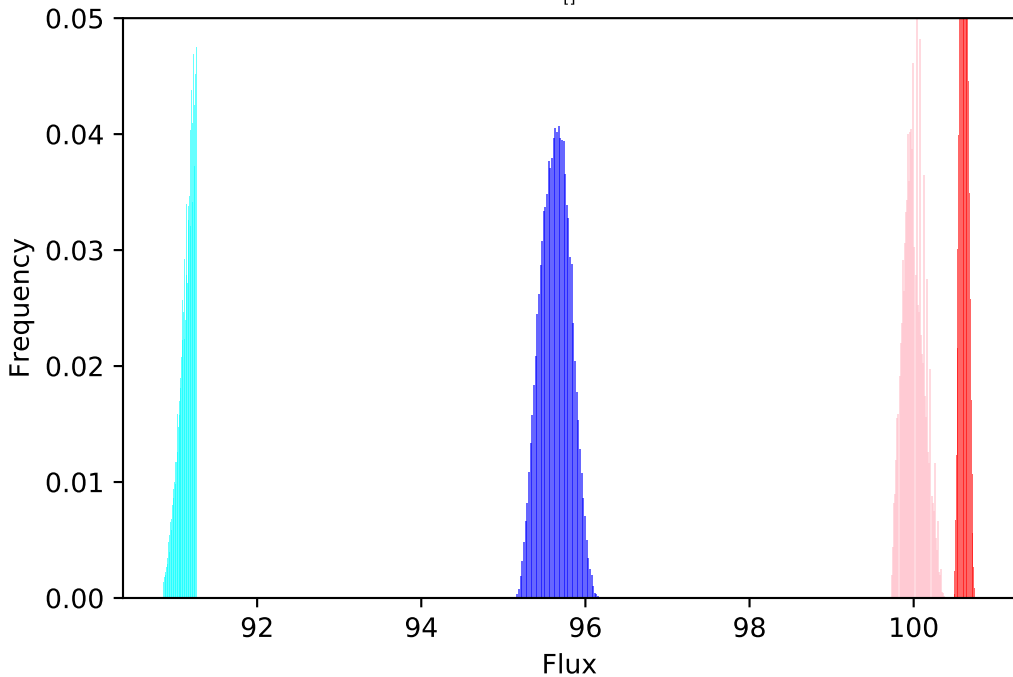
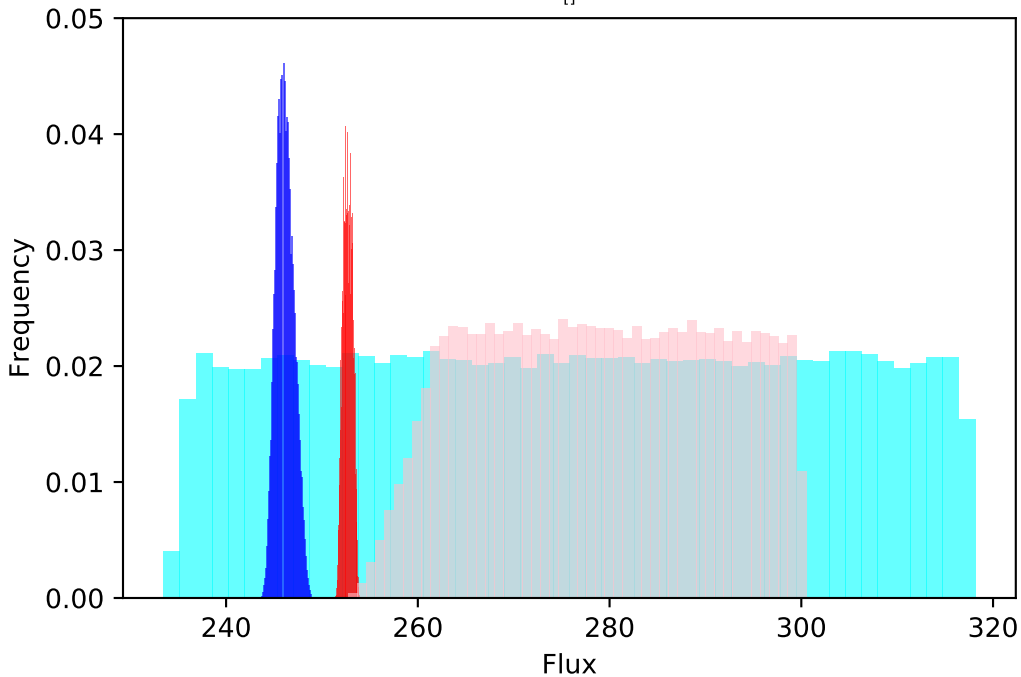


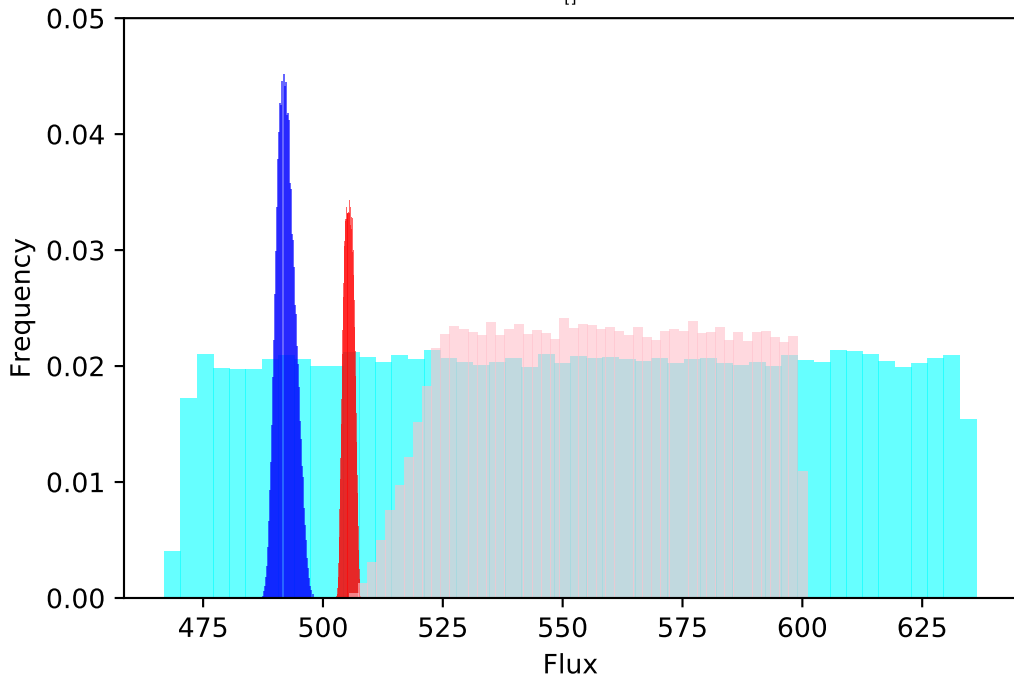
0 : 2.0 H2O\_h + 4.0 H\_h + 2.0 PQ\_h + 4.0 hnu\_h --> 4.0 H\_l + O2\_h + 2.0 PQH2\_h  
[]

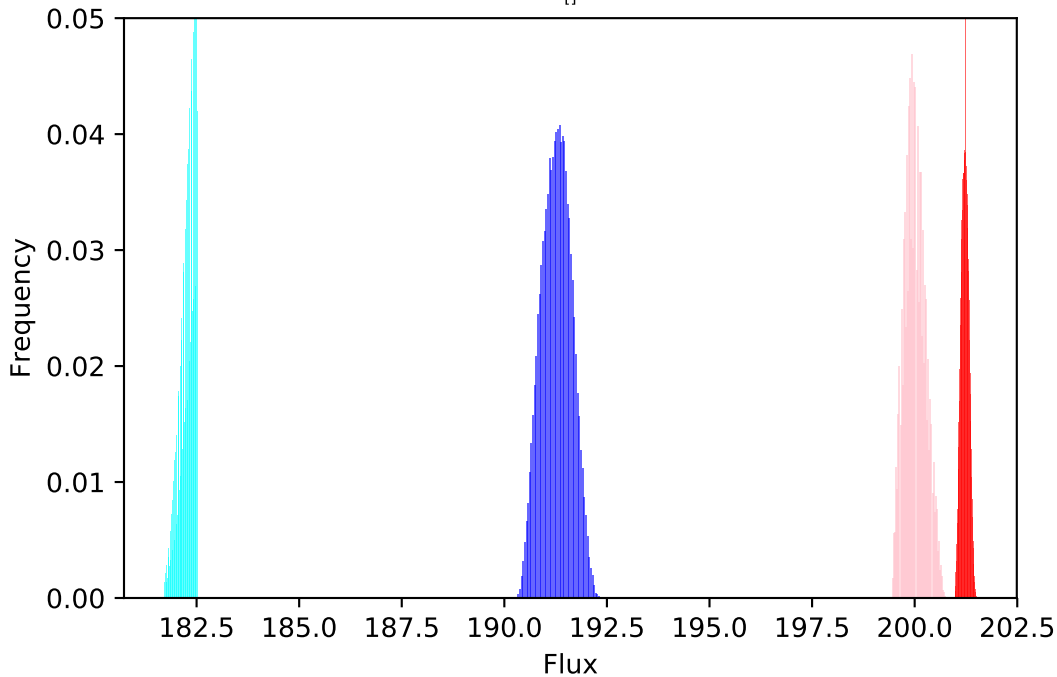
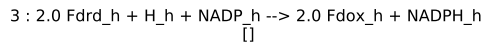


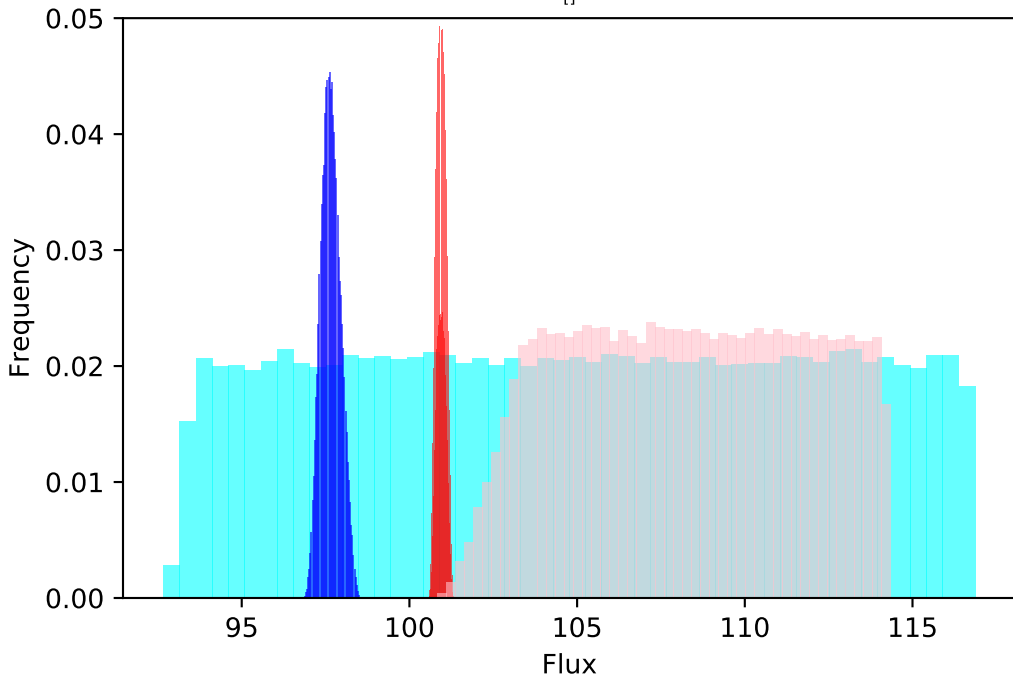
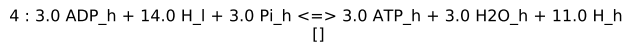
$$1 : 2.0 \text{ H\_h} + 2.0 \text{ PCox\_h} + \text{PQH2\_h} \rightarrow 4.0 \text{ H\_l} + 2.0 \text{ PCrd\_h} + \text{PQ\_h}$$

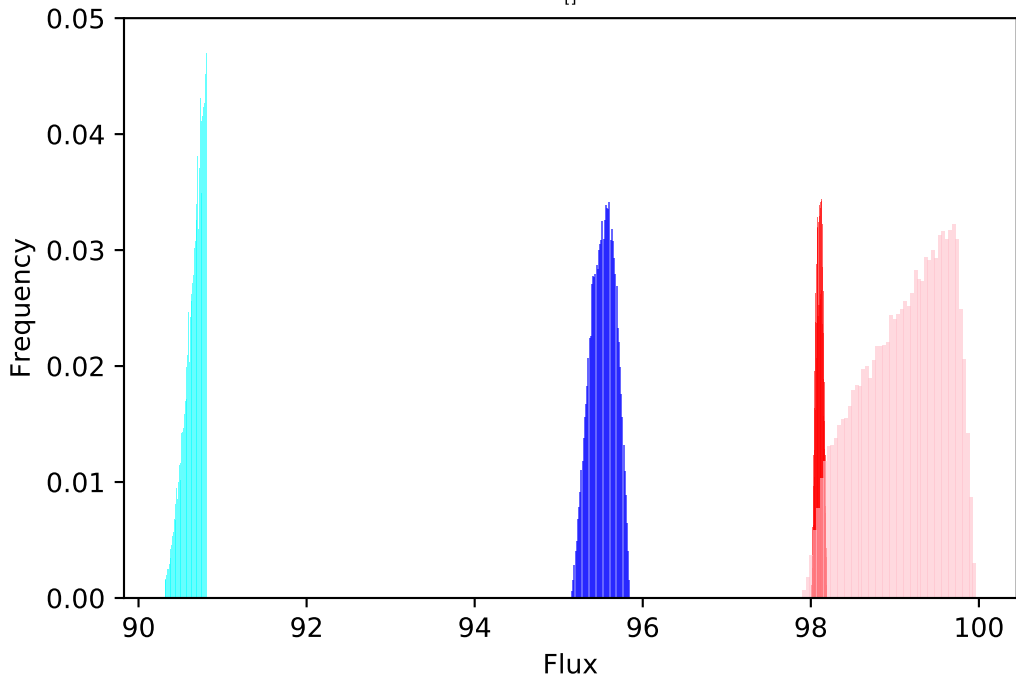
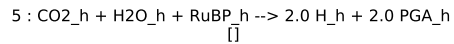


2 : Fd<sub>ox</sub>\_h + PCrd\_h + hnu\_h --> Fd<sub>rd</sub>\_h + PCox\_h  
[]

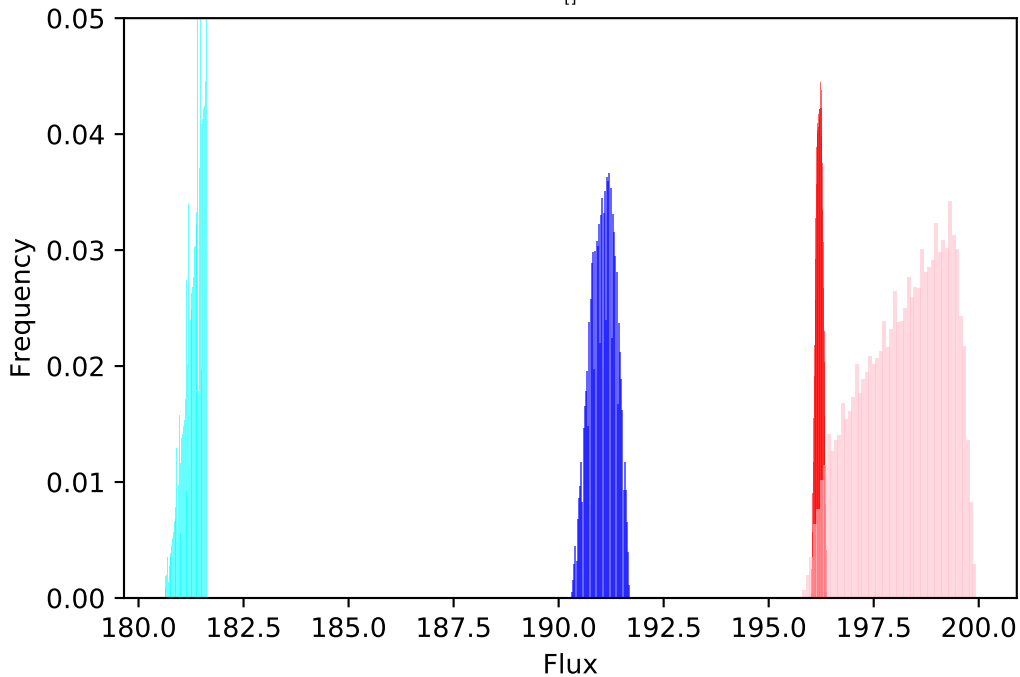




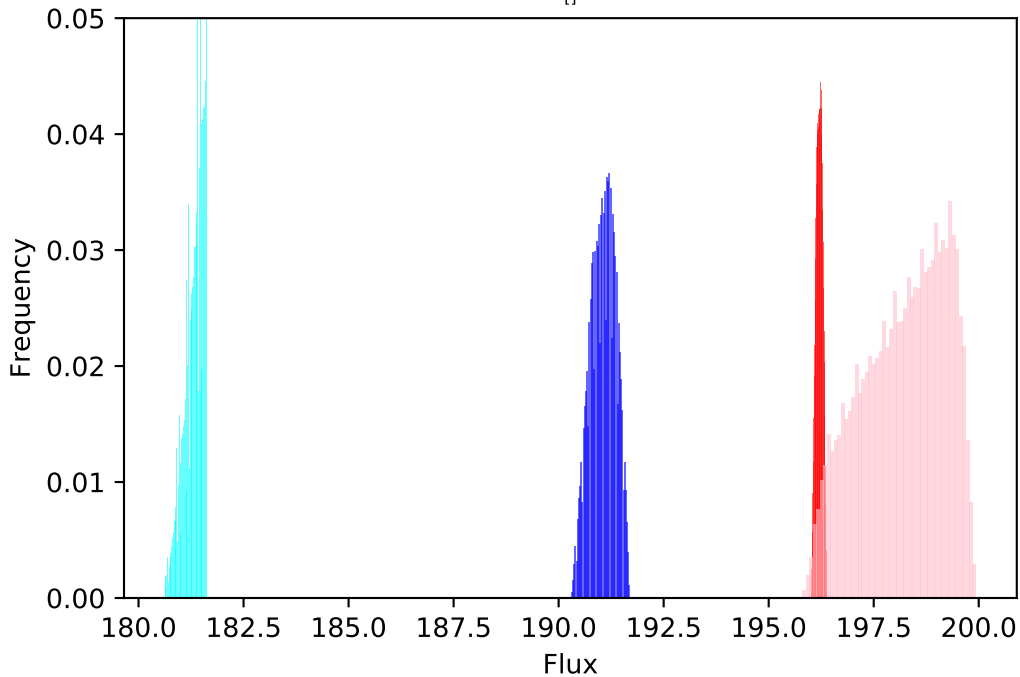




6 : ATP\_h + PGA\_h <=> ADP\_h + DPGA\_h  
[]

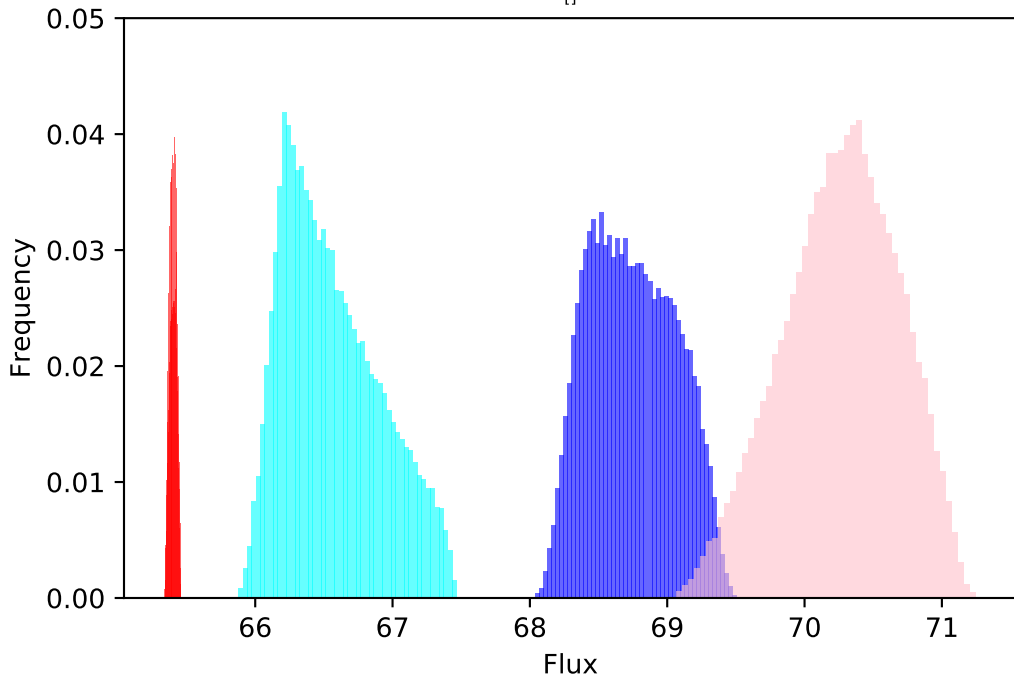


7 : DPGA\_h + H\_h + NADPH\_h --> GAP\_h + NADP\_h + Pi\_h  
[]

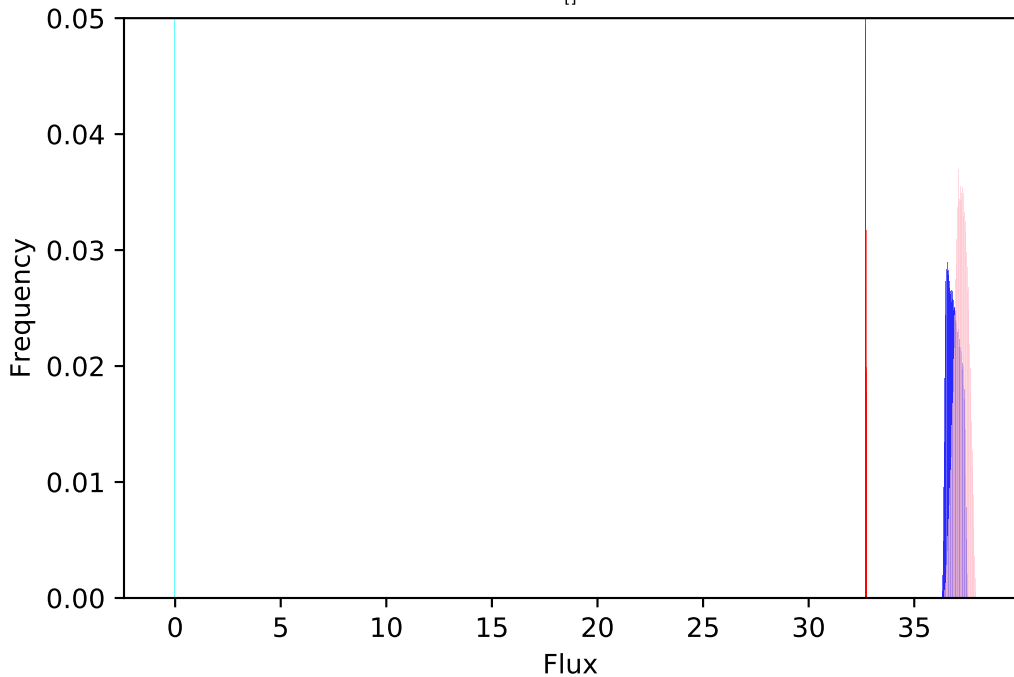


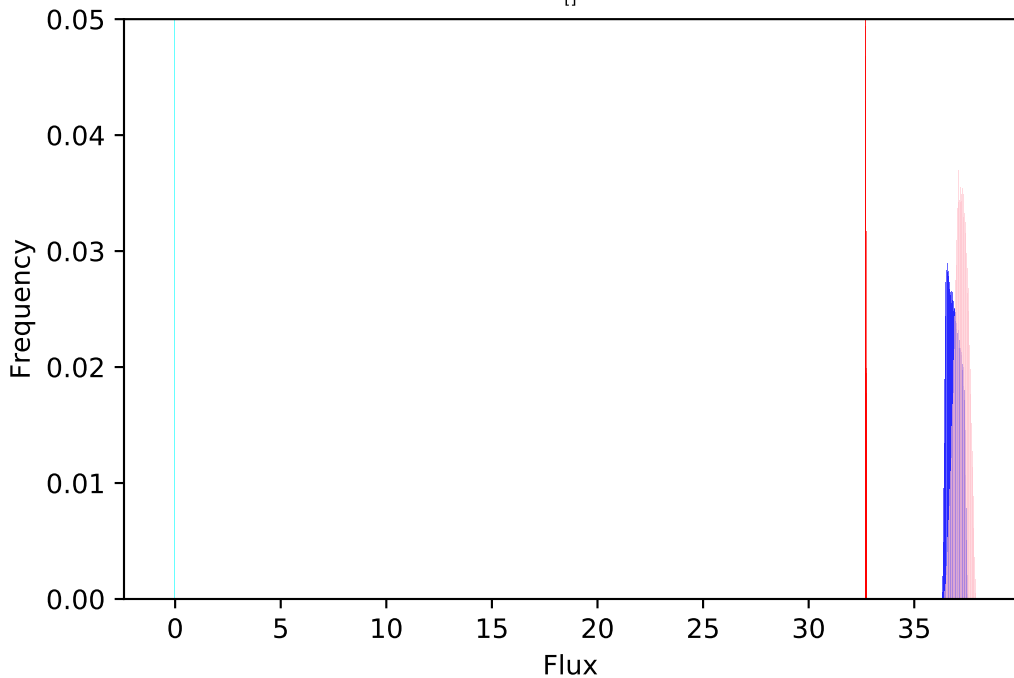
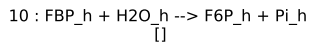


8 : GAP\_h <=> DHAP\_h  
[]

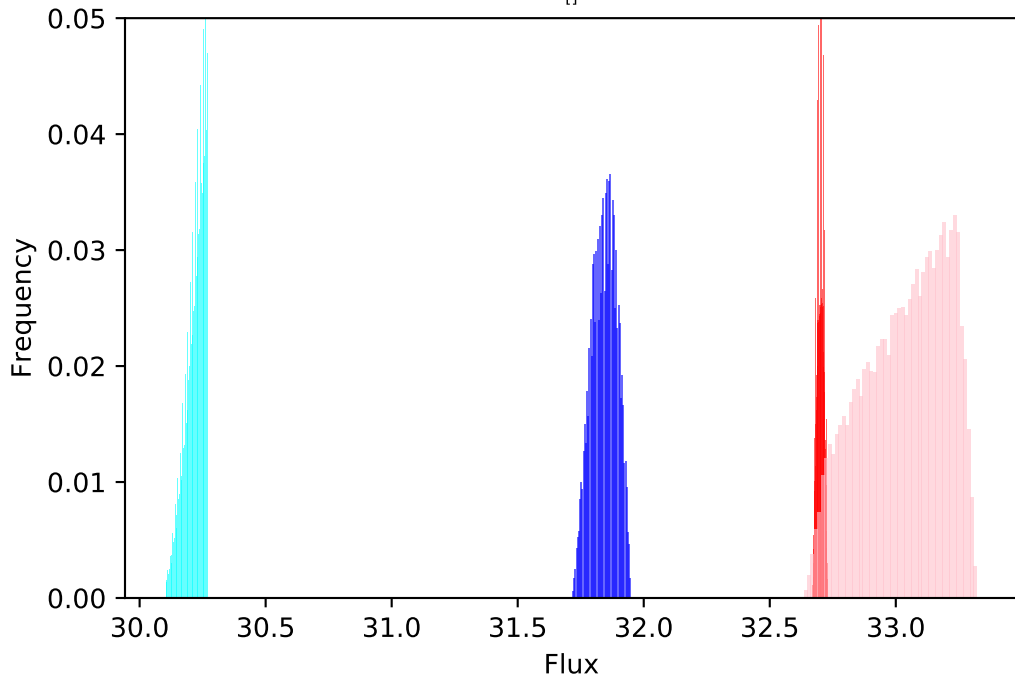


9 : DHAP\_h + GAP\_h <=> FBP\_h  
[]

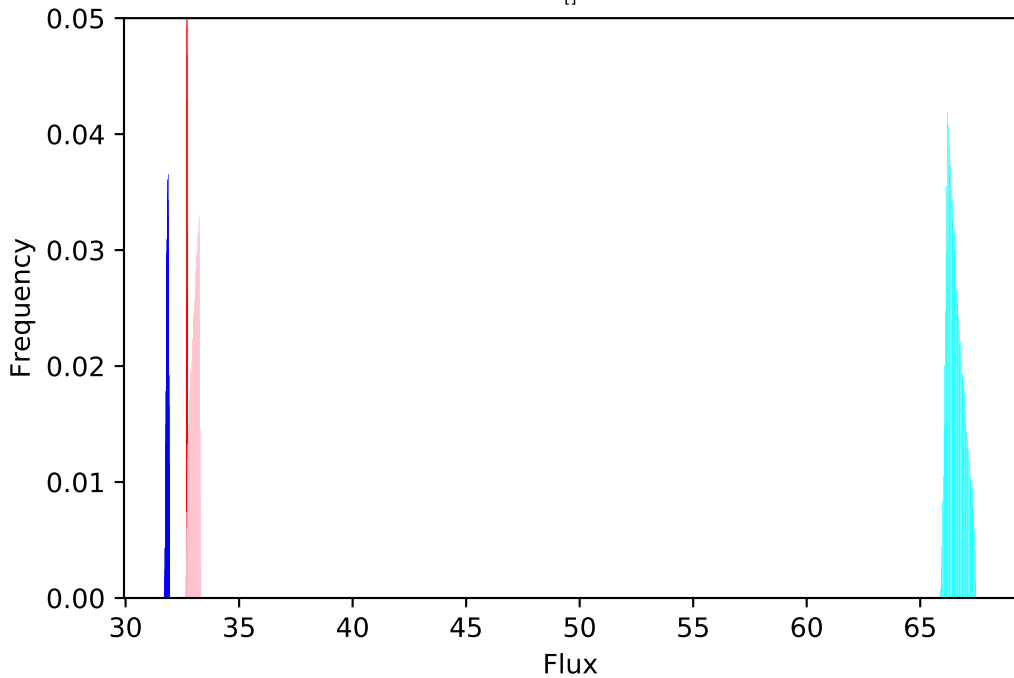




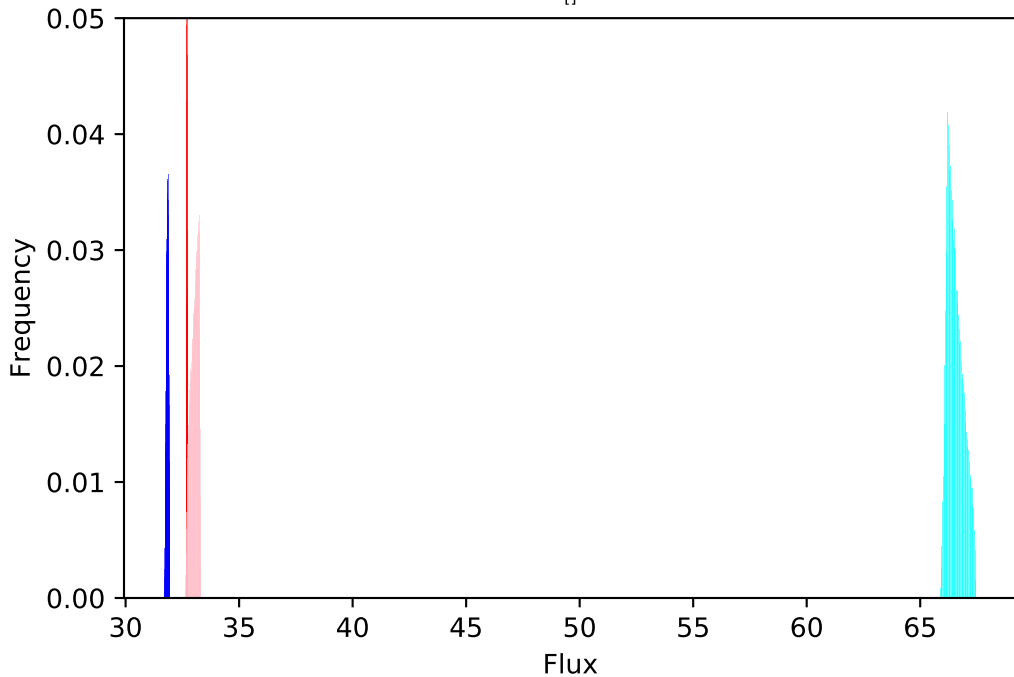
11 : F6P\_h + GAP\_h <=> E4P\_h + X5P\_h  
[]



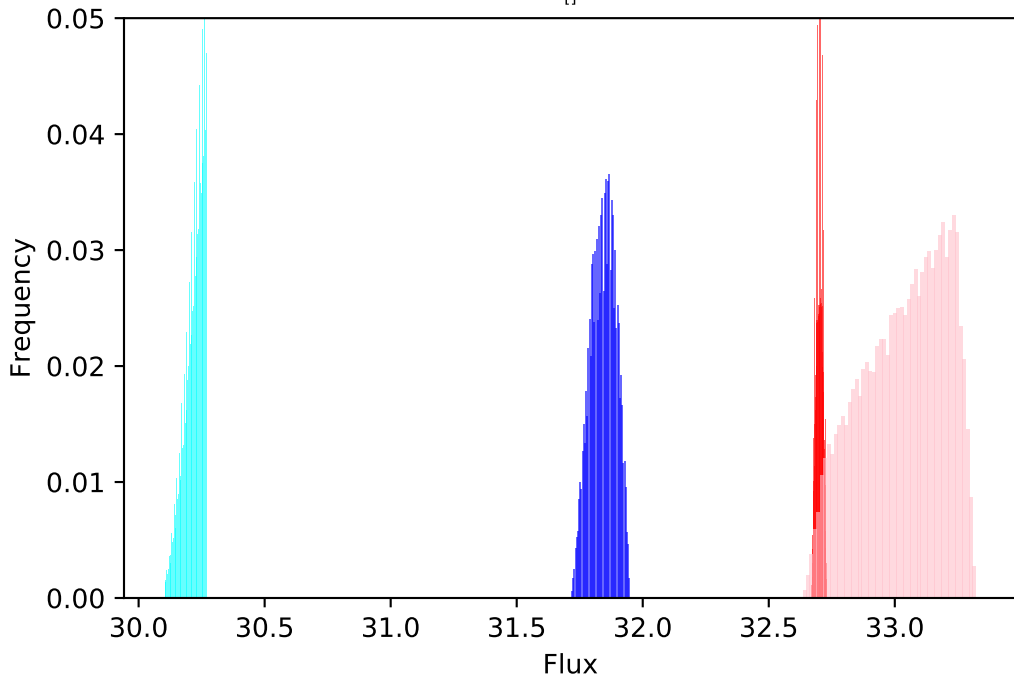
12 : DHAP\_h + E4P\_h --> SBP\_h  
[]



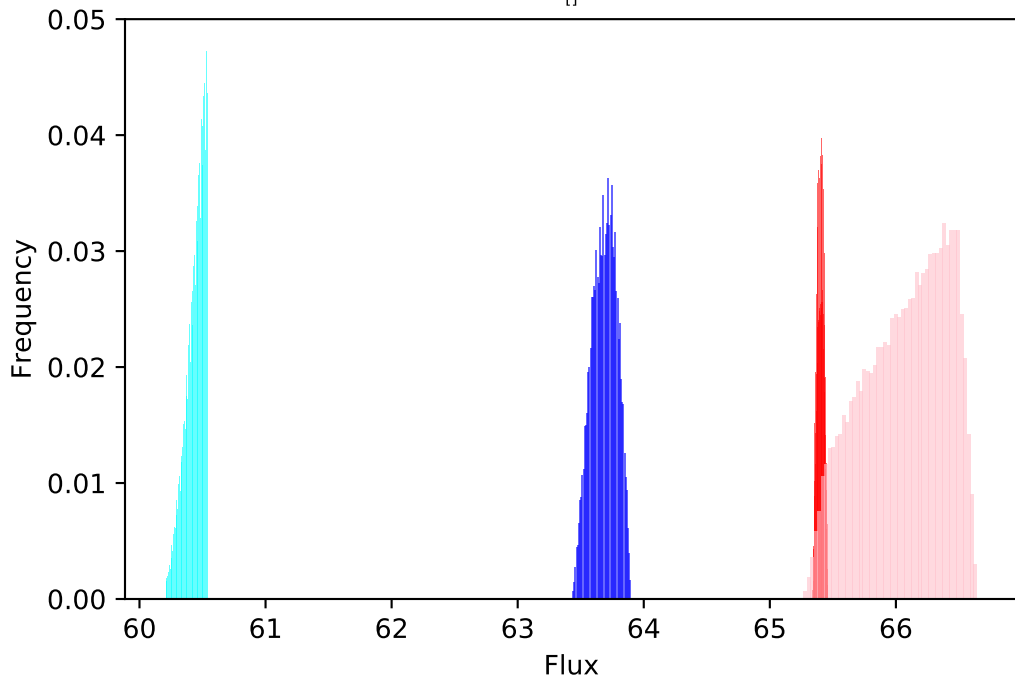
13 : H2O\_h + SBP\_h --> Pi\_h + S7P\_h  
[ ]



14 : GAP\_h + S7P\_h <=> R5P\_h + X5P\_h  
[]

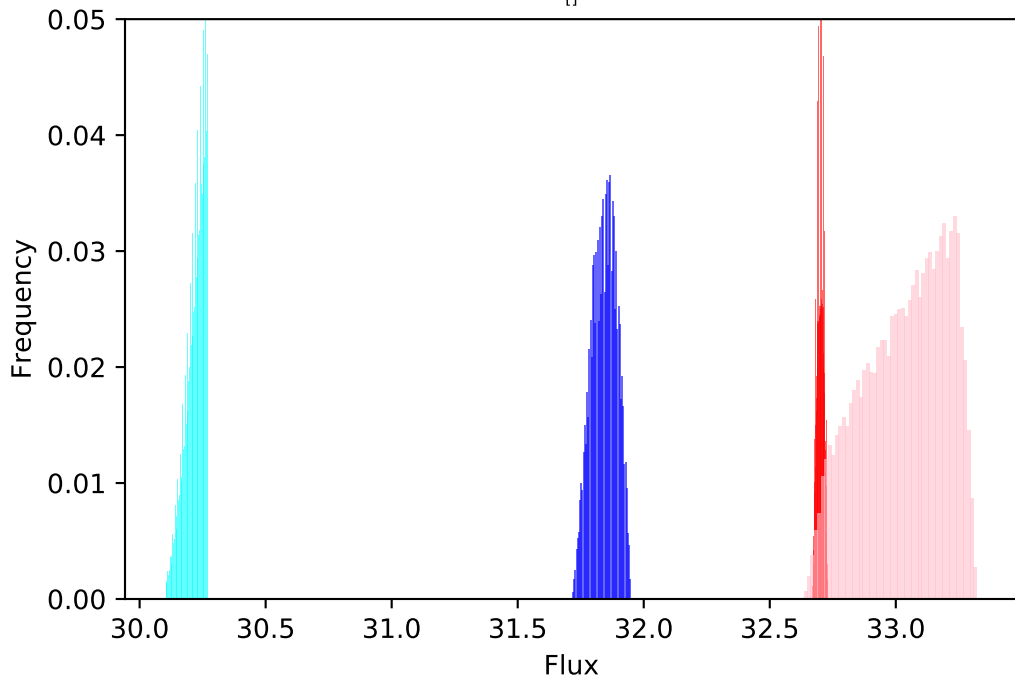


15 : X5P\_h <=> Ru5P\_h  
[]

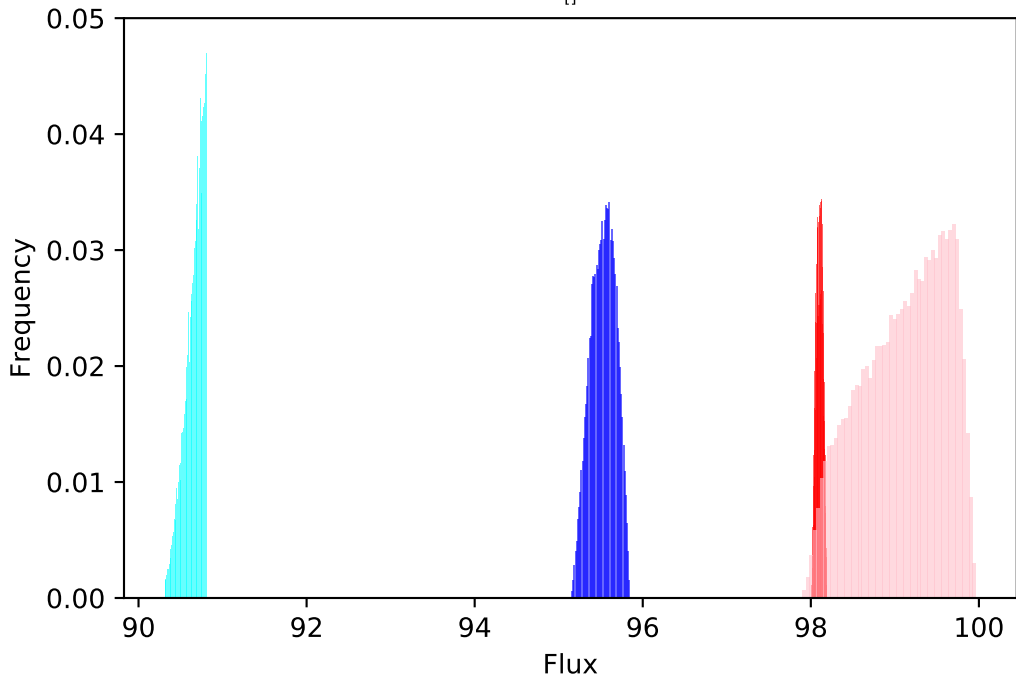




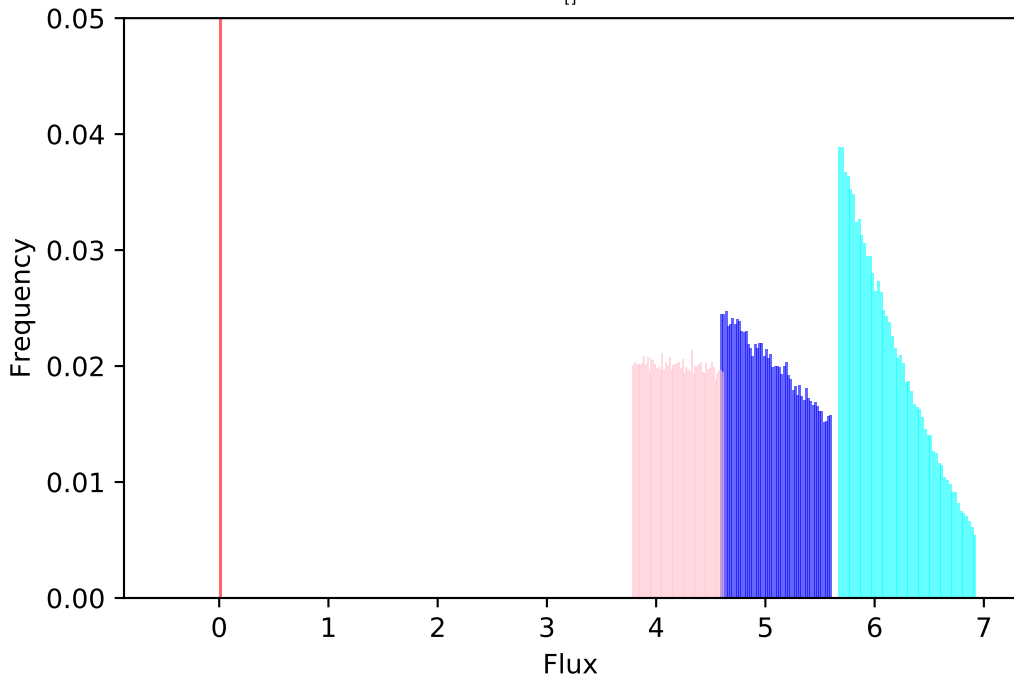
16 : R5P\_h <=> Ru5P\_h  
[]



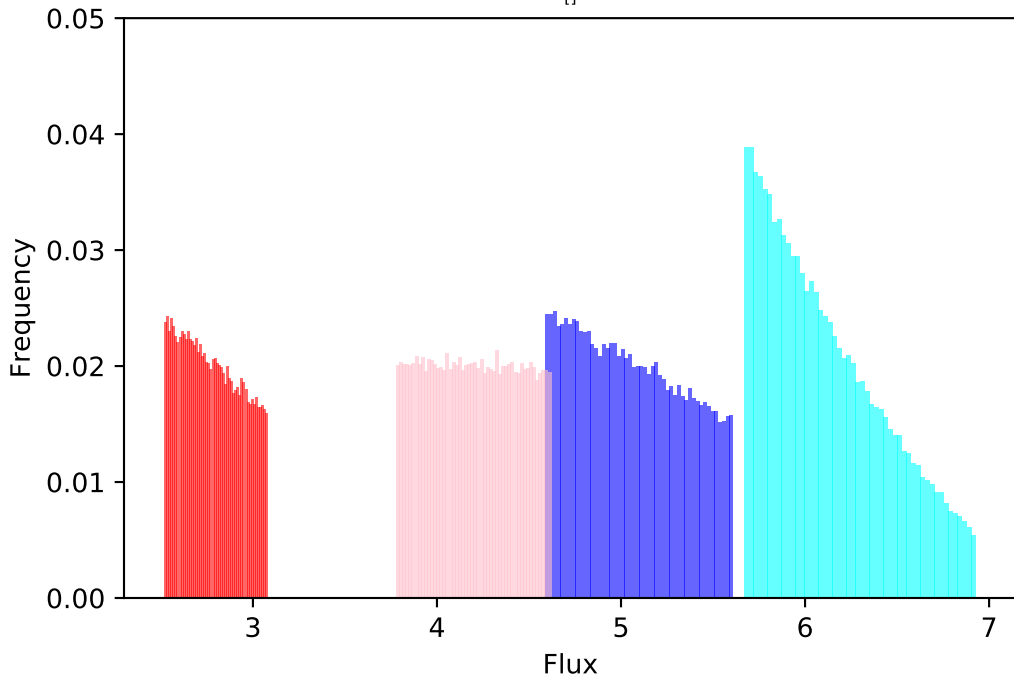
17 : ATP\_h + Ru5P\_h --> ADP\_h + H\_h + RuBP\_h  
[ ]



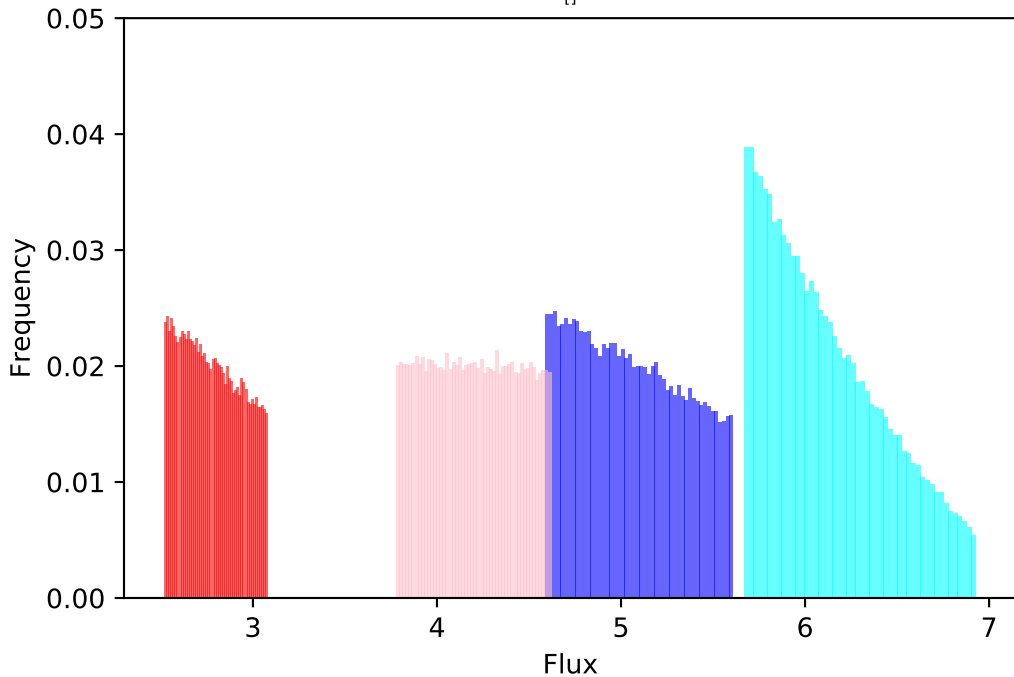
18 : F6P\_h <=> G6P\_h  
[]



