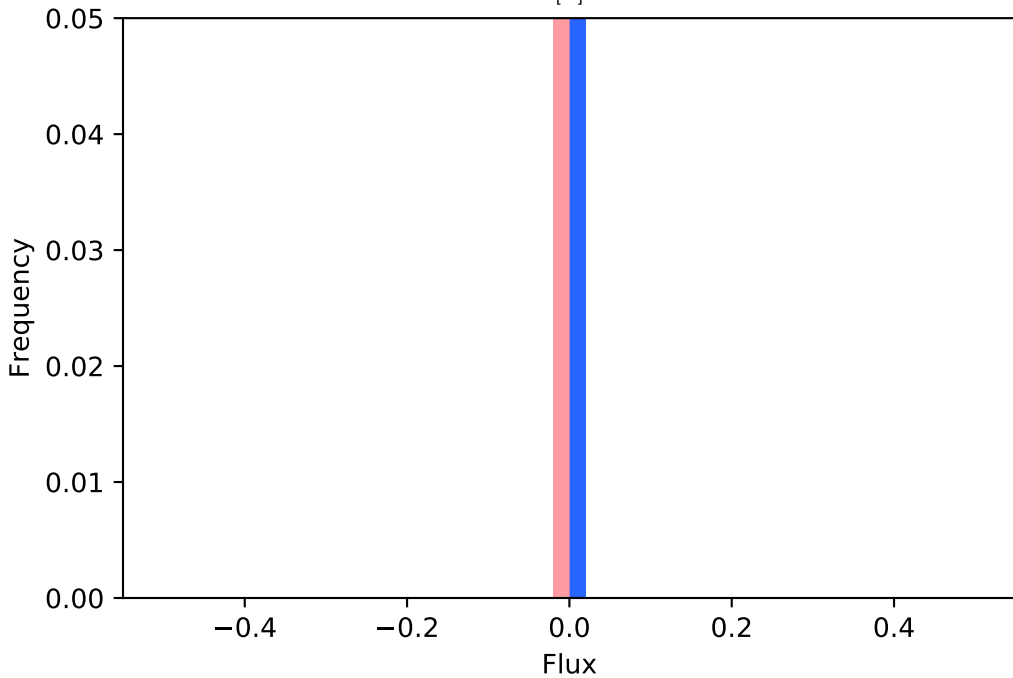
337 : Mas\_h --> Mas\_c  
['-']



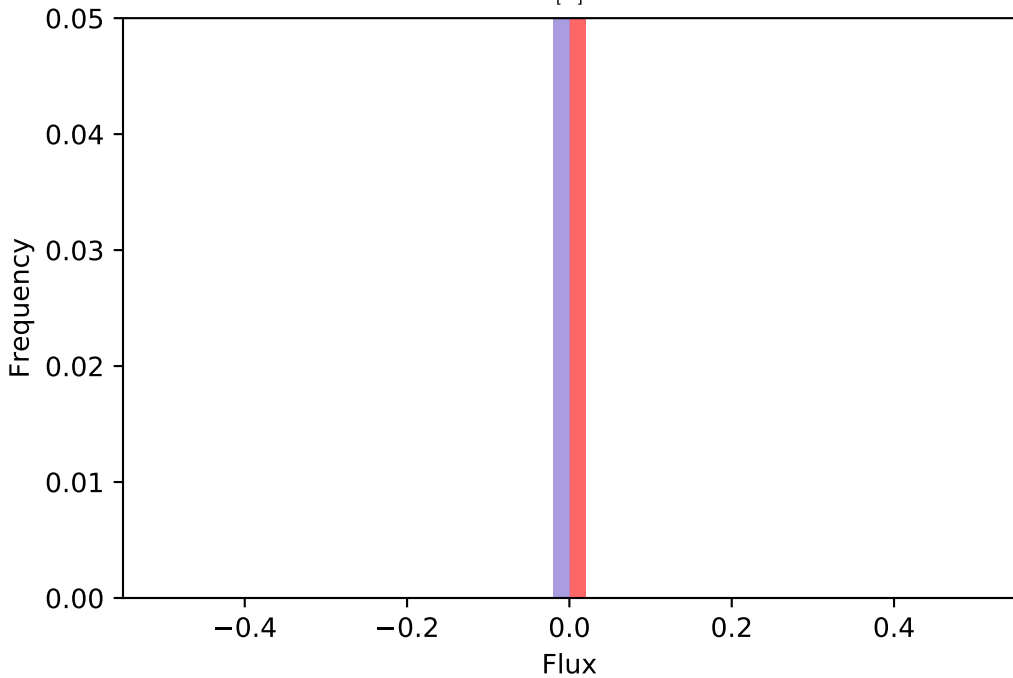
338 : Rib\_c --> Rib\_h  
[<sup>+</sup>-<sup>+</sup>]



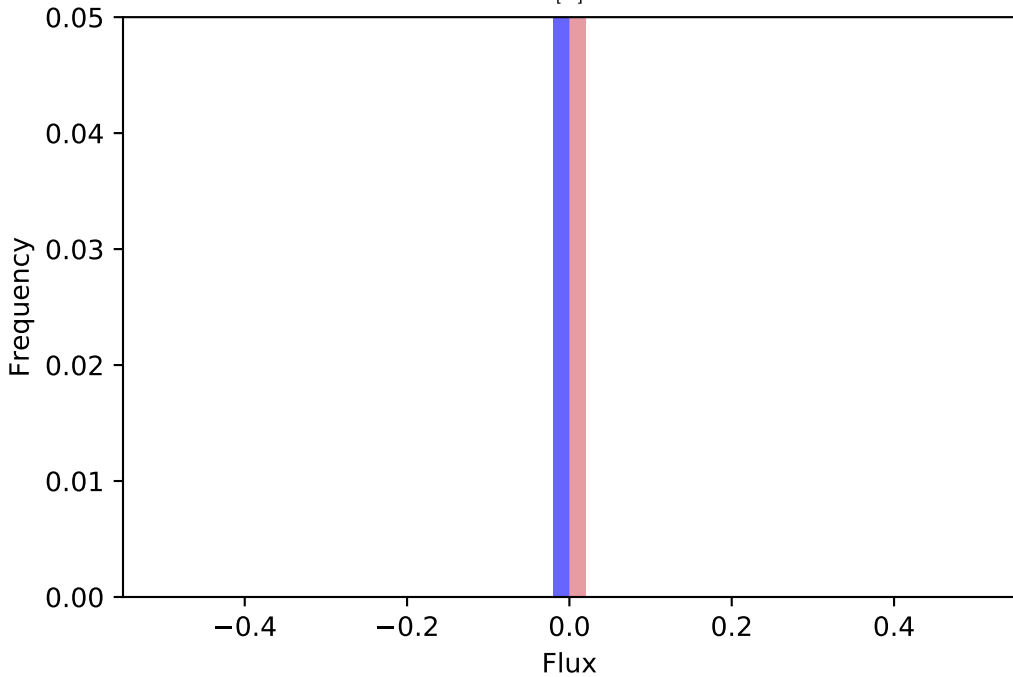
339 : Mal\_c + Pi\_m <=> Mal\_m + Pi\_c  
['-']



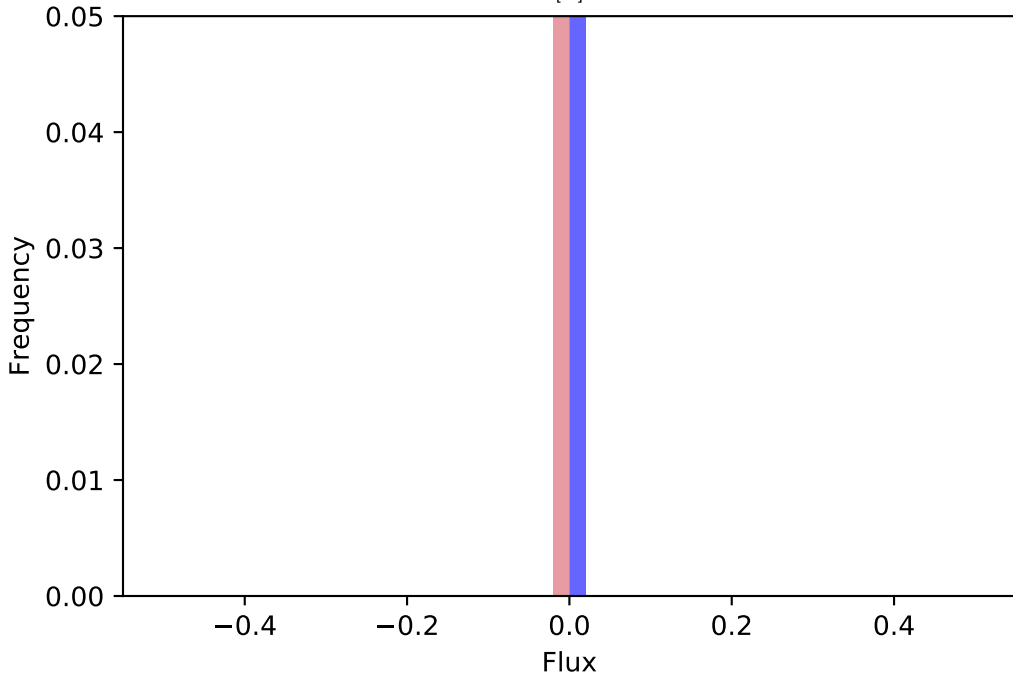
340 :  $\text{Pi}_m + \text{SCA}_c \leq \text{Pi}_c + \text{SCA}_m$   
['-']



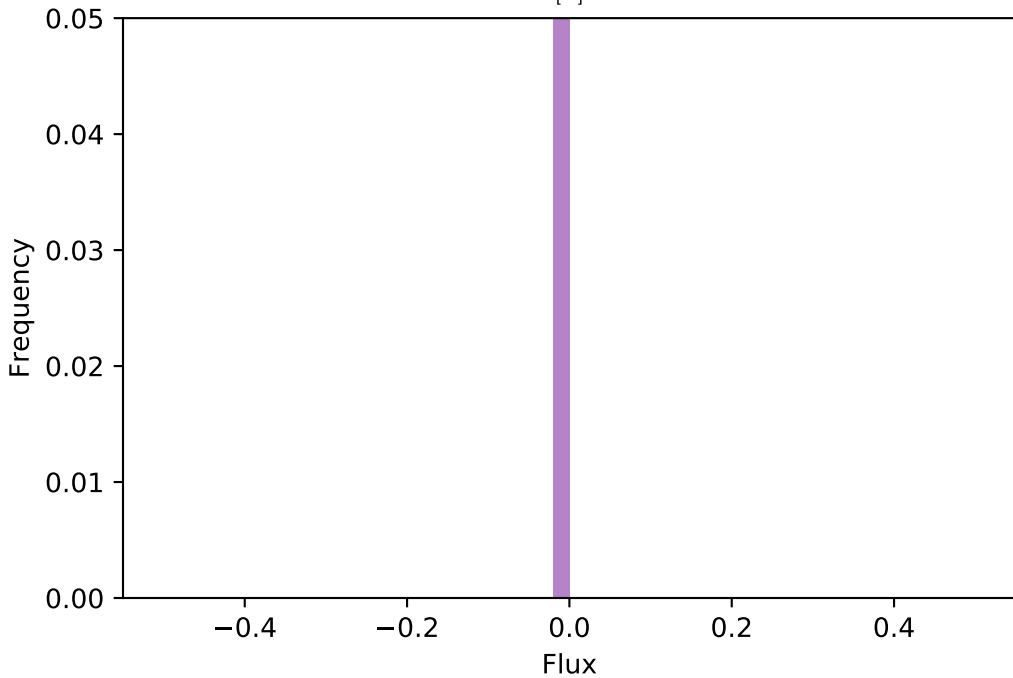
341 : KG\_c + Mal\_h --> KG\_h + Mal\_c  
['-']



342 : Glu\_h + Mal\_c --> Glu\_c + Mal\_h  
[<sup>-1</sup>]

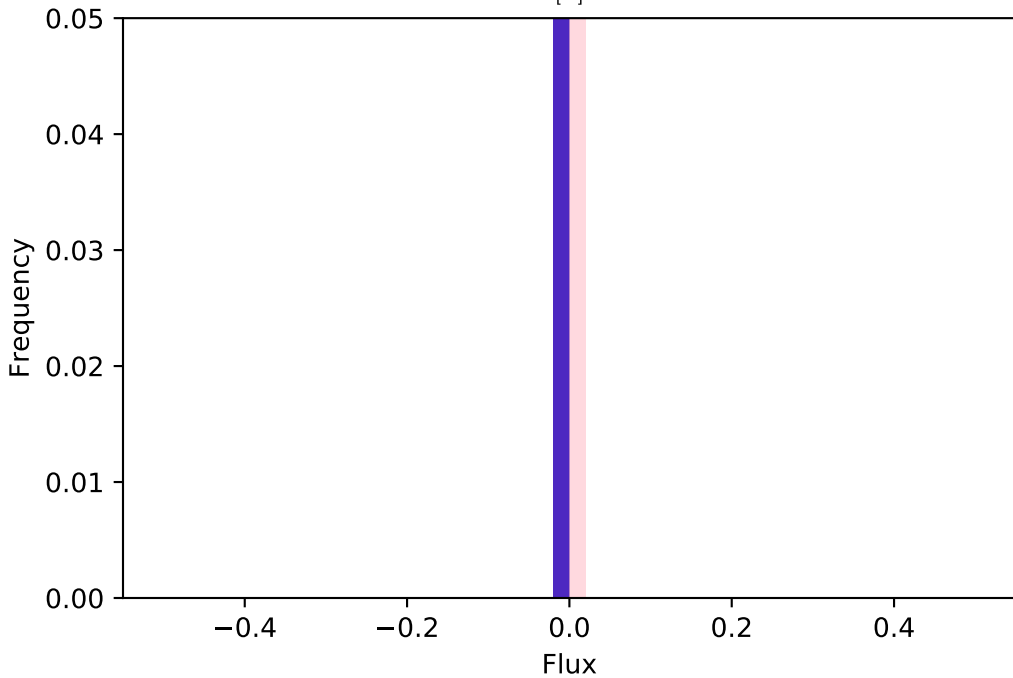


343 : Cit\_m + KG\_c --> Cit\_c + KG\_m  
[<sup>-1</sup>]

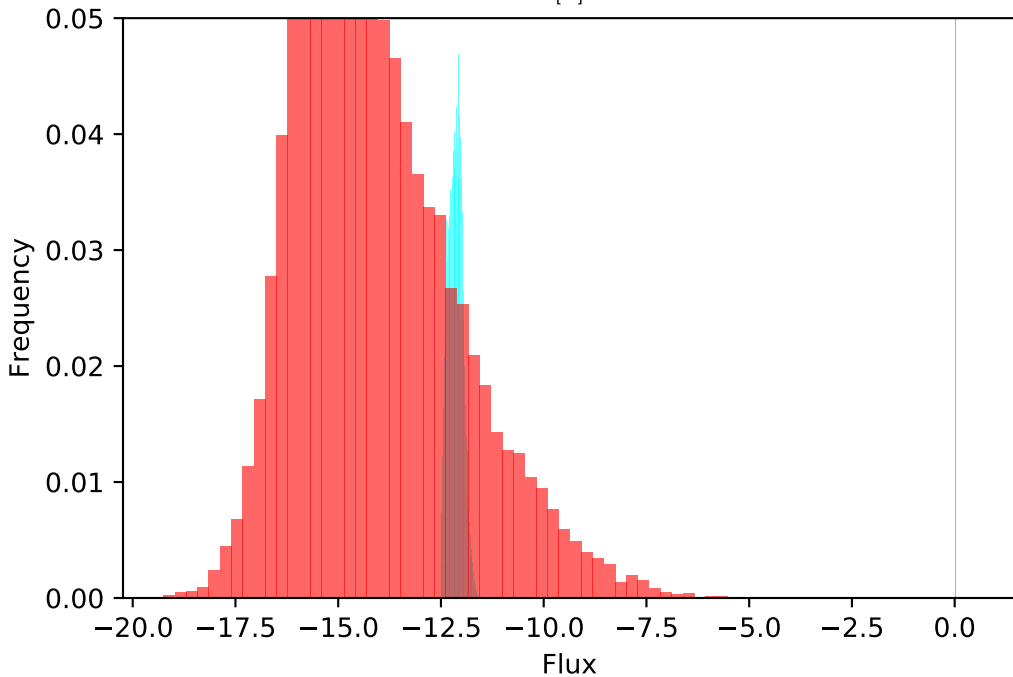




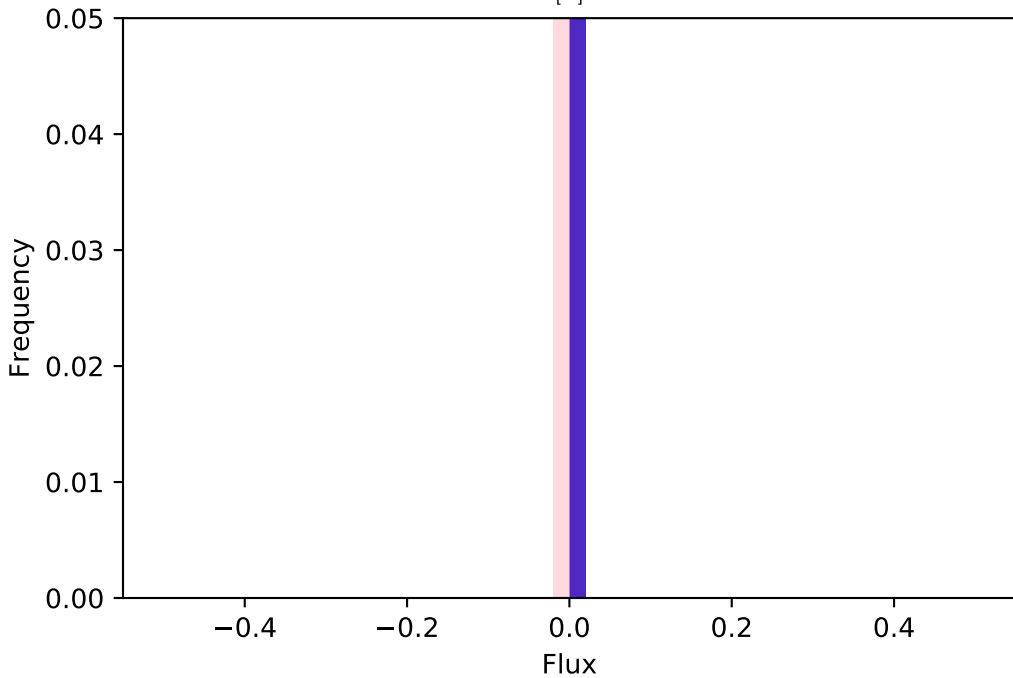
344 : KG\_c + iCit\_m --> KG\_m + iCit\_c  
['-']



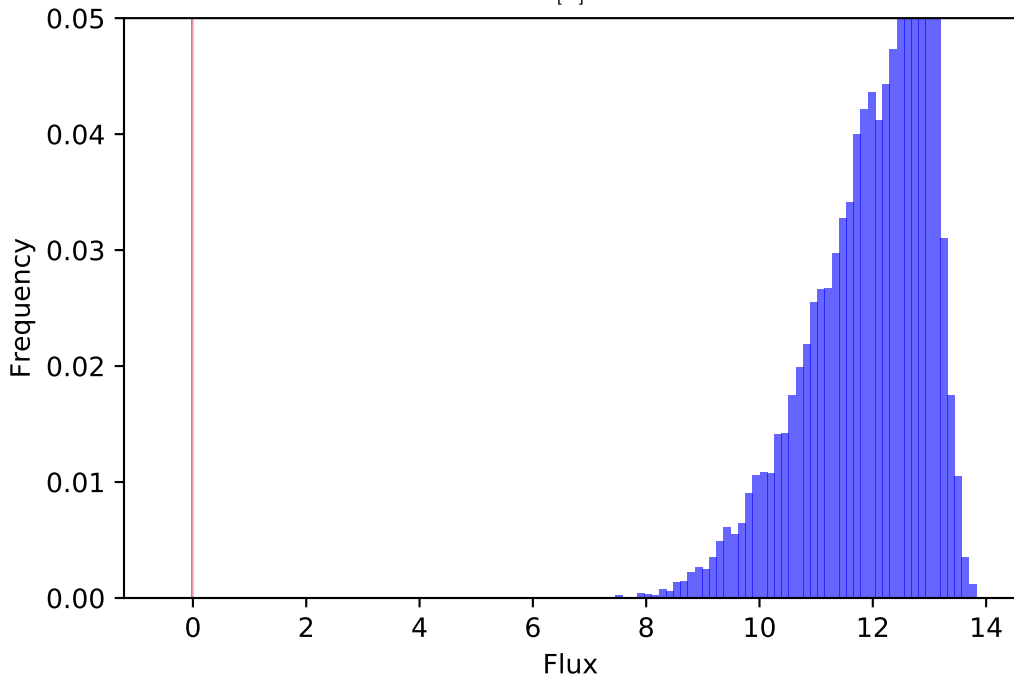
345 : KG\_c + cACN\_m <=> KG\_m + cACN\_c  
['-']



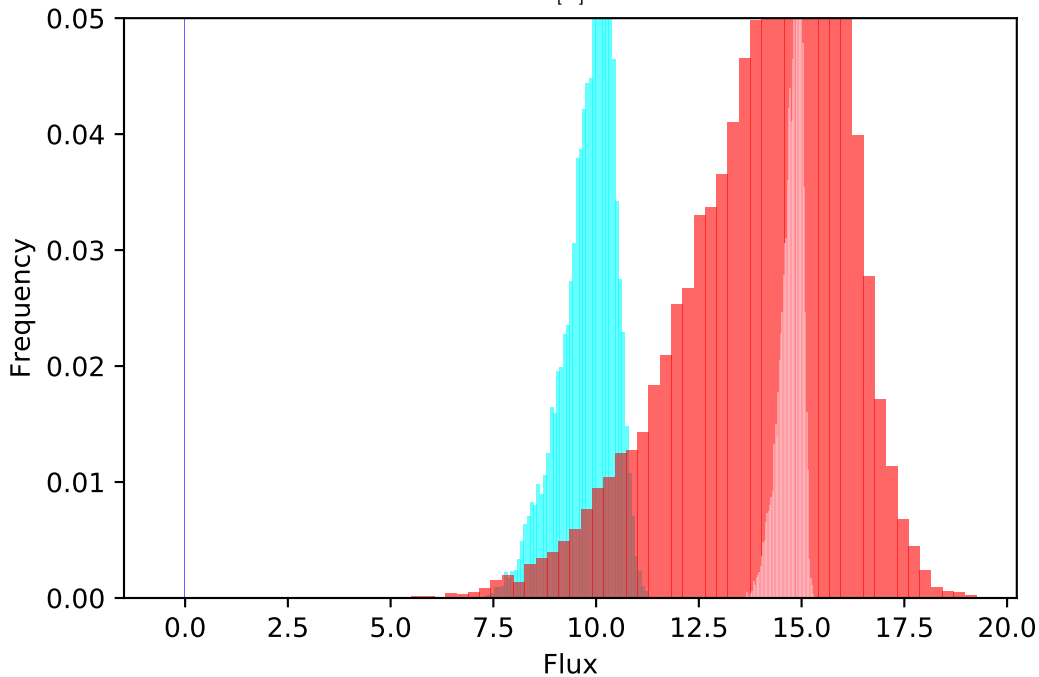
346 : Cit\_m + Mal\_c --> Cit\_c + Mal\_m  
[<sup>-1</sup>]



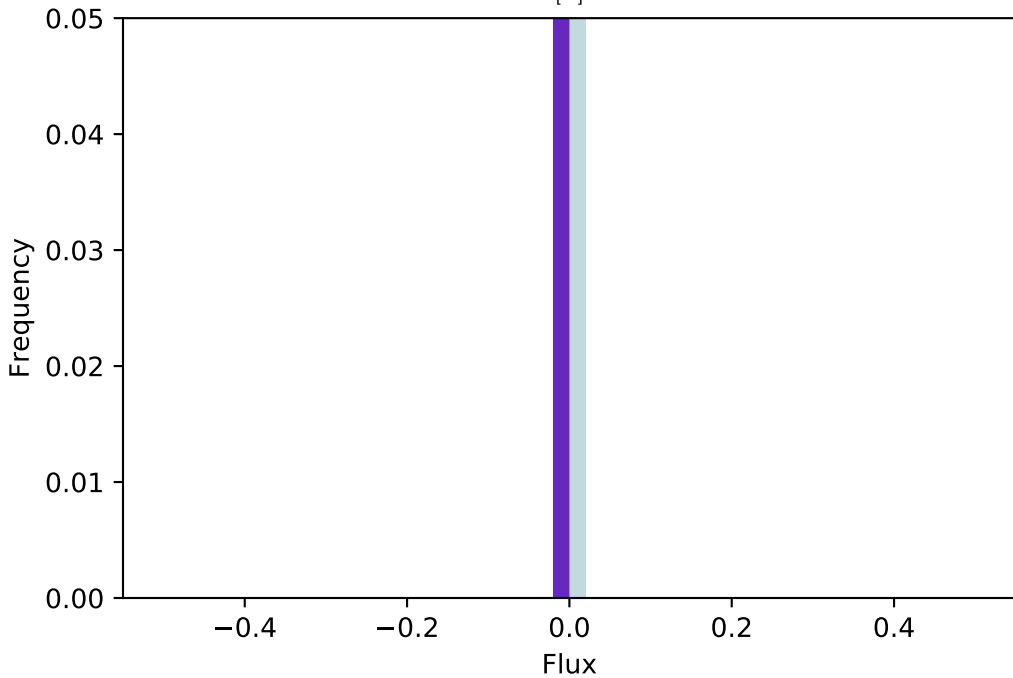
347 : Mal\_c + iCit\_m --> Mal\_m + iCit\_c  
['-']



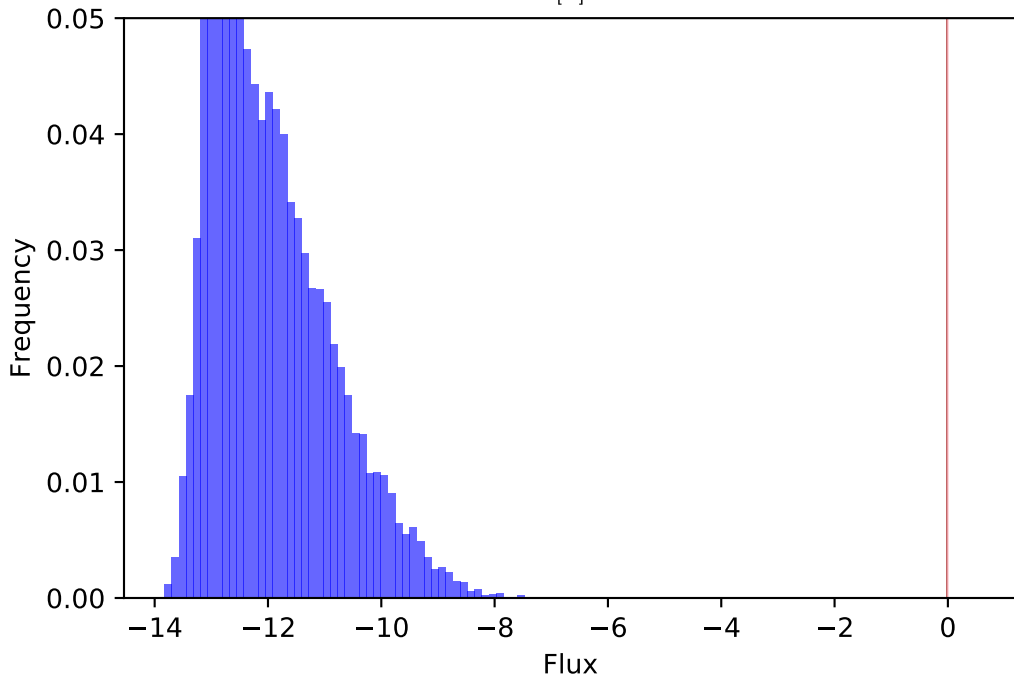
348 : Mal\_c + cACN\_m <=> Mal\_m + cACN\_c  
['-']



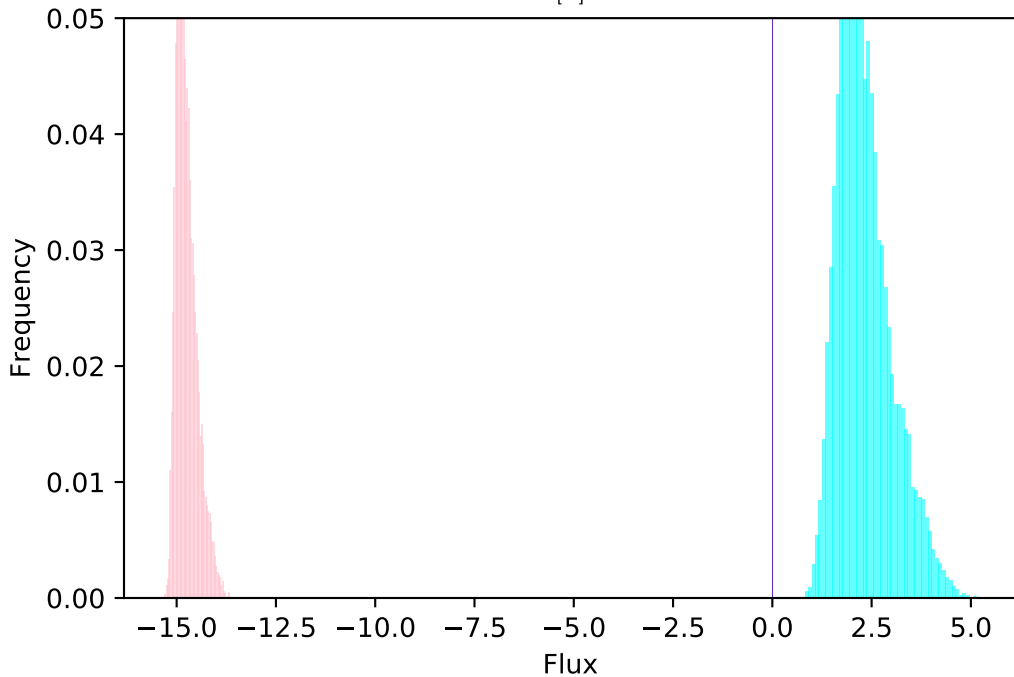
349 : Cit\_m + OAA\_c --> Cit\_c + OAA\_m  
[<sup>-1</sup>]



350 : OAA\_c + iCit\_m <=> OAA\_m + iCit\_c  
['-']

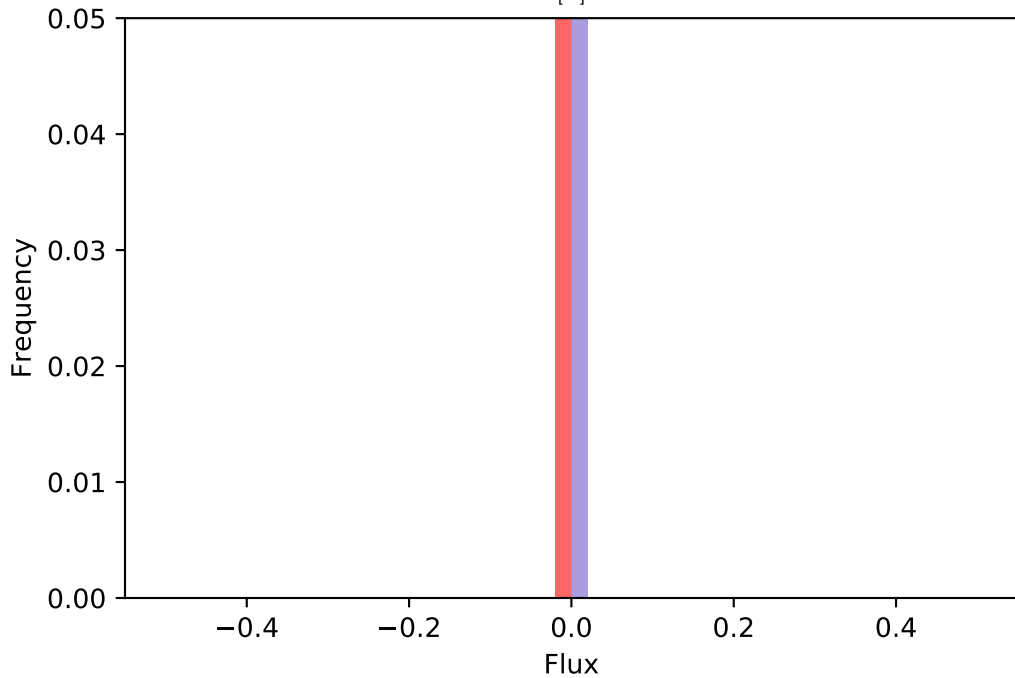


351 : OAA\_c + cACN\_m --> OAA\_m + cACN\_c  
['-']

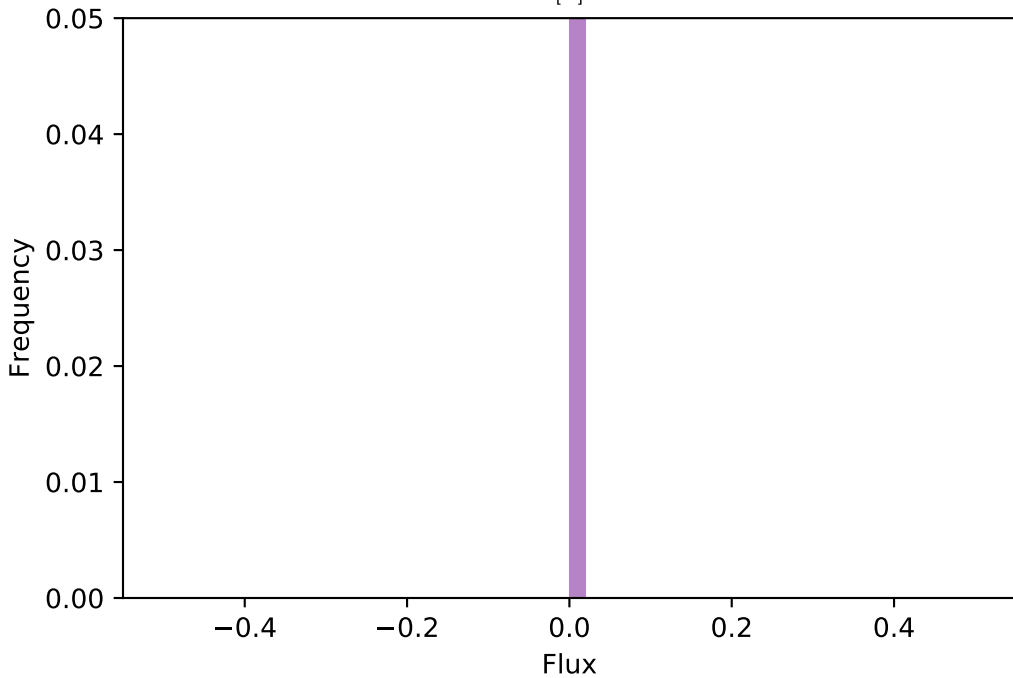




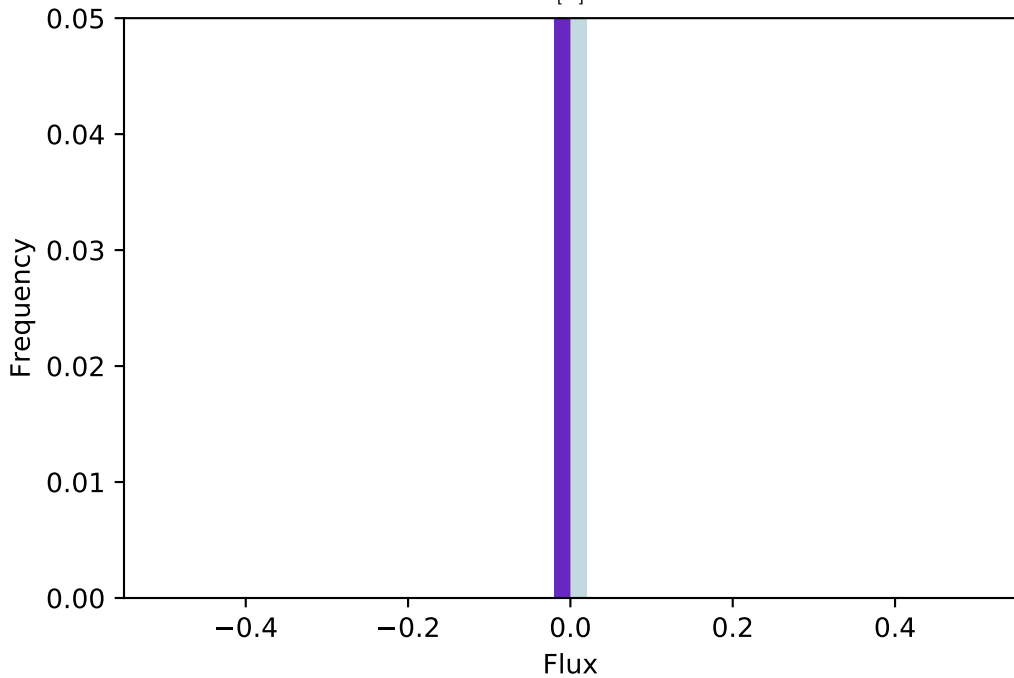
352 : Cit\_m + SCA\_c --> Cit\_c + SCA\_m  
[<sup>-1</sup>]



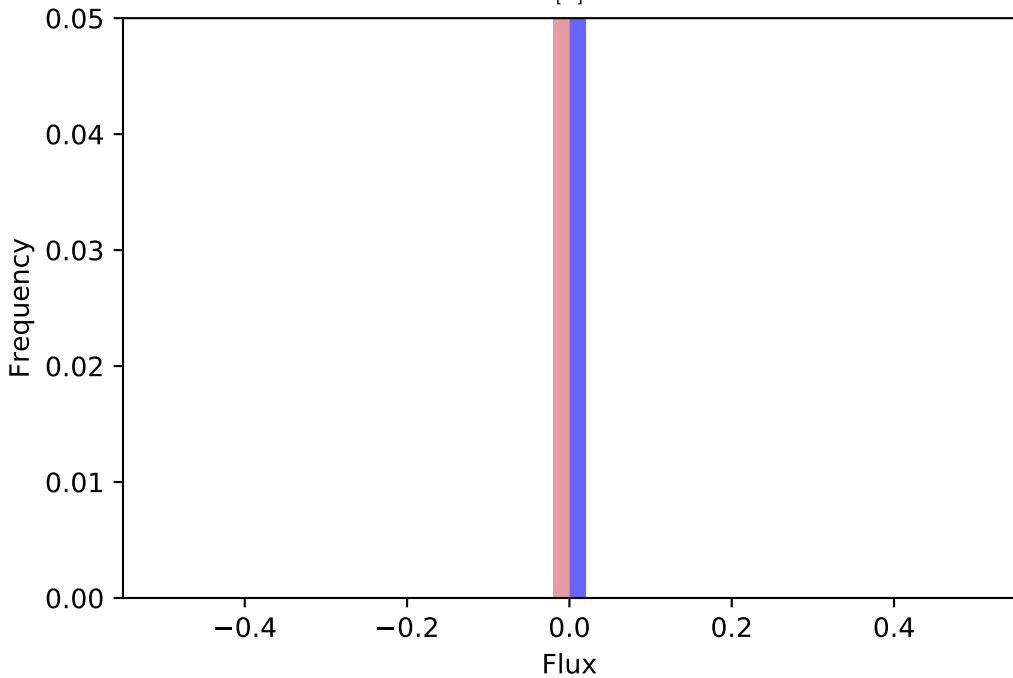
353 : SCA\_c + iCit\_m --> SCA\_m + iCit\_c  
['-']



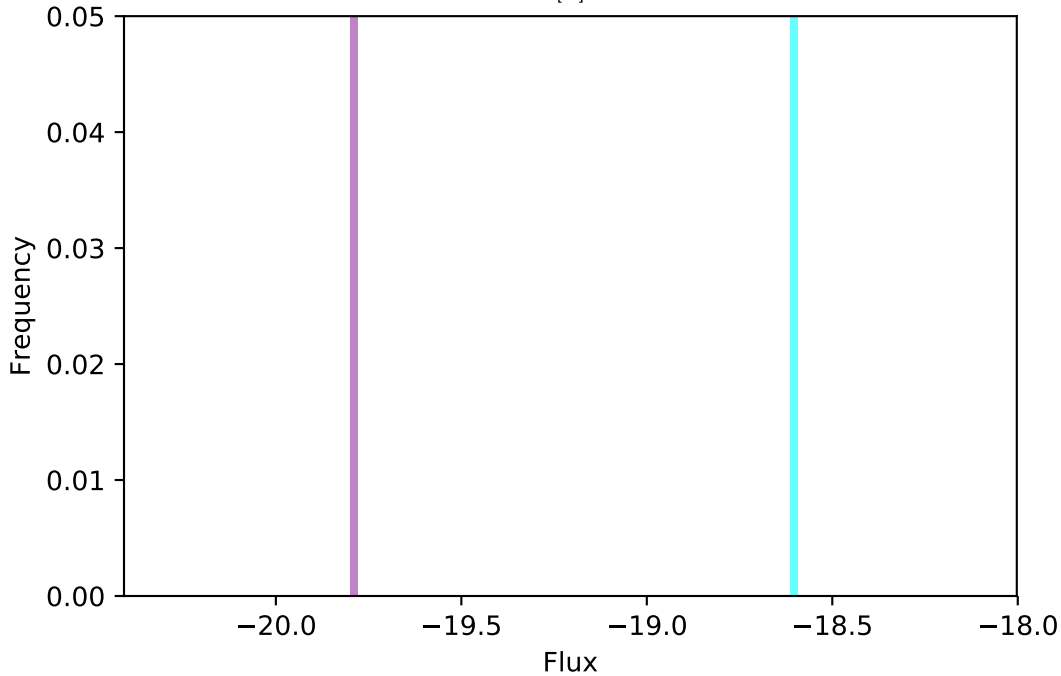
354 : SCA\_c + cACN\_m --> SCA\_m + cACN\_c  
['-']



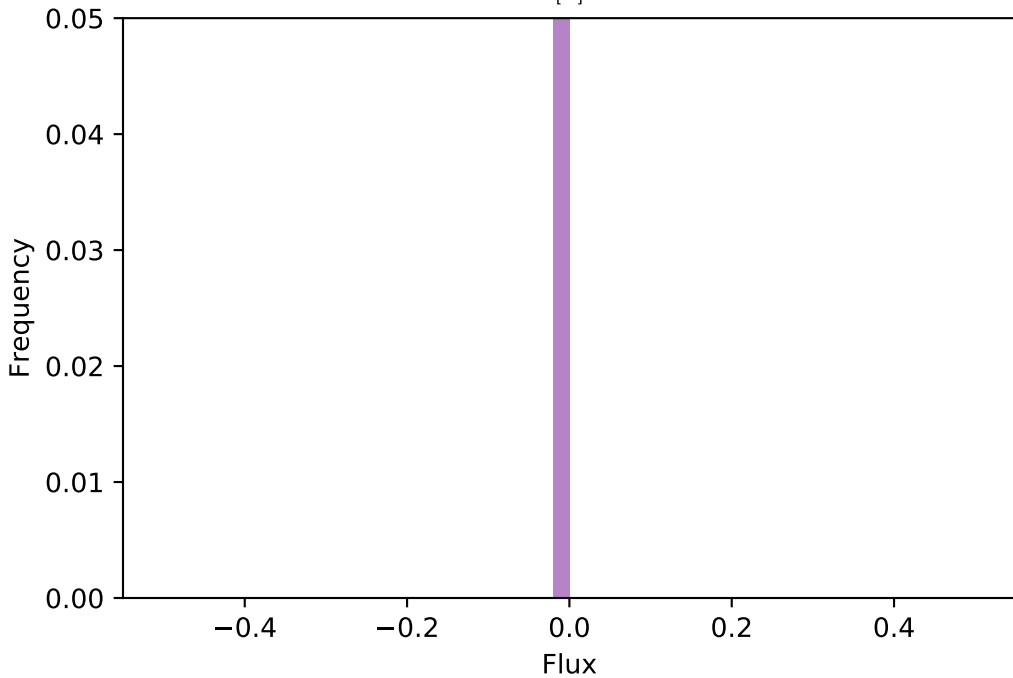
355 : Fum\_m + SCA\_c --> Fum\_c + SCA\_m  
[<sup>1</sup>-<sup>1</sup>]



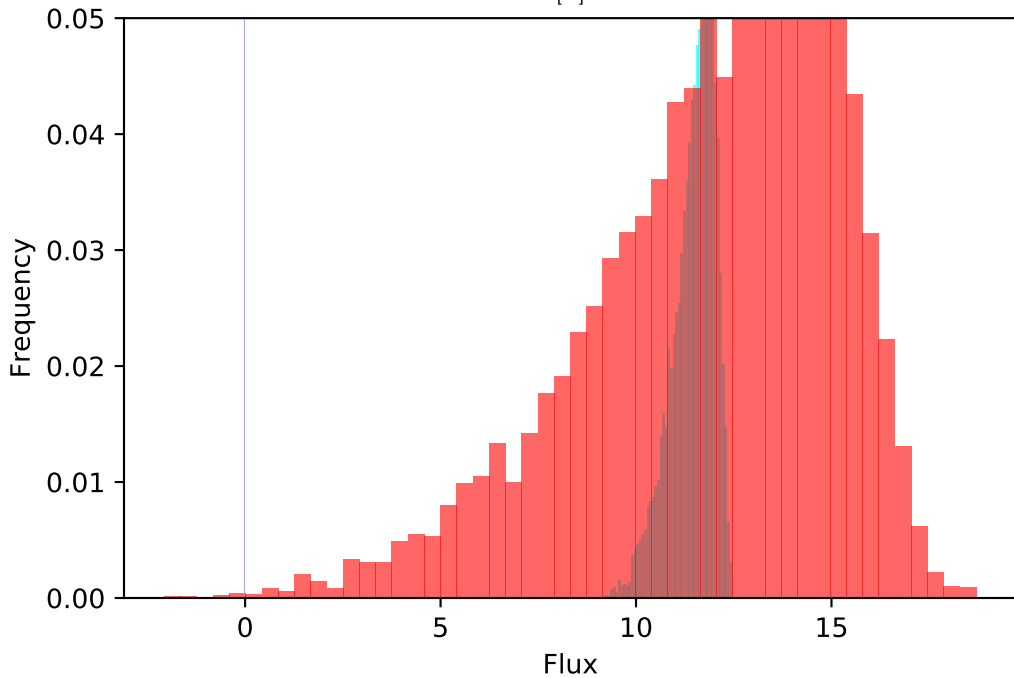
356 : Ala\_c <=> Ala\_m  
['-']



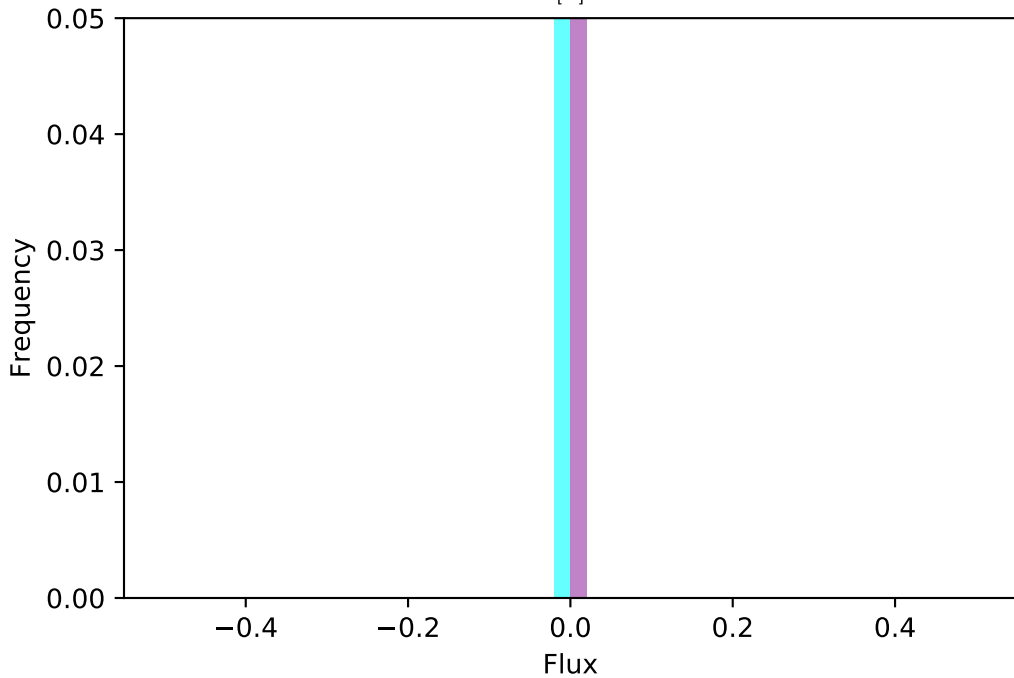
357 : Arg\_c <=> Arg\_m  
['-']



358 : Glu\_c <=> Glu\_m  
['-']

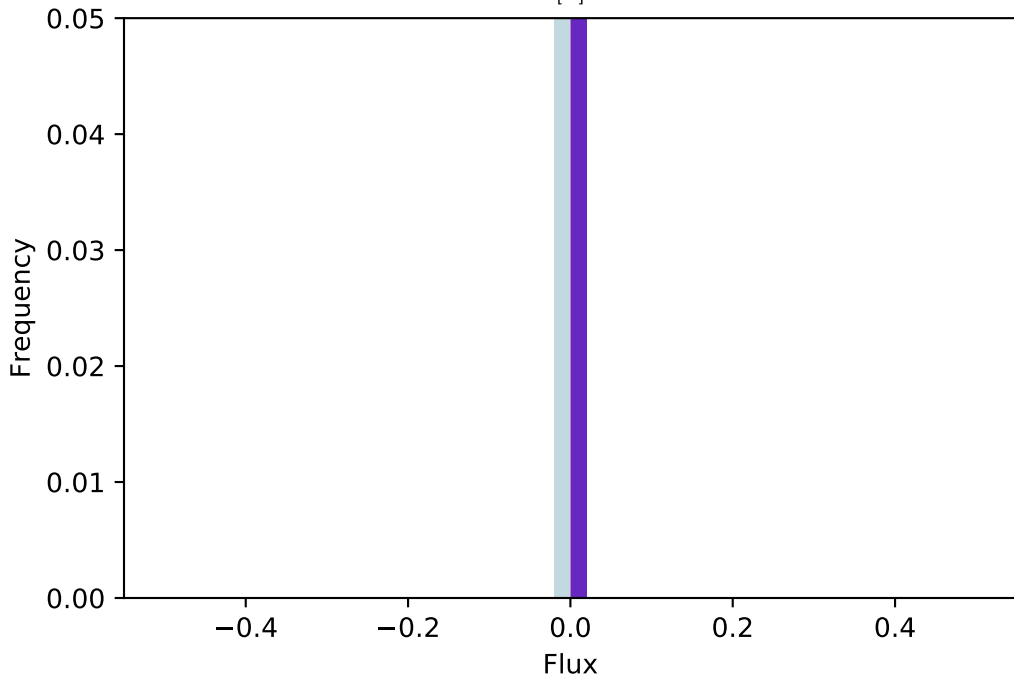


359 : Lys\_c --> Lys\_m  
['-']

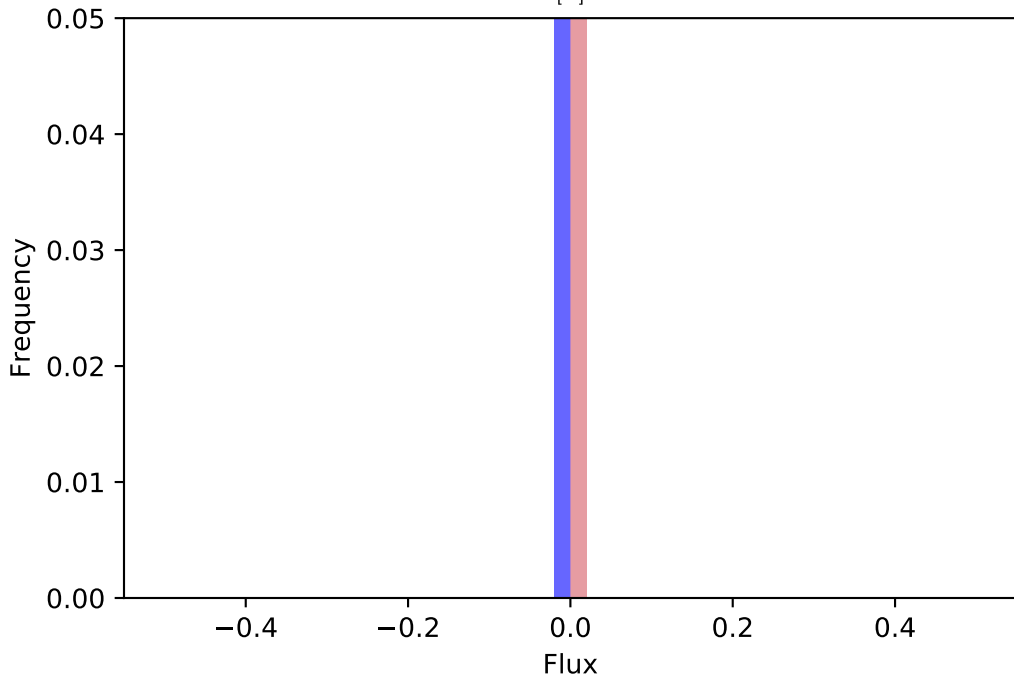




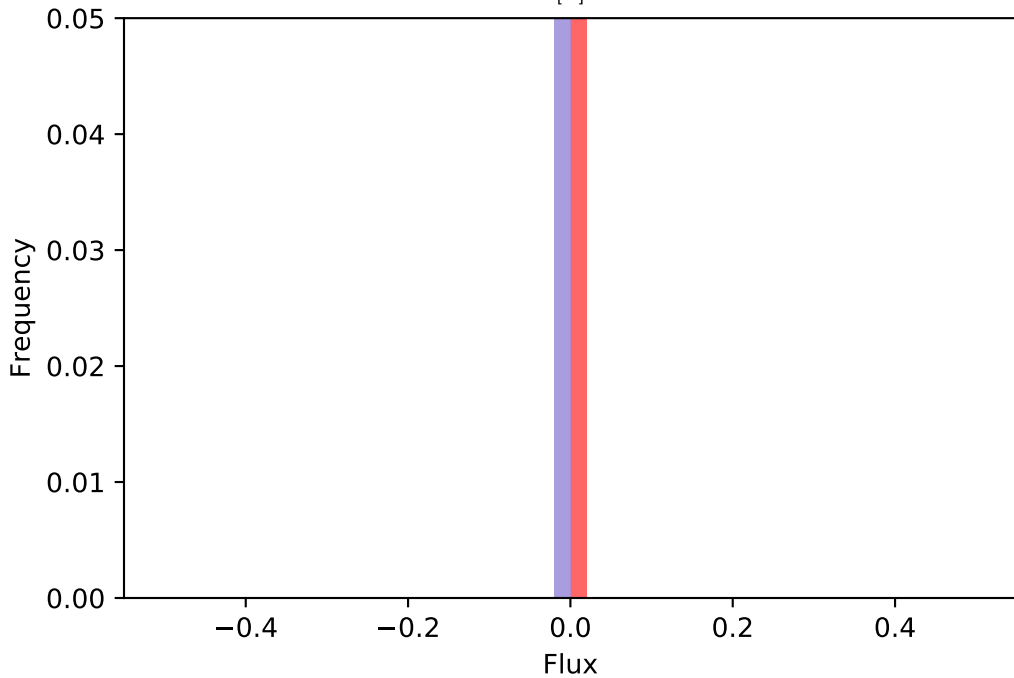
360 : GABA\_c <=> GABA\_m  
['-']



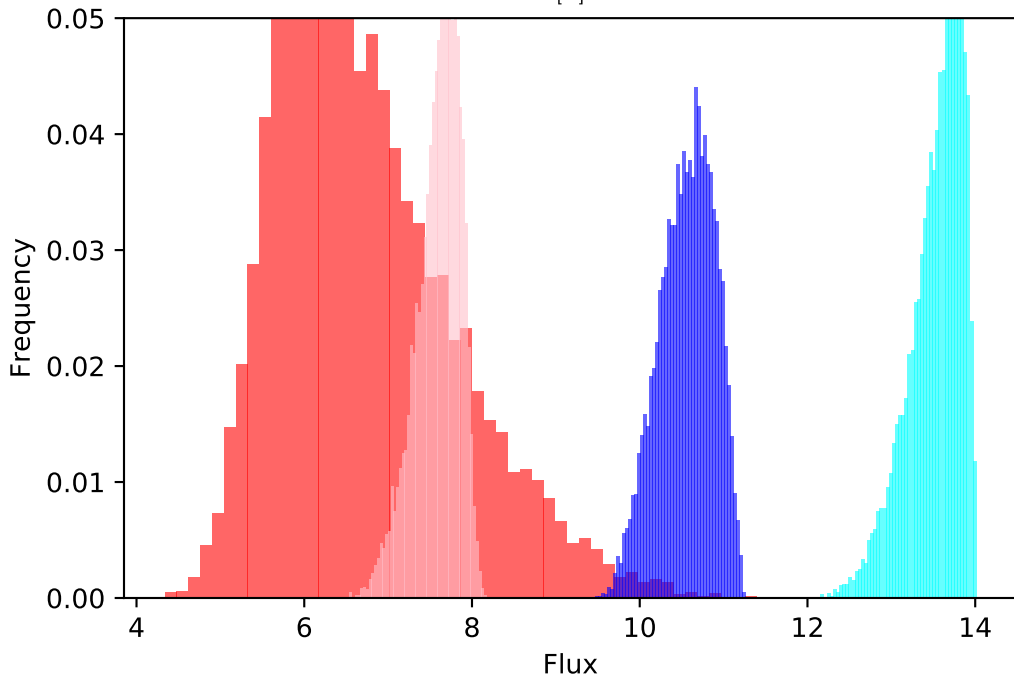
361 : Arg\_c + His\_m --> Arg\_m + His\_c  
['-']



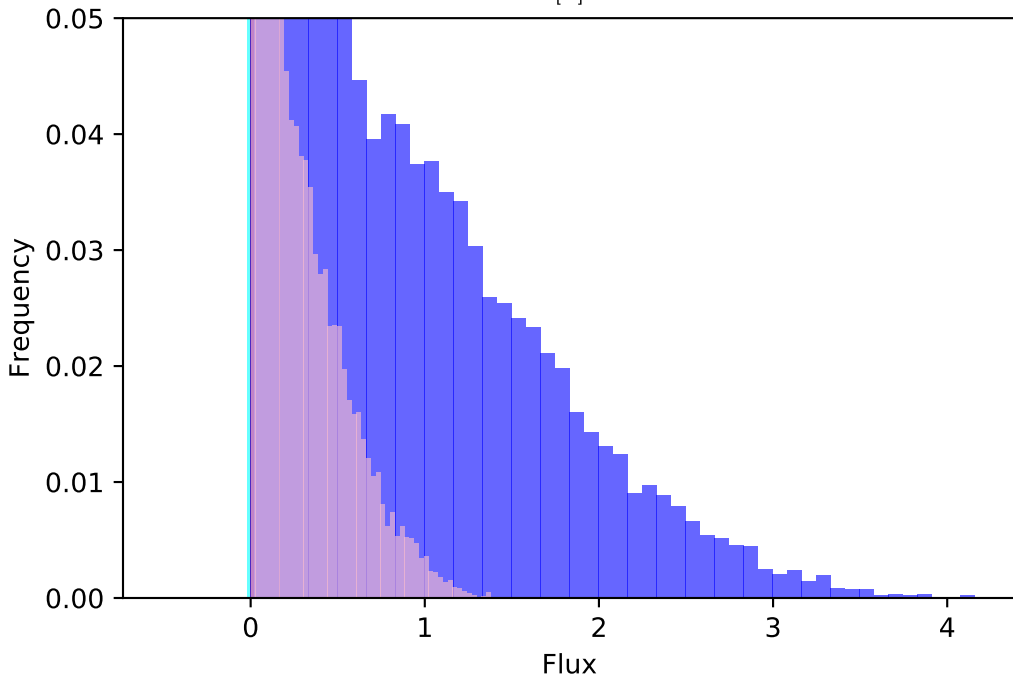
362 : Arg\_c + Lys\_m --> Arg\_m + Lys\_c  
['-']