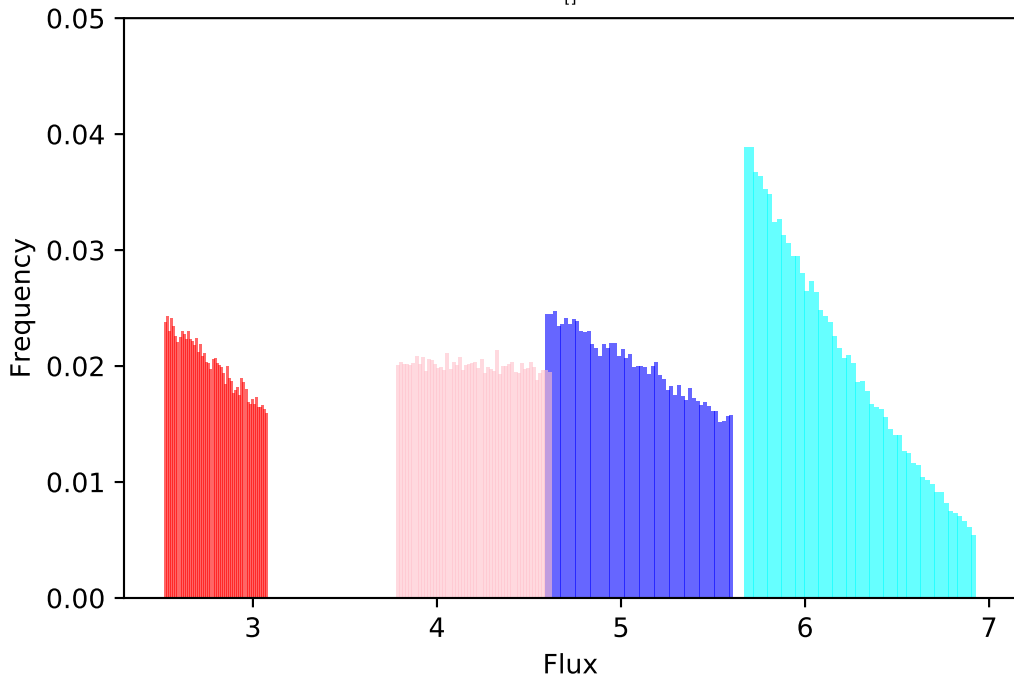
19 : G6P\_h <=> G1P\_h  
[]



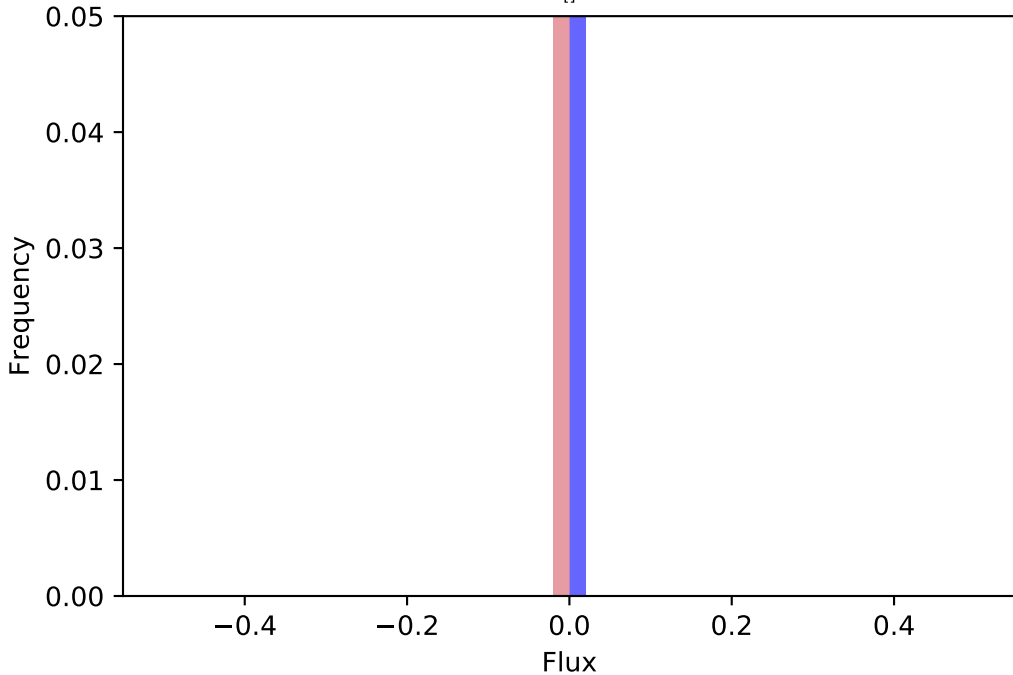
20 : ATP\_h + G1P\_h --> ADPG\_h + PPi\_h  
[]



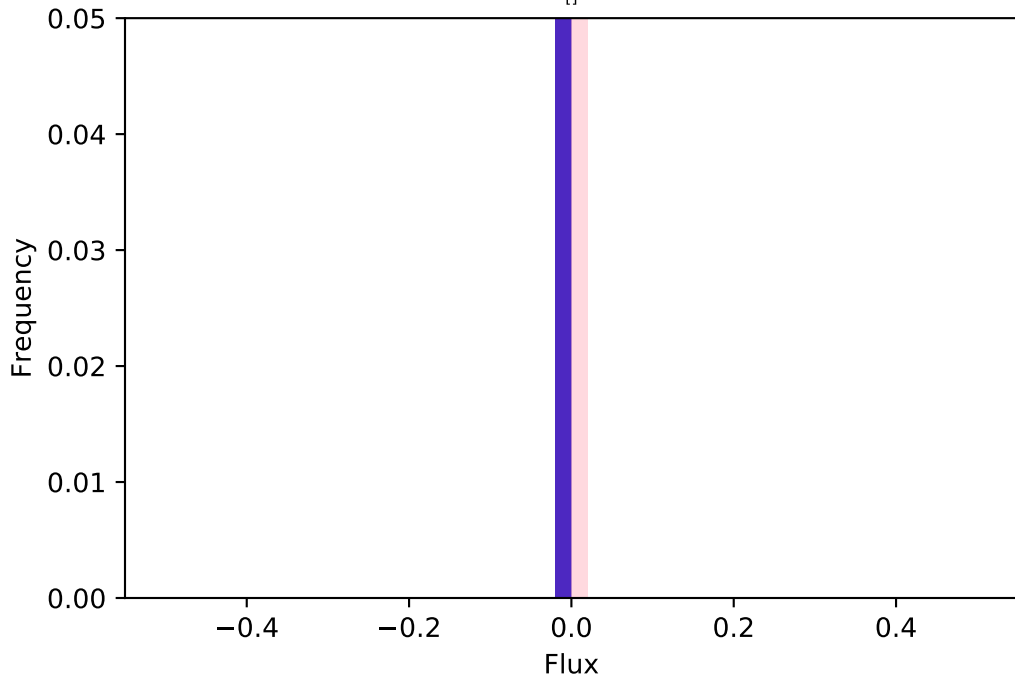
21 : ADPG\_h + H2O\_h --> ADP\_h + H\_h + starch1\_h  
[]



22 : ADPG\_h + starch1\_h --> ADP\_h + H\_h + starch2\_h  
[ ]

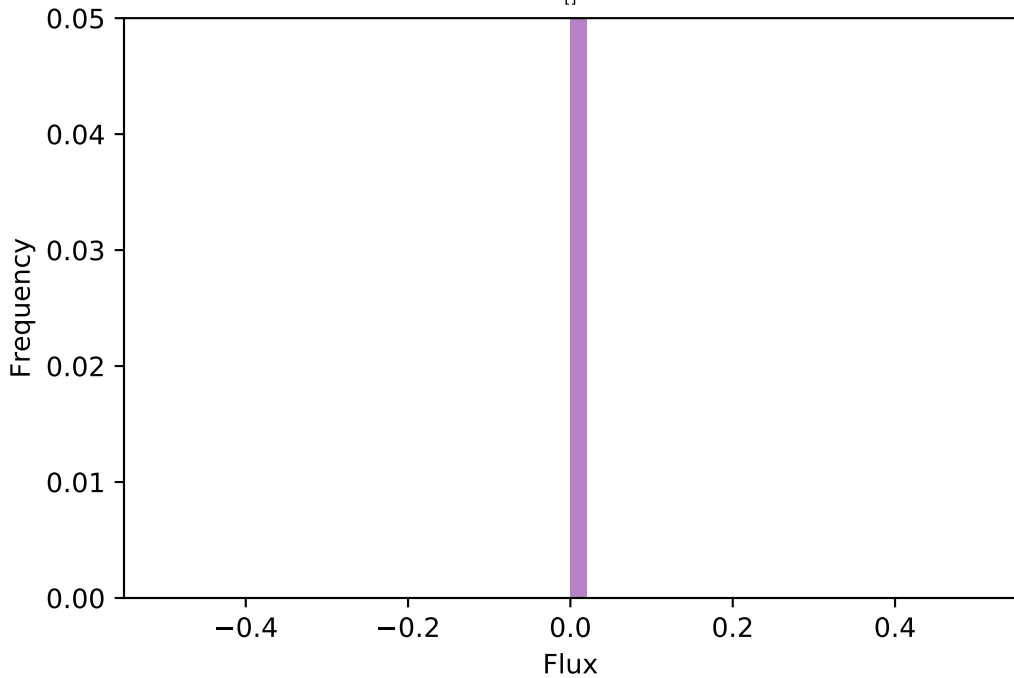


23 : ADPG\_h + starch2\_h --> ADP\_h + H\_h + starch3\_h  
[]

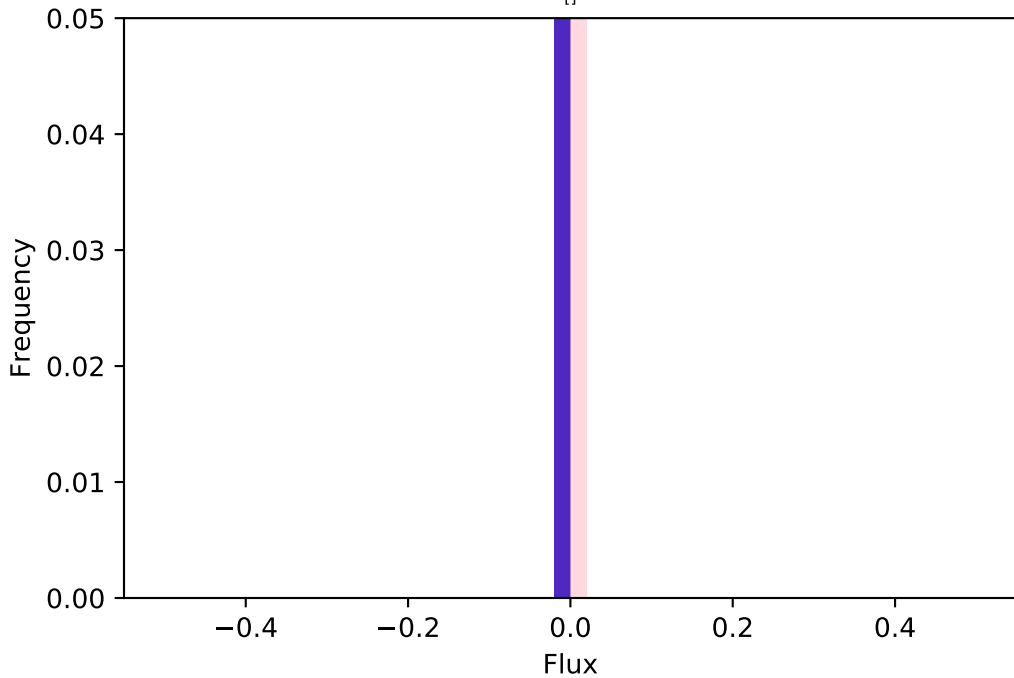




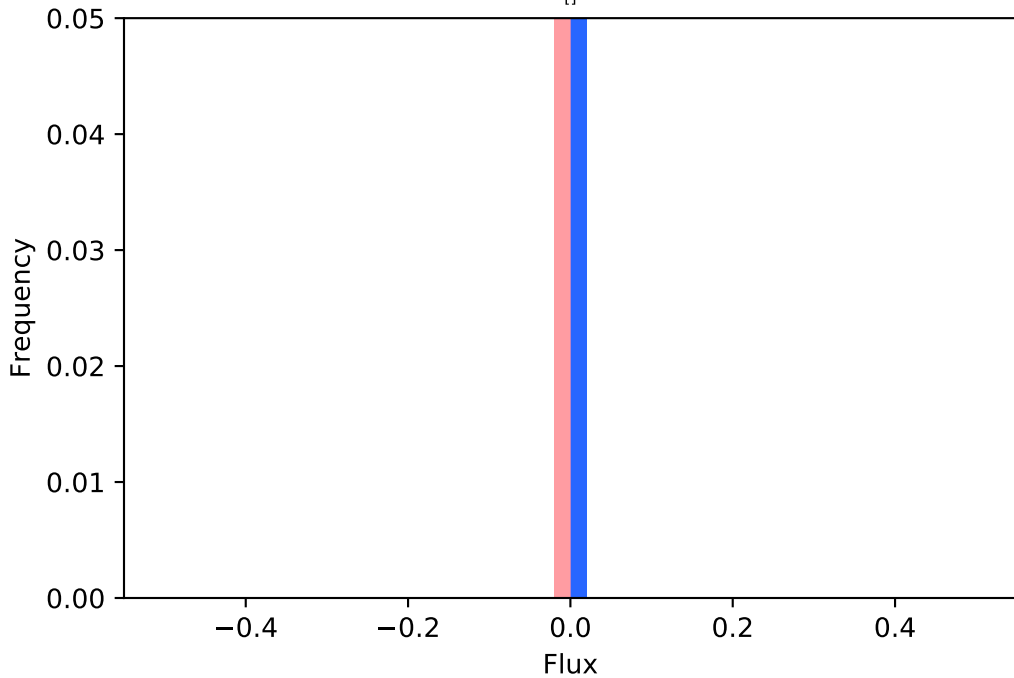
24 : H2O\_h + starch5\_h --> Mas\_h + starch3\_h  
[]



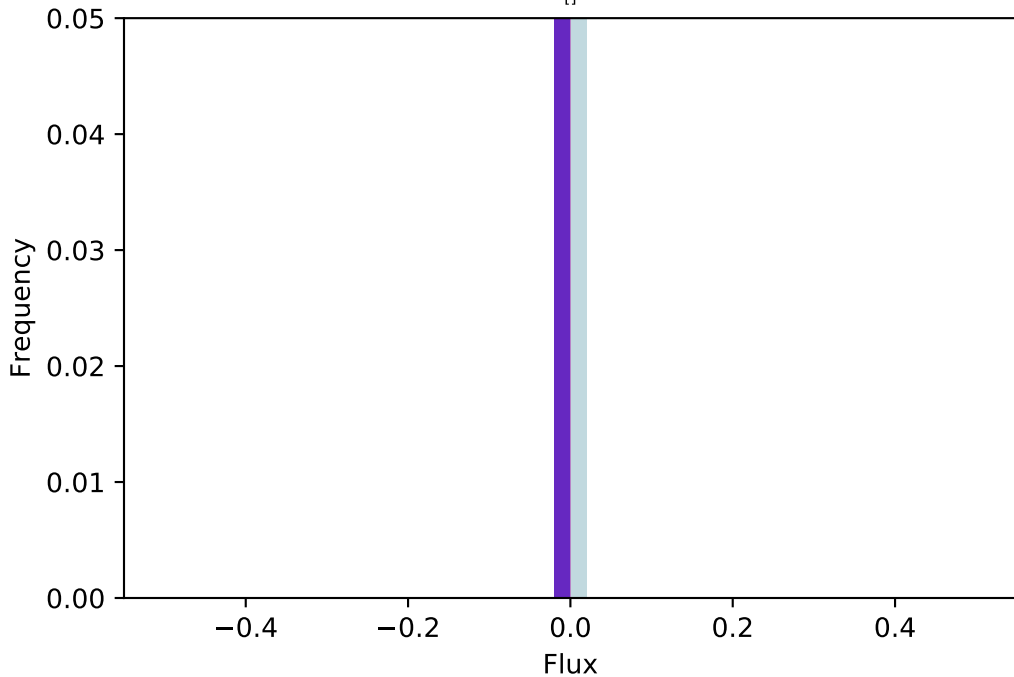
25 : H2O\_h + starch3\_h --> Mas\_h + starch1\_h  
[]



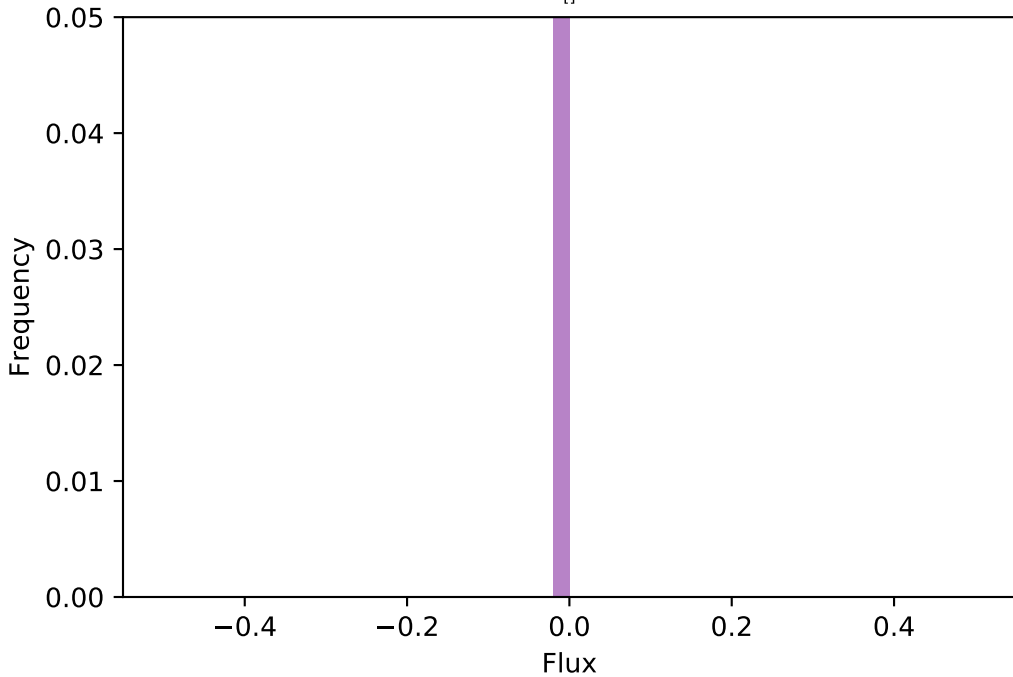
26 : 2.0 starch3\_h --> Glc\_h + starch5\_h  
[]



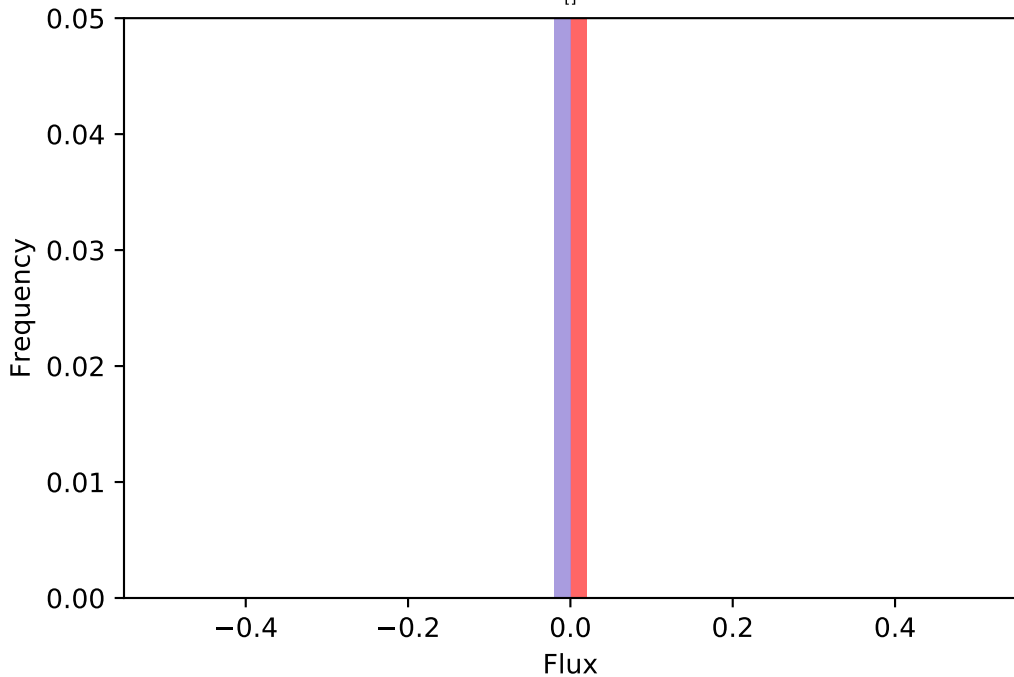
27 : Mas\_h + starch1\_h --> Glc\_h + starch2\_h  
[]



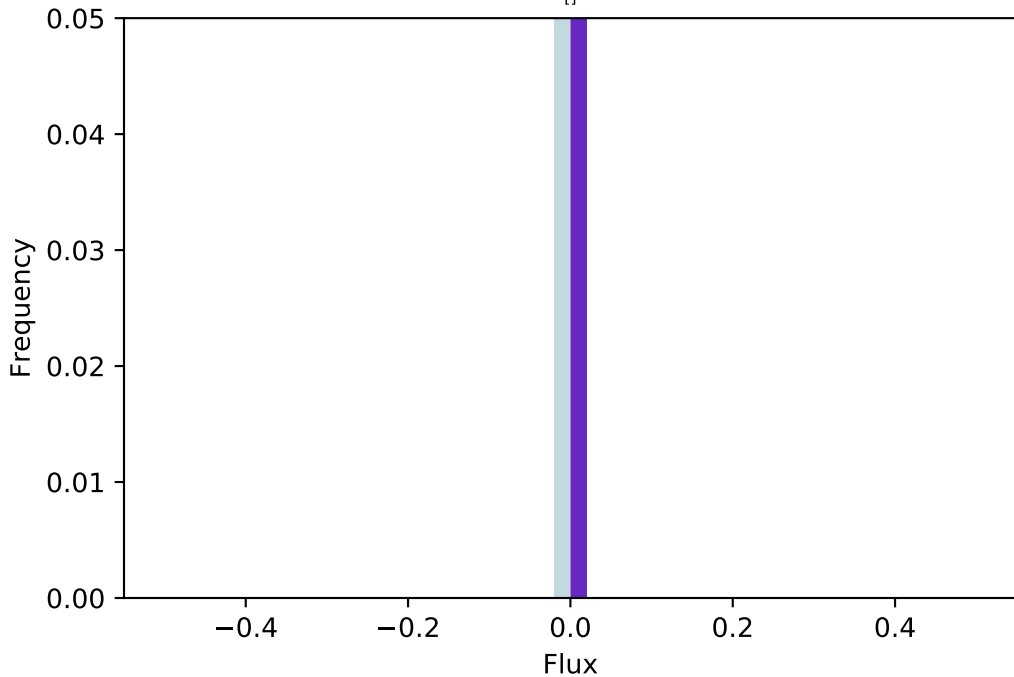
28 : Mas\_h + starch2\_h --> Glc\_h + starch3\_h  
[ ]



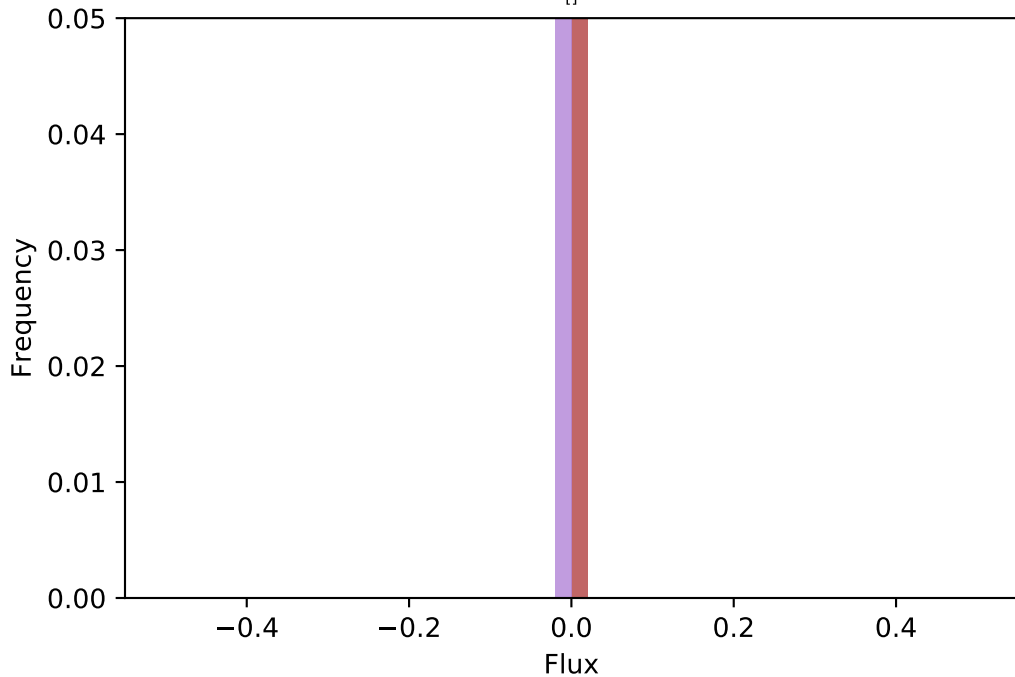
29 : Mas\_c + starch1\_c --> Glc\_c + starch2\_c  
[]



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

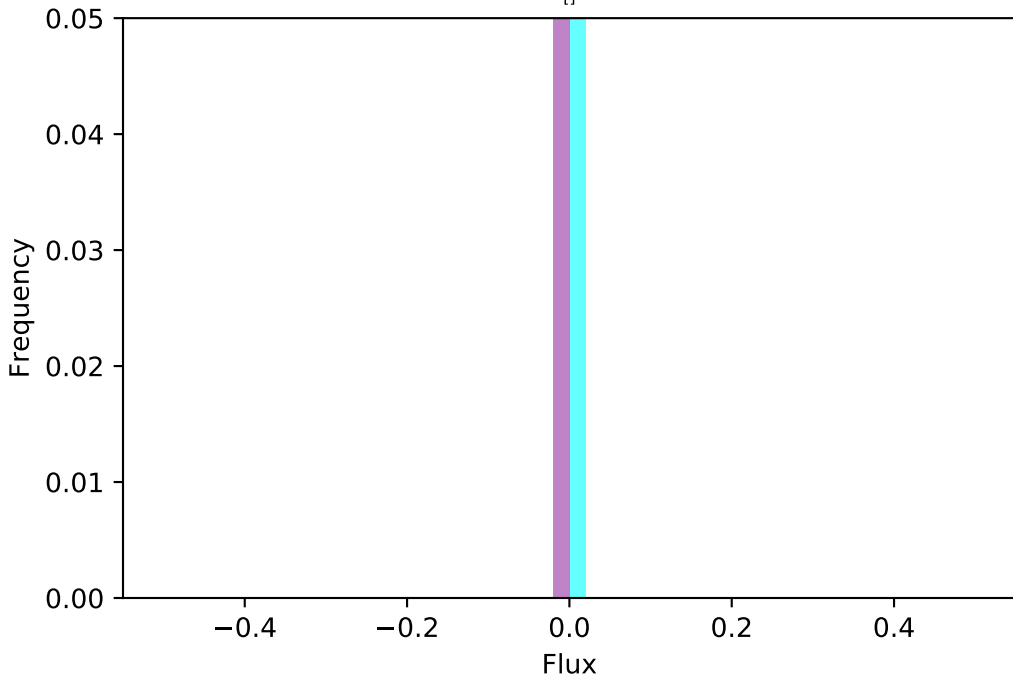


31 : Pi\_h + starch2\_h --> G1P\_h + starch1\_h  
[]

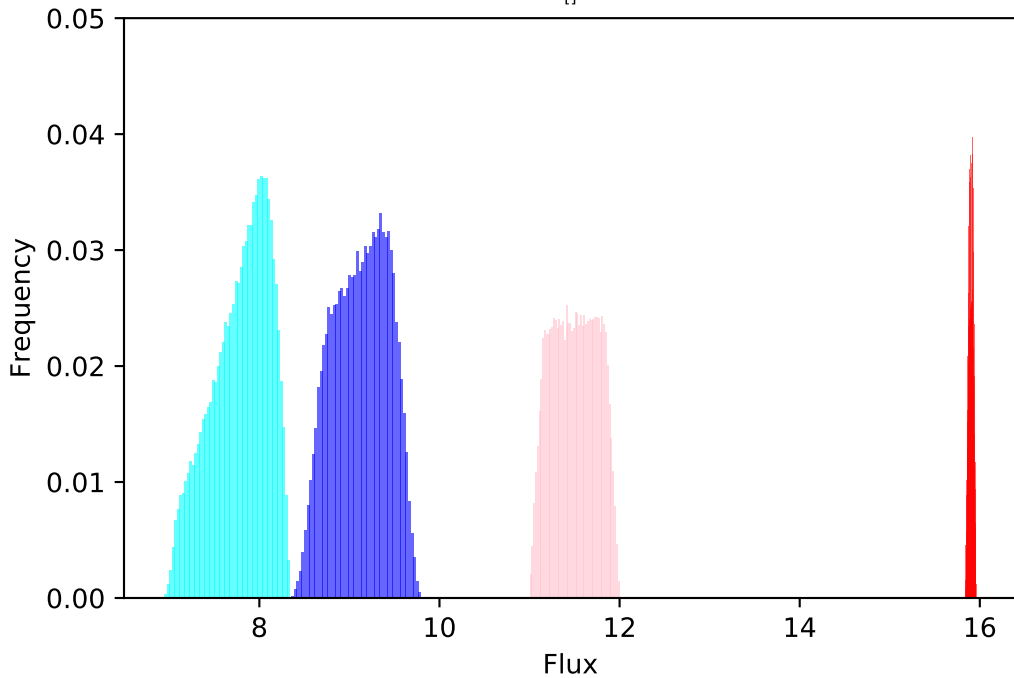




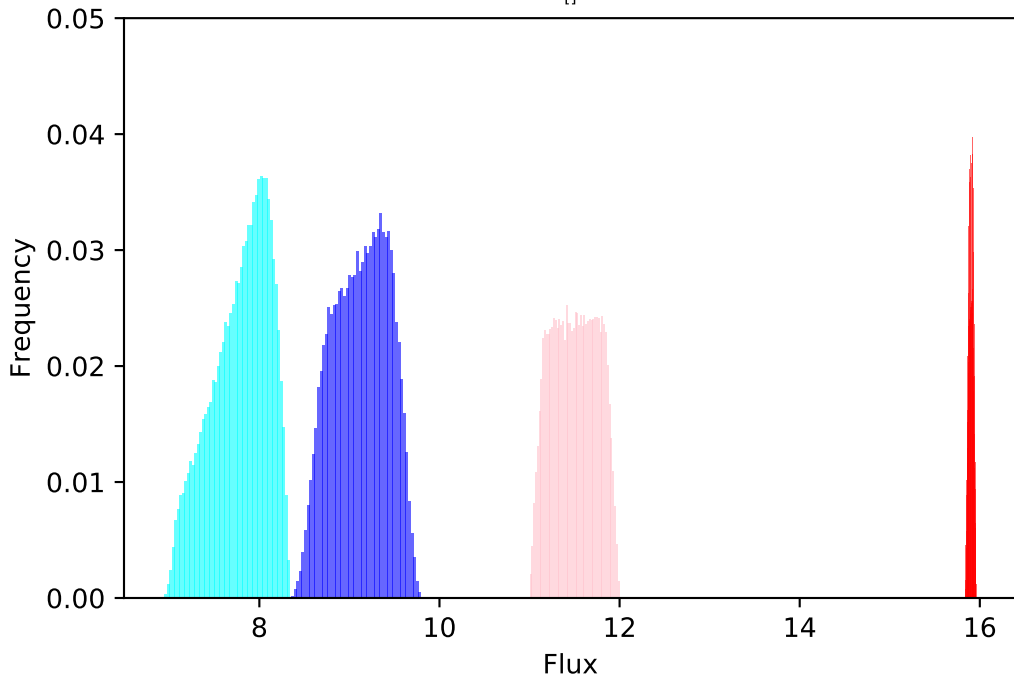
32 : Pi\_c + starch2\_c --> G1P\_c + starch1\_c  
[]



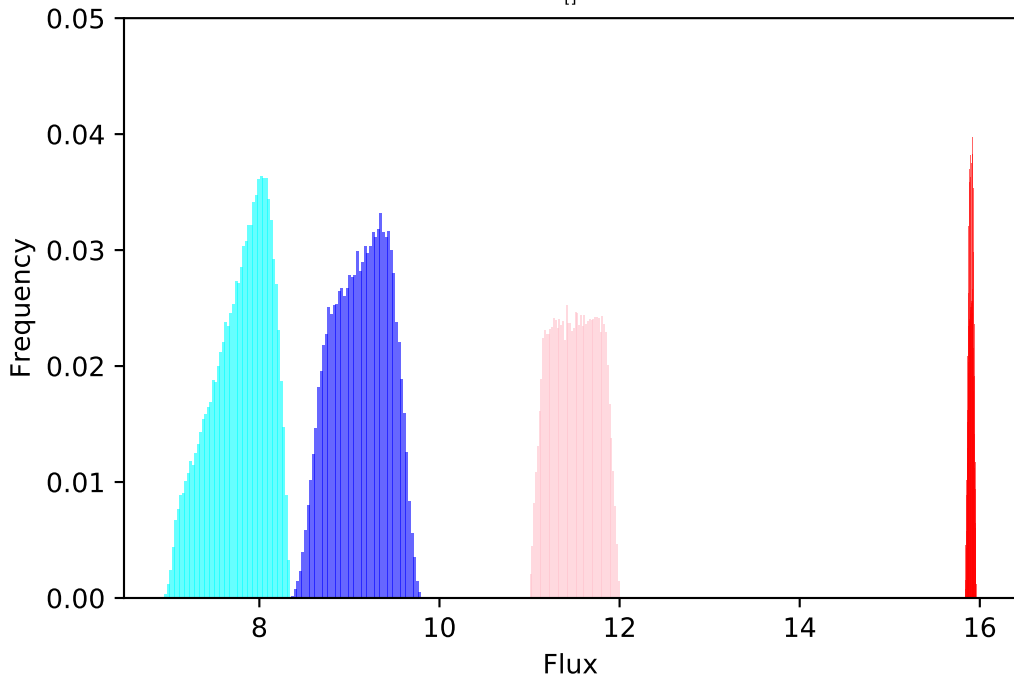
33 : GAP\_c --> DHAP\_c  
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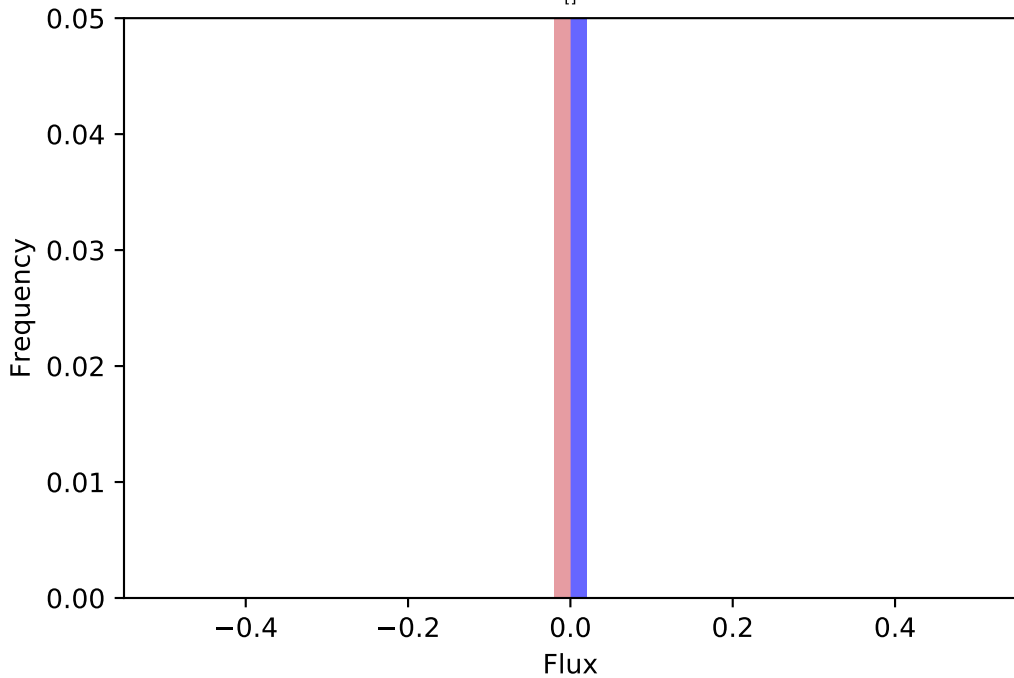
34 : DHAP\_c + GAP\_c --> FBP\_c  
[]



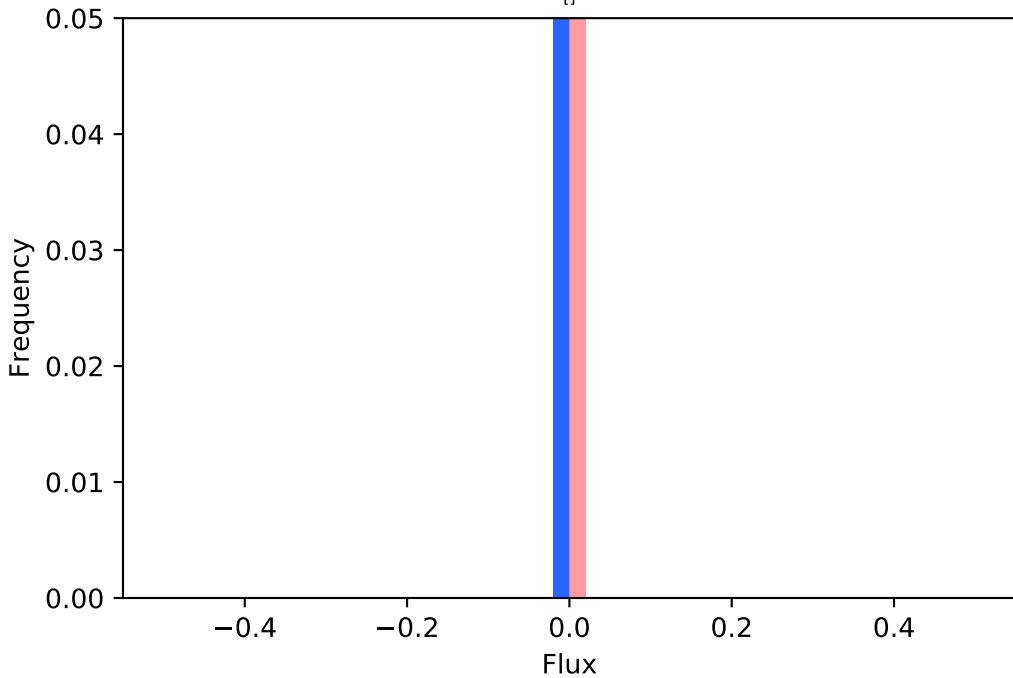
35 : FBP\_c + H2O\_c --> F6P\_c + Pi\_c  
[ ]



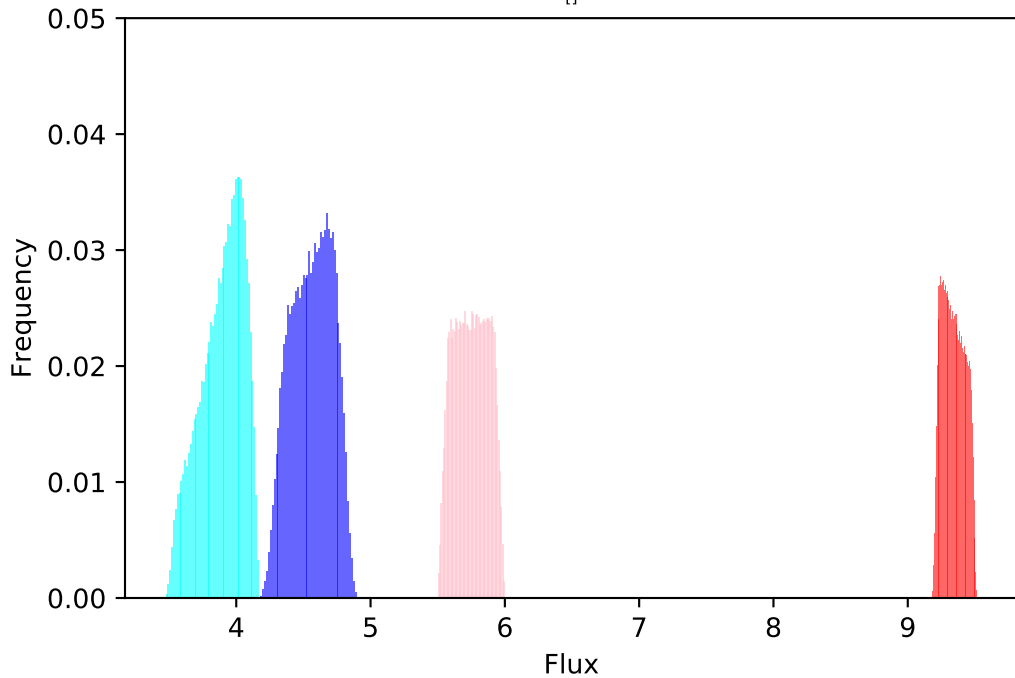
36 : ATP\_c + F6P\_c --> ADP\_c + F26BP\_c + H\_c  
[]



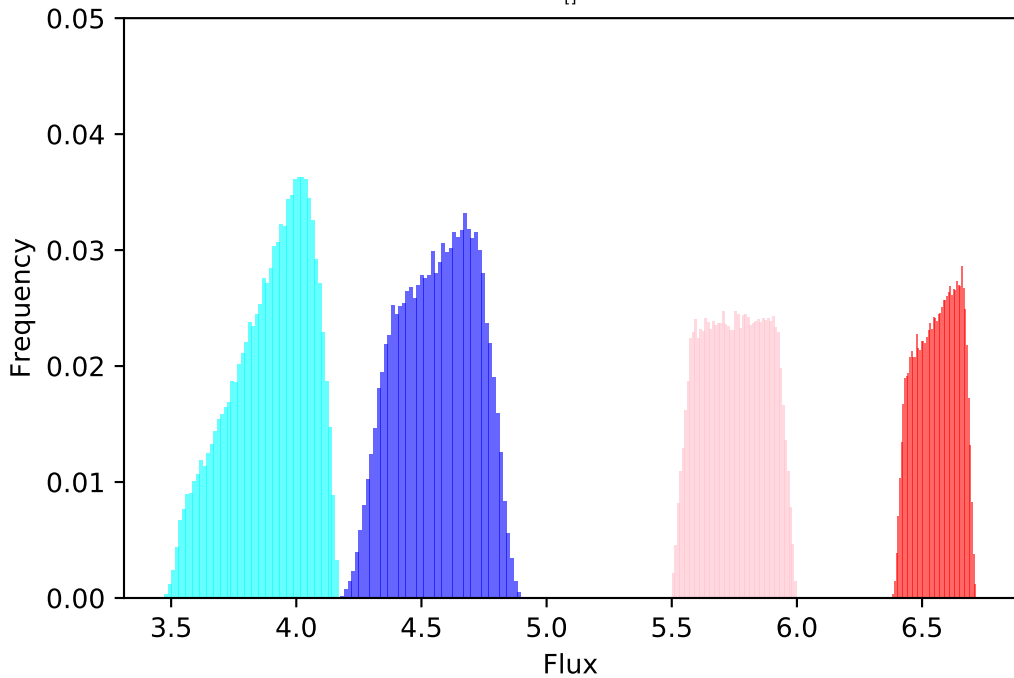
37 : F26BP\_c + H2O\_c --> F6P\_c + Pi\_c  
[ ]



38 : F6P\_c <=> G6P\_c  
[]

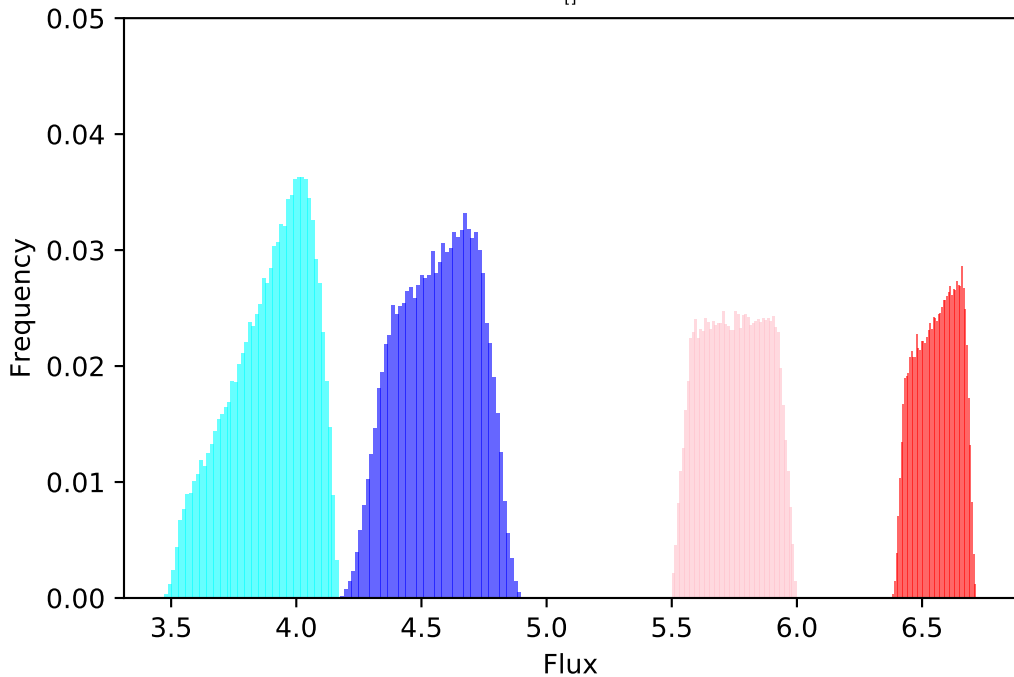


39 : G6P\_c <=> G1P\_c  
[]