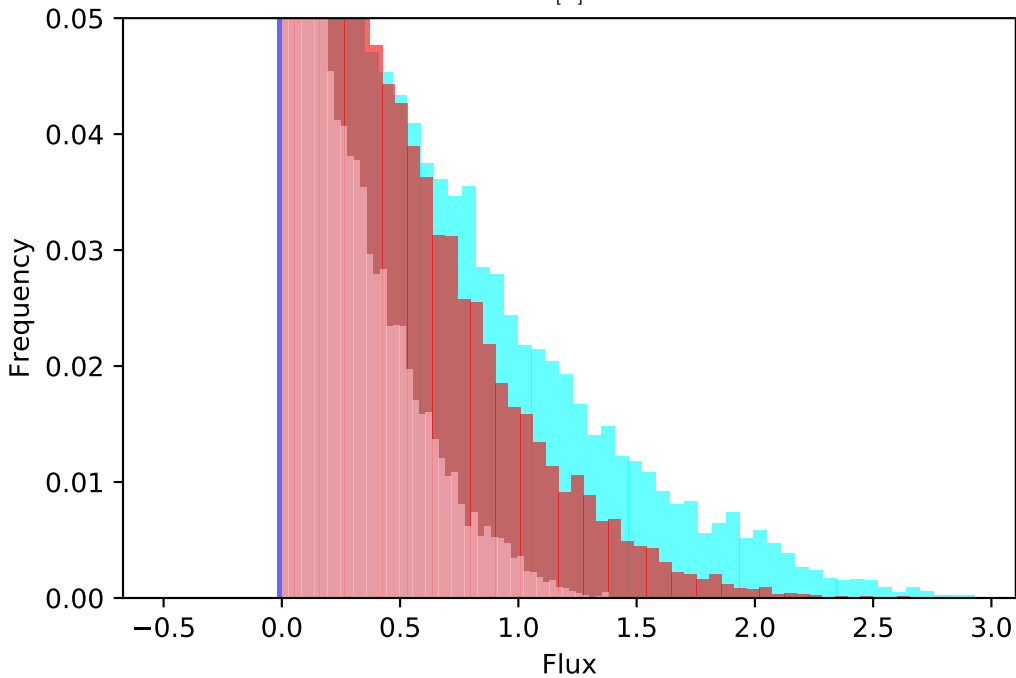
363 : Pro\_c --> Pro\_m  
['-']



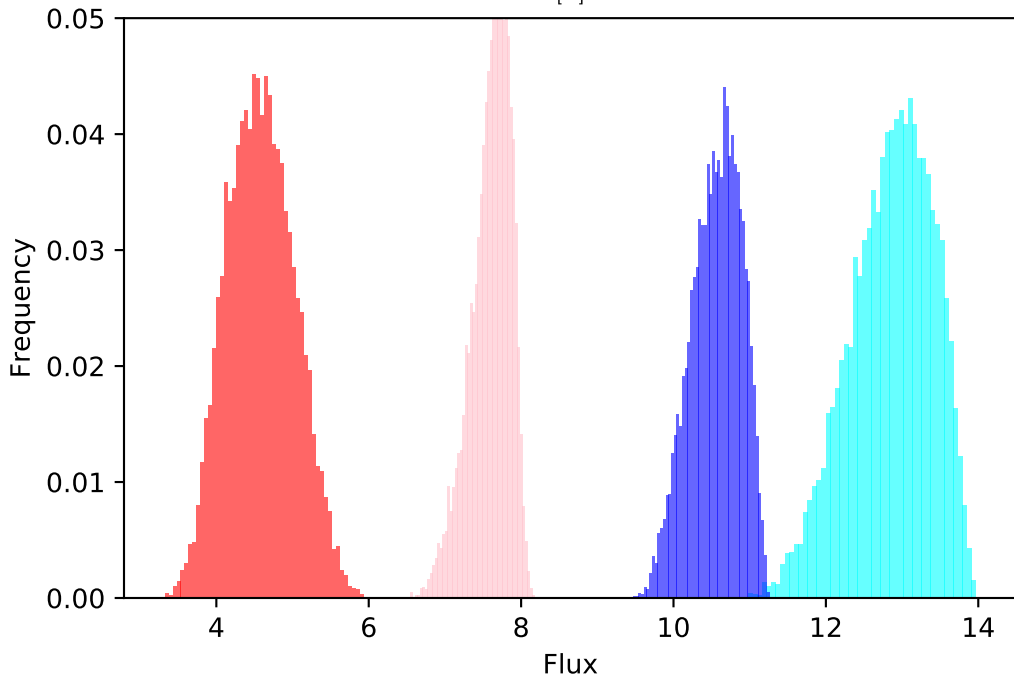
364 : Glu\_m + Pro\_c --> Glu\_c + Pro\_m  
[<sup>-1</sup>]



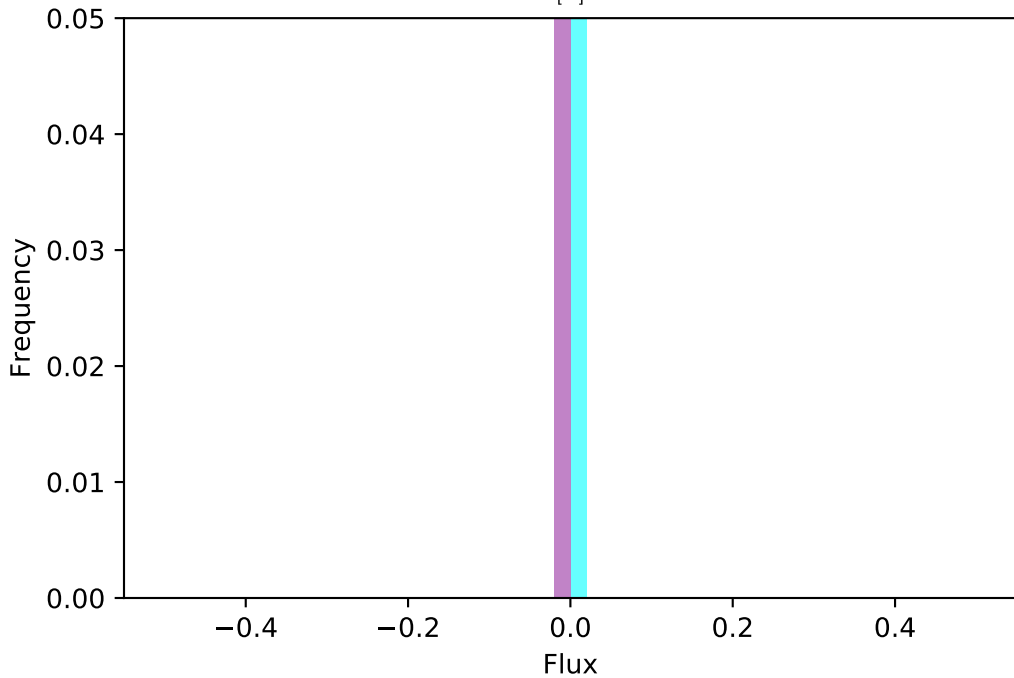
365 : P5C\_h --> P5C\_c  
[<sup>-1</sup>]



366 : P5C\_m --> P5C\_c  
['-']

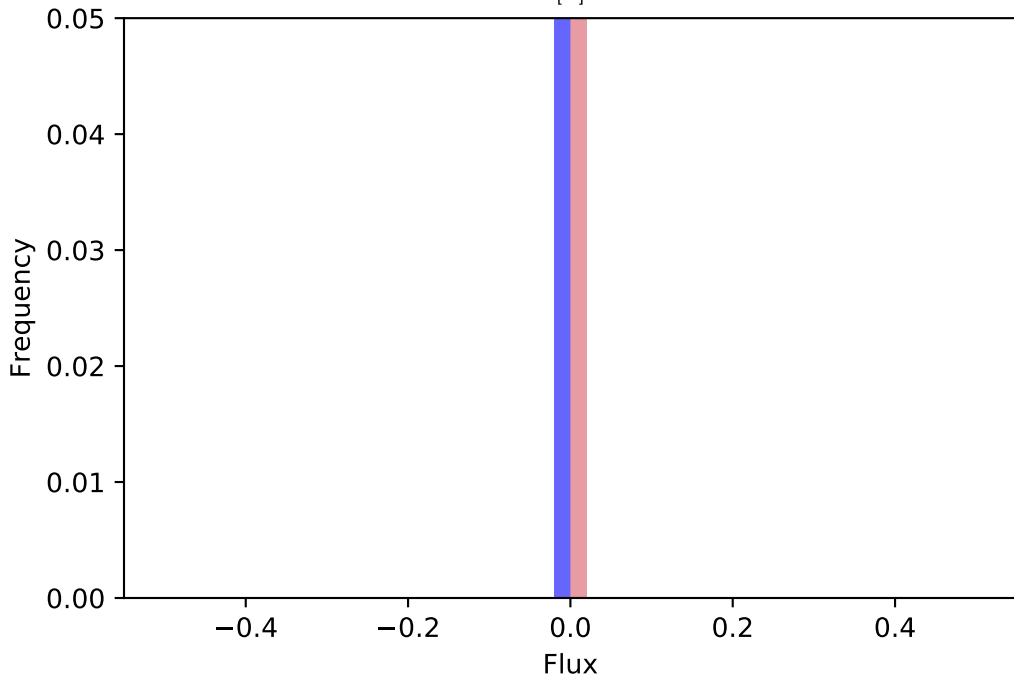


367 : H\_h + PRPP\_h --> PRPP\_c  
['-']

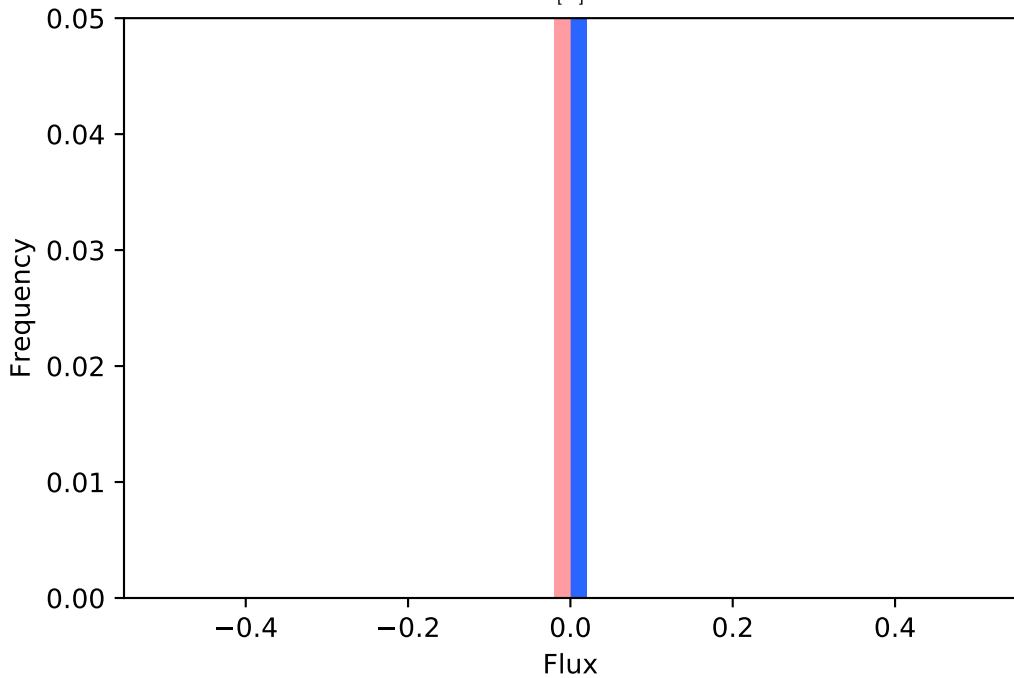




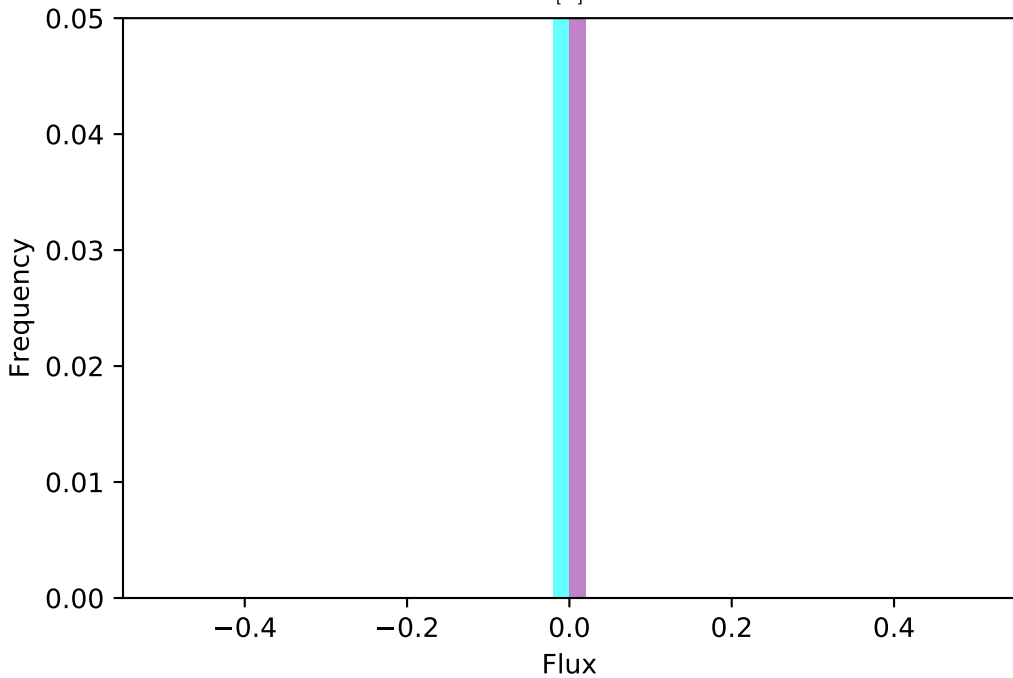
368 : Fum\_h --> Fum\_c  
[<sup>+</sup>-<sup>+</sup>]



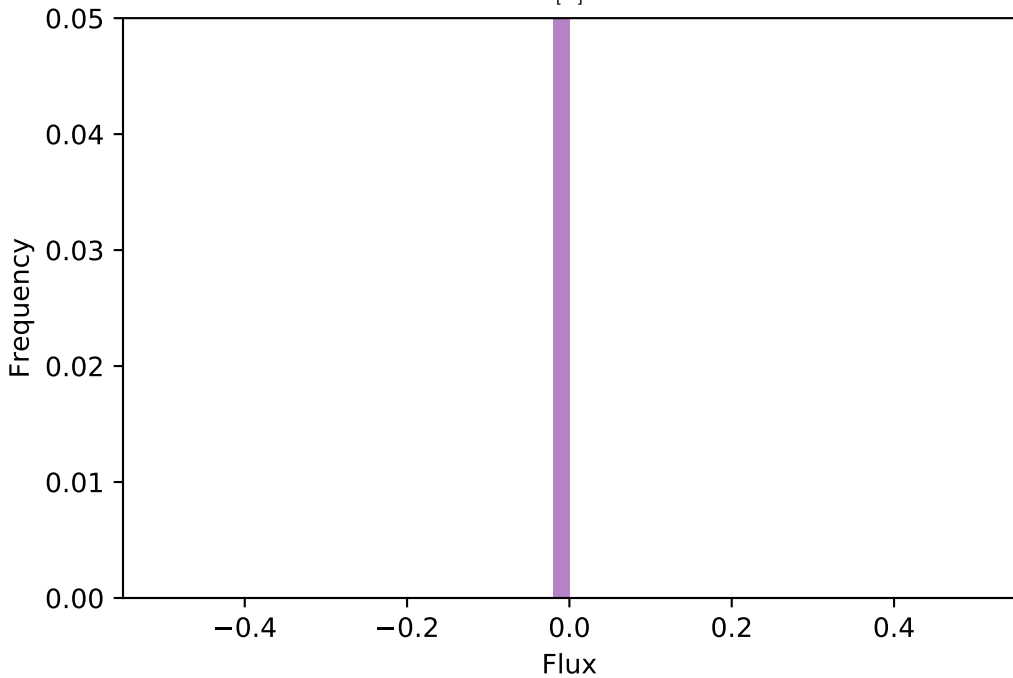
369 : H\_DASH\_Cys\_h --> H\_DASH\_Cys\_c  
['-']



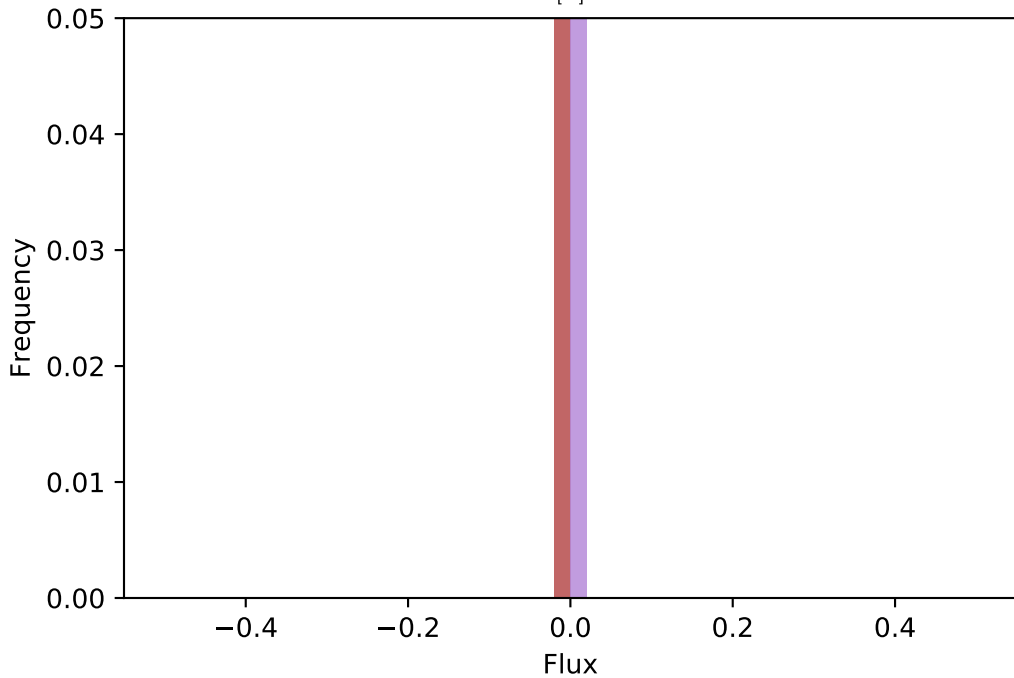
370 : orO\_m --> orO\_c  
['-']



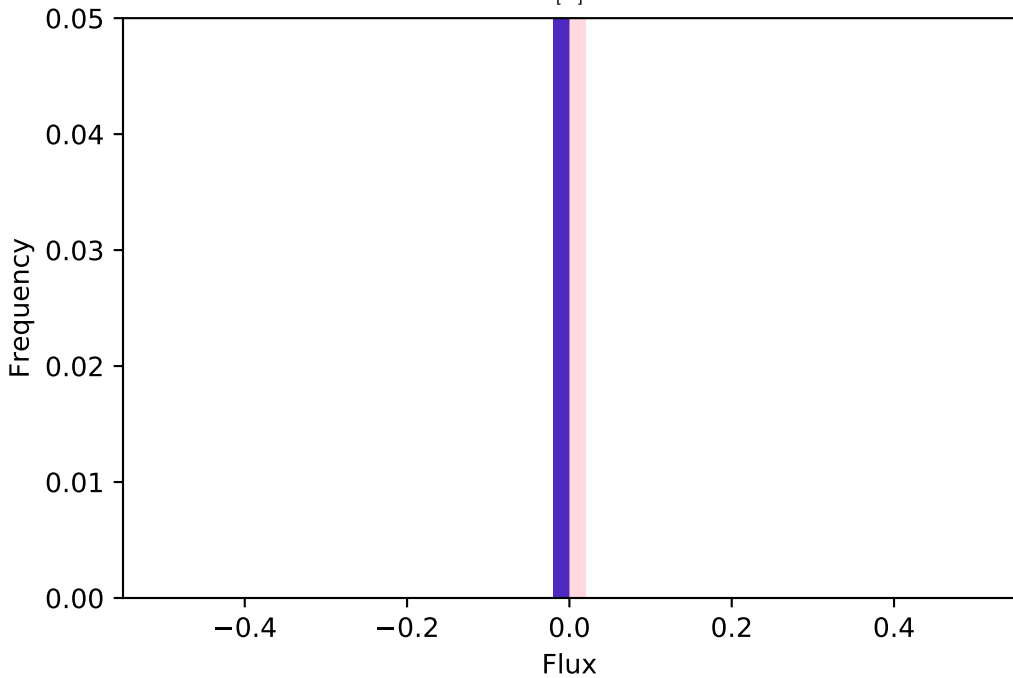
371 : DHO\_h --> DHO\_c  
[<sup>+</sup>-<sup>+</sup>]



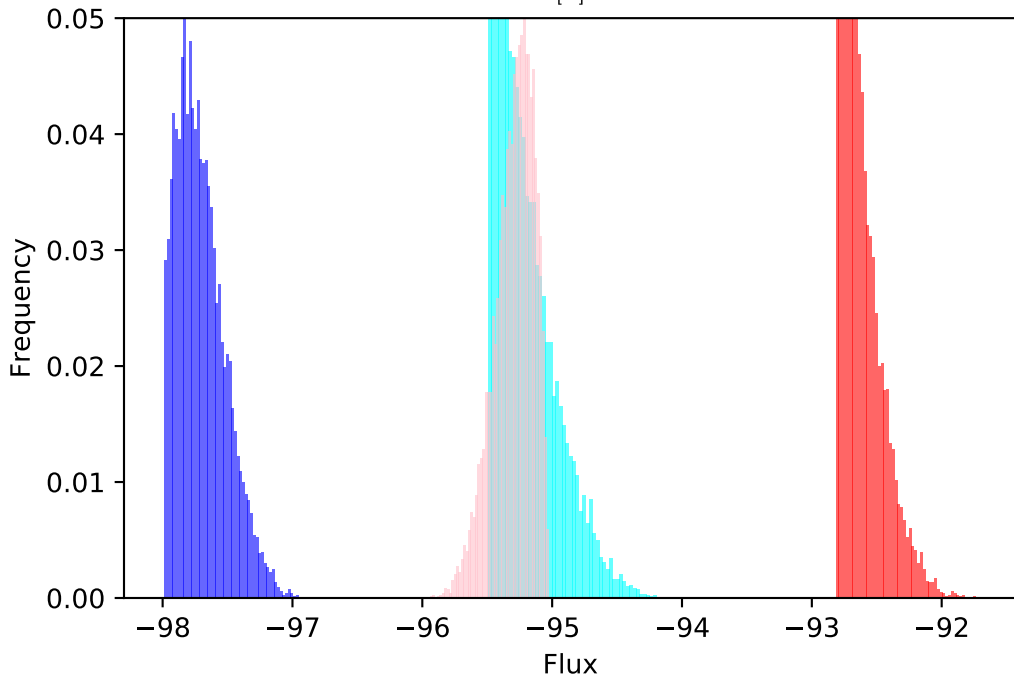
372 : DHO\_c --> DHO\_m  
['-']



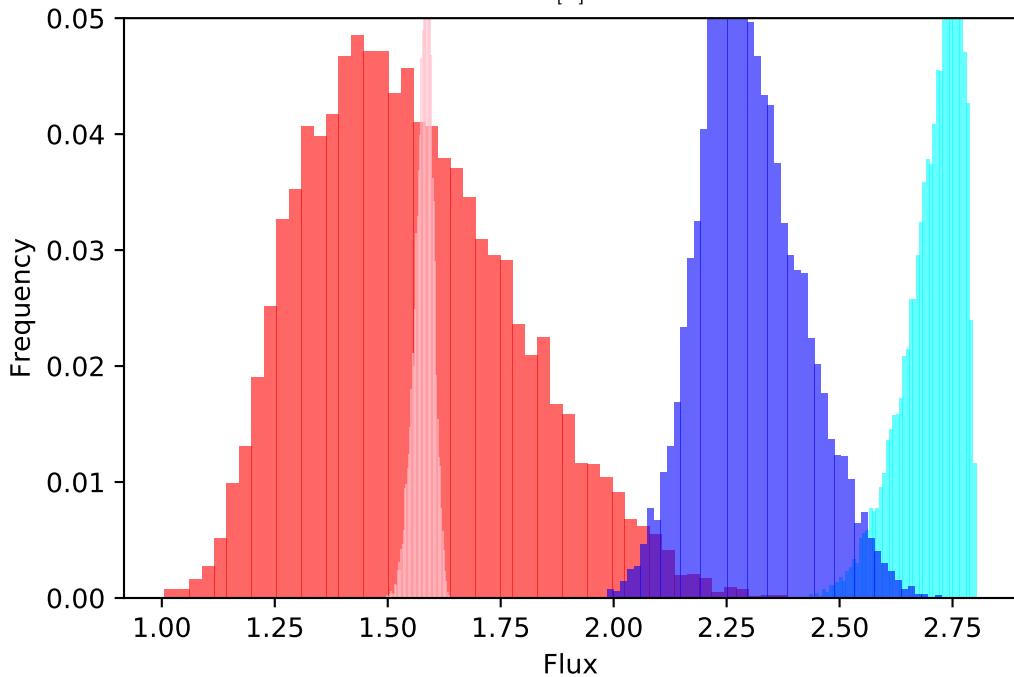
373 : Gly\_c + Ser\_m --> Gly\_m + Ser\_c  
['-']



374 : O2\_c <=> O2\_h  
['-']

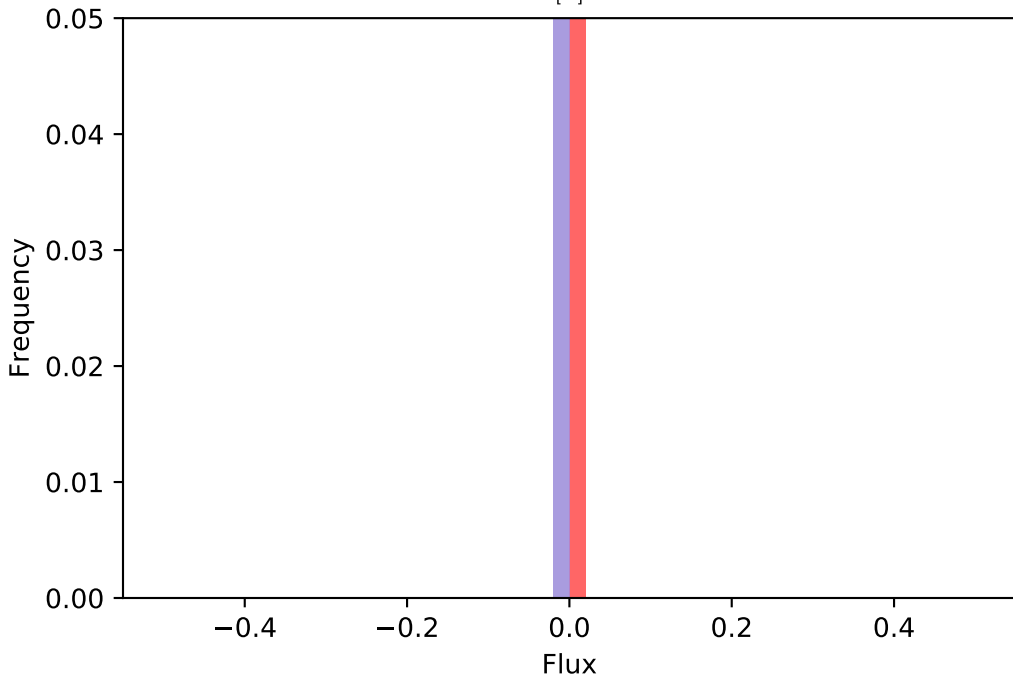


375 : O2\_c <=> O2\_m  
['-']

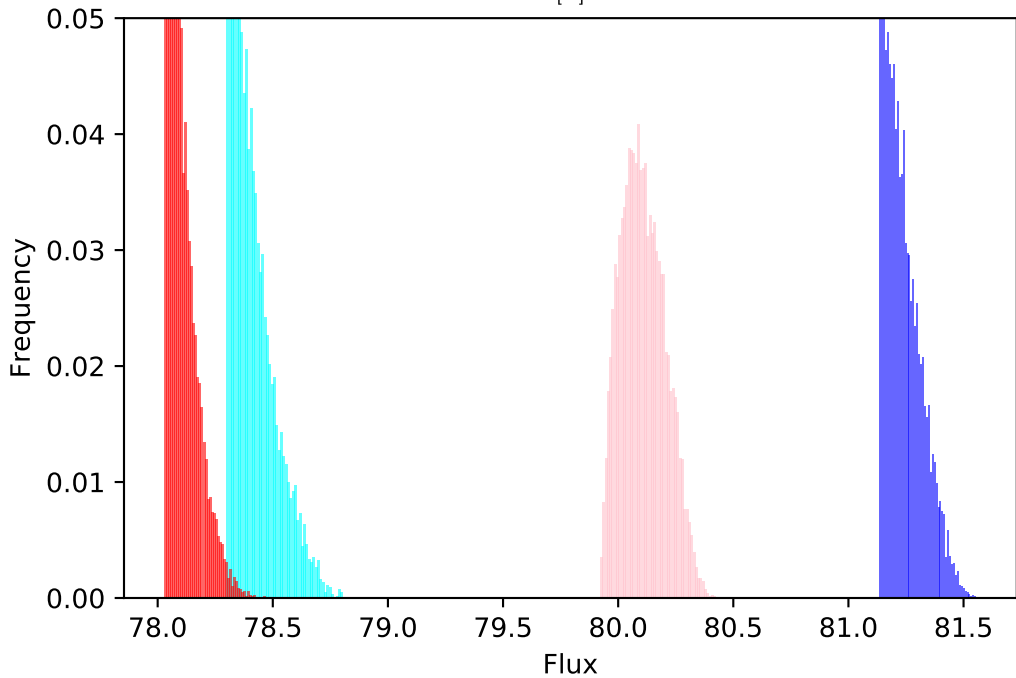




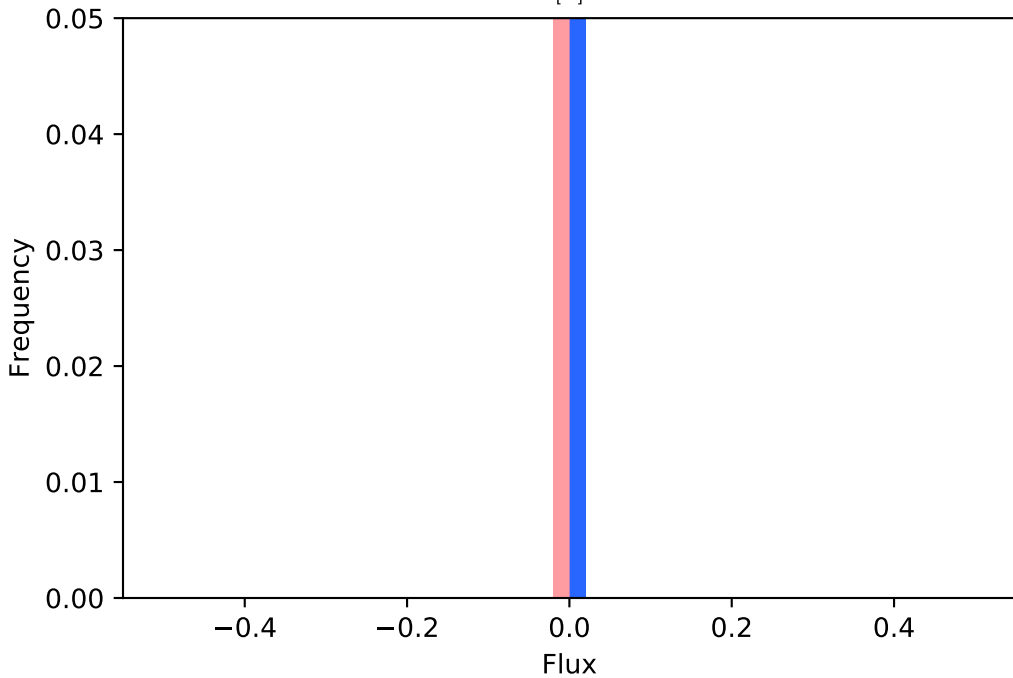
376 : O2\_c --> O2\_p  
[<sup>+</sup>-<sup>+</sup>]



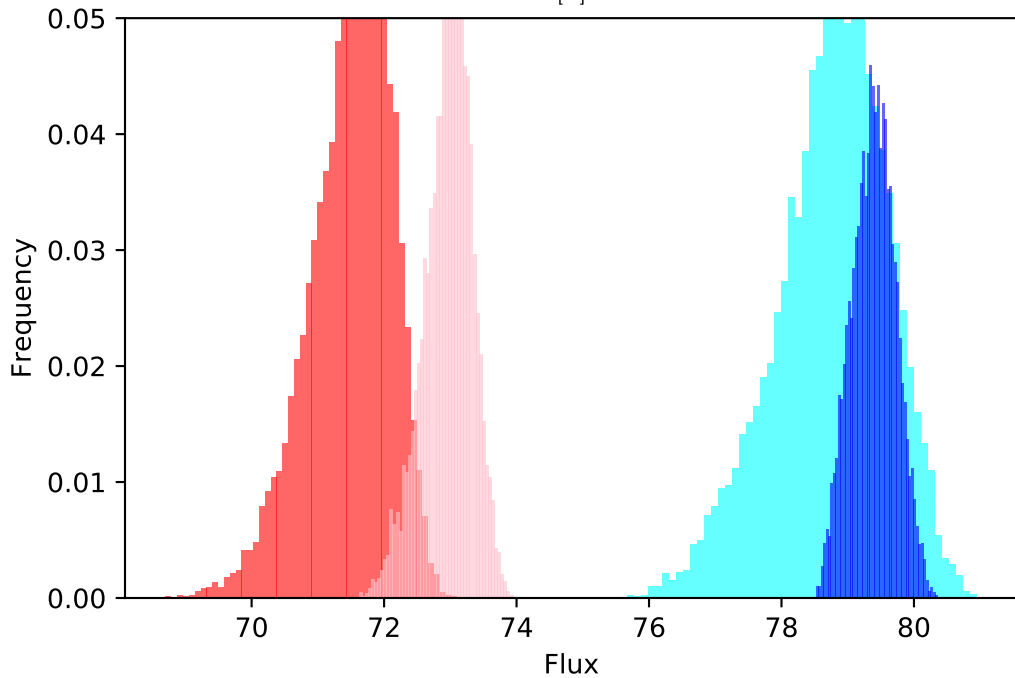
377 : CO2\_c <=> CO2\_h  
['-']



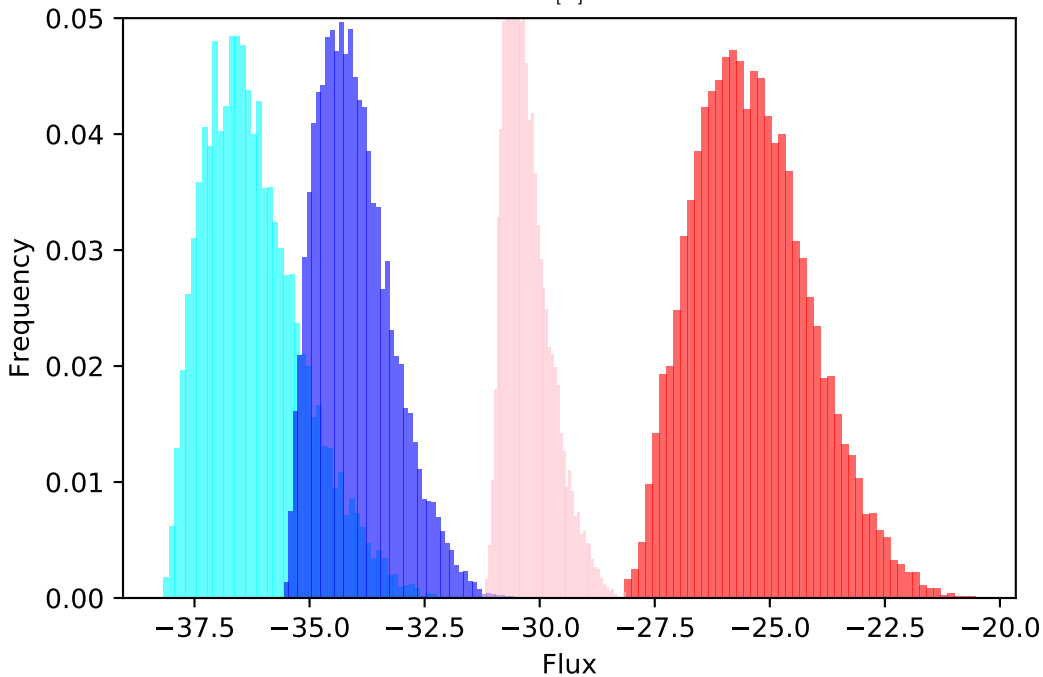
378 : CO2\_c <=> CO2\_m  
['-']



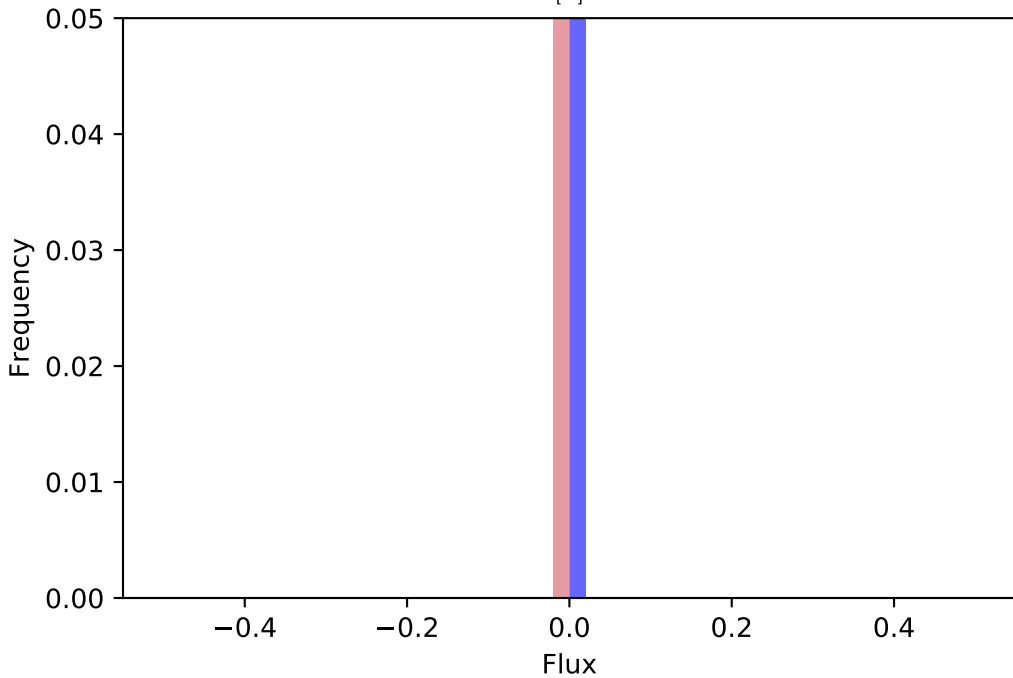
379 : H2O\_c <=> H2O\_h  
['-']



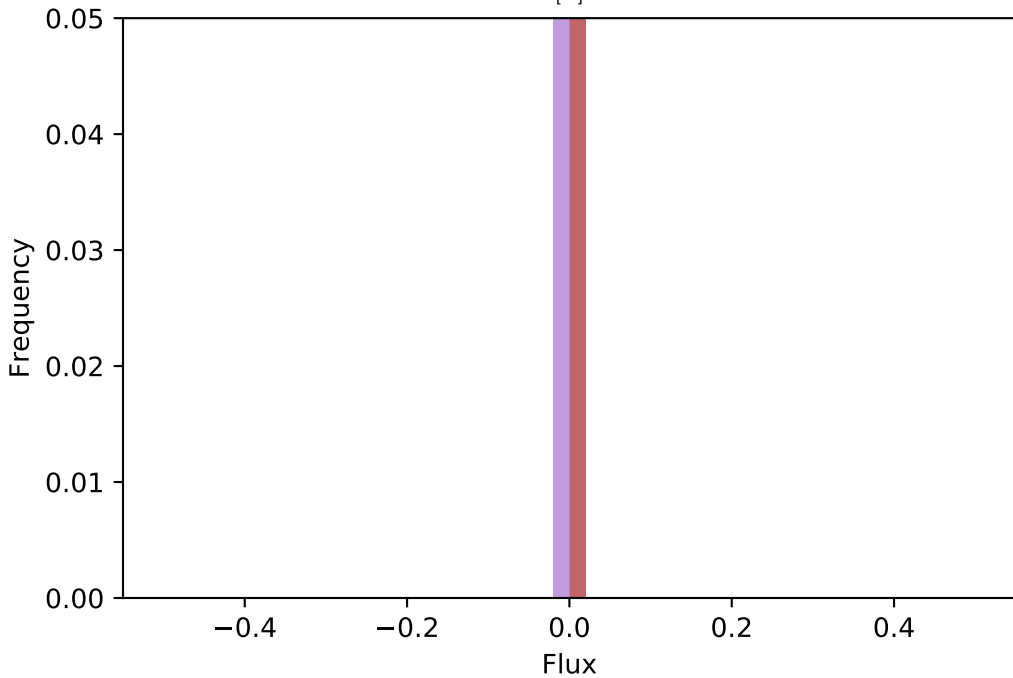
380 : H2O\_c <=> H2O\_m  
['-']



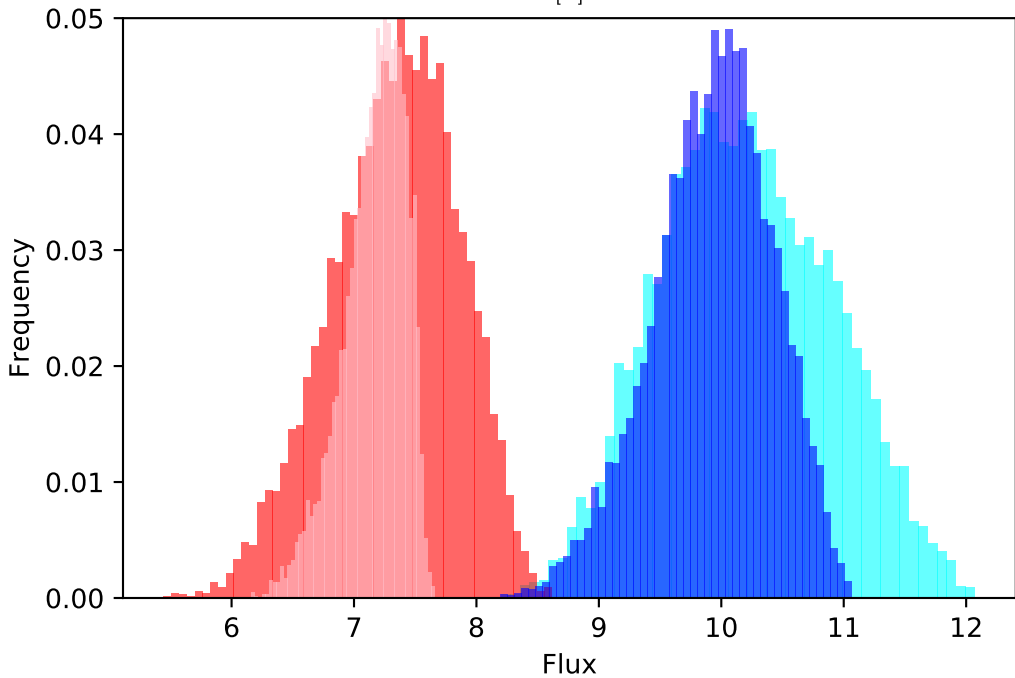
381 : H2O\_c --> H2O\_p  
[<sup>1</sup>-<sup>1</sup>]



382 : H<sub>c</sub> --> H<sub>p</sub>  
[<sup>1</sup>-<sup>1</sup>]

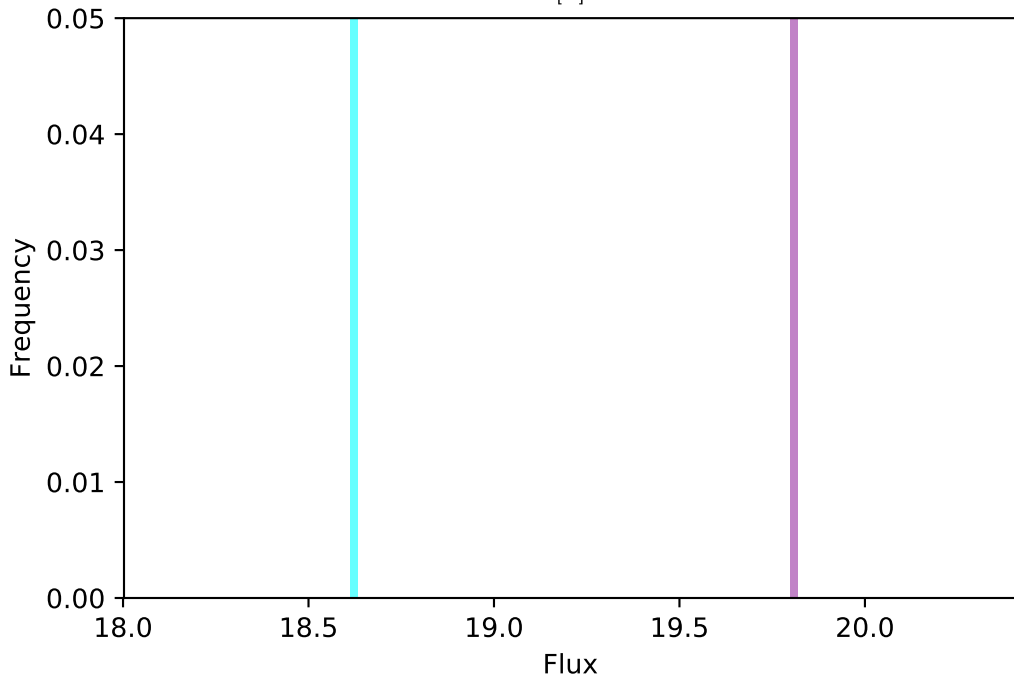


383 : NH4\_c <=> NH4\_h  
['-']

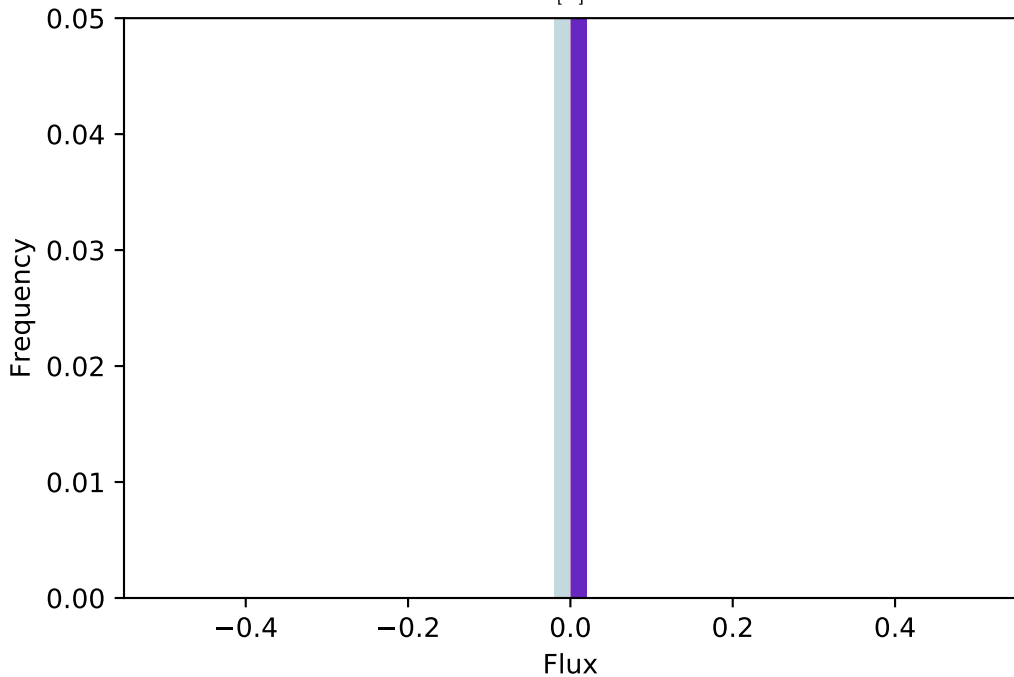




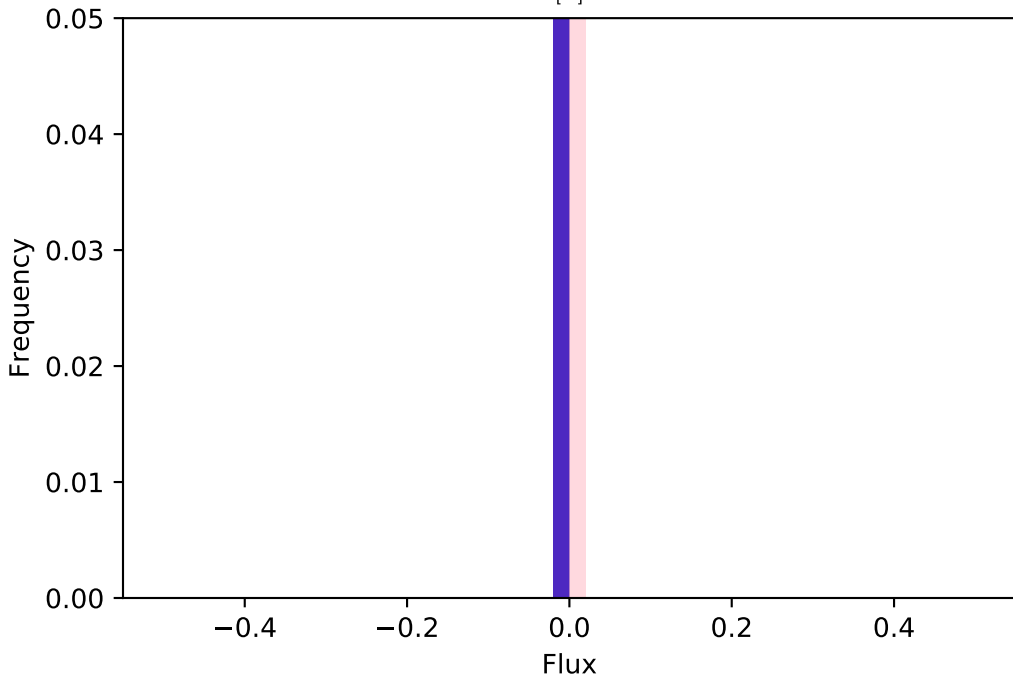
384 : NH4\_c <=> NH4\_m  
['-']



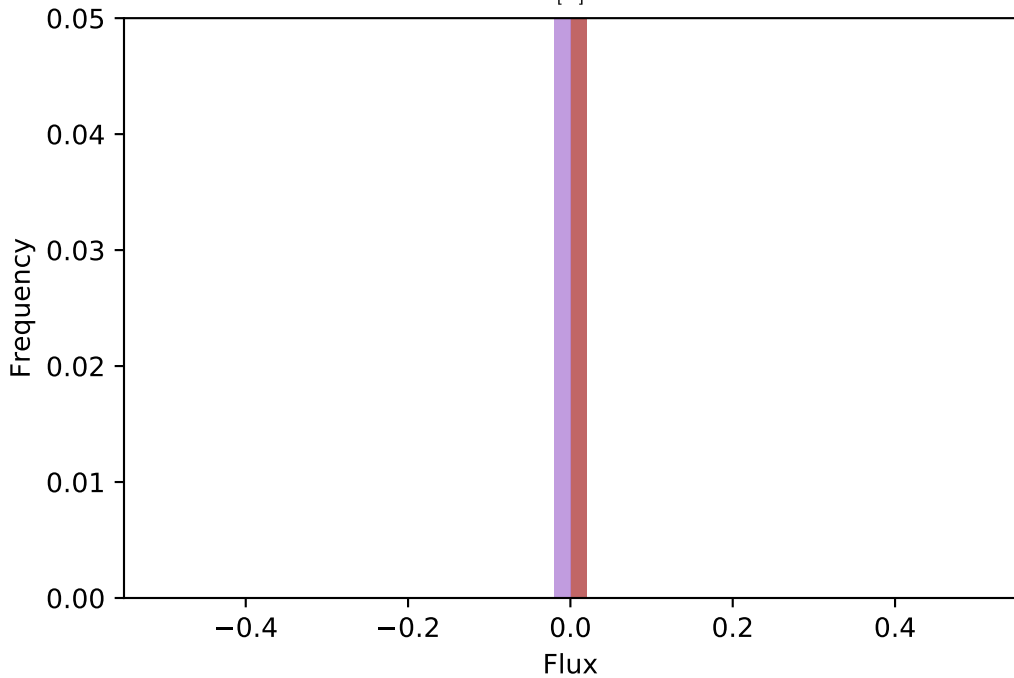
385 : H2S\_c <=> H2S\_h  
['-']



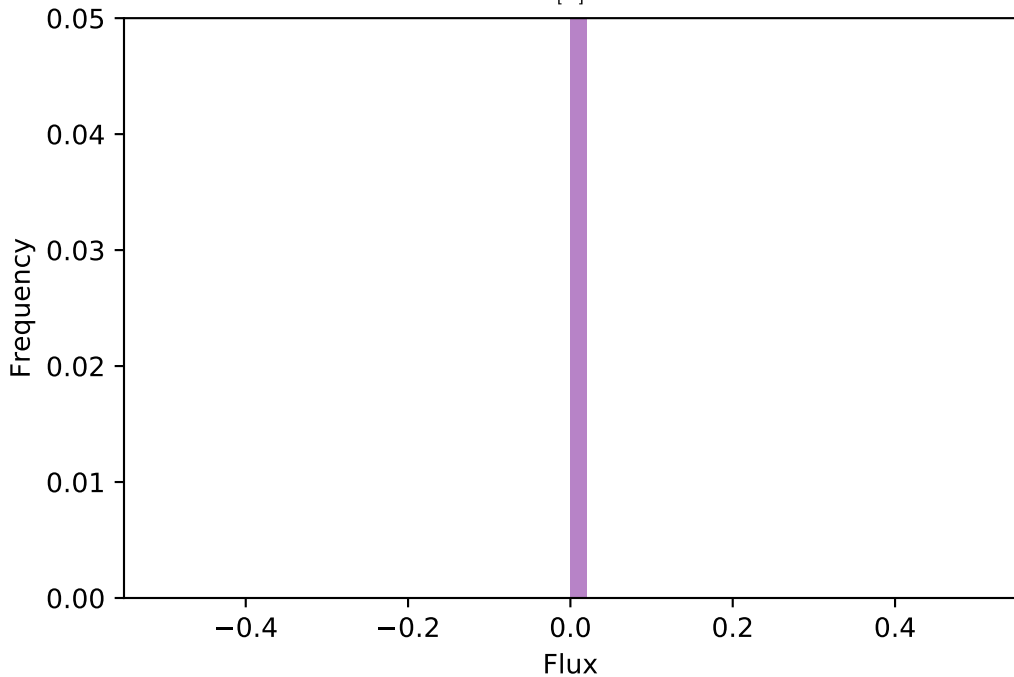
386 : H2S\_c --> H2S\_m  
['-']



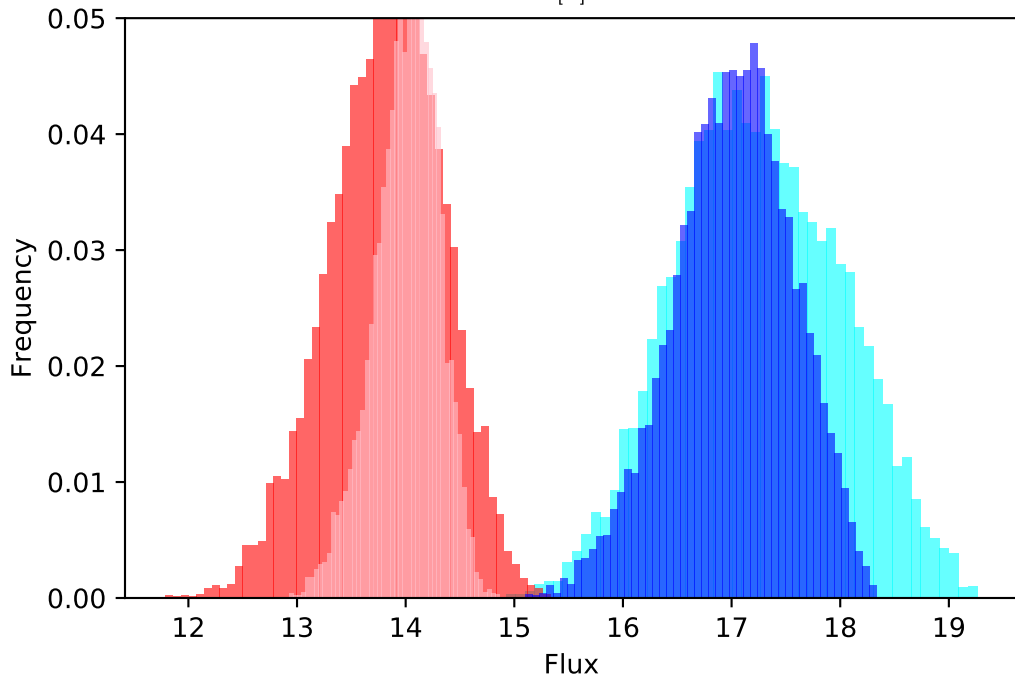
387 : AC\_c <=> AC\_h  
['-']



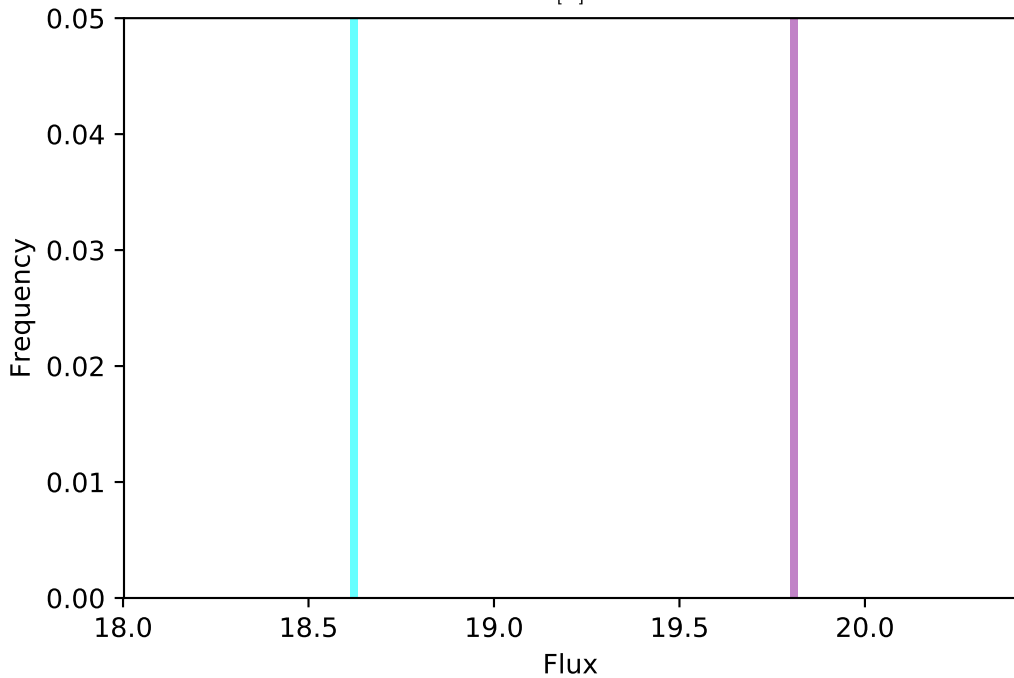
388 : AC\_c --> AC\_m  
['-']



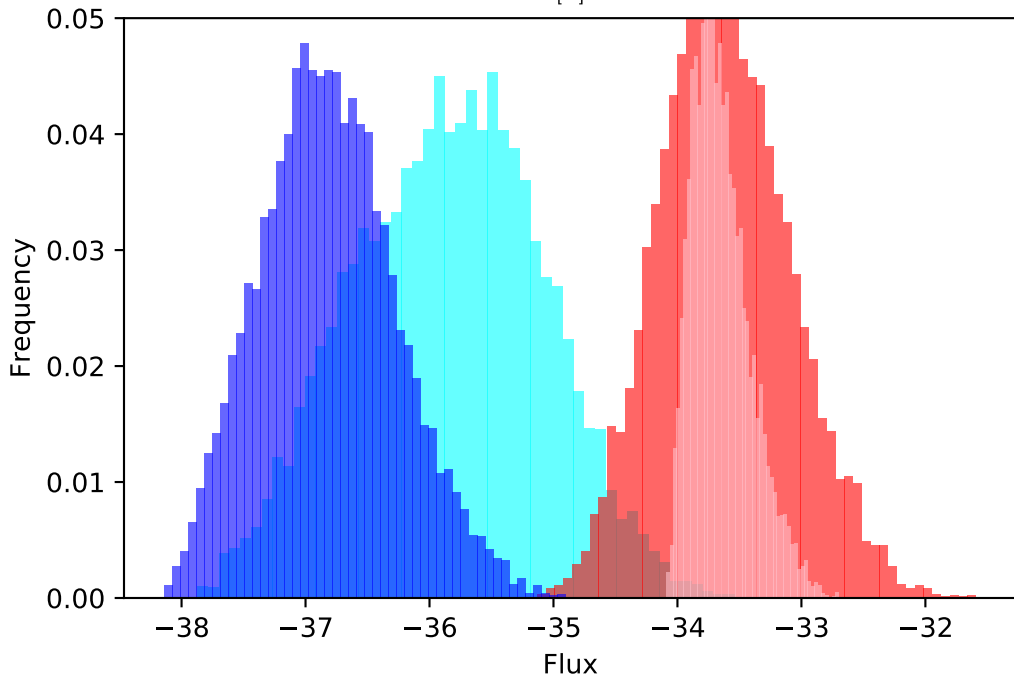
389 : Pyr\_c <=> Pyr\_h  
['-']