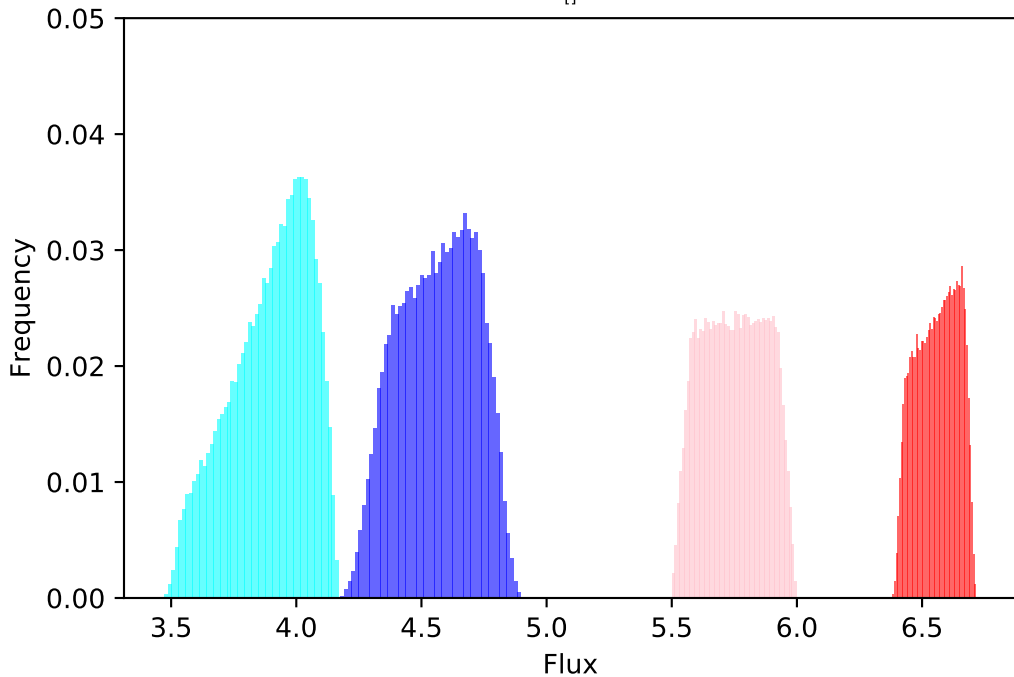


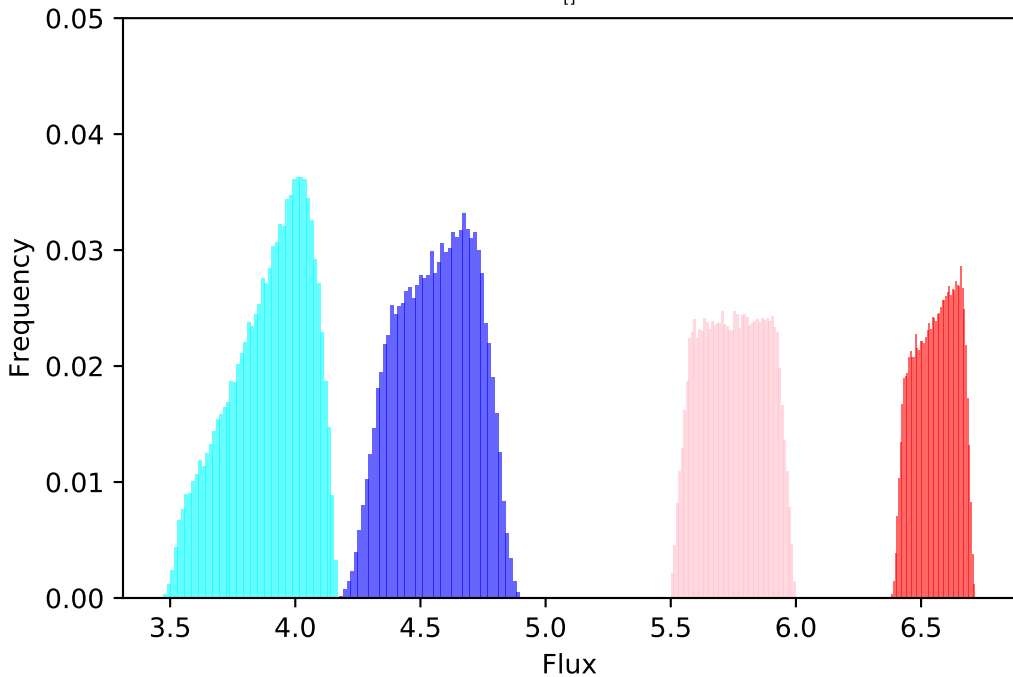
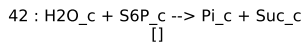


40 : G1P\_c + H\_c + UTP\_c <=> PPI\_c + UDPG\_c  
[ ]

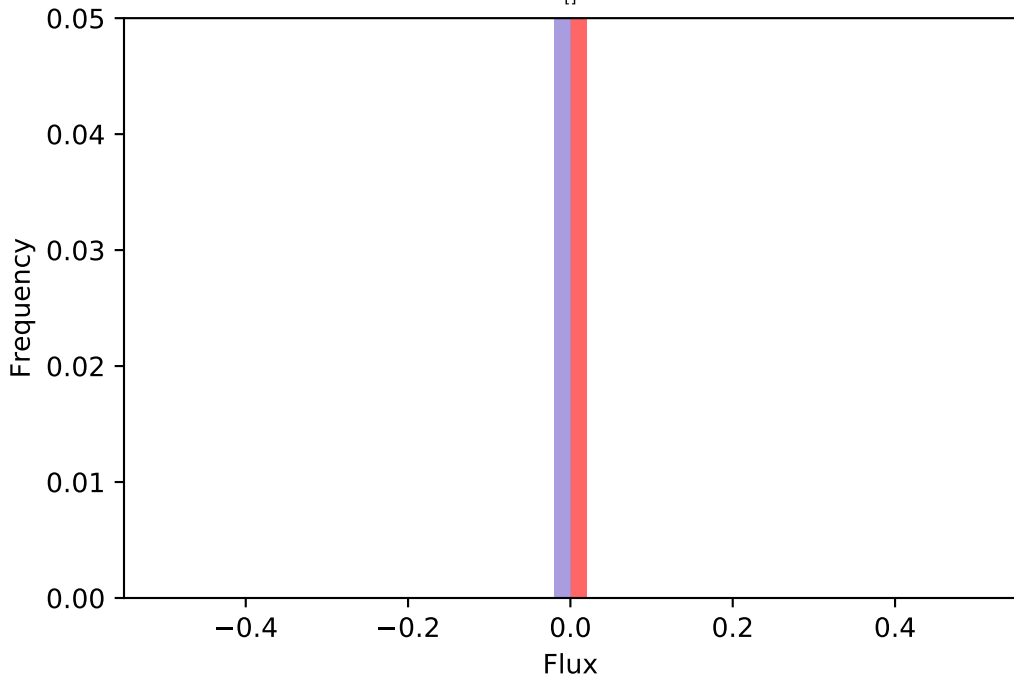


41 : F6P\_c + UDPG\_c --> S6P\_c + UDP\_c  
[]

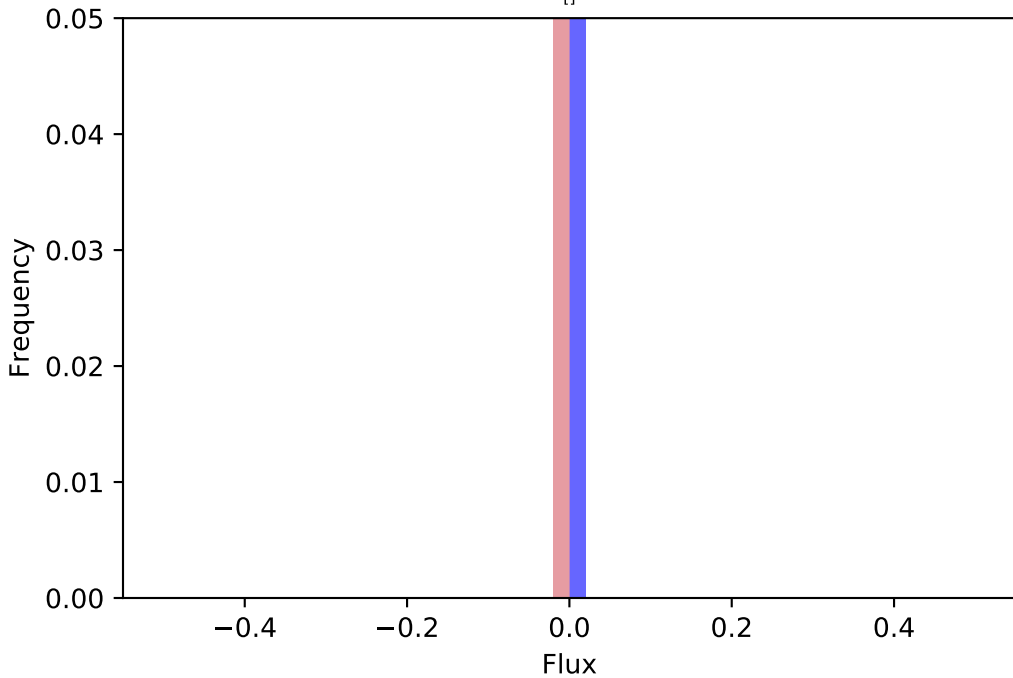




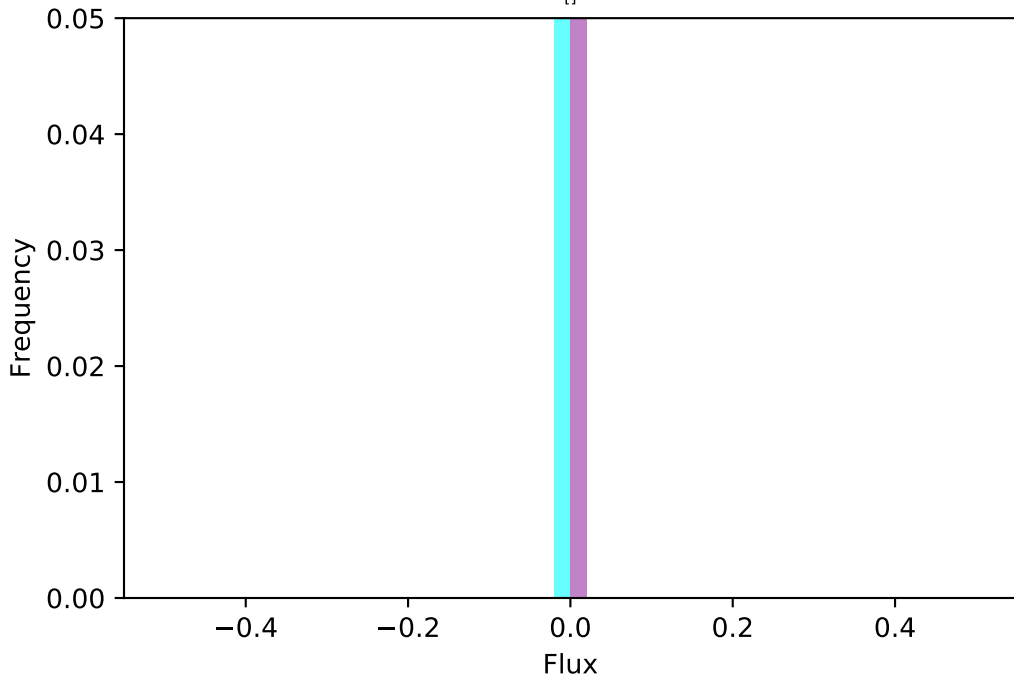
43 : Suc\_c + UDP\_c <=> Frc\_c + UDPG\_c  
[]



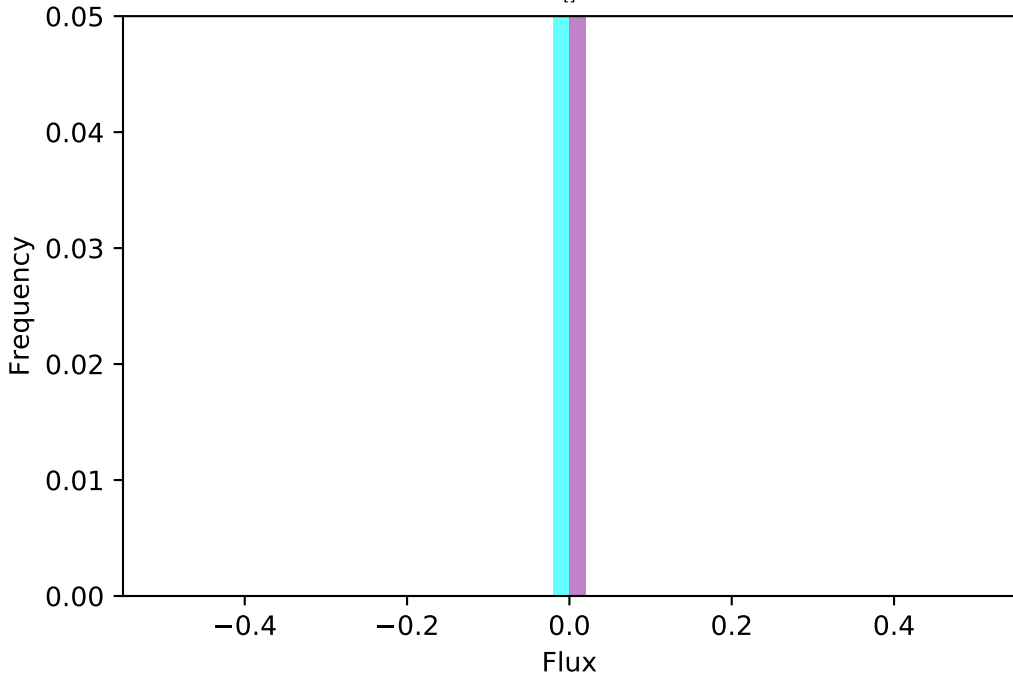
44 : H2O\_c + Suc\_c --> Frc\_c + Glc\_c  
[]



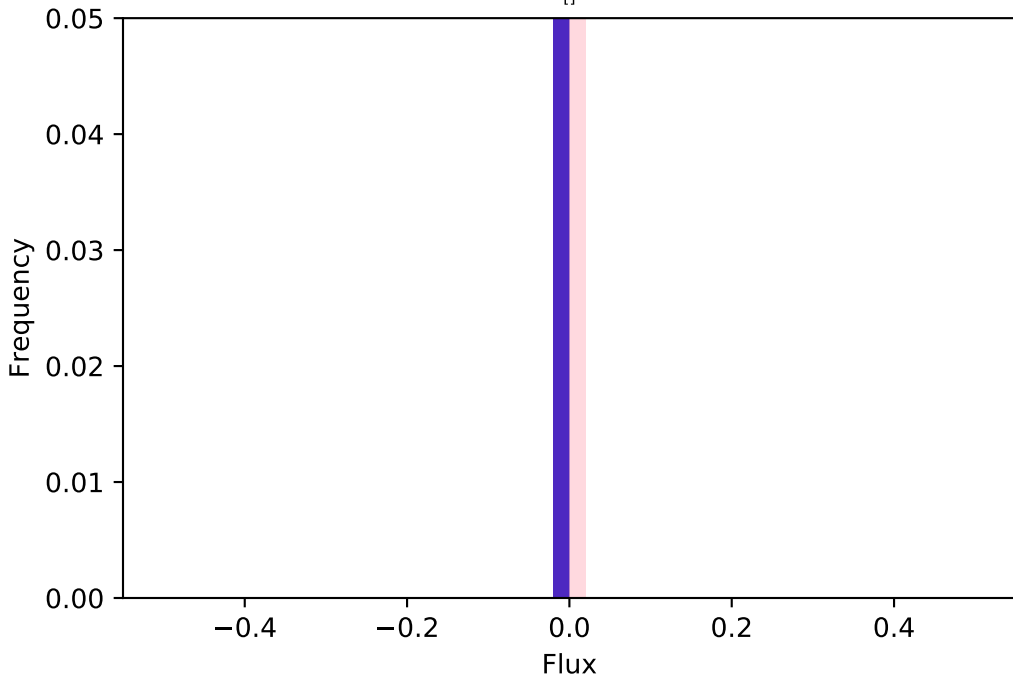
45 : ATP\_c + Frc\_c --> ADP\_c + F6P\_c + H\_c  
[]



46 : G6P\_c + UDPG\_c --> T6P\_c + UDP\_c  
[]

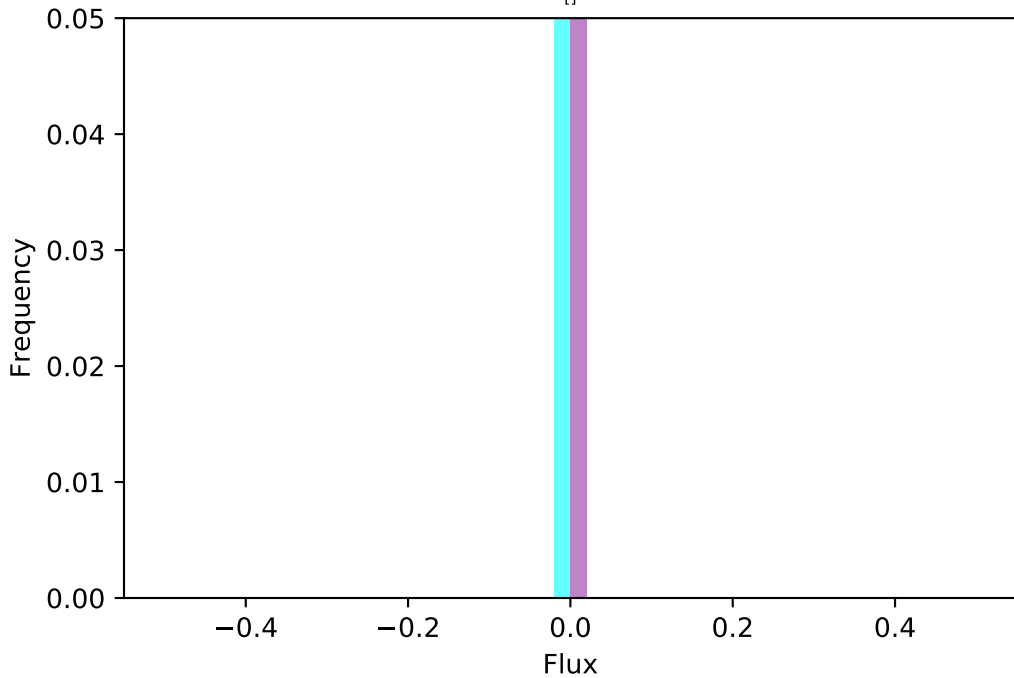


47 : H2O\_c + T6P\_c --> Pi\_c + Tre\_c  
[]

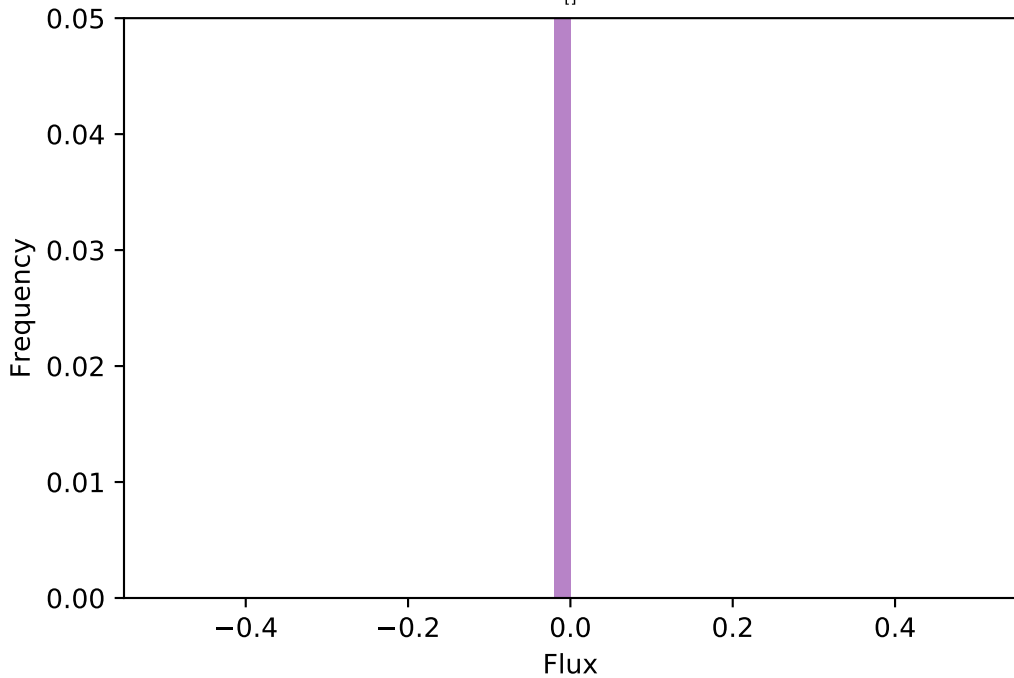




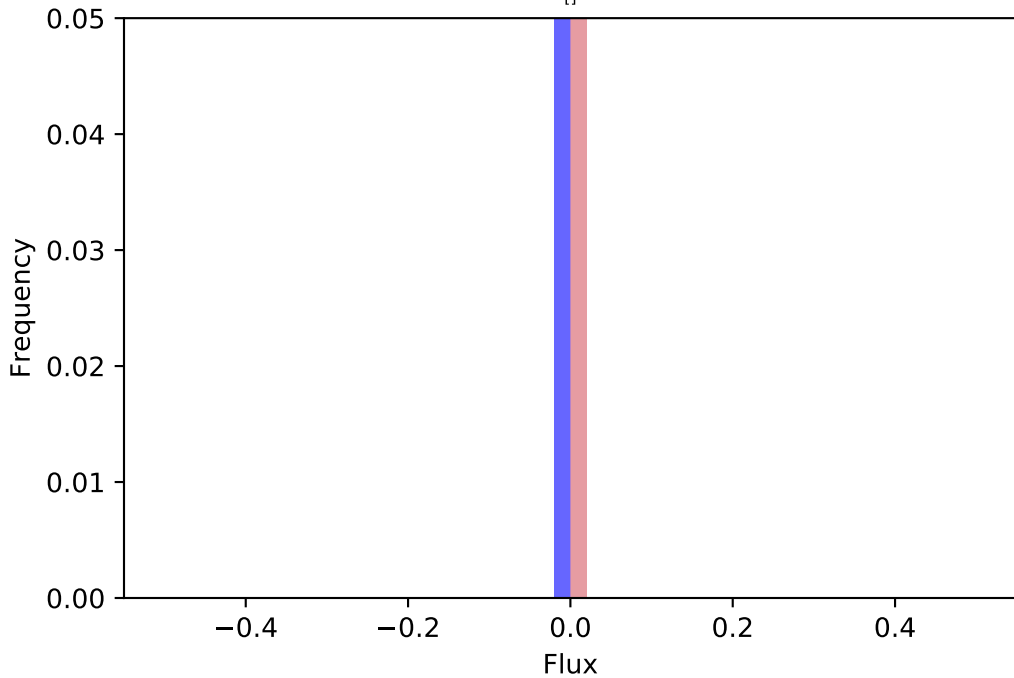
48 : H<sub>2</sub>O\_c + UDPG\_c --> UDP\_c + cellulose1\_c  
[ ]



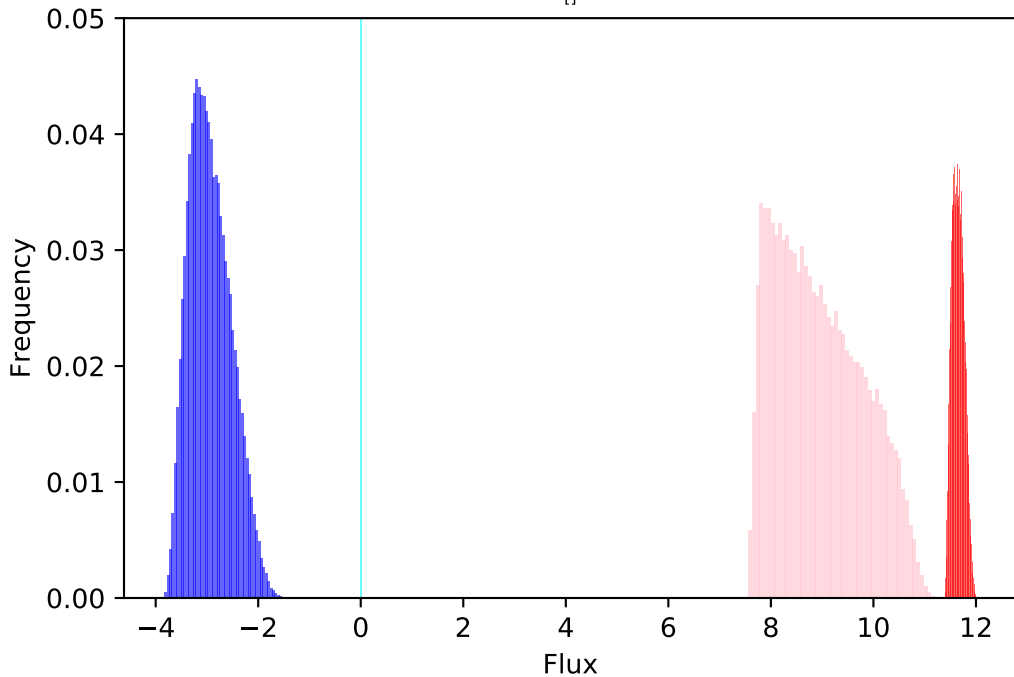
49 : UDPG\_c + cellulose1\_c --> UDP\_c + cellulose2\_c  
[]

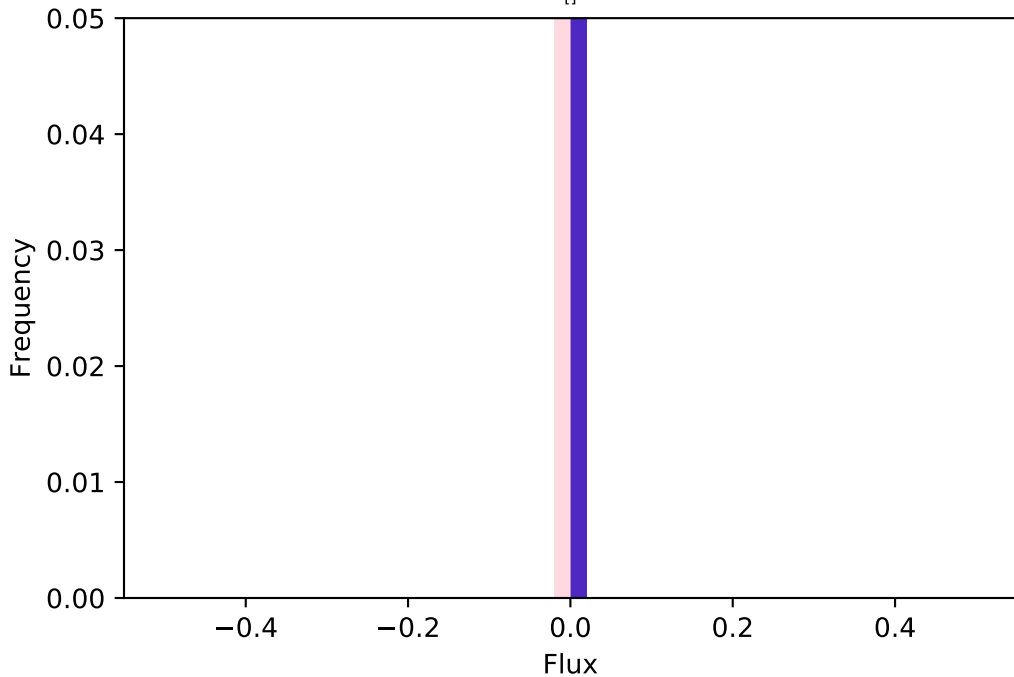
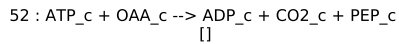


50 : UDPG\_c + cellulose2\_c --> UDP\_c + cellulose3\_c  
[]

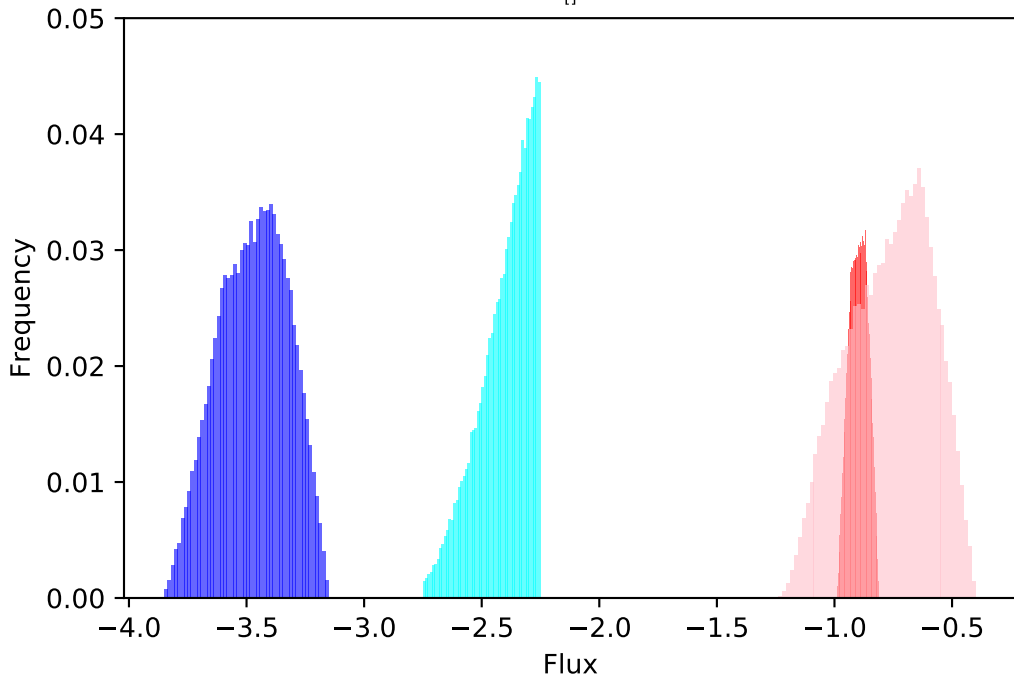


51 : Mal\_c + NAD\_c --> NADH\_c + OAA\_c  
[ ]

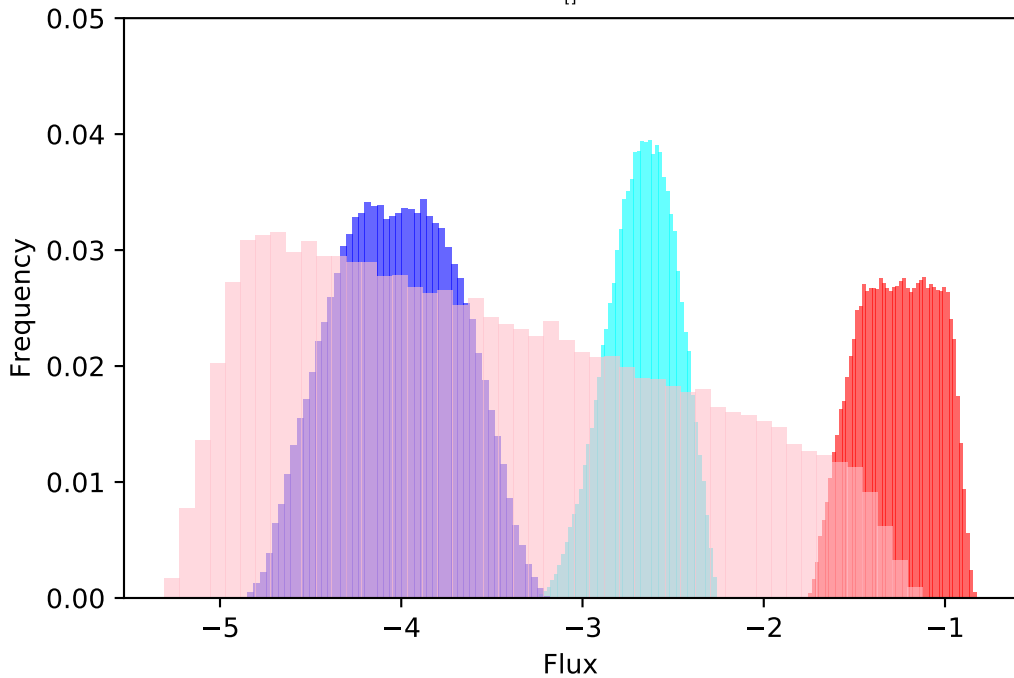




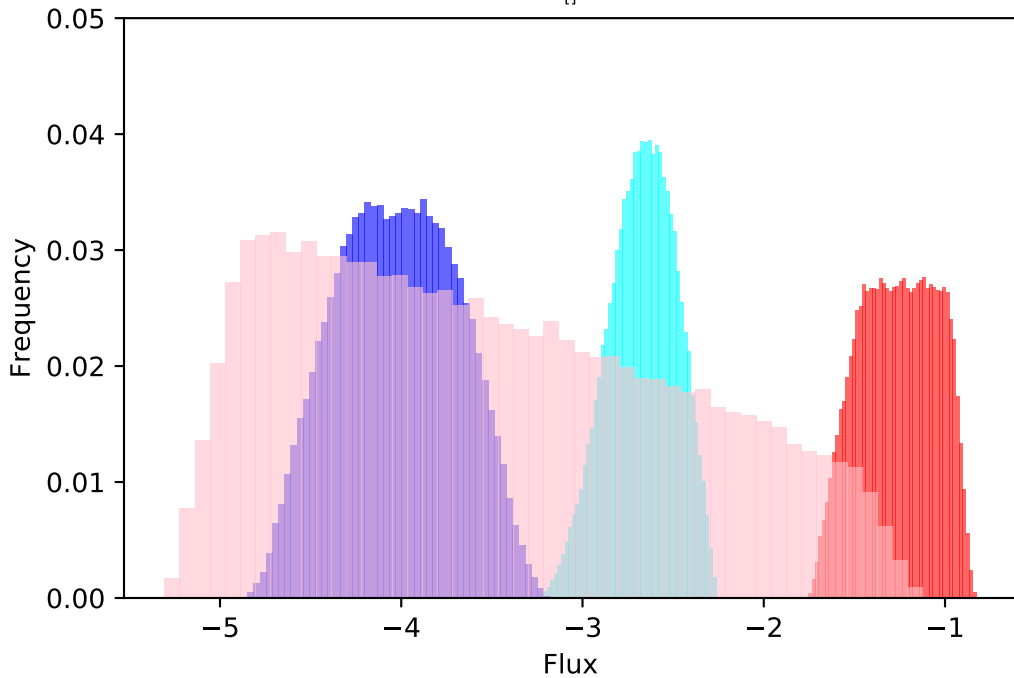
53 : OAA\_c + Pi\_c <=> HCO3\_c + PEP\_c  
[]



54 : H2O\_c + PEP\_c <=> 2PGA\_c  
[ ]

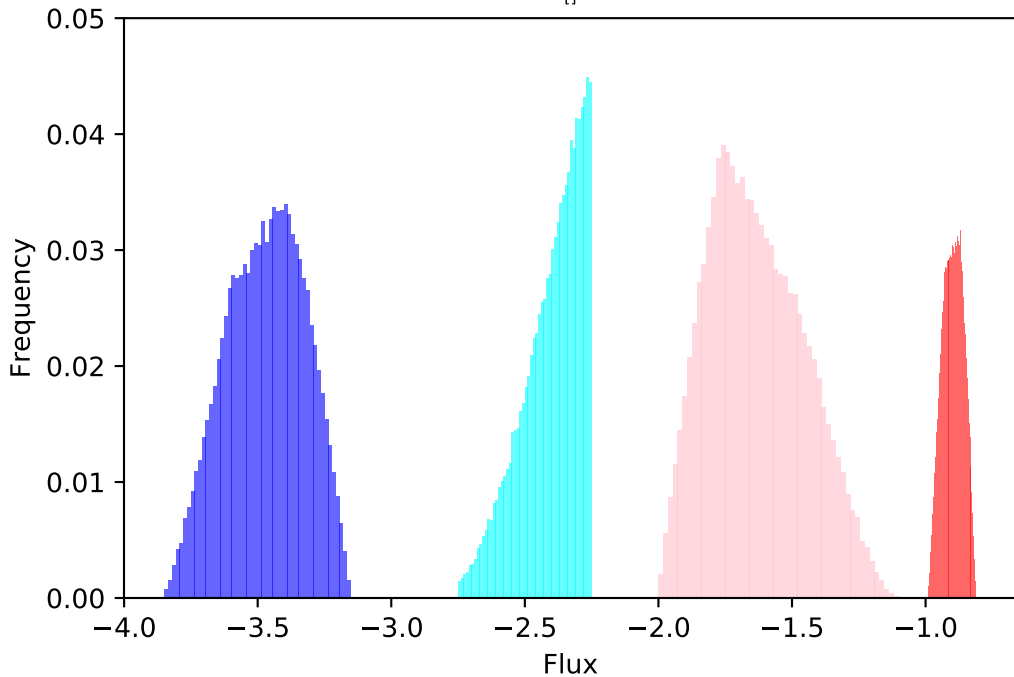


55 : 2PGA\_c <=> PGA\_c  
[]

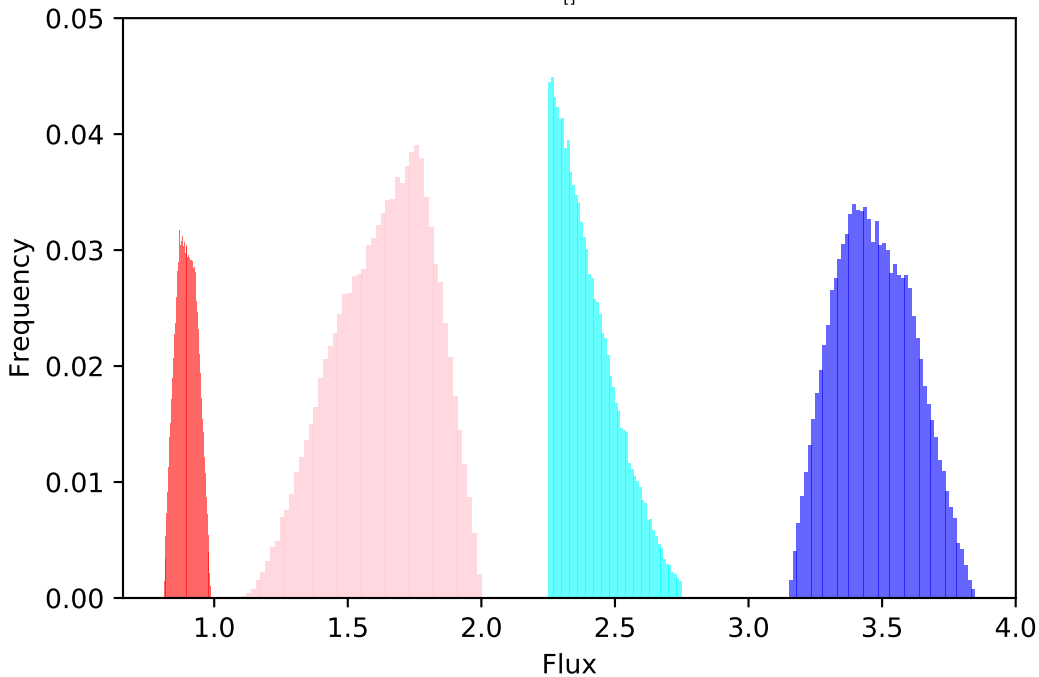




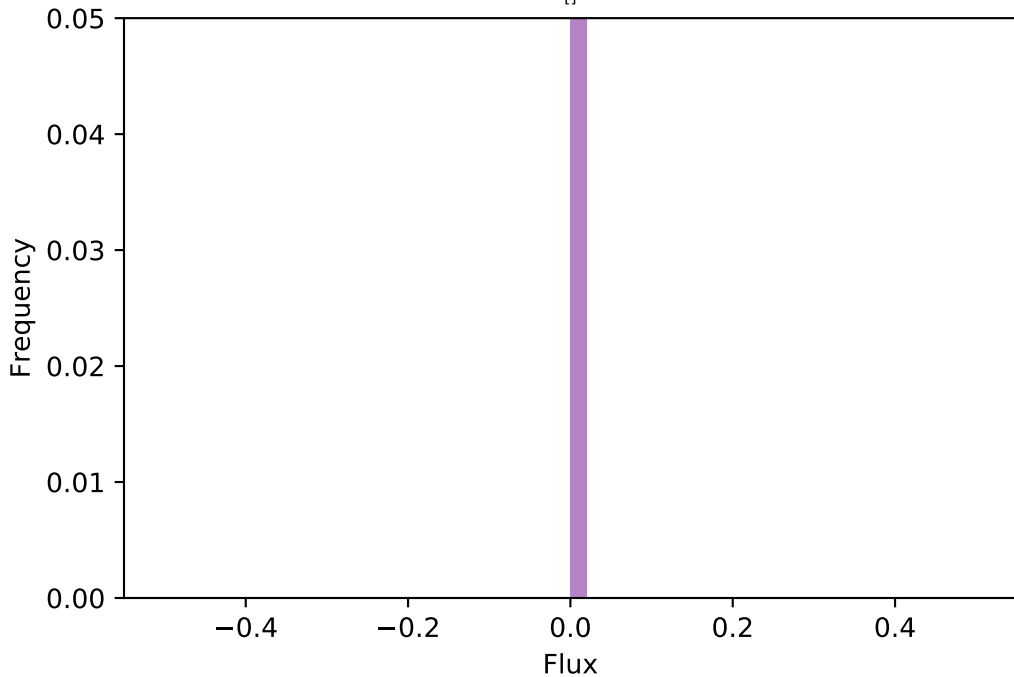
56 : ATP\_c + PGA\_c <=> ADP\_c + DPGA\_c  
[]



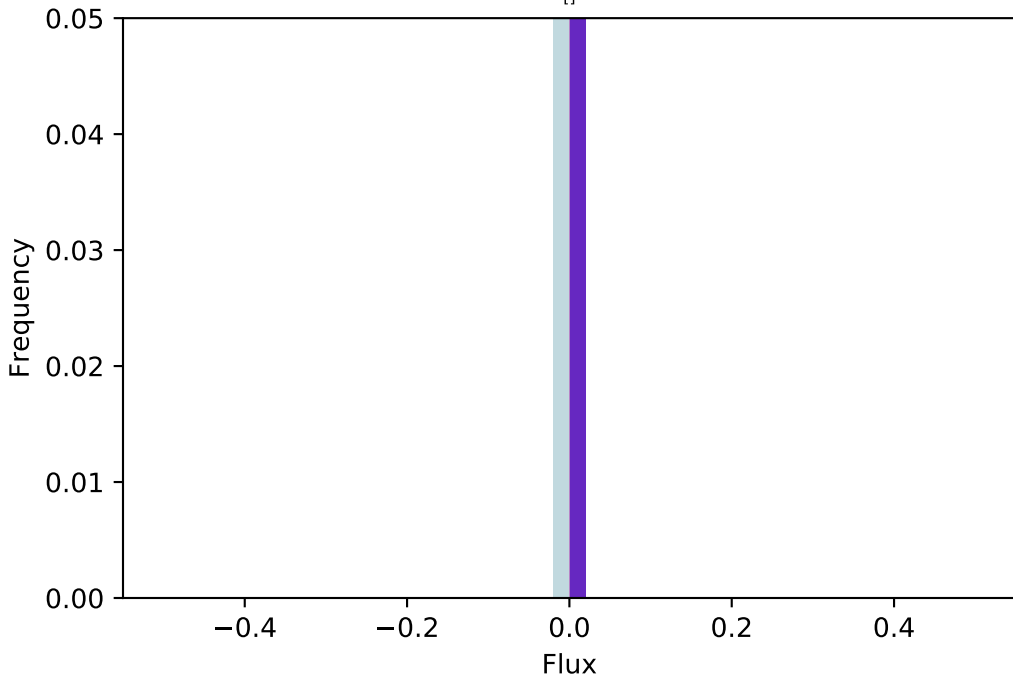
57 : GAP\_c + NAD\_c + Pi\_c ==> DPGA\_c + NADH\_c  
[ ]



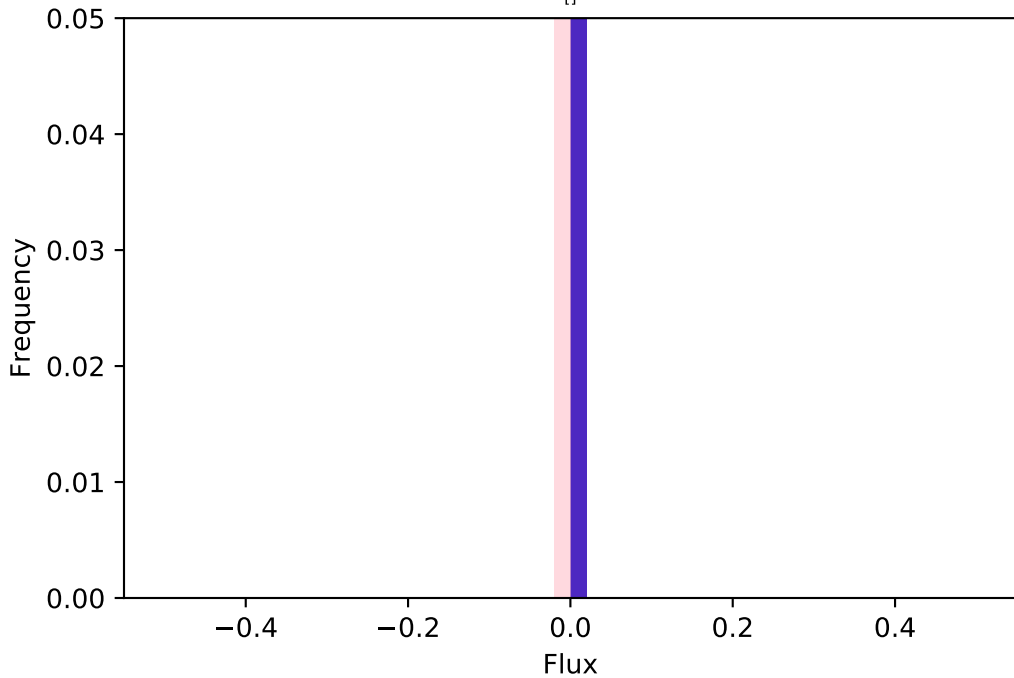
58 : GAP\_c + H2O\_c + NADP\_c --> H\_c + NADPH\_c + PGA\_c  
[]



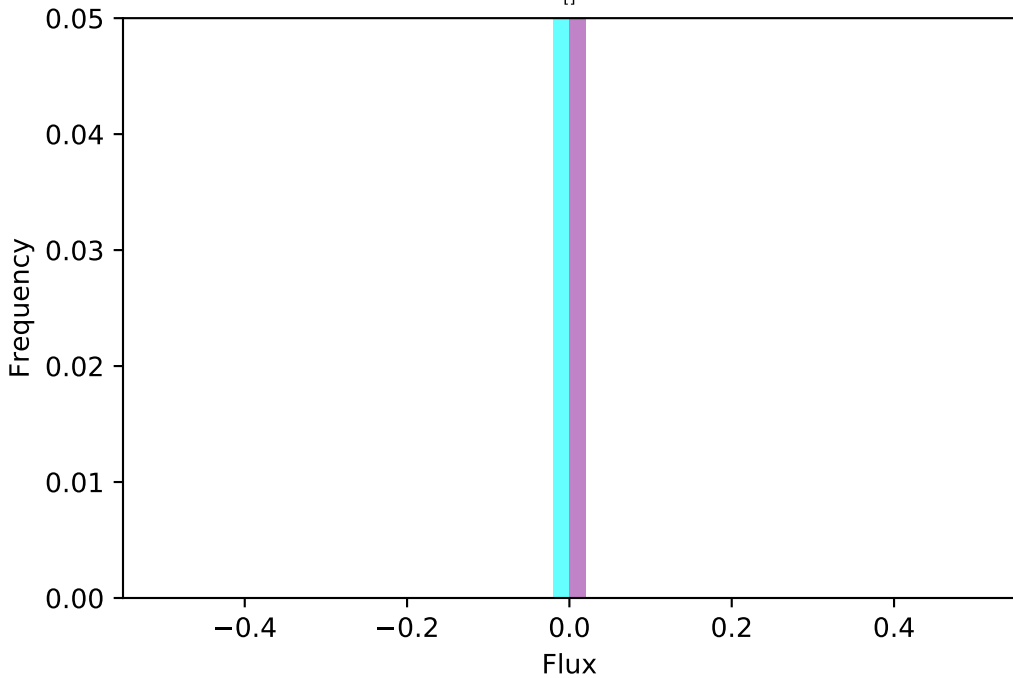
59 : ATP\_c + F6P\_c --> ADP\_c + FBP\_c + H\_c  
[]



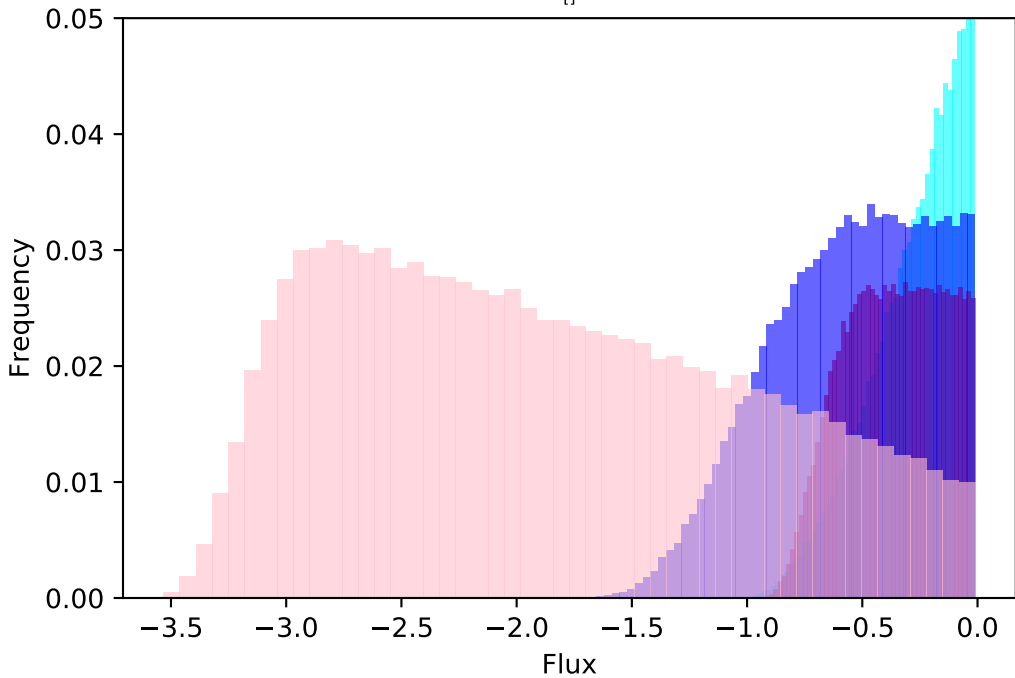
60 : ATP\_h + F6P\_h --> ADP\_h + FBP\_h + H\_h  
[ ]



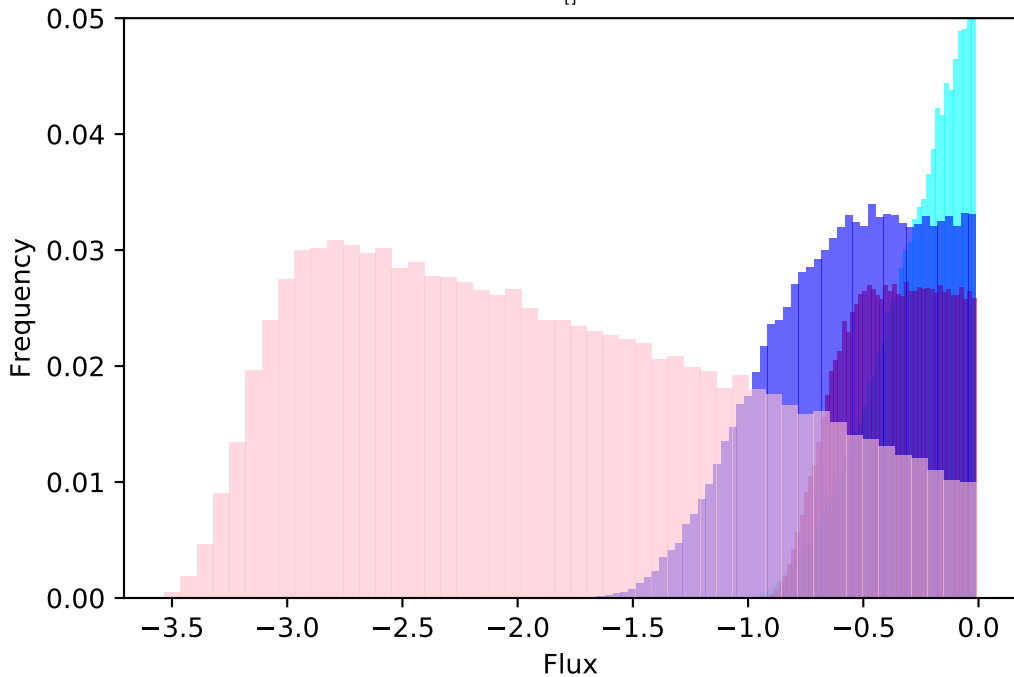
61 : GAP\_h + NAD\_h + Pi\_h --> DPGA\_h + H\_h + NADH\_h  
[ ]



62 : PGA\_h --> 2PGA\_h  
[]

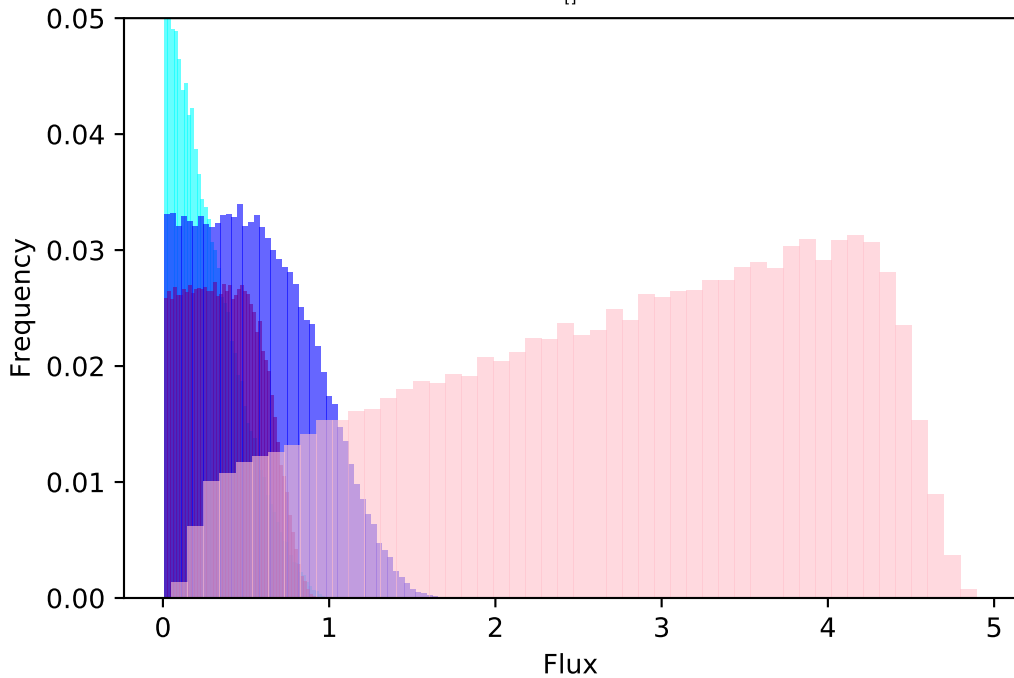


63 : 2PGA\_h <=> H2O\_h + PEP\_h  
[]

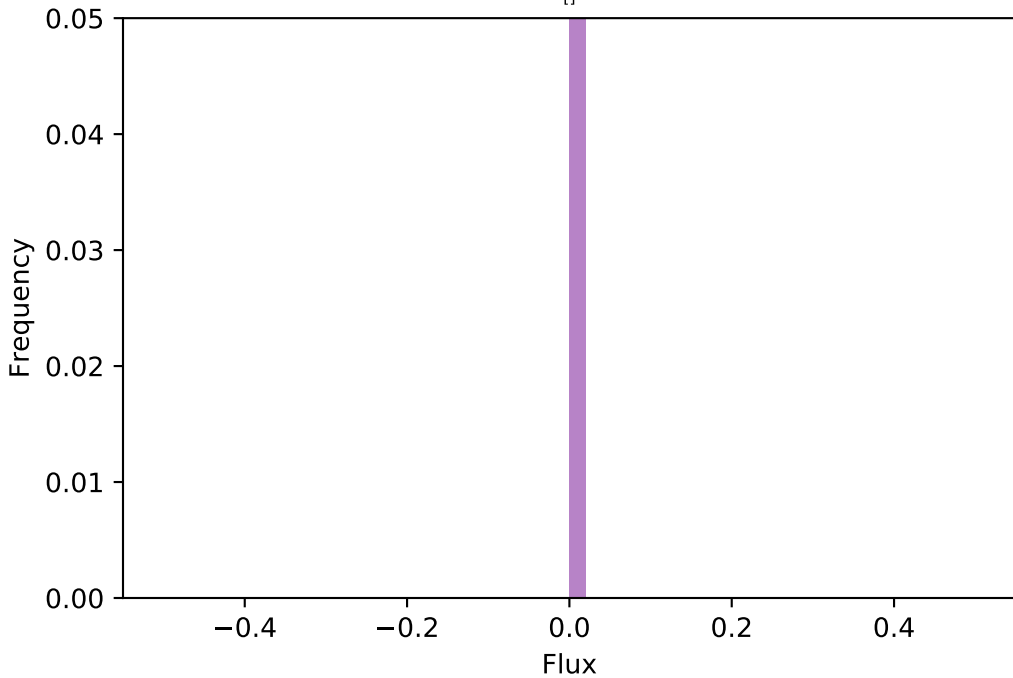




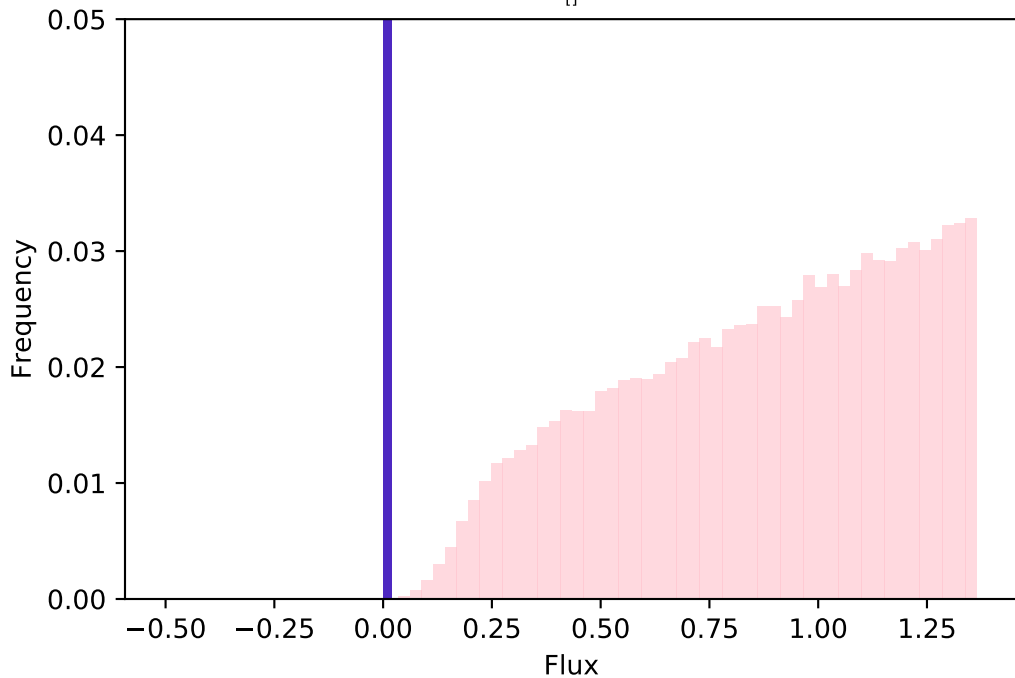
64 : ADP\_c + H\_c + PEP\_c --> ATP\_c + Pyr\_c  
[ ]



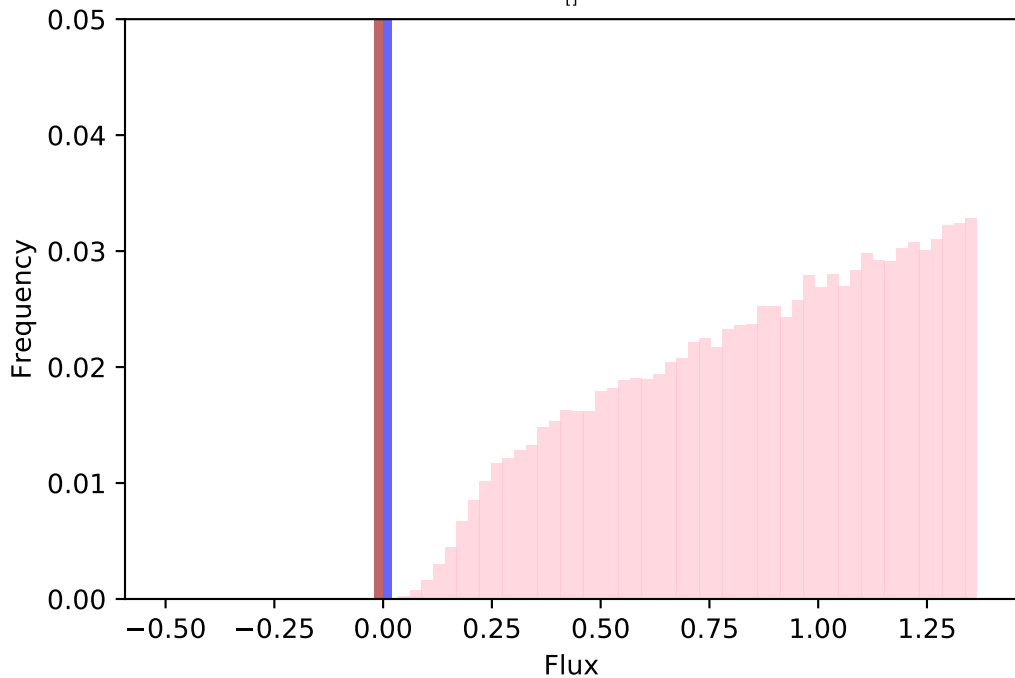
65 : ADP\_h + H\_h + PEP\_h --> ATP\_h + Pyr\_h  
[]



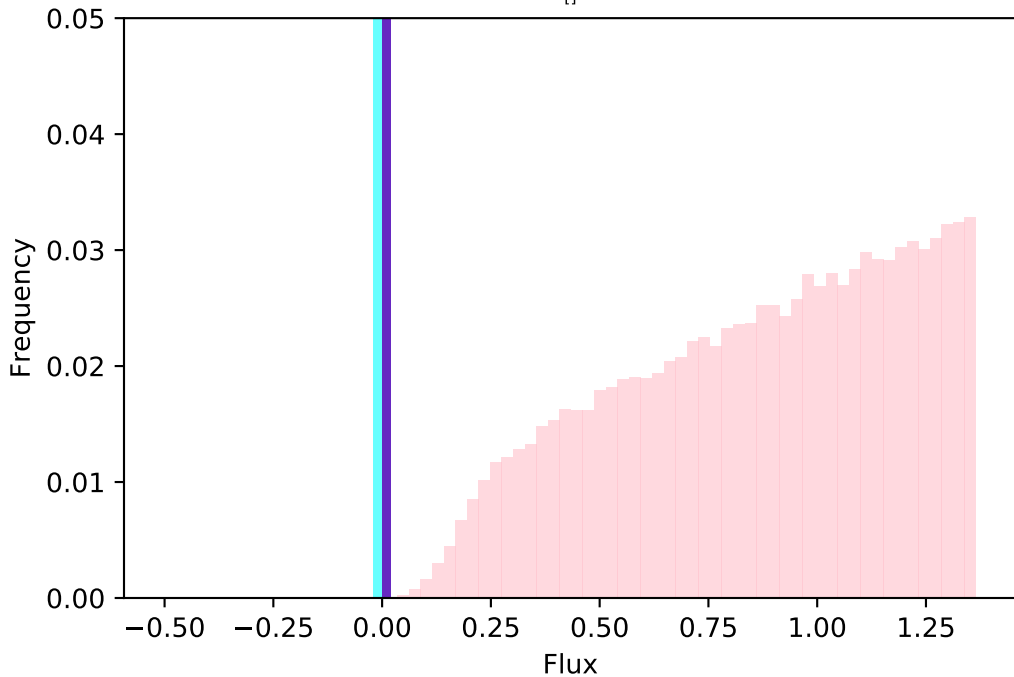
66 : H\_m + Pyr\_m + ThPP\_m --> CO2\_m + H\_DASH\_Eth\_DASH\_ThPP\_m  
[]



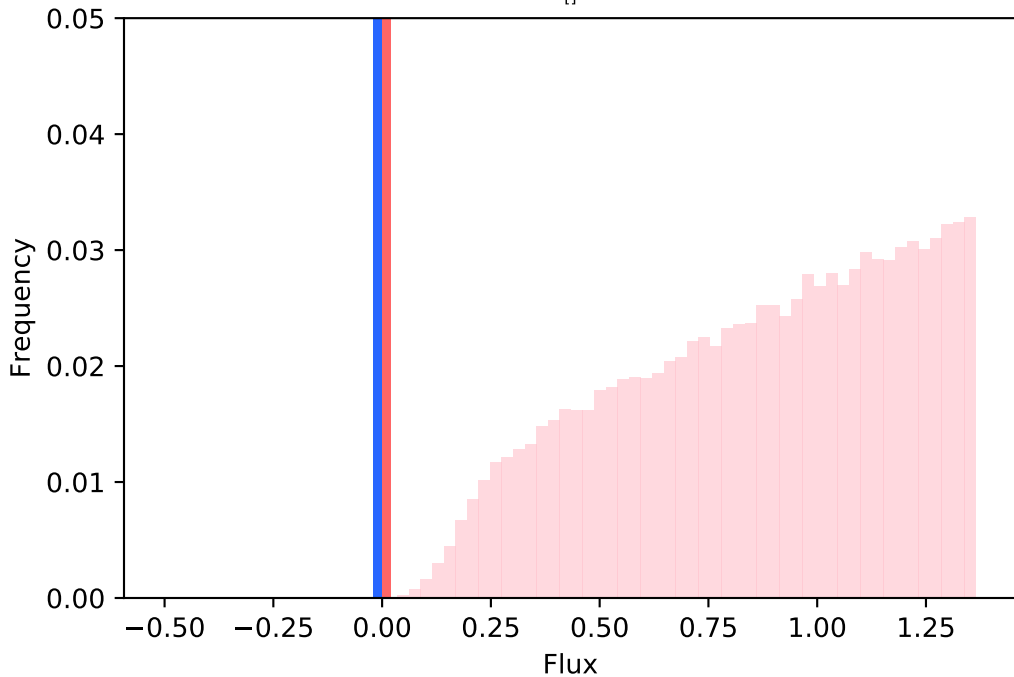
67 : H\_DASH\_Eth\_DASH\_ThPP\_m + LPA\_m --> A\_DASH\_DHL\_m + ThPP\_m  
[]



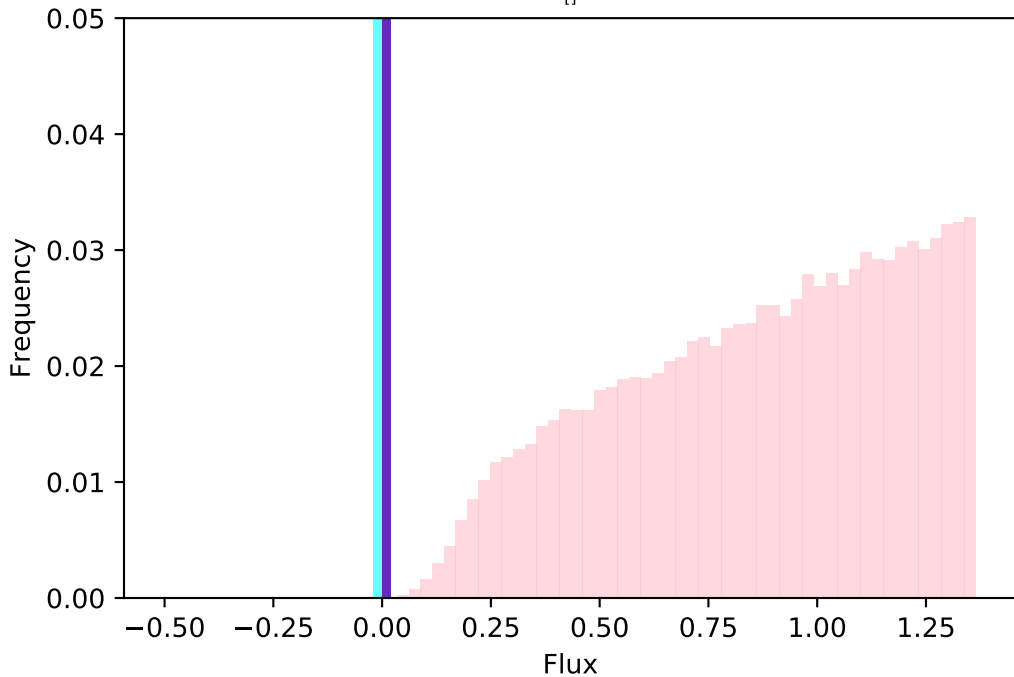
68 : A\_DASH\_DHL\_m + CoA\_m --> A\_DASH\_CoA\_m + DHL\_m  
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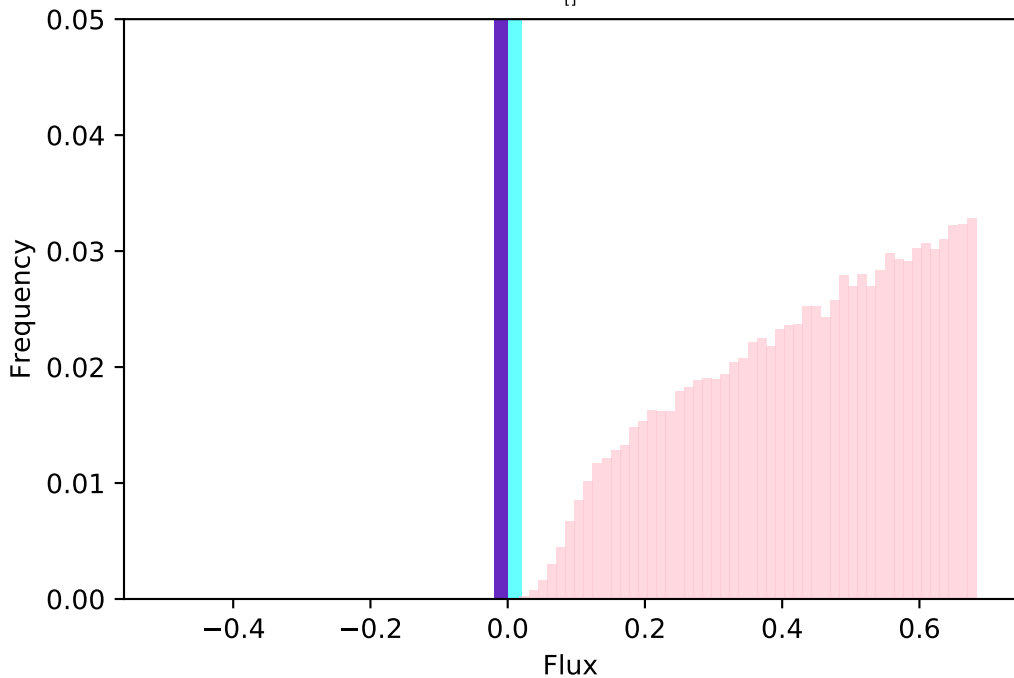
69 : DHL\_m + NAD\_m --> H\_m + LPA\_m + NADH\_m  
[]



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

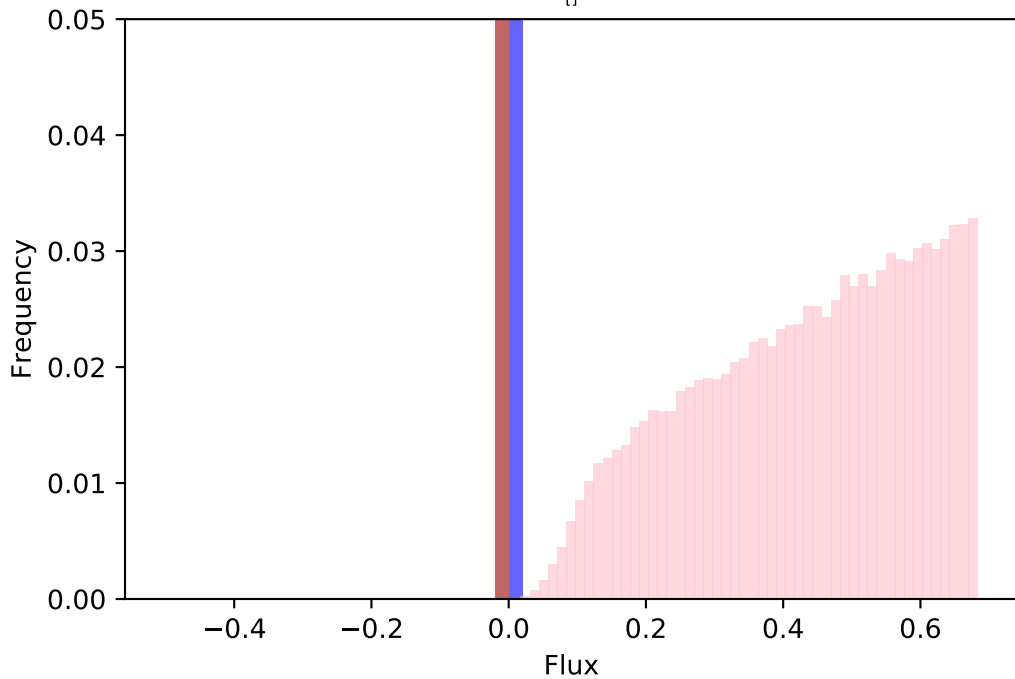


71 : Cit\_m --> H2O\_m + cACN\_m  
[]

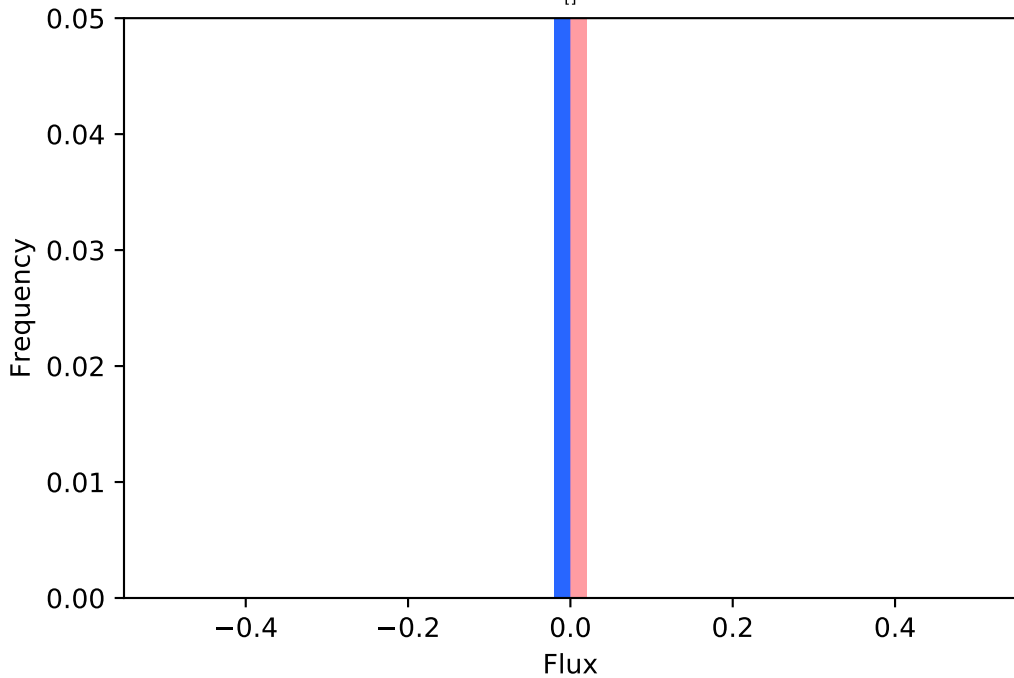




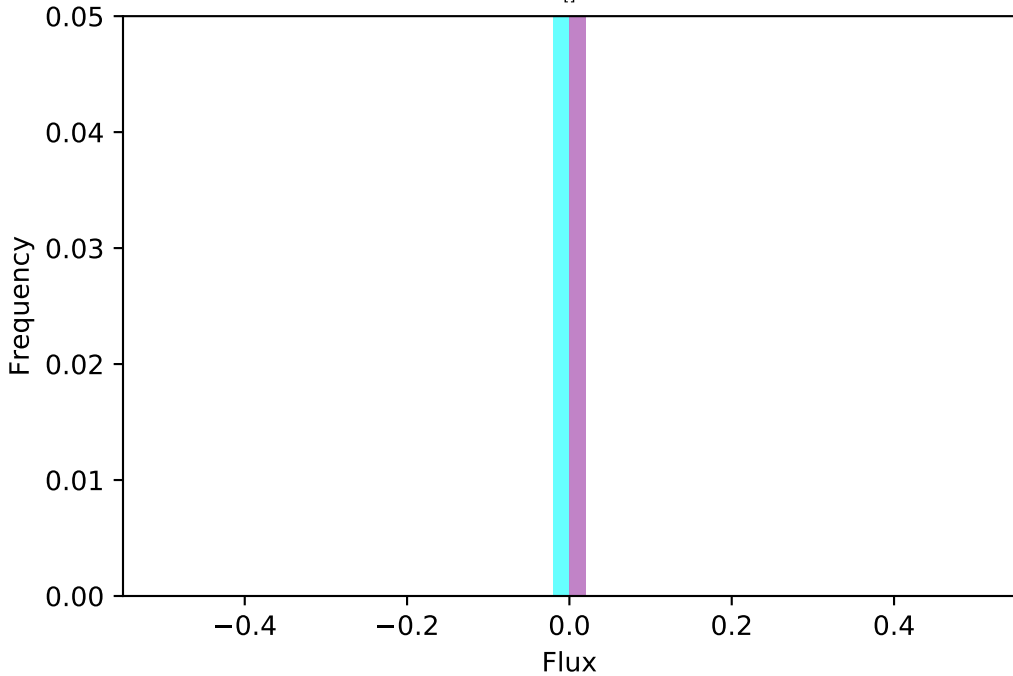
72 : H2O\_m + cACN\_m --> iCit\_m  
[]



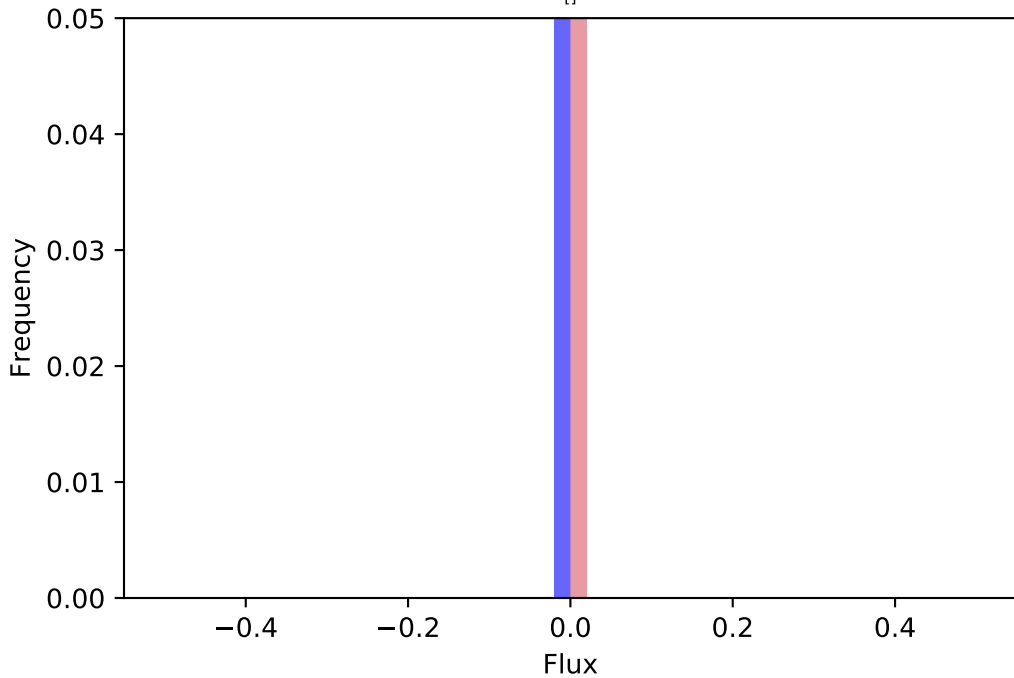
73 : NAD\_m + iCit\_m --> CO2\_m + KG\_m + NADH\_m  
[]



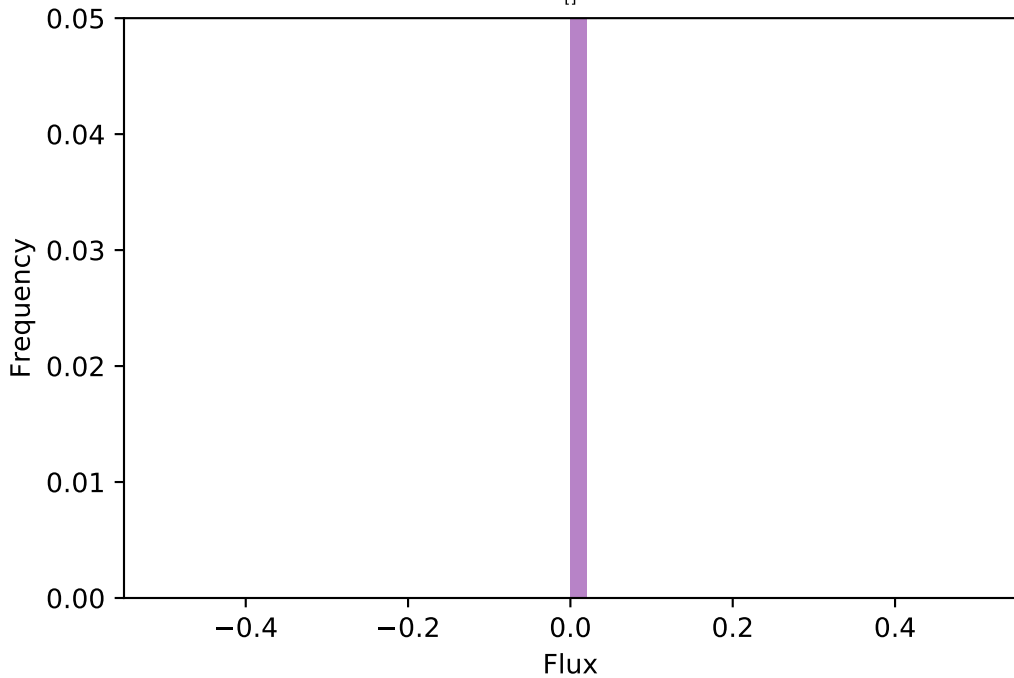
74 : H\_m + KG\_m + LPA\_m --> CO2\_m + S\_DASH\_DHL\_m  
[]



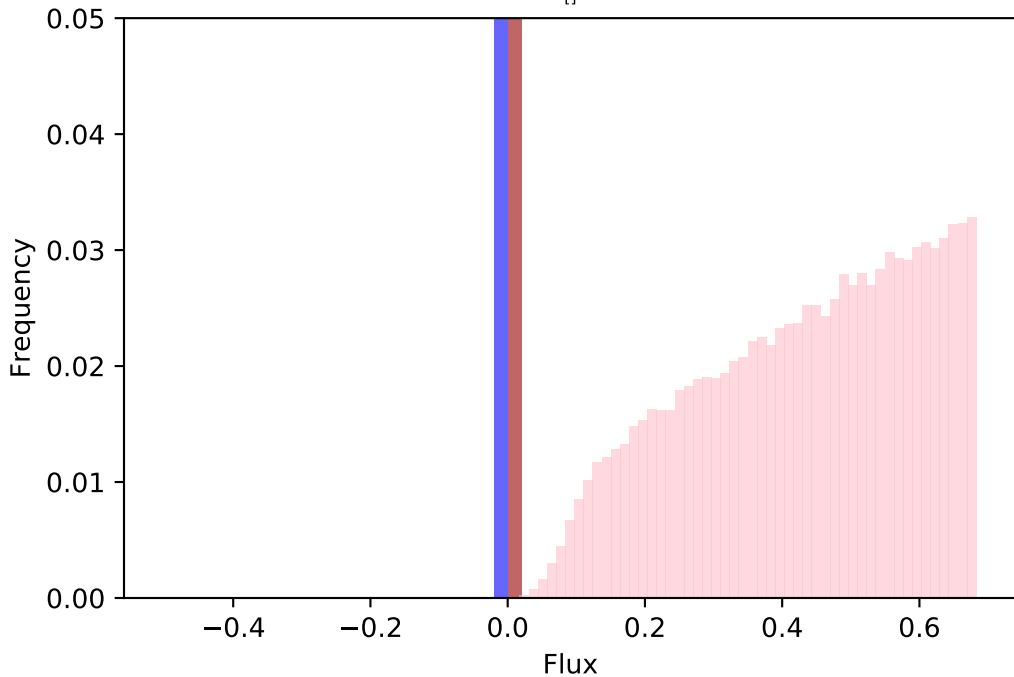
75 : CoA\_m + S\_DASH\_DHL\_m --> DHL\_m + S\_DASH\_CoA\_m  
[]



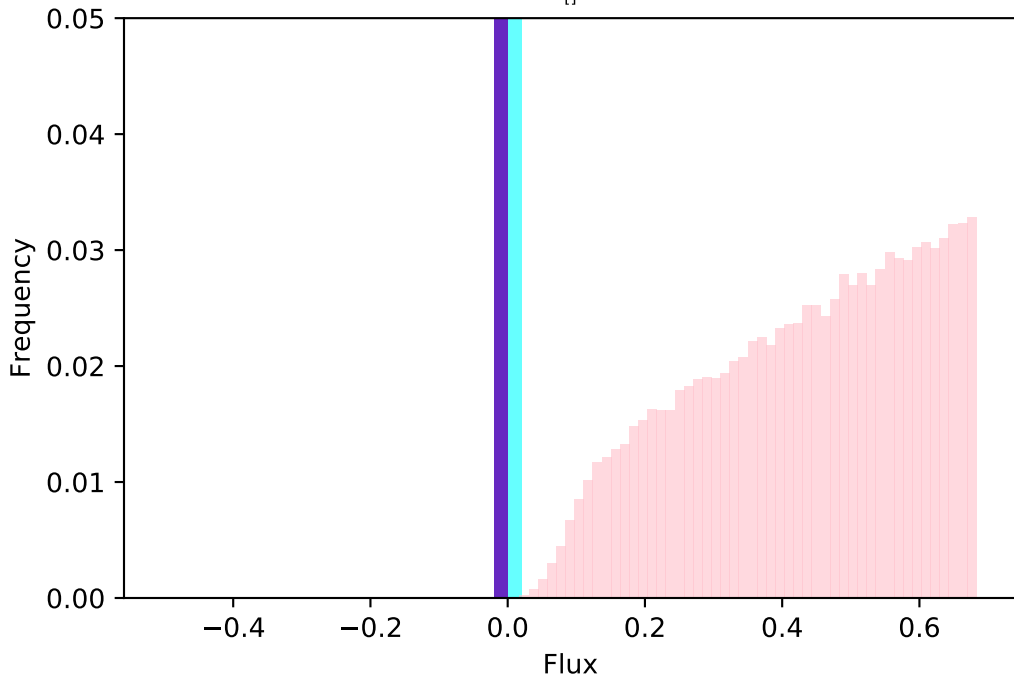
76 : ADP\_m + Pi\_m + S\_DASH\_CoA\_m --> ATP\_m + CoA\_m + SCA\_m  
[ ]



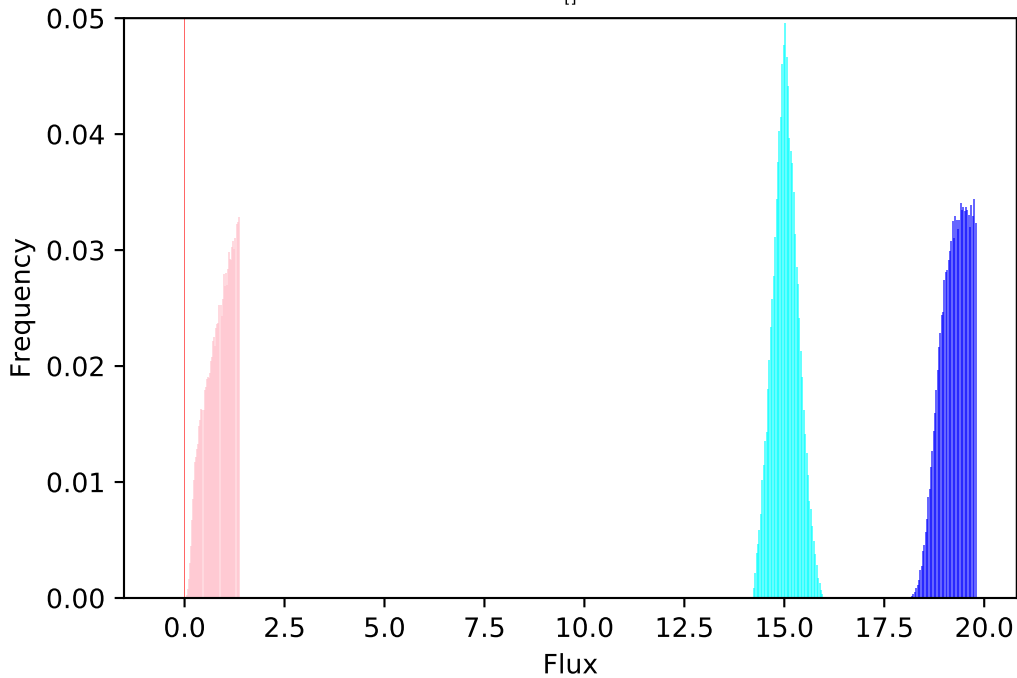
77 : Q\_m + SCA\_m --> Fum\_m + QH2\_m  
[]



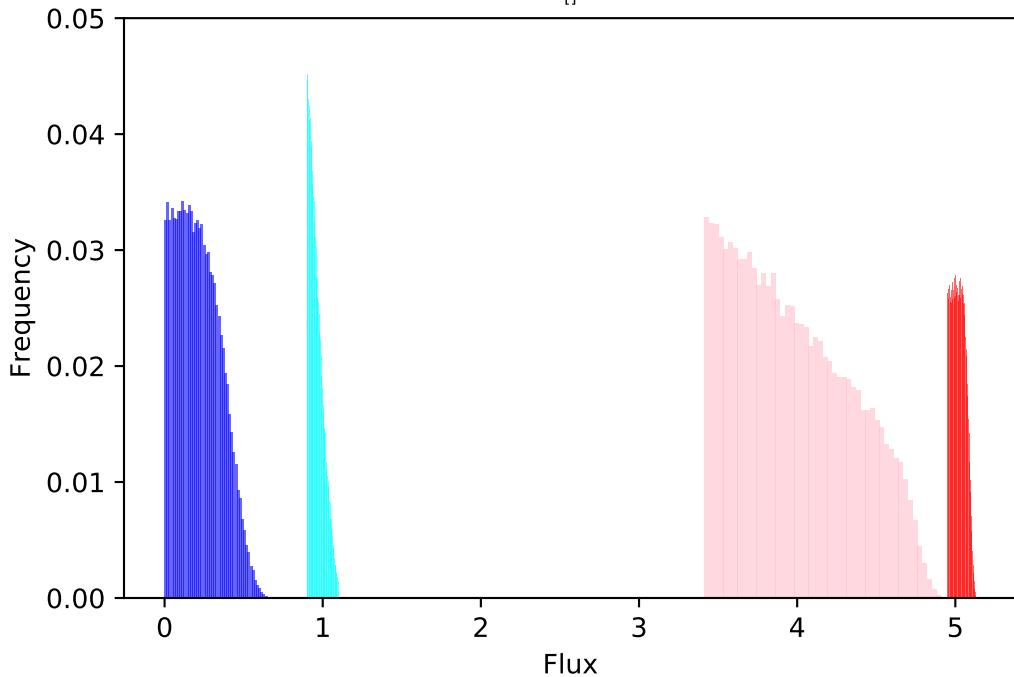
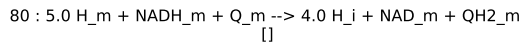
78 : Fum\_m + H2O\_m --> Mal\_m  
[]

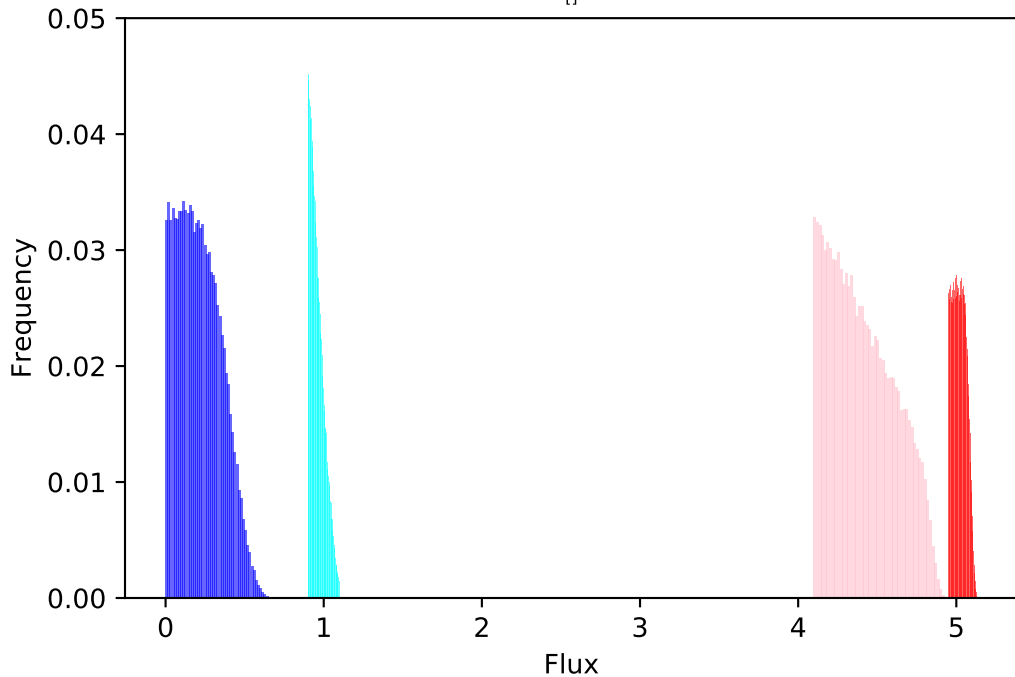
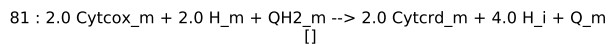


79 : Mal\_m + NAD\_m <=> H\_m + NADH\_m + OAA\_m  
[]

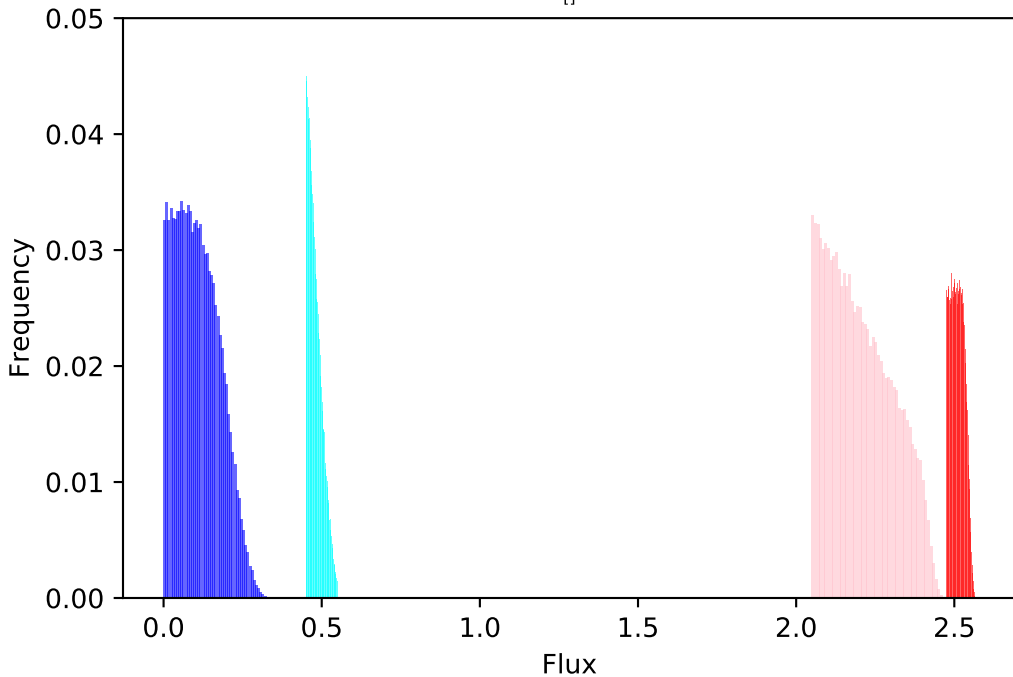




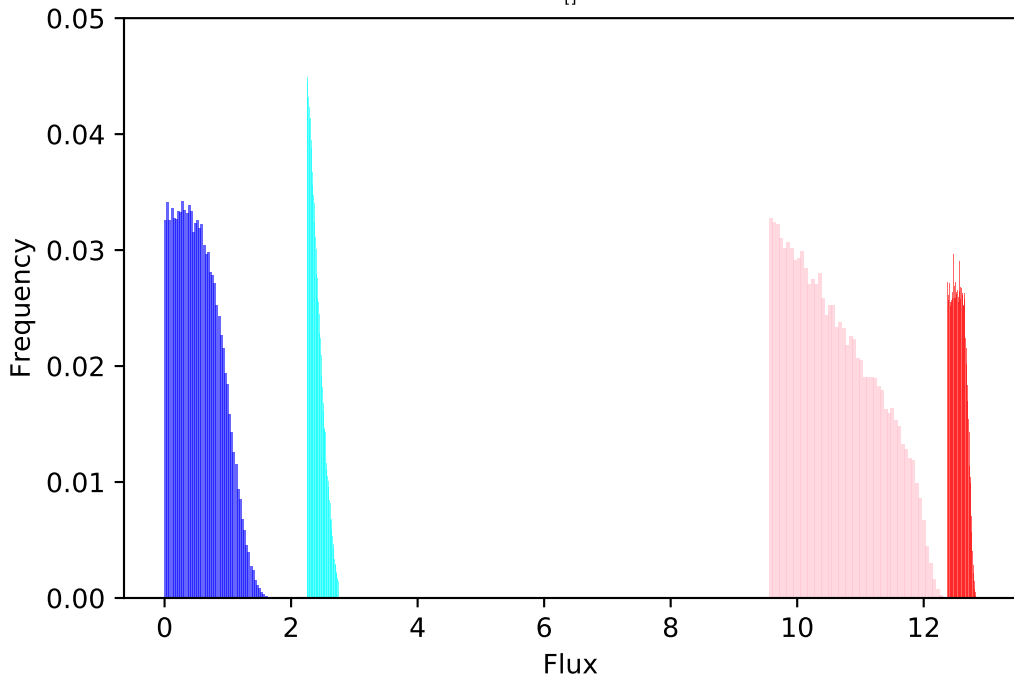




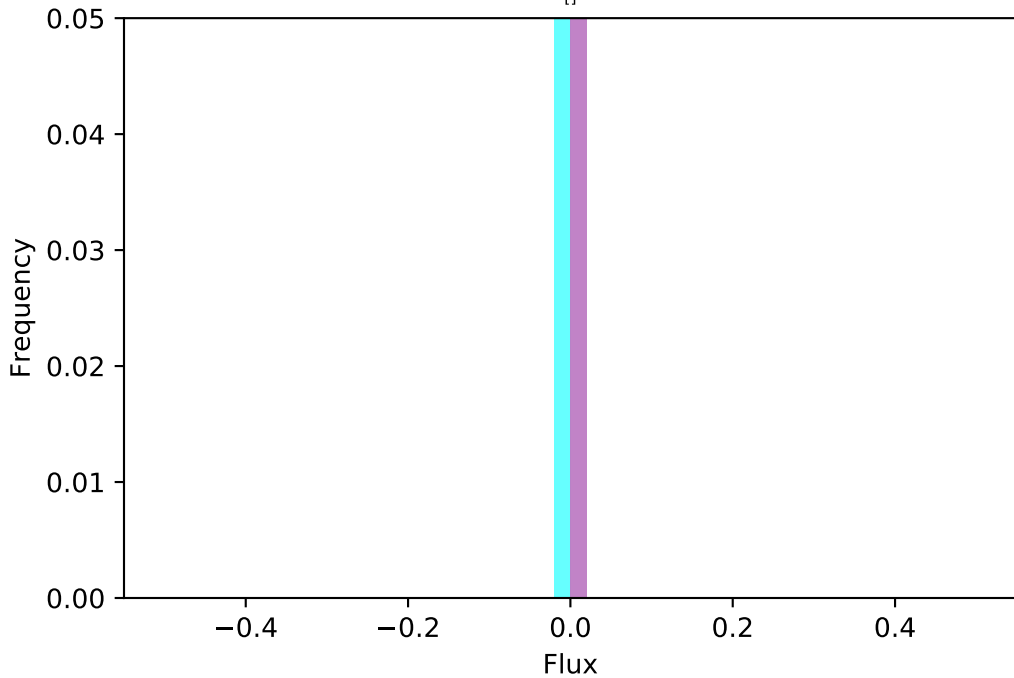
82 : 4.0 Cytcrd\_m + 8.0 H\_m + O2\_m --> 4.0 Cytcox\_m + 2.0 H2O\_m + 4.0 H\_i  
[]