390 : Pyr\_c --> Pyr\_m  
['-']

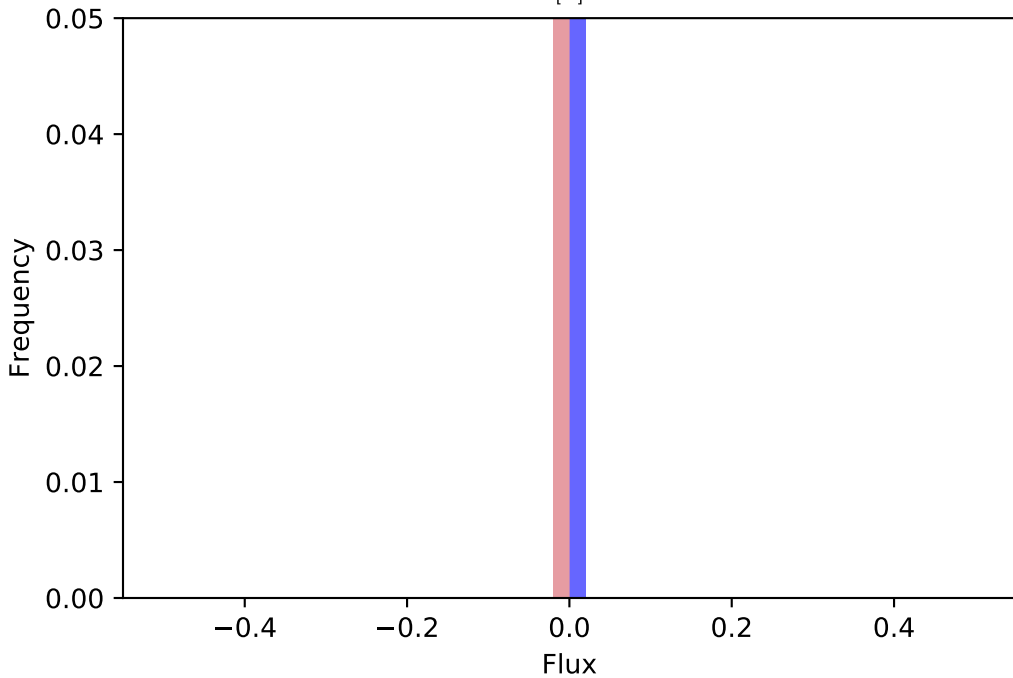


391 : Pyr\_c <=> Pyr\_p  
['-']

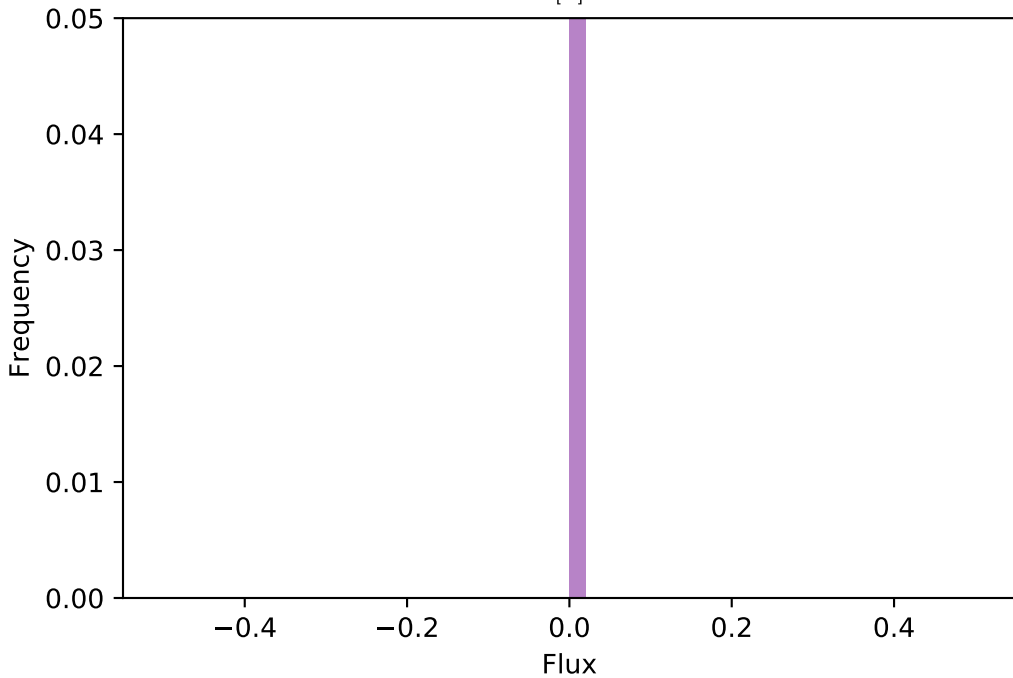




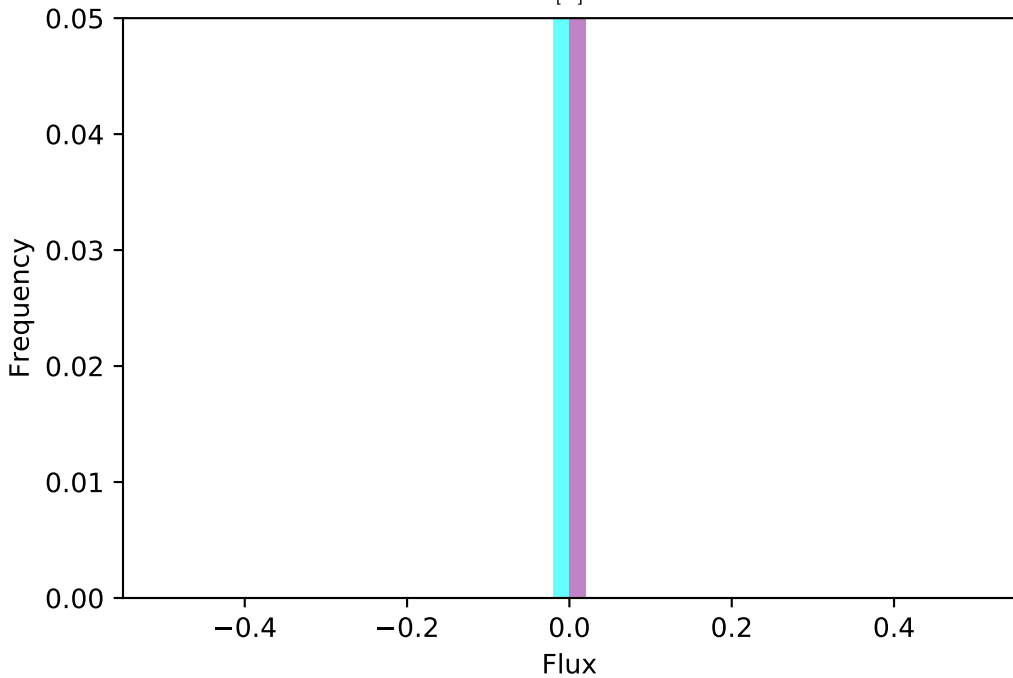
392 : GCA\_c --> GCA\_p  
[<sup>1</sup> -<sup>1</sup>]



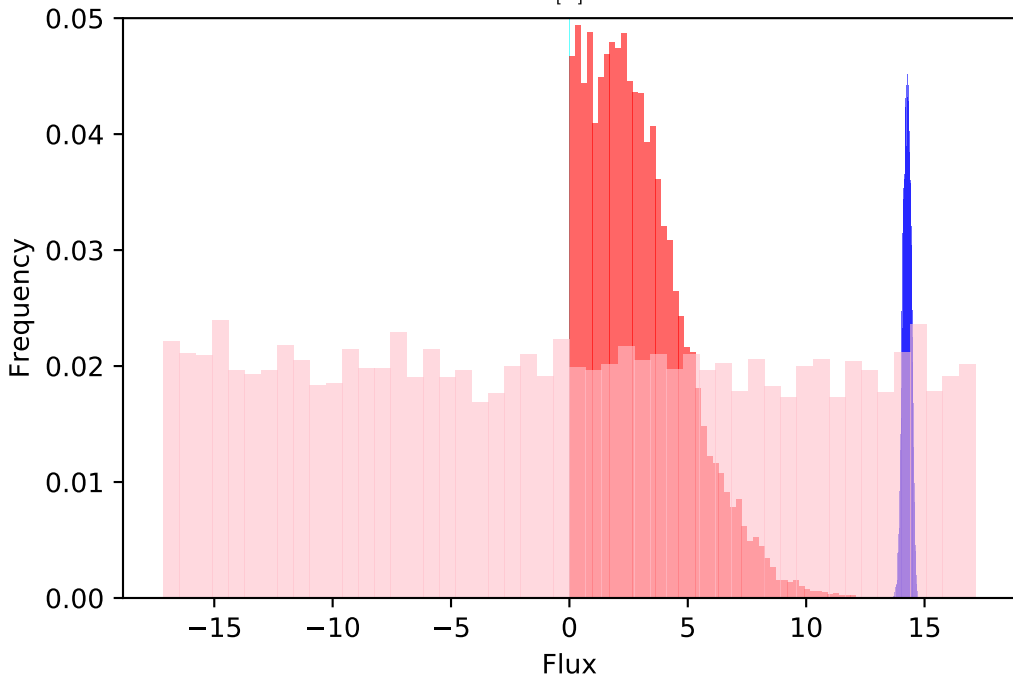
393 : GCEA\_c --> GCEA\_p  
[<sup>1</sup>-<sup>1</sup>]



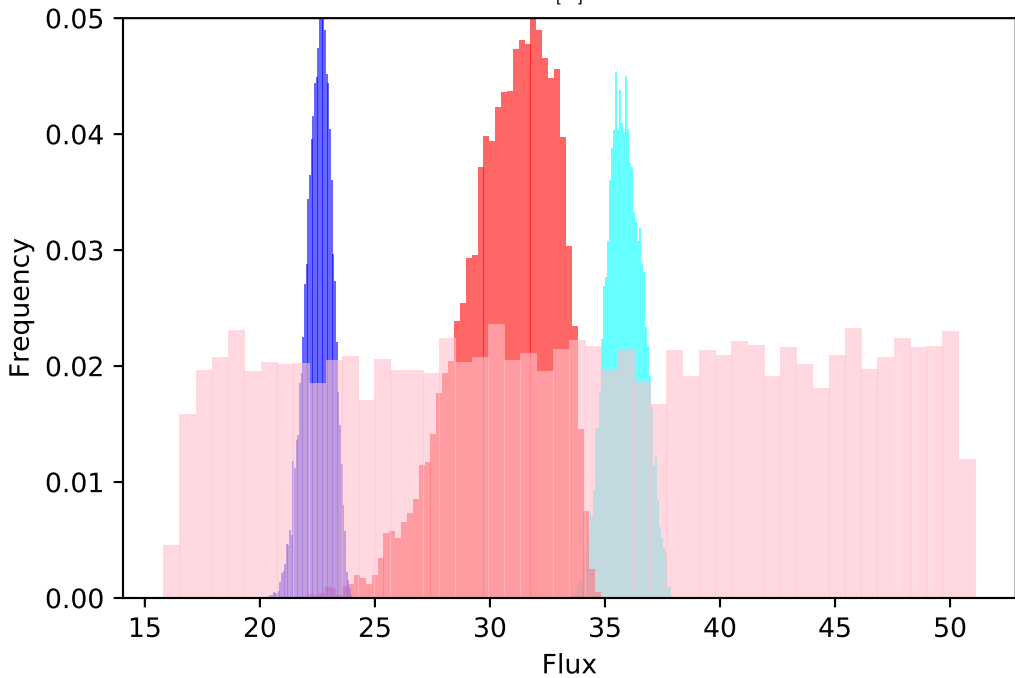
394 : Mal\_c --> Mal\_p  
['-']



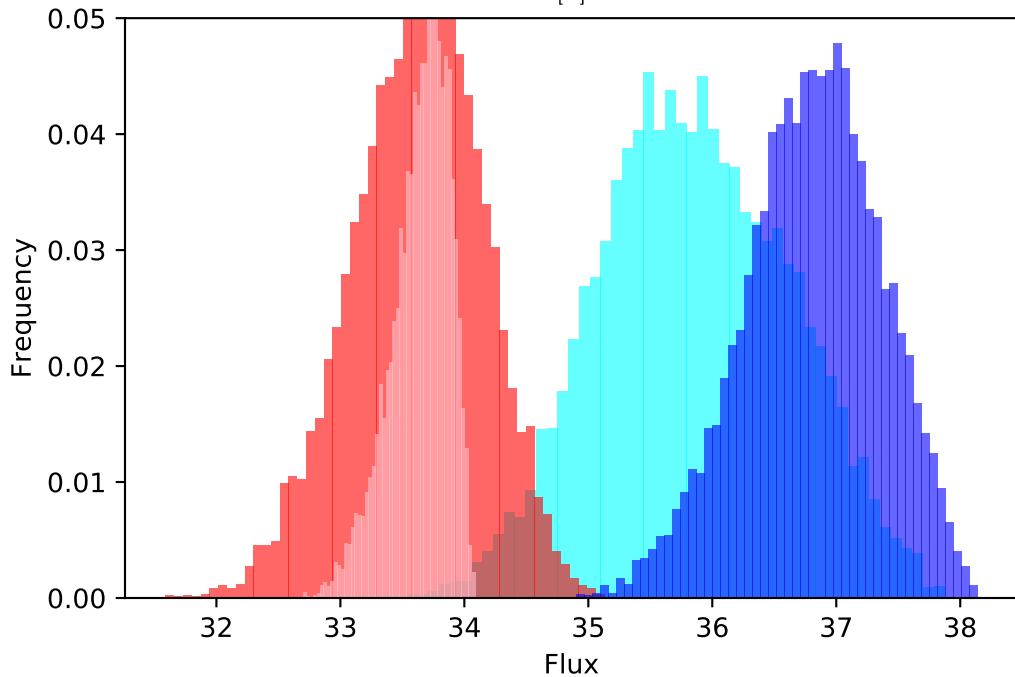
395 : OAA\_c <=> OAA\_p  
['-']



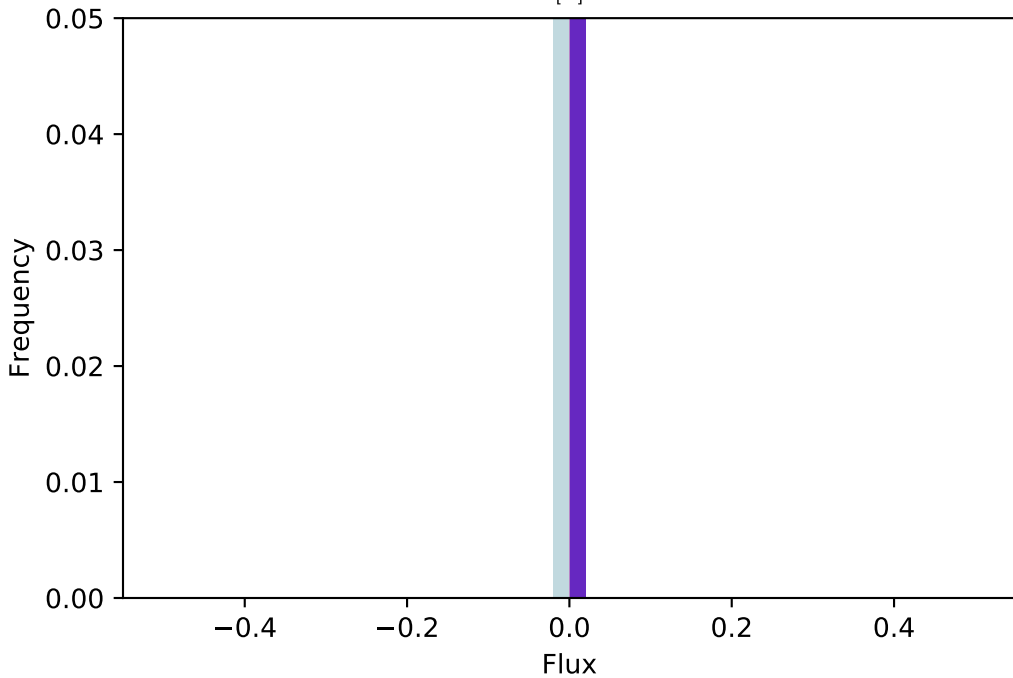
396 : KG\_c <=> KG\_p  
['-']



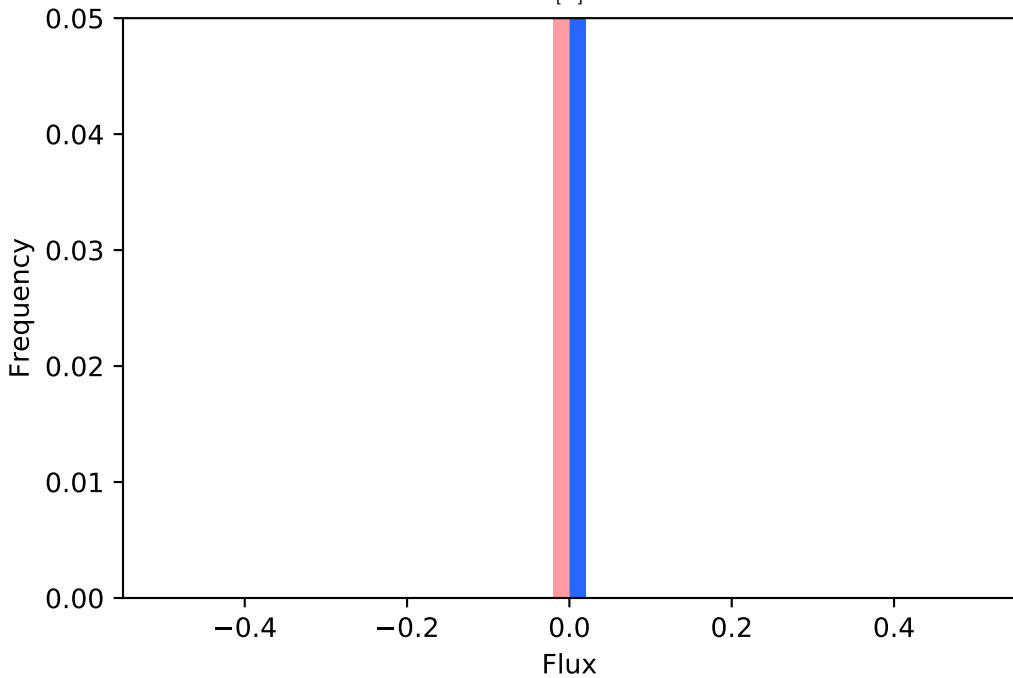
397 : Ala\_c <=> Ala\_p  
['-']



398 : Arg\_c --> Arg\_p  
['-']

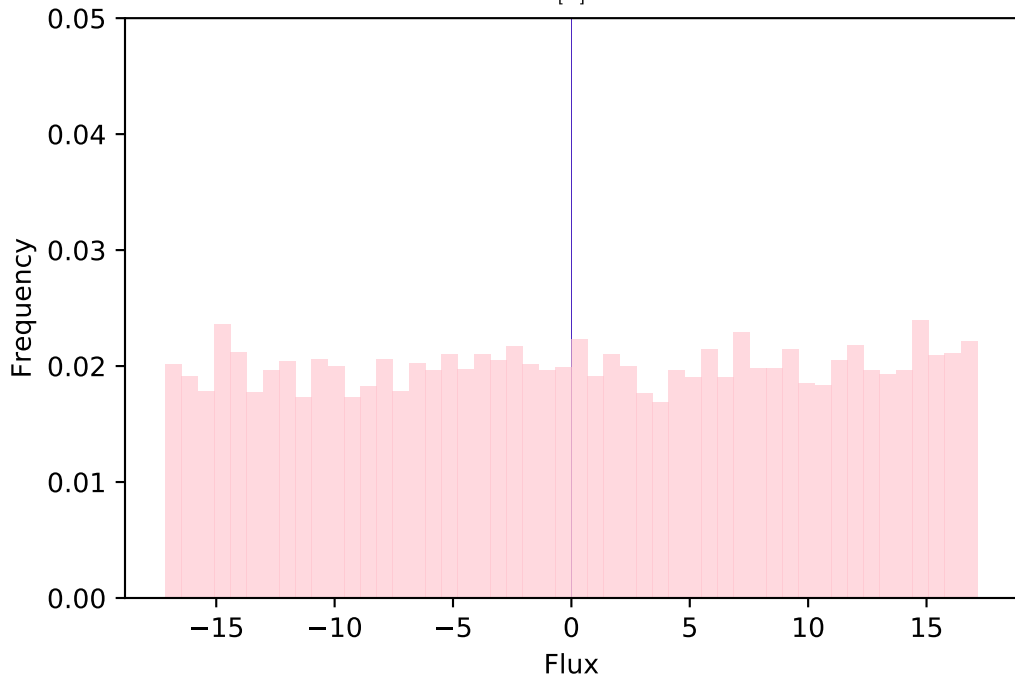


399 : Asn\_c --> Asn\_p + H\_p  
['-']

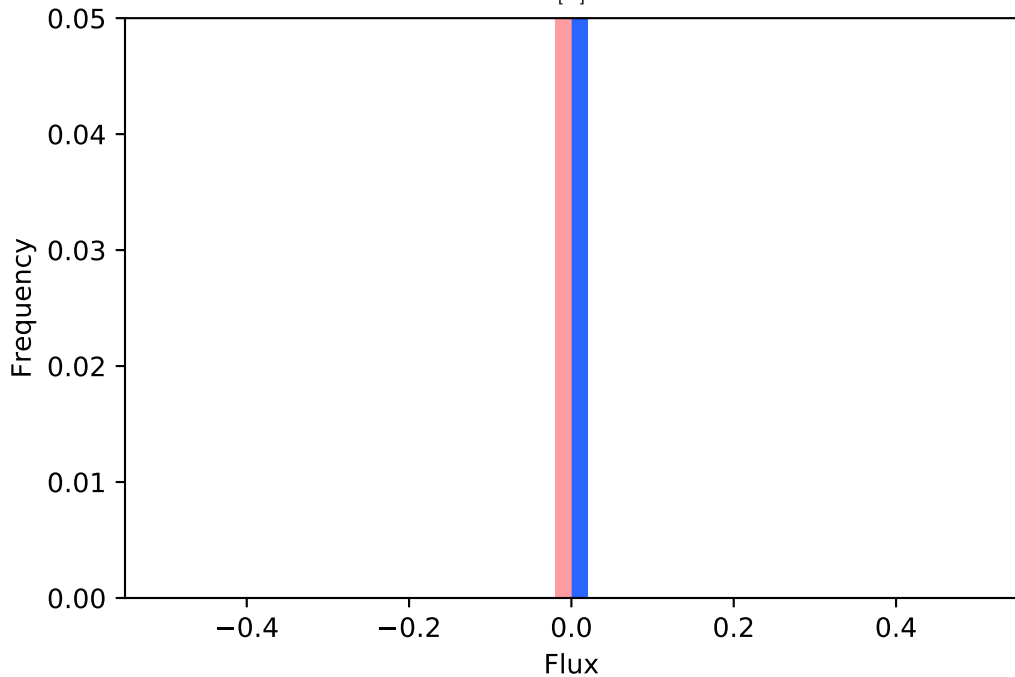




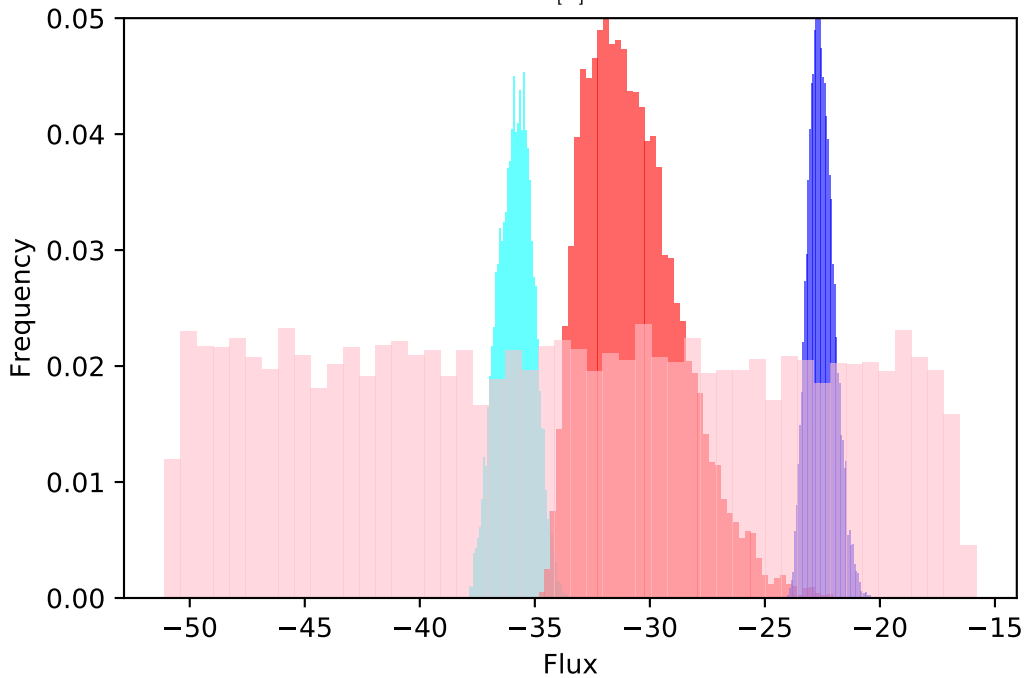
400 : Asp\_c --> Asp\_p  
['-']



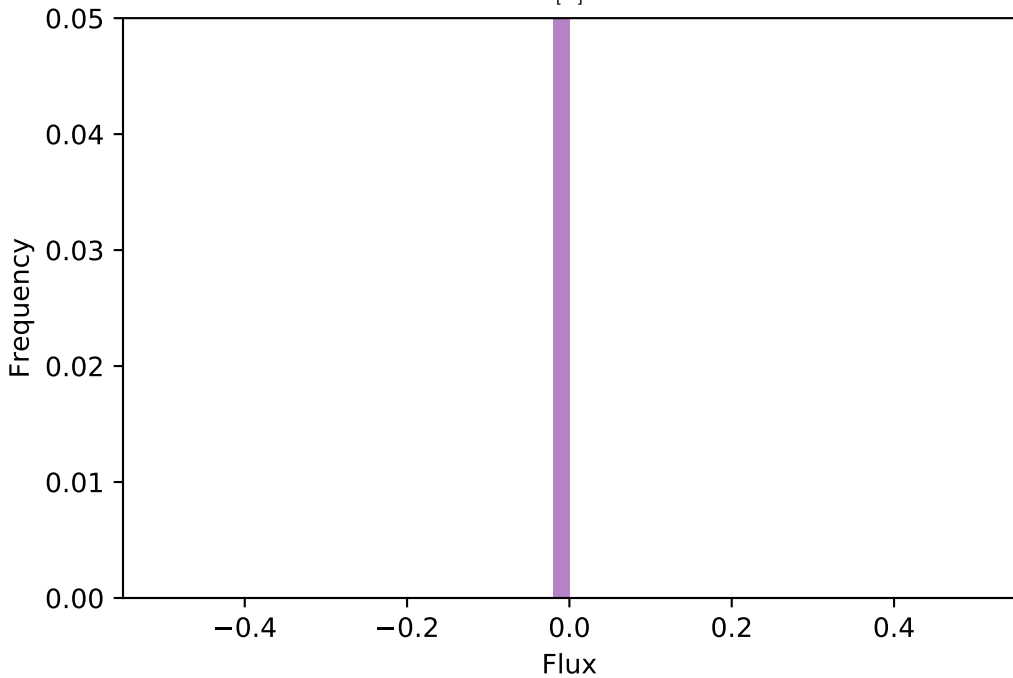
401 : Cys\_c --> Cys\_p  
[<sup>-</sup>']



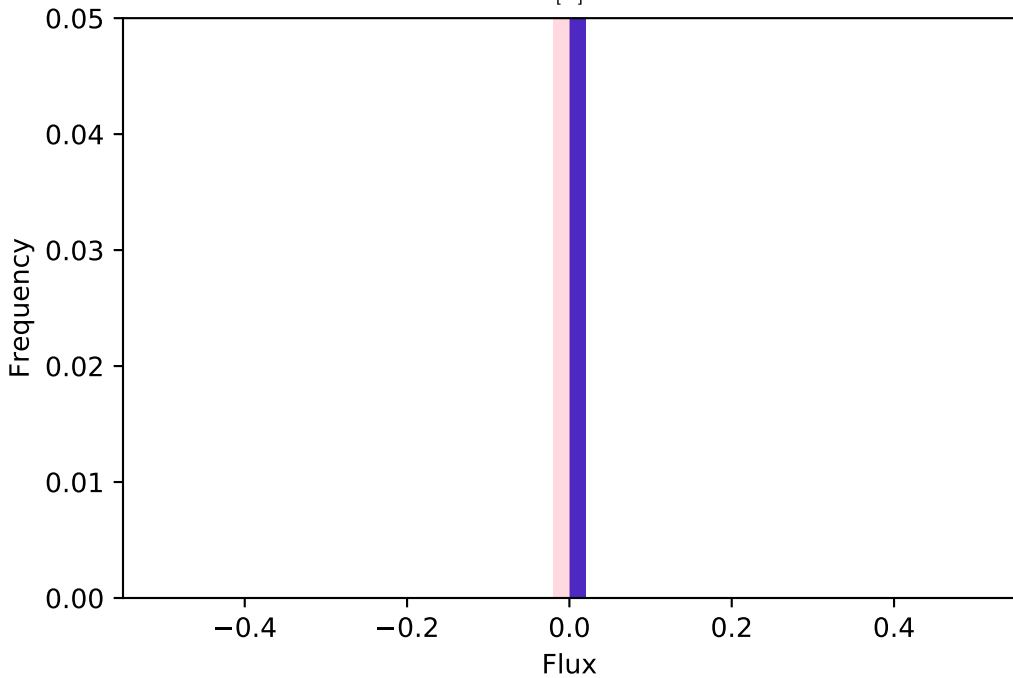
402 : Glu\_c <=> Glu\_p  
['-']



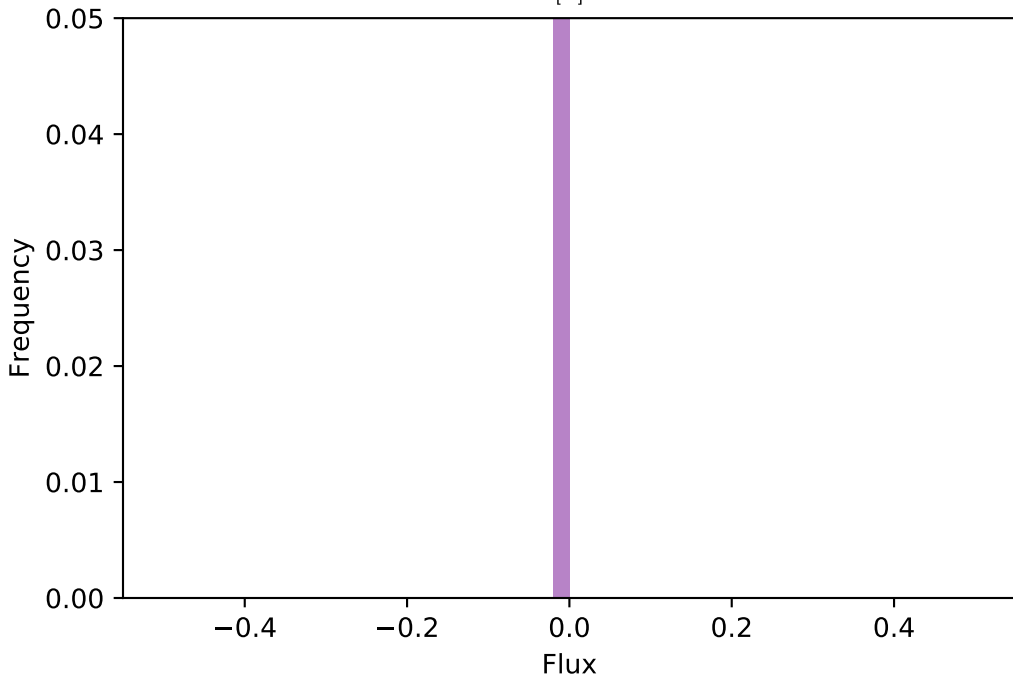
403 : Gln\_c --> Gln\_p + H\_p  
['-']

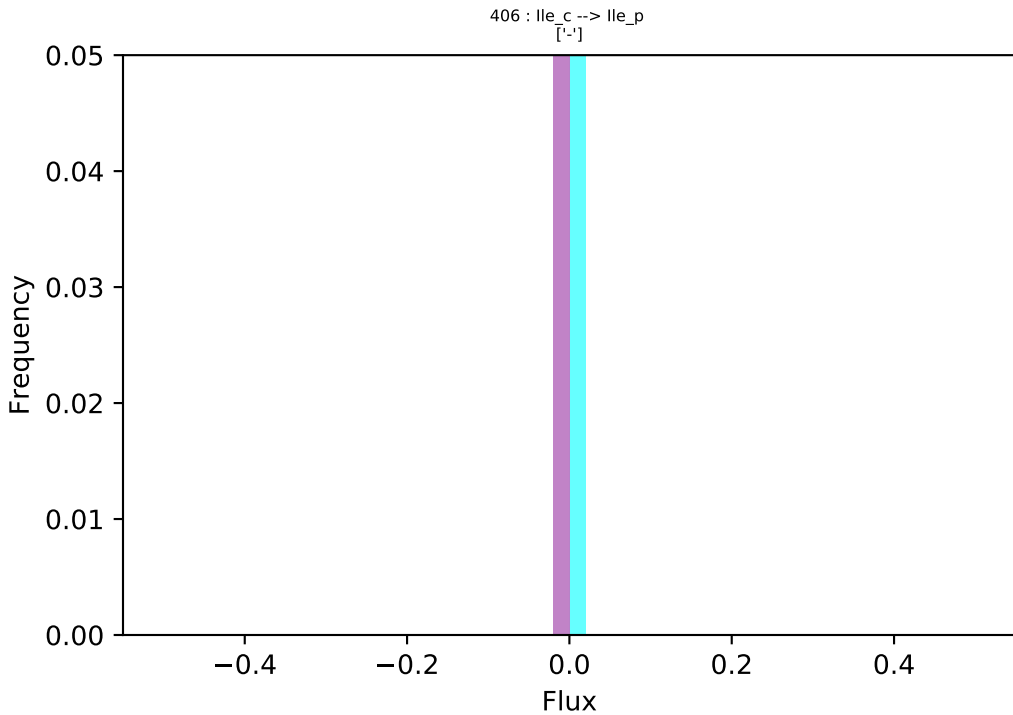


404 : Gly\_c --> Gly\_p  
[<sup>-</sup>']

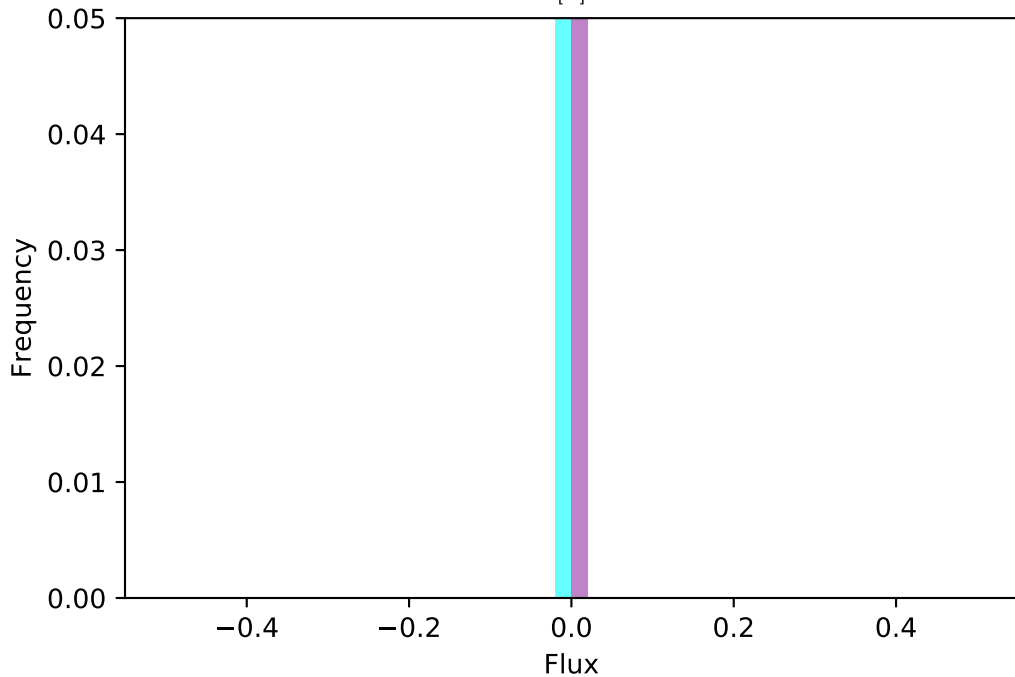


405 : His\_c --> His\_p  
[1-1]



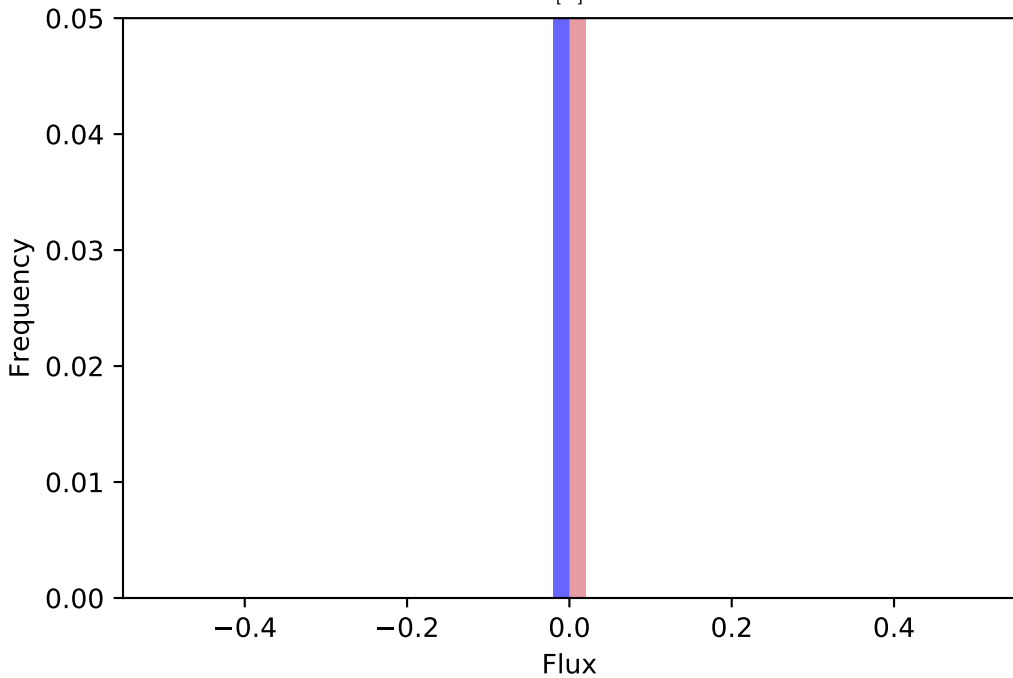


407 : Leu\_c --> Leu\_p  
[<sup>+</sup>-<sup>+</sup>]

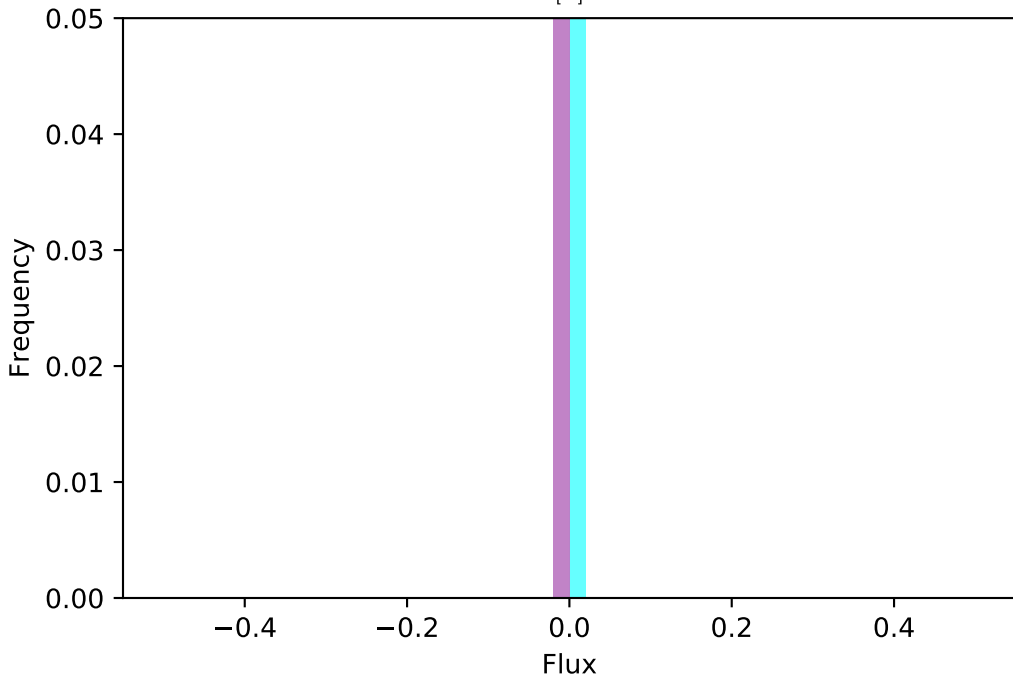




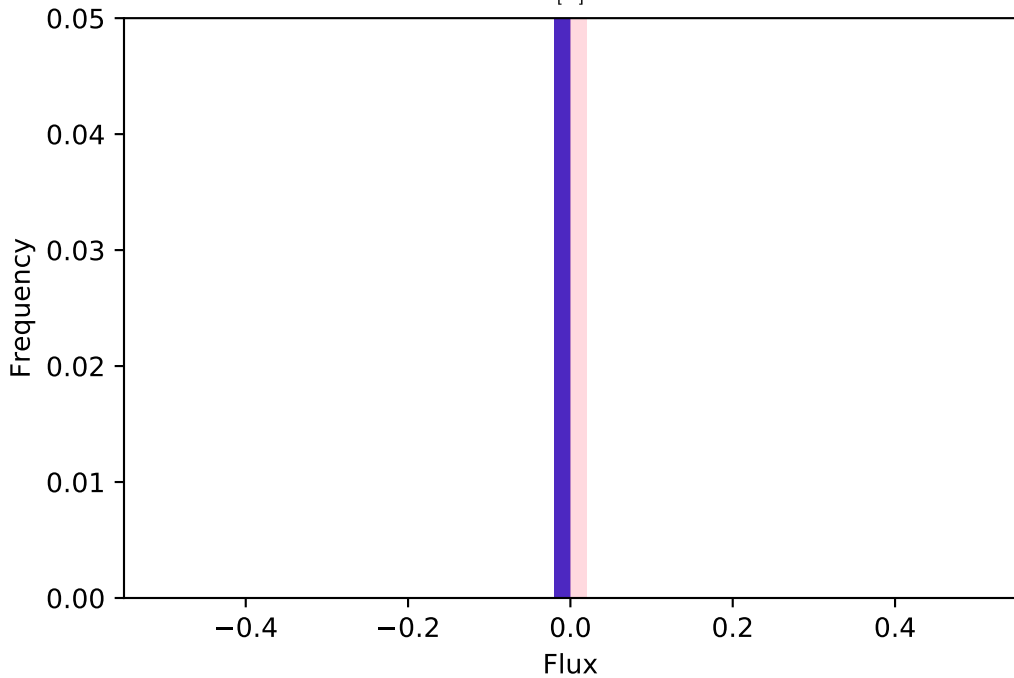
408 : Lys\_c --> Lys\_p  
[<sup>+</sup>-<sup>+</sup>]



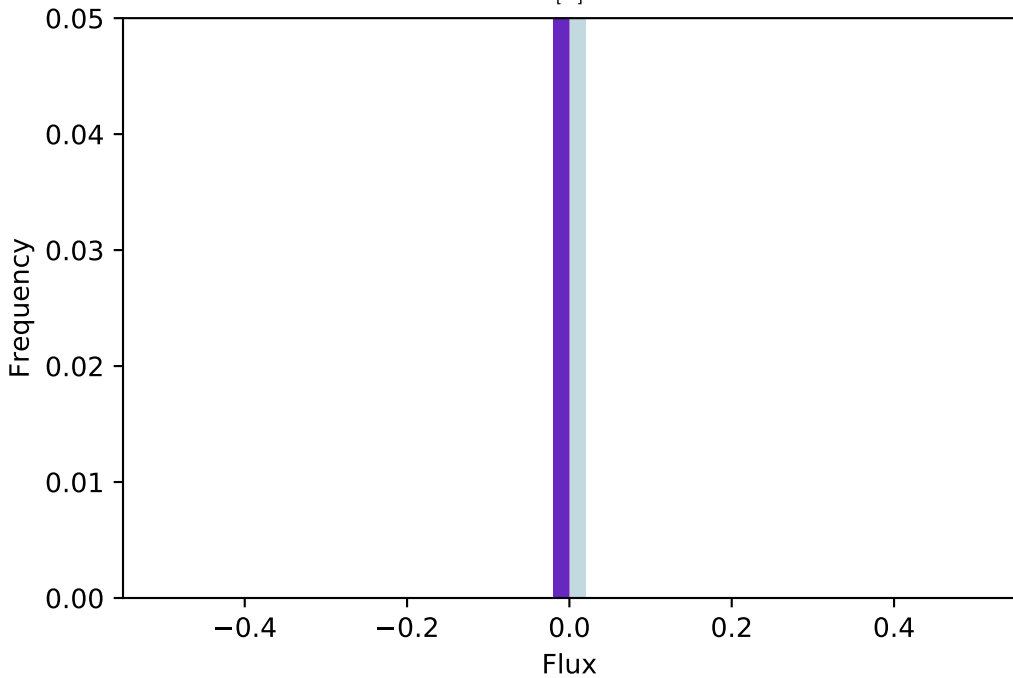
409 : Met\_c --> Met\_p  
[<sup>+</sup>-<sup>+</sup>]



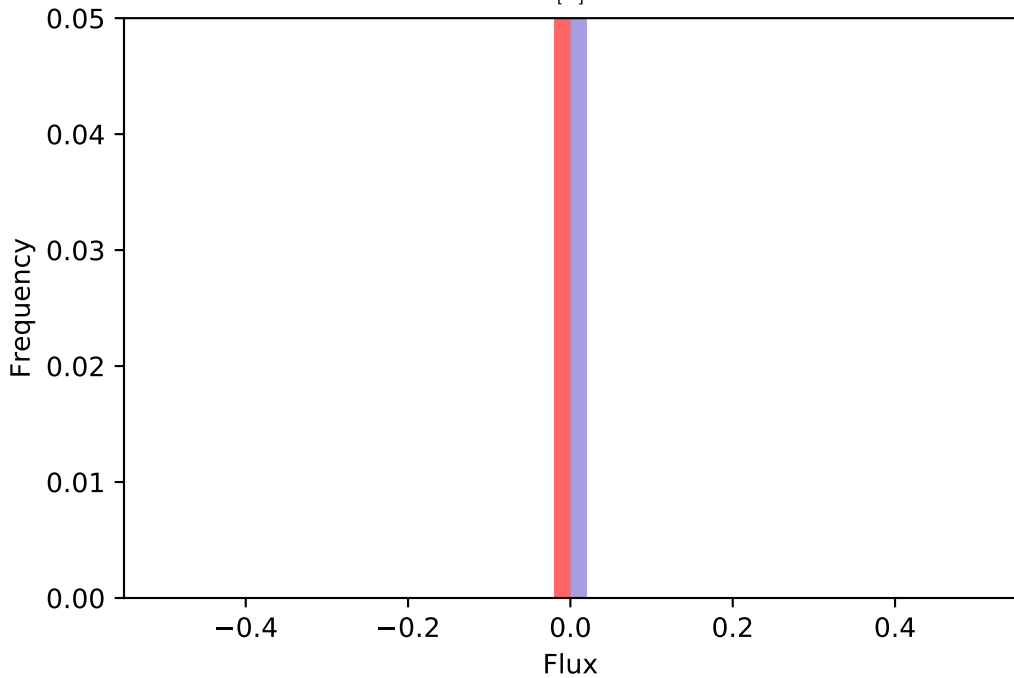
410 : Phe\_c --> Phe\_p  
[<sup>-</sup>']



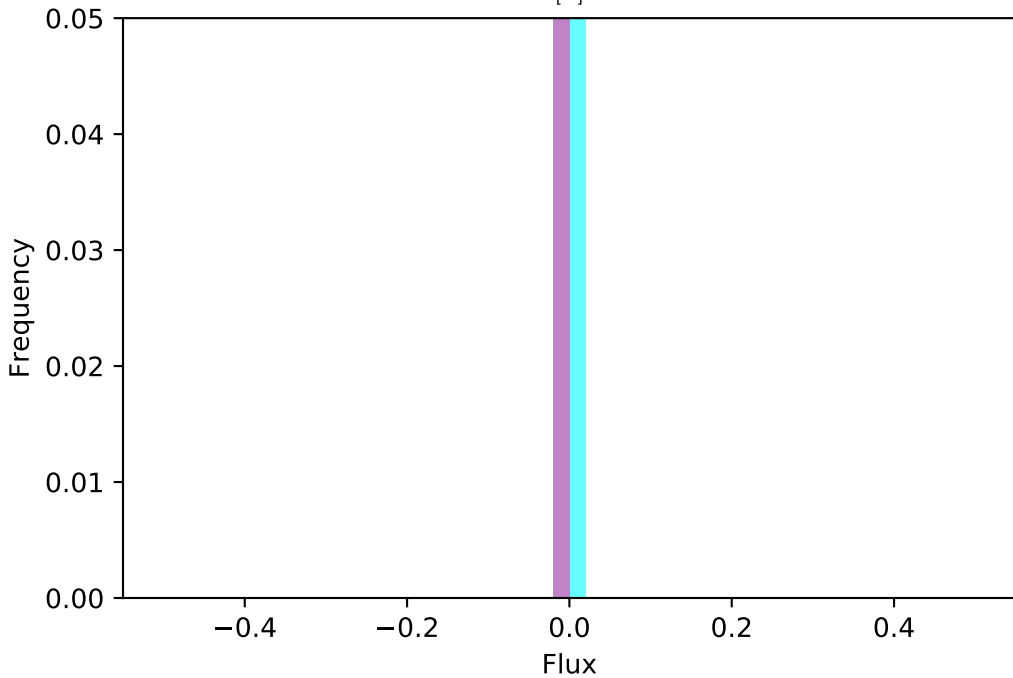
411 : Pro\_c --> Pro\_p  
[1-1]



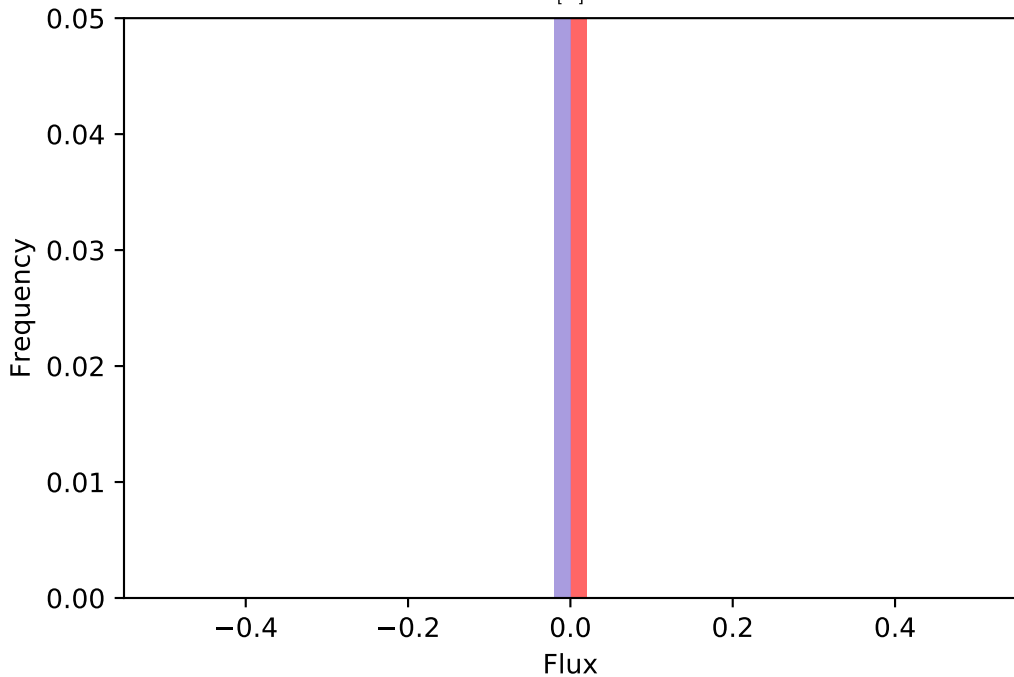
412 : Ser\_c --> Ser\_p  
[<sup>+</sup>-<sup>+</sup>]



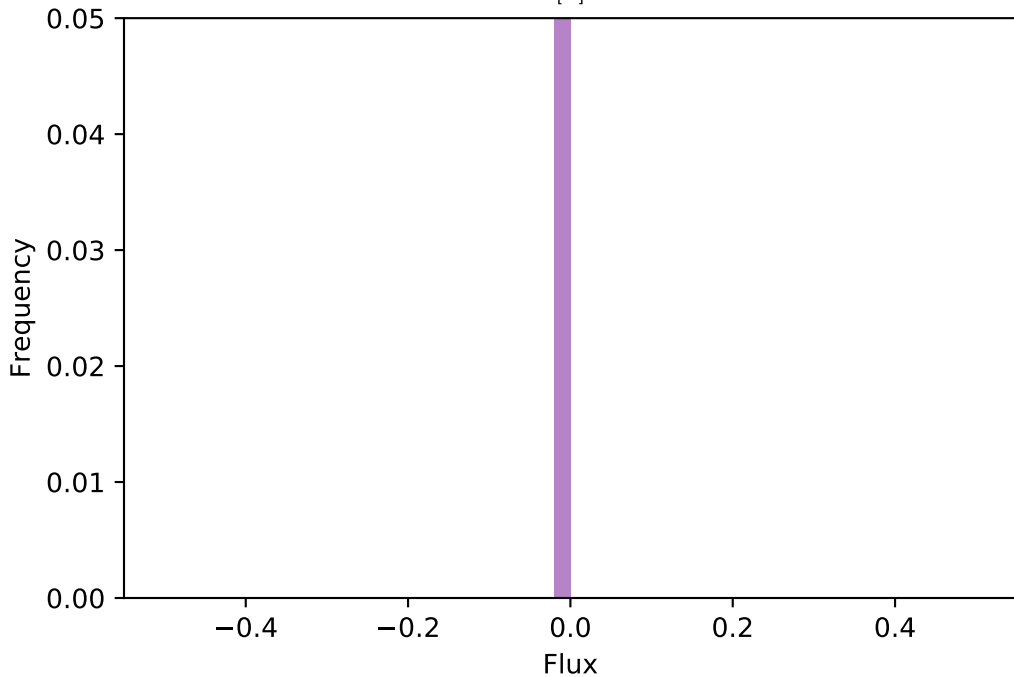
413 : Thr\_c --> Thr\_p  
[<sup>-1</sup>]



414 : Trp\_c --> Trp\_p  
[<sup>+</sup>-<sup>+</sup>]

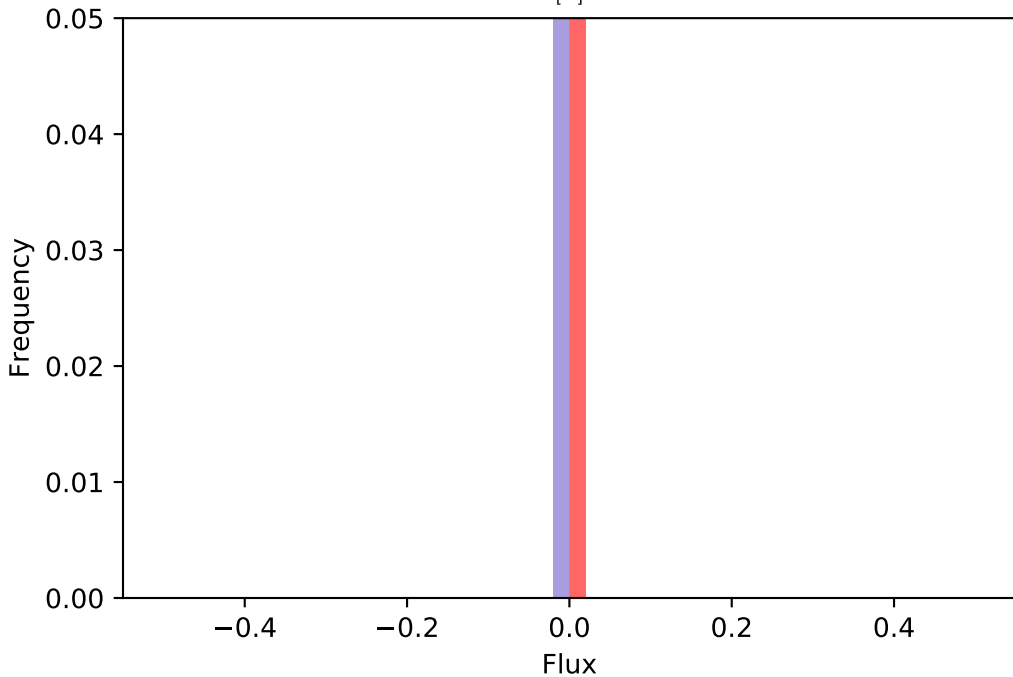


415 : Tyr\_c --> Tyr\_p  
[<sup>-1</sup>]

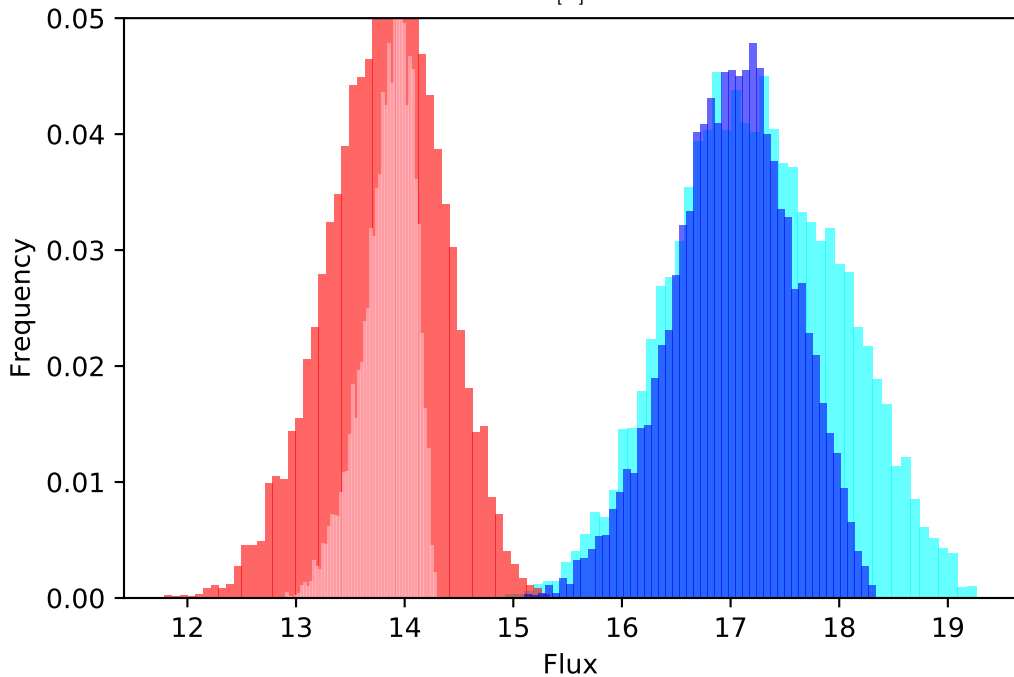




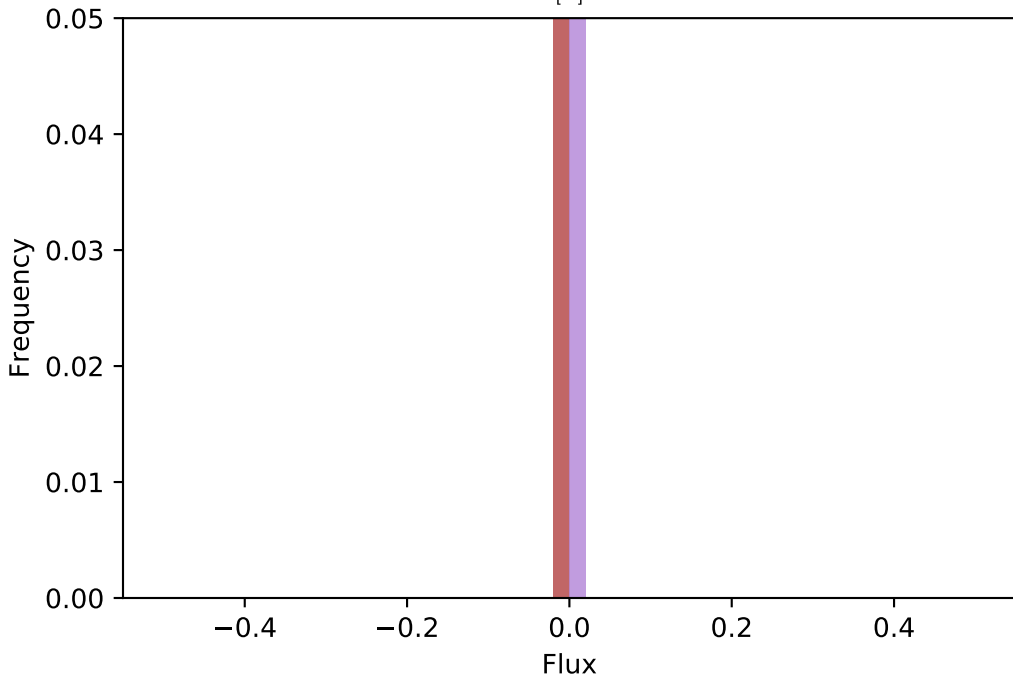
416 : Val\_c --> Val\_p  
[<sup>-</sup>'<sup>-</sup>']