83 :  $\text{ADP}_m + 4.0 \text{ H}_i + \text{Pi}_m \rightleftharpoons \text{ATP}_m + \text{H}_2\text{O}_m + 3.0 \text{ H}_m$   
[]

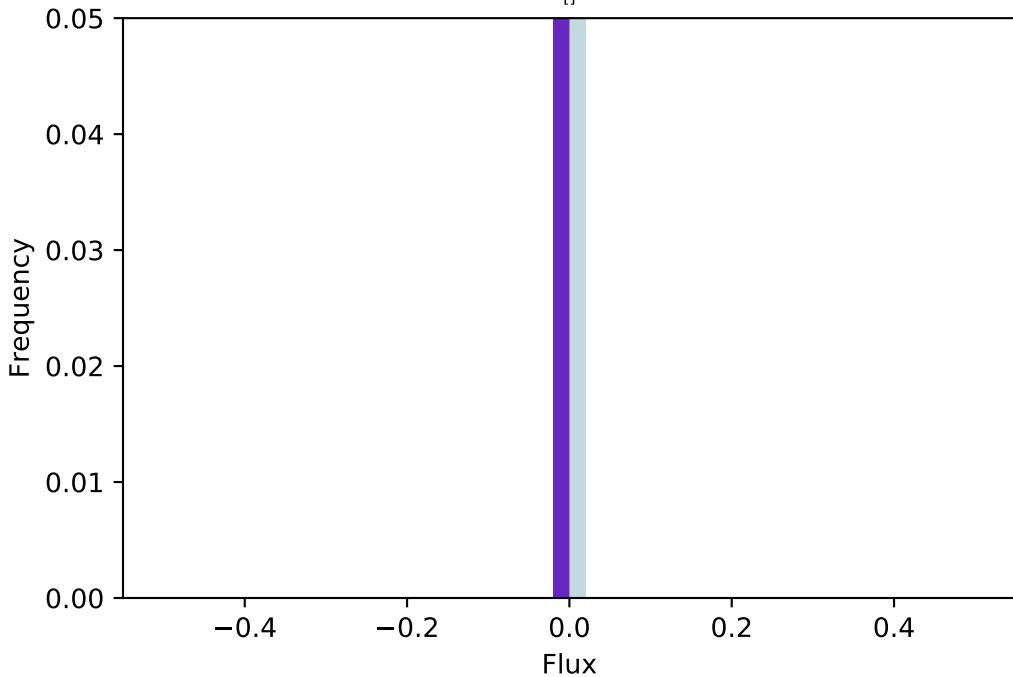


84 : O2\_h + RuBP\_h --> 2.0 H\_h + PGA\_h + PGCA\_h  
[]

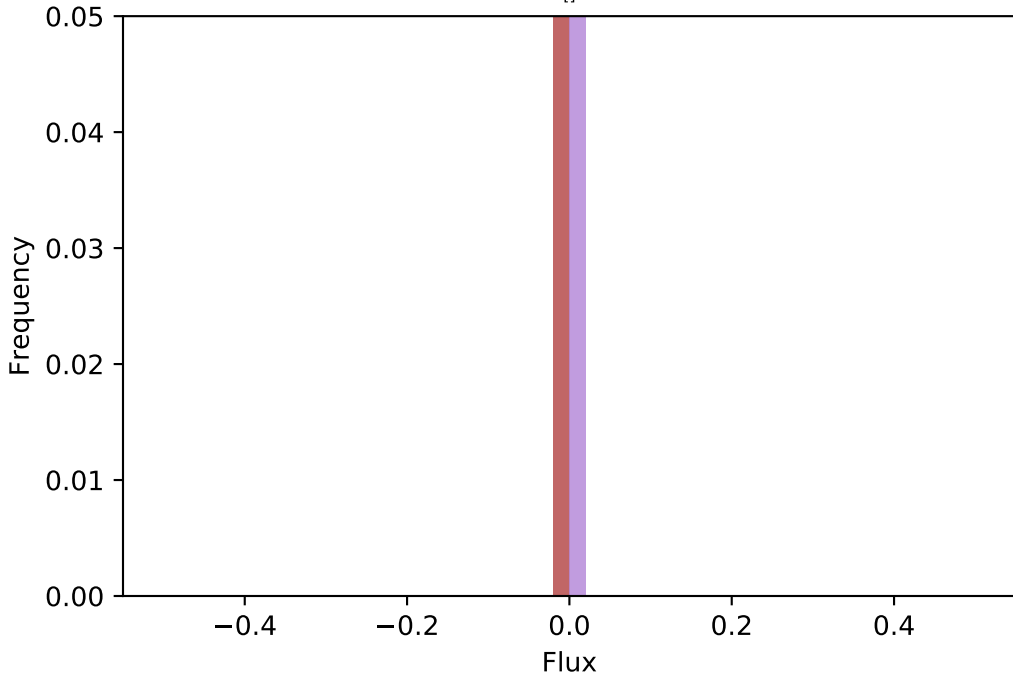


85 : H2O\_h + PGCA\_h --> GCA\_h + Pi\_h

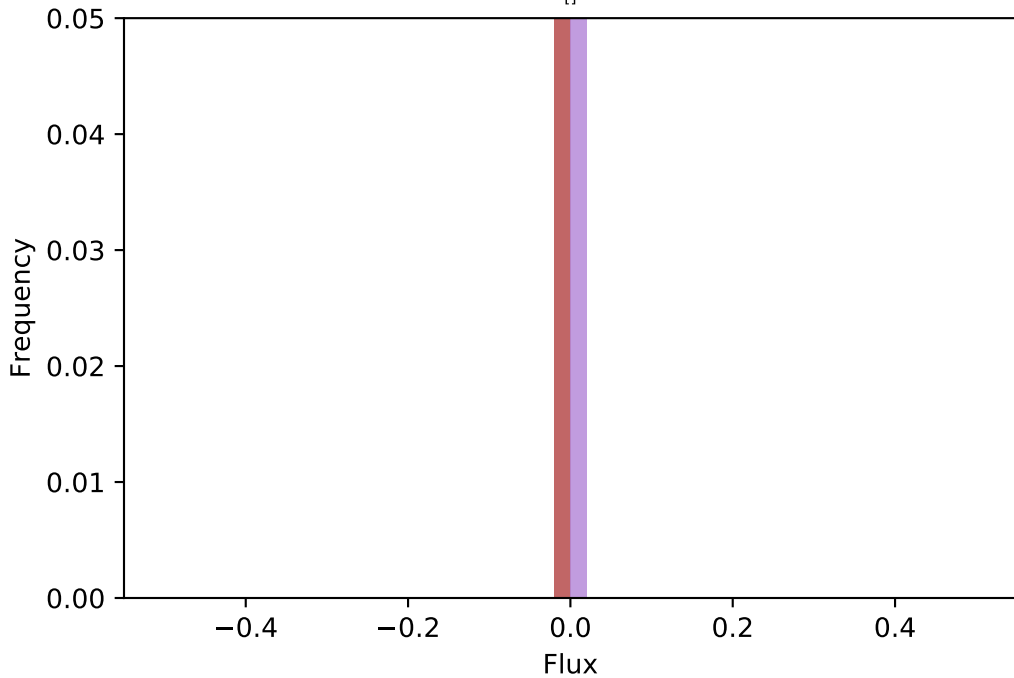
[ ]



86 : GCA\_p + O2\_p --> GLX\_p + H2O2\_p  
[]

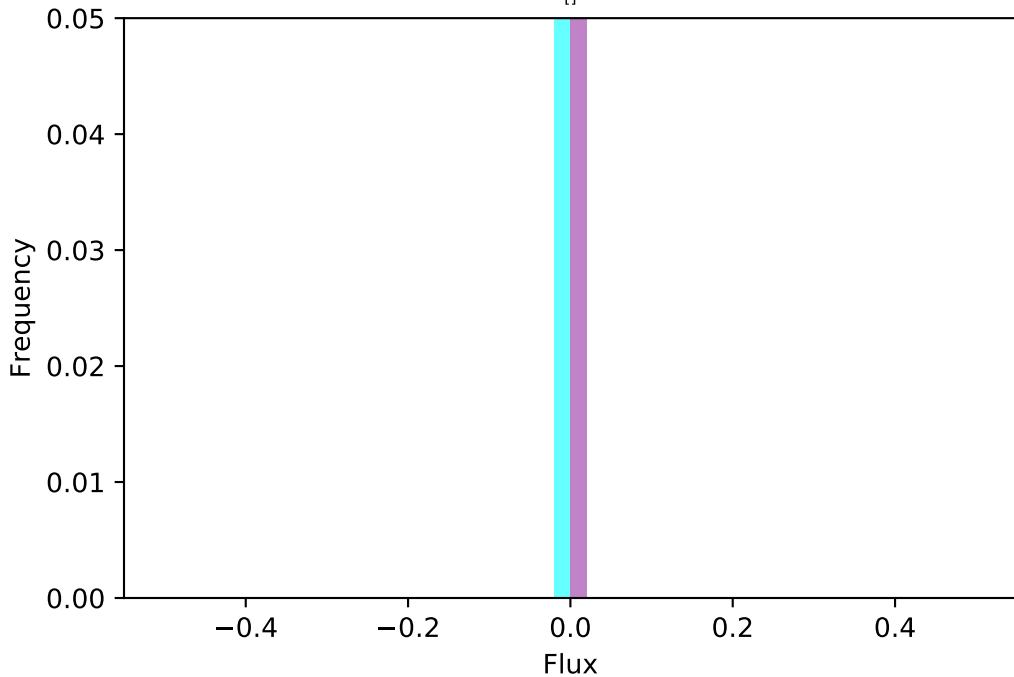


87 : 2.0 H2O2\_p --> 2.0 H2O\_p + O2\_p  
[]

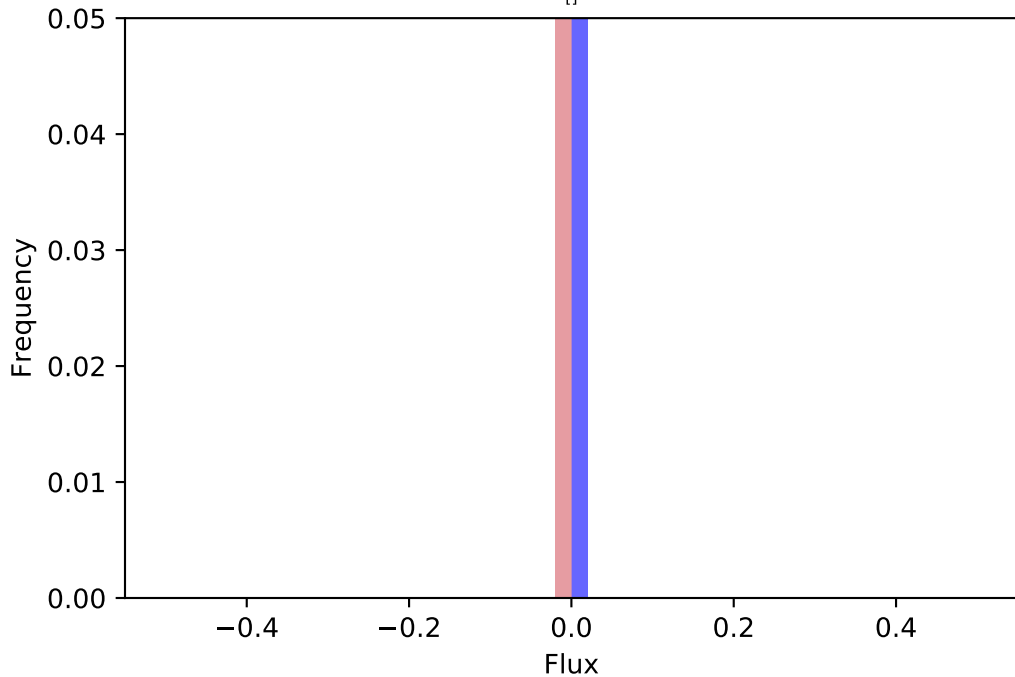




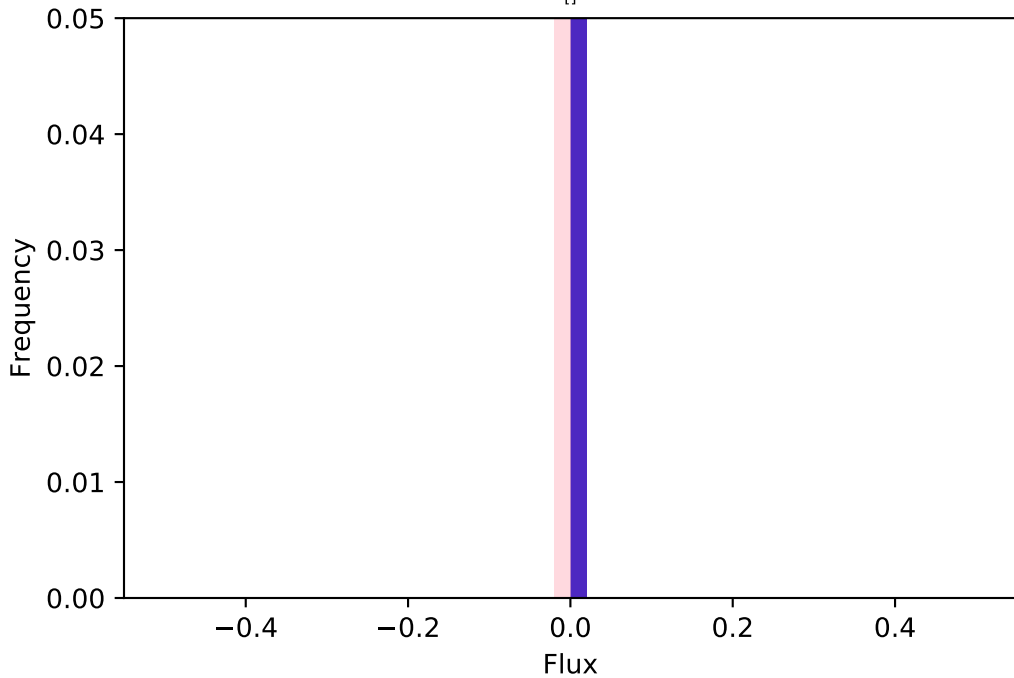
88 : GLX\_p + Glu\_p --> Gly\_p + KG\_p  
[]



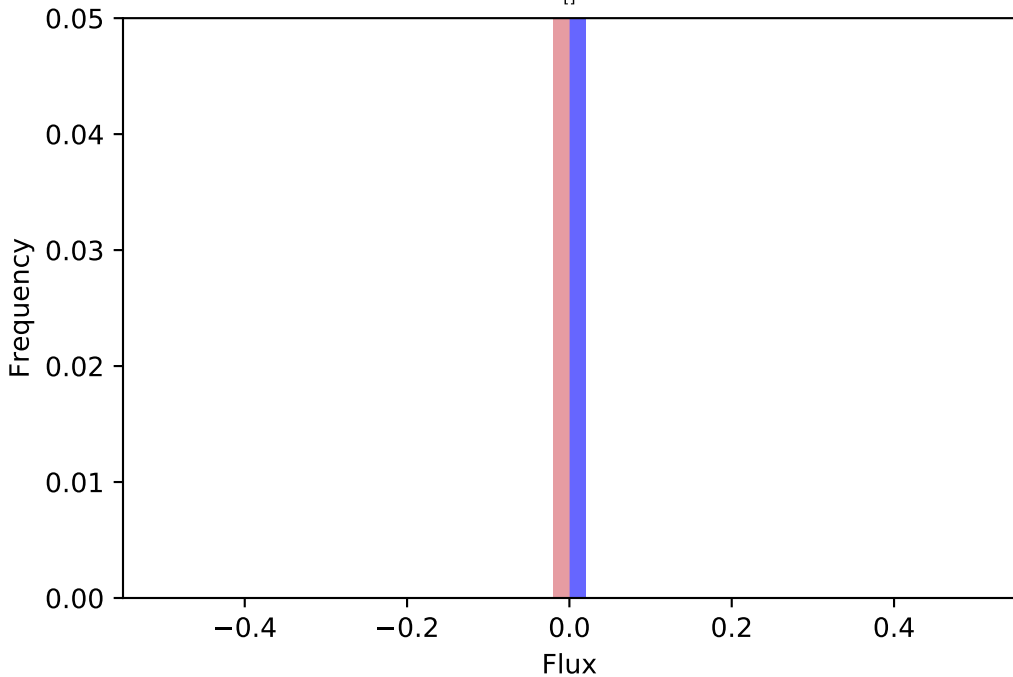
89 : Gly\_m + H\_m + LPL\_m --> CO2\_m + amDHP\_m  
[]



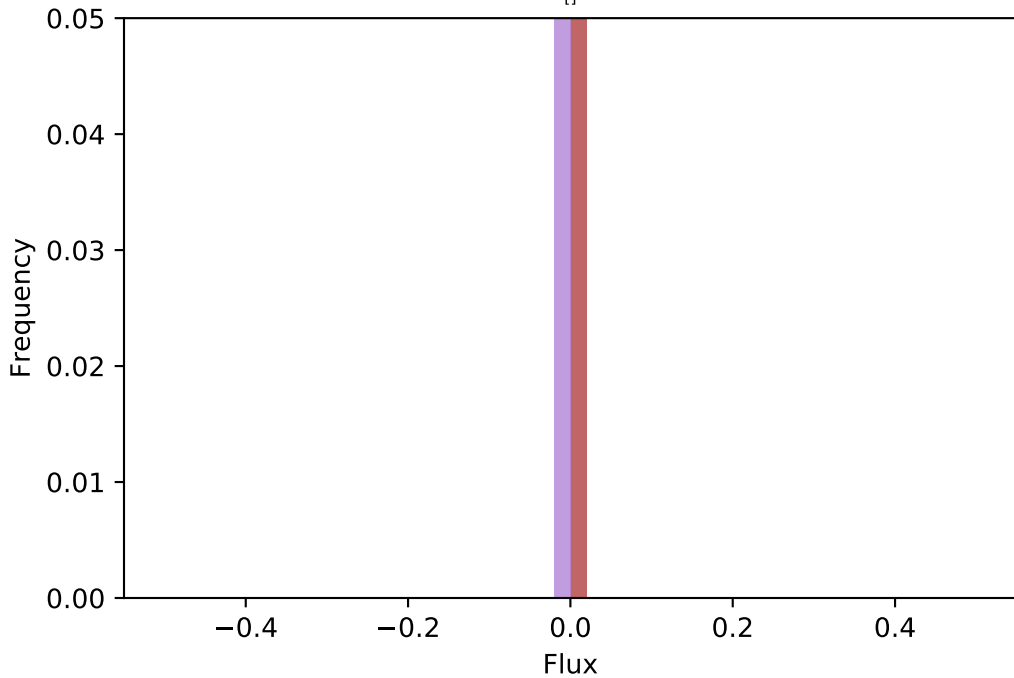
90 : THF\_m + amDHP\_m --> DHP\_m + M\_DASH\_THF\_m + NH4\_m  
[ ]



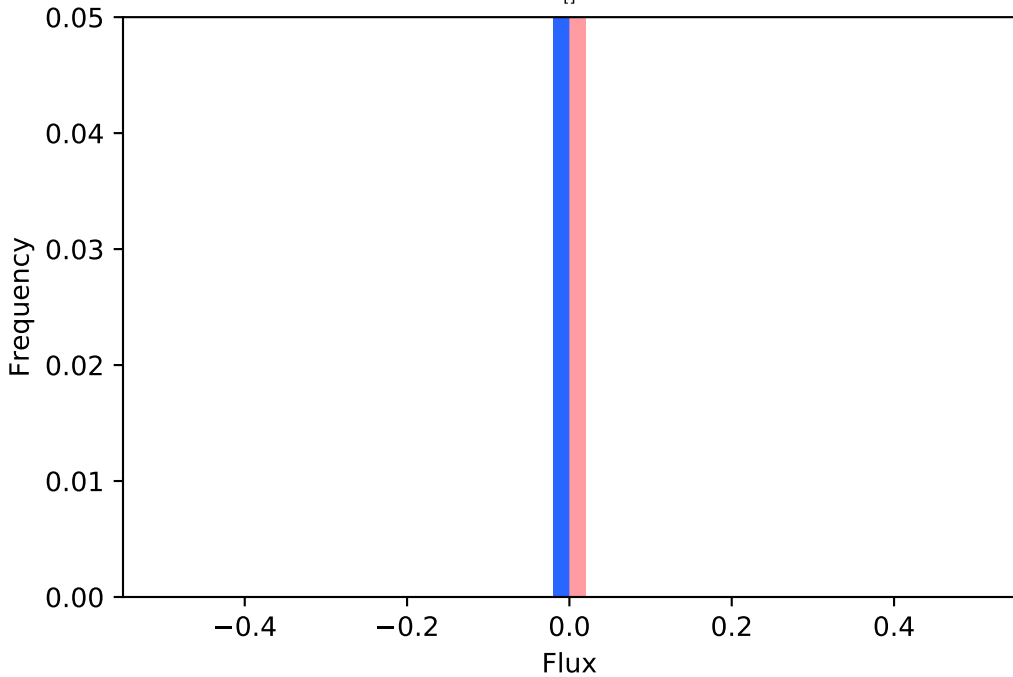
91 : DHP\_m + NAD\_m --> H\_m + LPL\_m + NADH\_m  
[]



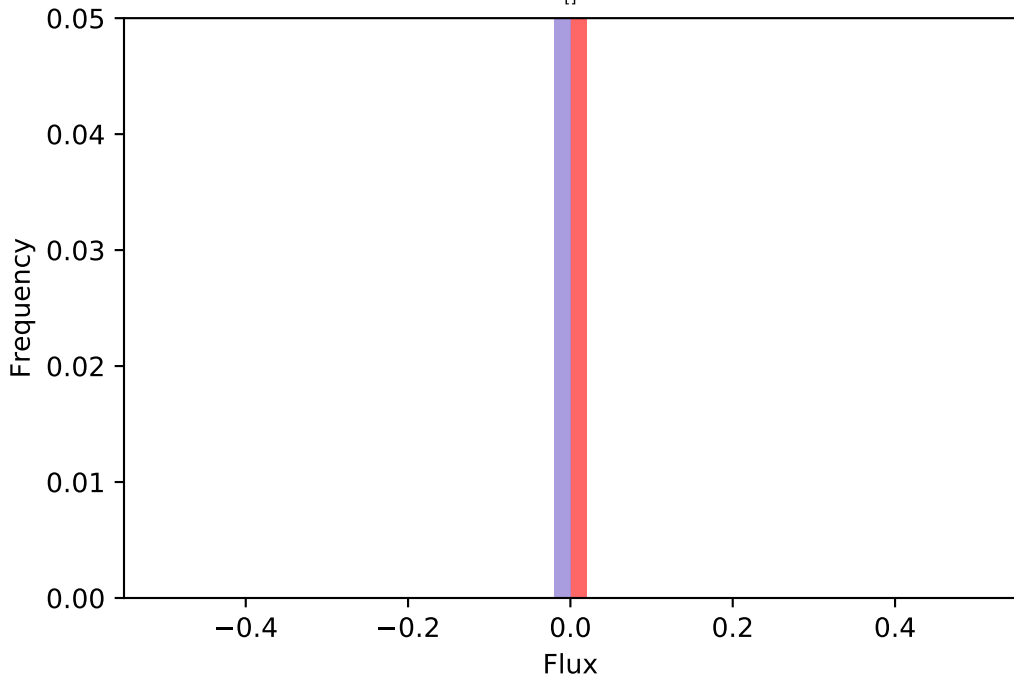
92 : Gly\_m + H2O\_m + M\_DASH\_THF\_m <=> Ser\_m + THF\_m  
[ ]



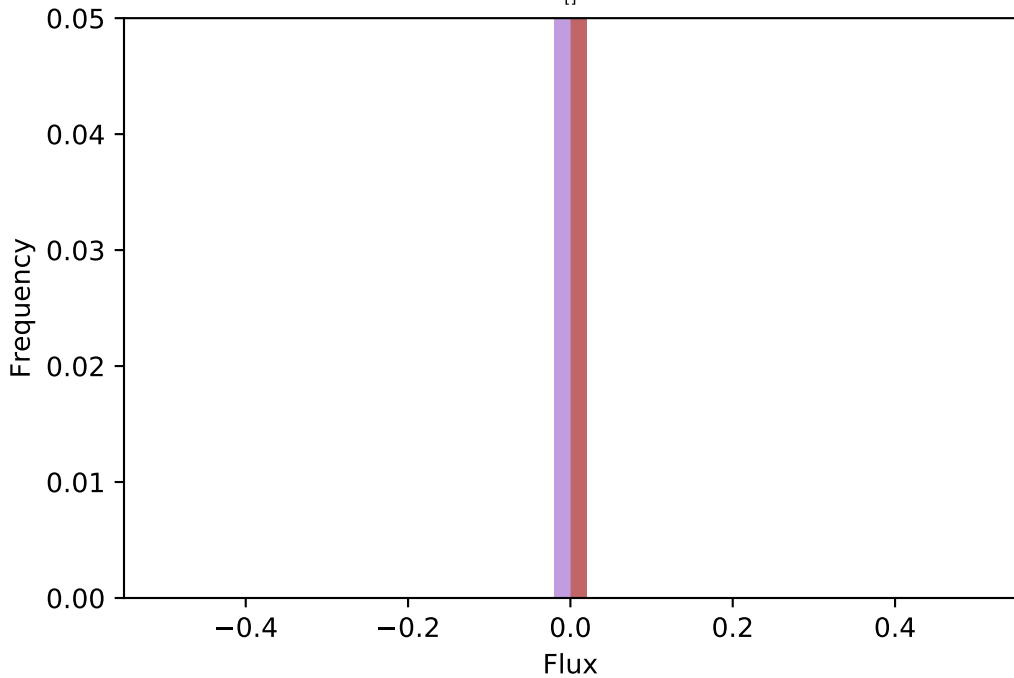
93 : GLX\_p + Ser\_p --> Gly\_p + HPR\_p  
[]



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

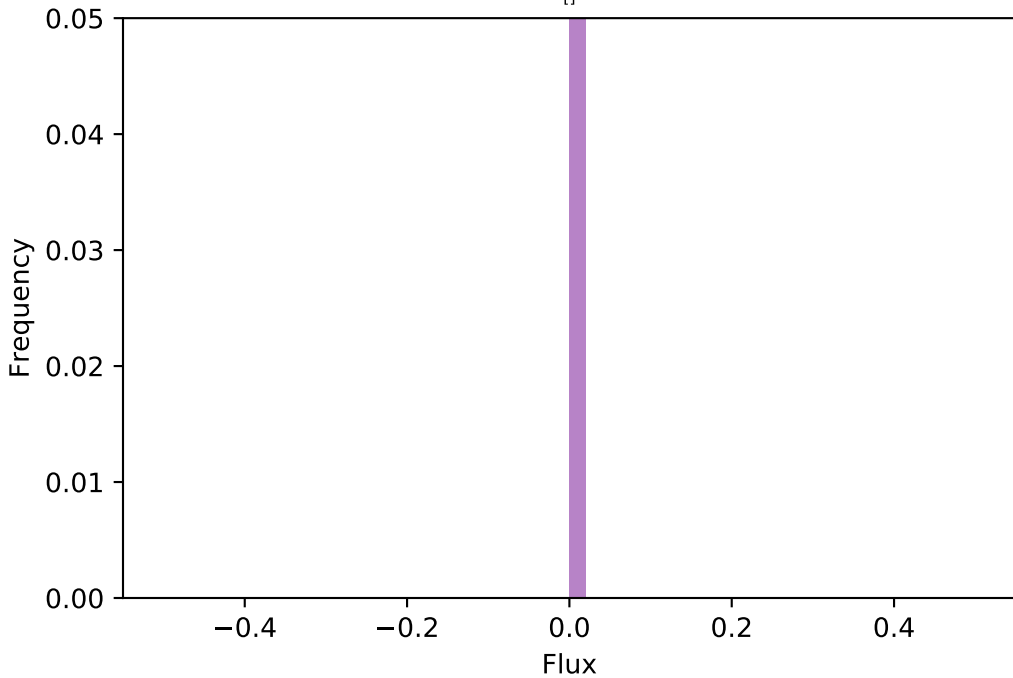


95 : Mal\_p + NAD\_p <=> H\_p + NADH\_p + OAA\_p  
[]

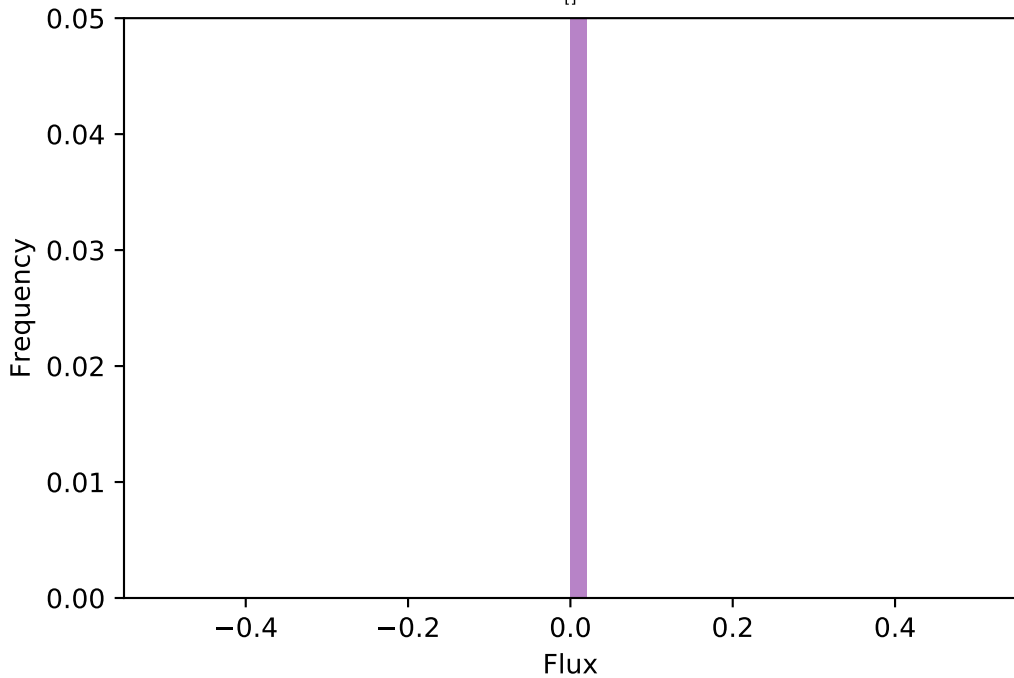




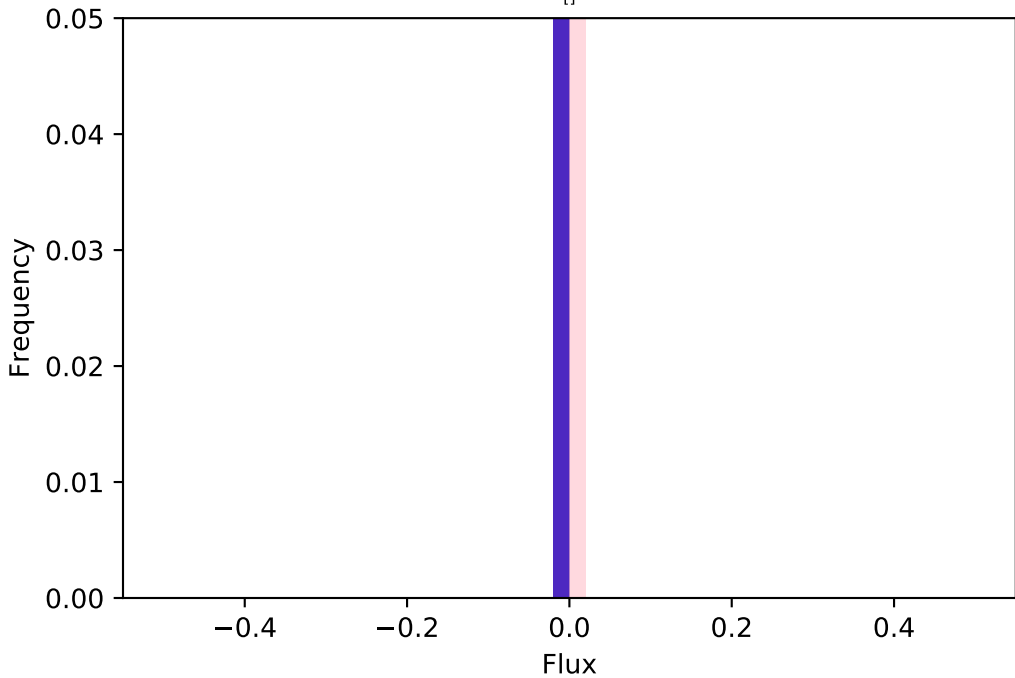
96 : ATP\_h + GCEA\_h --> ADP\_h + H\_h + PGA\_h  
[]



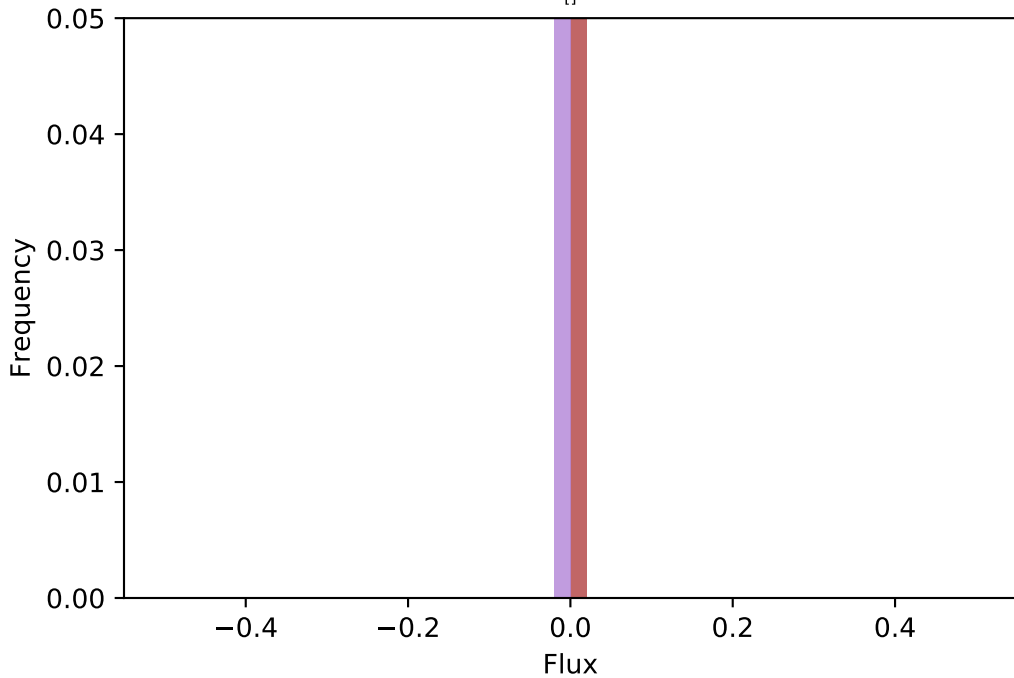
97 : G6P\_h + NADP\_h --> GLP\_h + H\_h + NADPH\_h  
[]



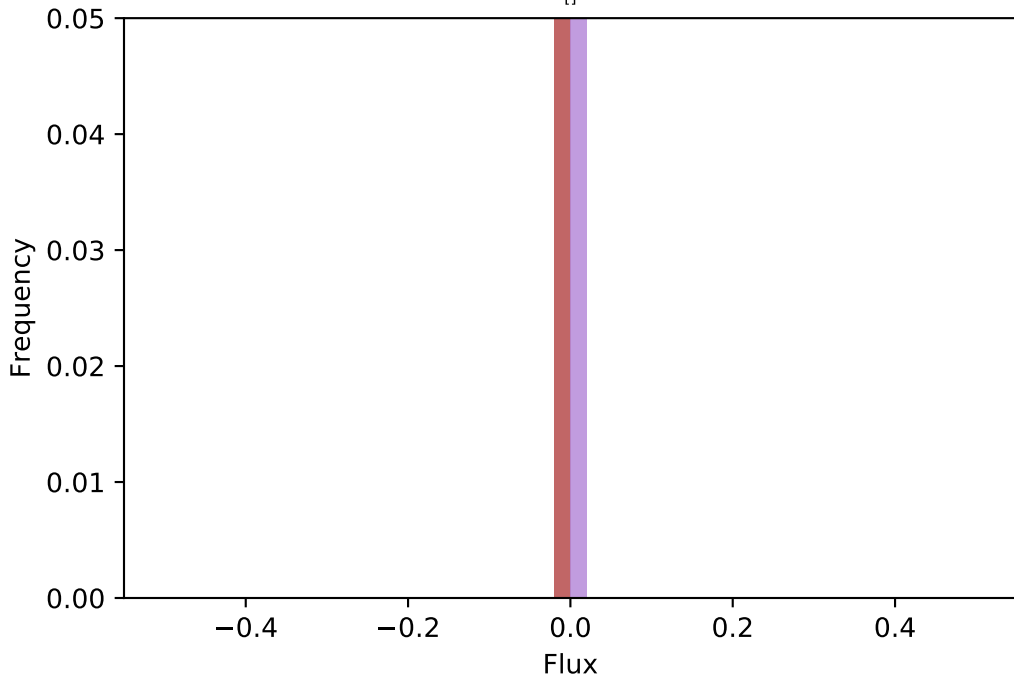
98 : GLP\_h + H2O\_h --> 6PG\_h + H\_h  
[ ]



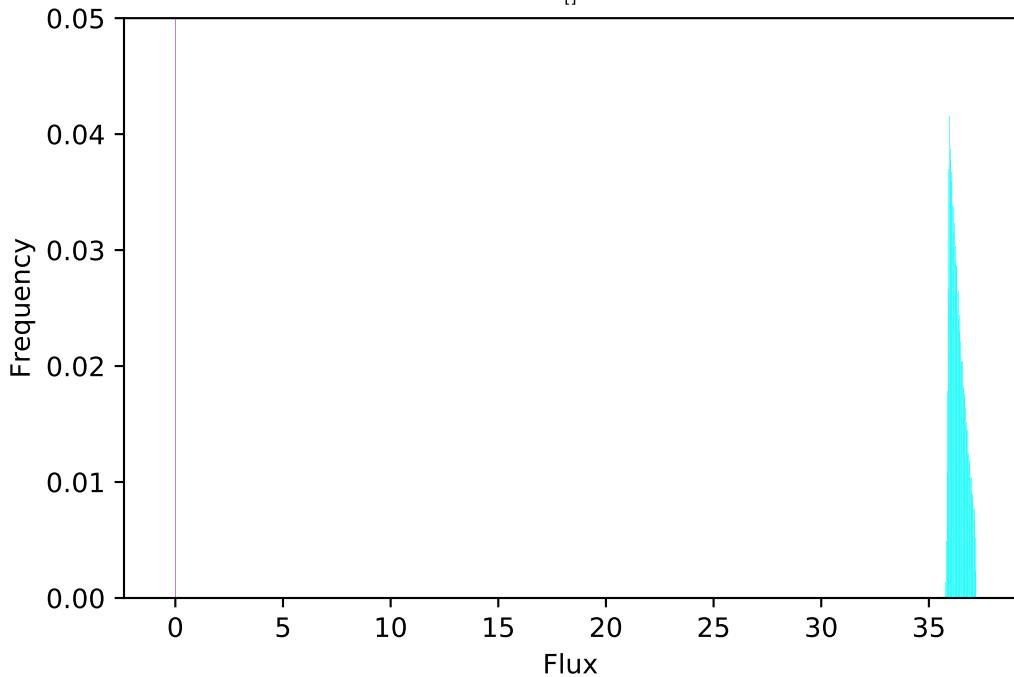
99 : 6PG\_h + NAD\_h --> CO2\_h + NADH\_h + Ru5P\_h  
[]



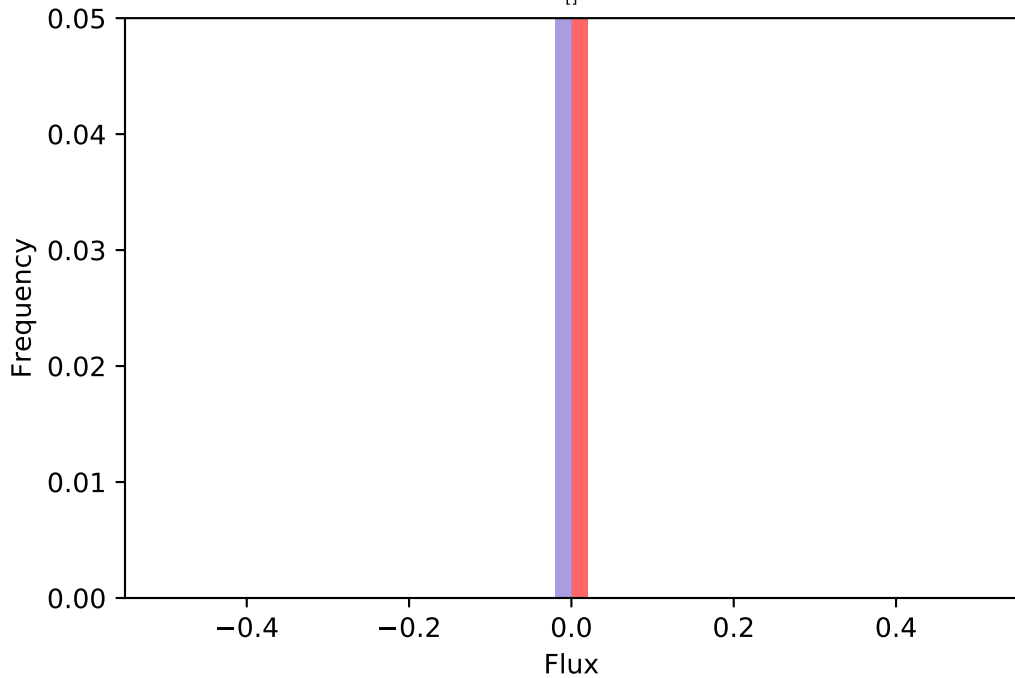
100 : 6PG\_h + NADP\_h --> CO2\_h + NADPH\_h + Ru5P\_h  
[ ]



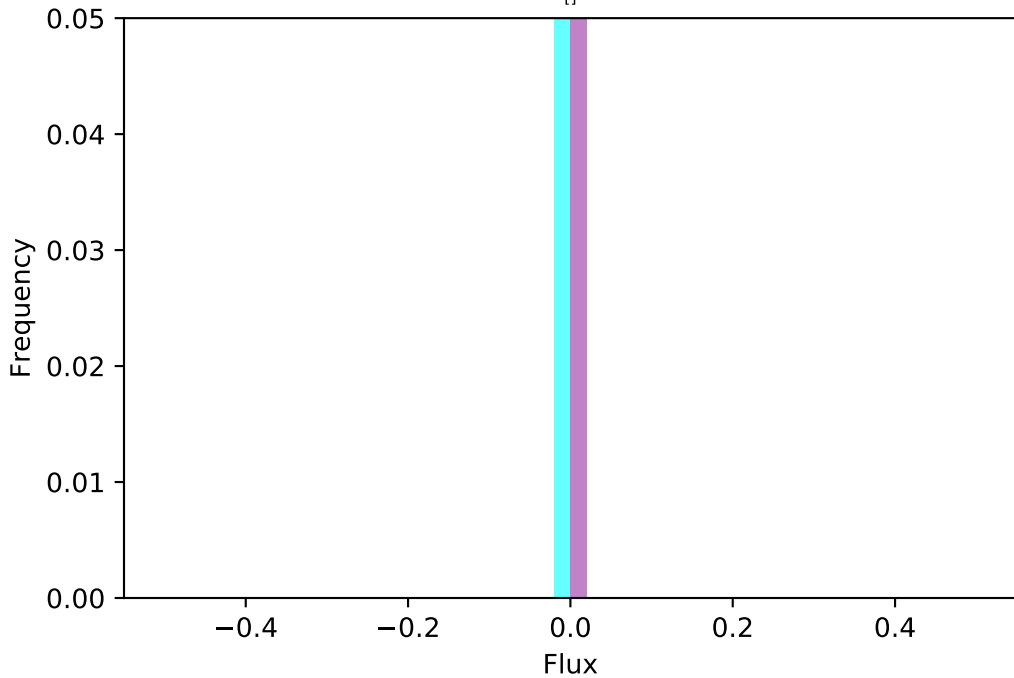
101 : GAP\_h + S7P\_h --> E4P\_h + F6P\_h  
[]



102 : E4P\_h + H2O\_h + PEP\_h --> DAHP\_h + Pi\_h  
[]

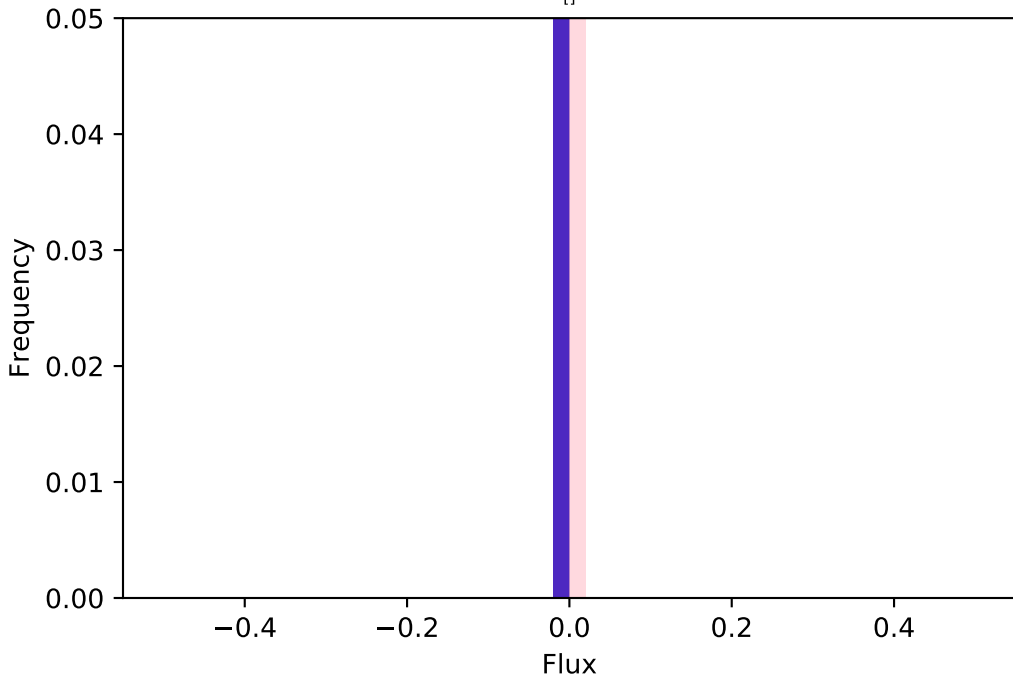


103 : DAHP\_h --> DHQ\_h + Pi\_h  
[]