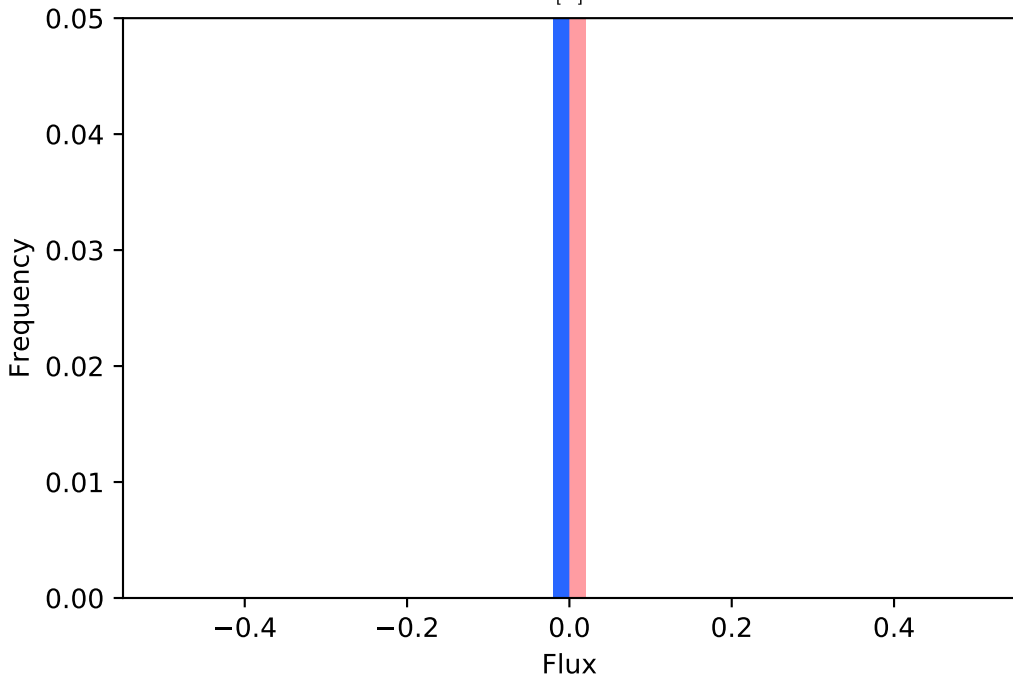
417 : Ala\_h --> Ala\_c  
[<sup>-</sup>]



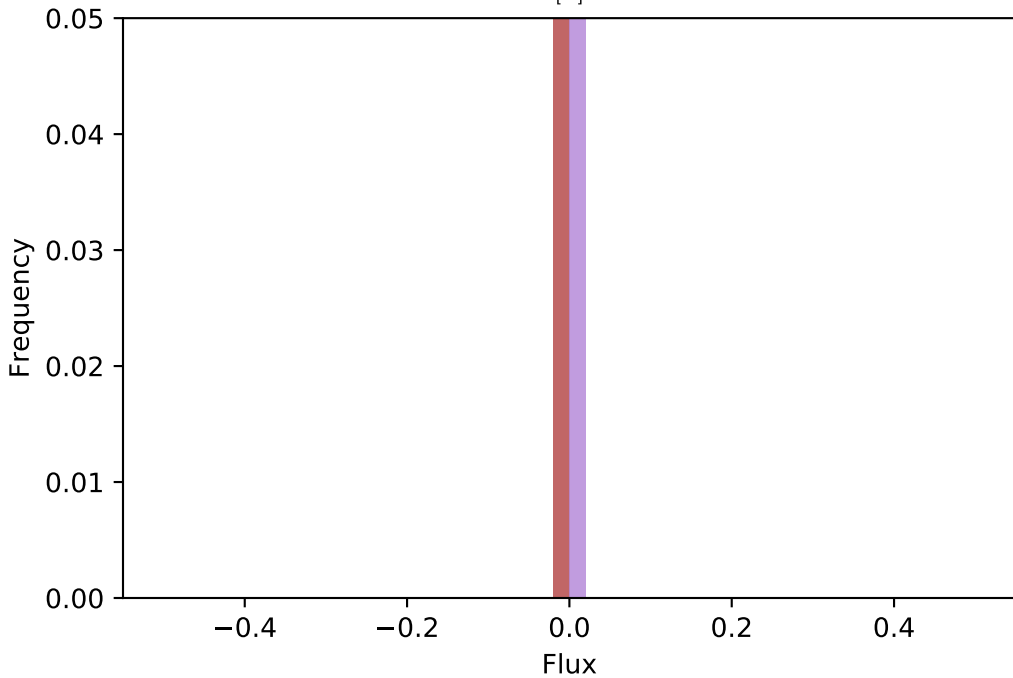
418 : Arg\_h --> Arg\_c  
['-']



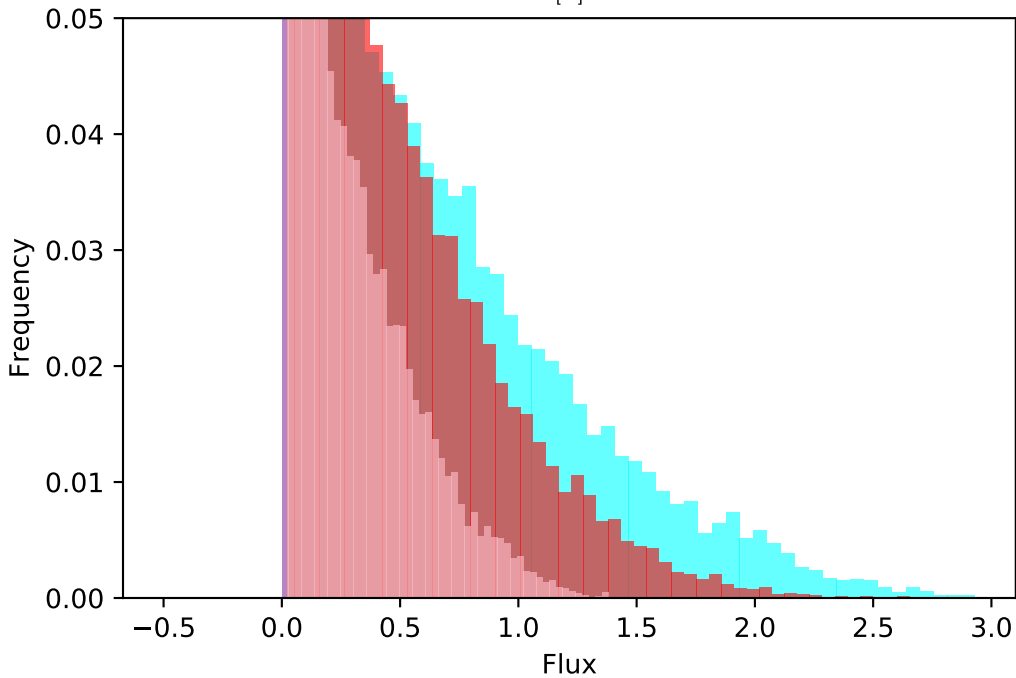
419 : Asn\_c --> Asn\_h + H\_h  
['-']



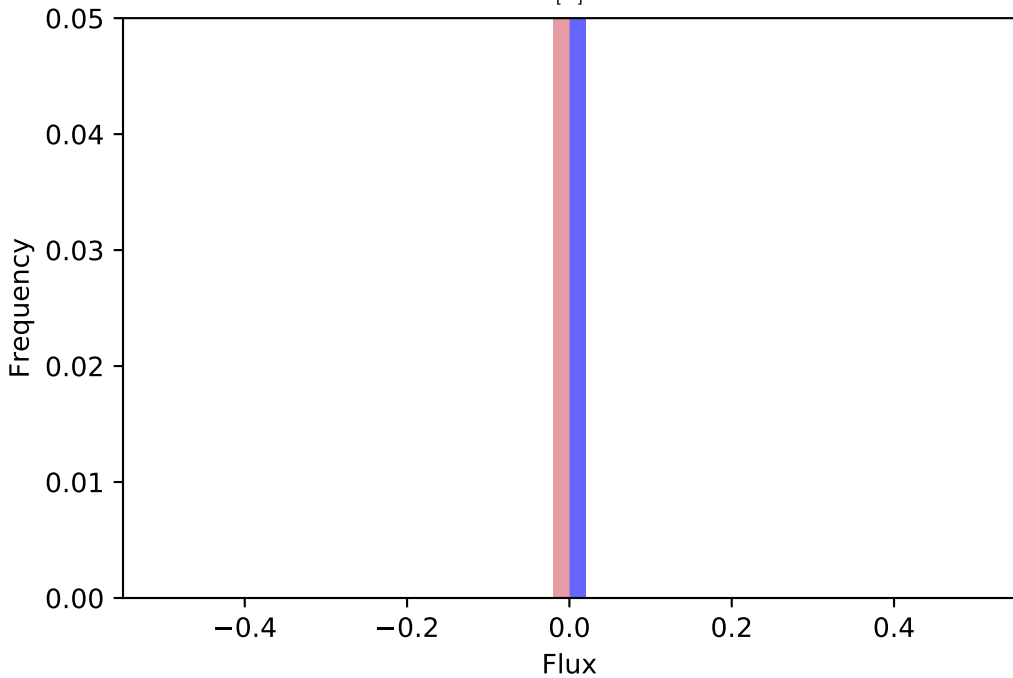
420 : Asn\_c --> Asn\_m  
['-']



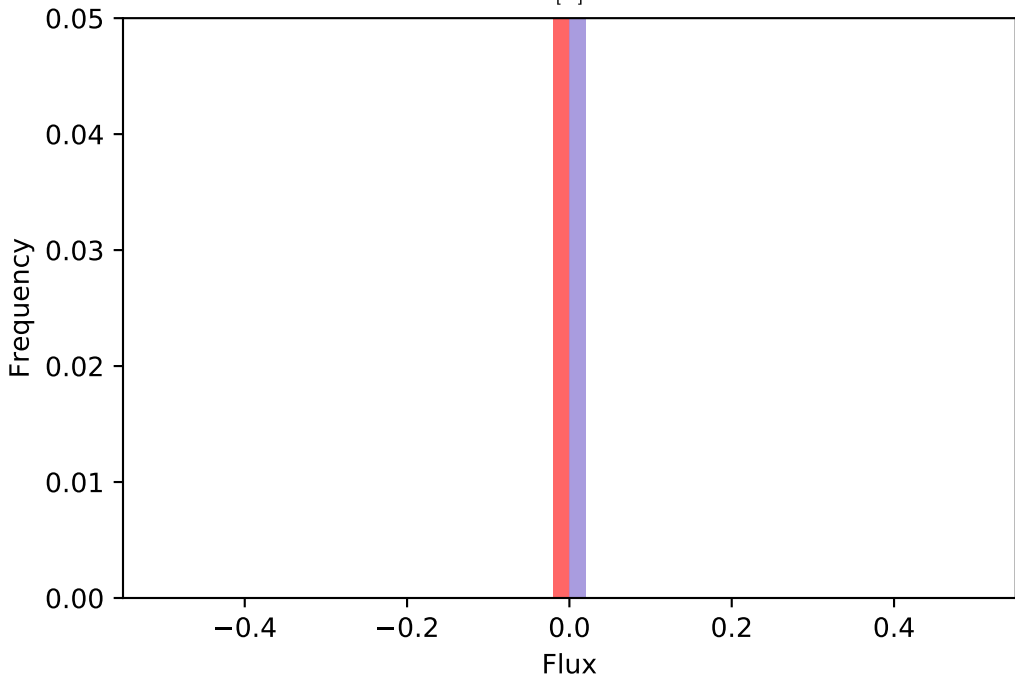
421 : Glu\_c --> Glu\_h  
[<sup>-1</sup>]



422 : His\_h --> His\_c  
[<sup>+</sup>-<sup>+</sup>]

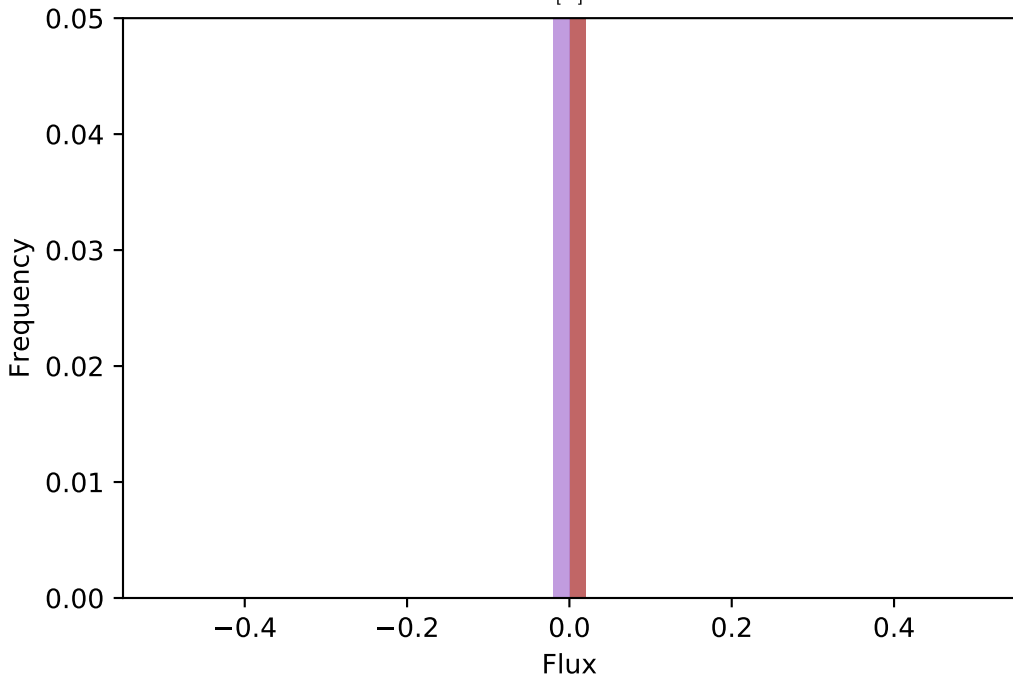


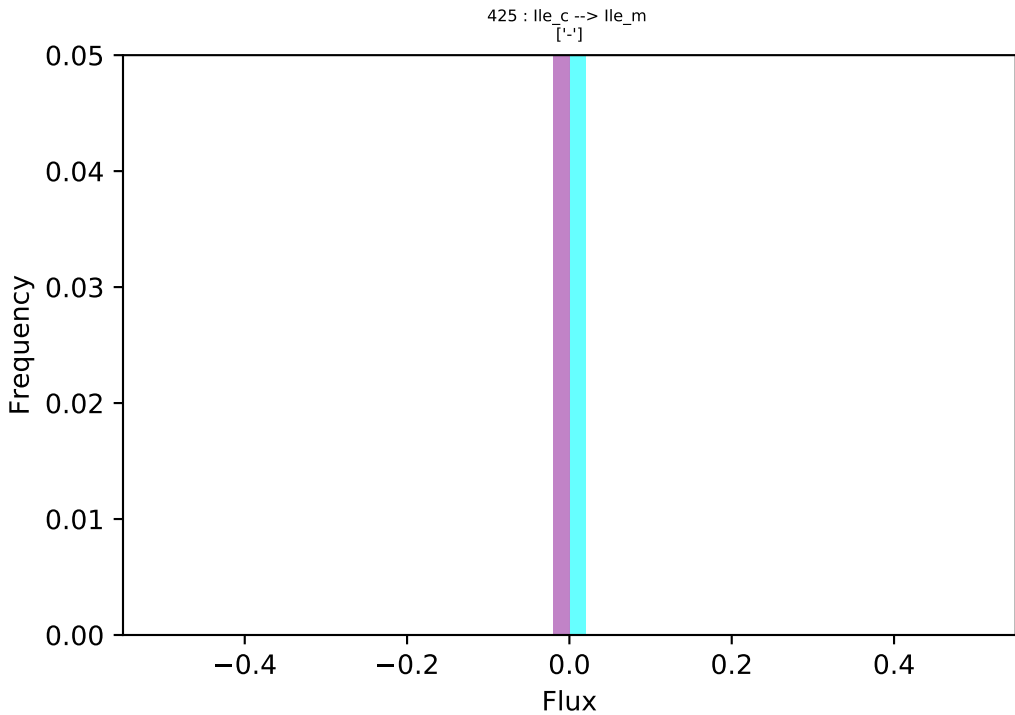
423 : His\_c --> His\_m  
['-']



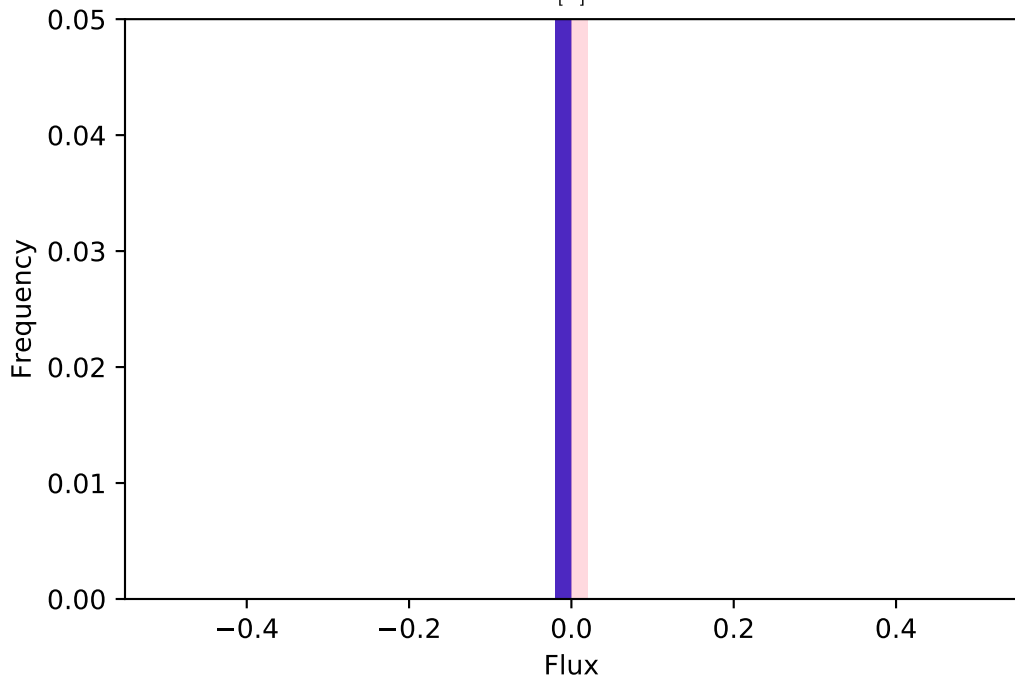


424 : Ile\_h --> Ile\_c  
[<sup>-</sup>']

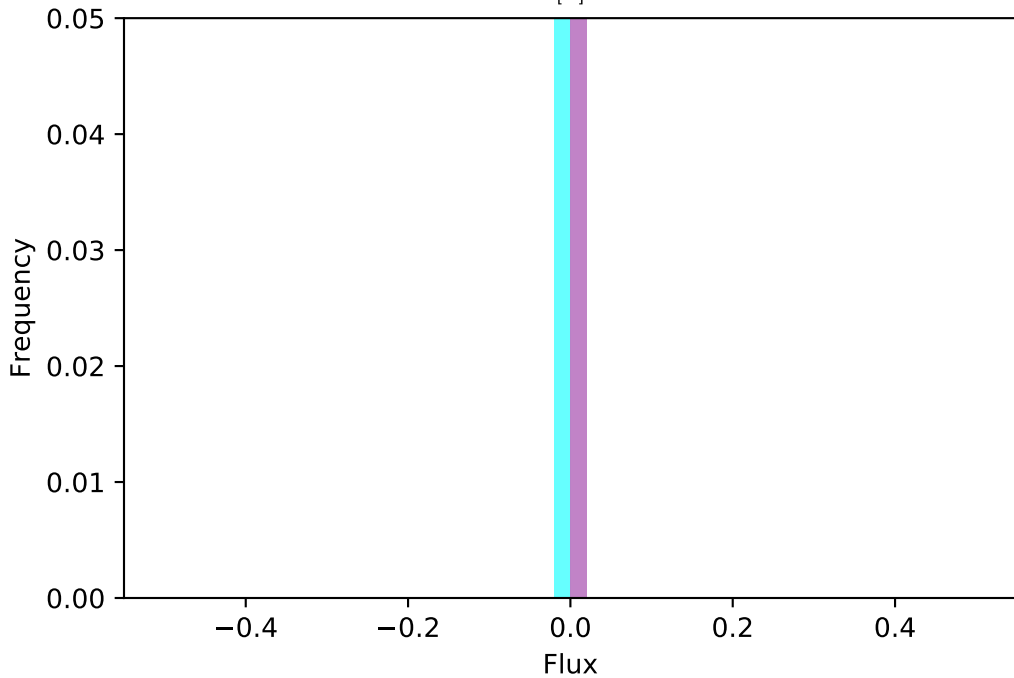




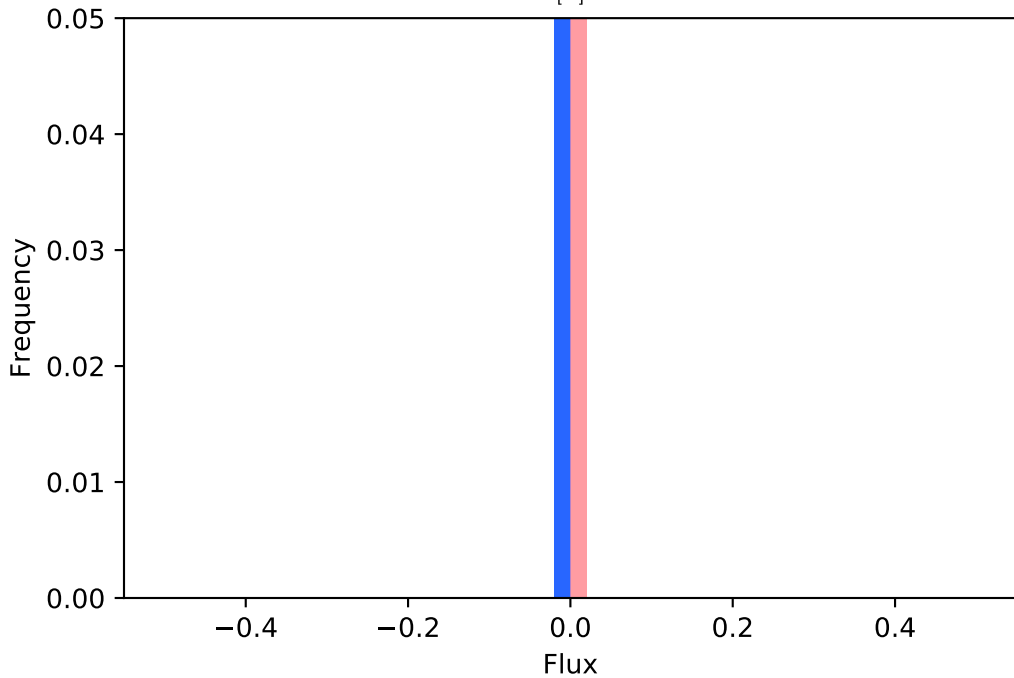
426 : Leu\_h --> Leu\_c  
[<sup>+</sup>-<sup>+</sup>]



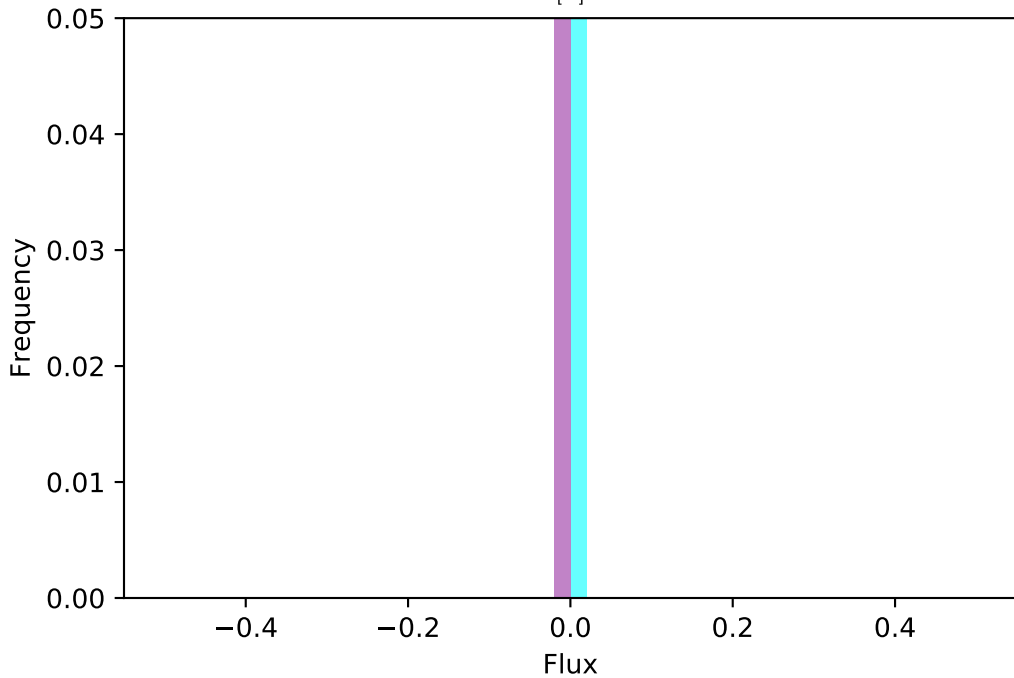
427 : Leu\_c --> Leu\_m  
['-']



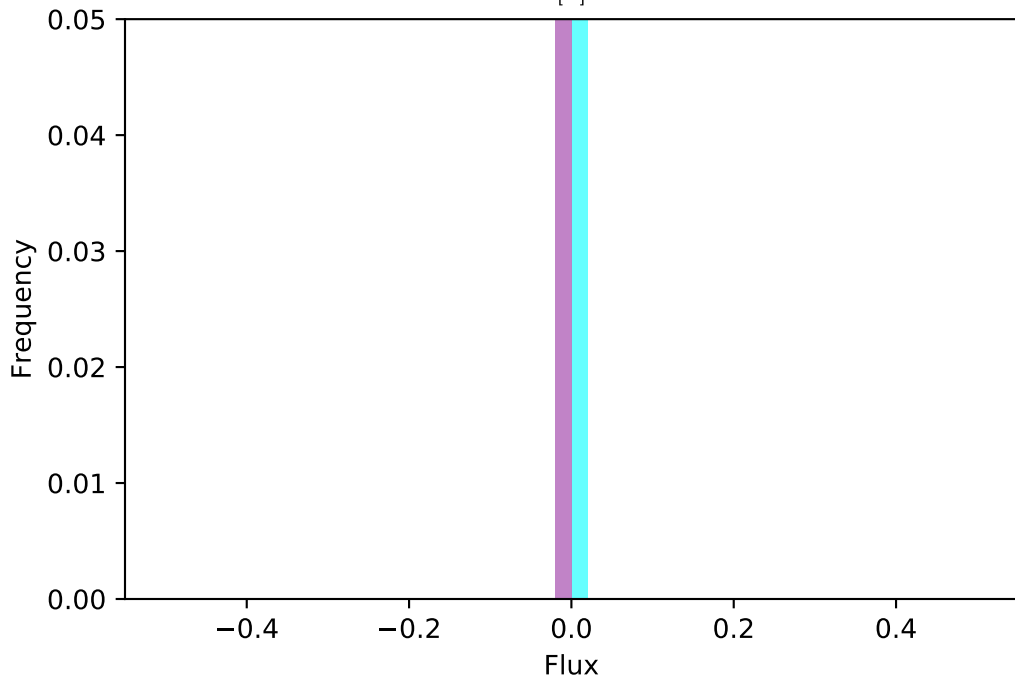
428 : Lys\_h --> Lys\_c  
[<sup>+</sup>-<sup>+</sup>]



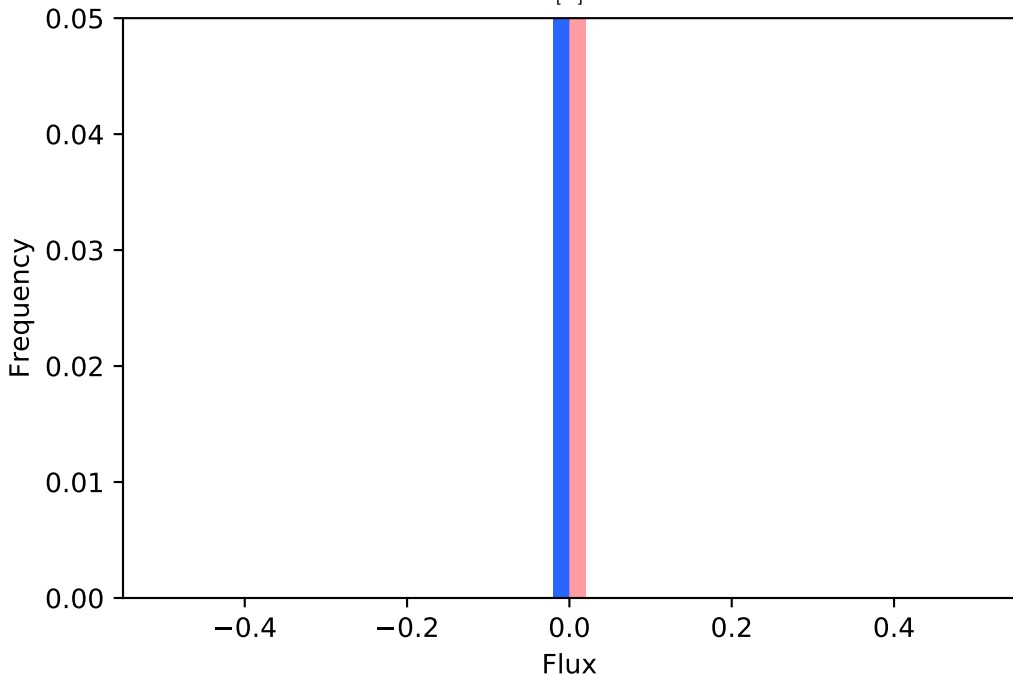
429 : Met\_c --> Met\_h  
[<sup>+</sup>-<sup>+</sup>]



430 : Met\_c --> Met\_m  
['-']

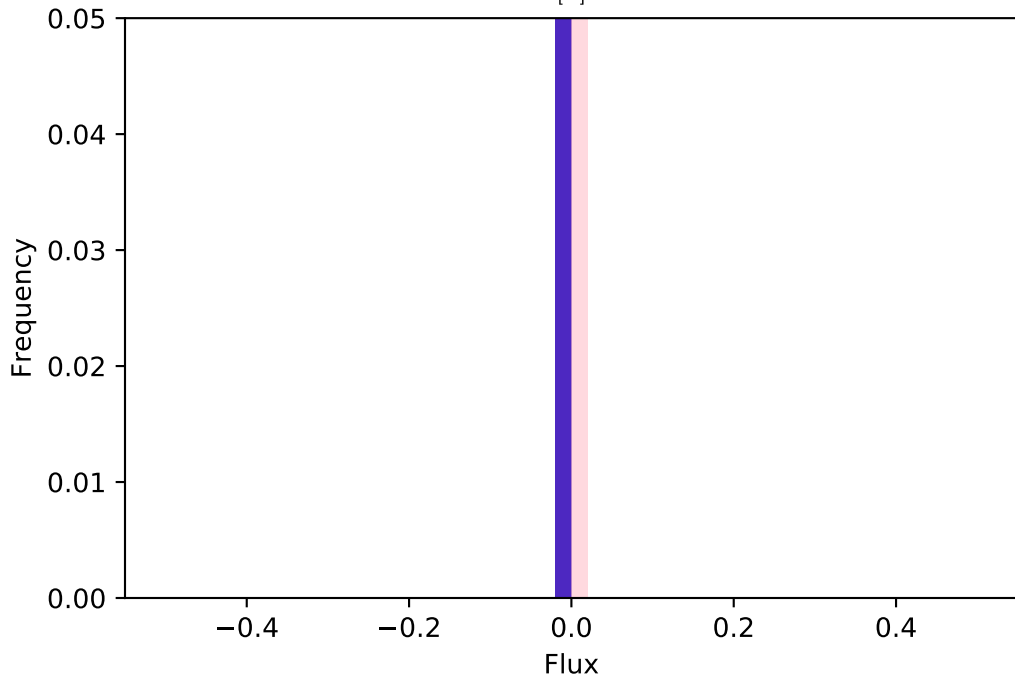


431 : Phe\_h --> Phe\_c  
[<sup>-</sup>']

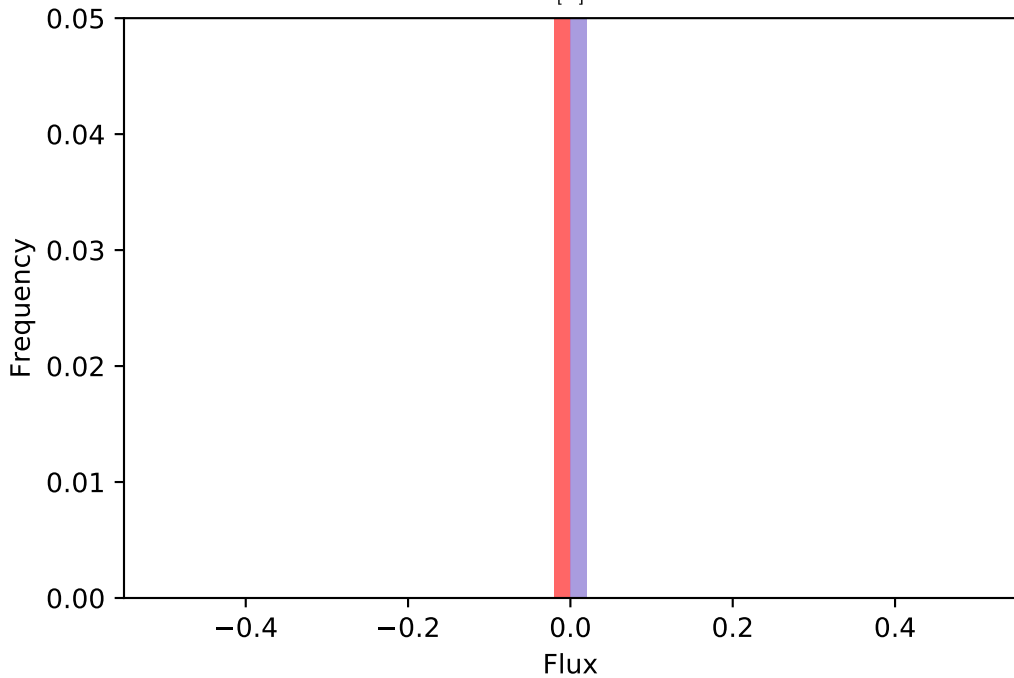




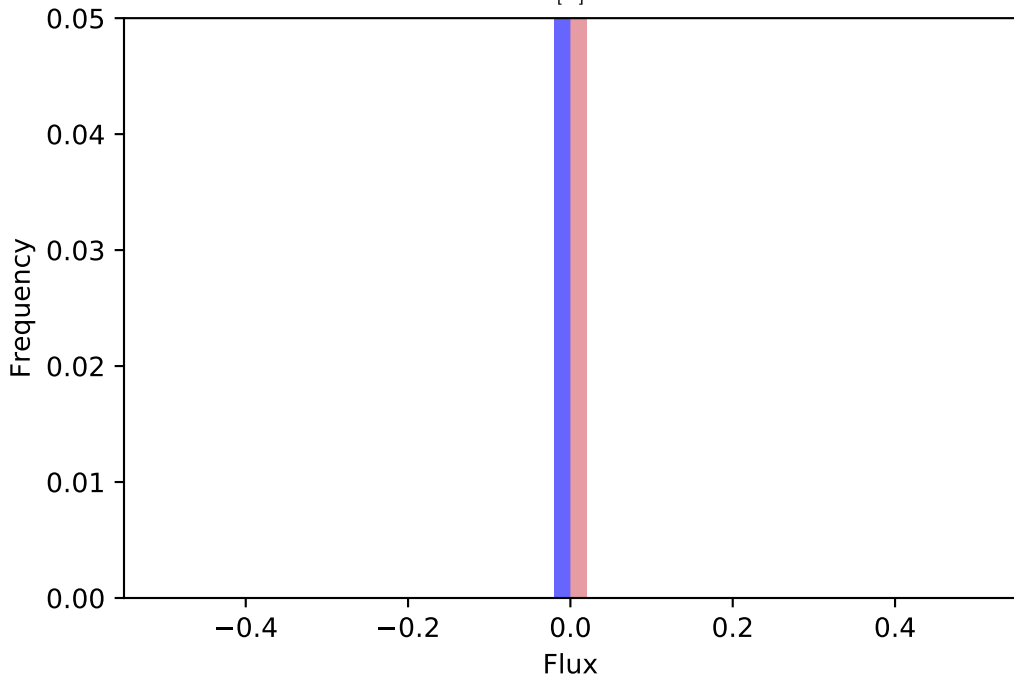
432 : Phe\_c --> Phe\_m  
['-']



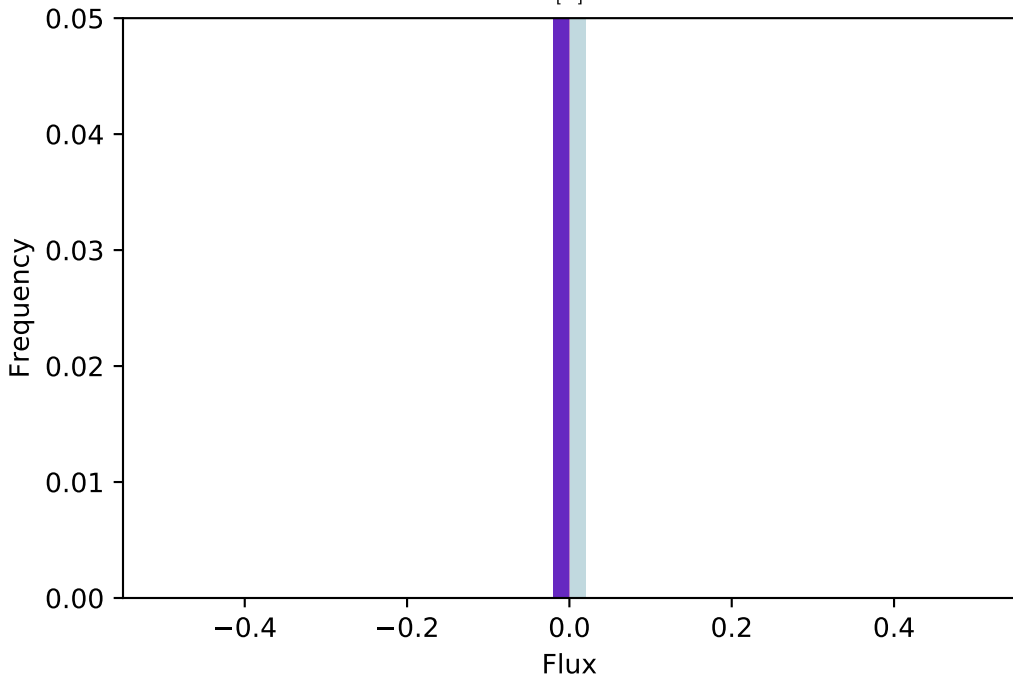
433 : Pro\_c --> Pro\_h  
[<sup>+</sup>-<sup>+</sup>]



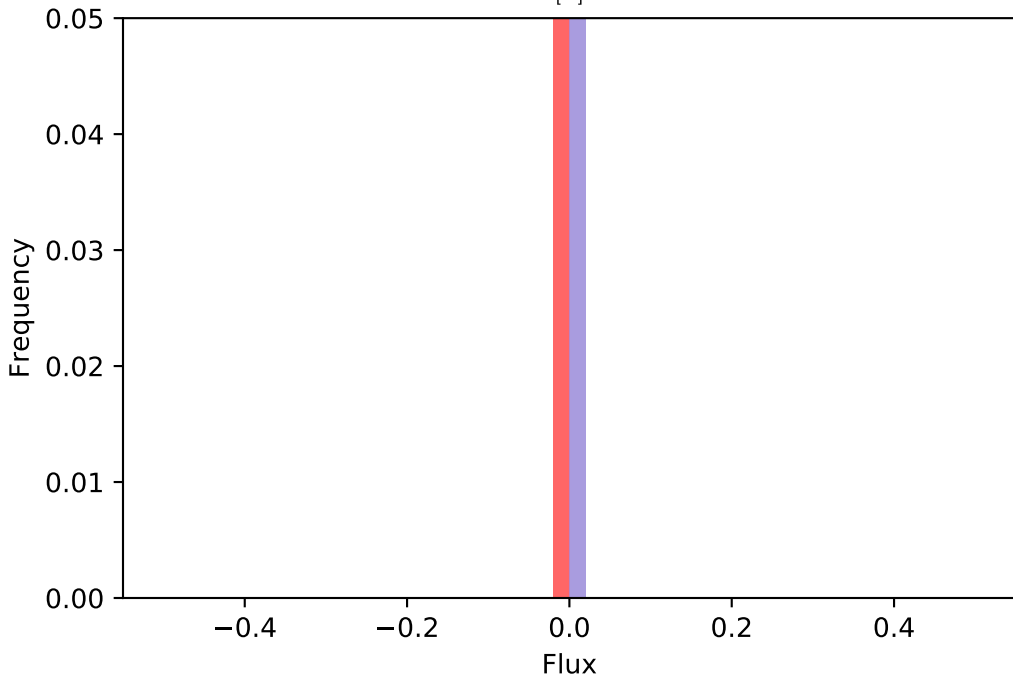
434 : Ser\_h --> Ser\_c  
[<sup>-</sup>'<sup>-</sup>']



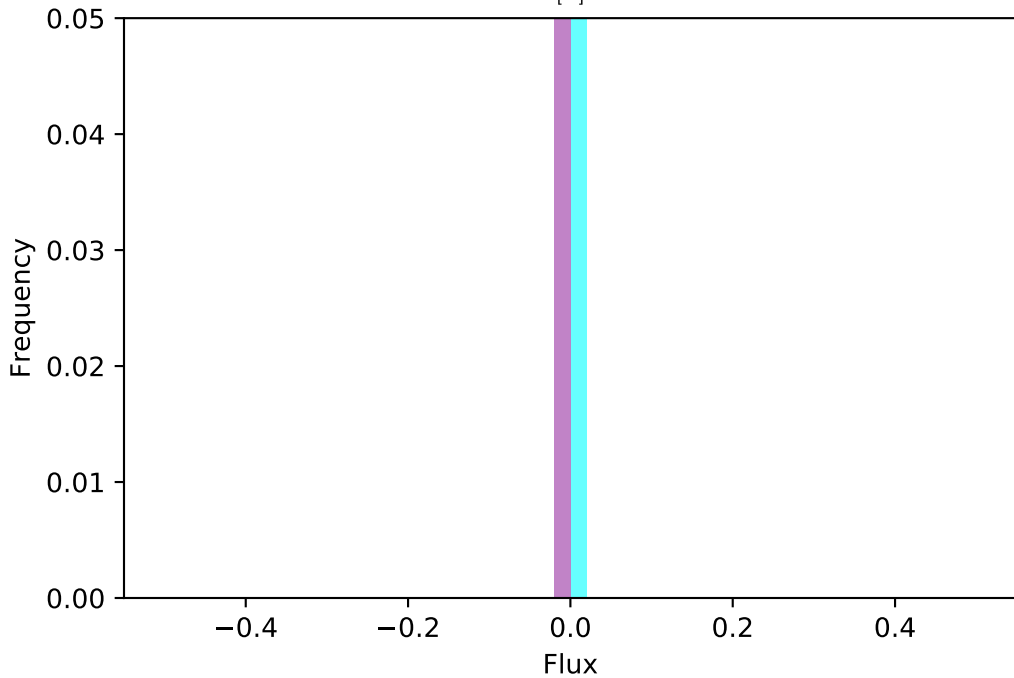
435 : Ser\_c --> Ser\_m  
['-']



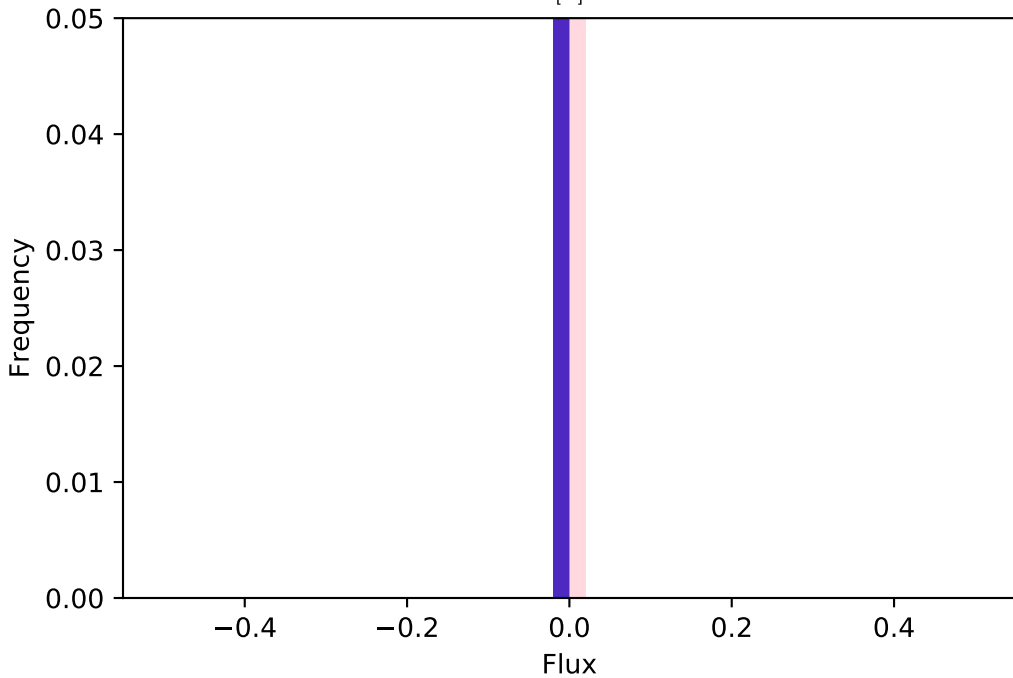
436 : Thr\_h --> Thr\_c  
[<sup>-1</sup>]



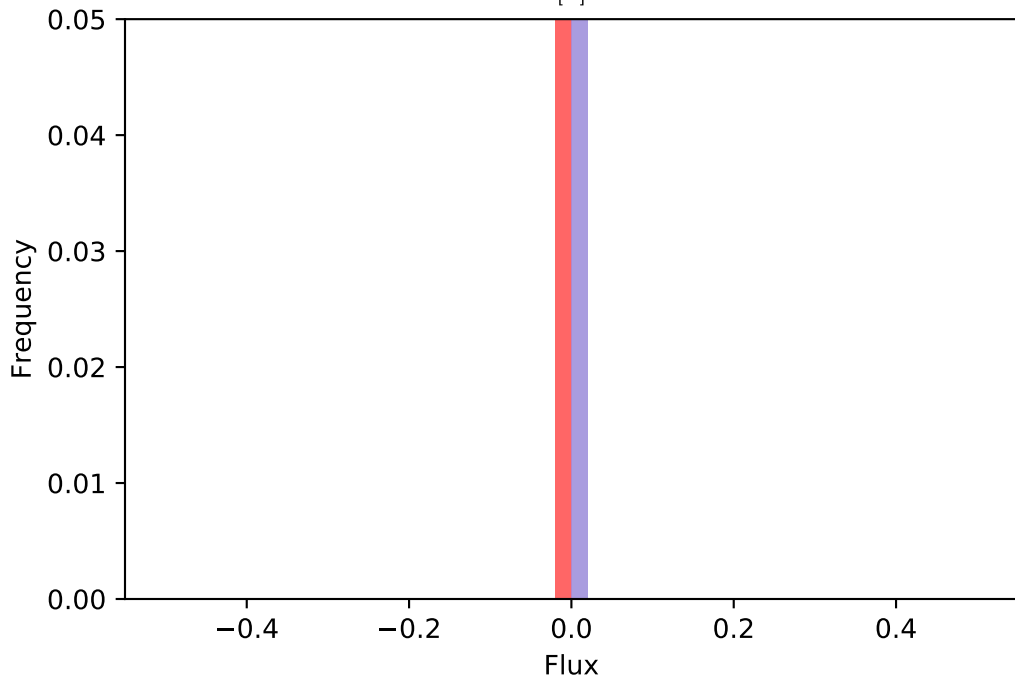
437 : Thr\_c --> Thr\_m  
['-']



438 : Trp\_h --> Trp\_c  
[<sup>-1</sup>]

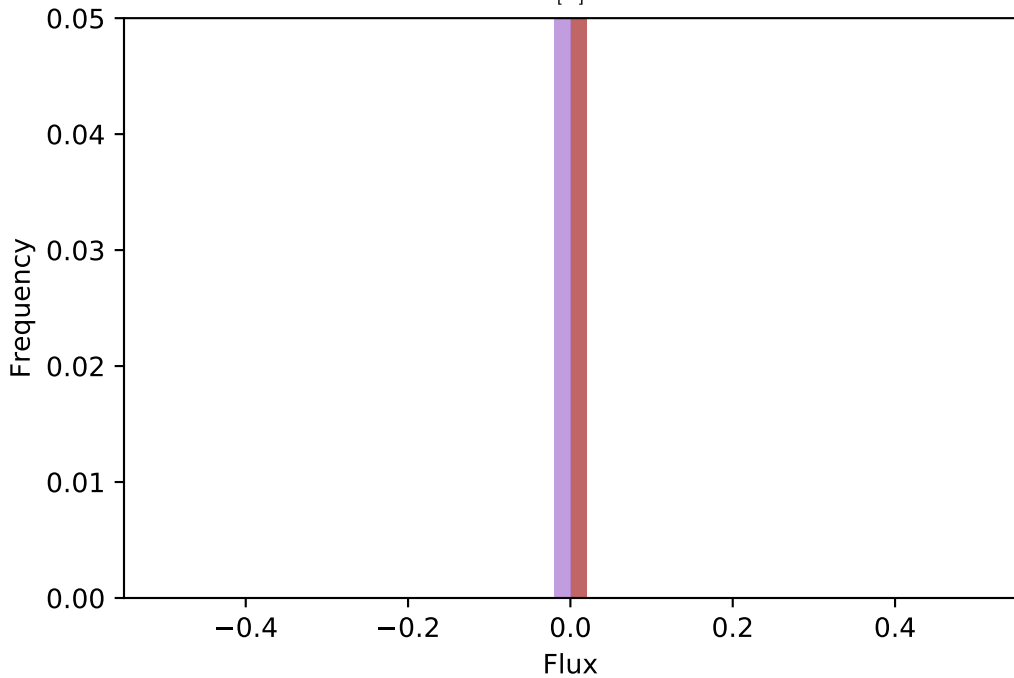


439 : Trp\_c --> Trp\_m  
['-']

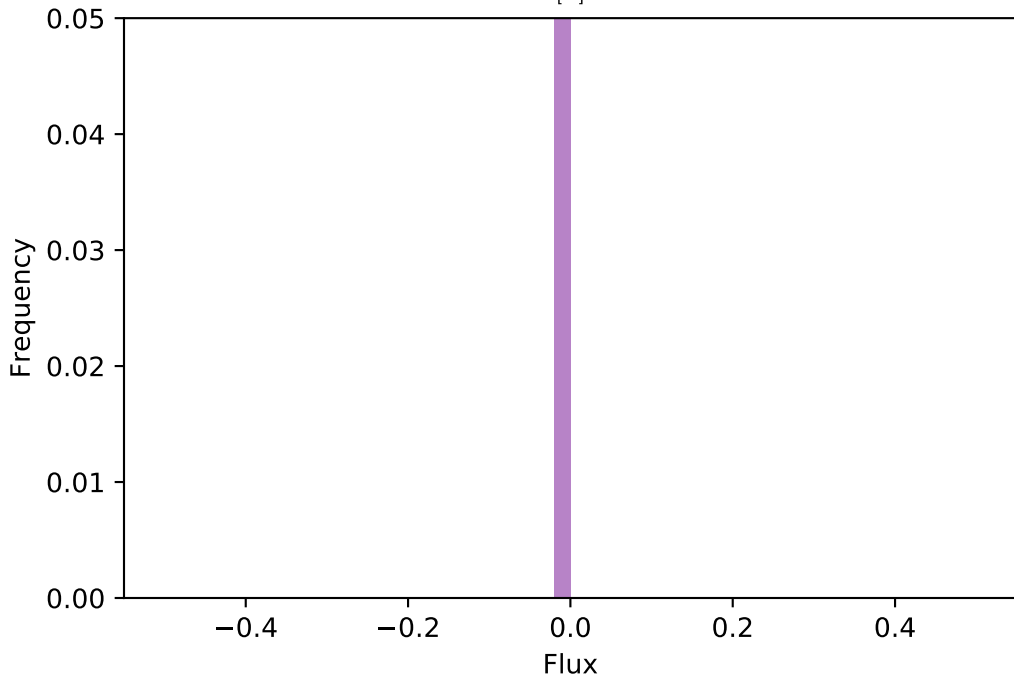




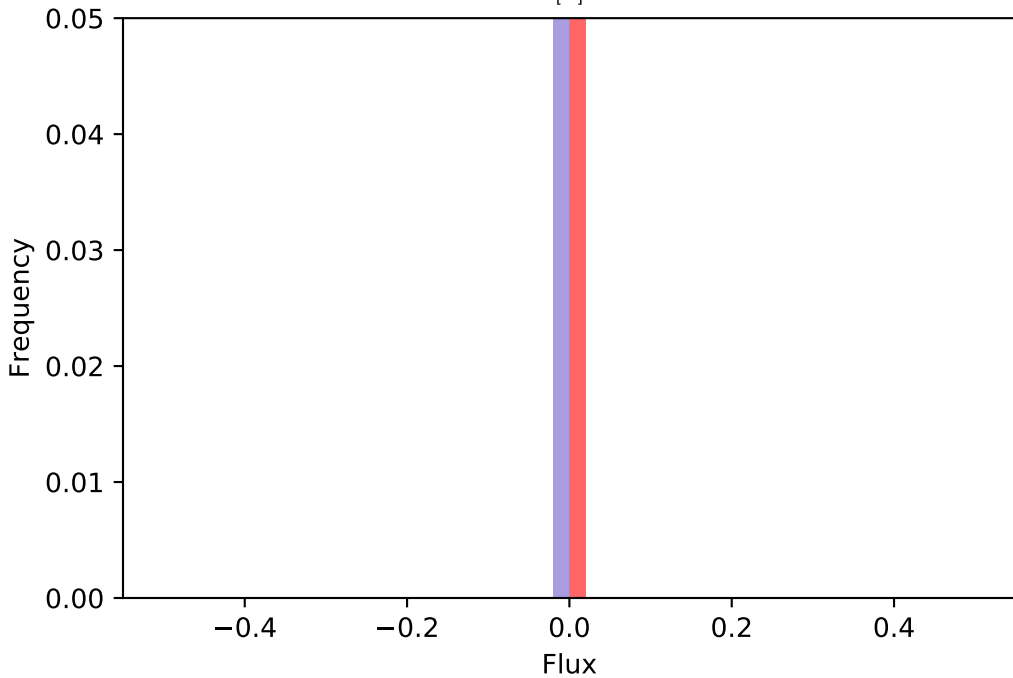
440 : Tyr\_h --> Tyr\_c  
[<sup>-1</sup>]



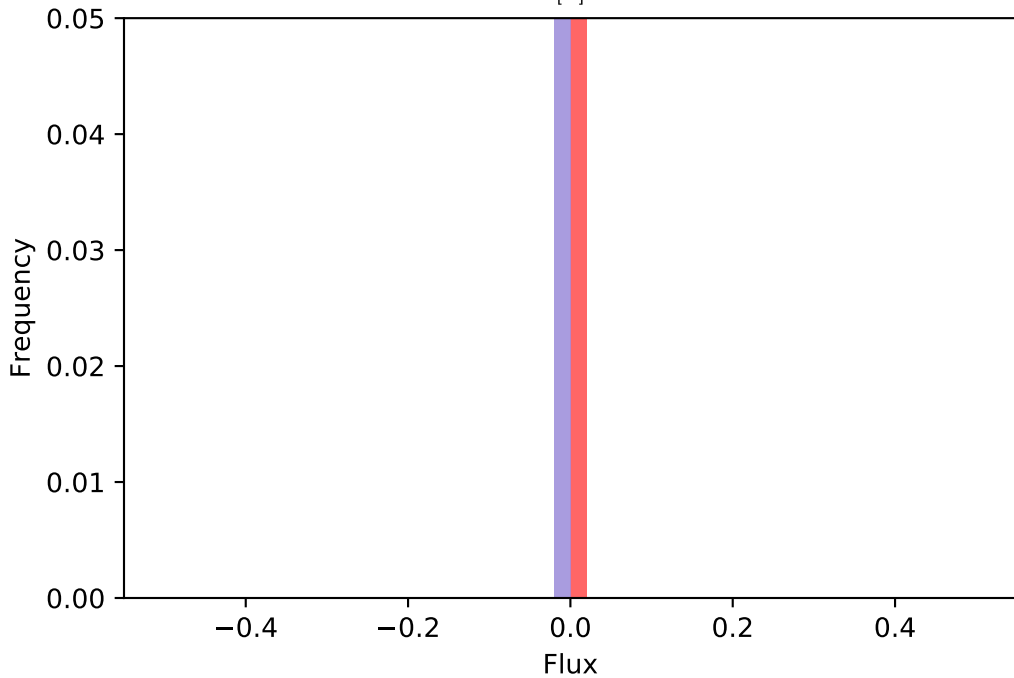
441 : Tyr\_c --> Tyr\_m  
['-']



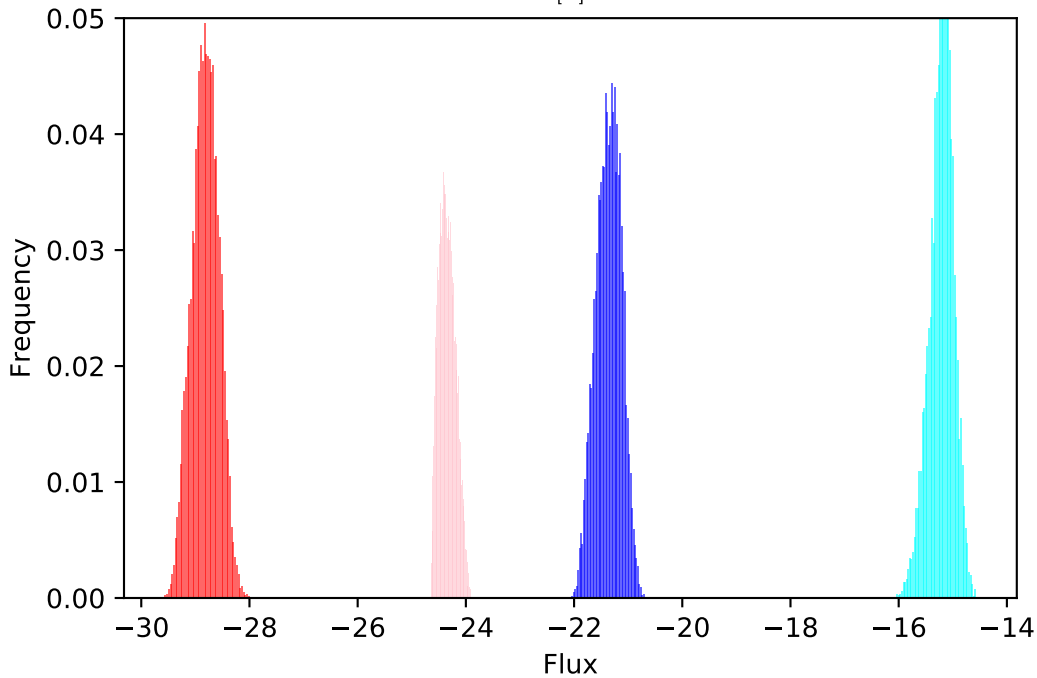
442 : Val\_h --> Val\_c  
['-']