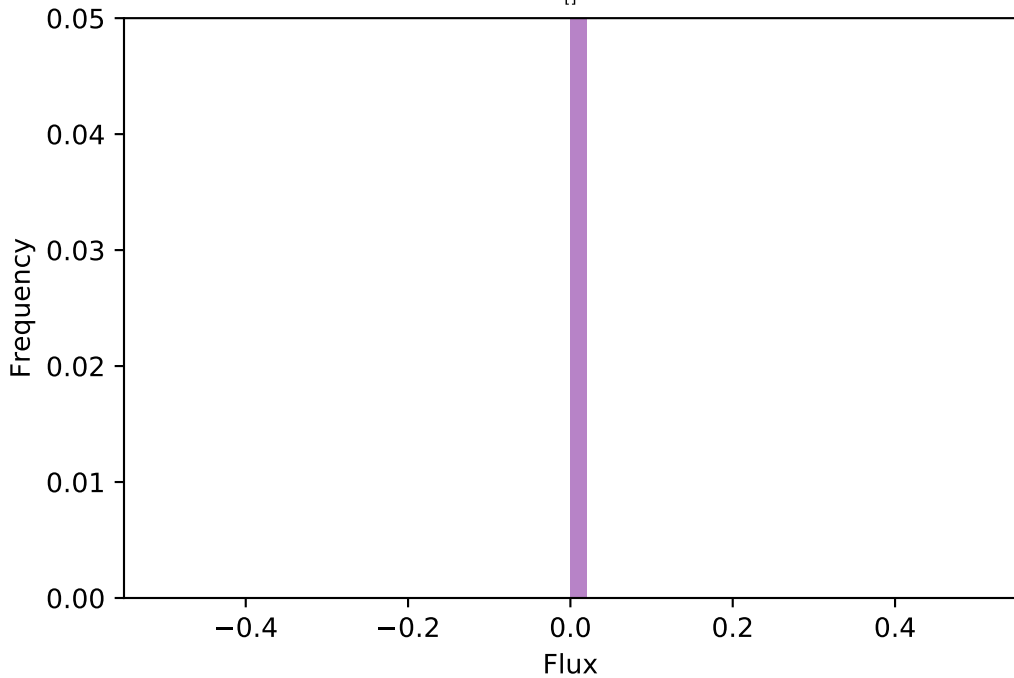




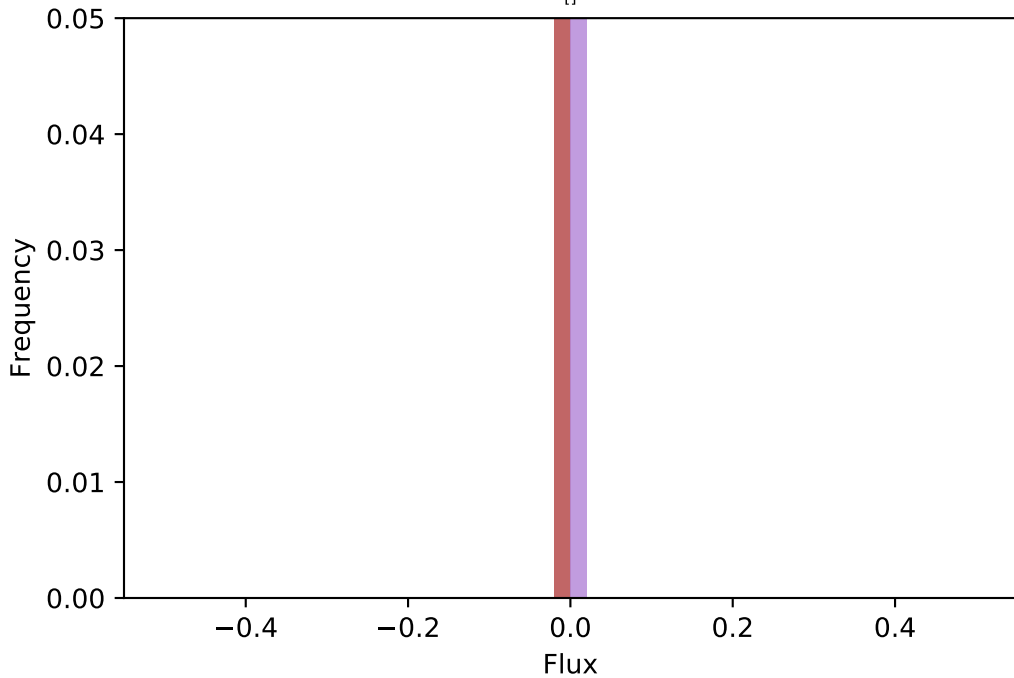
104 : DHQ\_h --> DHS\_h + H2O\_h  
[ ]



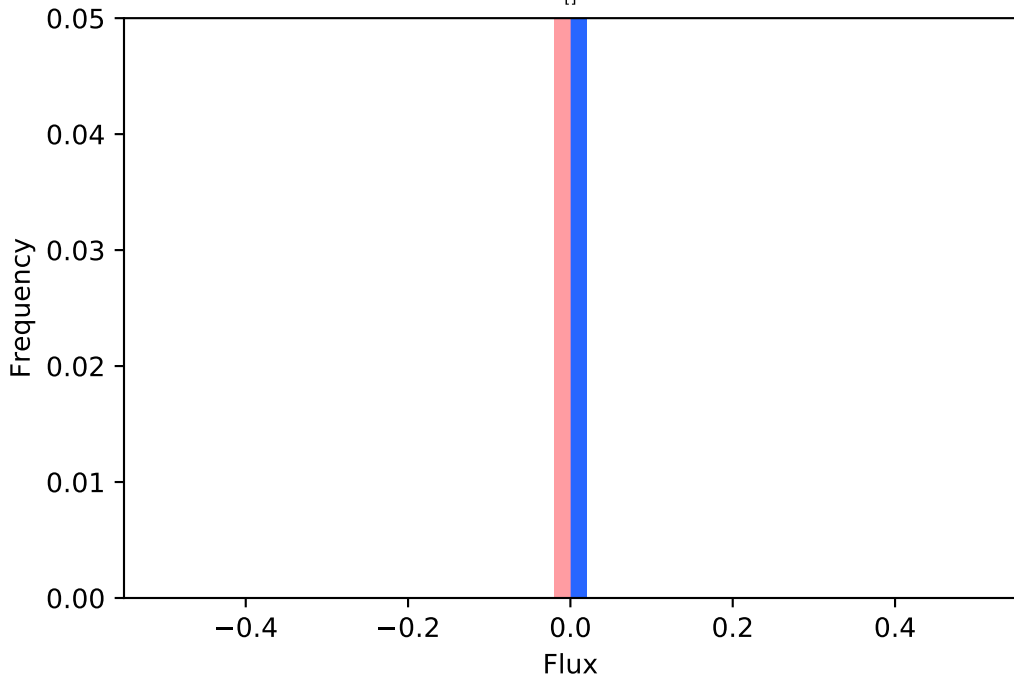
105 : DHS\_h + H\_h + NADPH\_h --> NADP\_h + SA\_h  
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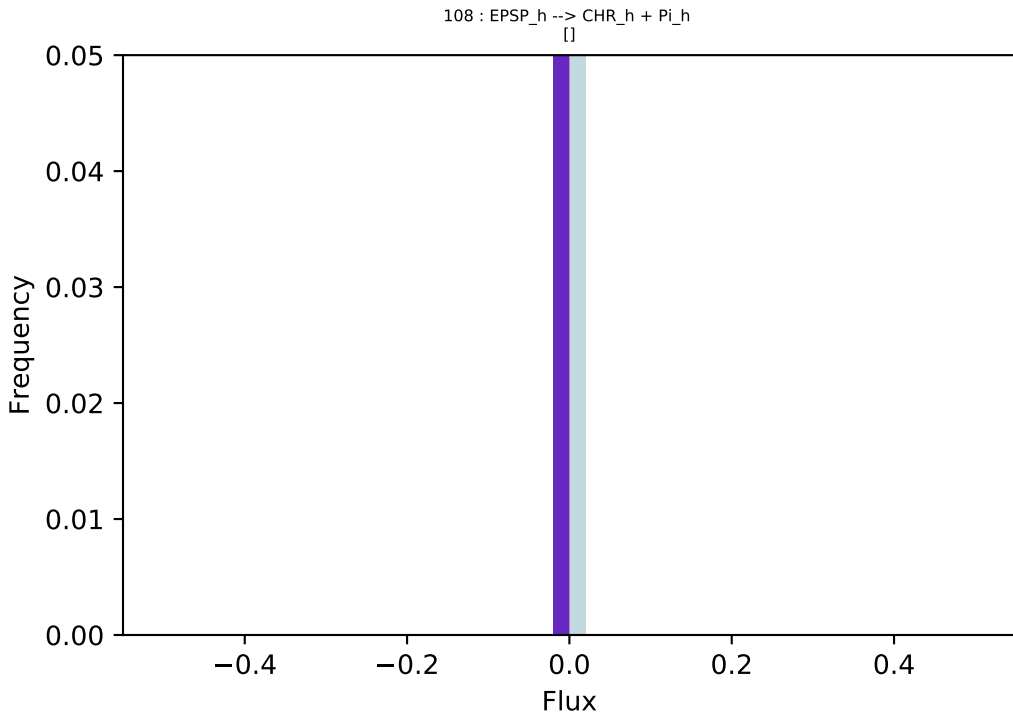


106 : ATP\_h + SA\_h --> ADP\_h + H\_h + S3P\_h  
[ ]

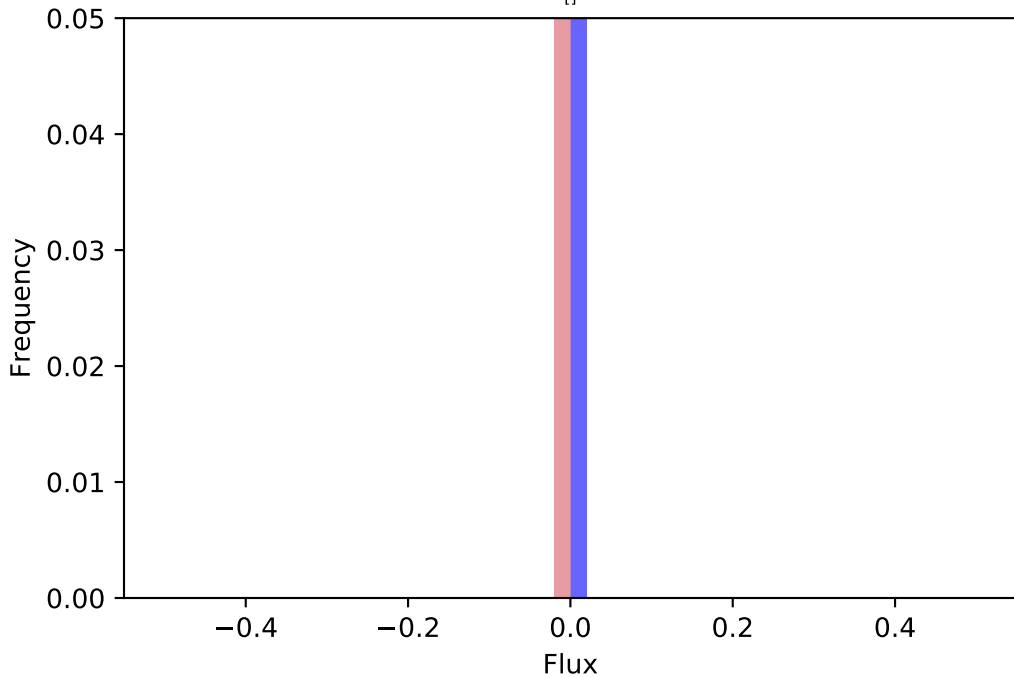


107 : PEP\_h + S3P\_h --> EPSP\_h + Pi\_h  
[ ]

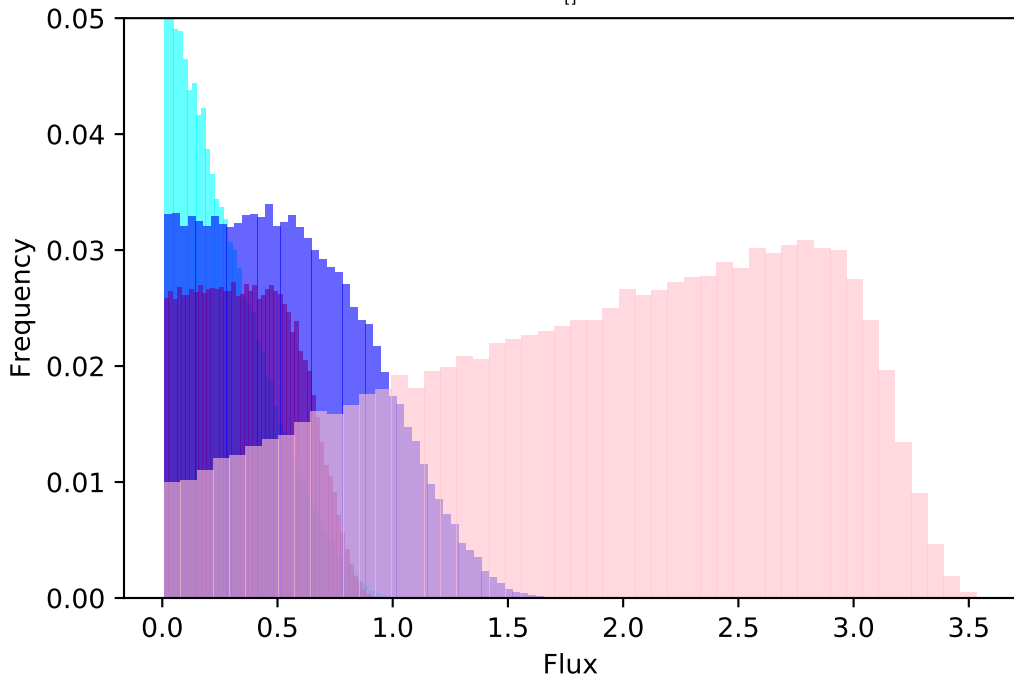


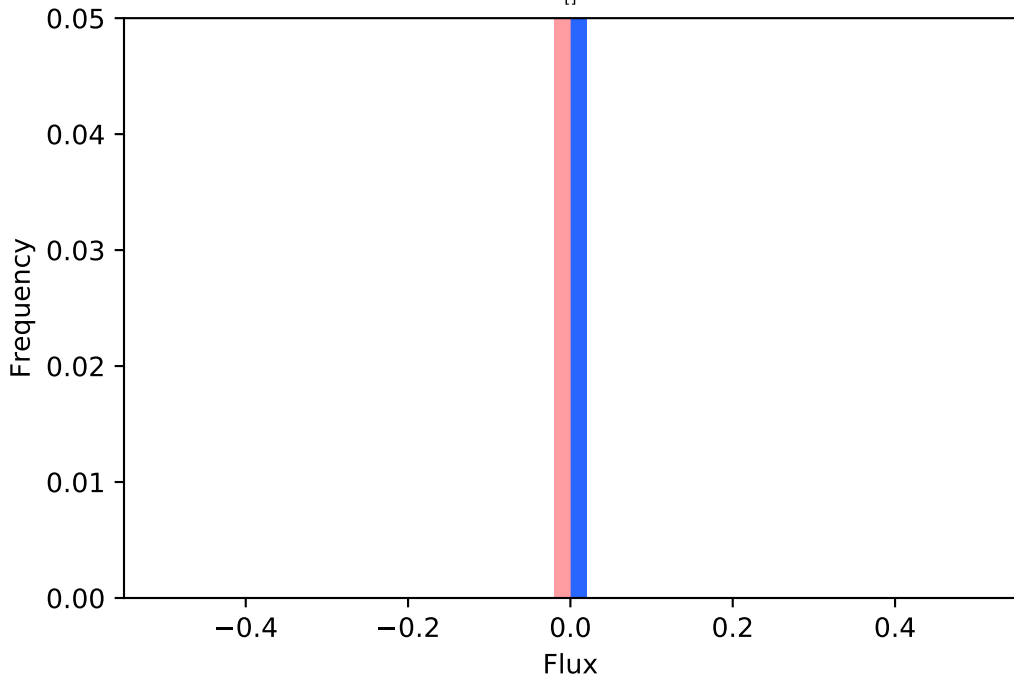
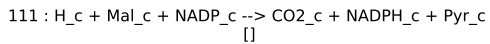


109 : ATP\_h + R5P\_h --> AMP\_h + H\_h + PRPP\_h  
[ ]



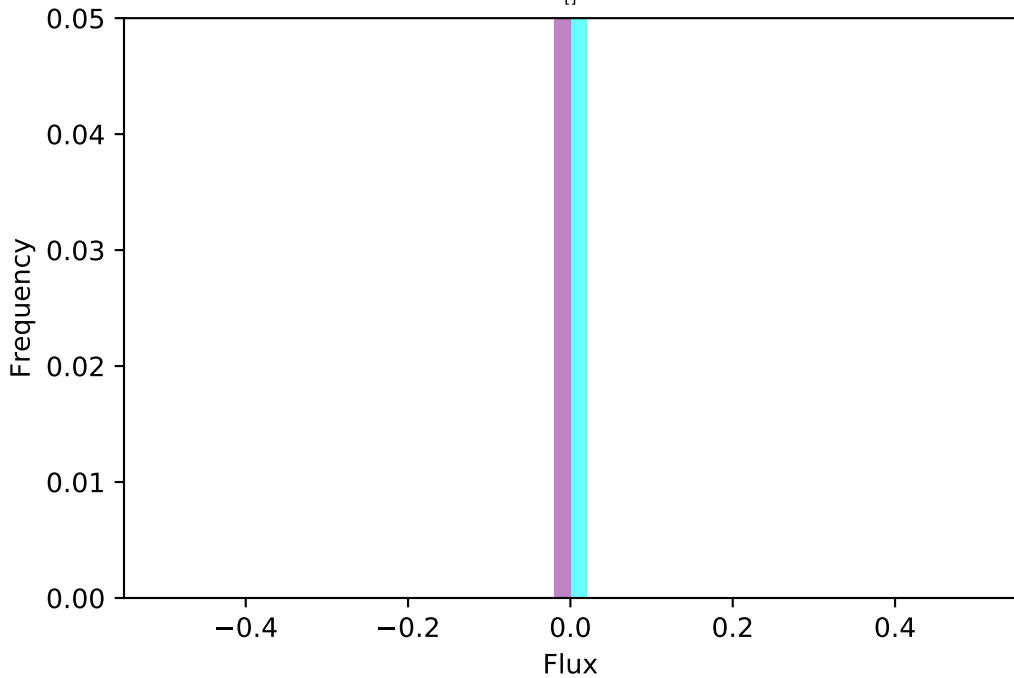
110 : ATP\_h + Pi\_h + Pyr\_h <=> AMP\_h + 2.0 H\_h + PEP\_h + PPi\_h  
[]



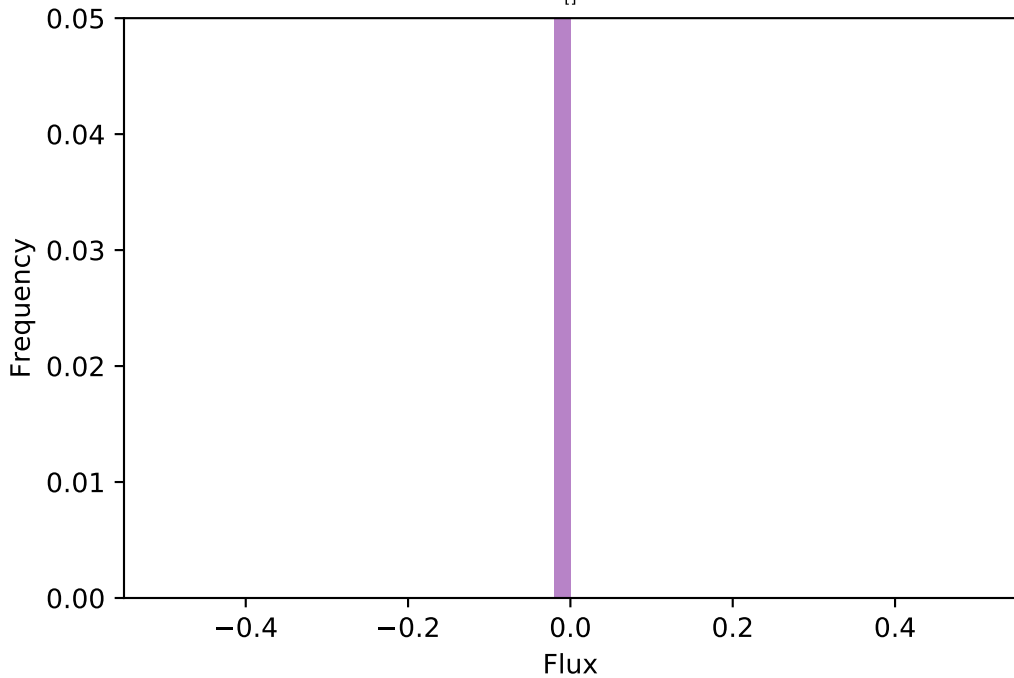


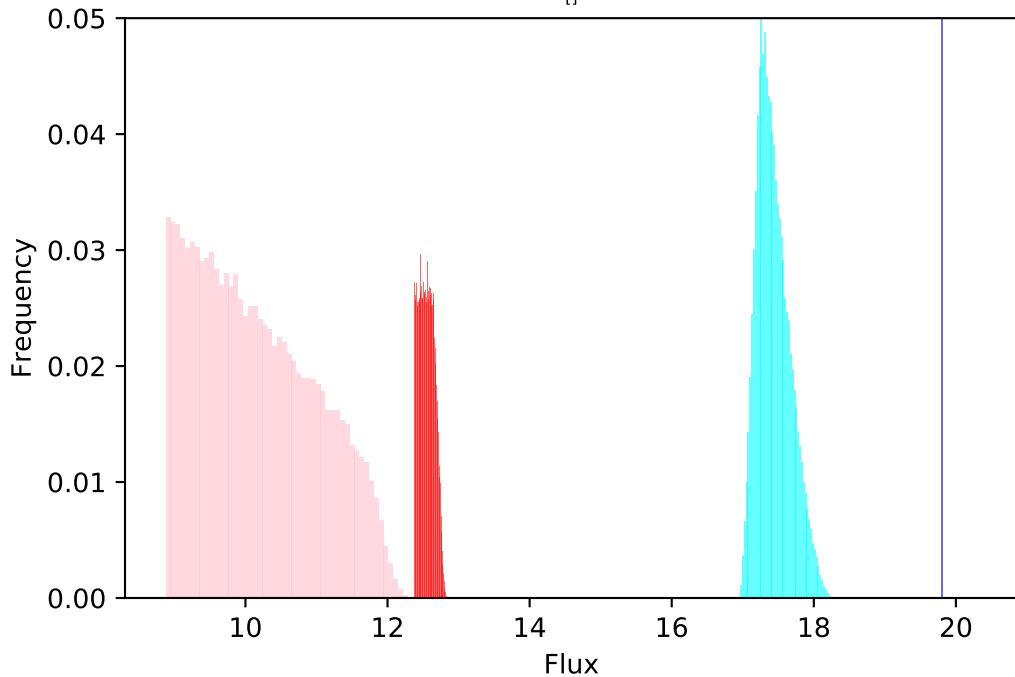
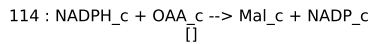


112 : Mal\_h + NADP\_h --> CO2\_h + NADPH\_h + Pyr\_h  
[ ]

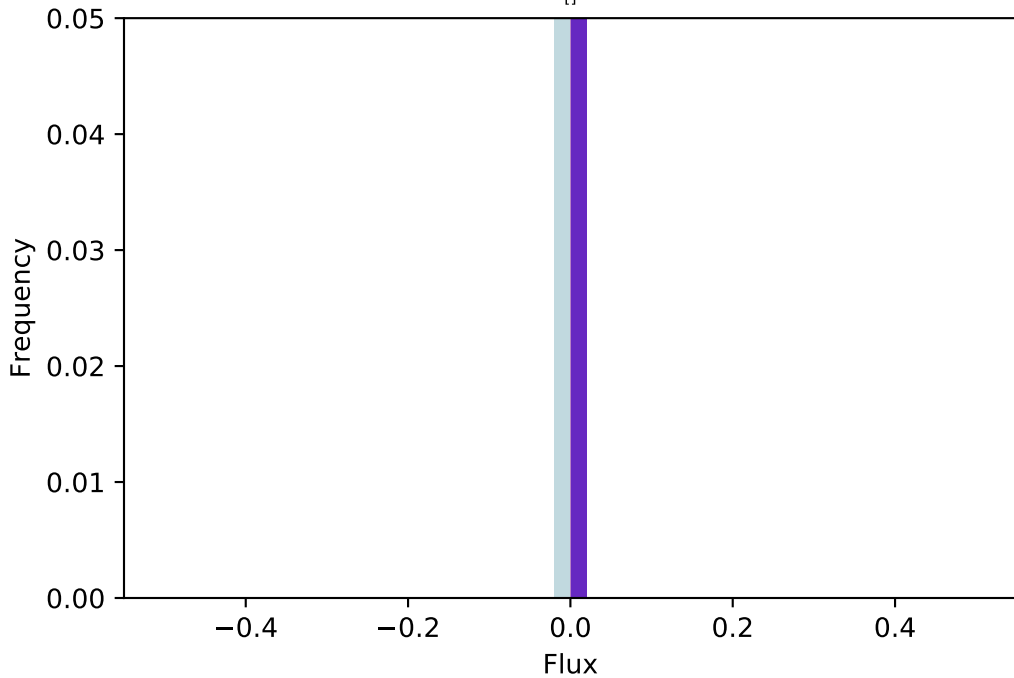


113 : Mal\_h + NAD\_h --> H\_h + NADH\_h + OAA\_h  
[ ]

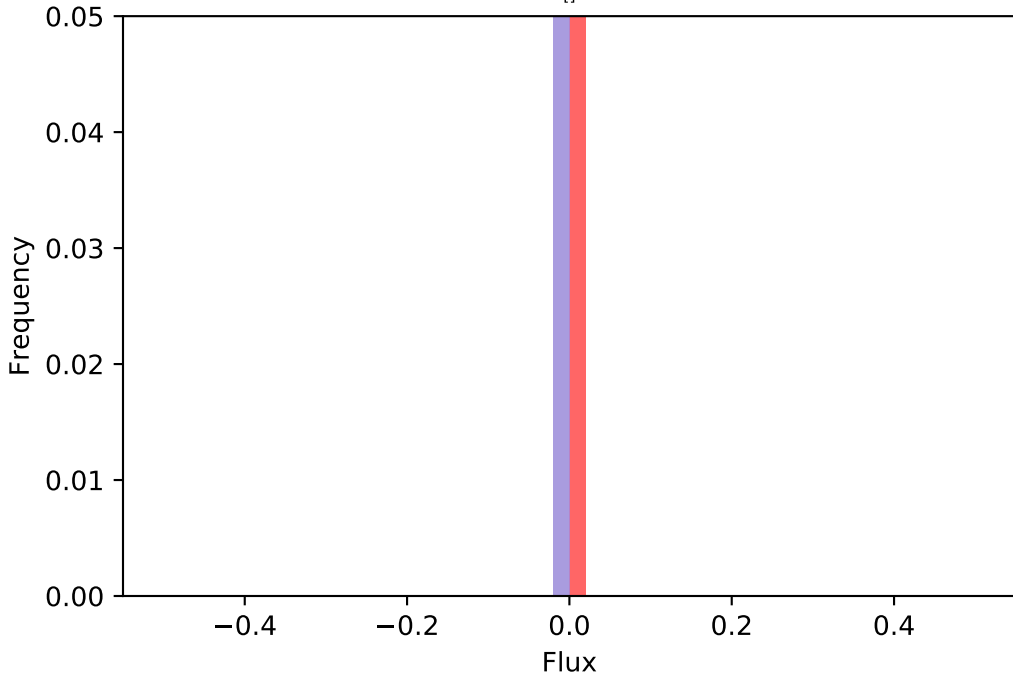




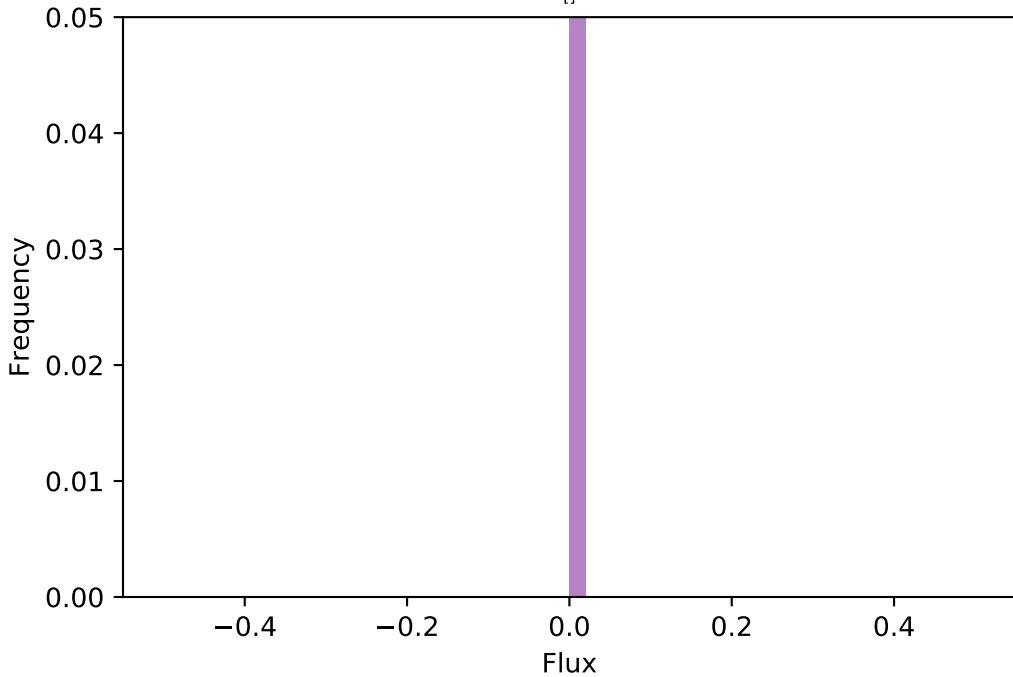
115 : H\_h + NADPH\_h + OAA\_h --> Mal\_h + NADP\_h  
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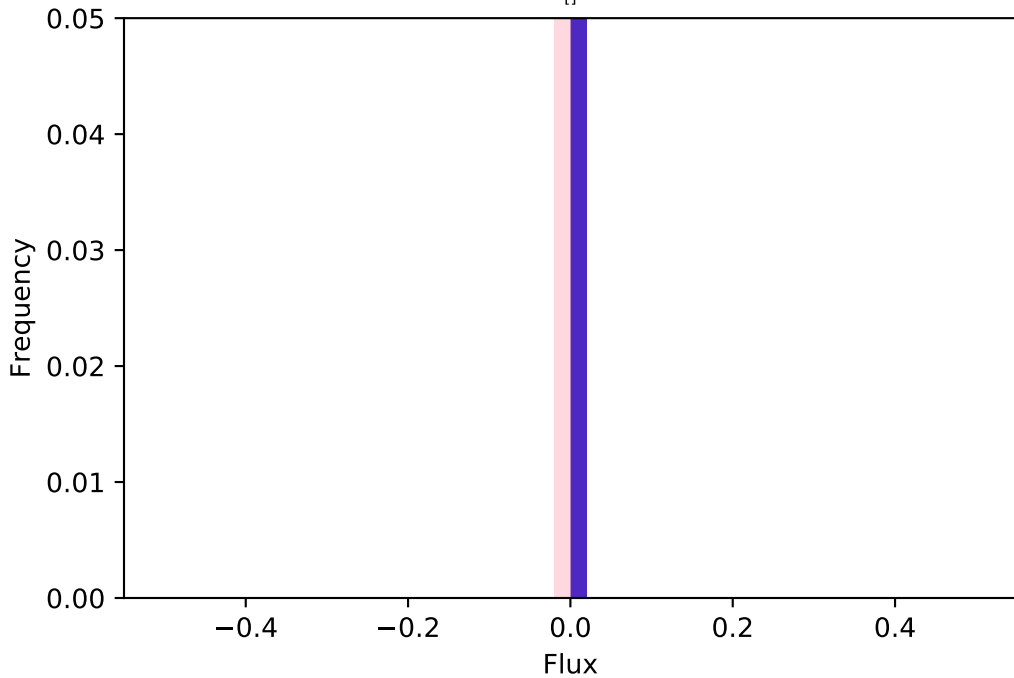
116 : H<sub>m</sub> + NADPH<sub>m</sub> + OAA<sub>m</sub> --> Mal<sub>m</sub> + NADP<sub>m</sub>  
[ ]



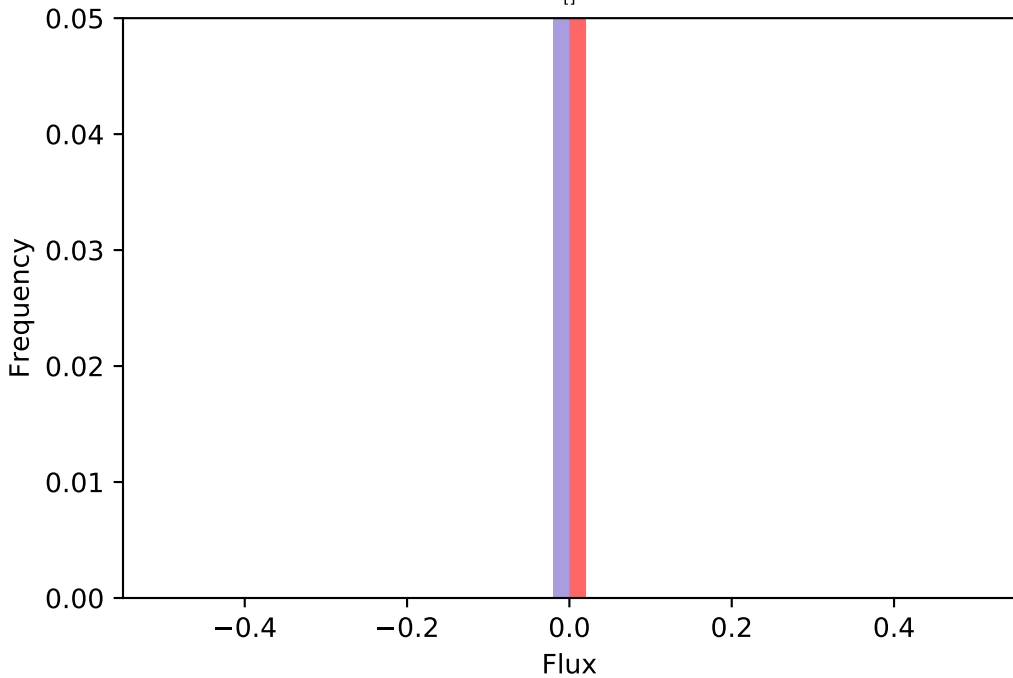
117 : A\_DASH\_CoA\_c + H2O\_c + OAA\_c --> Cit\_c + CoA\_c + H\_c  
[]



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

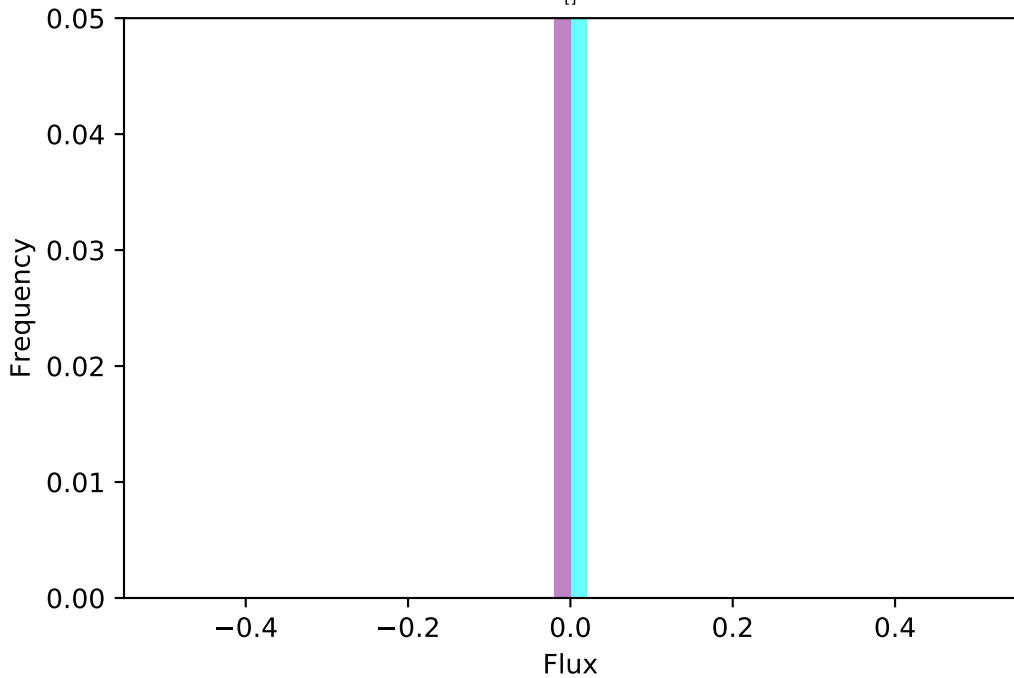


119 : Cit\_c --> H2O\_c + cACN\_c  
[ ]

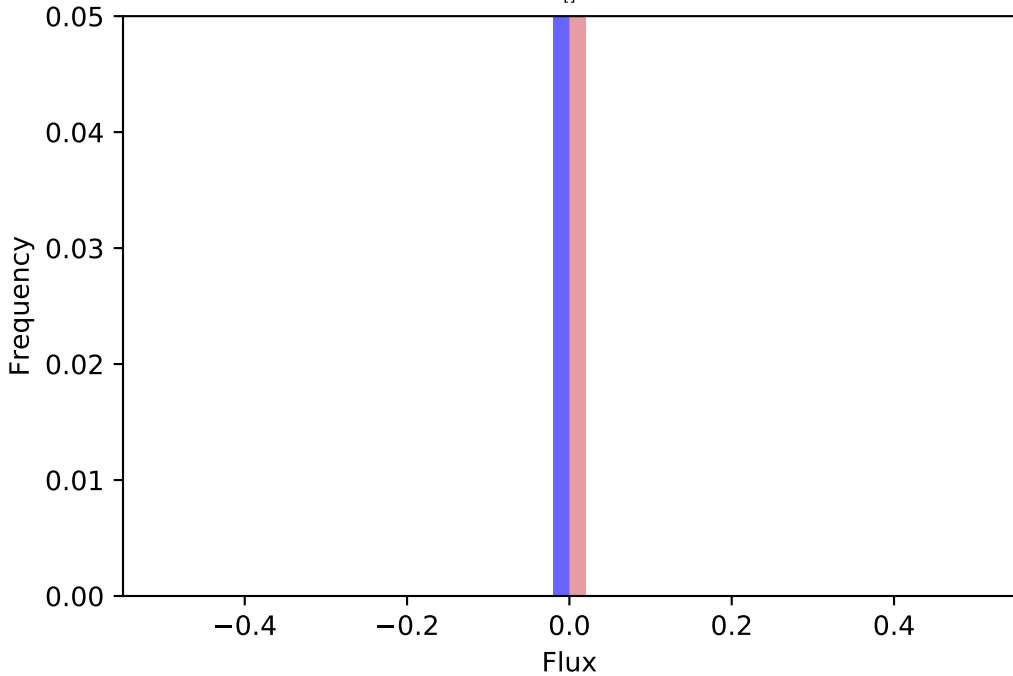




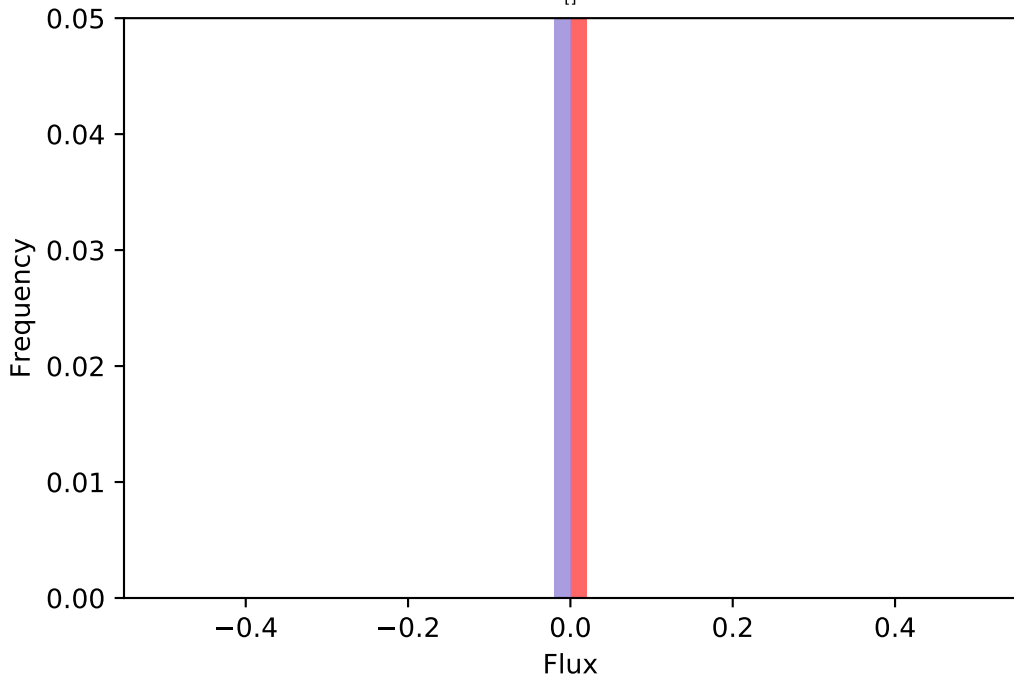
120 : Cit\_h --> H2O\_h + cACN\_h  
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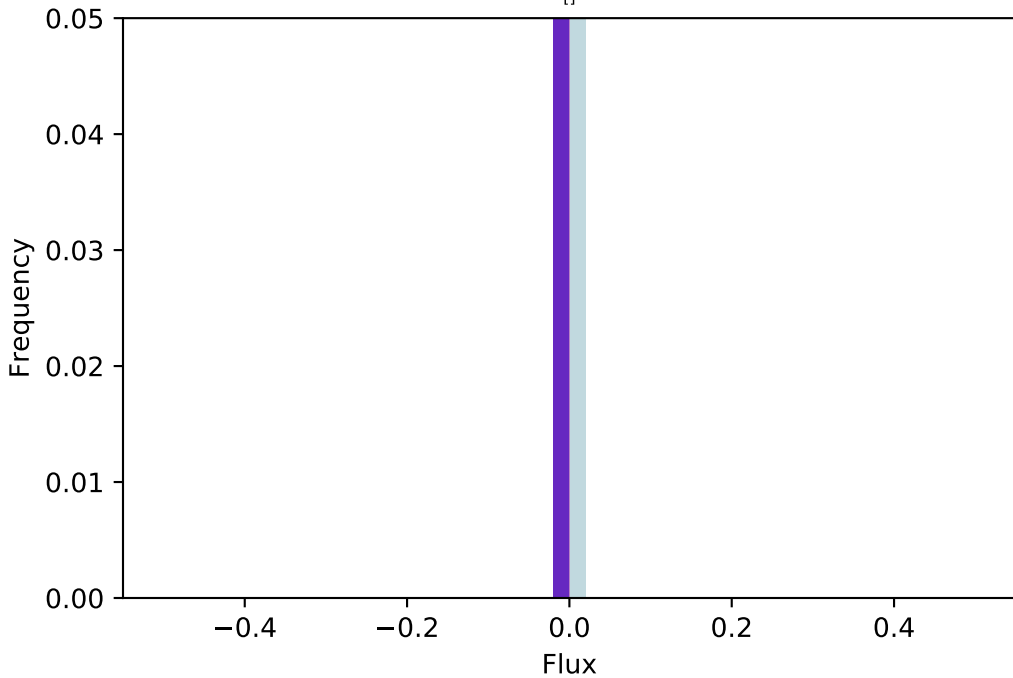
121 : H2O\_c + cACN\_c --> iCit\_c  
[]



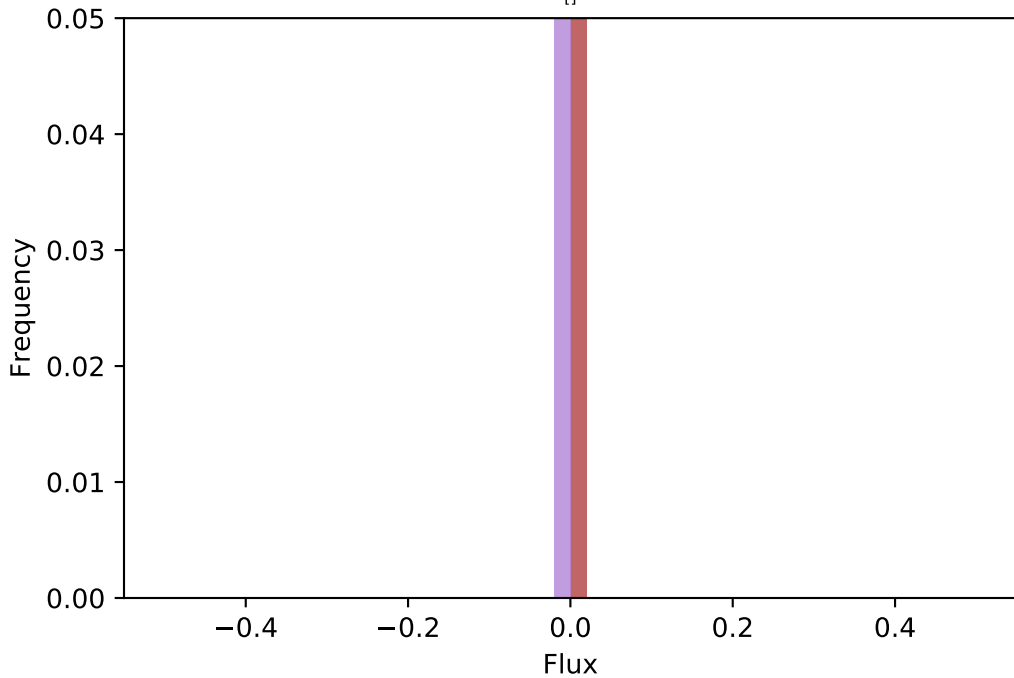
122 : H2O\_h + cACN\_h --> iCit\_h  
[]



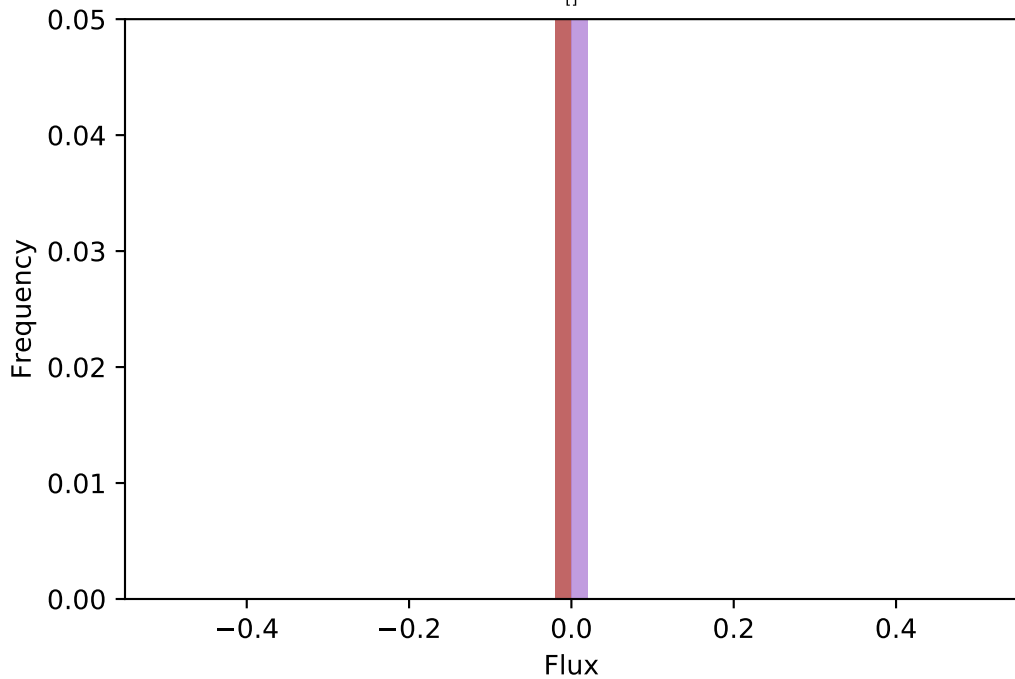
123 : H<sub>c</sub> + NAD<sub>c</sub> + iCit<sub>c</sub> --> CO2<sub>c</sub> + KG<sub>c</sub> + NADH<sub>c</sub>  
[]