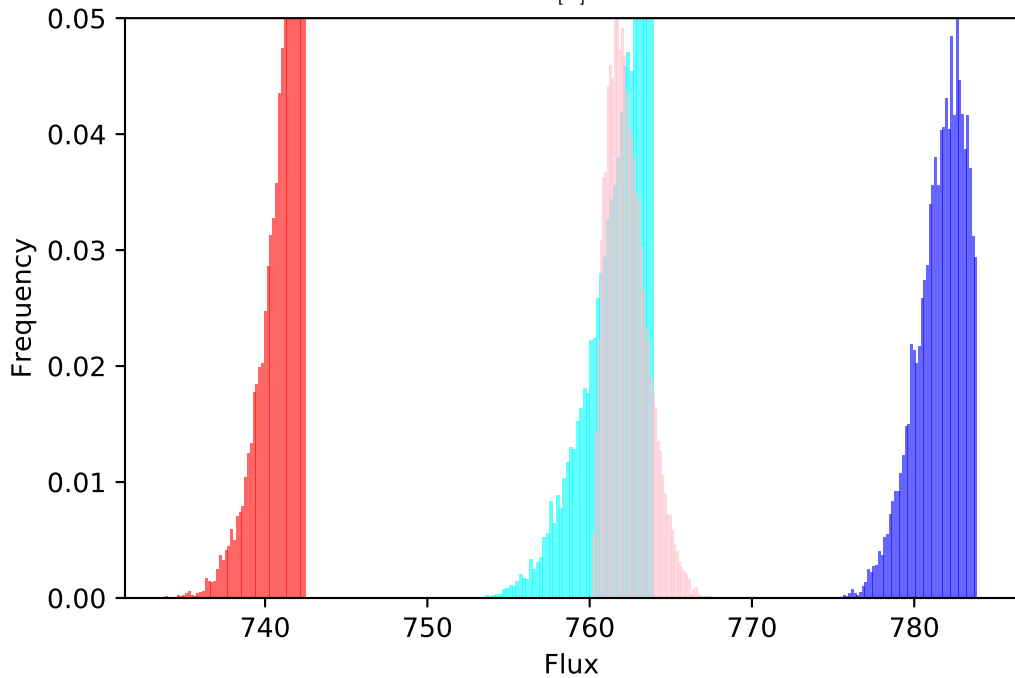
443 : Val\_c --> Val\_m  
['-']

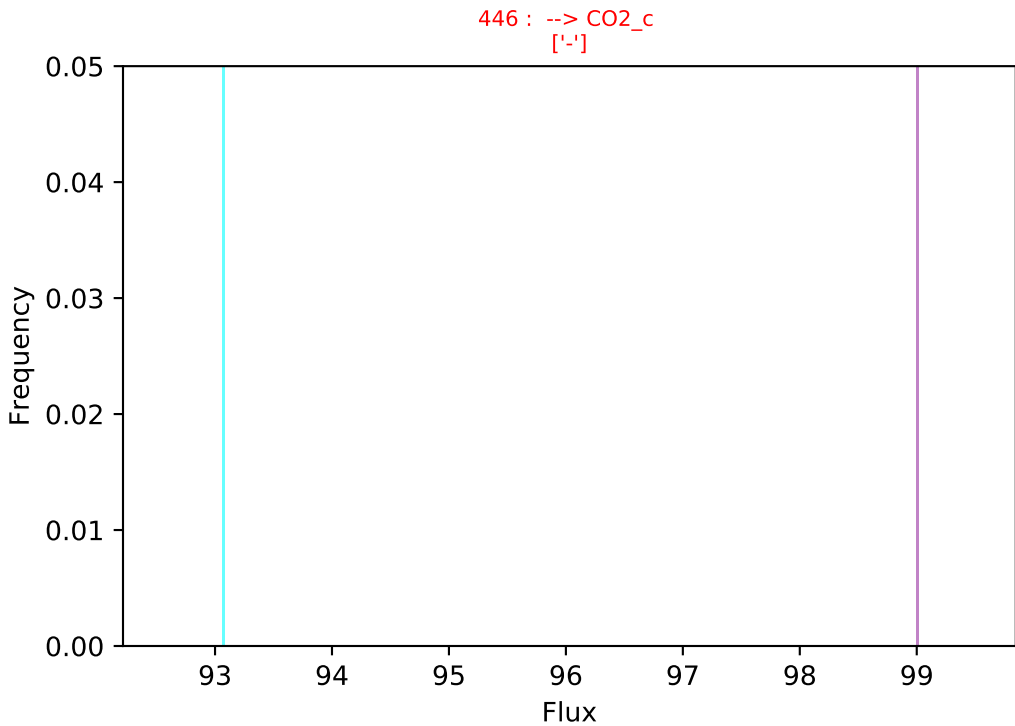


444 :  $\langle \Rightarrow \rangle$  H<sub>c</sub>  
['-']

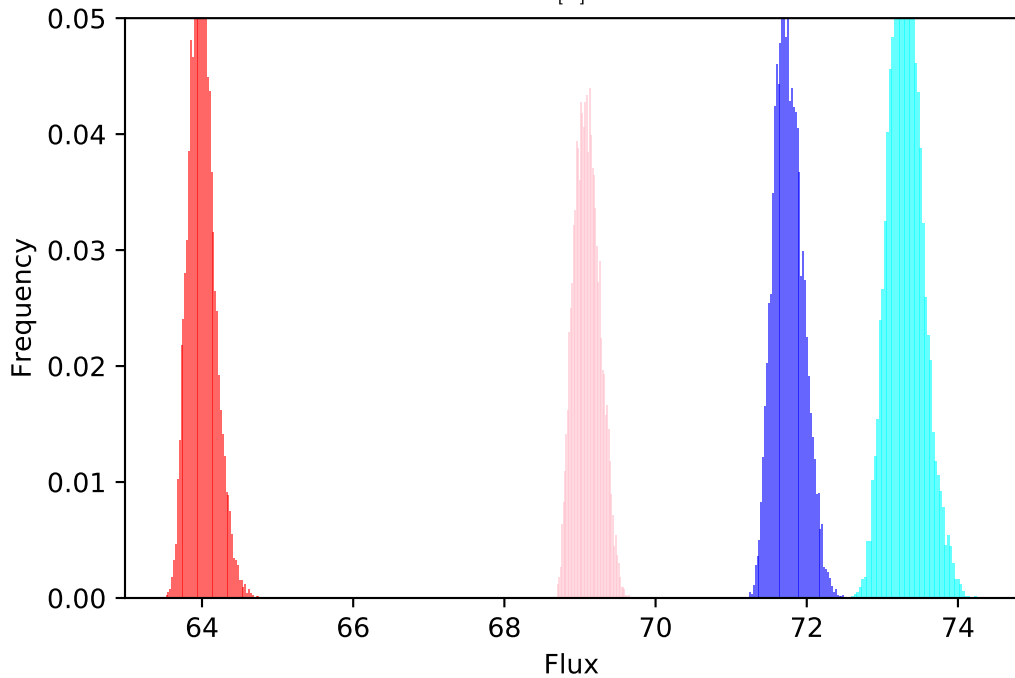


445 : --> hnu\_h  
['-']

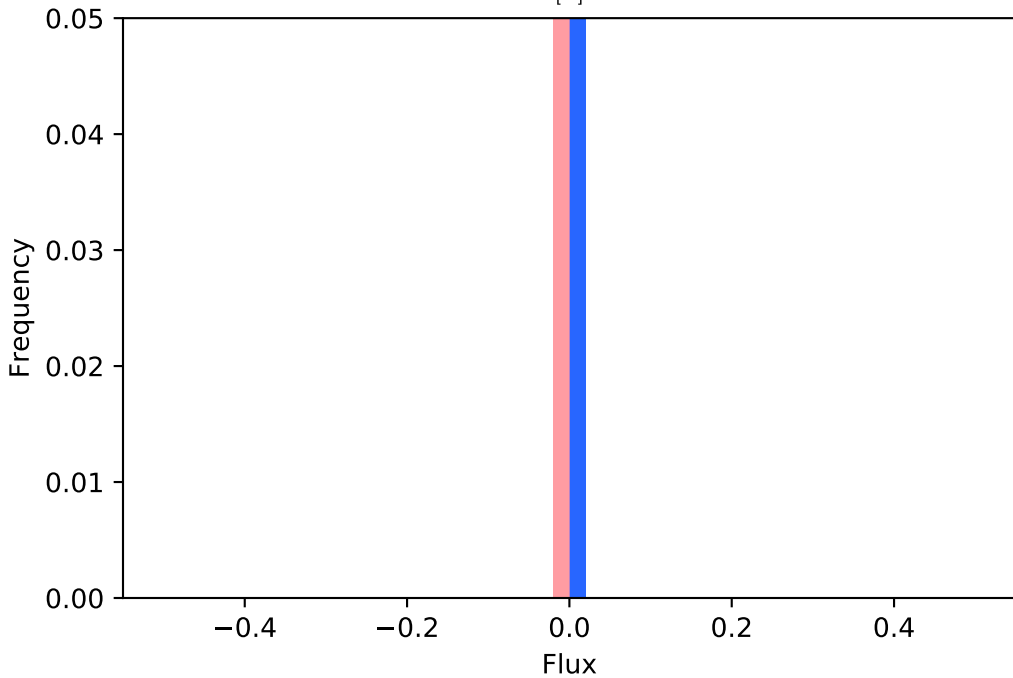
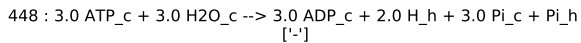


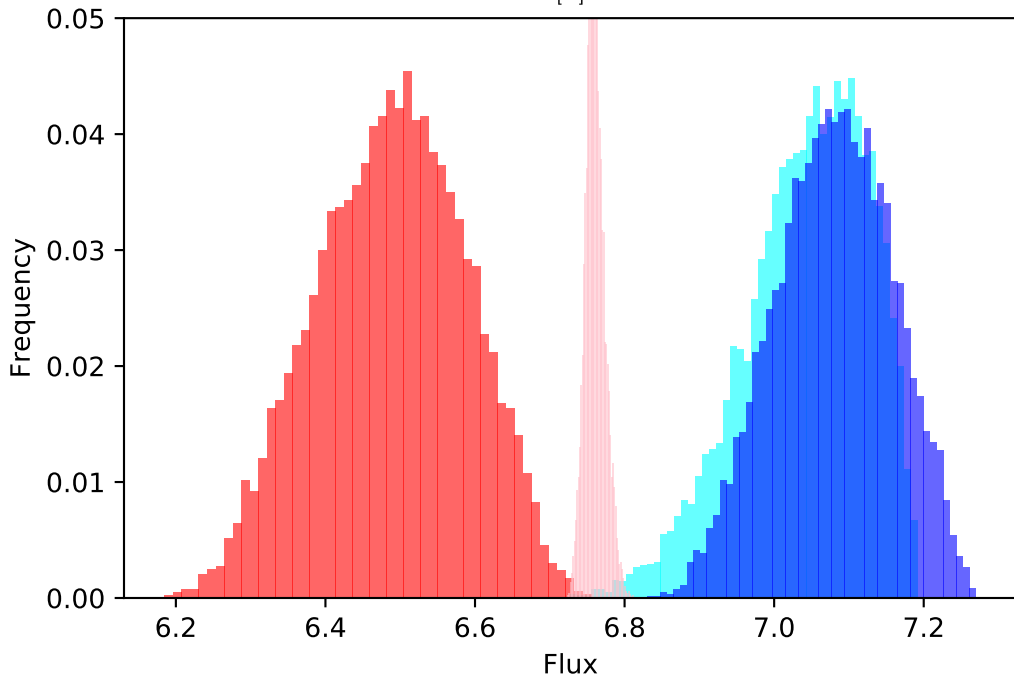
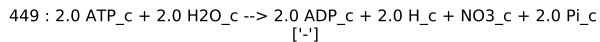


447 : --> H2O\_c  
['-']

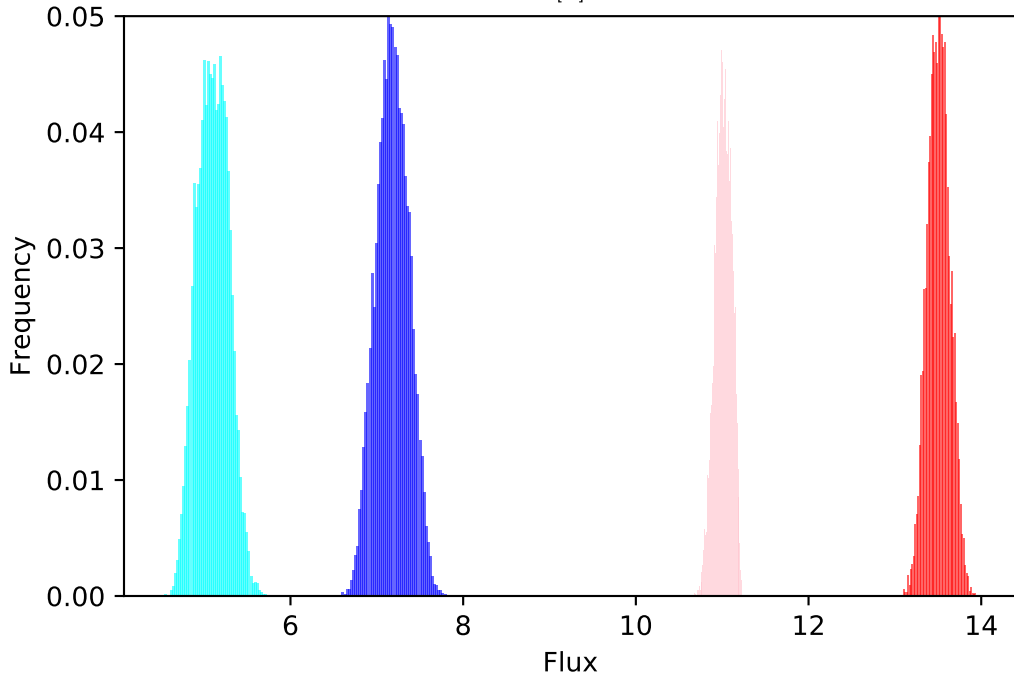




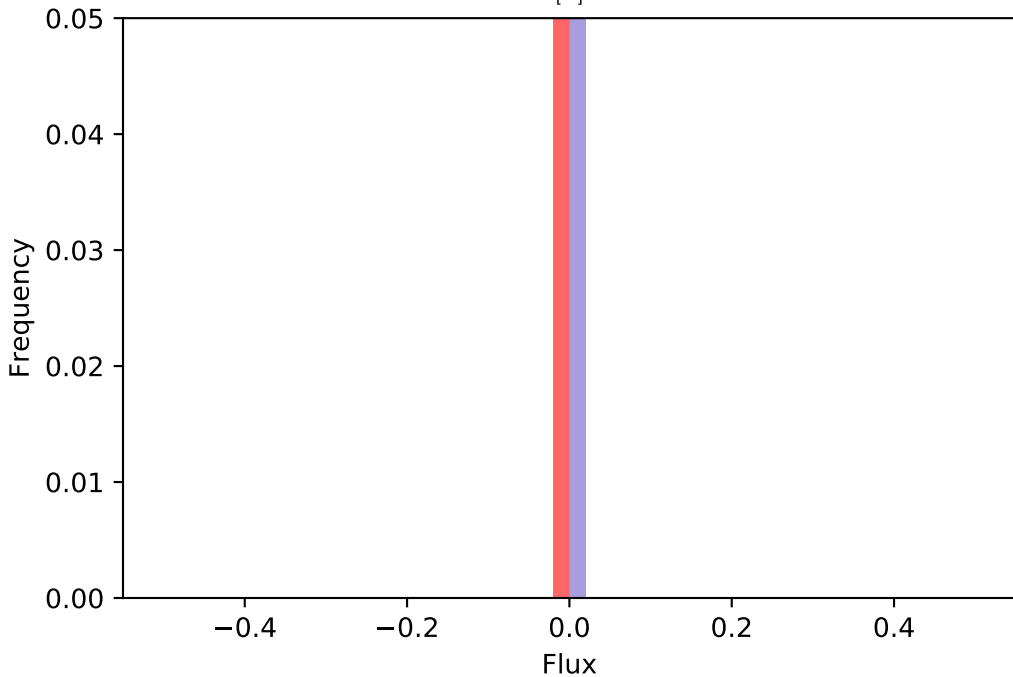


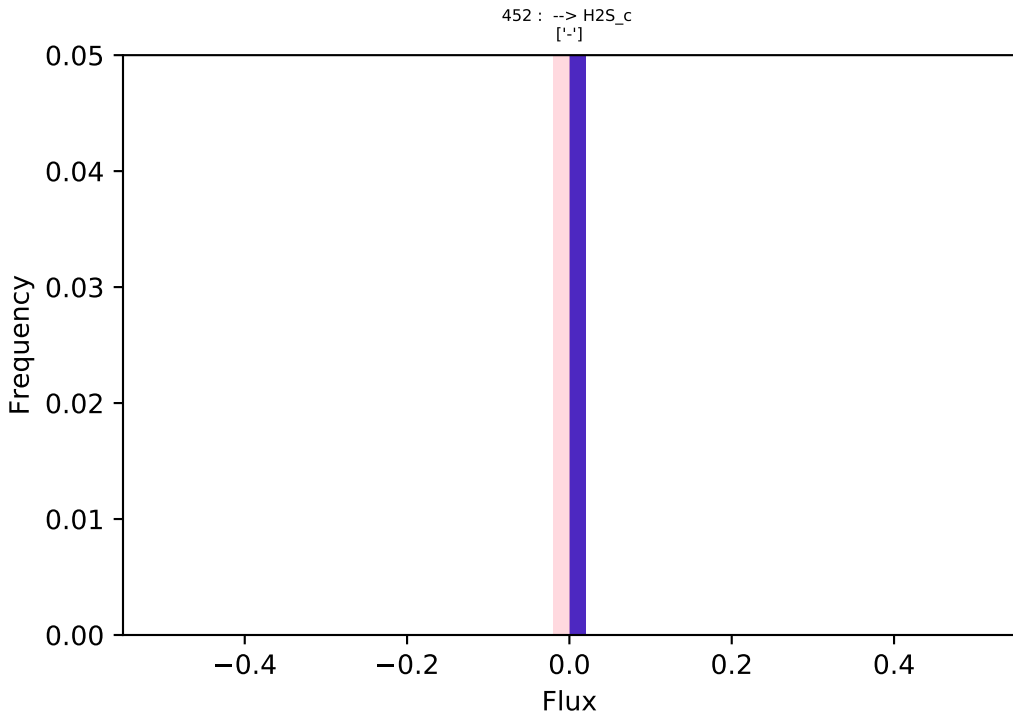


450 : --> NH4\_c  
['-']

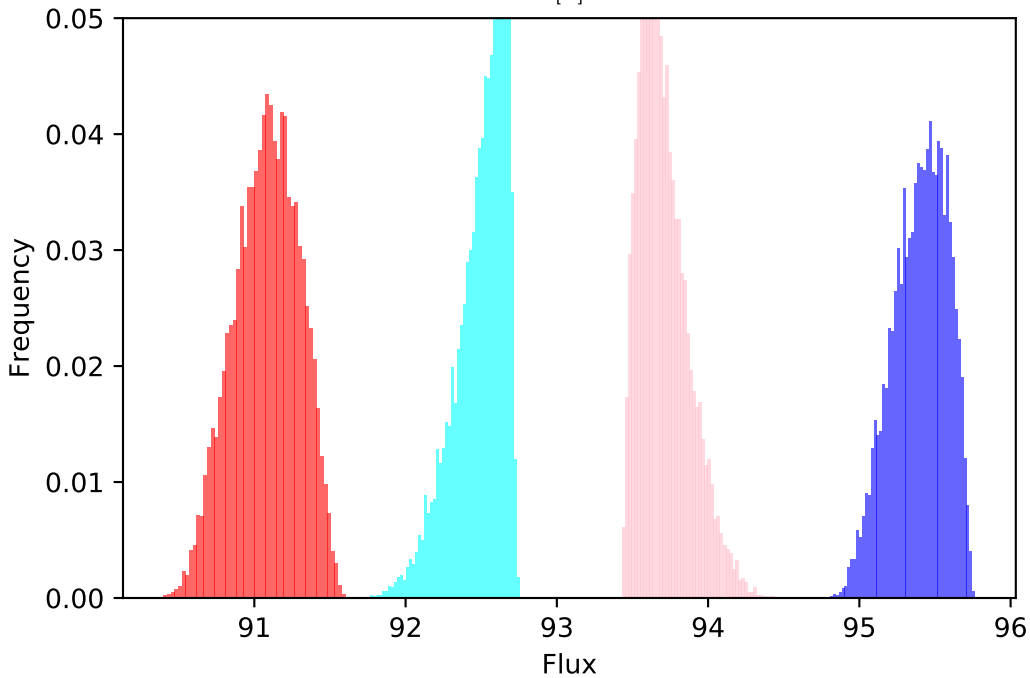


451 : 3.0 ATP\_c + 3.0 H2O\_c --> 3.0 ADP\_c + 3.0 H\_c + 3.0 Pi\_c + SO4\_c  
['-']

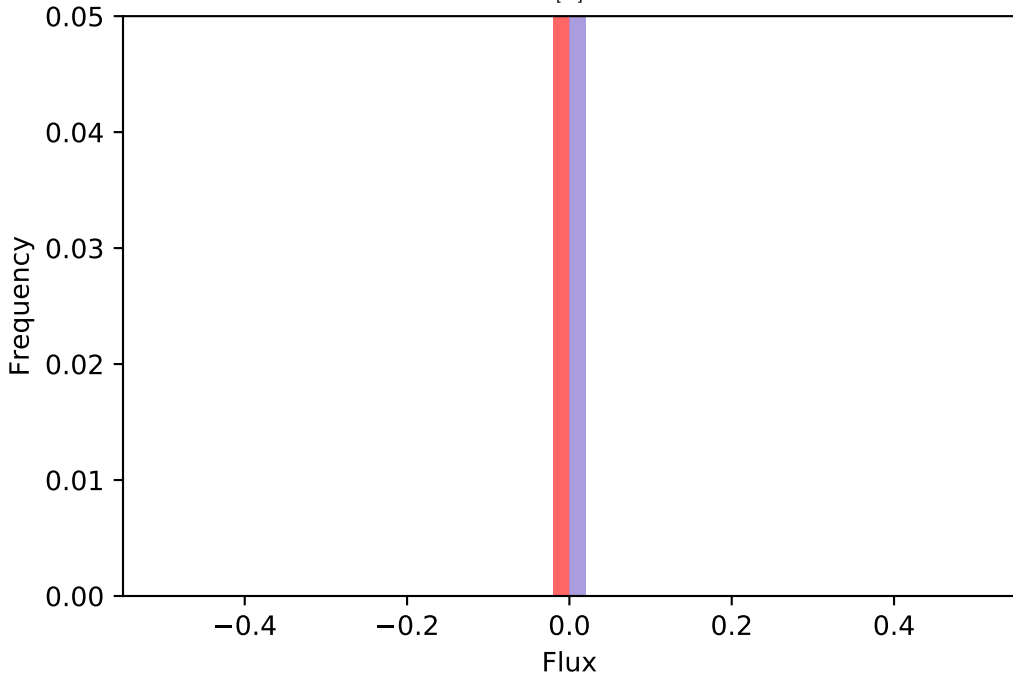




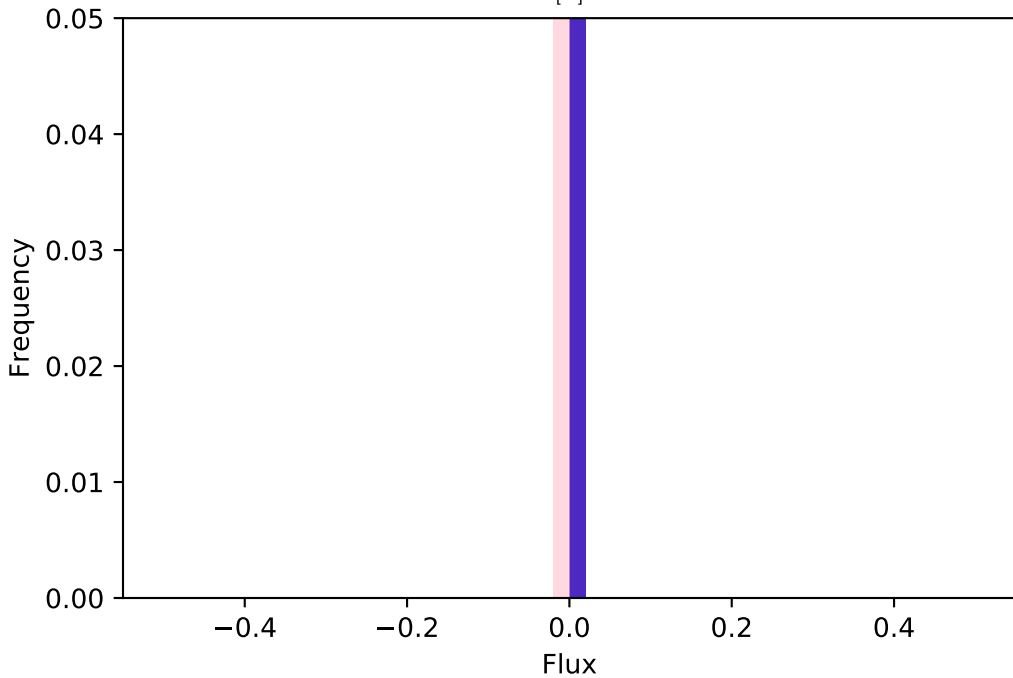
453 : O2\_c -->  
[<sup>-</sup>]



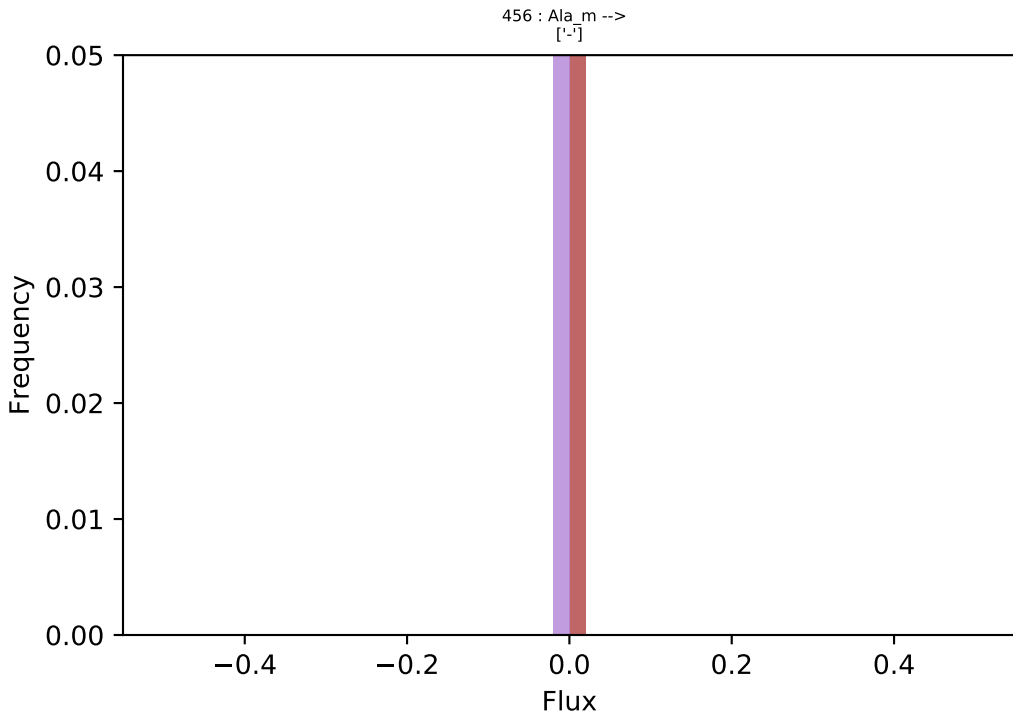
454 : Ala\_c -->  
[<sup>-</sup>]

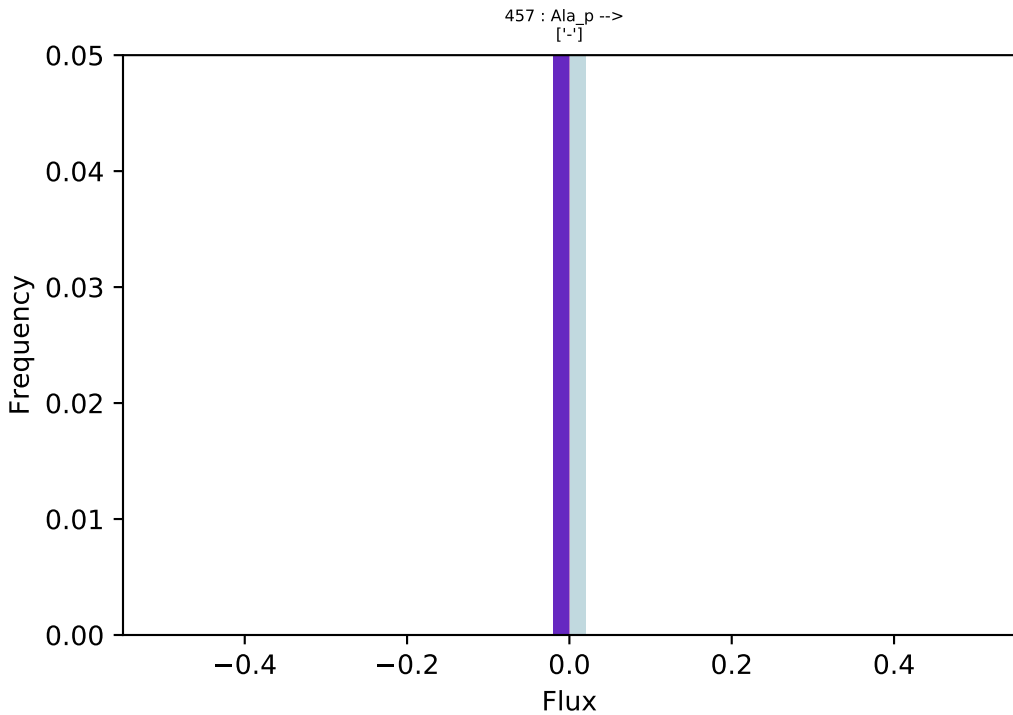


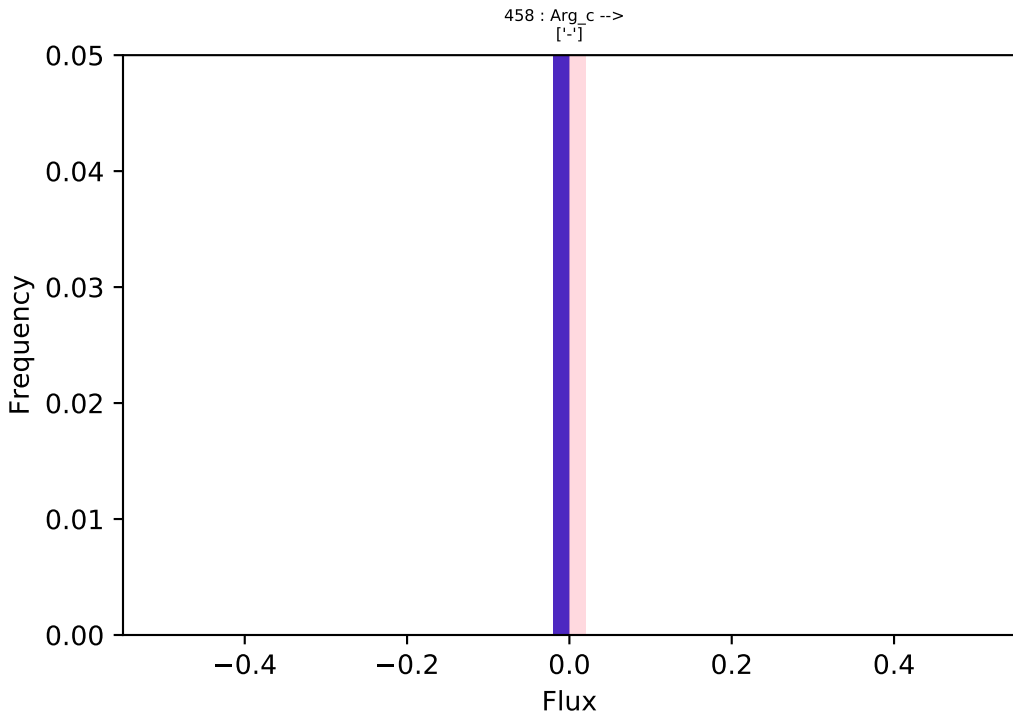
455 : Ala\_h -->  
[<sup>-</sup>]



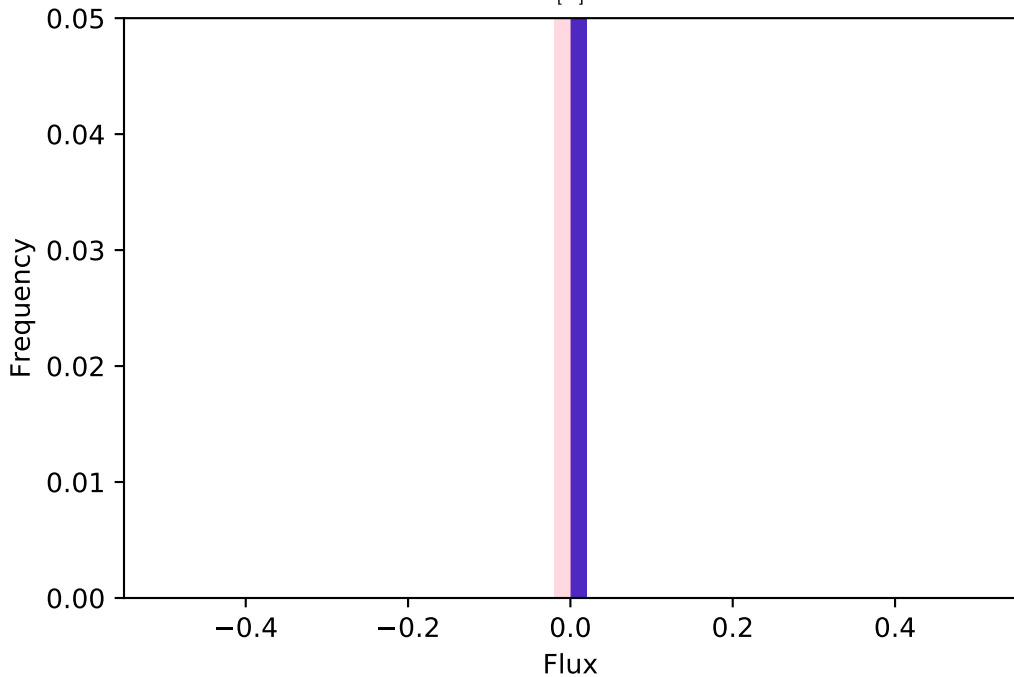


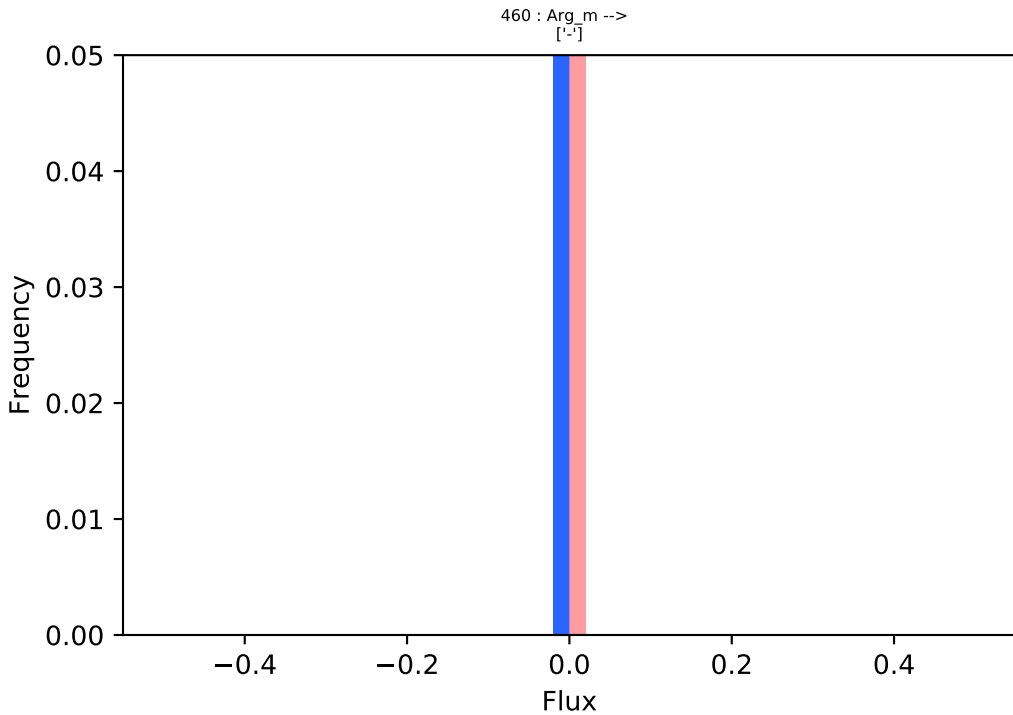


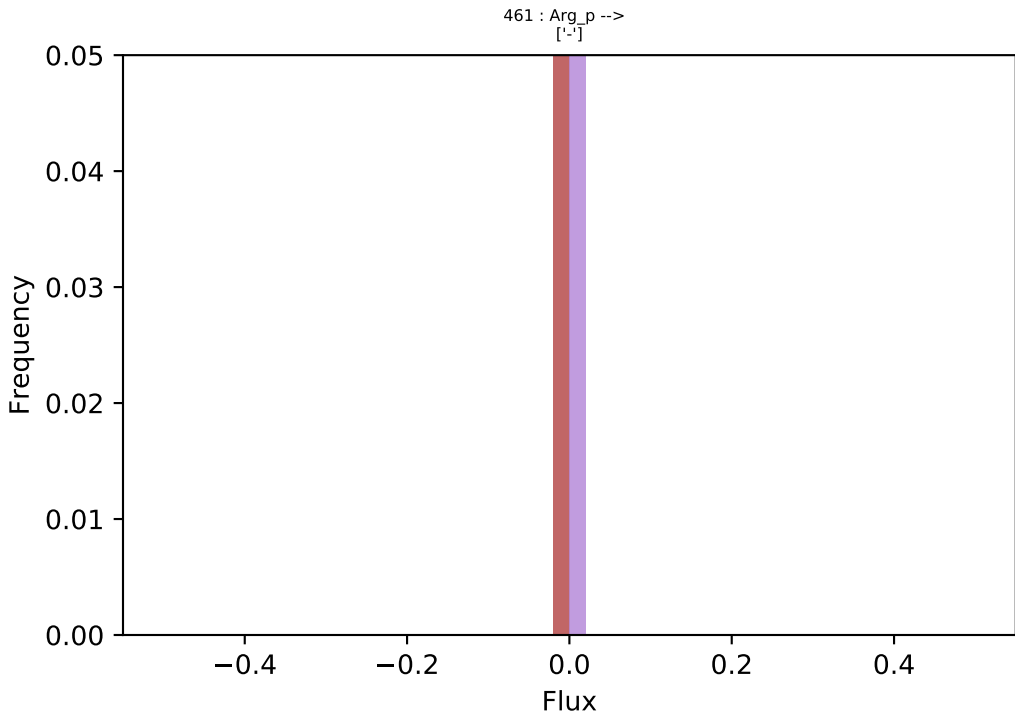


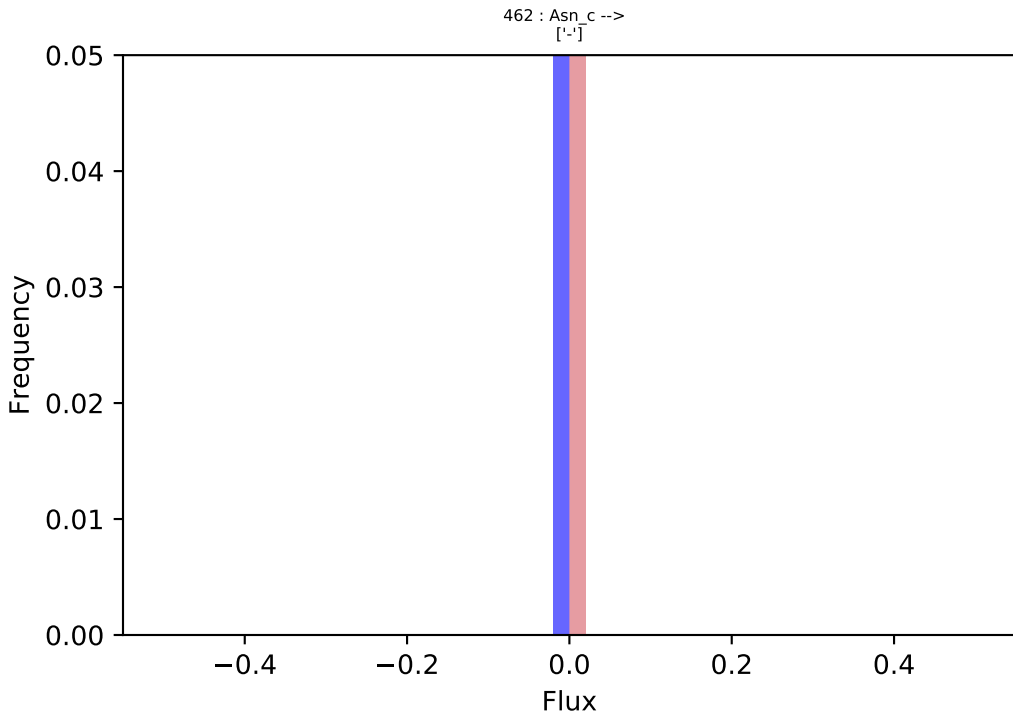


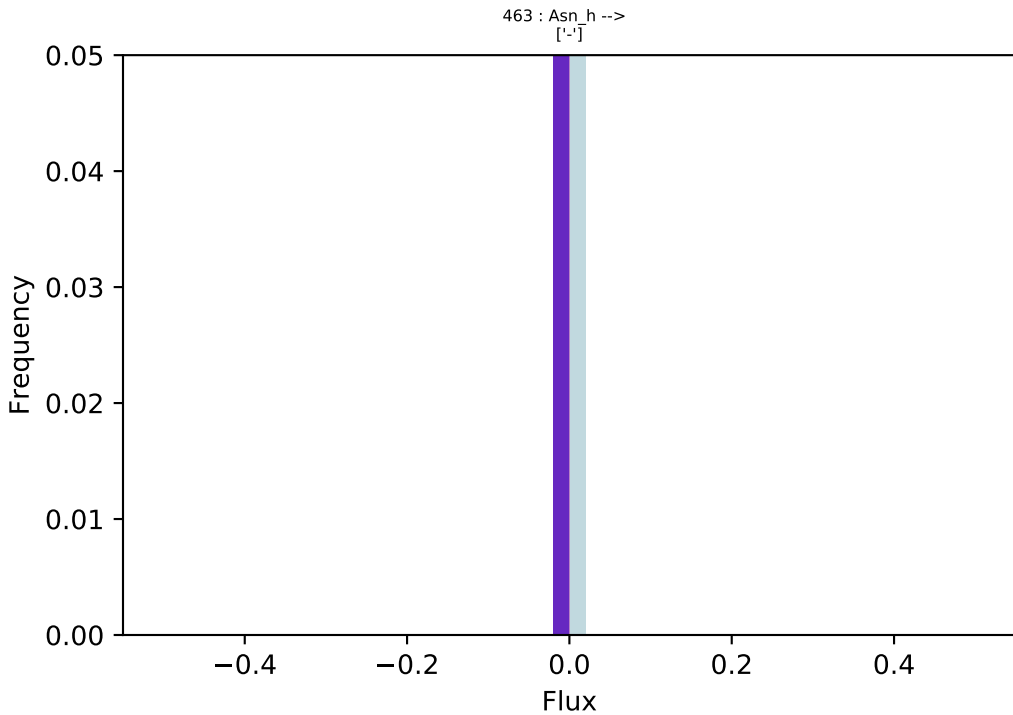
459 : Arg\_h -->  
['-']



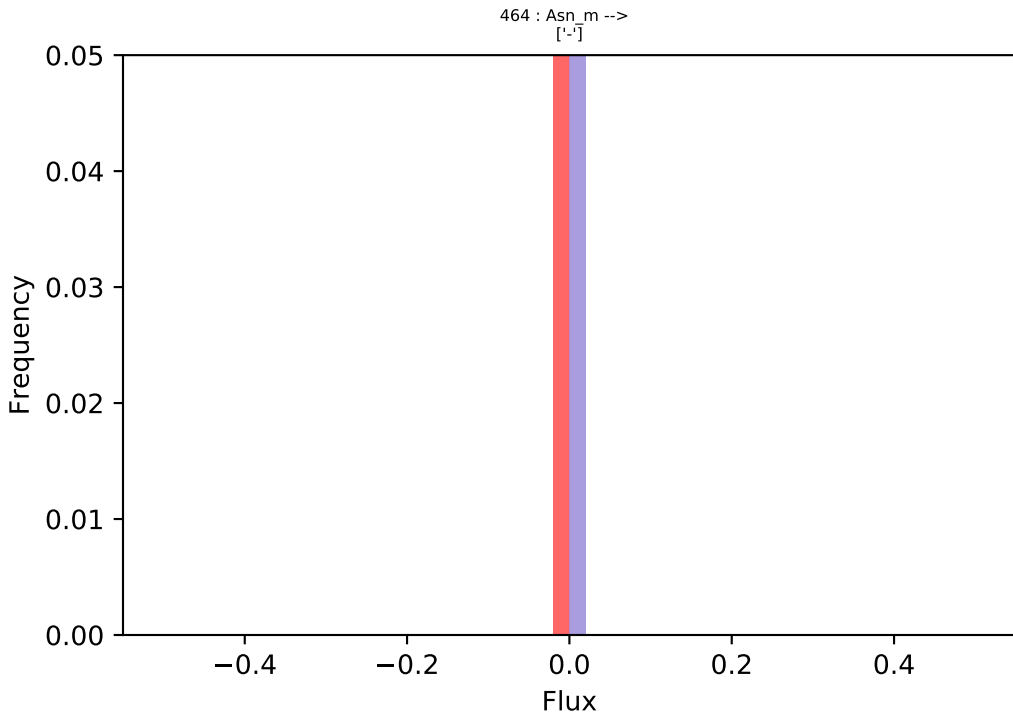


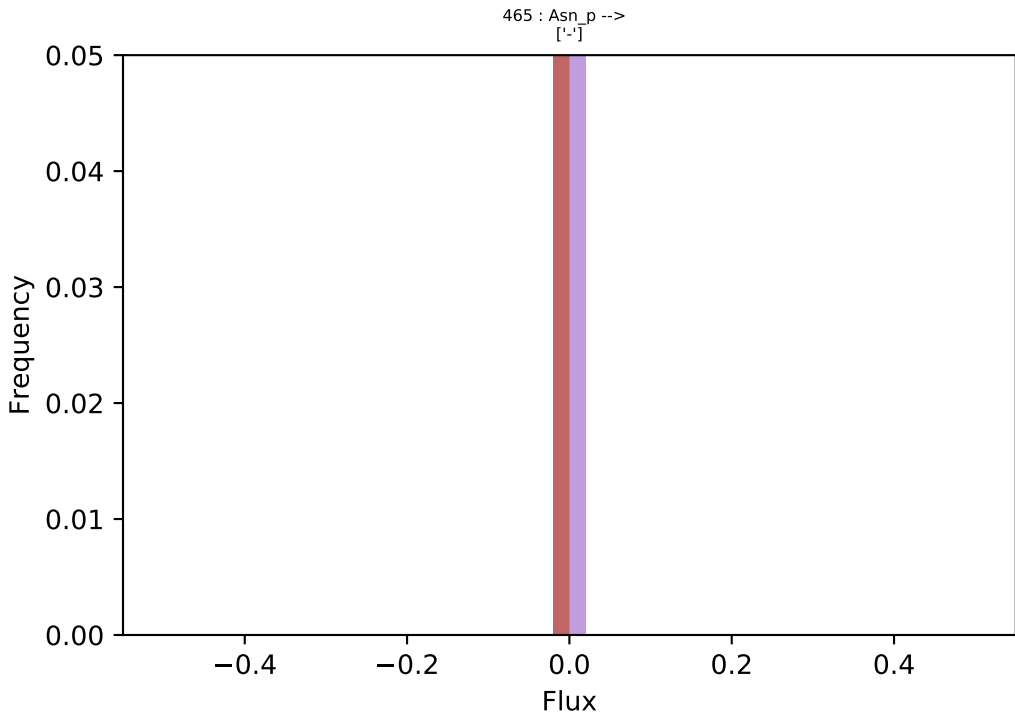




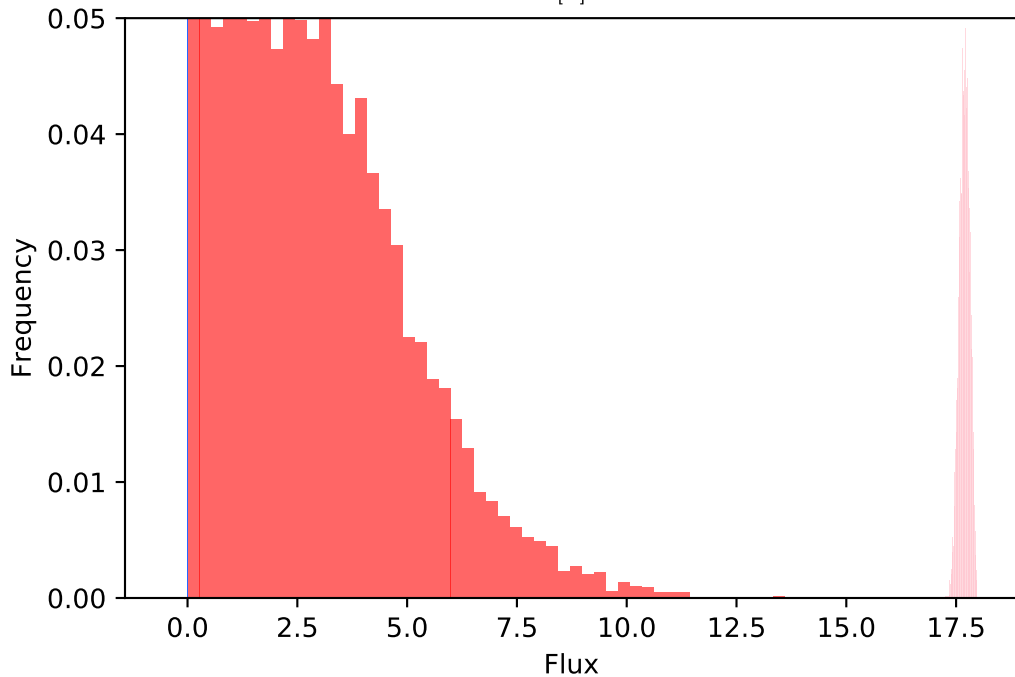




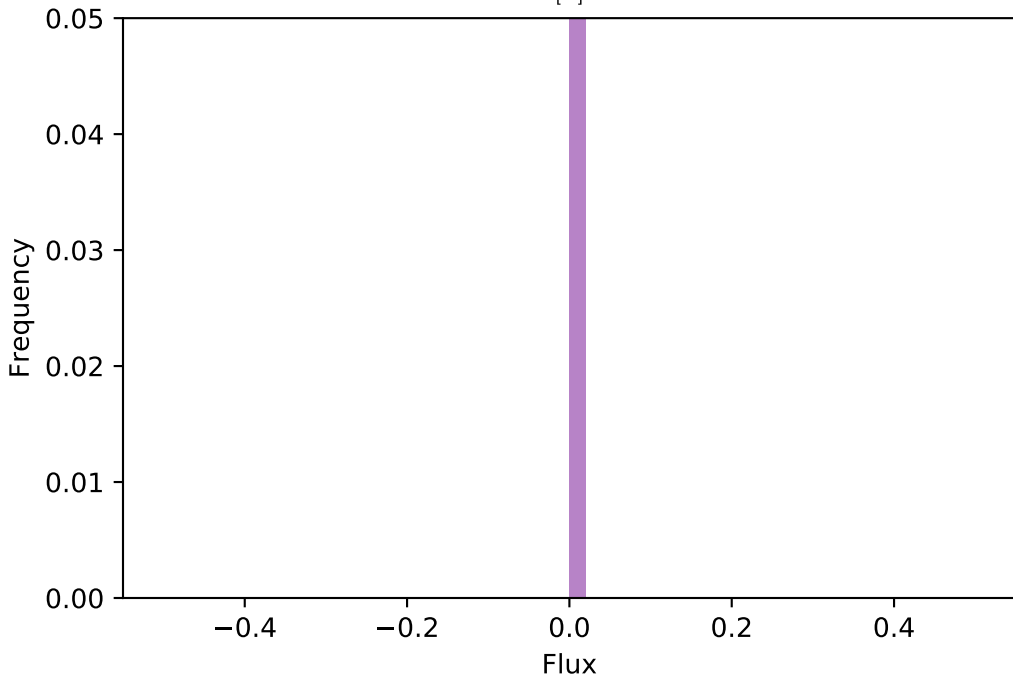




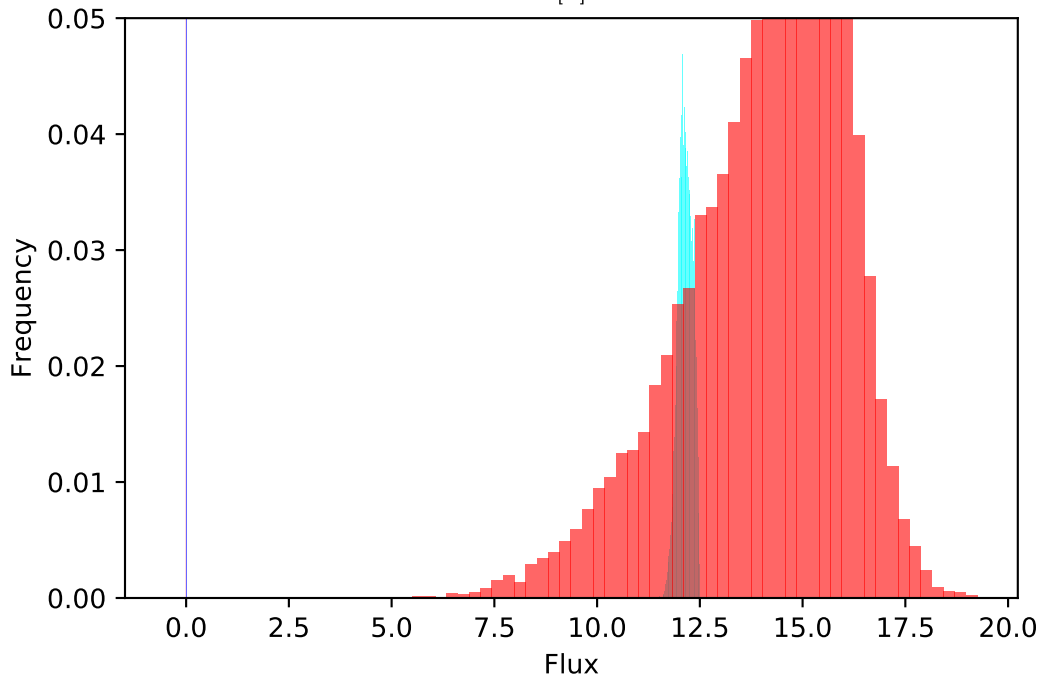
466 : Asp\_c -->  
['-']



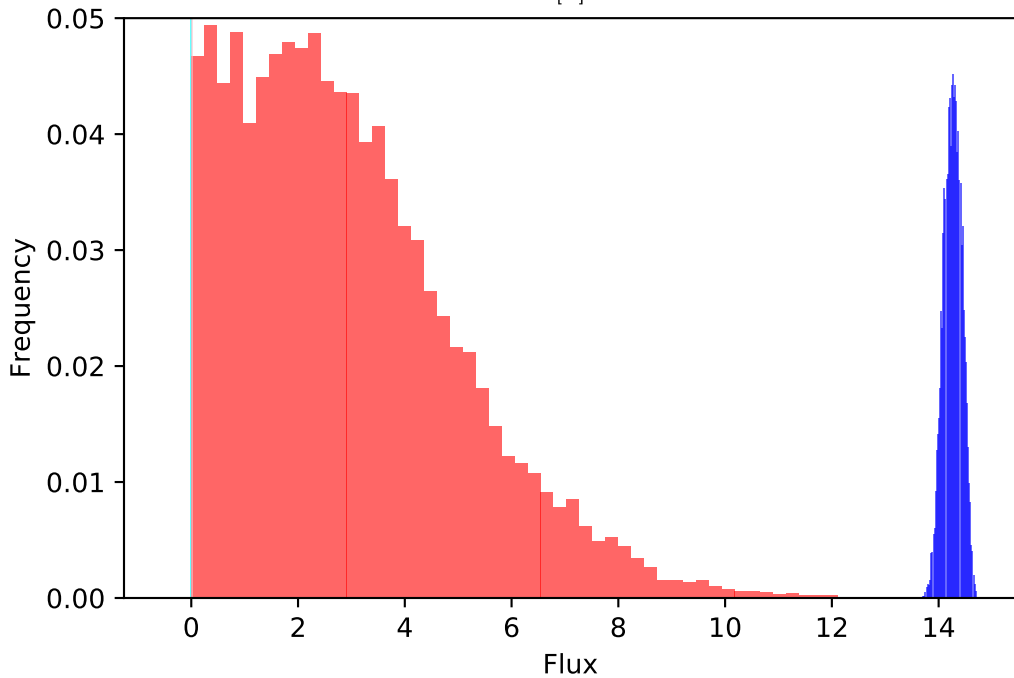
467 : Asp\_h -->  
['-']



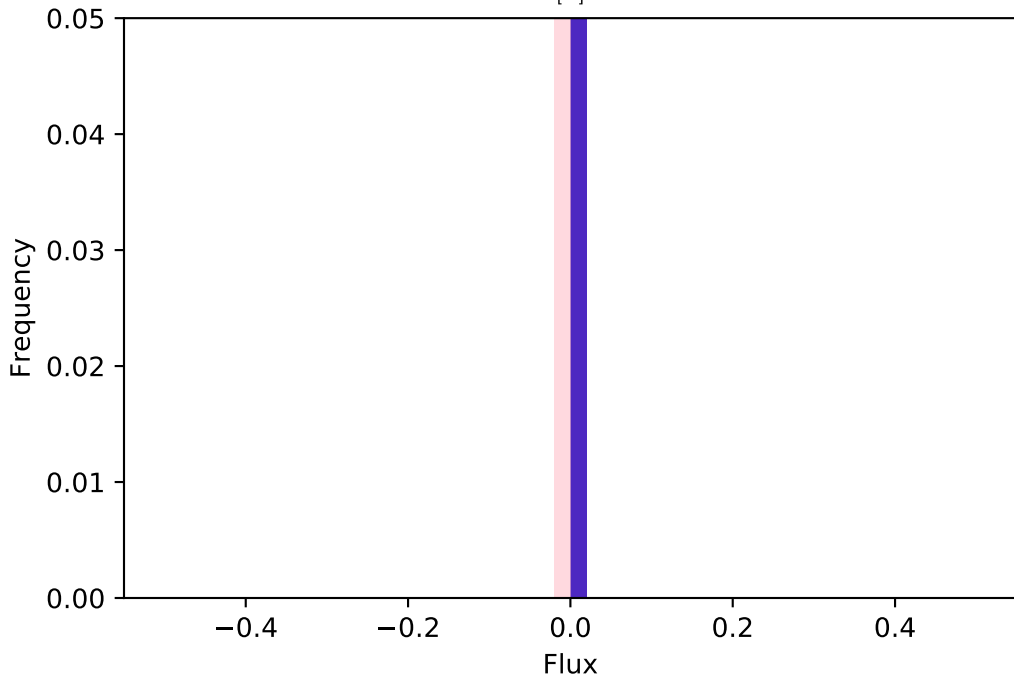
468 : Asp\_m -->  
['-']

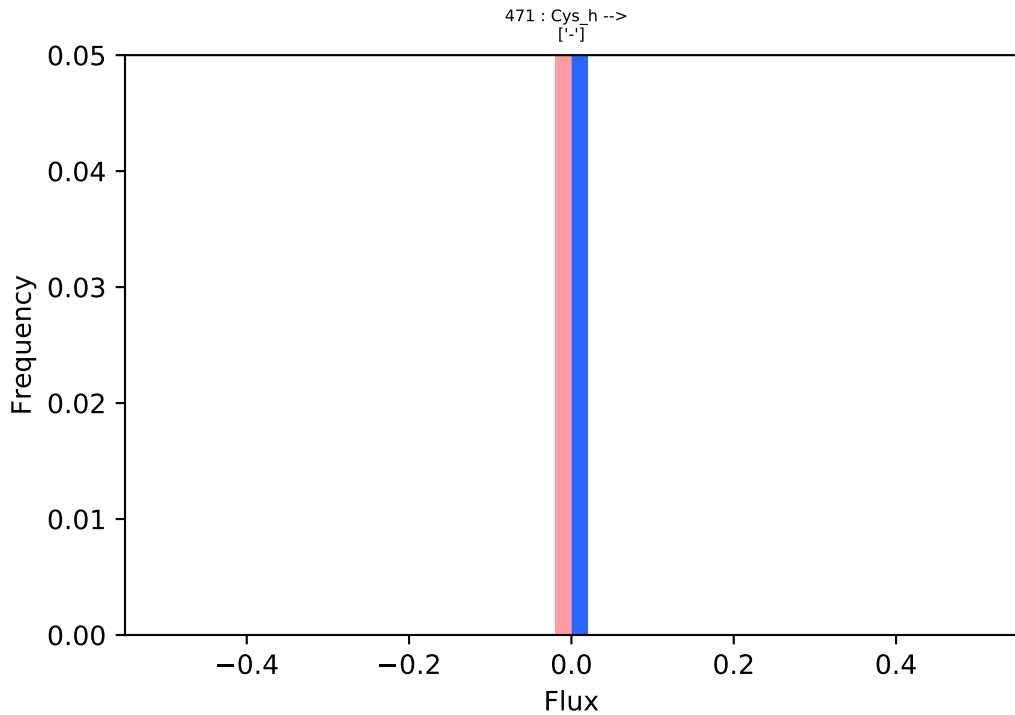


469 : Asp\_p -->  
['-']

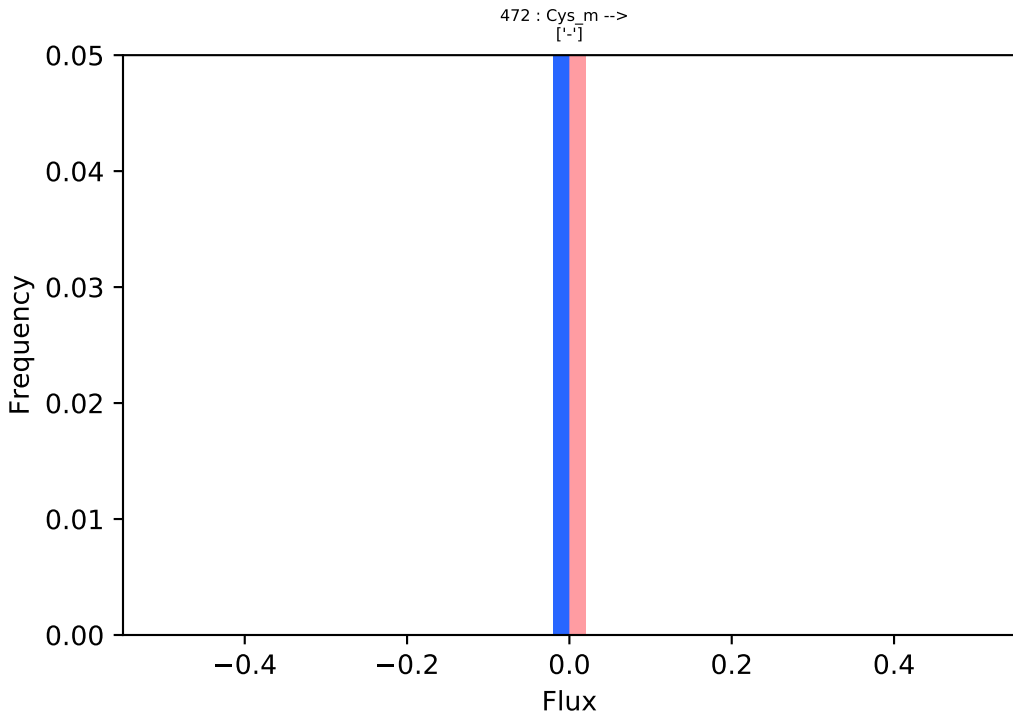


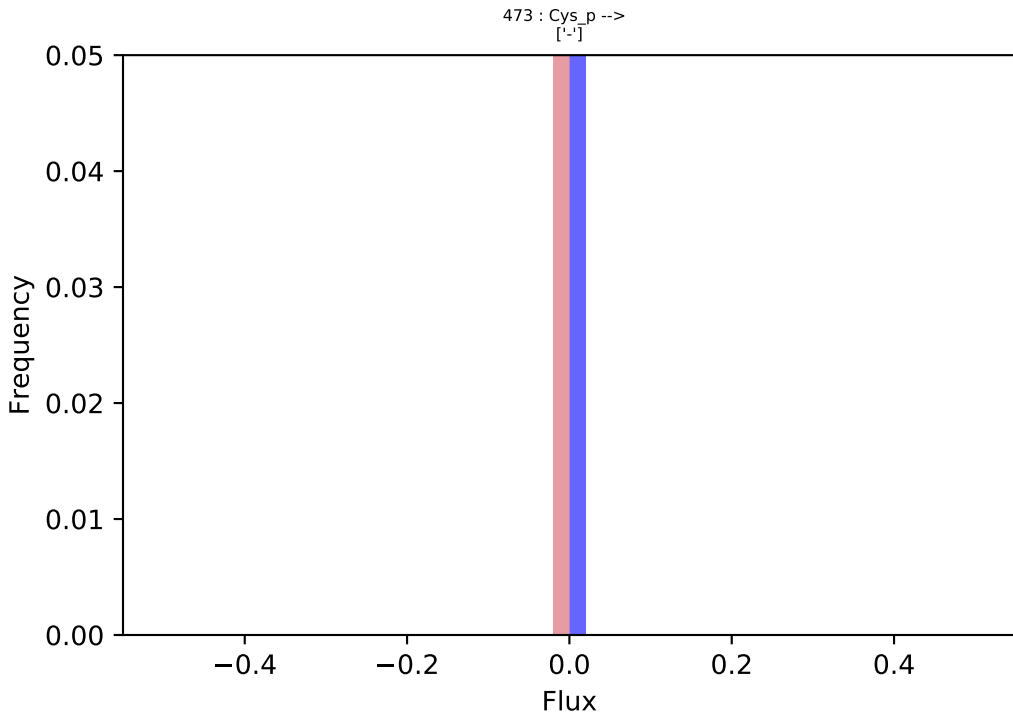
470 : Cys\_c -->  
[<sup>-</sup>]



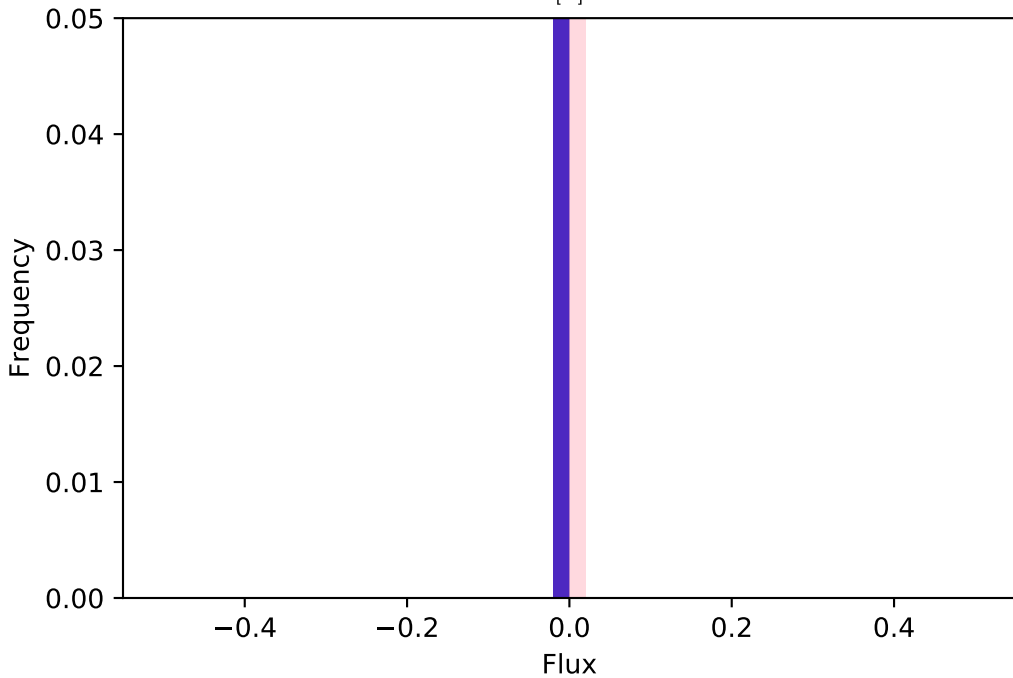


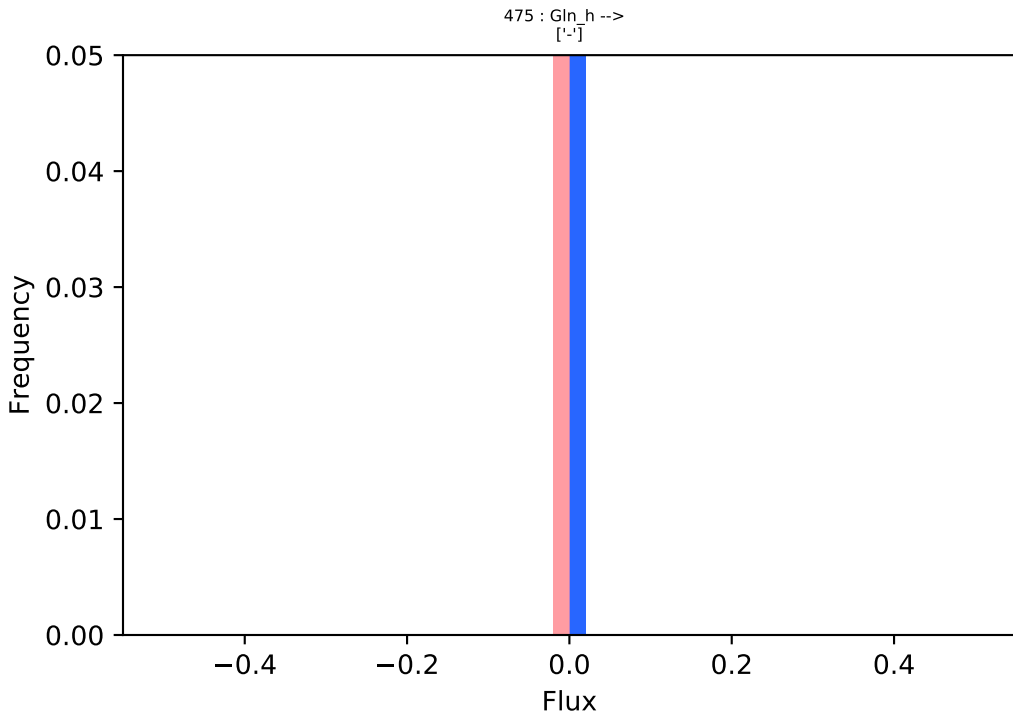


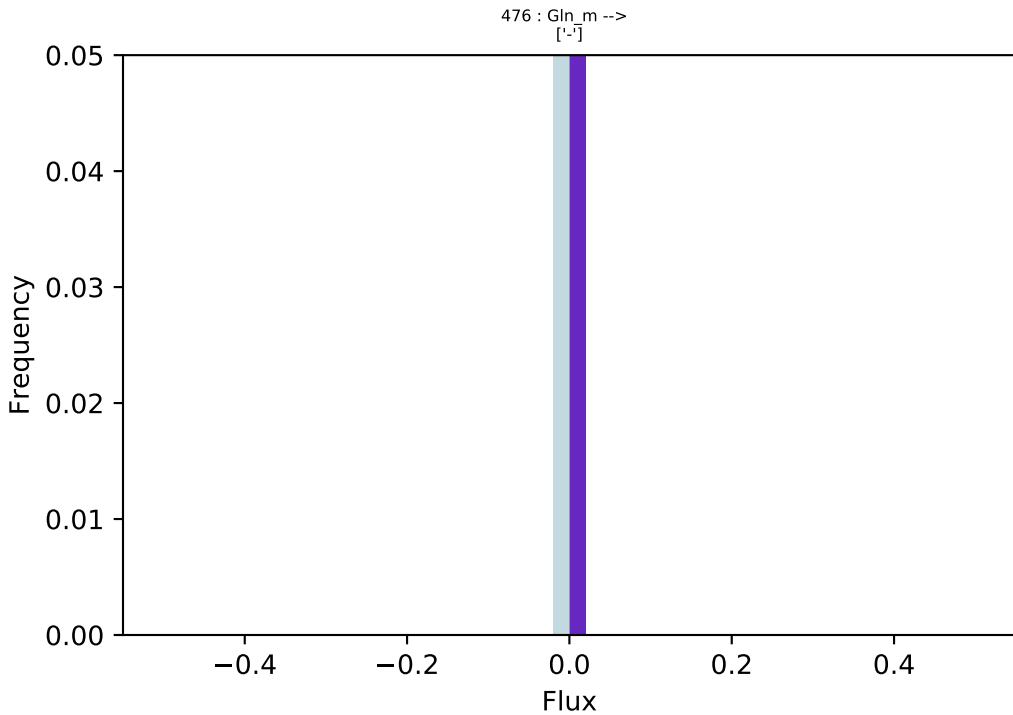




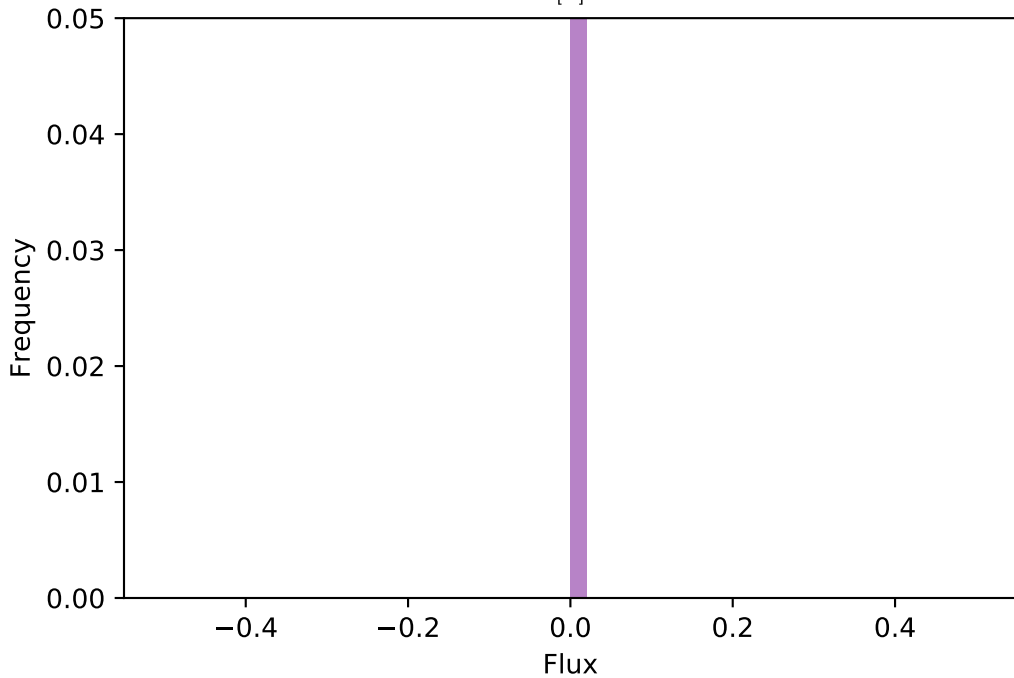
474 : Gln\_c -->  
[<sup>-</sup>-<sup>-</sup>]



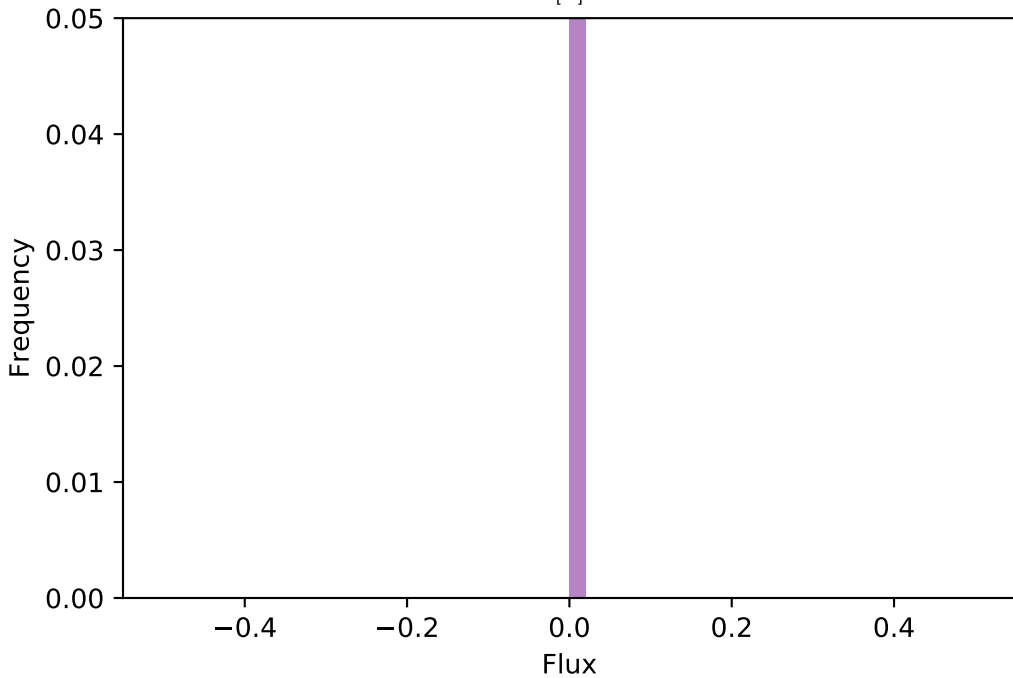




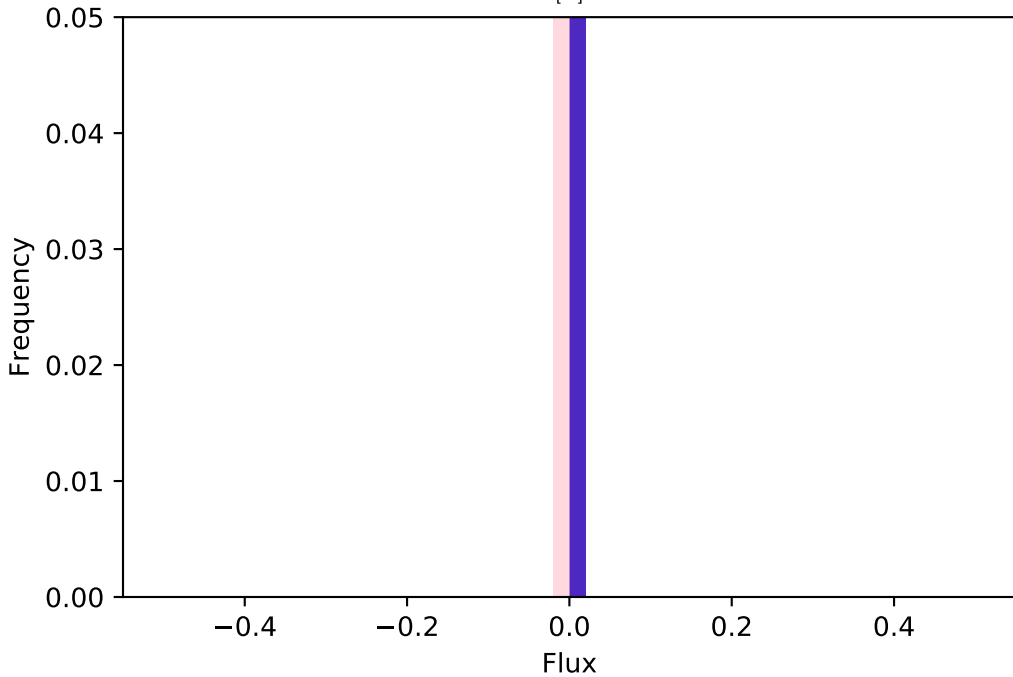
477 : Gln\_p -->  
['-']



478 : Glu\_c -->  
[<sup>-</sup>-<sup>-</sup>]

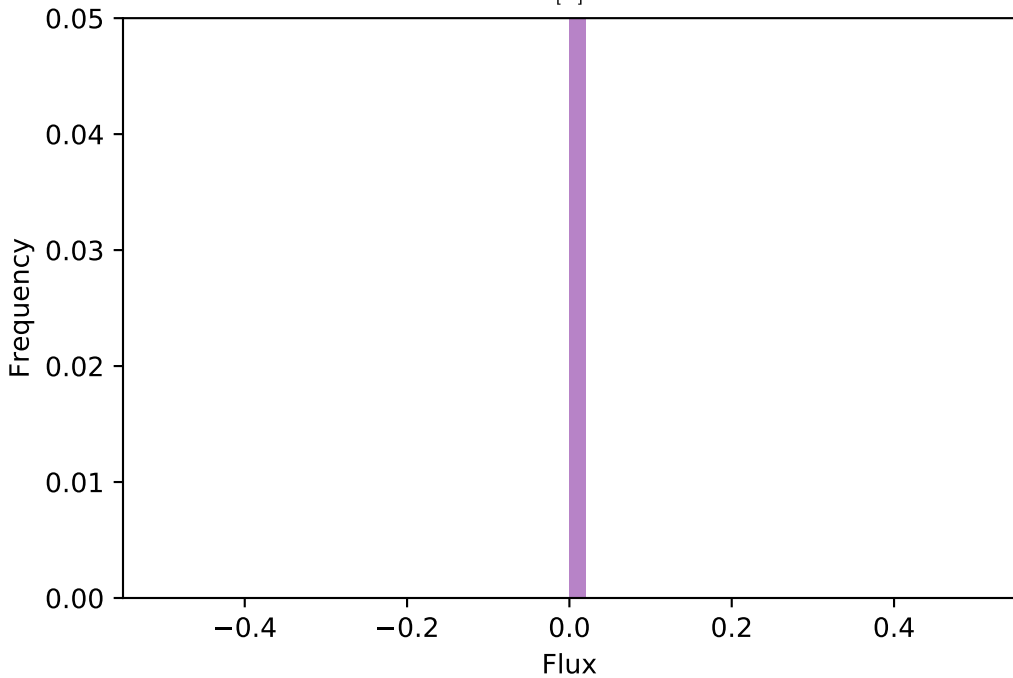


479 : Glu\_h -->  
['-']

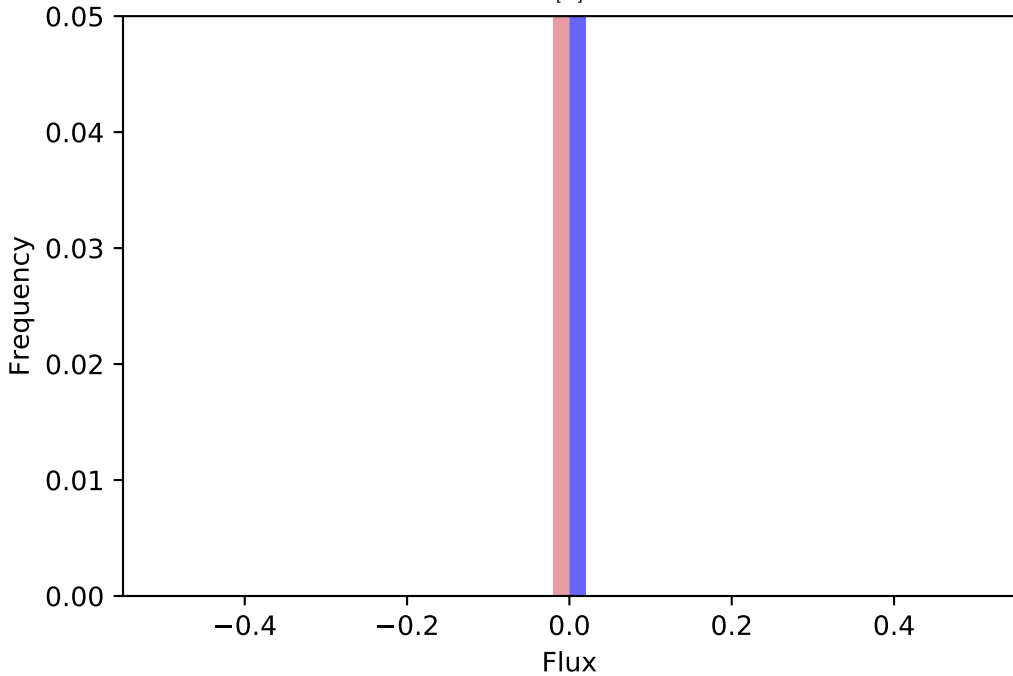




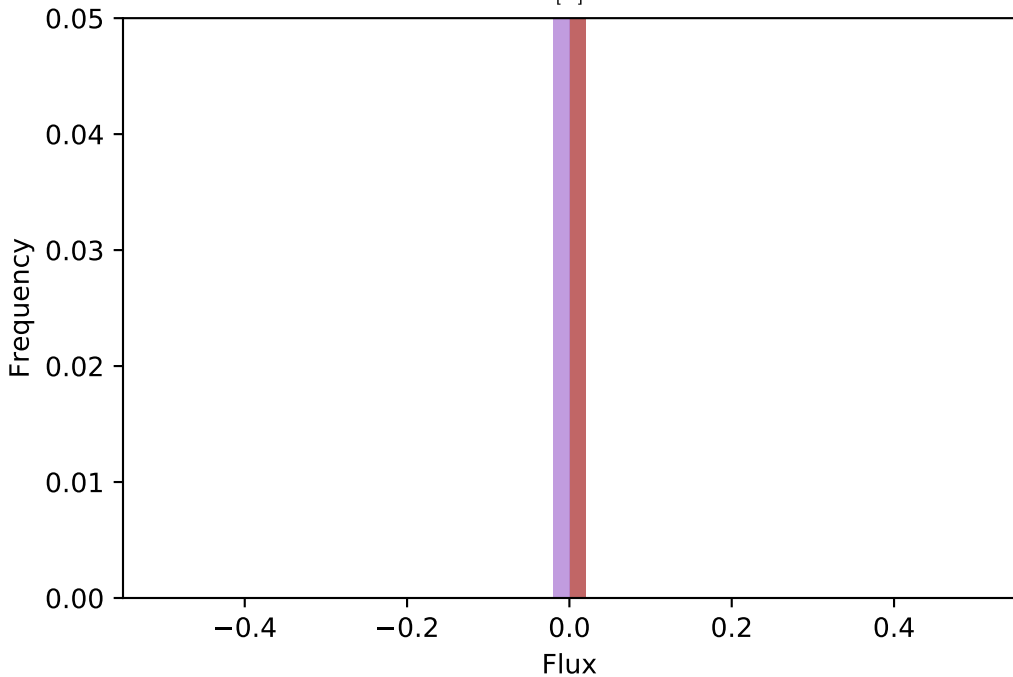
480 : Glu\_m -->  
[<sup>-1</sup>]

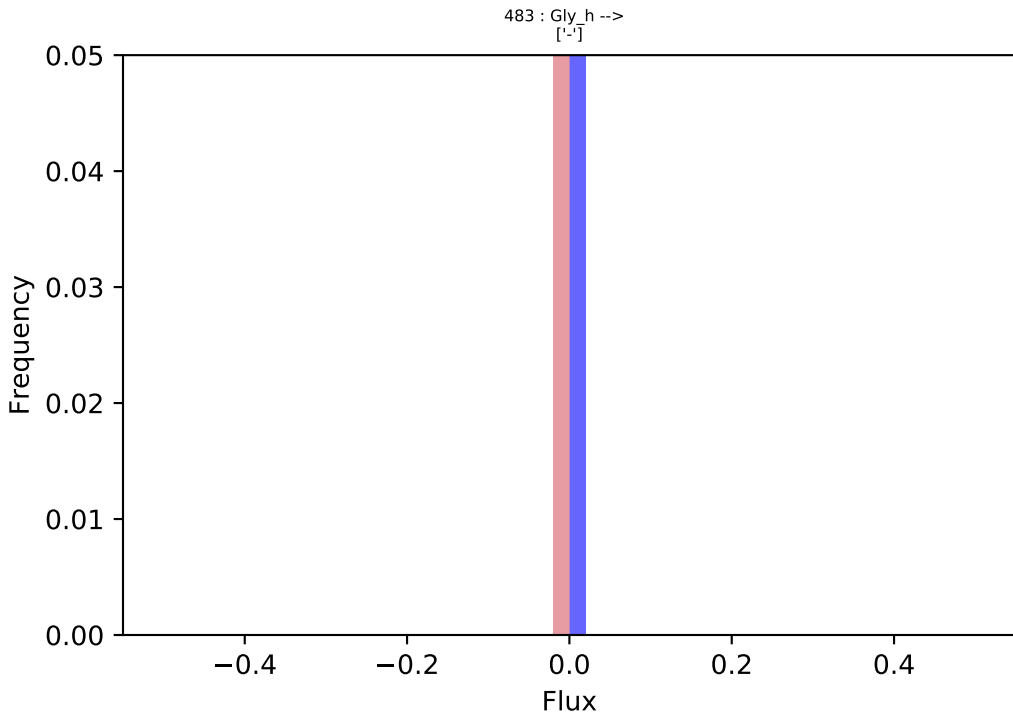


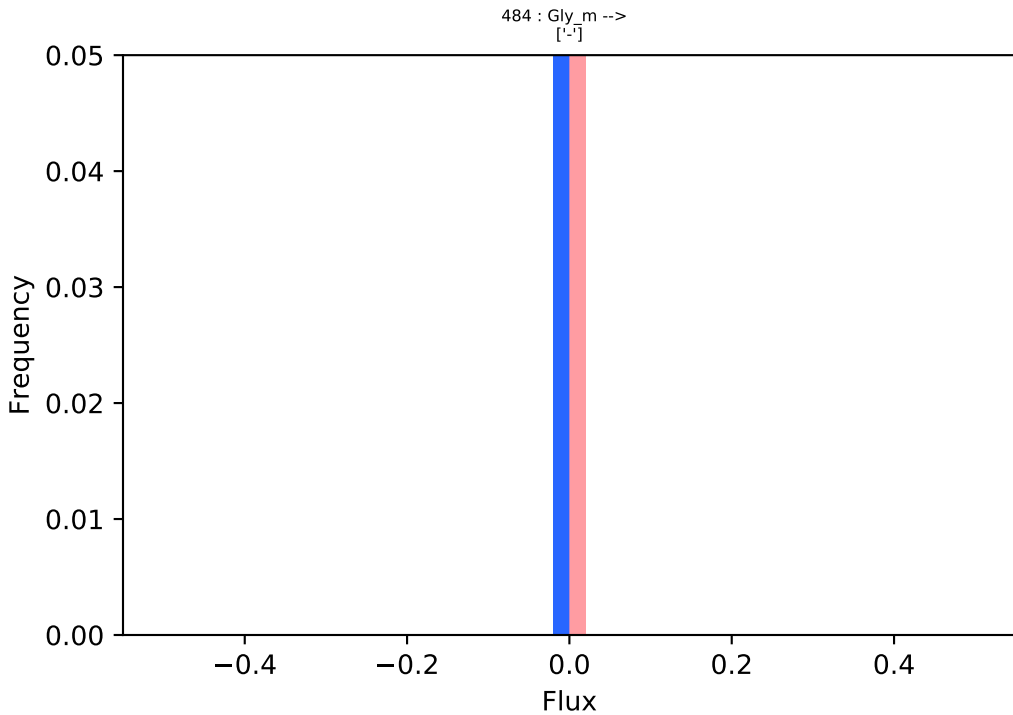
481 : Glu\_p -->  
['-']

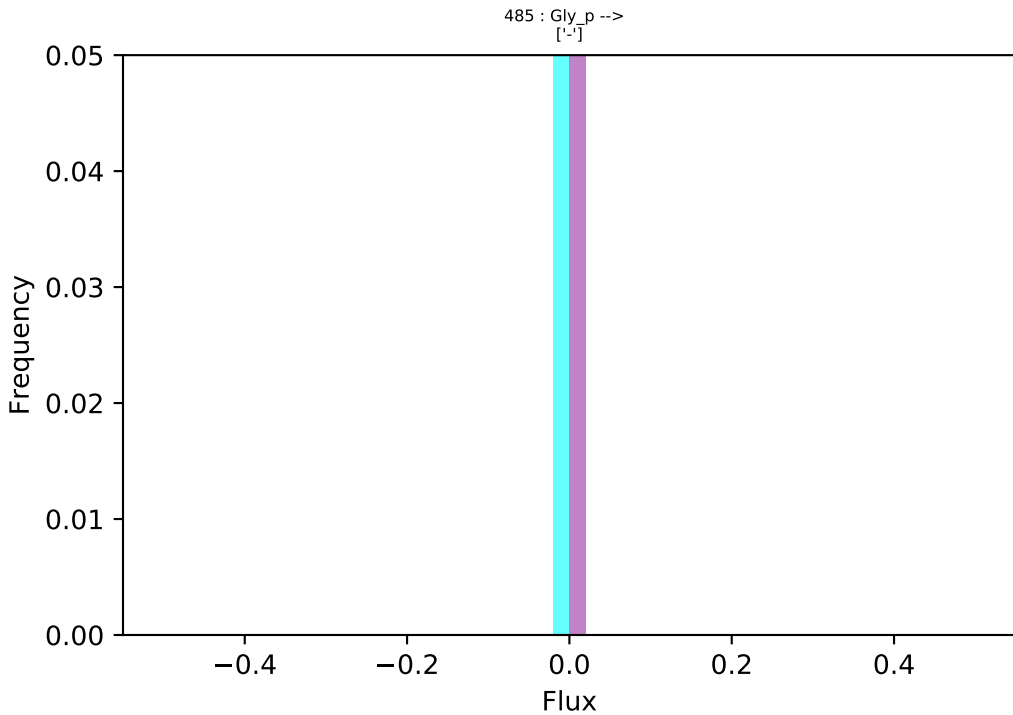


482 : Gly\_c -->  
['-']

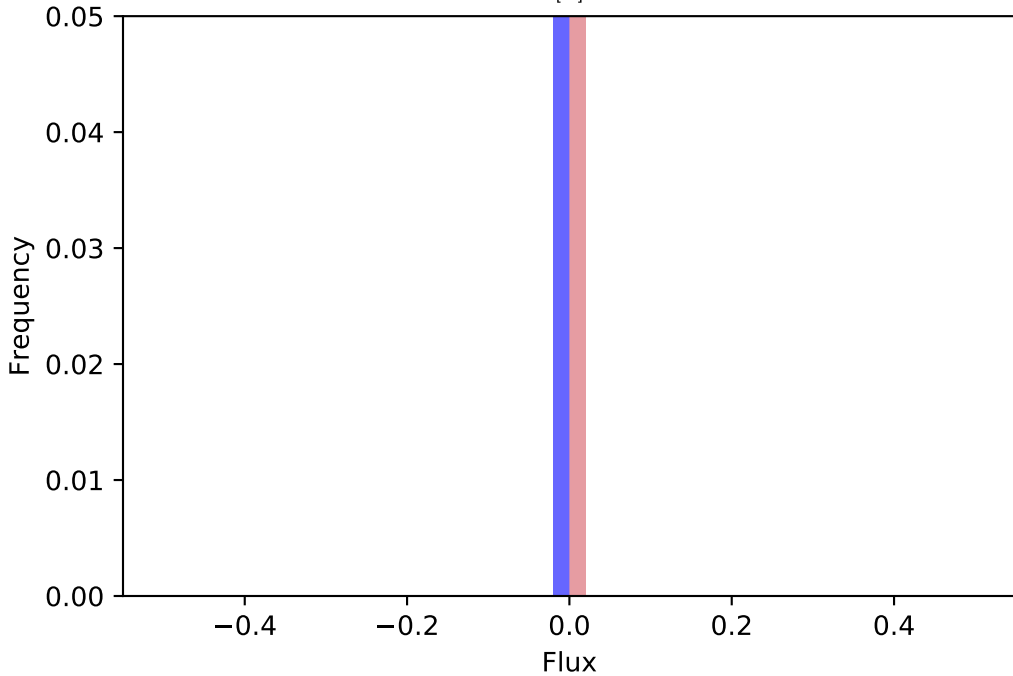


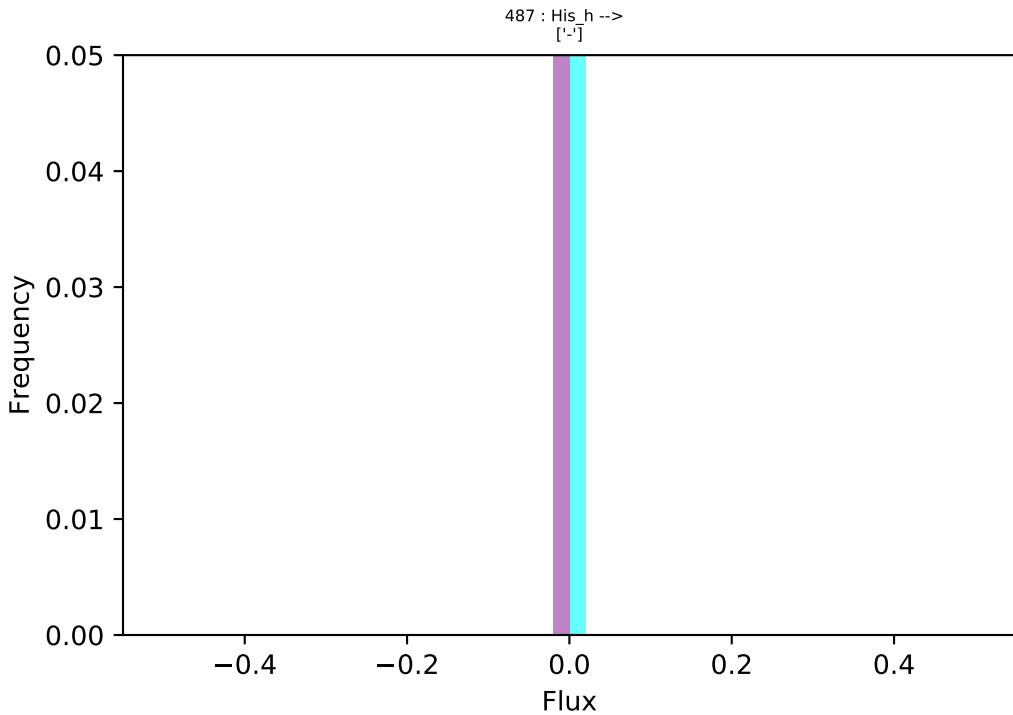






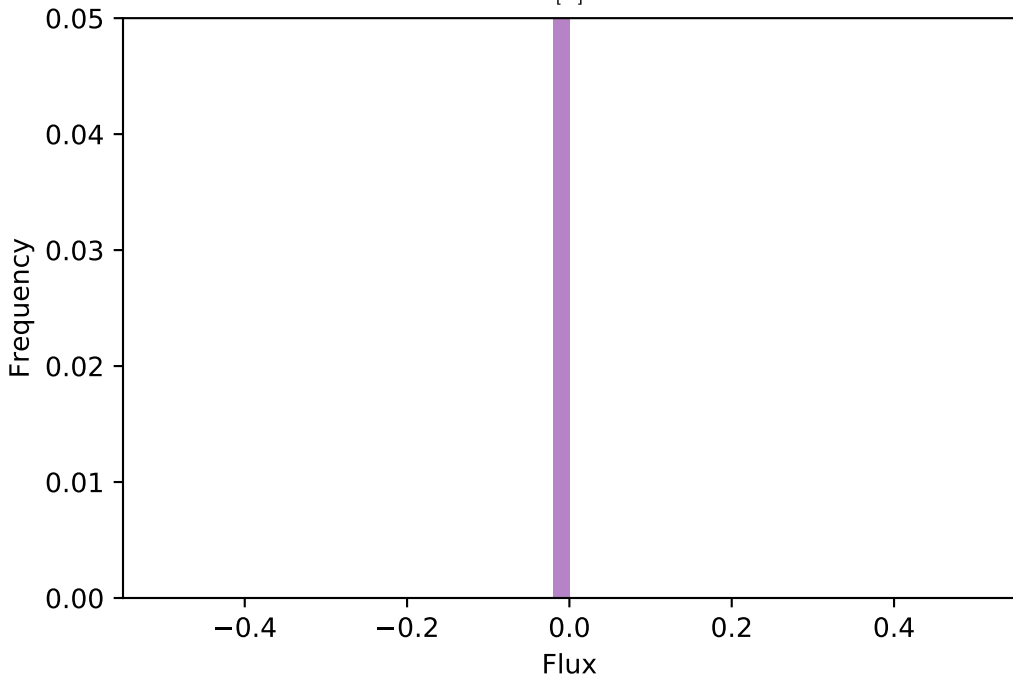
486 : His\_c -->  
['-']



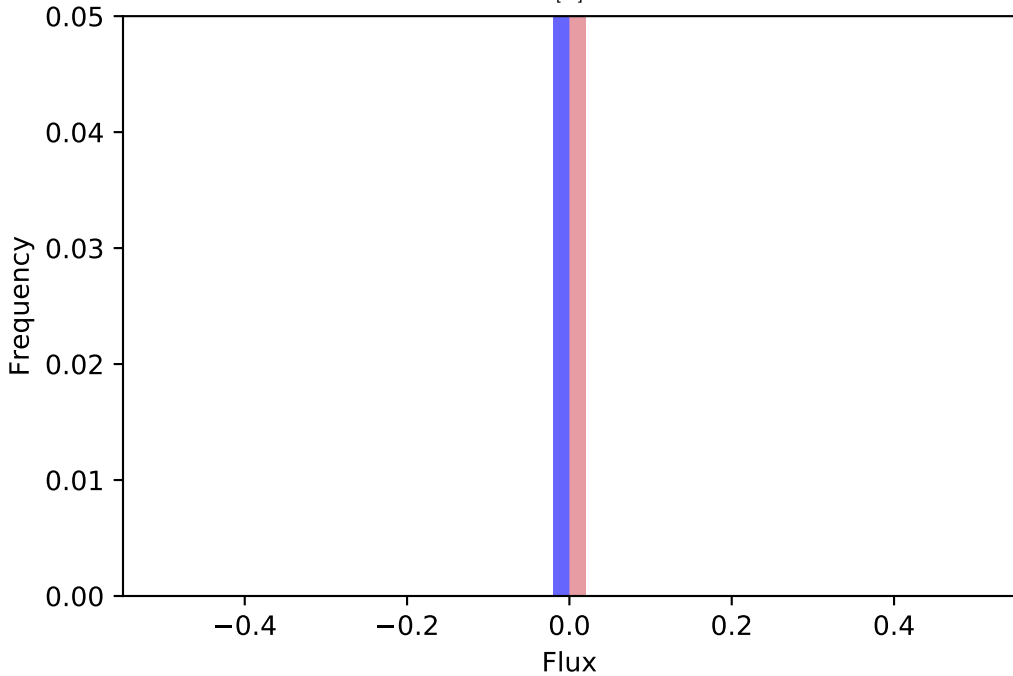


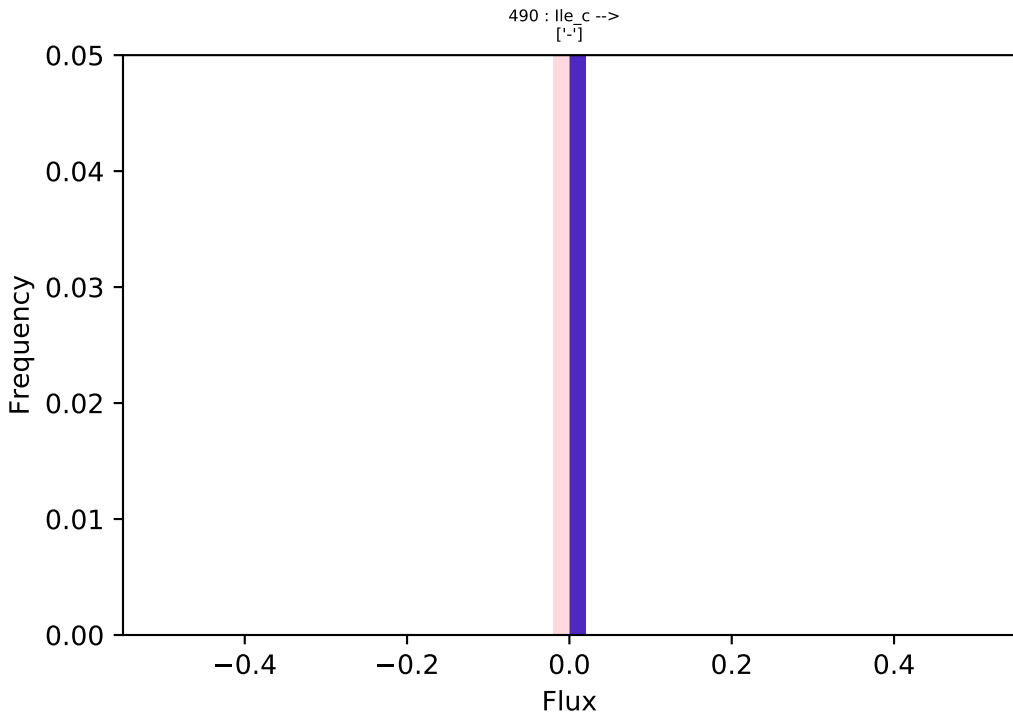


488 : His\_m -->  
['-']

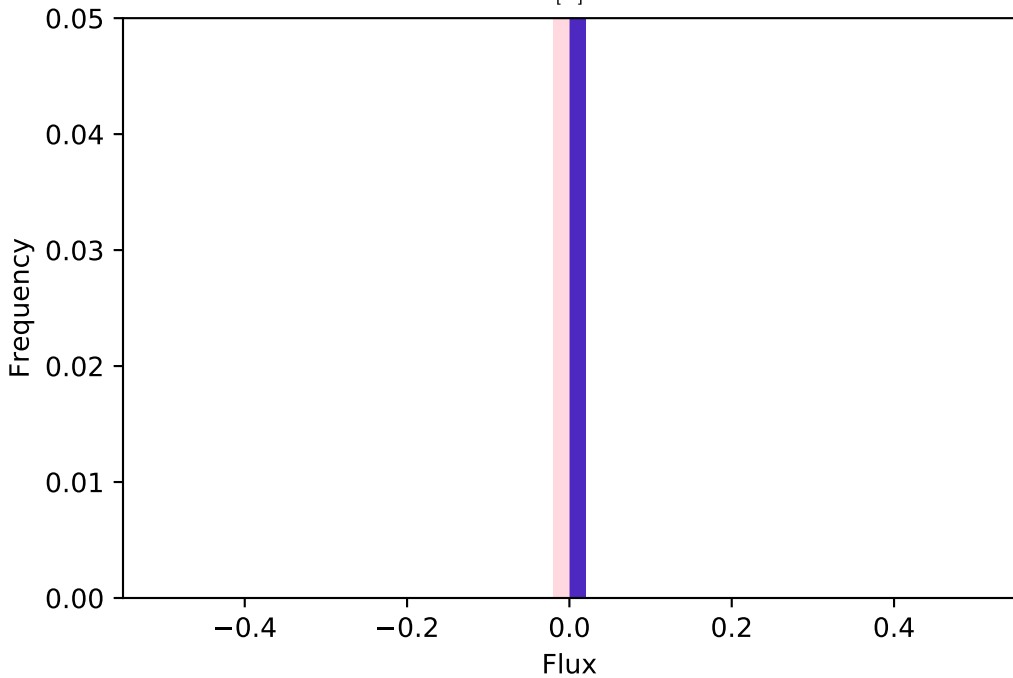


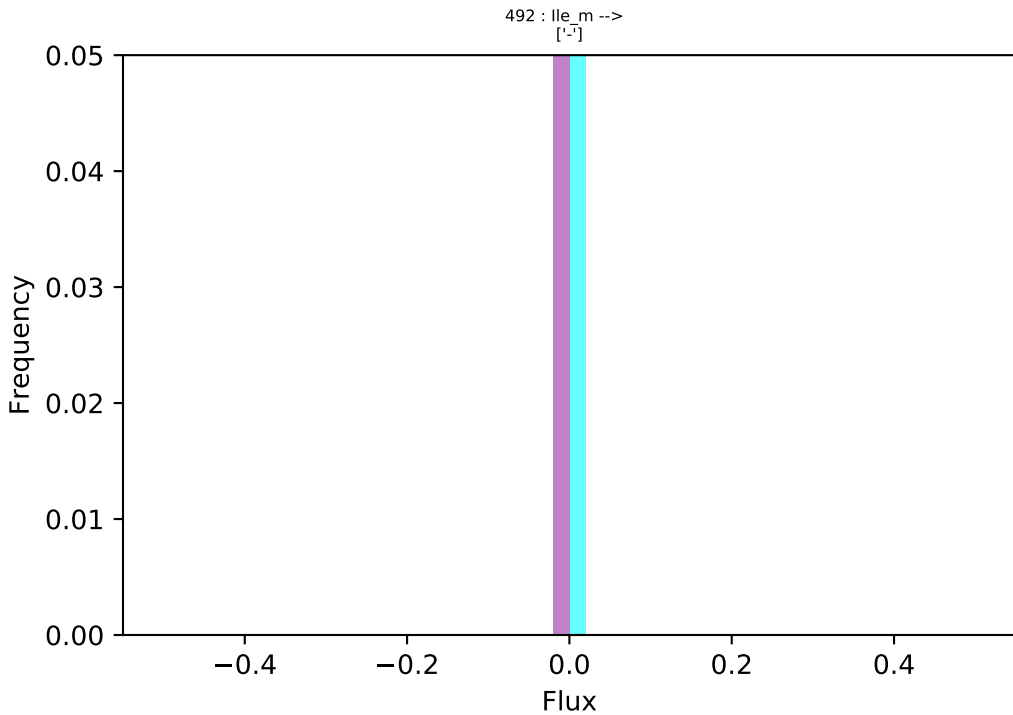
489 : His\_p -->  
['-']

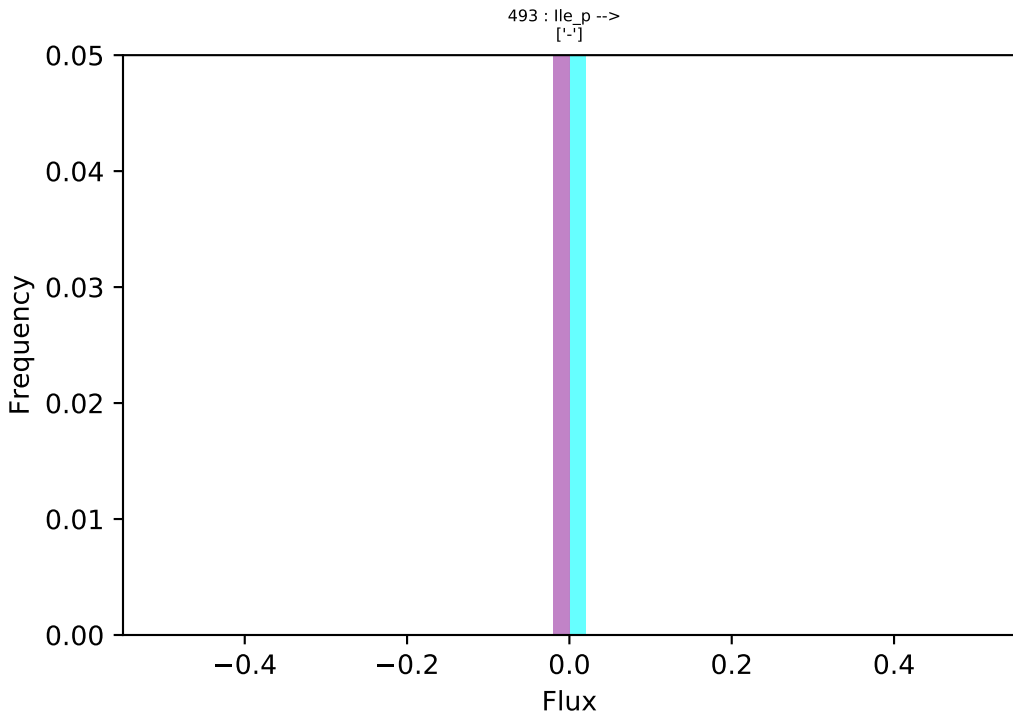




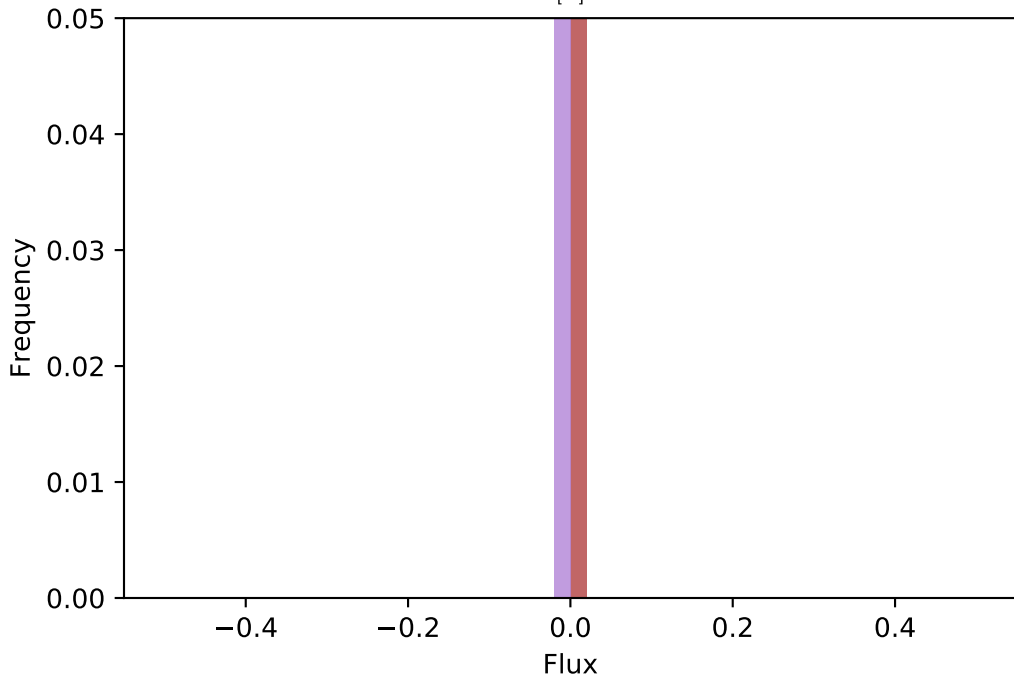
491 : lle\_h -->  
[<sup>-1</sup>]



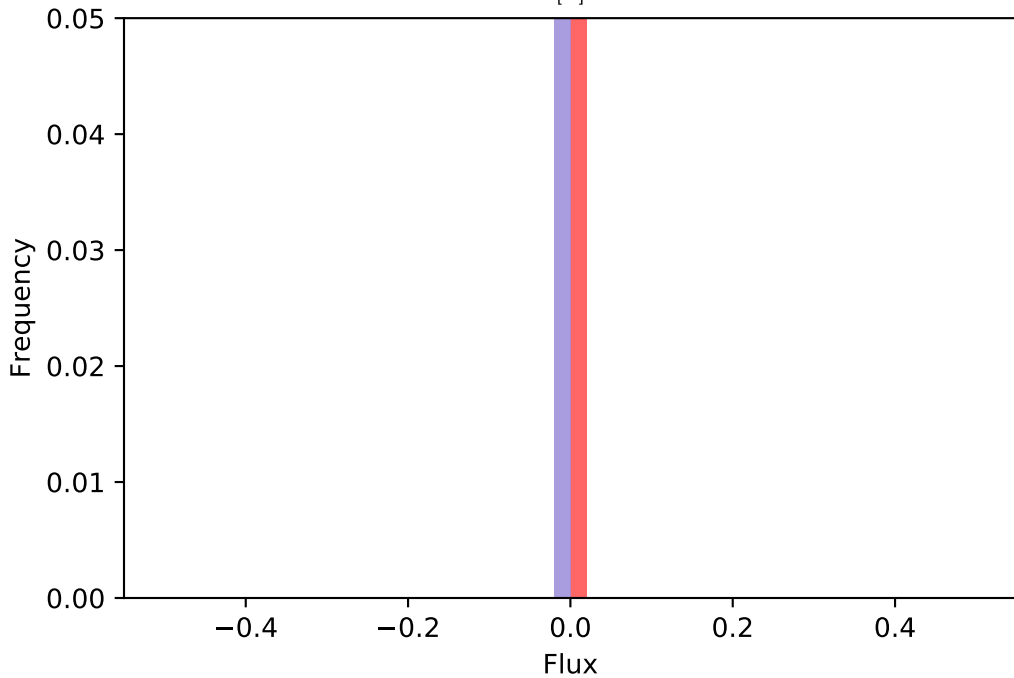




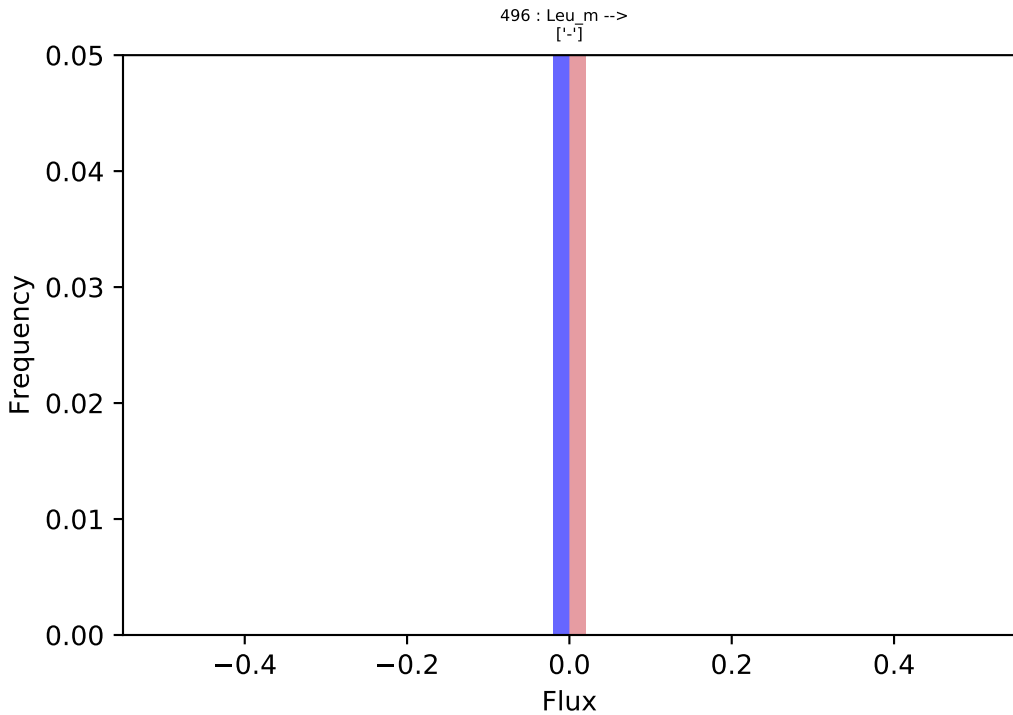
494 : Leu\_c -->  
[<sup>1</sup>-<sup>1</sup>]

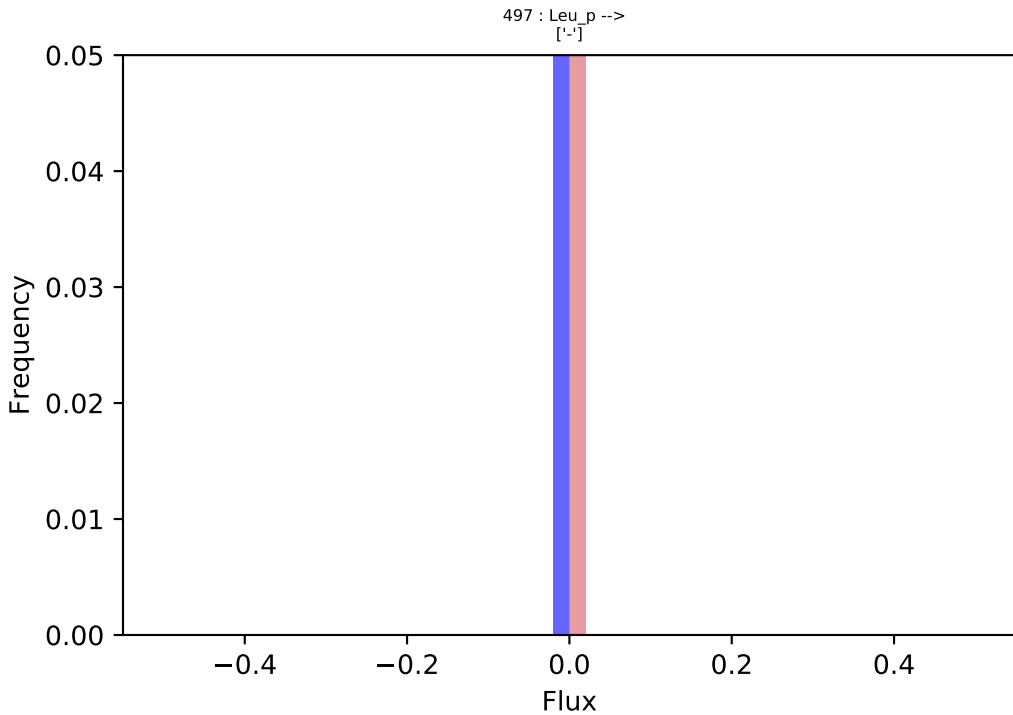


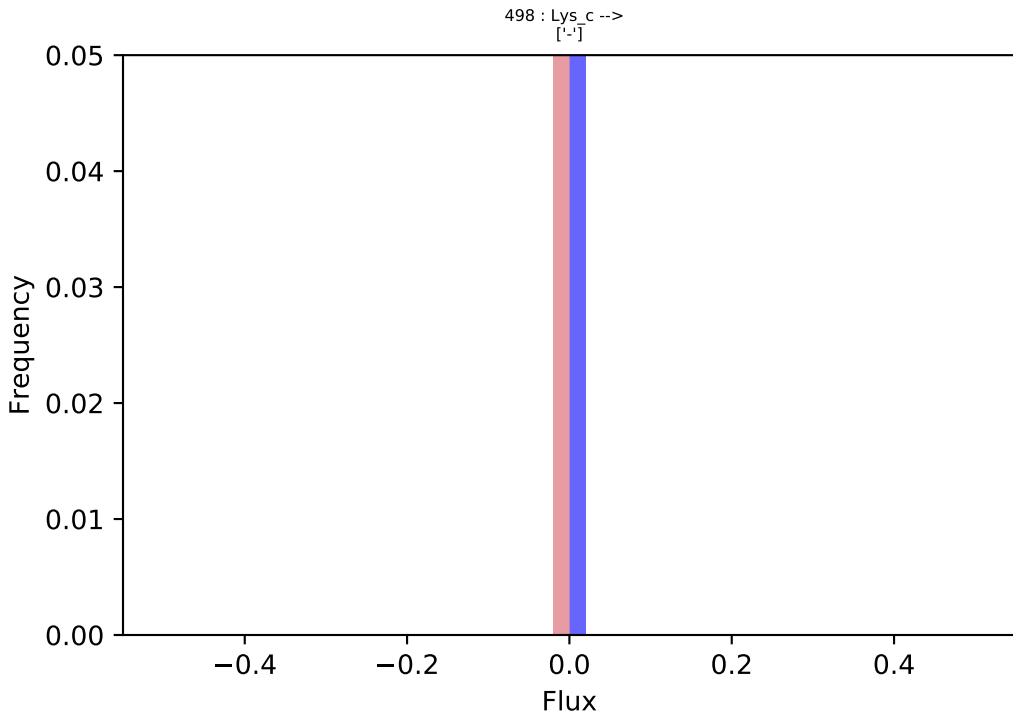
495 : Leu\_h -->  
[<sup>-</sup>']