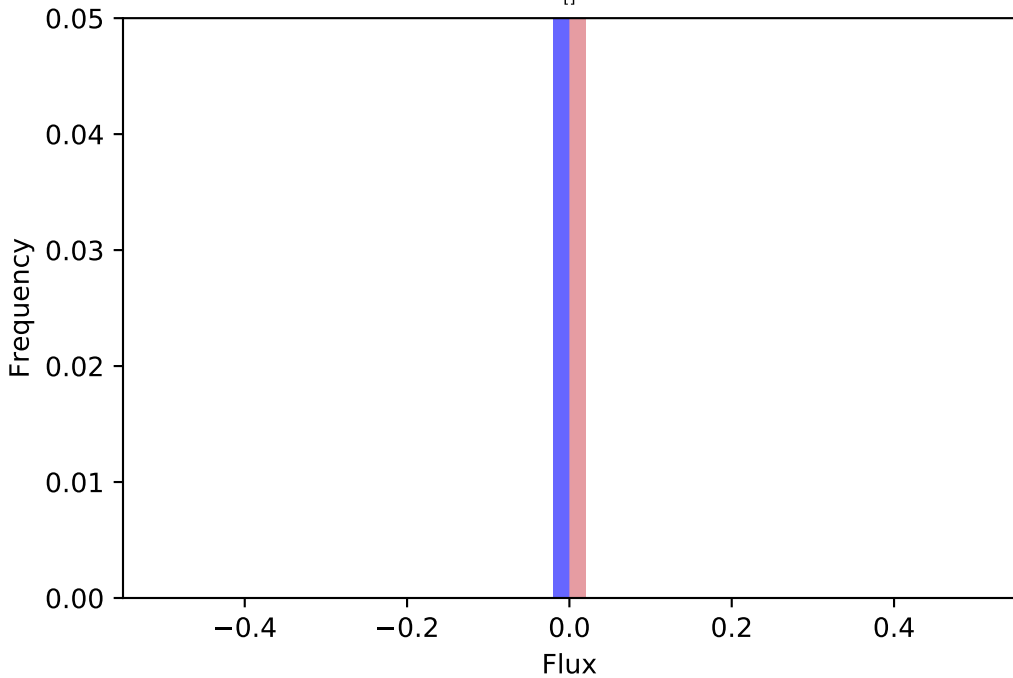
124 : H\_c + NADP\_c + iCit\_c --> CO2\_c + KG\_c + NADPH\_c  
[ ]



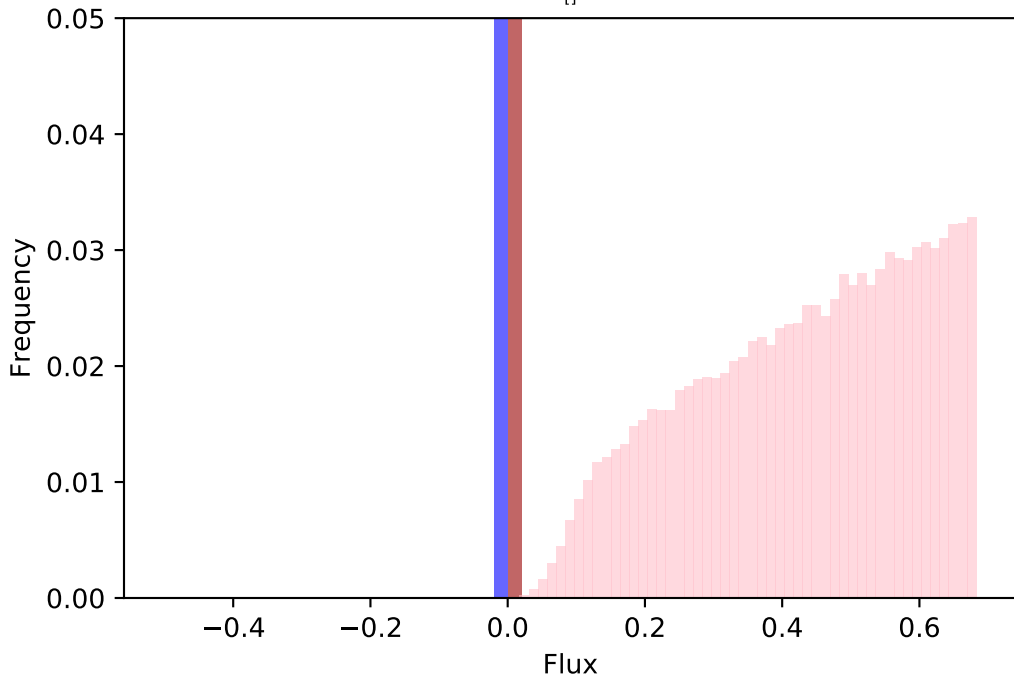
125 : NADP\_h + iCit\_h --> CO2\_h + KG\_h + NADPH\_h  
[]



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

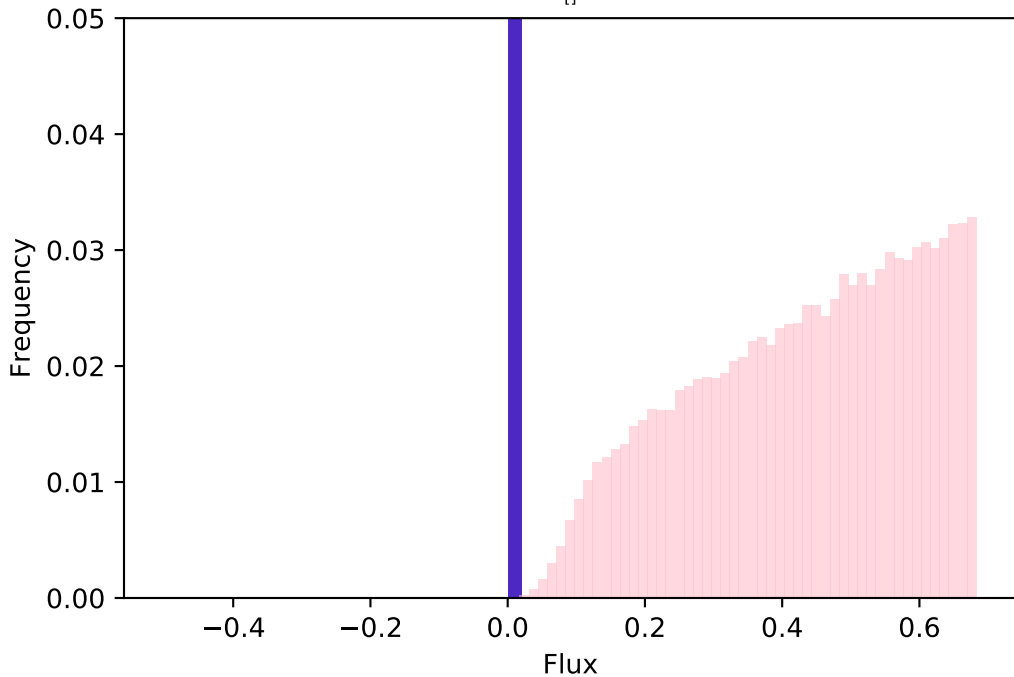


127 : iCit\_c --> GLX\_c + SCA\_c  
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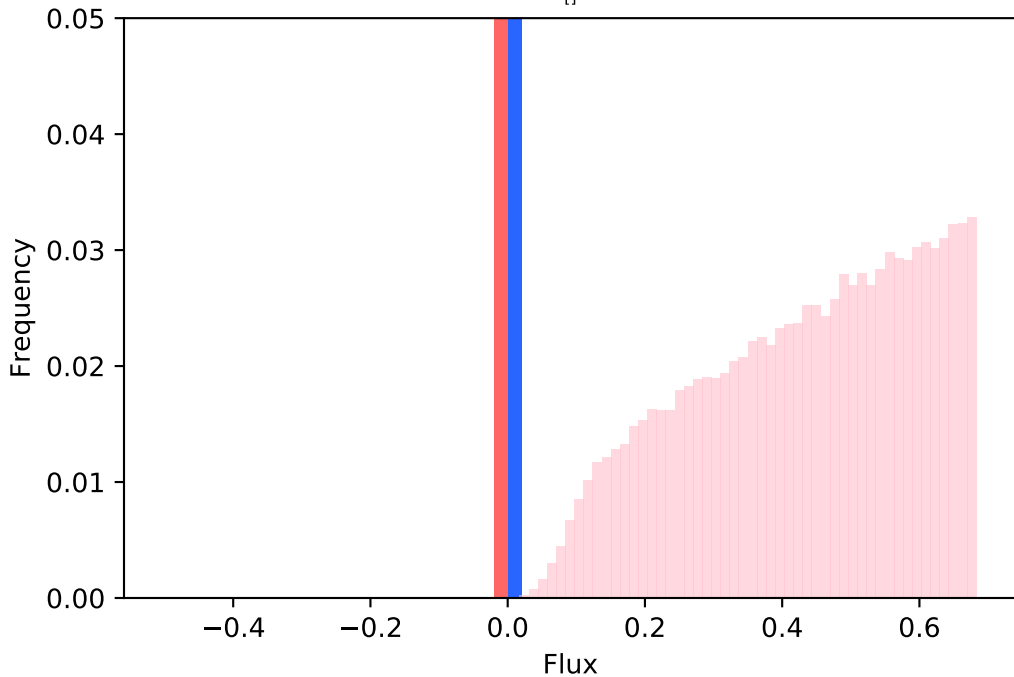




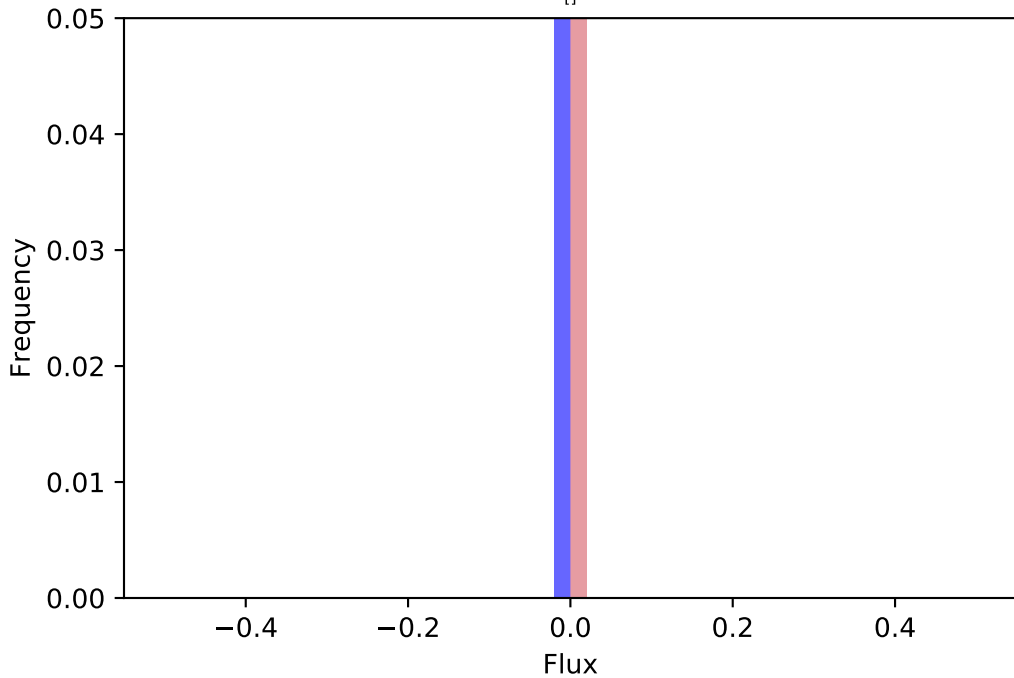
128 : A\_DASH\_CoA\_c + GLX\_c + H2O\_c --> CoA\_c + H\_c + Mal\_c  
[]



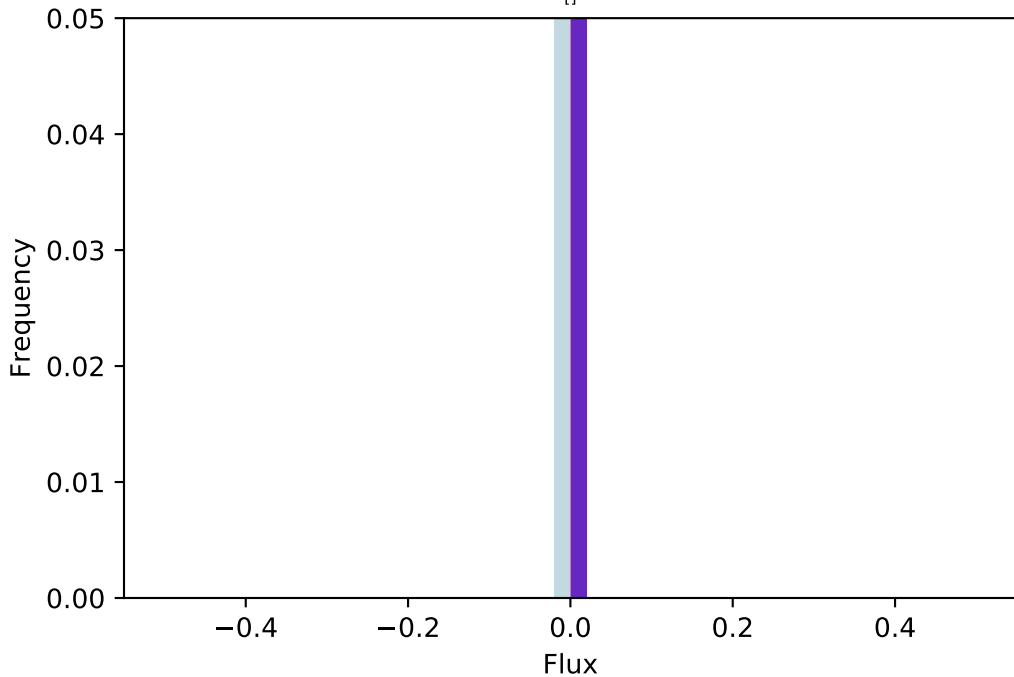
129 : ATP\_c + Cit\_c + CoA\_c --> ADP\_c + A\_DASH\_CoA\_c + OAA\_c + Pi\_c  
[ ]



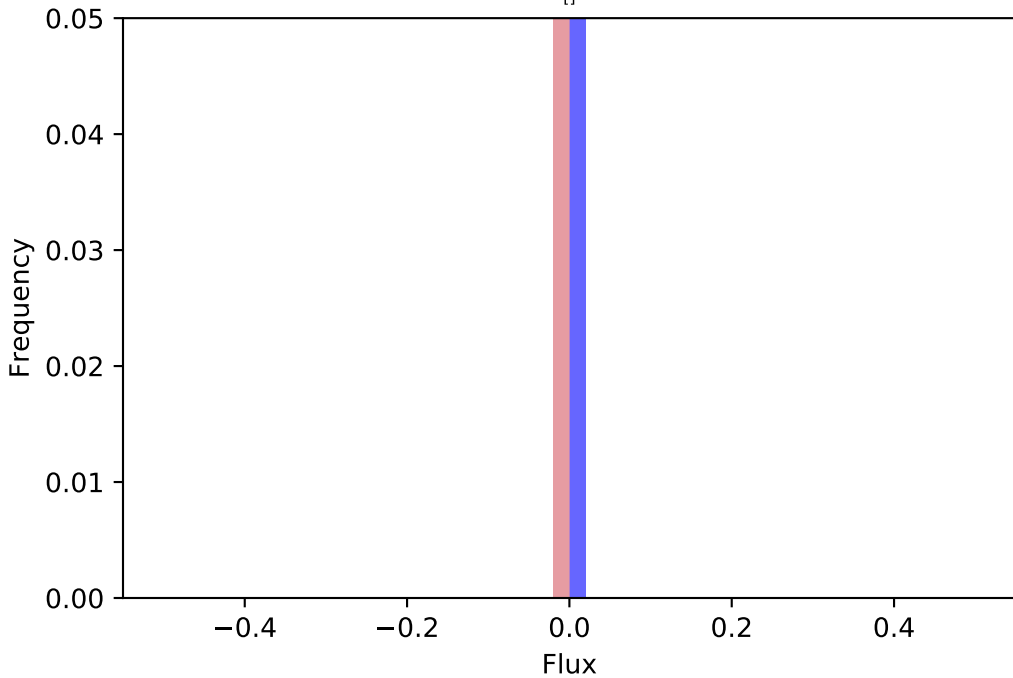
130 : AC\_h + ATP\_h + CoA\_h --> AMP\_h + A\_DASH\_CoA\_h + H\_h + PPi\_h  
[ ]



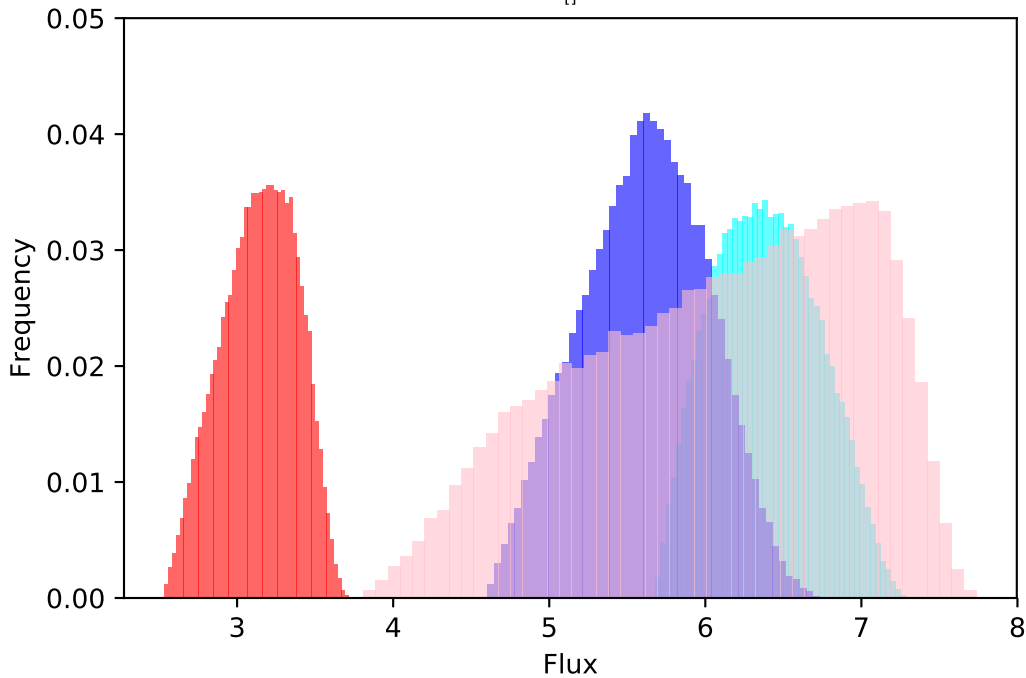
131 : ATP\_h + A\_DASH\_CoA\_h + HCO3\_h --> ADP\_h + H\_h + M\_DASH\_CoA\_h + Pi\_h  
[ ]



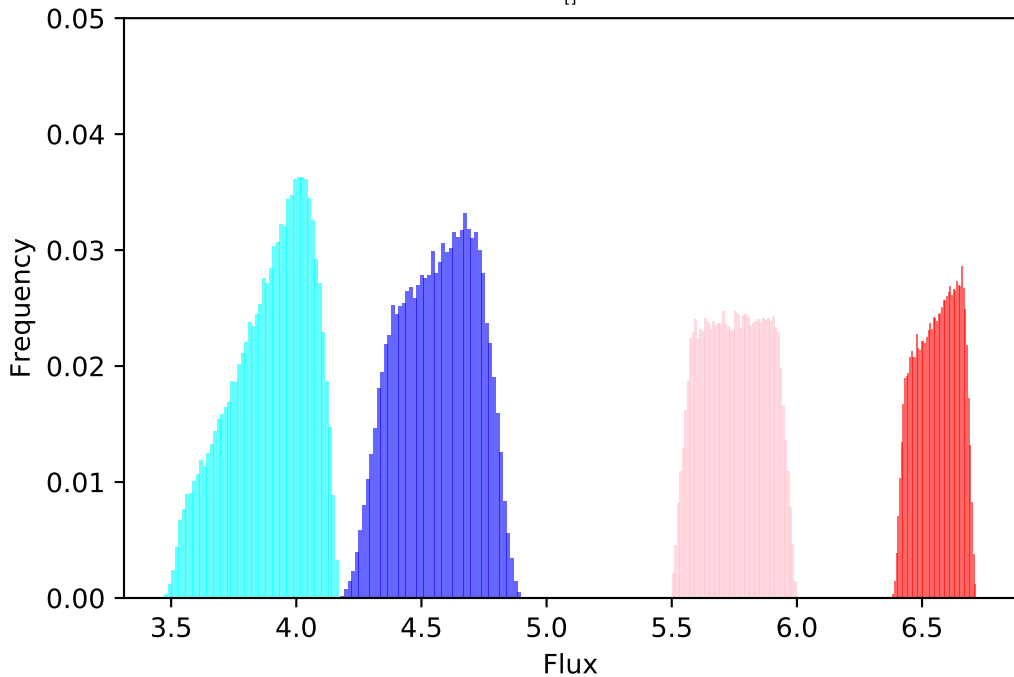
132 : ACP\_h + M\_DASH\_CoA\_h --> CoA\_h + M\_DASH\_ACP\_h  
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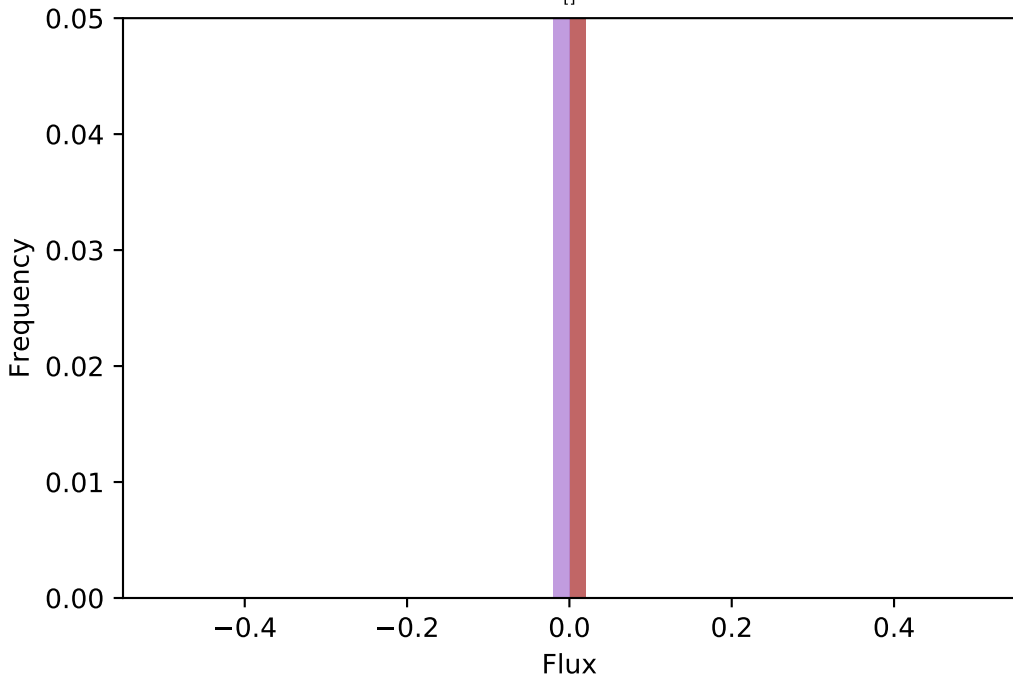
133 : H2O\_h + PPi\_h --> 2.0 Pi\_h  
[]



134 : H<sub>2</sub>O<sub>c</sub> + PPi<sub>c</sub> --> H<sub>c</sub> + 2.0 Pi<sub>c</sub>  
[ ]

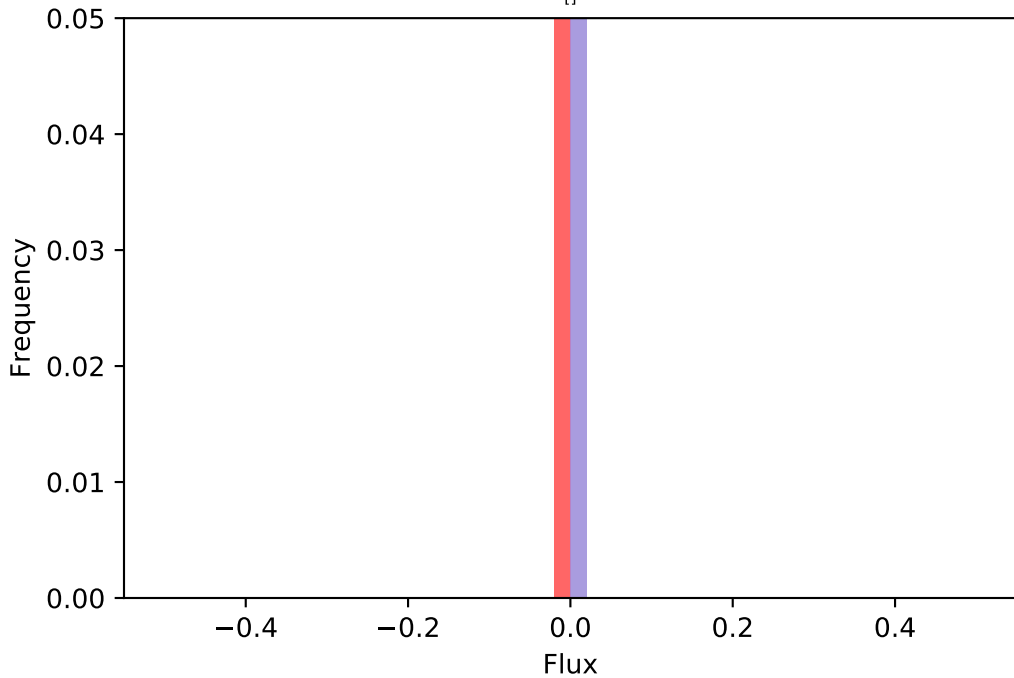


135 : F6P\_c + PPi\_c --> FBP\_c + H\_c + Pi\_c  
[ ]

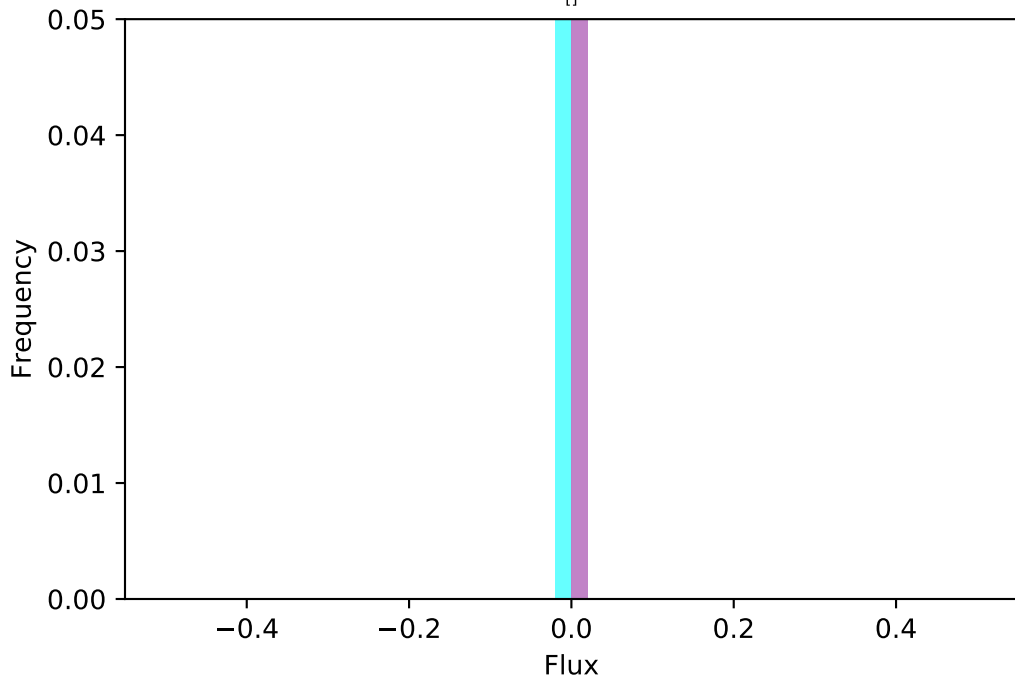




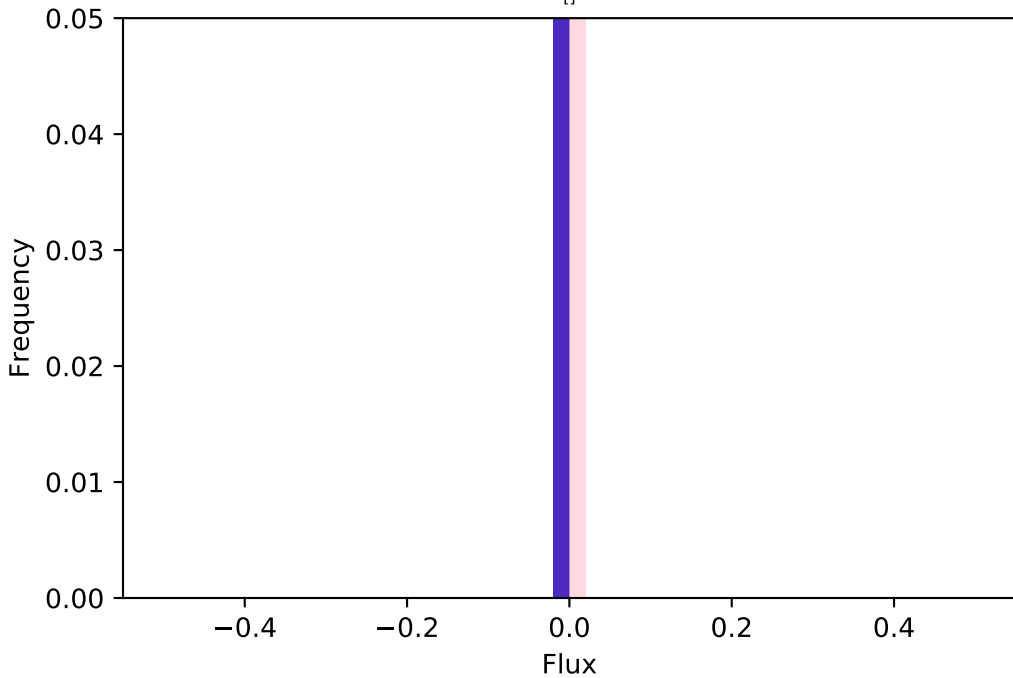
136 : CO2\_h + NADH\_h --> For\_h + NAD\_h  
[]



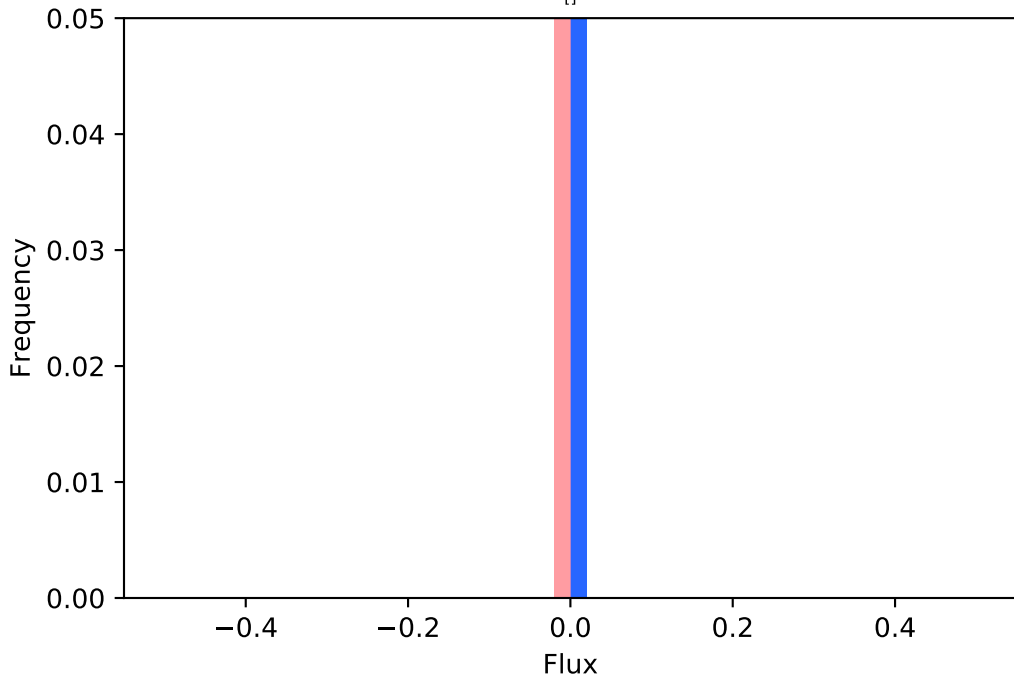
137 : ATP\_h + For\_h + H\_h + THF\_h --> ADP\_h + F\_DASH\_THF\_h + Pi\_h  
[ ]



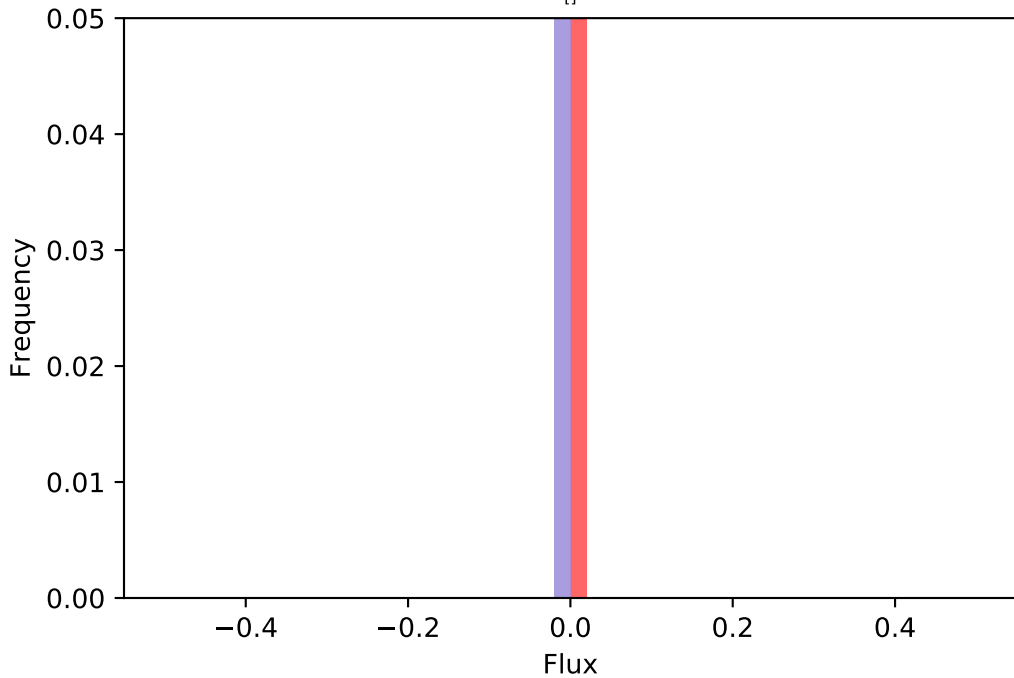
138 : DHF\_c + NADPH\_c --> NADP\_c + THF\_c  
[ ]



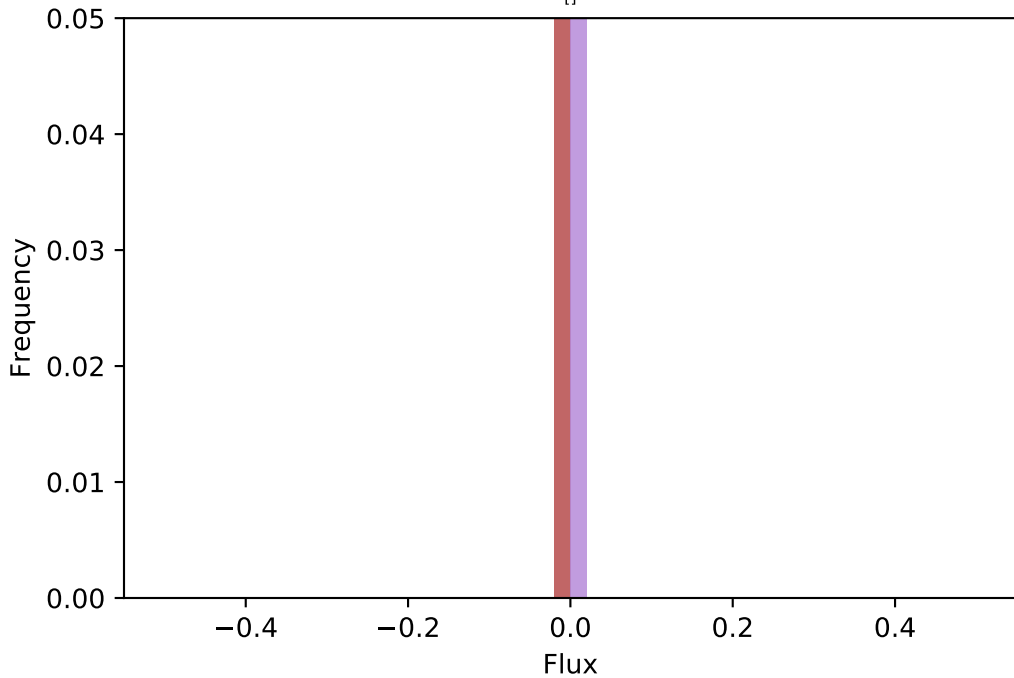
139 : NADPH\_c + TRXox\_c --> NADP\_c + TRXrd\_c  
[]



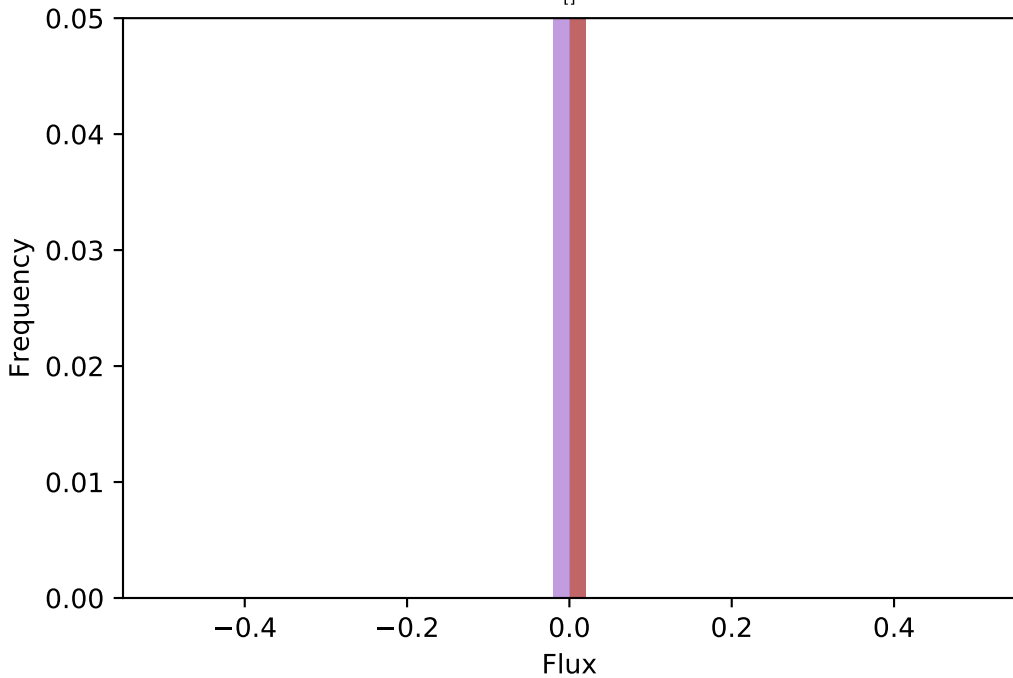
140 : ADN\_c + ATP\_c --> ADP\_c + AMP\_c + H\_c  
[ ]



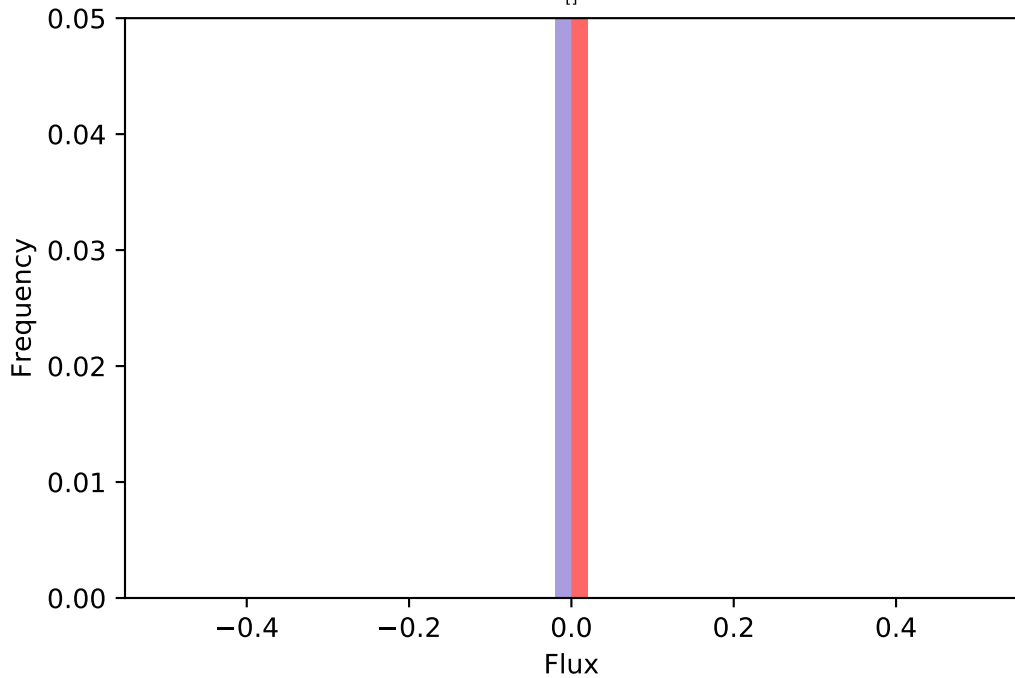
141 : ADN\_c + H2O\_c --> AD\_c + H\_c + Rib\_c  
[ ]



142 : AD\_c + PRPP\_c --> AMP\_c + PPi\_c  
[]

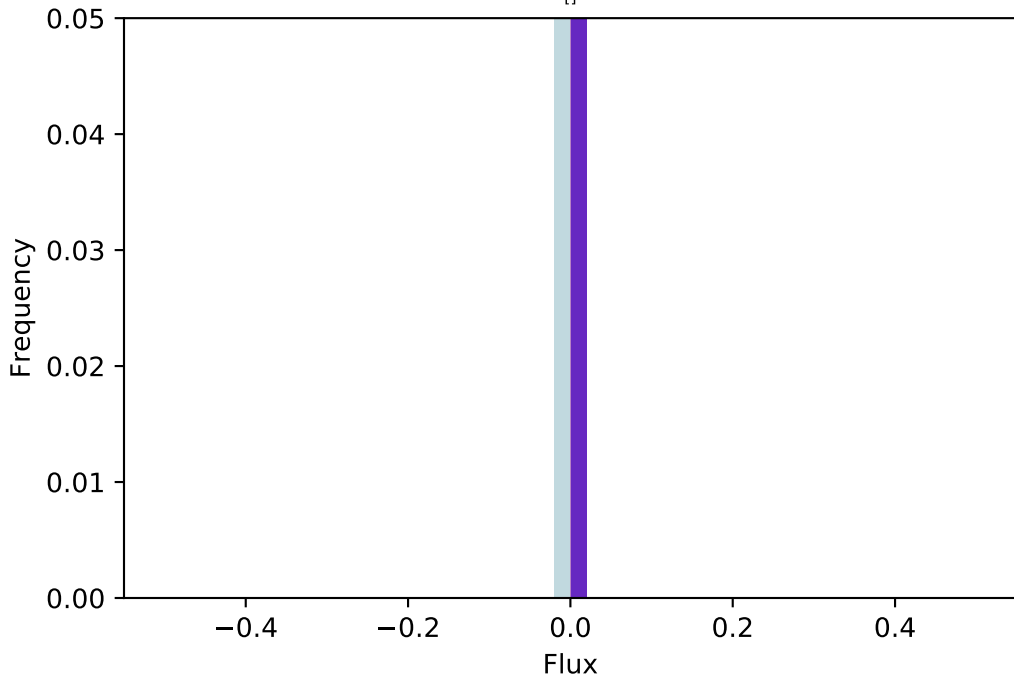


143 : ATP\_h + Rib\_h --> ADP\_h + H\_h + R5P\_h  
[ ]

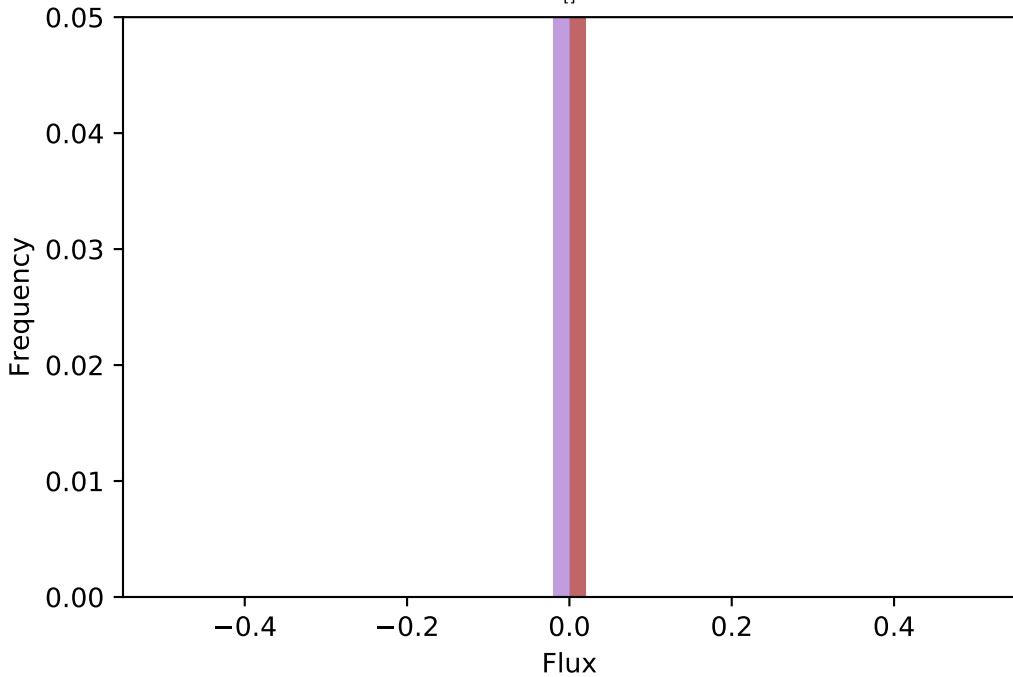




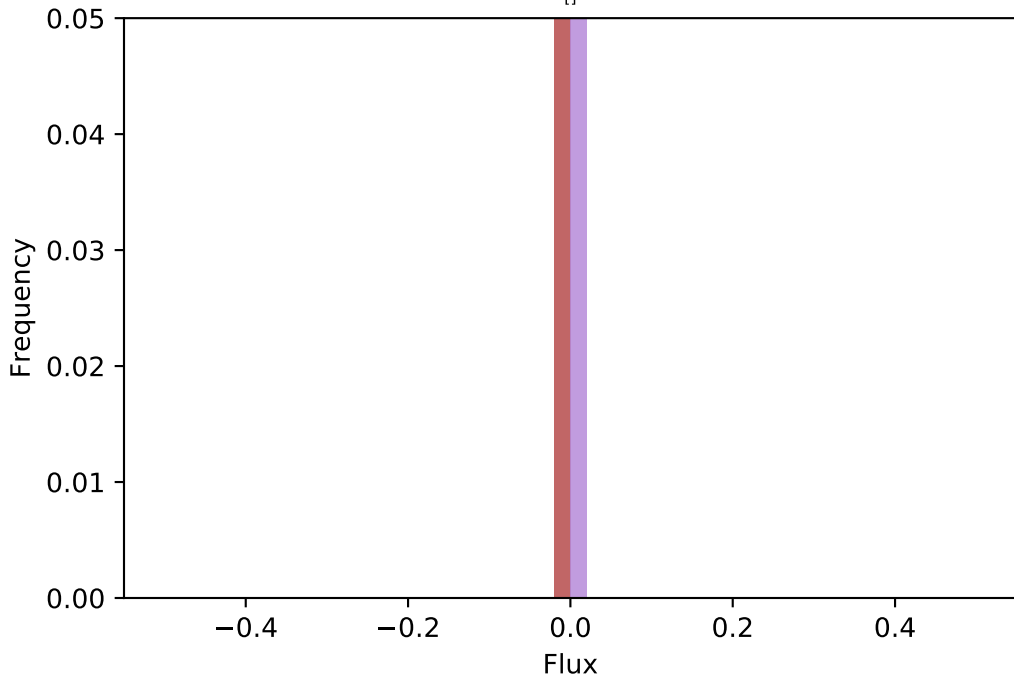
144 : NADH\_c + NO3\_c --> H2O\_c + NAD\_c + NO2\_c  
[]