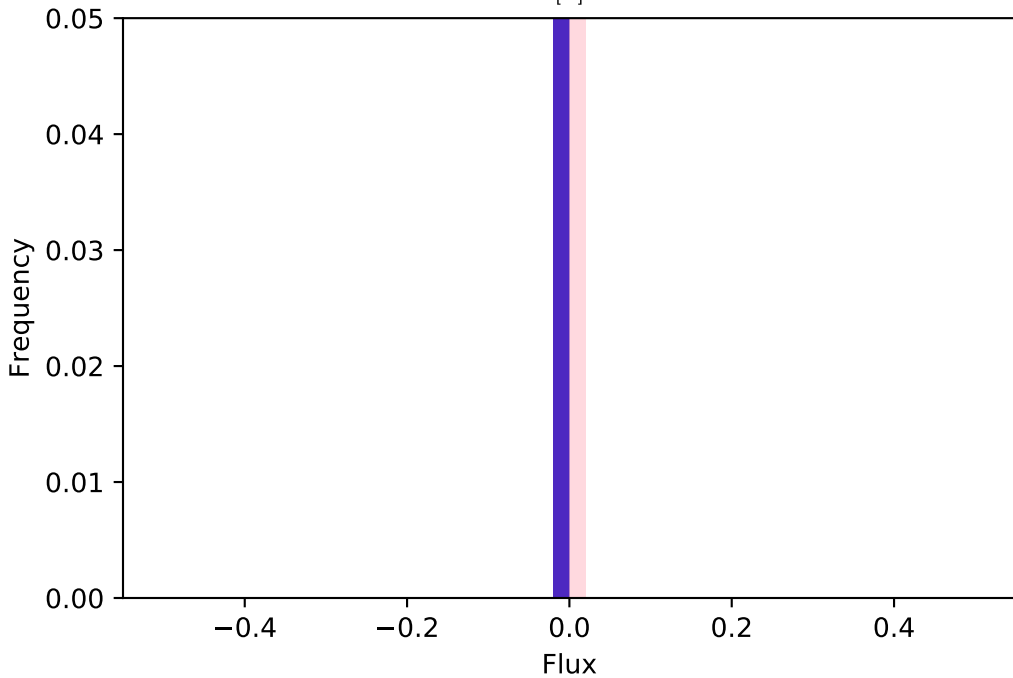


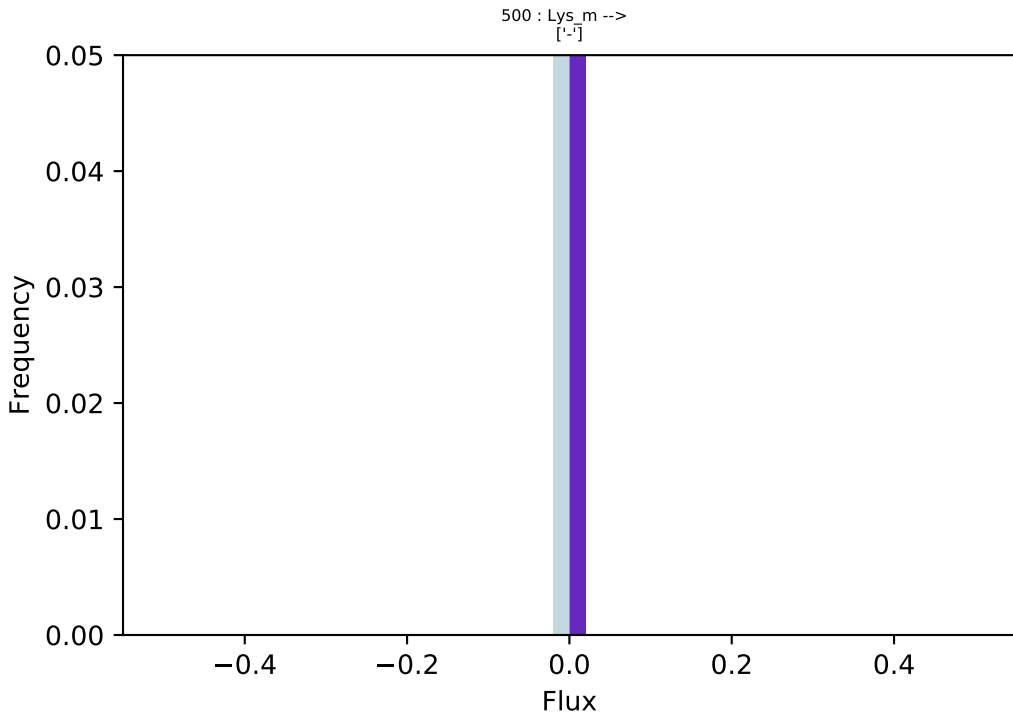


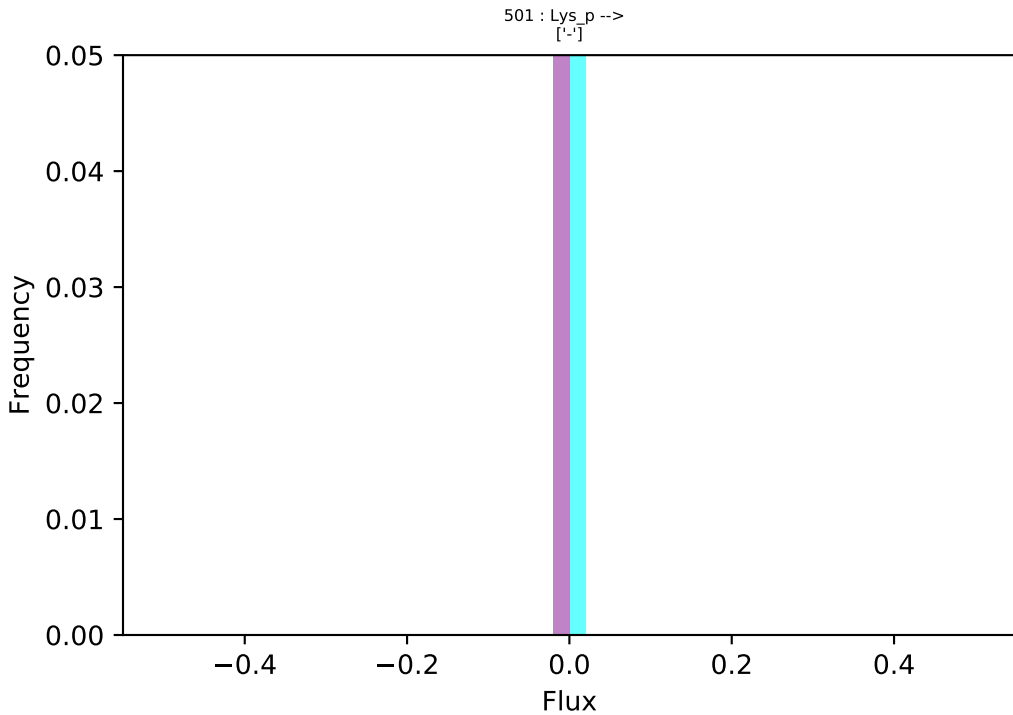




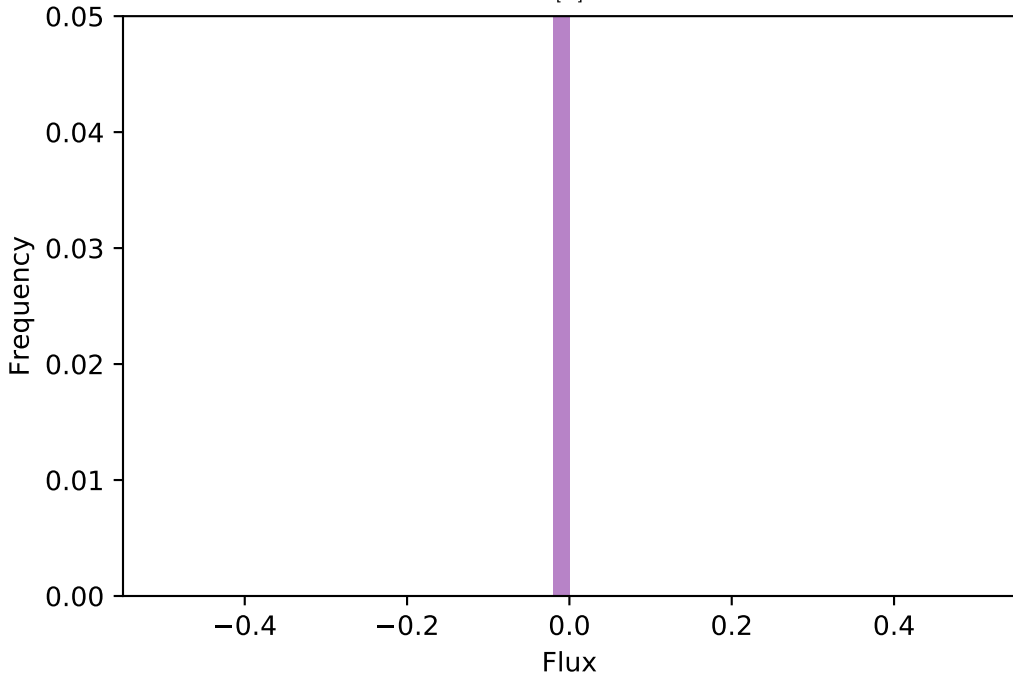
499 : Lys\_h -->  
['-']

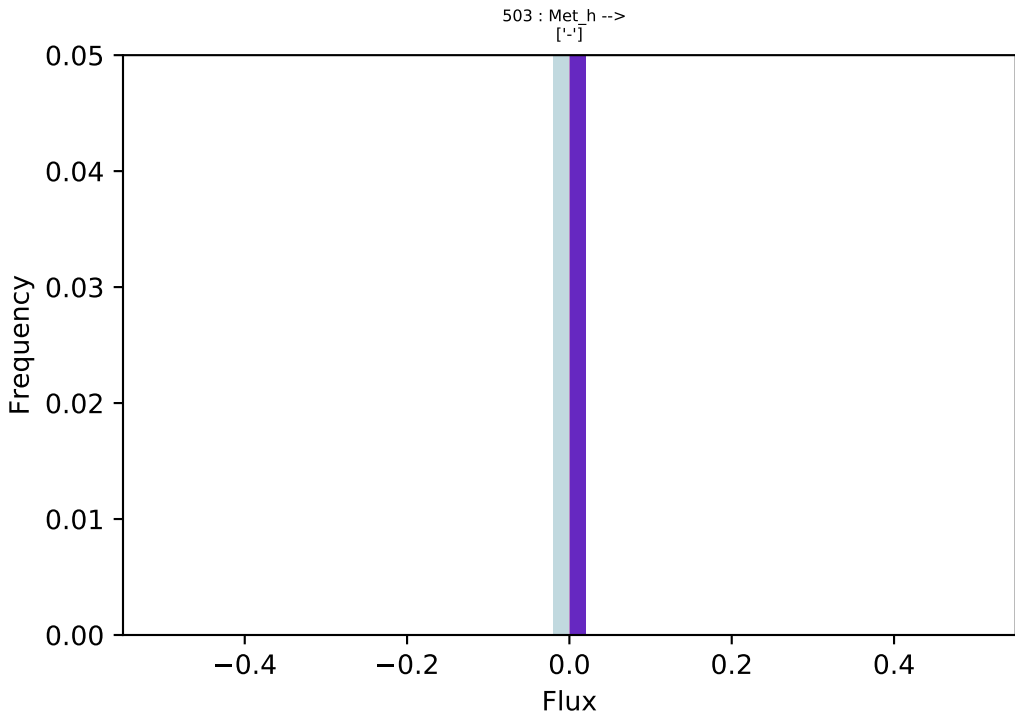




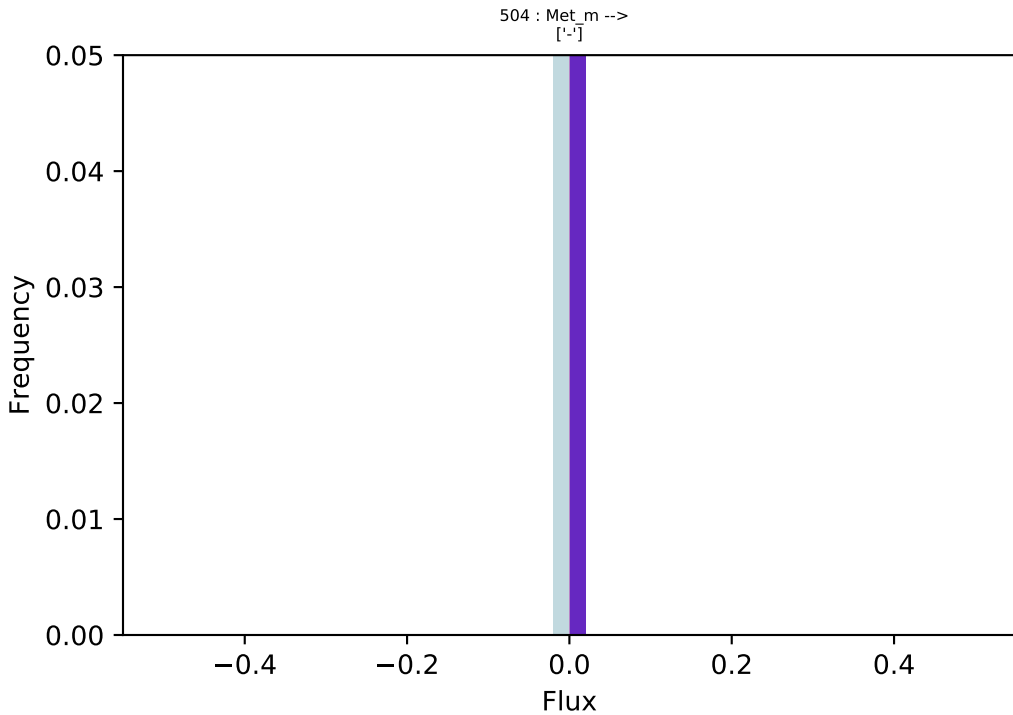


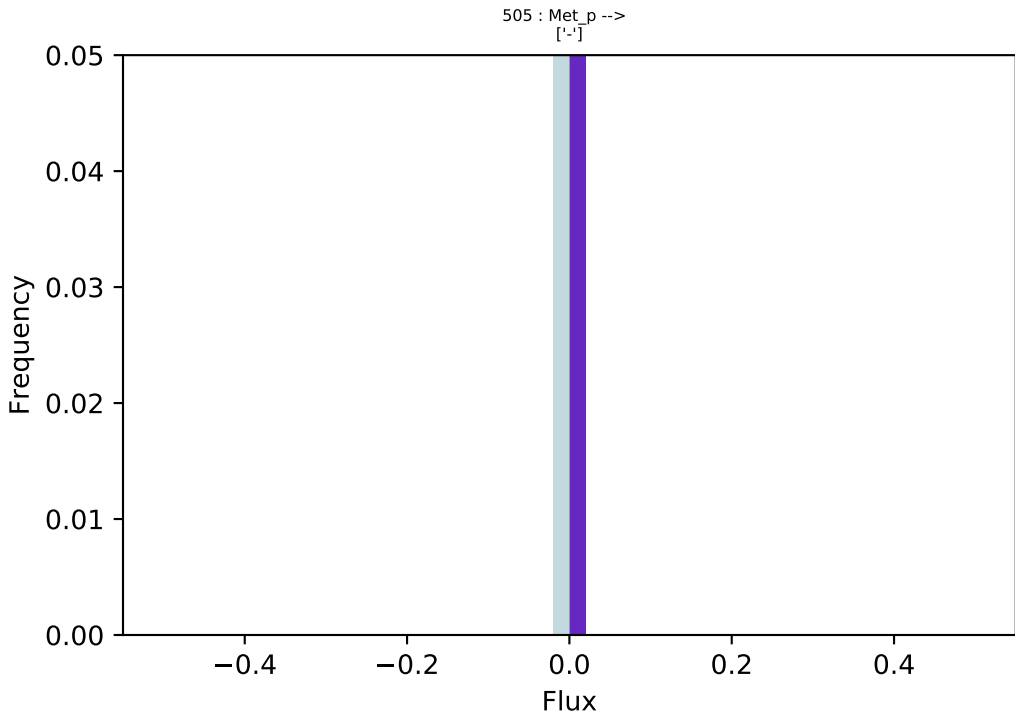
502 : Met\_c -->  
[<sup>+</sup>-<sup>+</sup>]

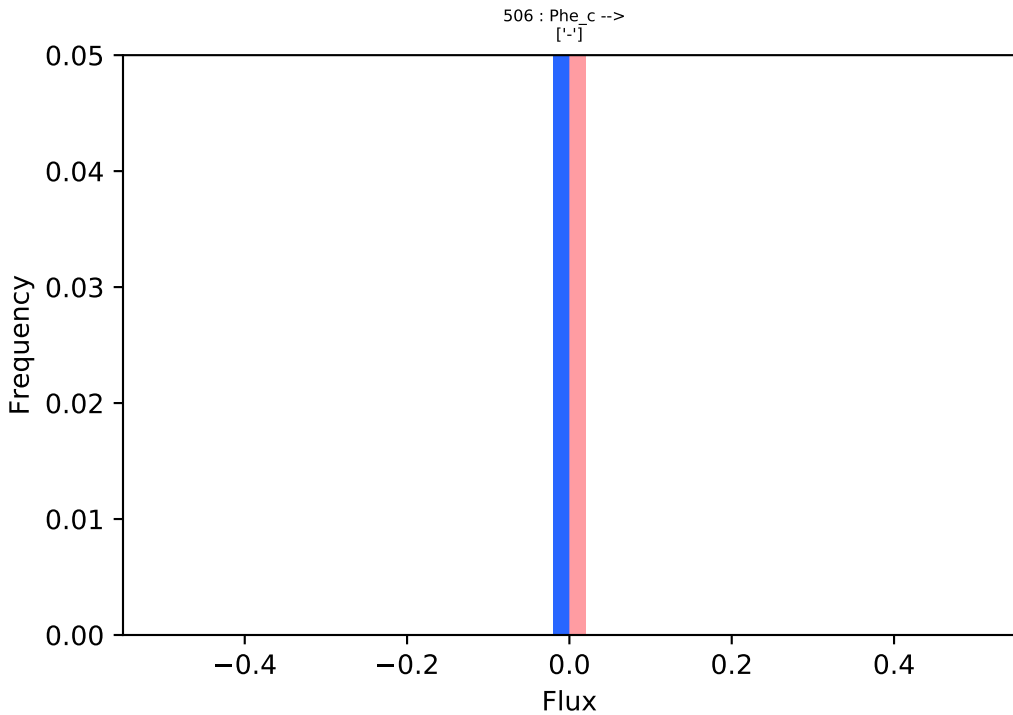


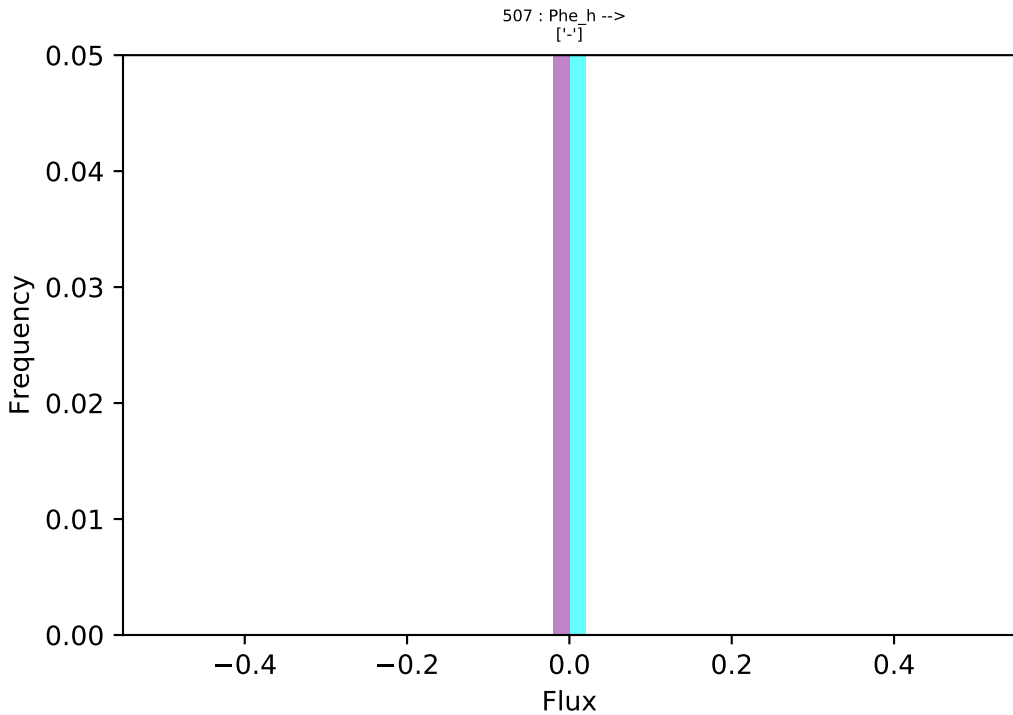




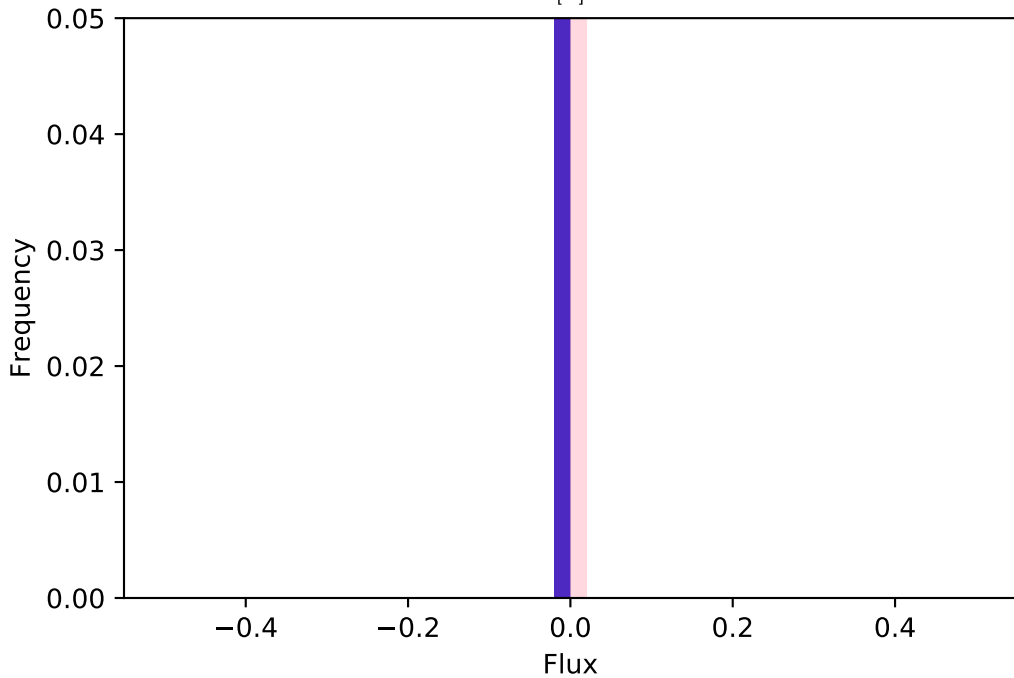


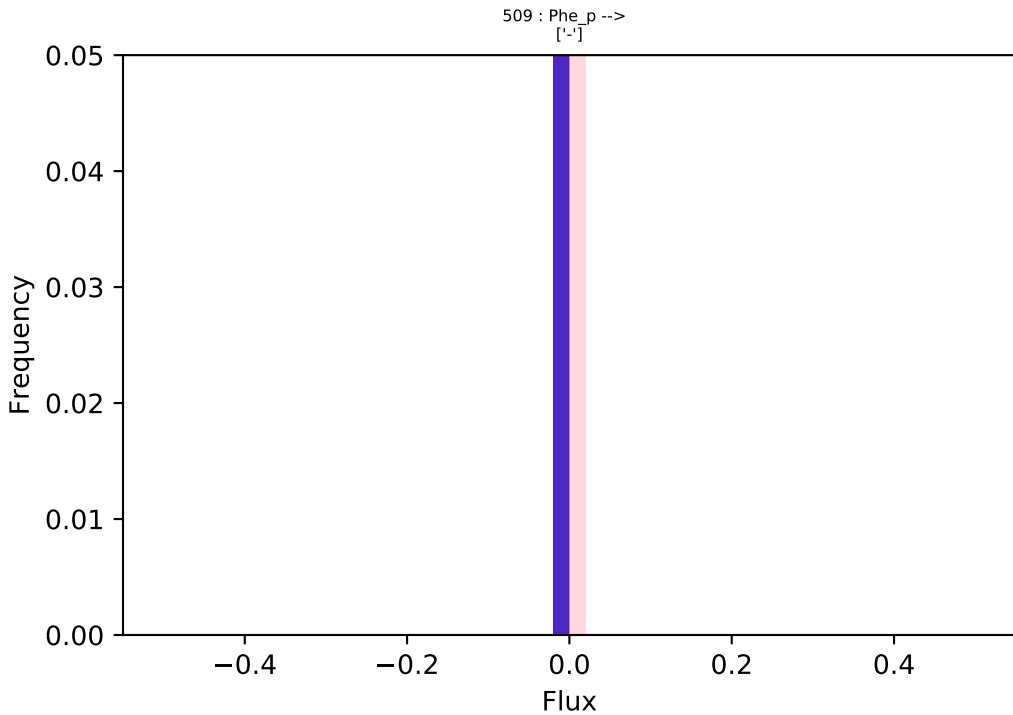


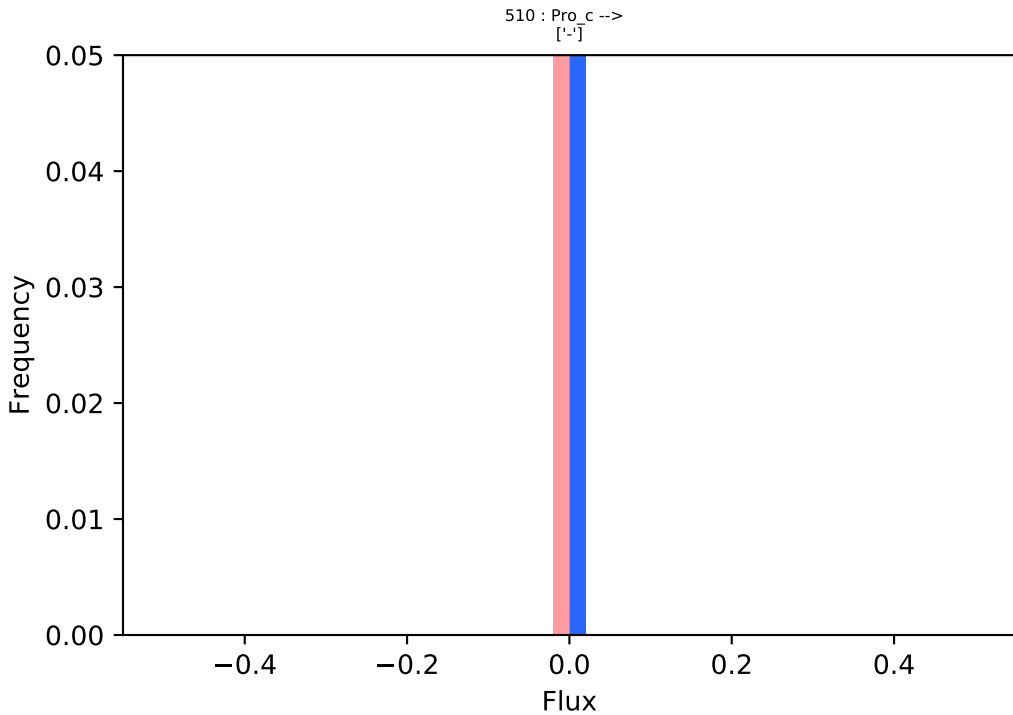




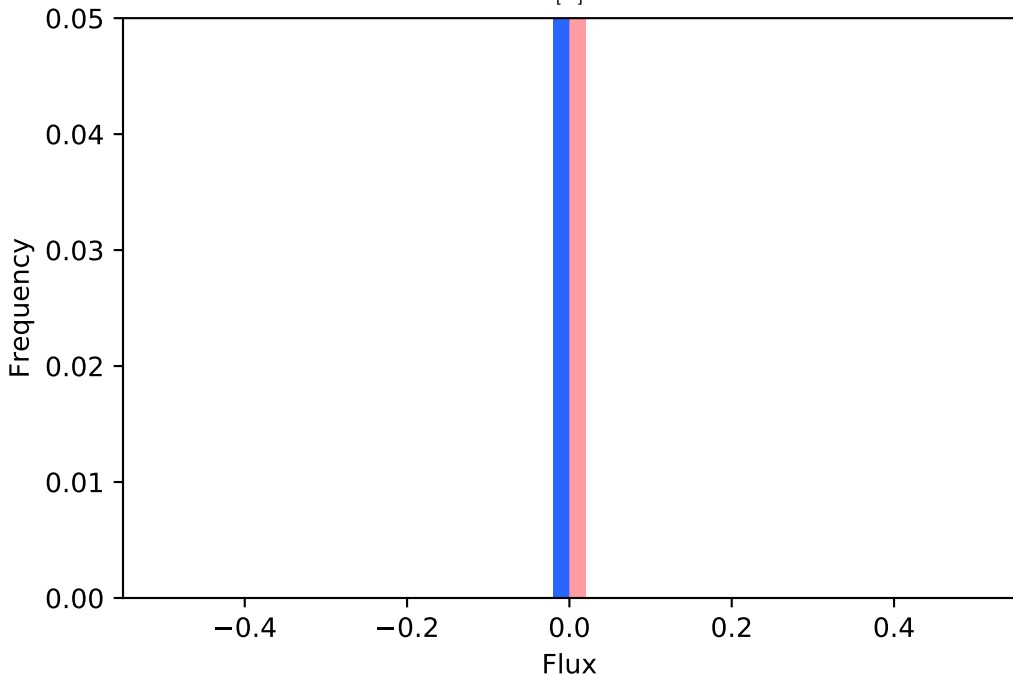
508 : Phe\_m -->  
['-']





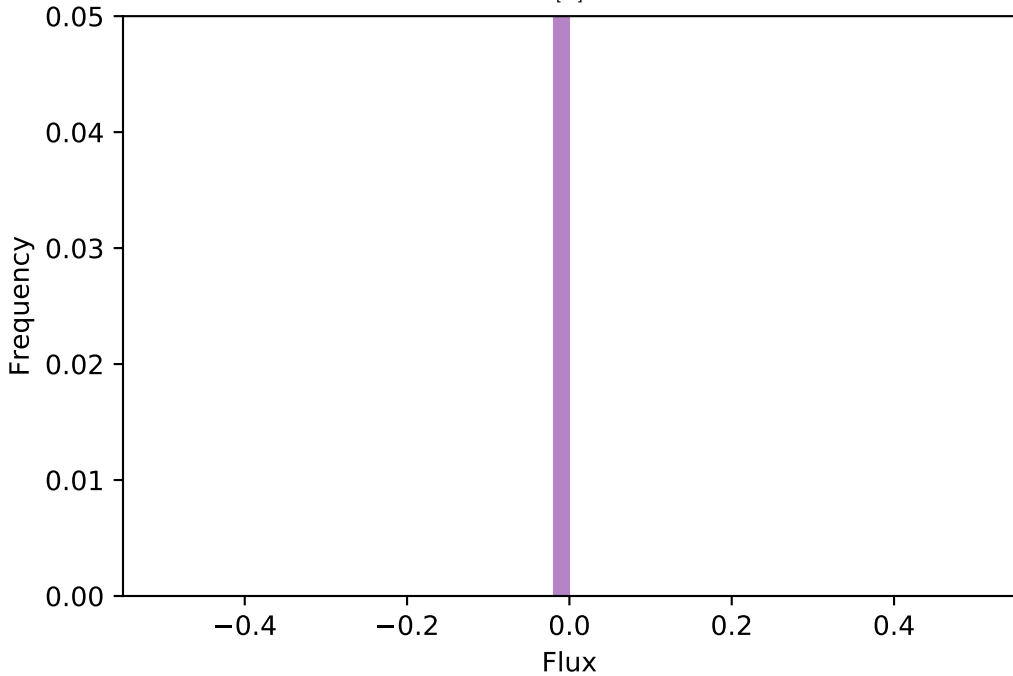


511 : Pro\_h -->  
['-']

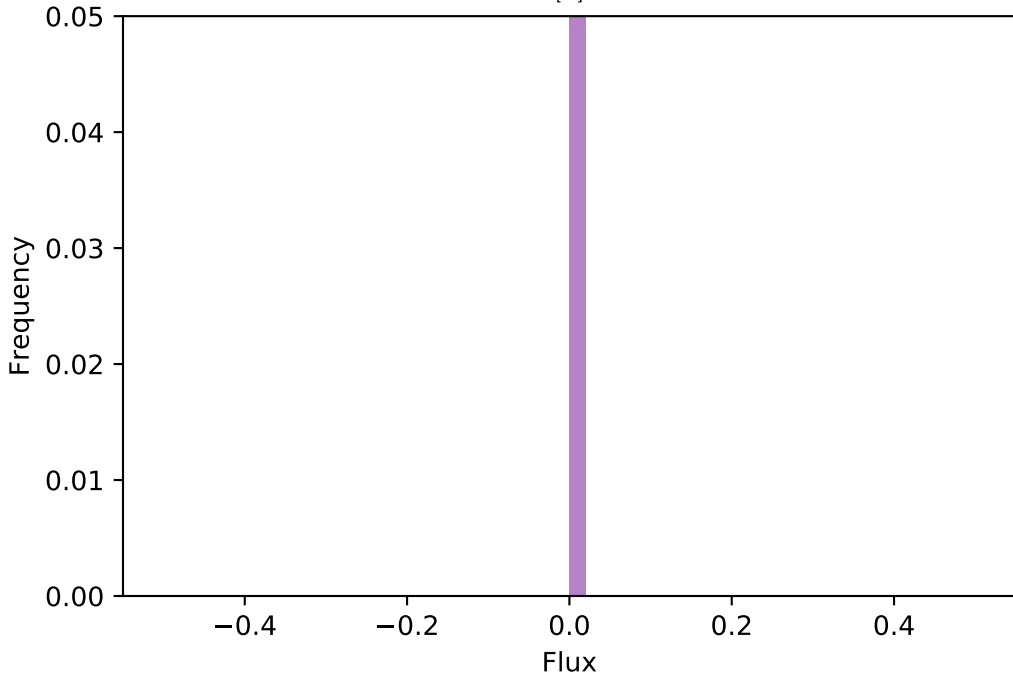


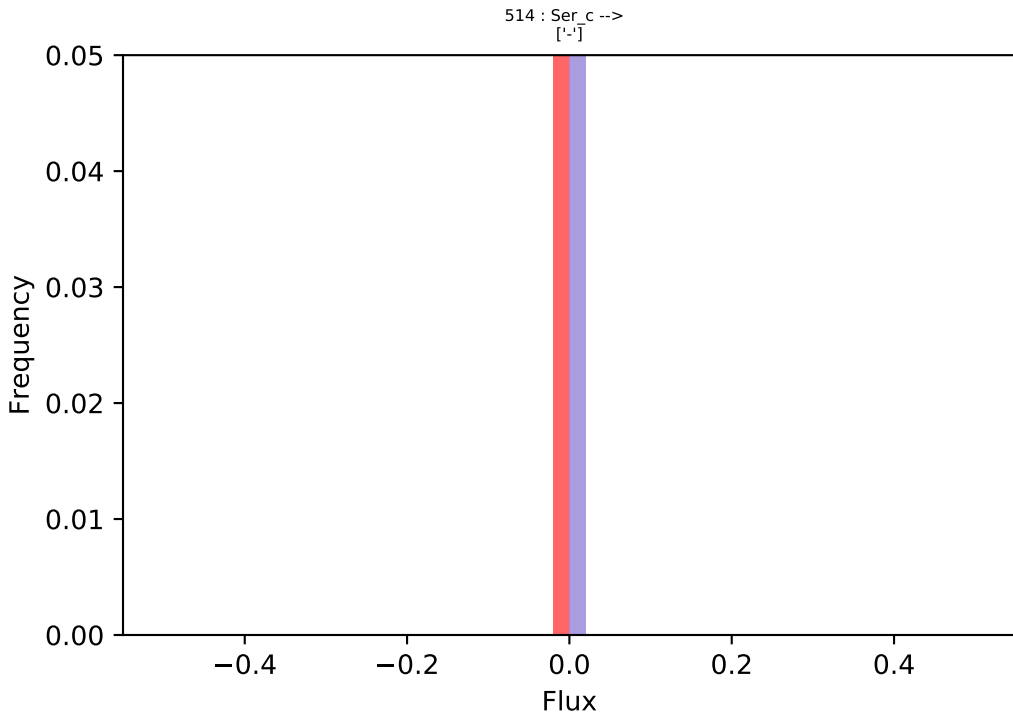


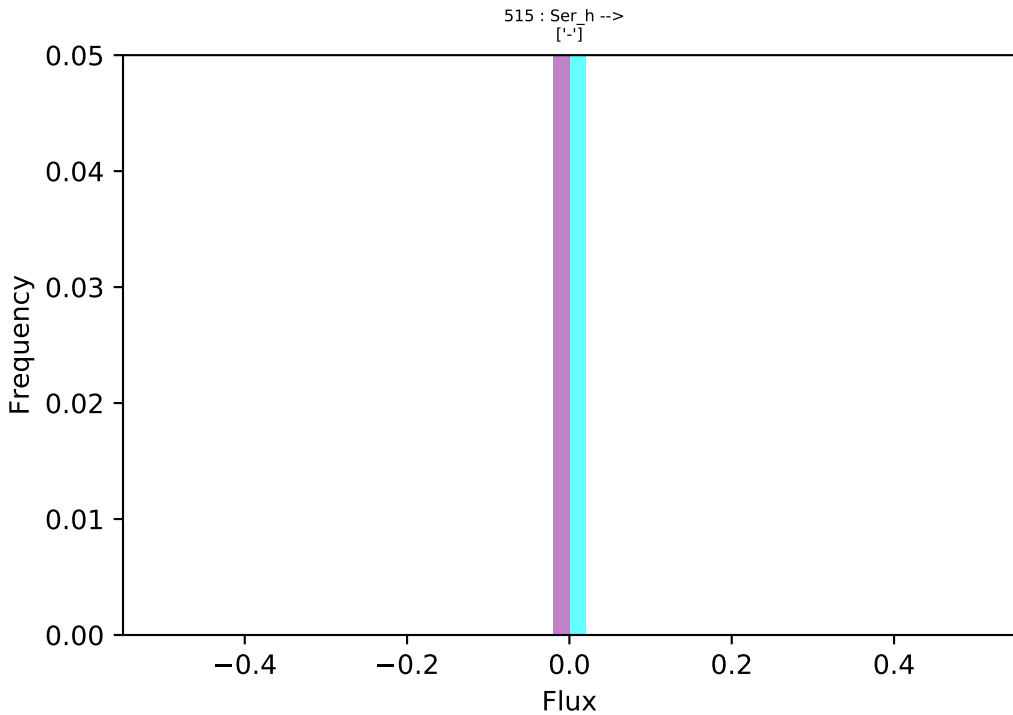
512 : Pro\_m -->  
[<sup>+</sup>-<sup>-</sup>]

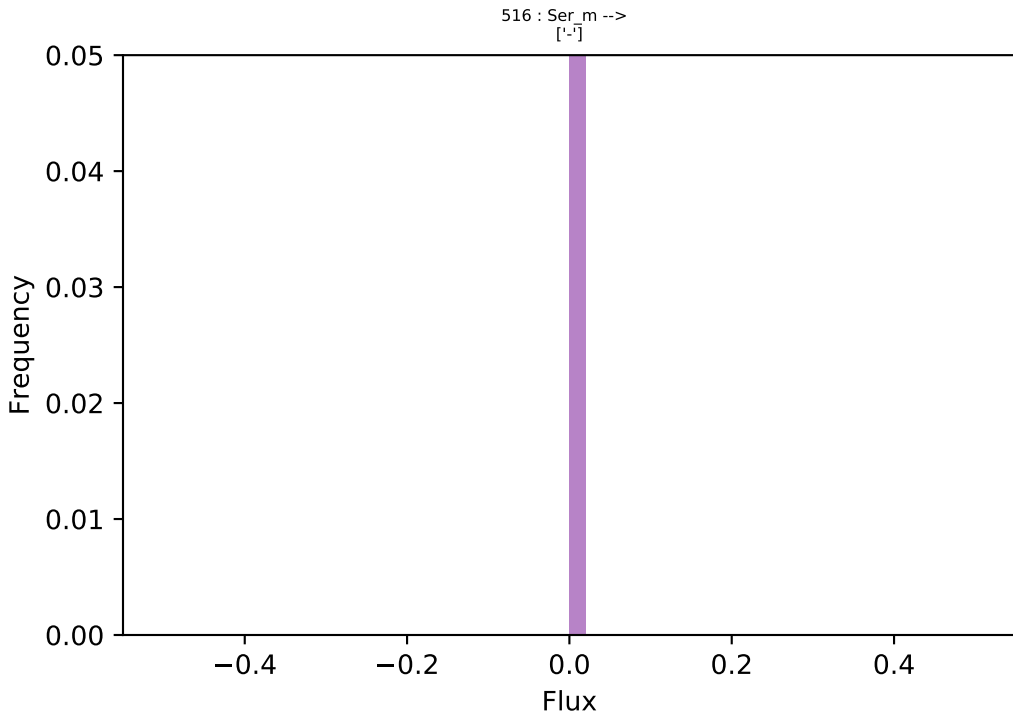


513 : Pro\_p -->  
['-']

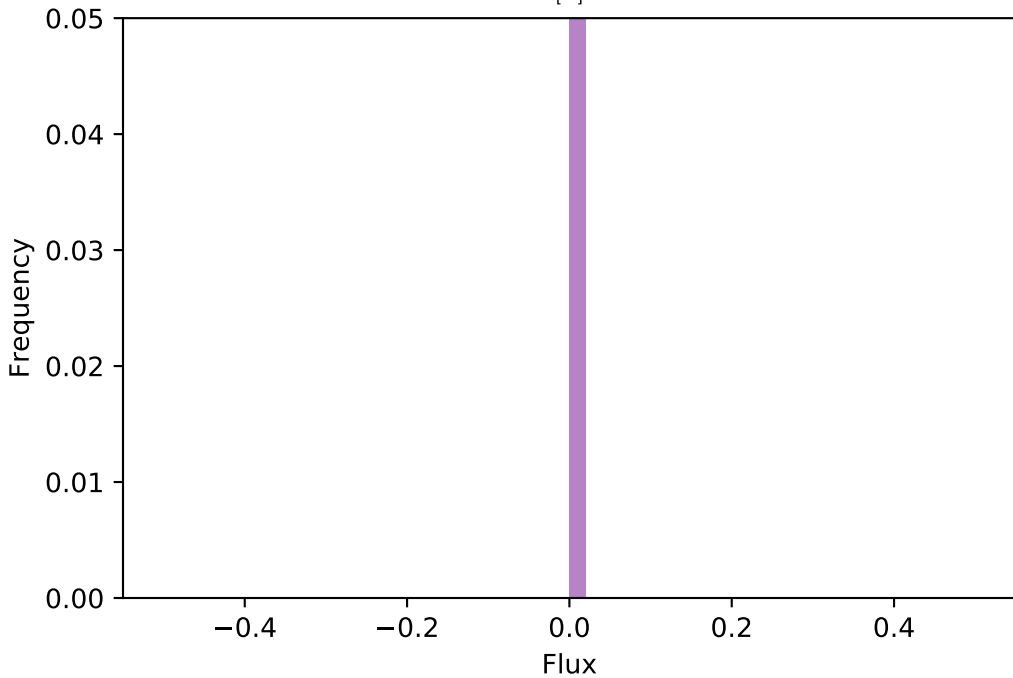


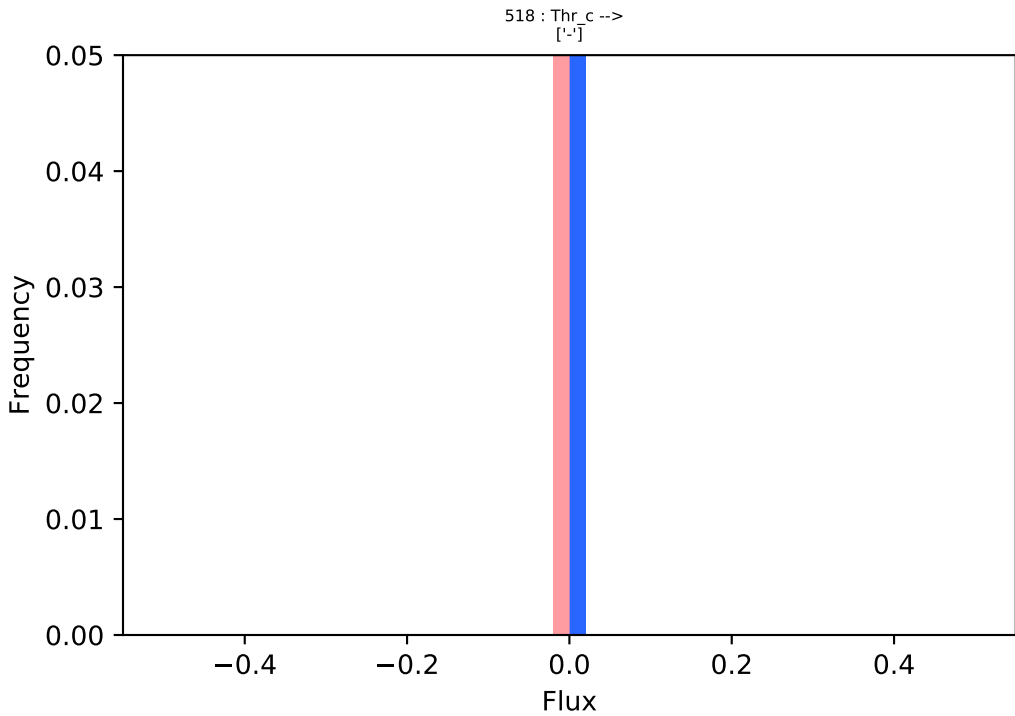


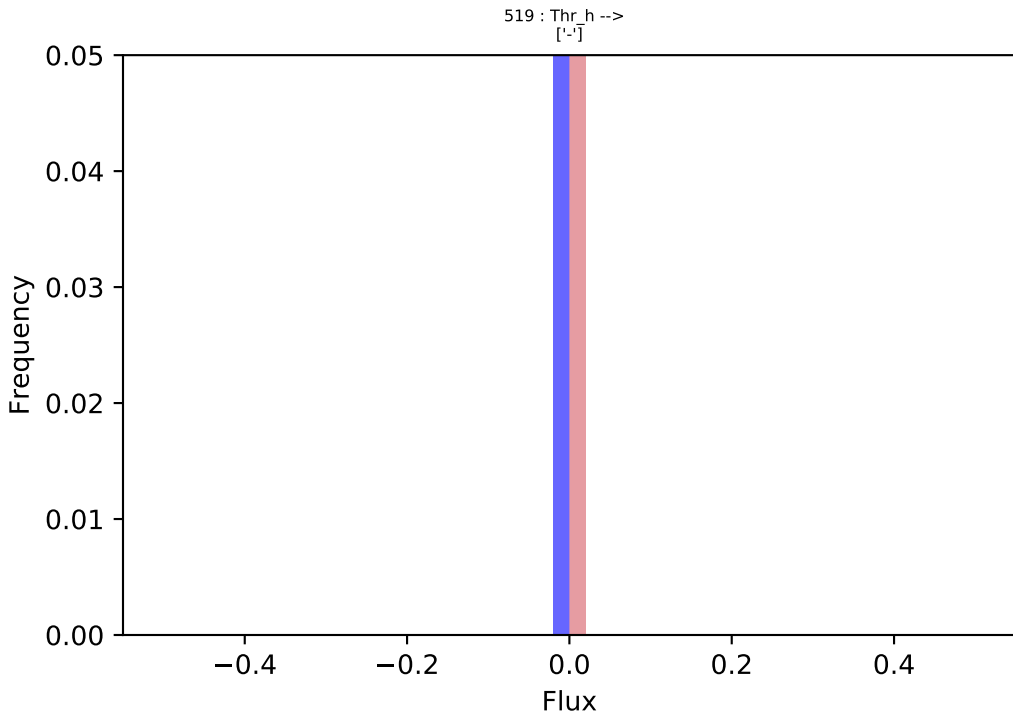




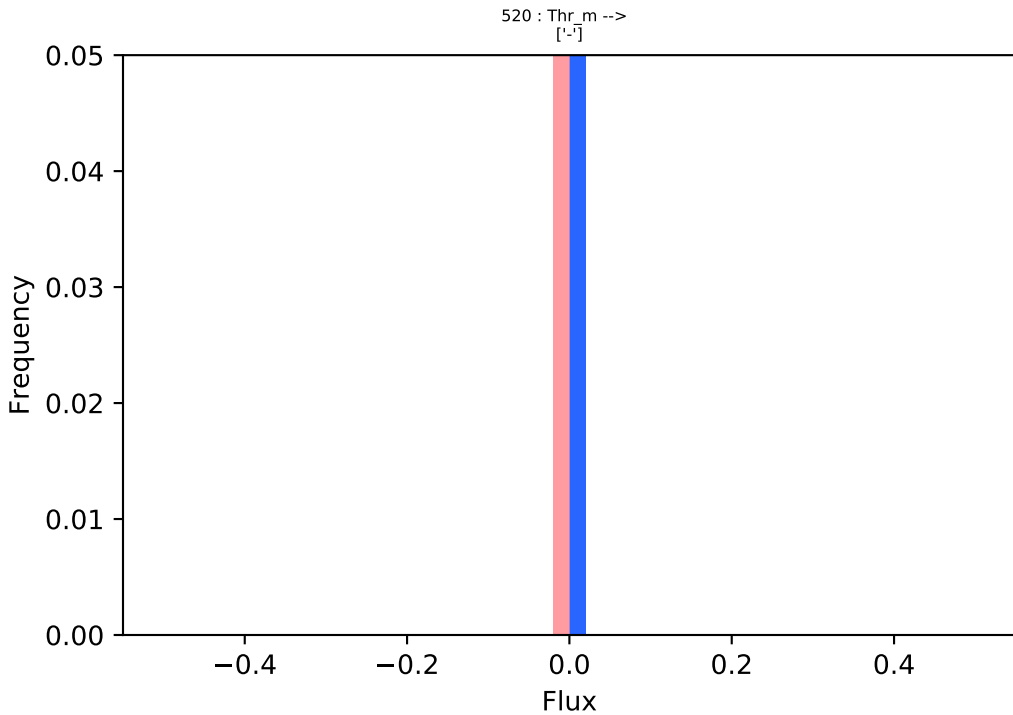
517 : Ser\_p -->  
['-']

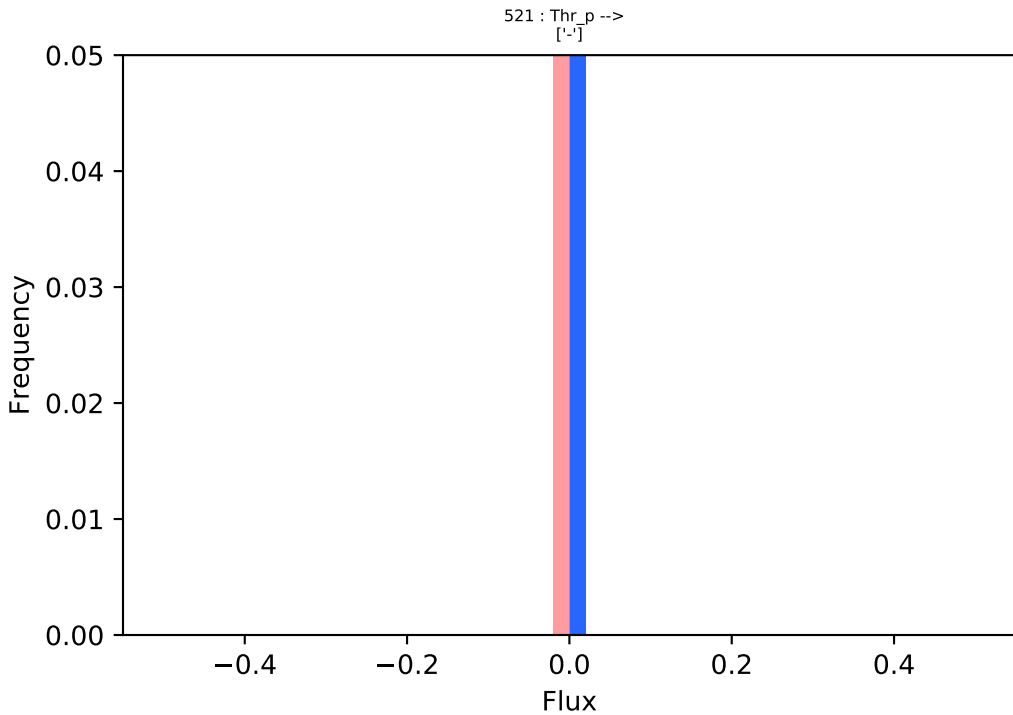




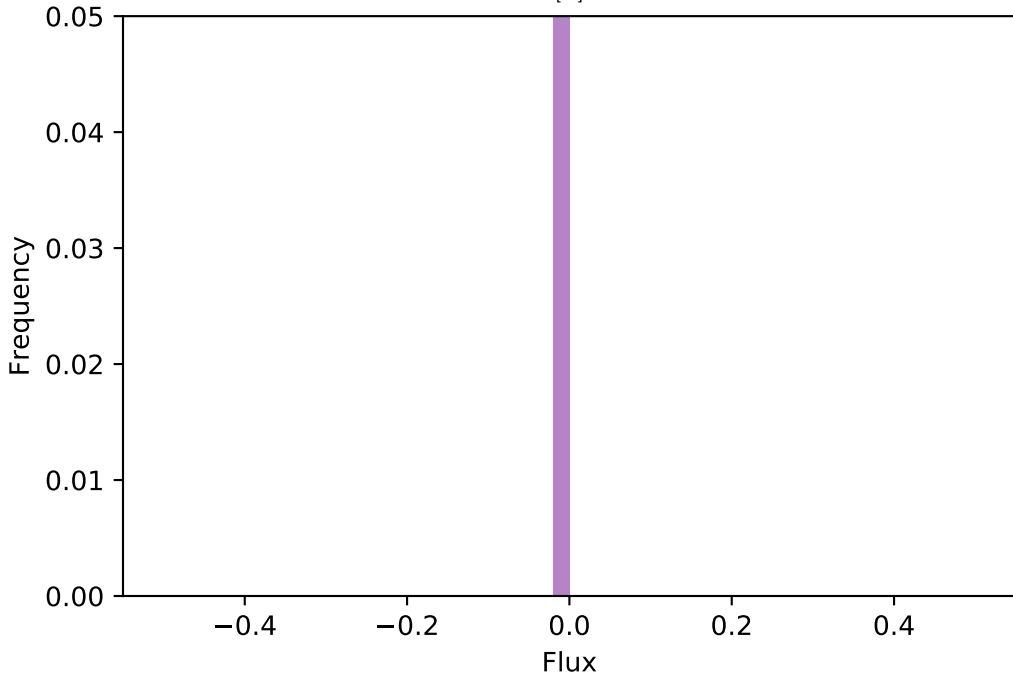


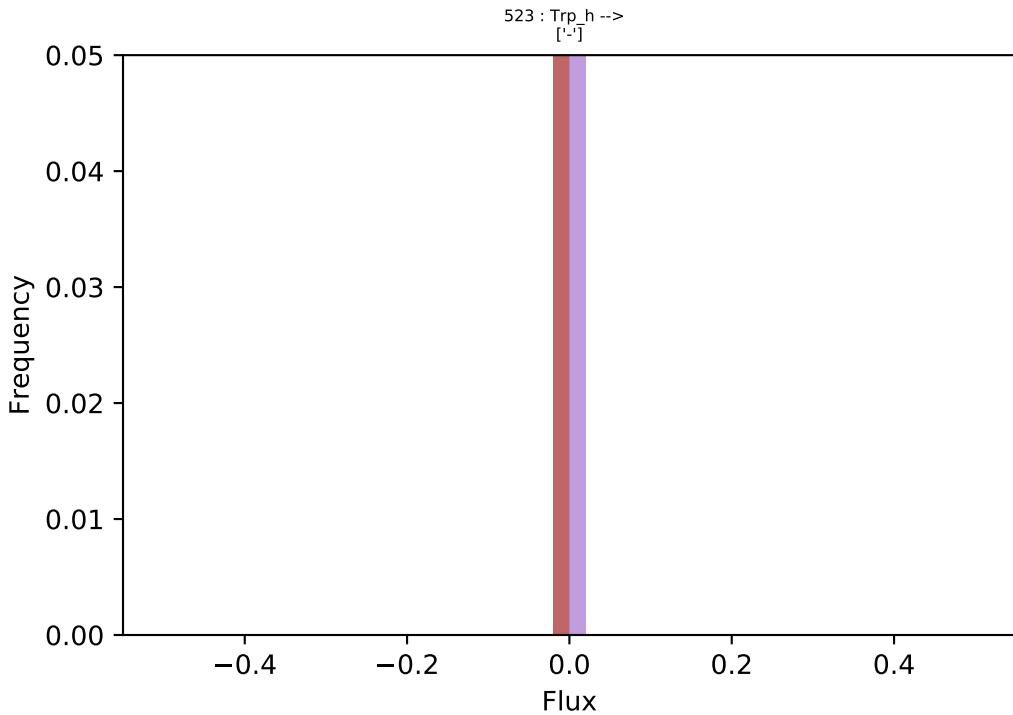


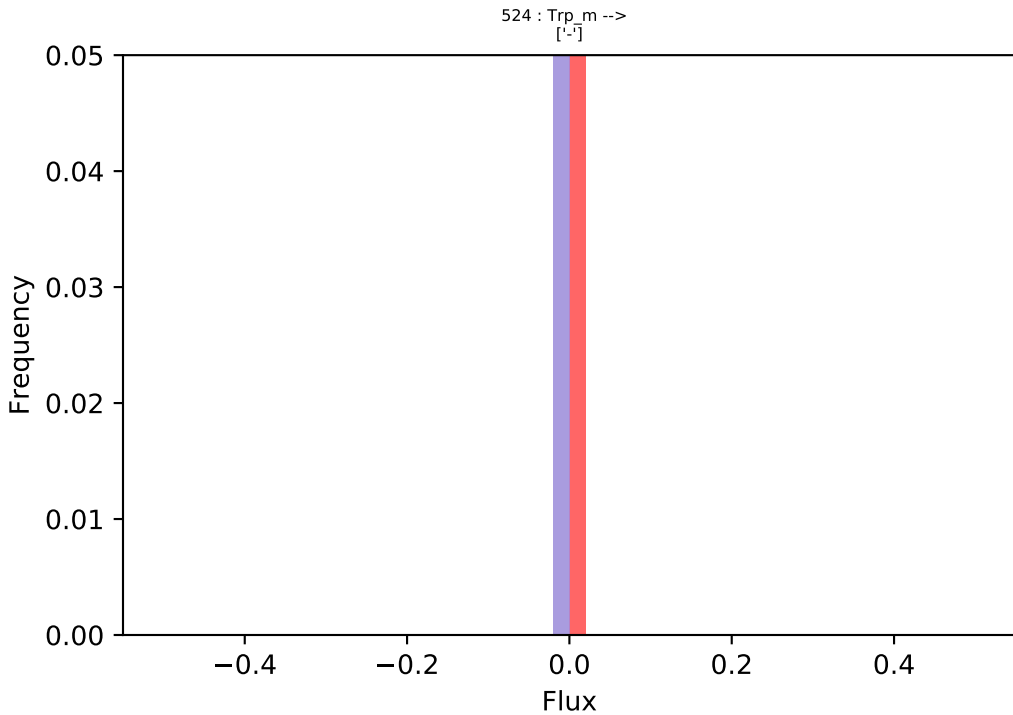


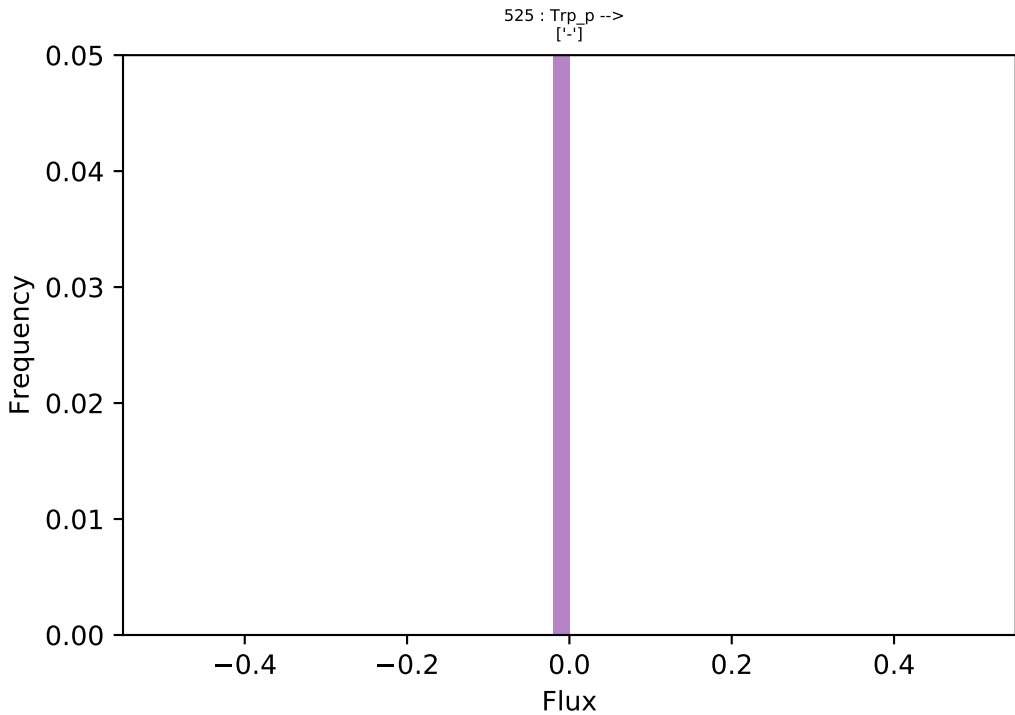


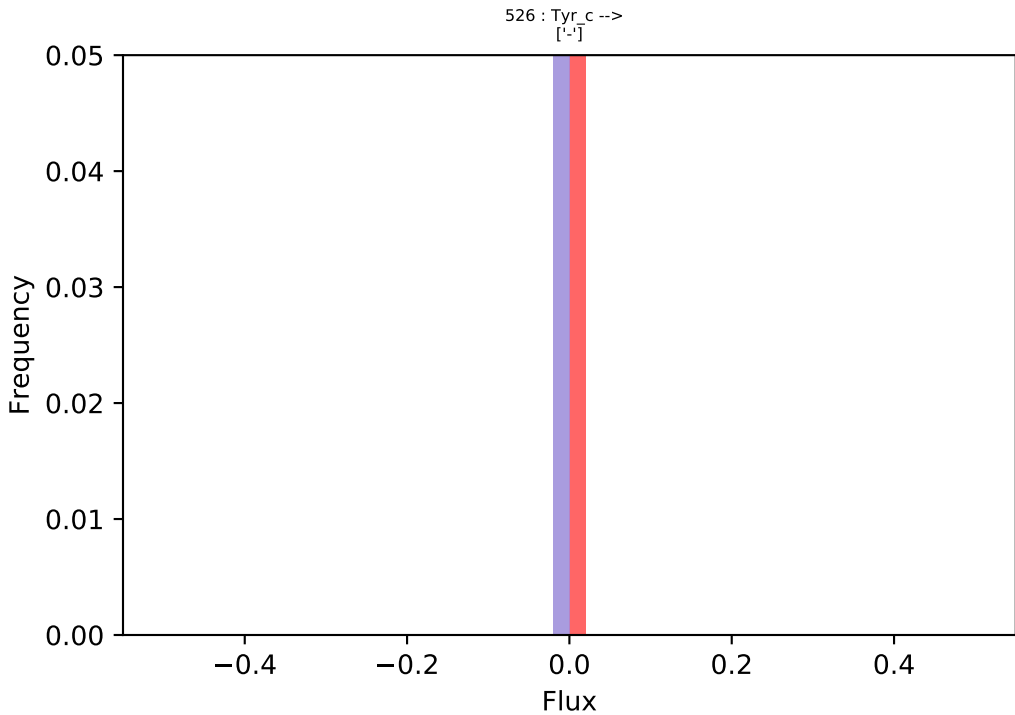
522 : Trp\_c -->  
['-']

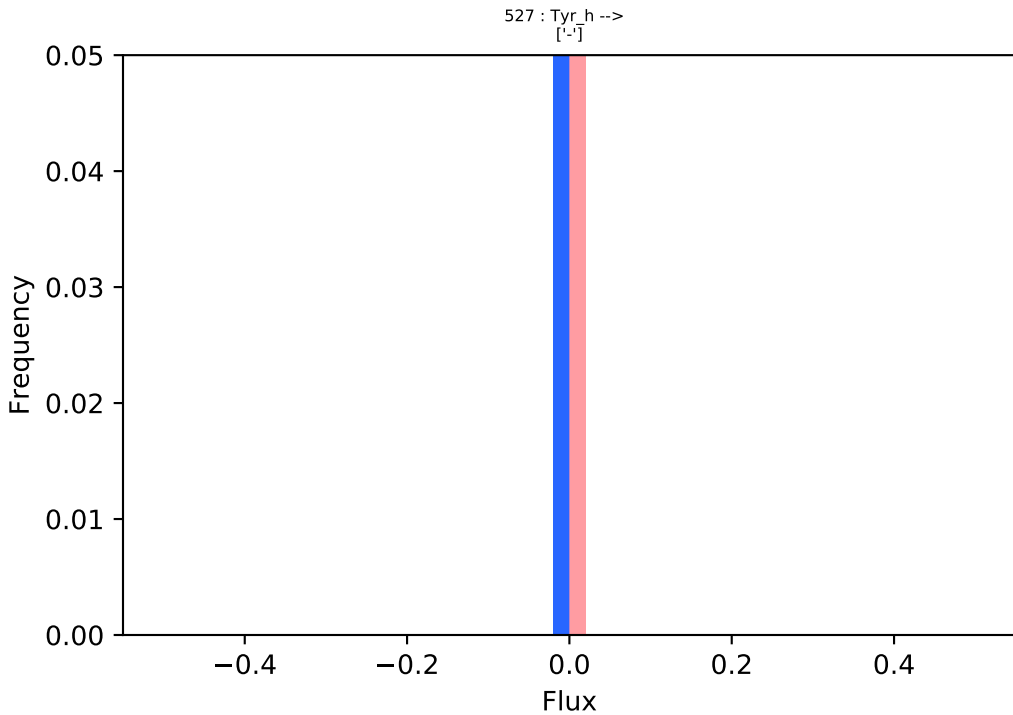




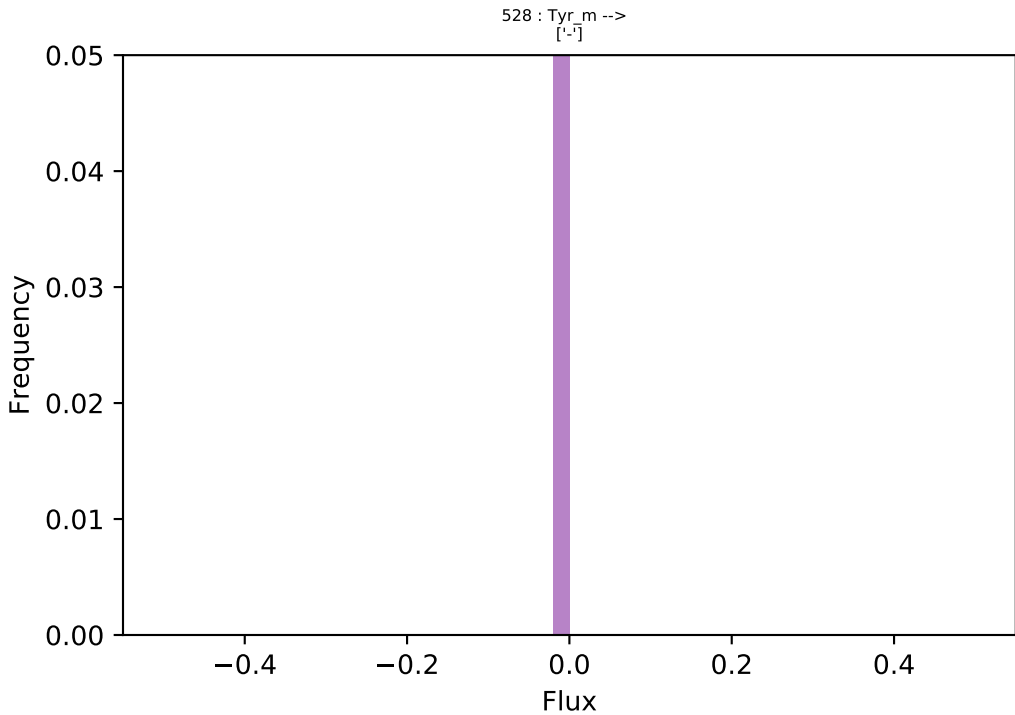


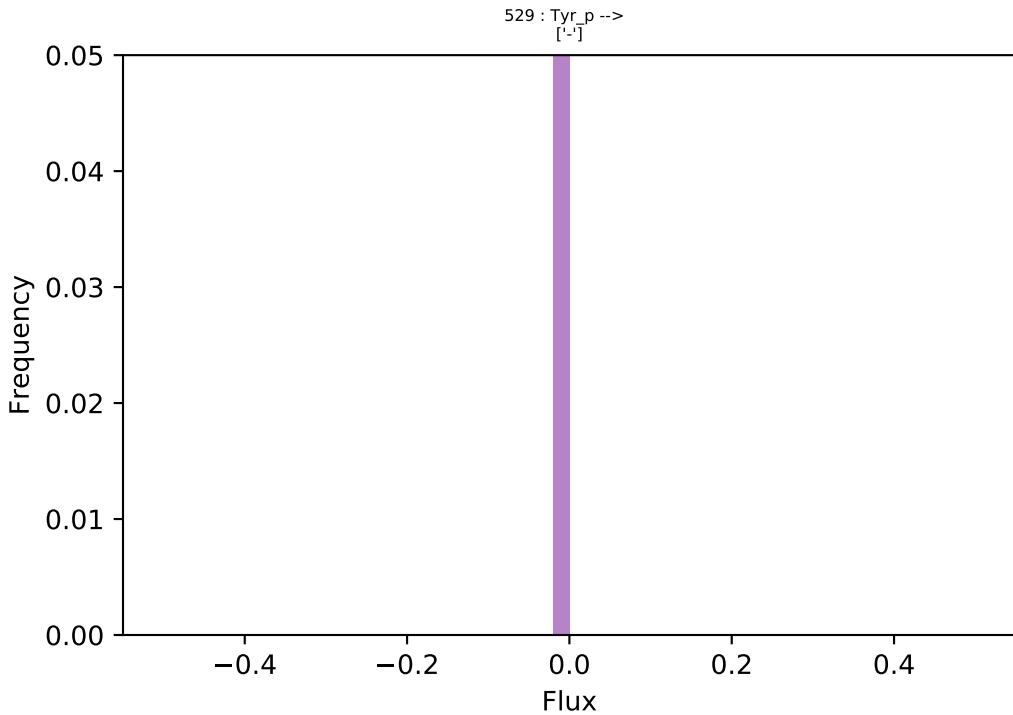




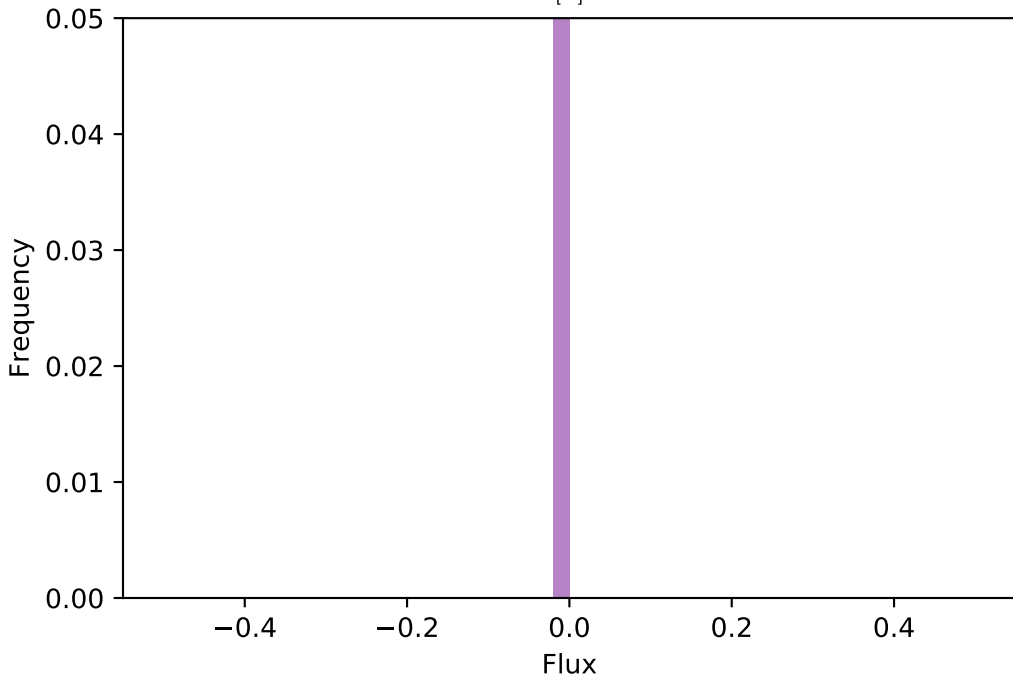




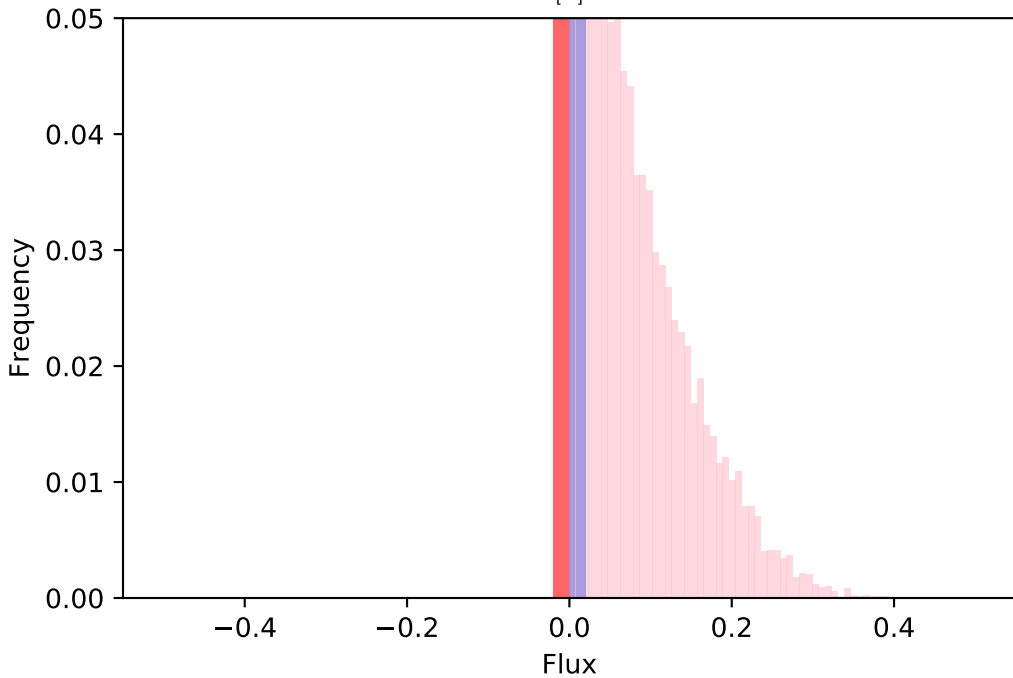


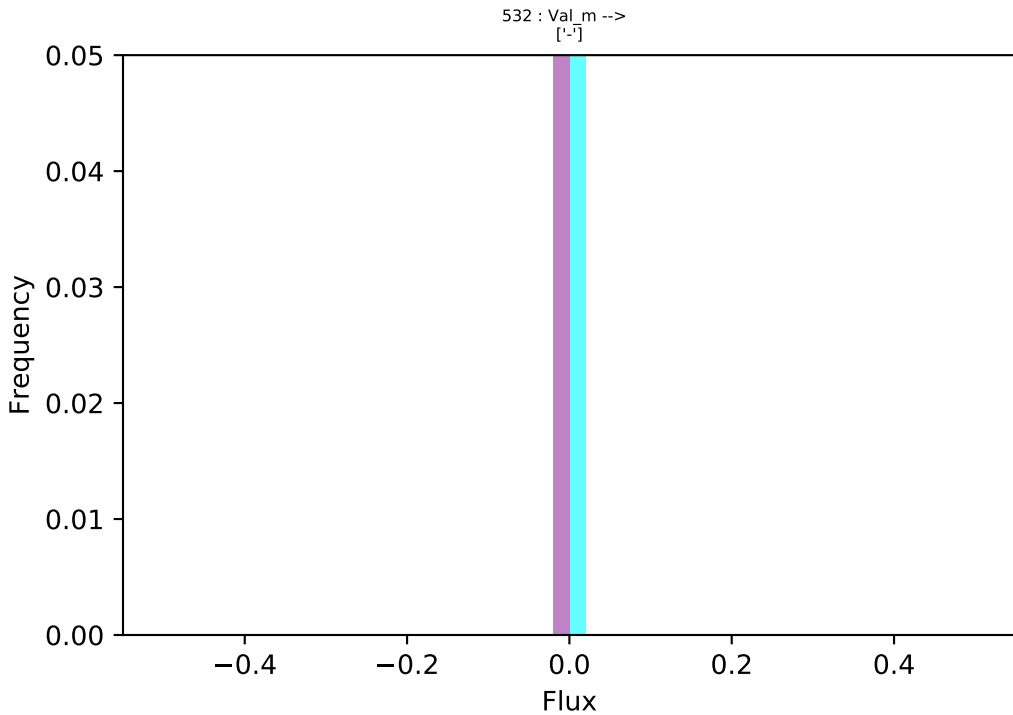


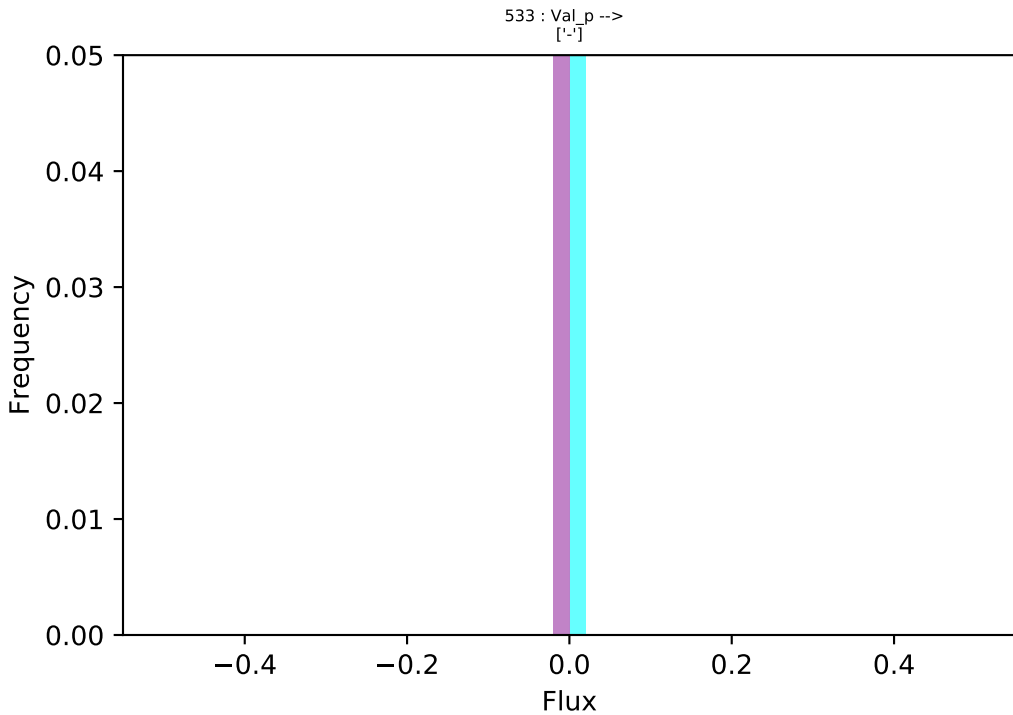
530 : Val\_c -->  
['-']

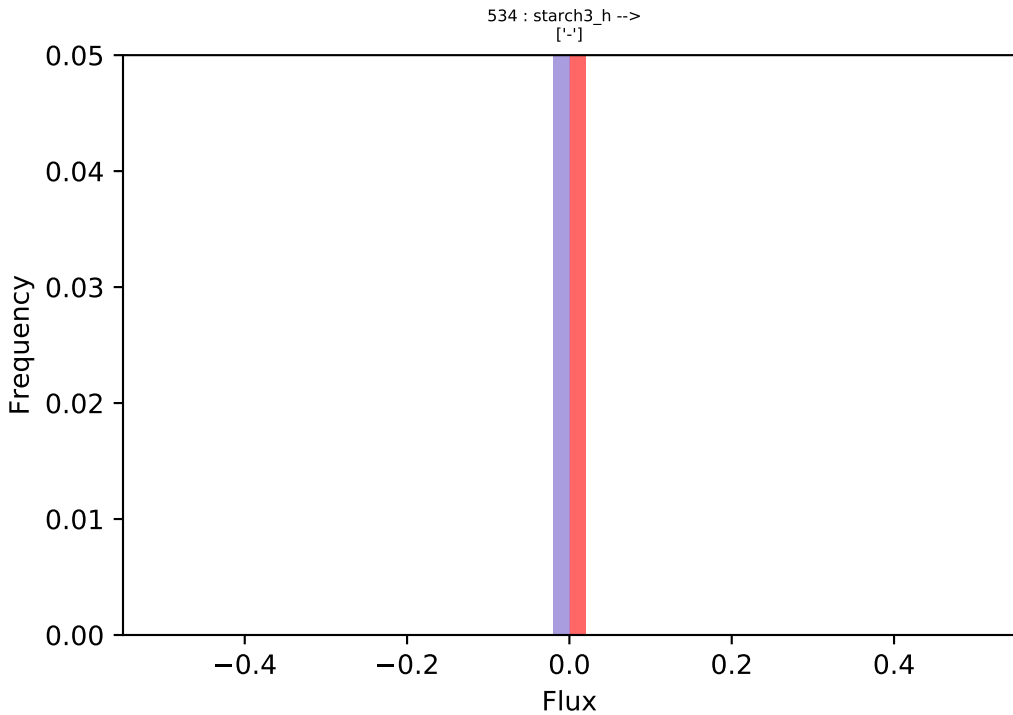


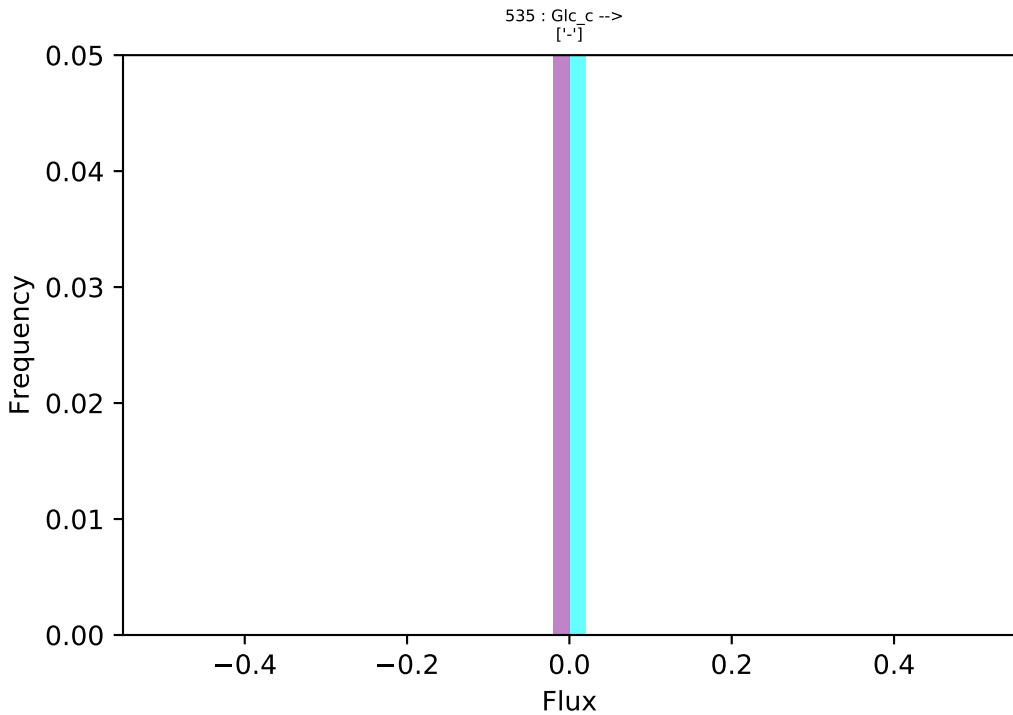
531 : Val\_h -->  
['-']





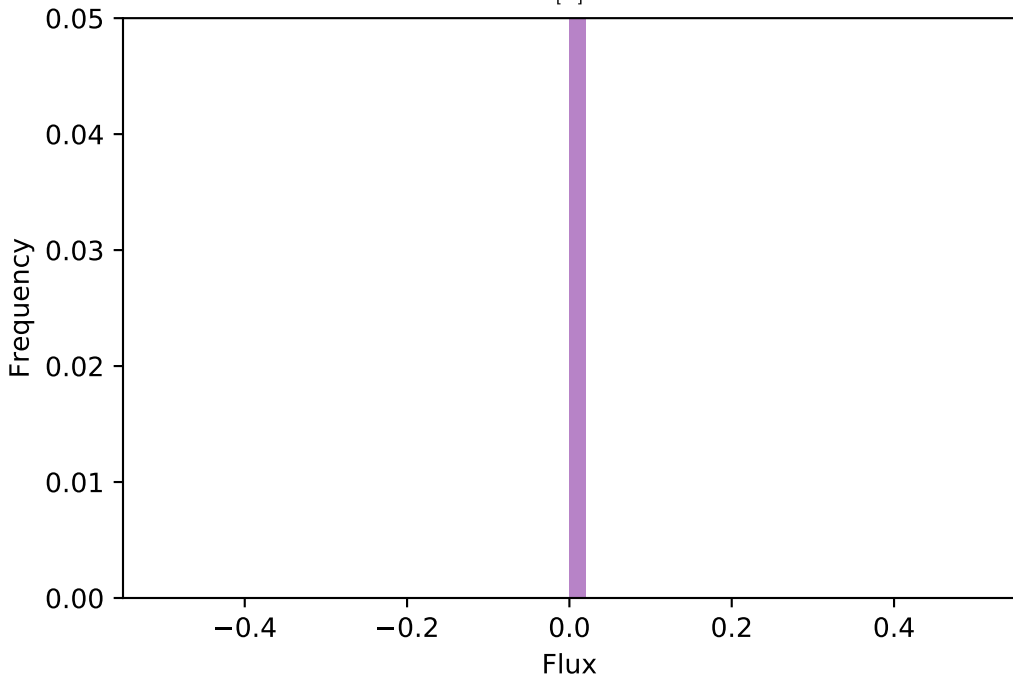


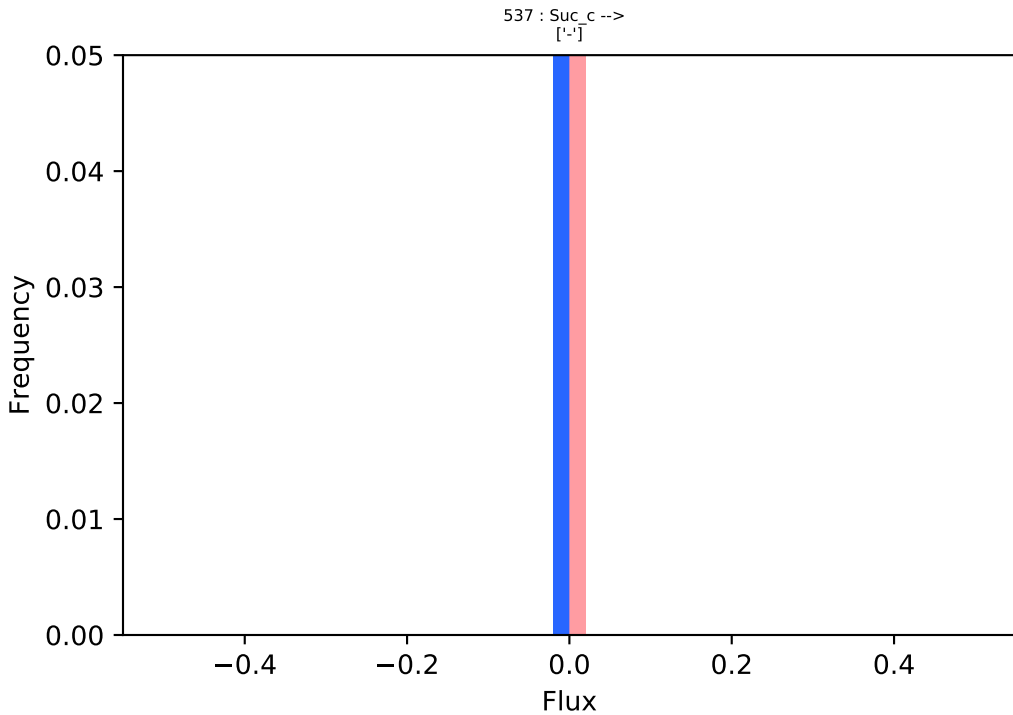




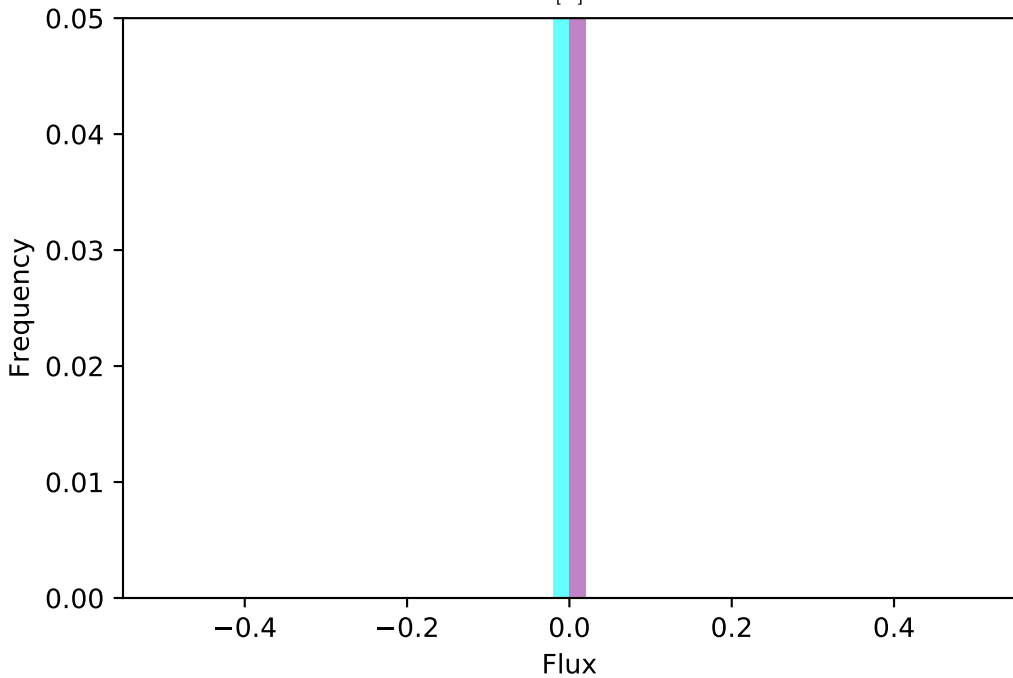


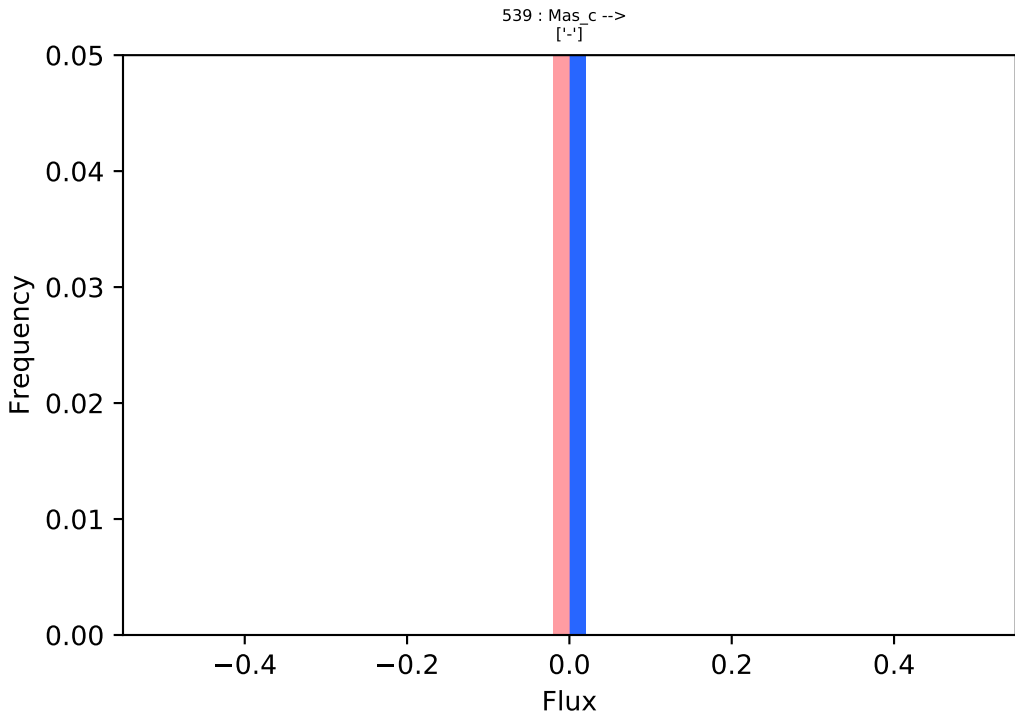
536 : Frc\_c -->  
[<sup>-</sup>-<sup>-</sup>]



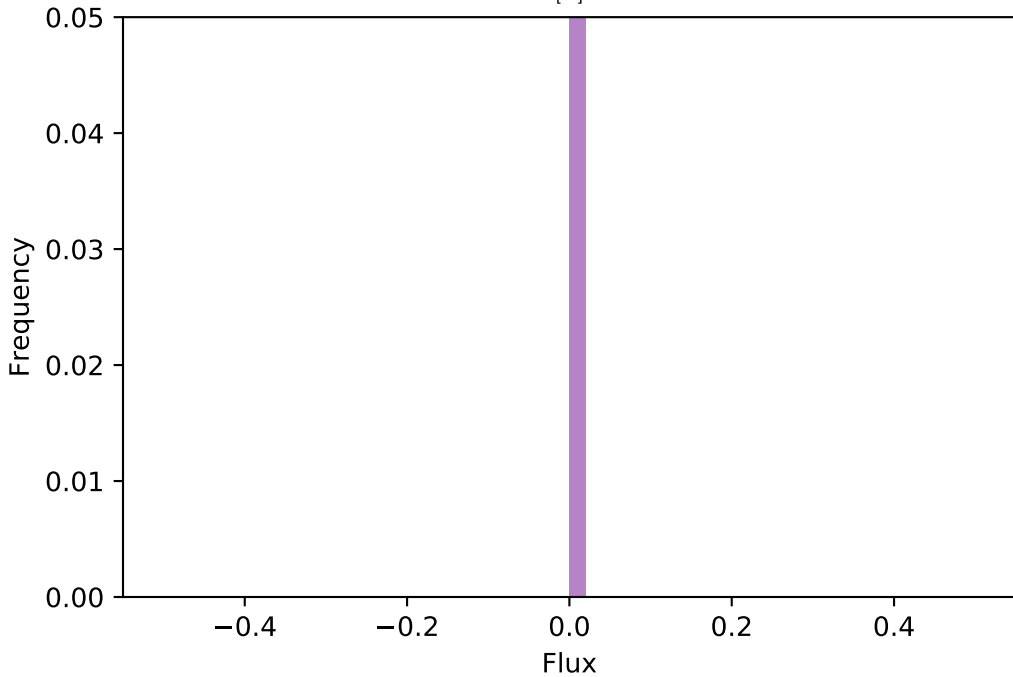


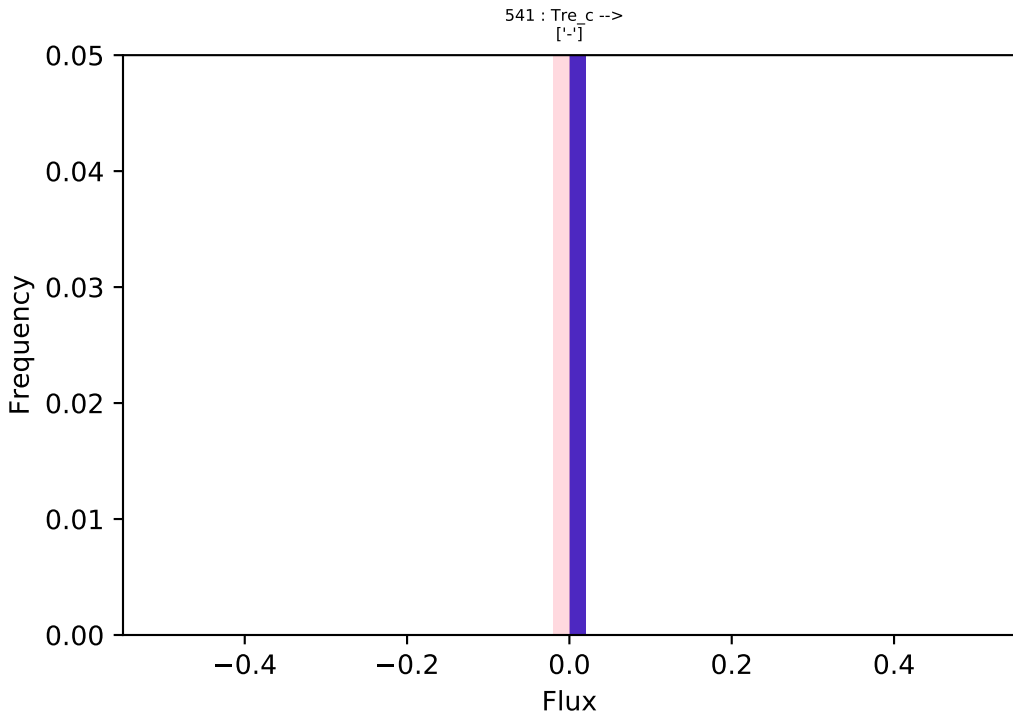
538 : cellulose3\_c -->  
['-']

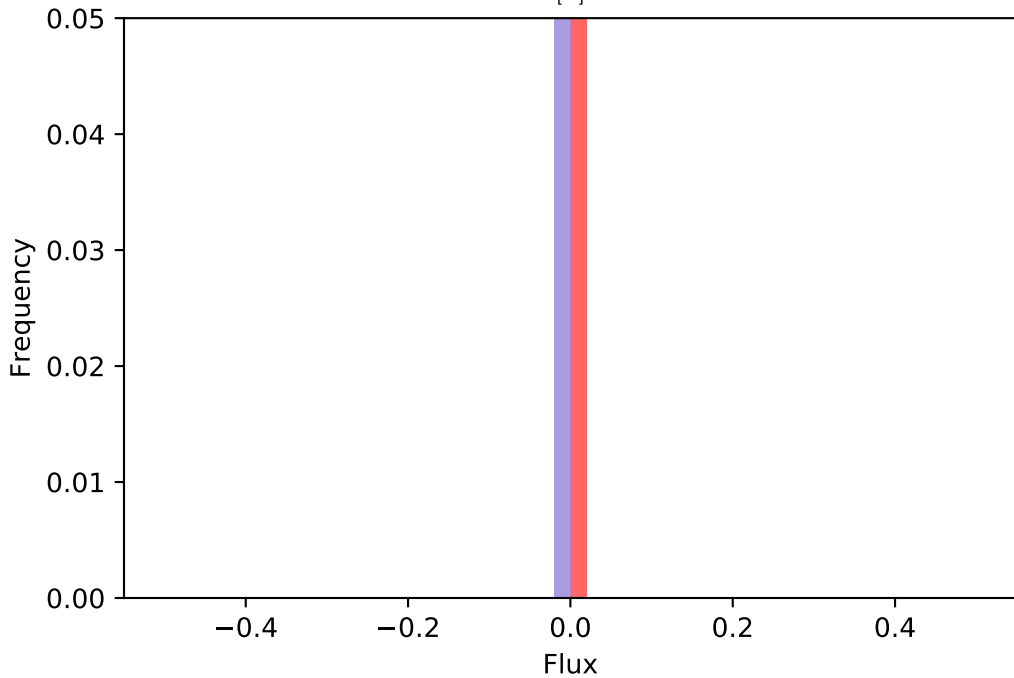
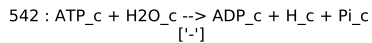




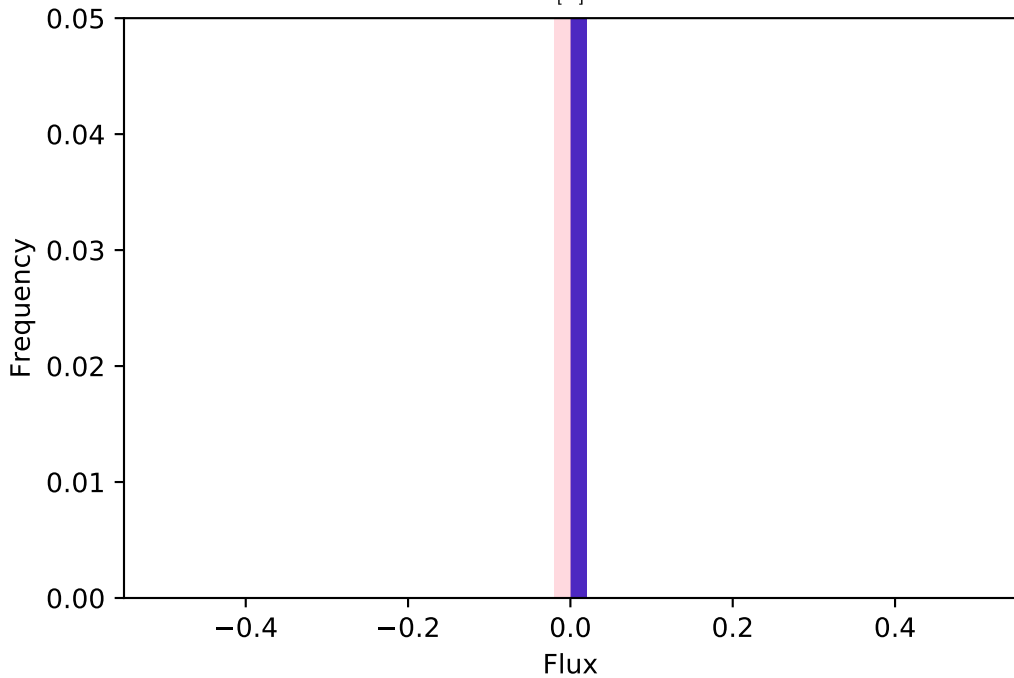
540 : M\_DASH\_ACP\_h --> ACP\_h + H\_h  
[<sup>-1</sup>]





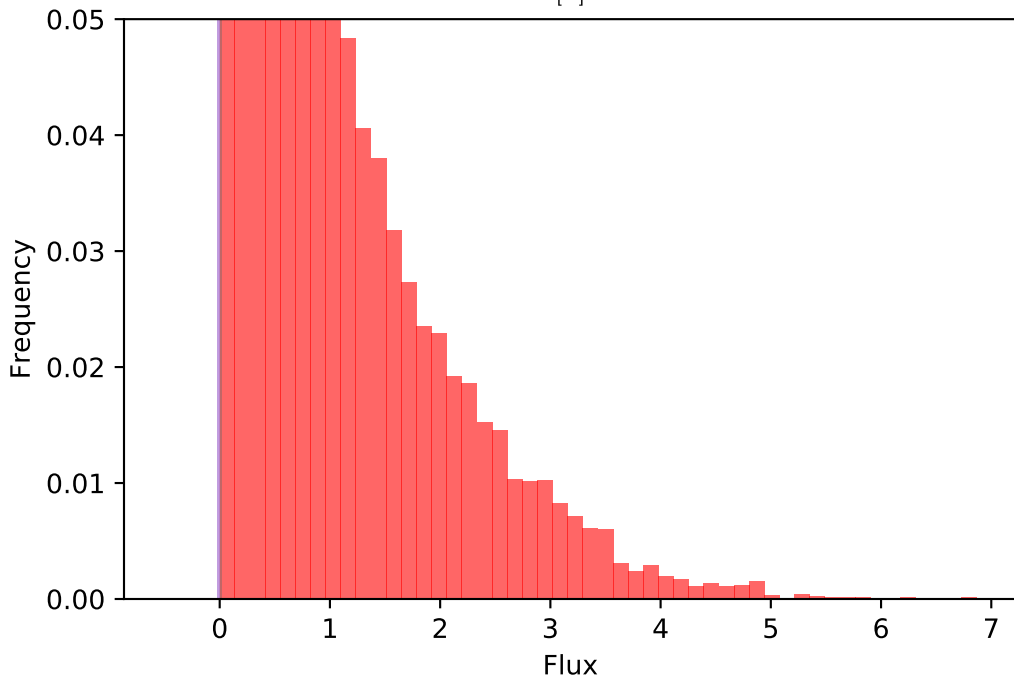


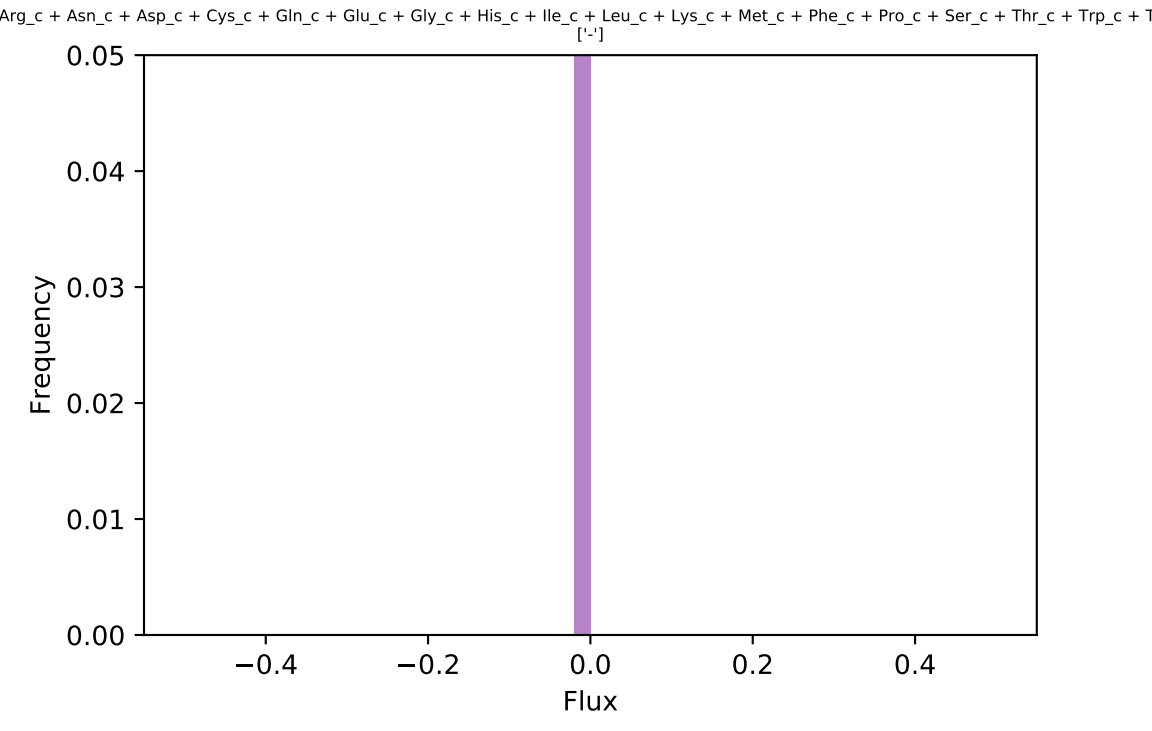
543 : ATP\_h + H2O\_h --> ADP\_h + H\_h + Pi\_h  
['-']





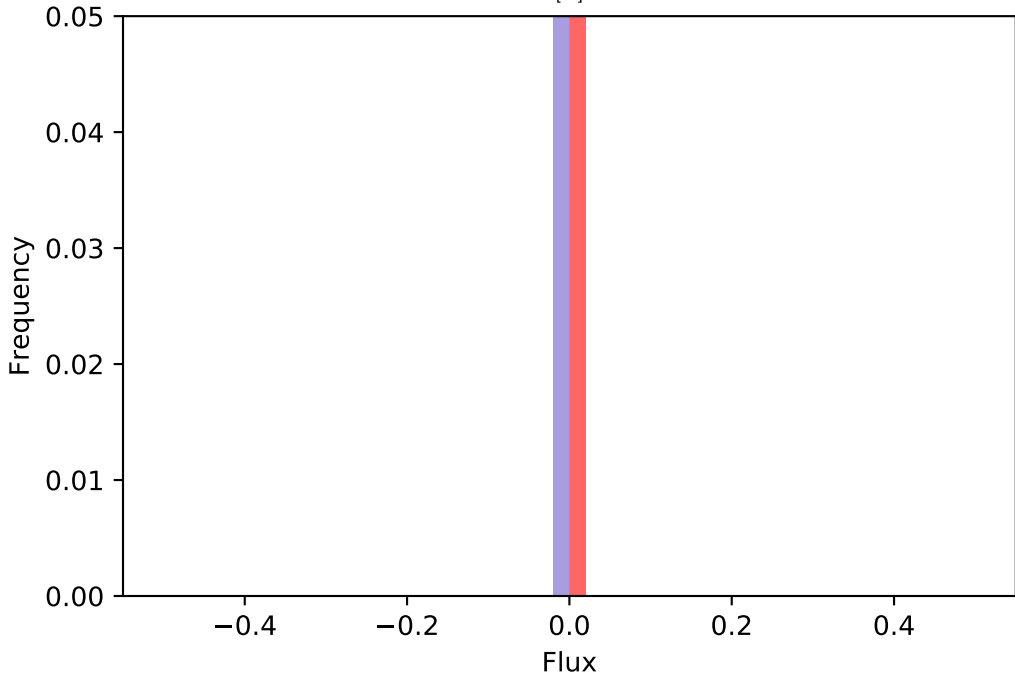
544 : ATP\_m + H2O\_m --> ADP\_m + H\_m + Pi\_m  
['-']





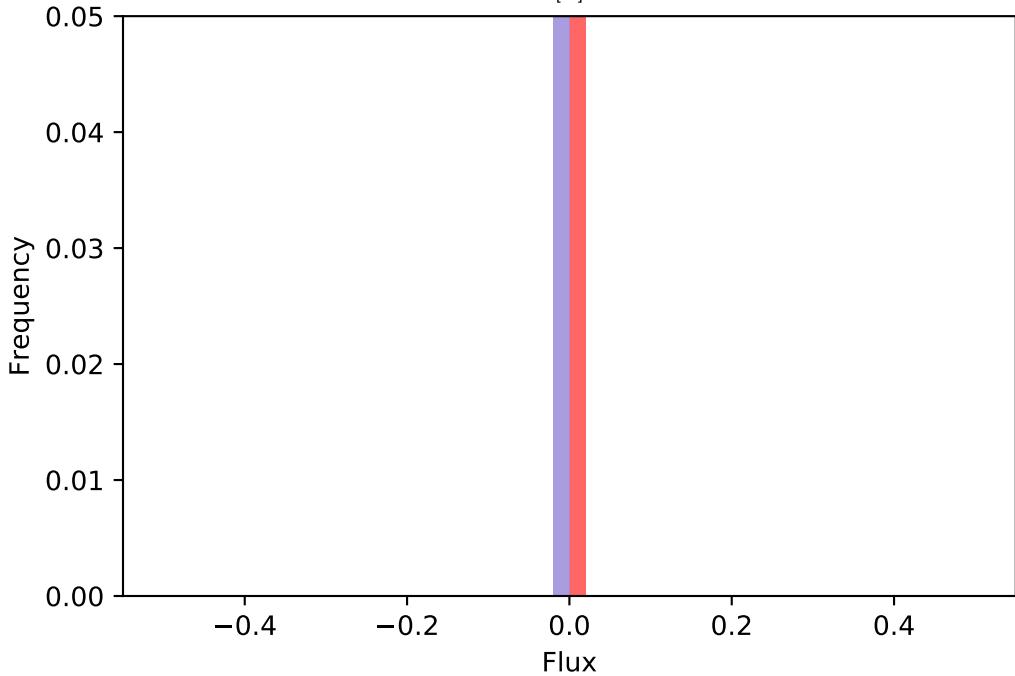
779.97036 M\_DASH\_ACP\_h + 38.11199 Mal\_m + 2.27742 Mas\_c + 30.37981 Met\_c + 14.60727 Orn\_h + 59.65081 Phe\_c + 96.88322 Pro\_c + 0

['-']

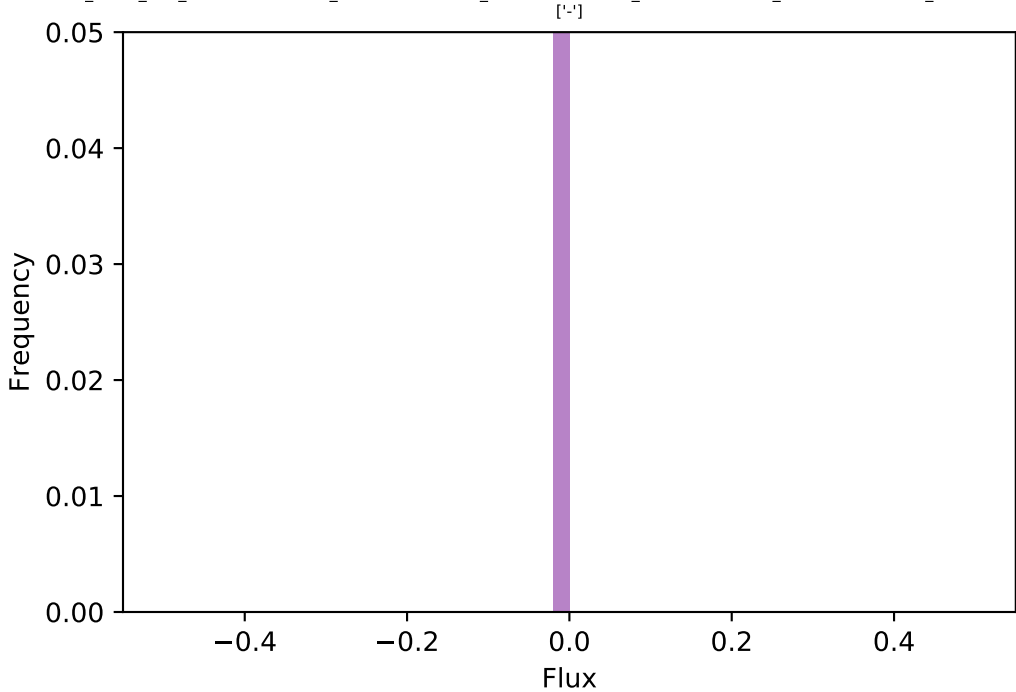


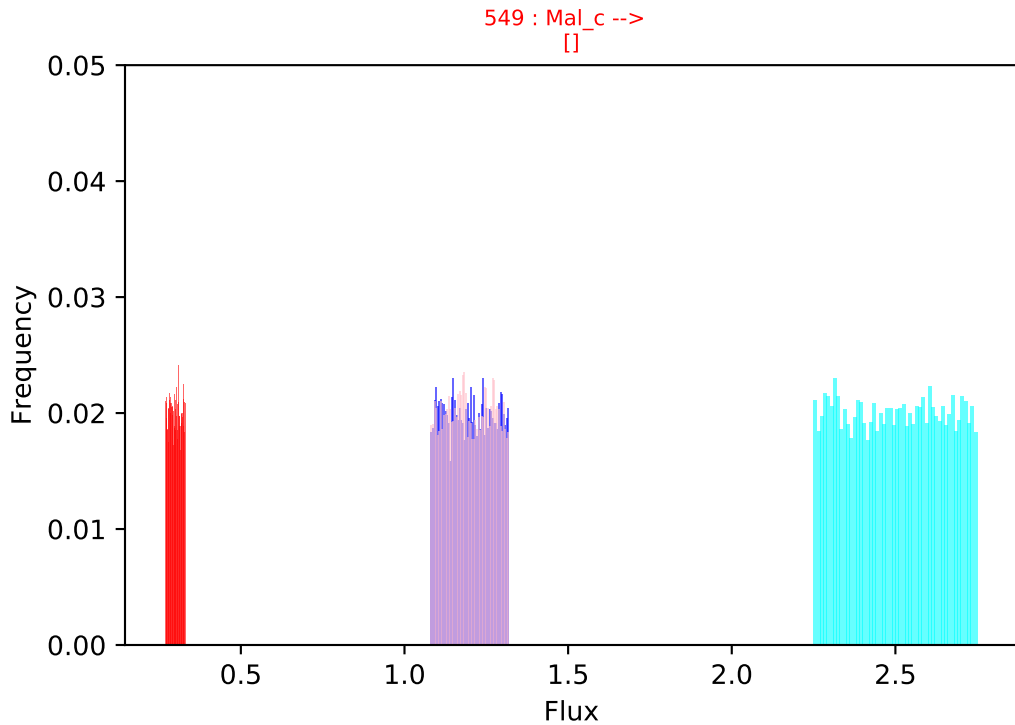
$\text{c} + 826.95653 \text{ M\_DASH\_ACP\_h} + 10.89856 \text{ Mal\_m} + 5.37965 \text{ Mas\_c} + 51.81818 \text{ Met\_c} + 9.64682 \text{ Orn\_h} + 101.65645 \text{ Phe\_c} + 164.00331 \text{ Pro}$

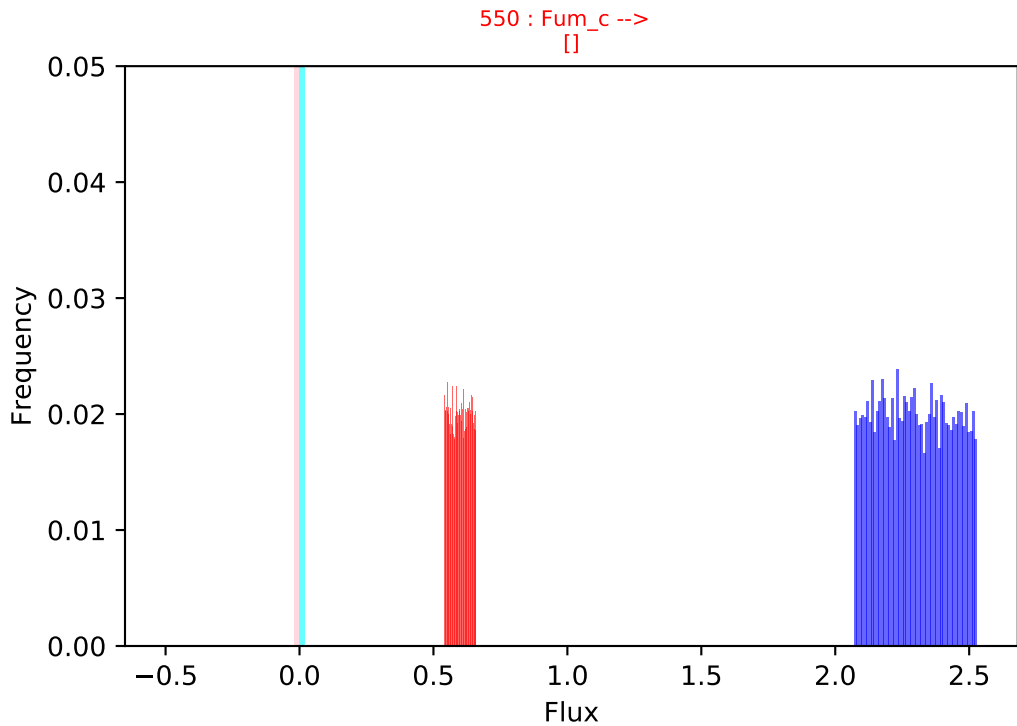
['-']



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







551 : starch1\_h -->  
[]