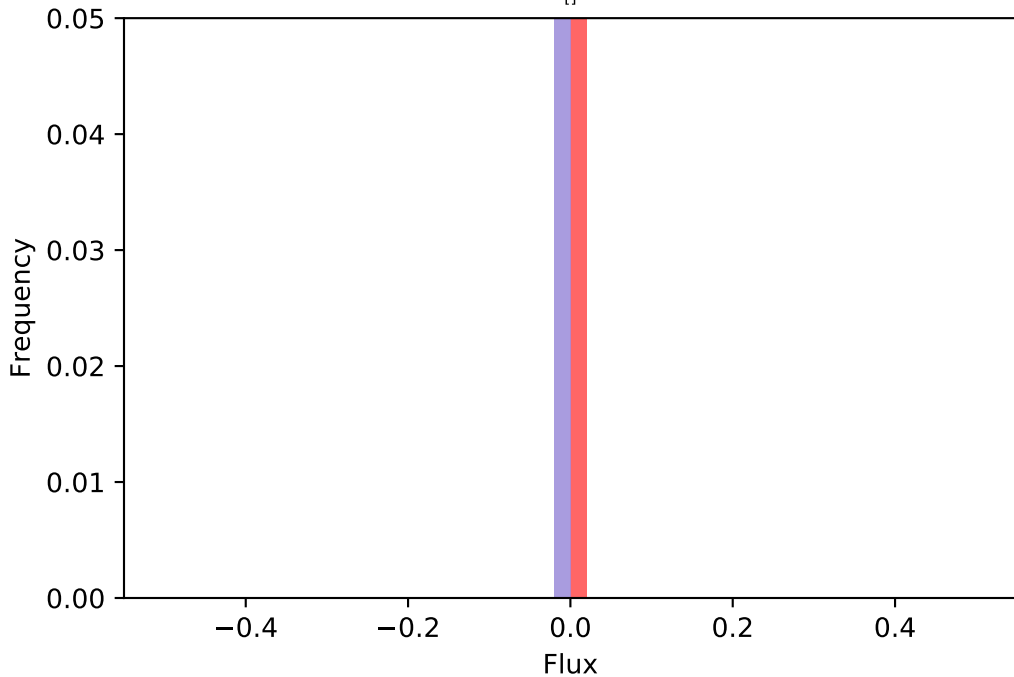
145 :  $\text{NADPH}_c + \text{NO3}_c \rightleftharpoons \text{H2O}_c + \text{NADP}_c + \text{NO2}_c$   
[ ]



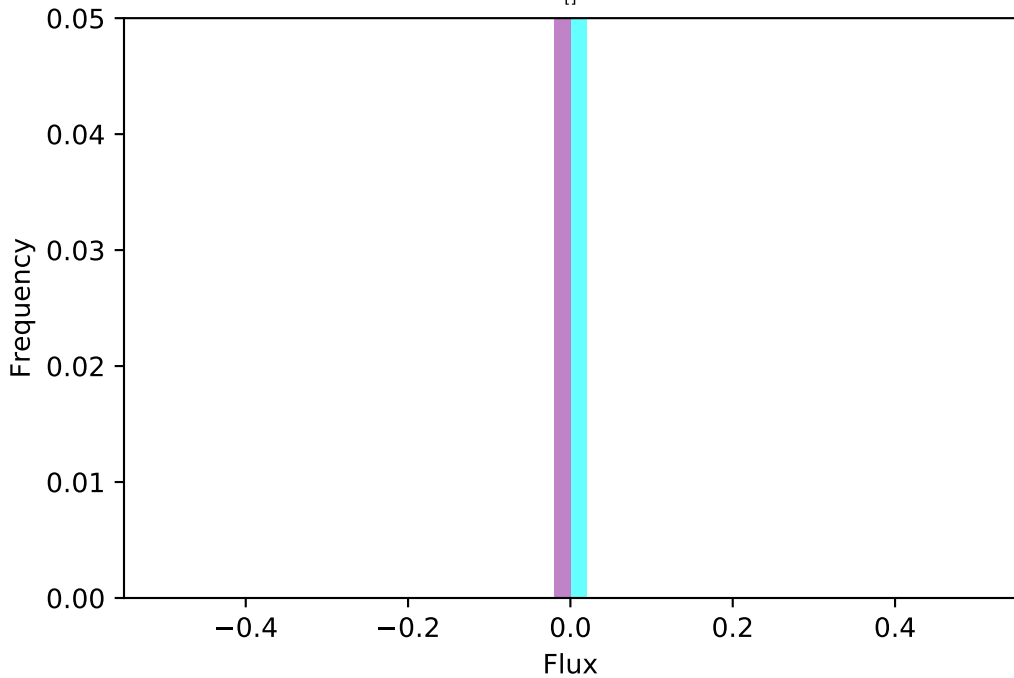
146 : 6.0 Fdrd\_h + 8.0 H\_h + NO2\_h --> 6.0 Fdox\_h + 2.0 H2O\_h + NH4\_h  
[ ]



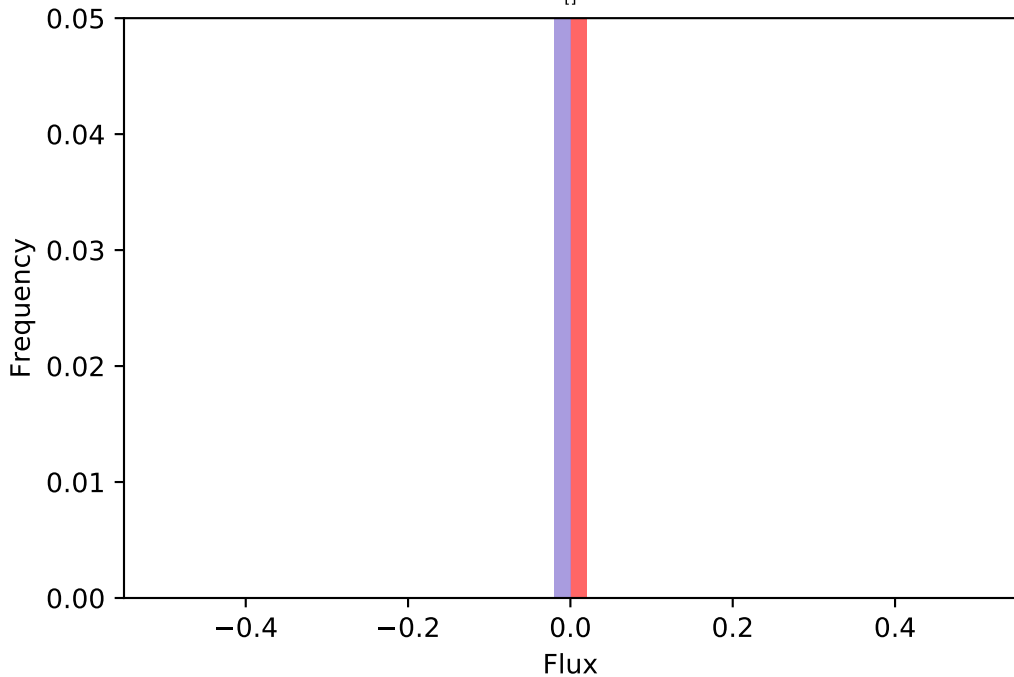
147 : ATP\_h + SO4\_h --> APS\_h + PPi\_h  
[ ]



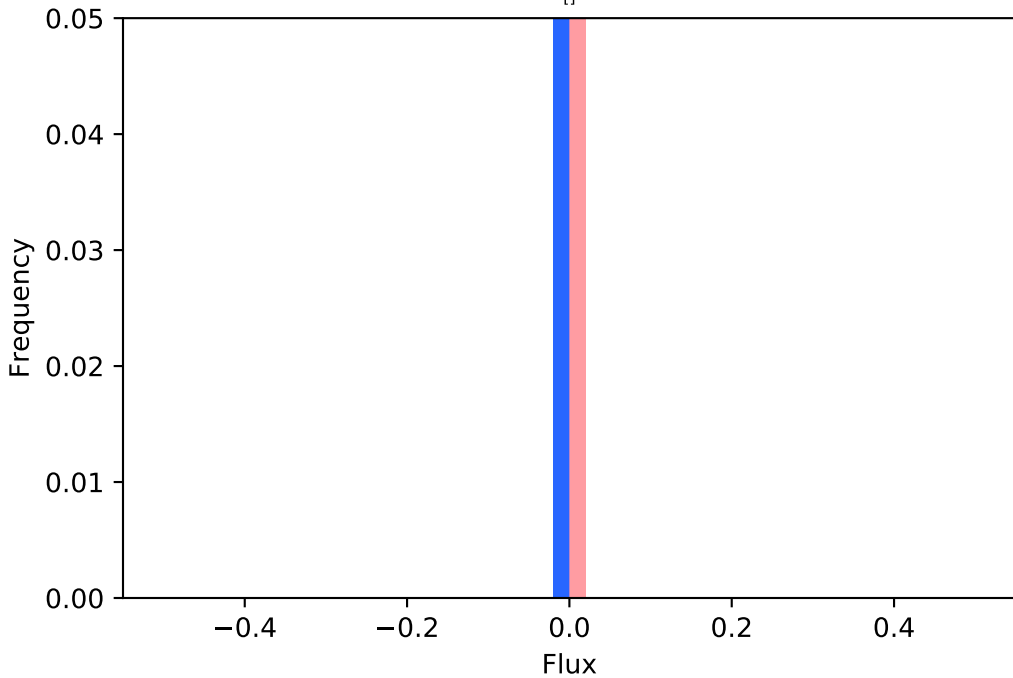
148 : APS\_h + 2.0 GSH\_h --> AMP\_h + GSSG\_h + H\_h + SO3\_h  
[ ]

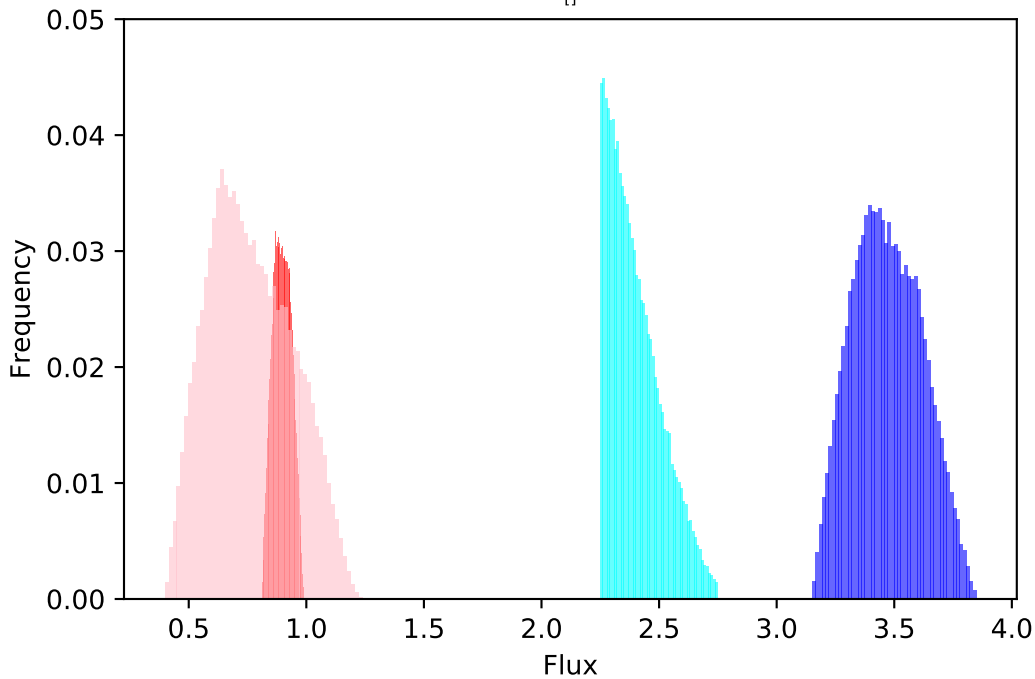
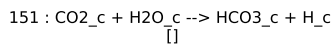


149 : GSSG\_h + H\_h + NADPH\_h --> 2.0 GSH\_h + NADP\_h  
[ ]



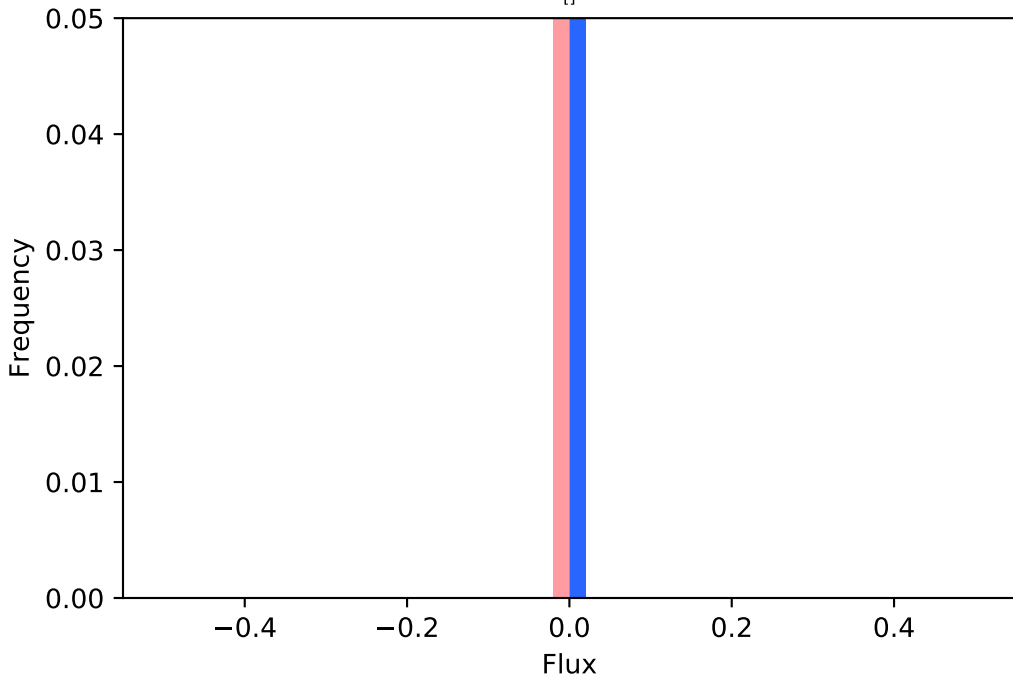
150 : 3.0 Fdrd\_h + 7.0 H\_h + SO3\_h --> 3.0 Fdox\_h + 3.0 H2O\_h + H2S\_h  
[ ]



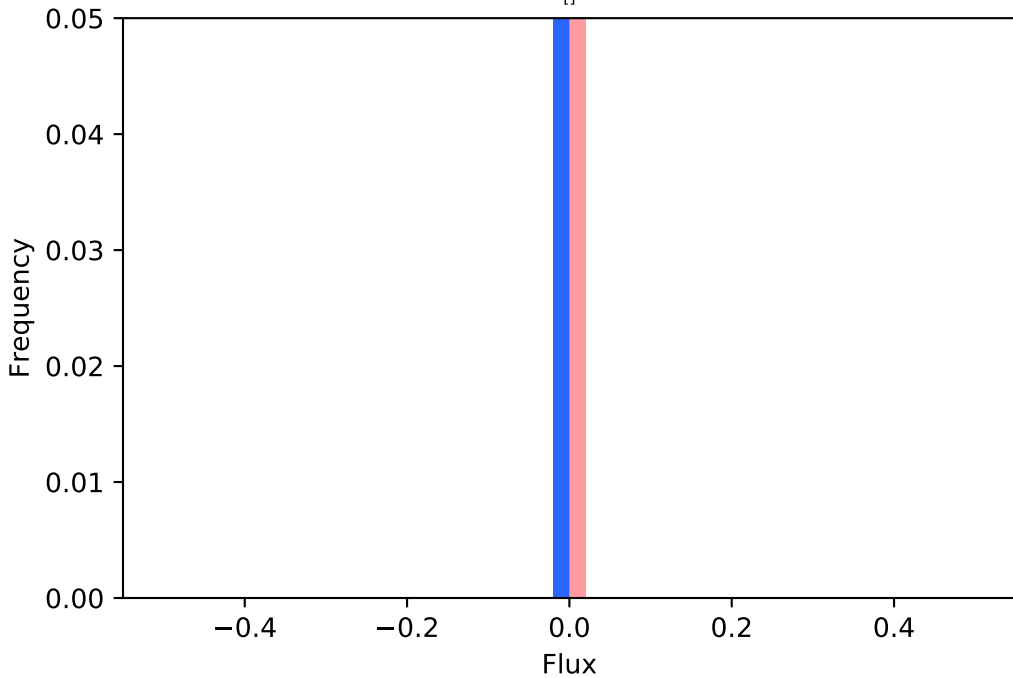




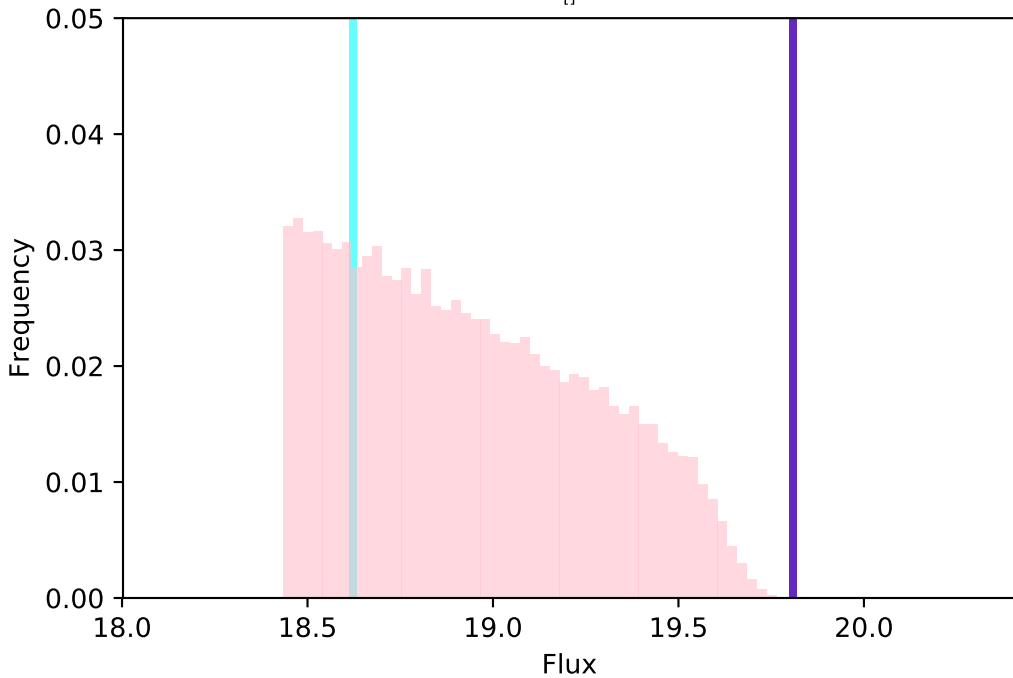
152 : CO2\_h + H2O\_h --> HCO3\_h + H\_h  
[ ]



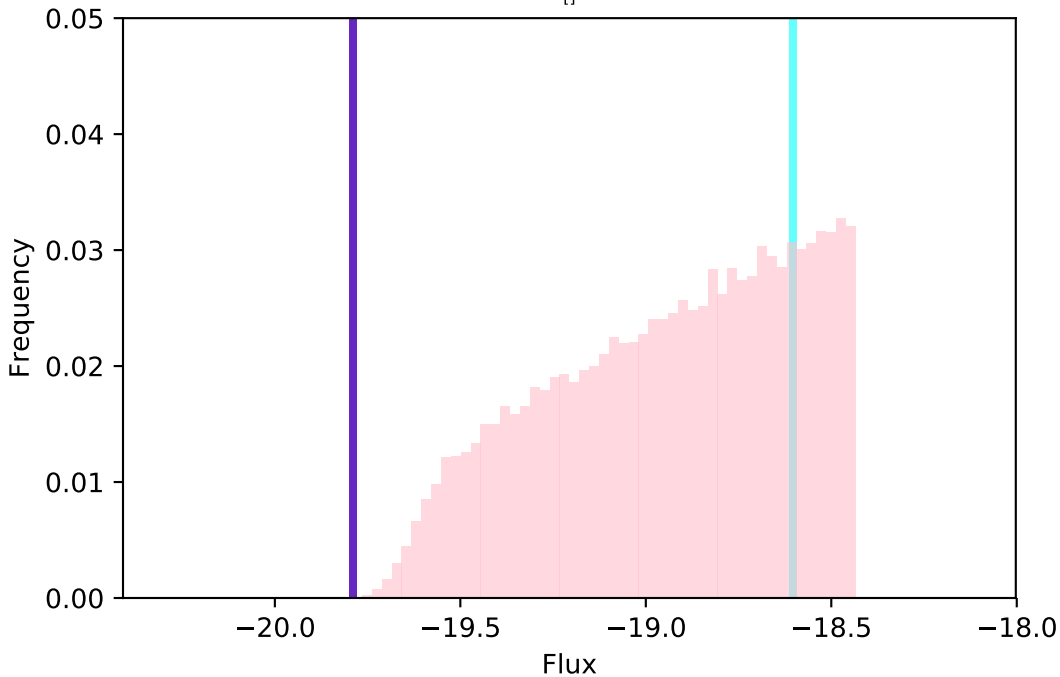
153 : Glu\_h + Pyr\_h <=> Ala\_h + KG\_h  
[ ]



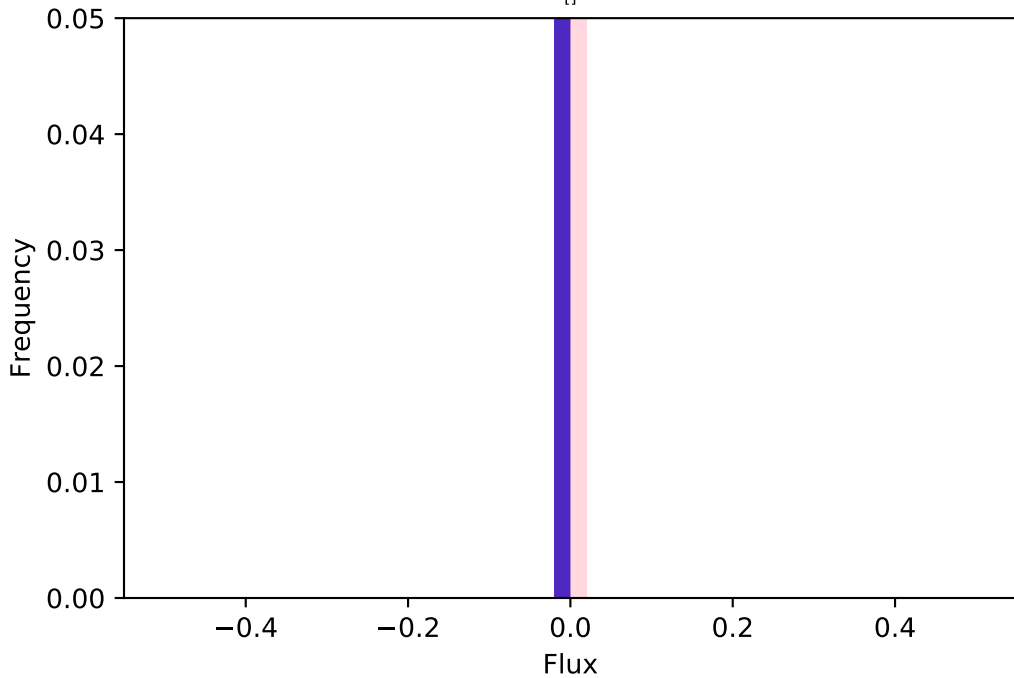
154 : Glu\_m + Pyr\_m <=> Ala\_m + KG\_m  
[]



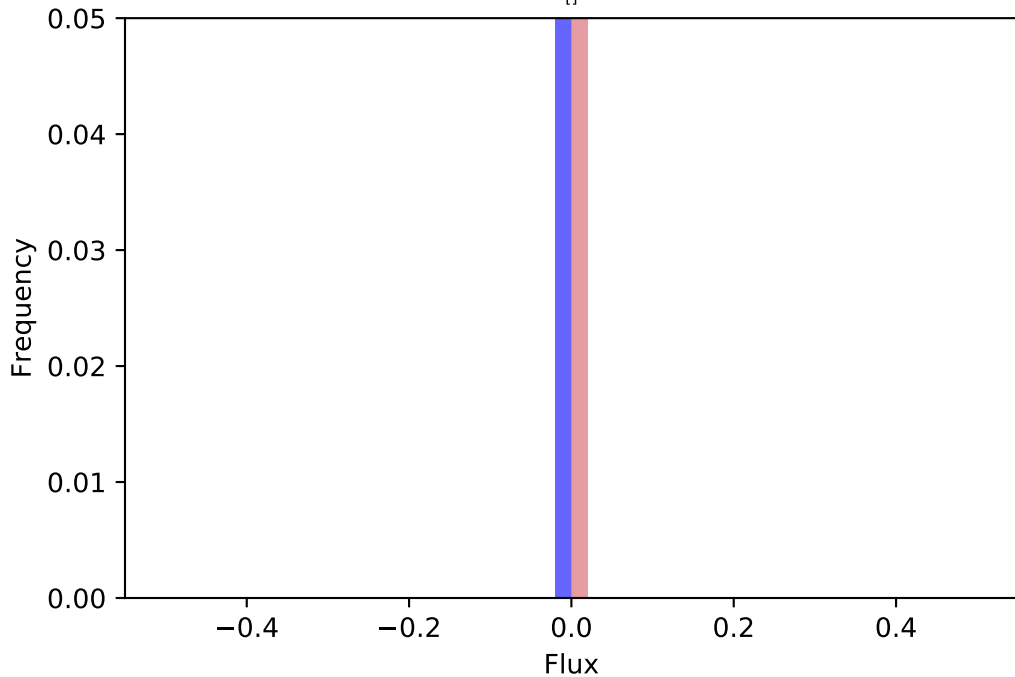
155 : Glu\_p + Pyr\_p <=> Ala\_p + KG\_p  
[]



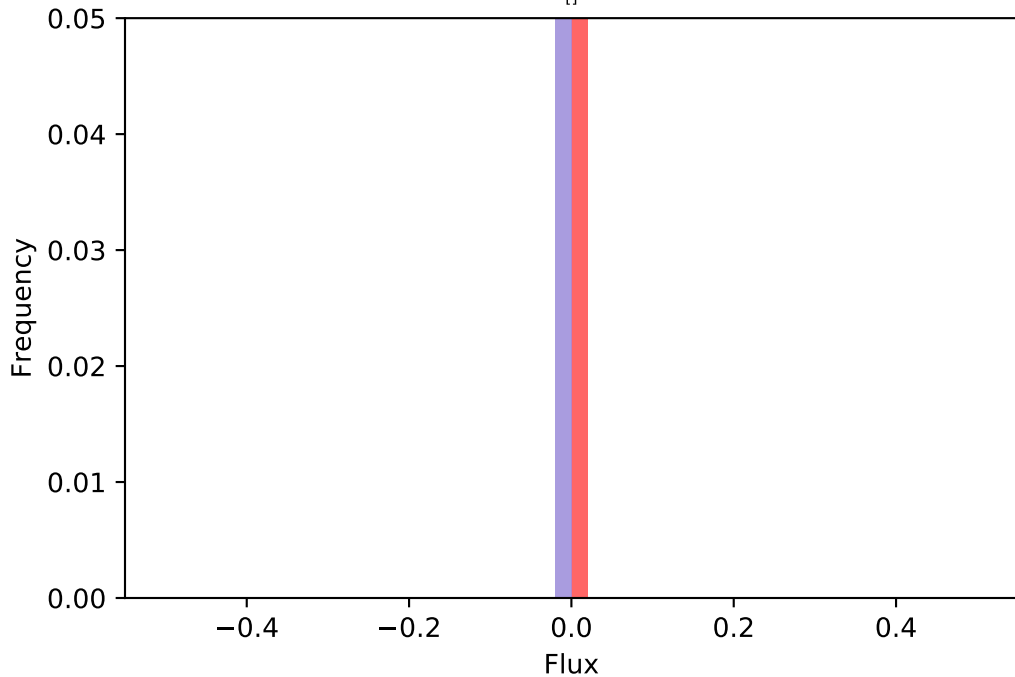
156 : ATP\_h + A\_DASH\_Glu\_h --> ADP\_h + A\_DASH\_GluP\_h  
[]



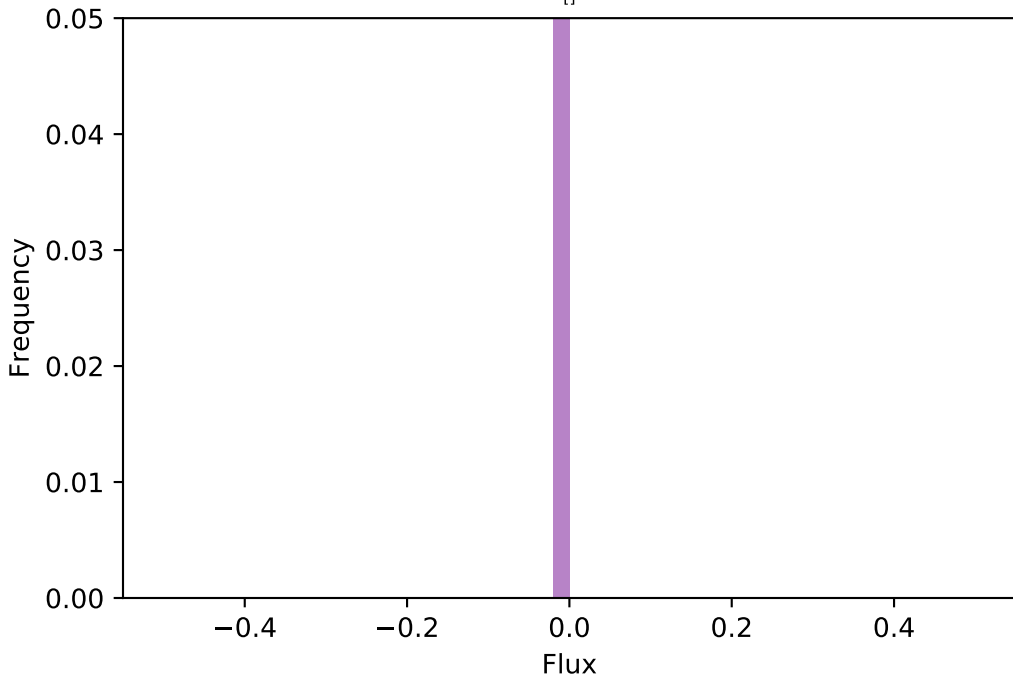
157 : A\_DASH\_GluP\_h + H\_h + NADPH\_h --> A\_DASH\_Glu\_DASH\_SeA\_h + NADP\_h + Pi\_h  
[ ]



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

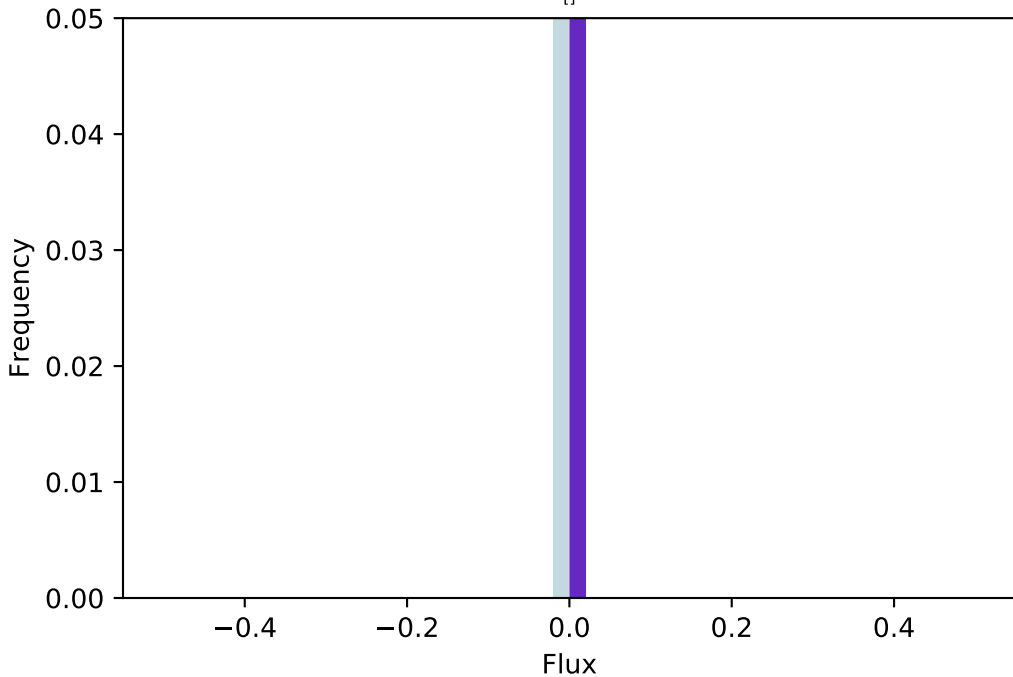


159 : A\_DASH\_Orn\_h + Glu\_h --> A\_DASH\_Glu\_h + Orn\_h  
[]

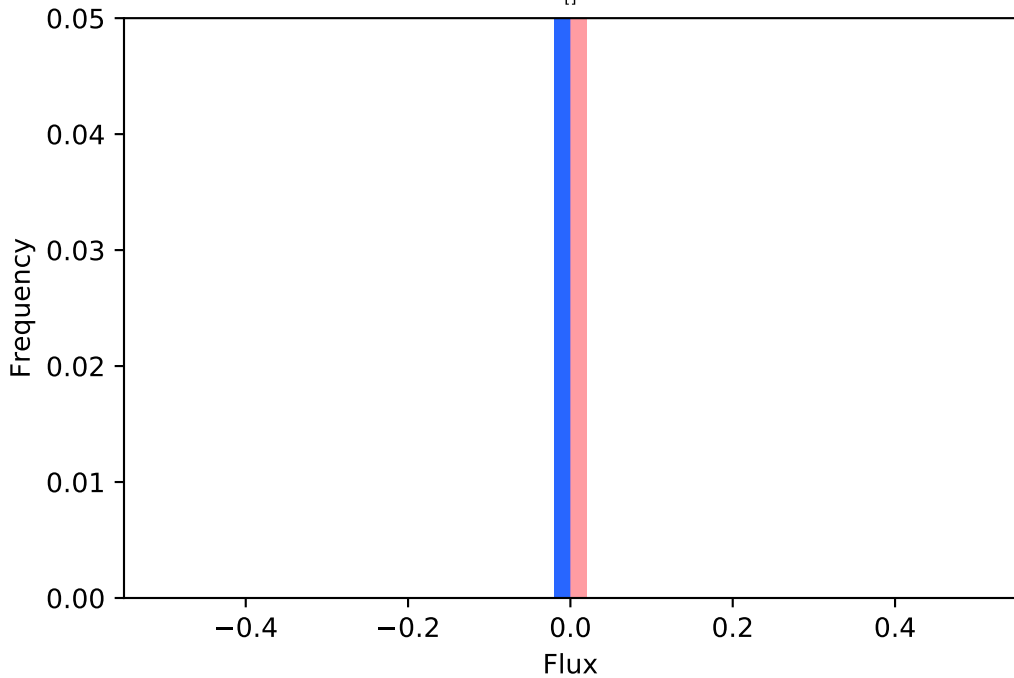




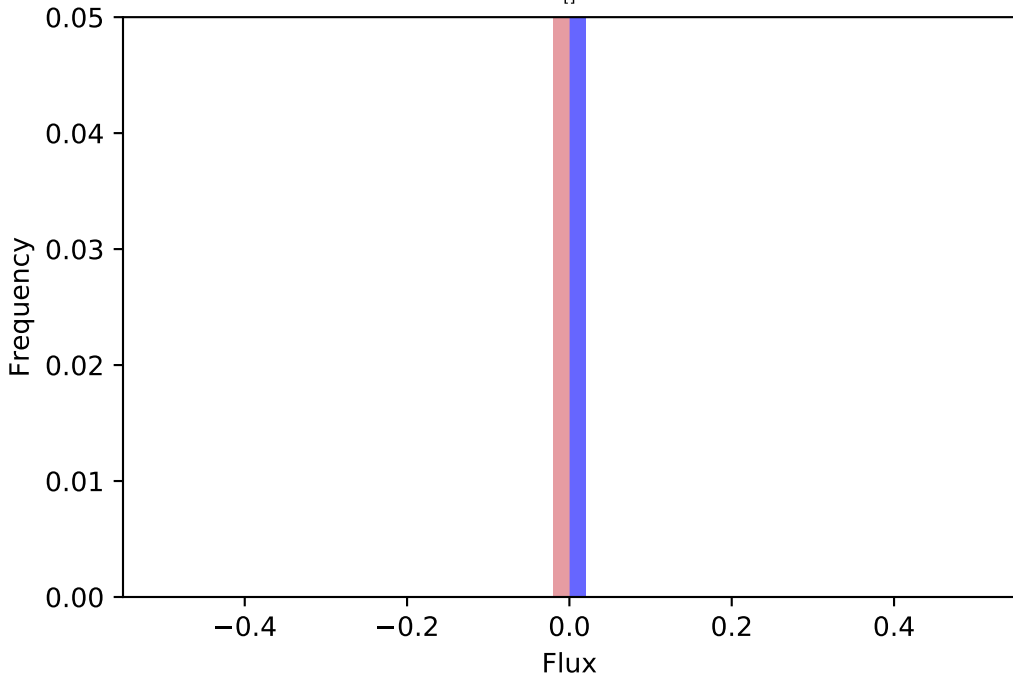
160 : 2.0 ATP\_h + Gln\_h + H2O\_h + HCO3\_h --> 2.0 ADP\_h + CBP\_h + Glu\_h + 3.0 H\_h + Pi\_h  
[ ]



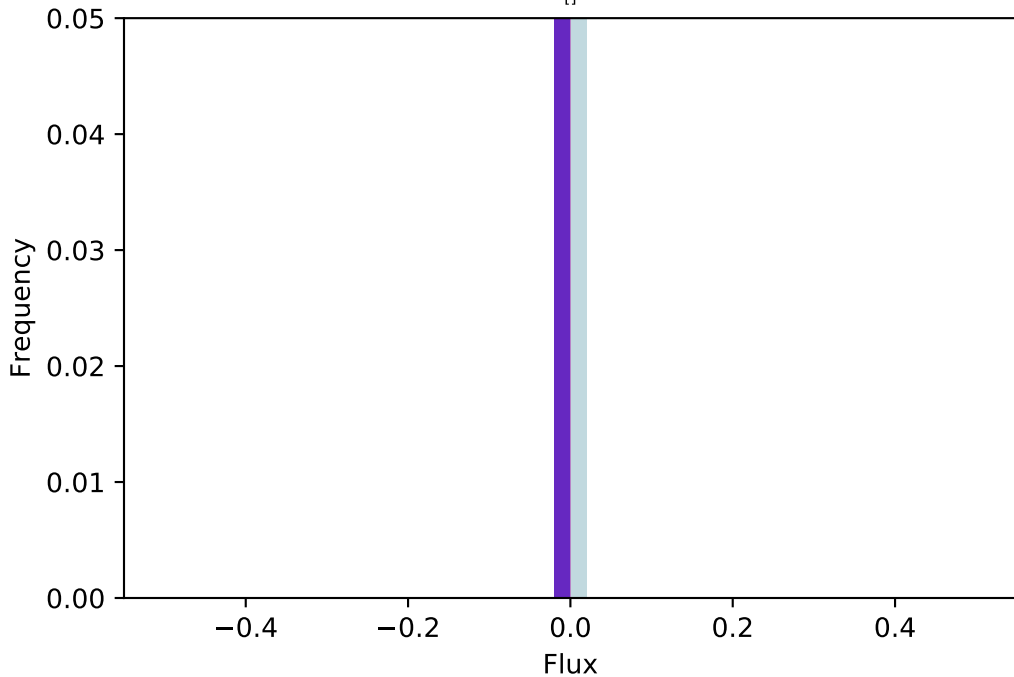
161 : CBP\_h + H\_h + Orn\_h <=> CTL\_h + Pi\_h  
[]



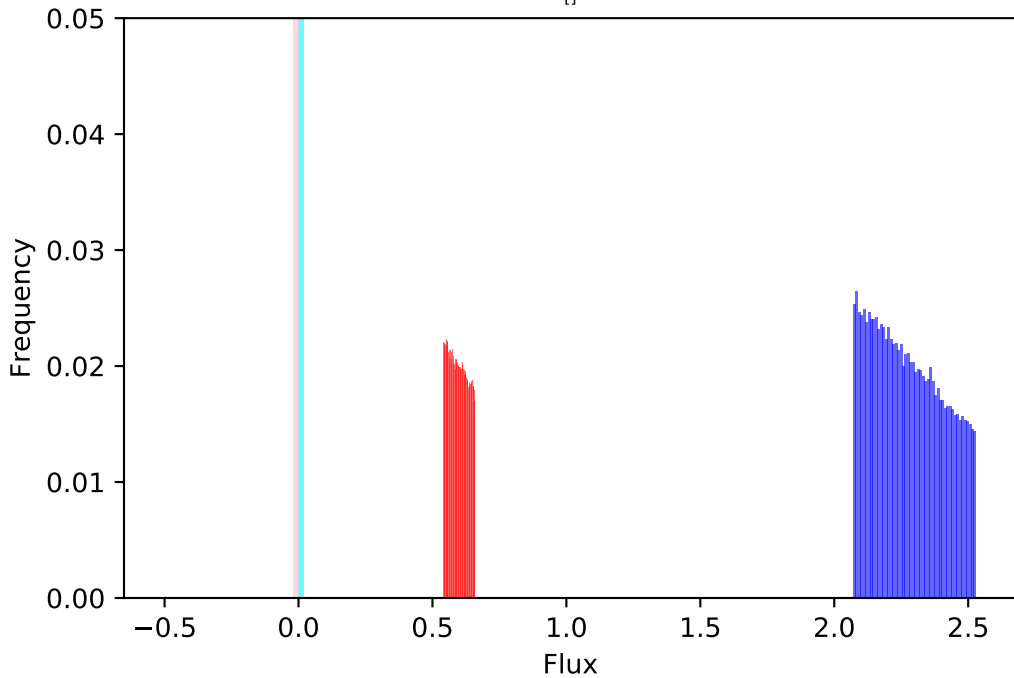
162 : ATP\_h + Asp\_h + CTL\_h --> AMP\_h + Arg\_DASH\_SCA\_h + 3.0 H\_h + PPI\_h  
[ ]



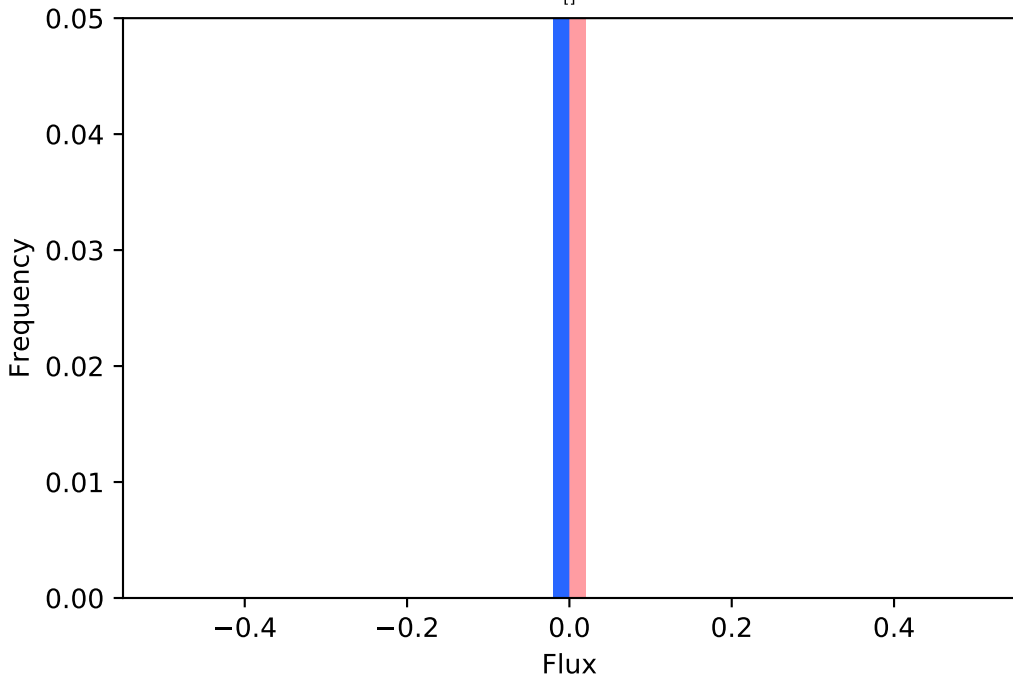
163 : Arg\_DASH\_SCA\_h --> Arg\_h + Fum\_h  
[]



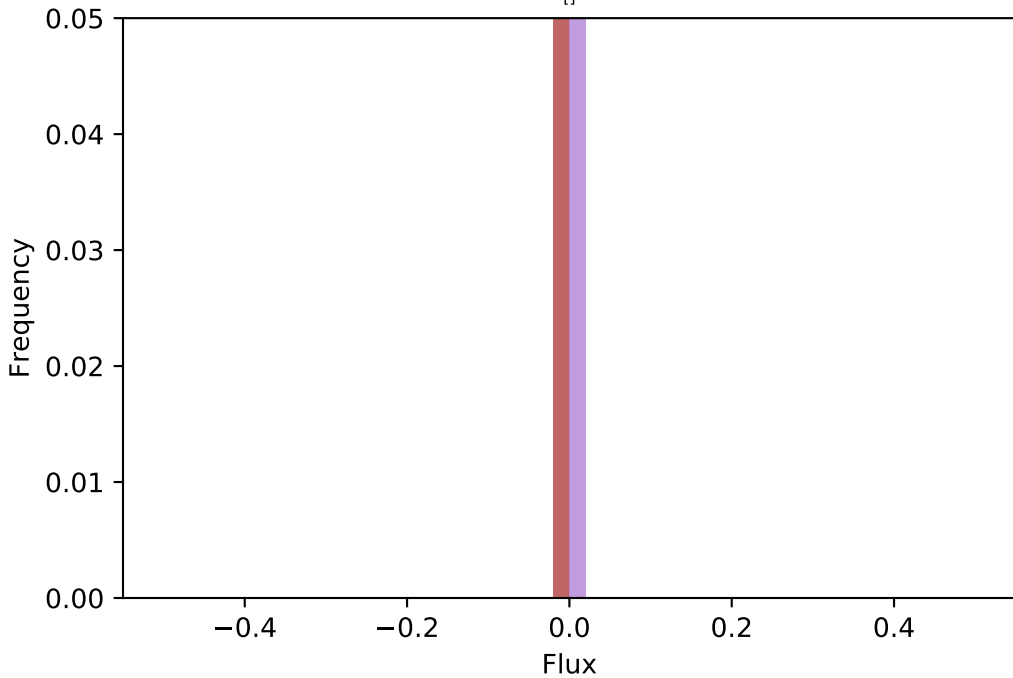
164 : Mal\_c --> Fum\_c + H2O\_c  
[]



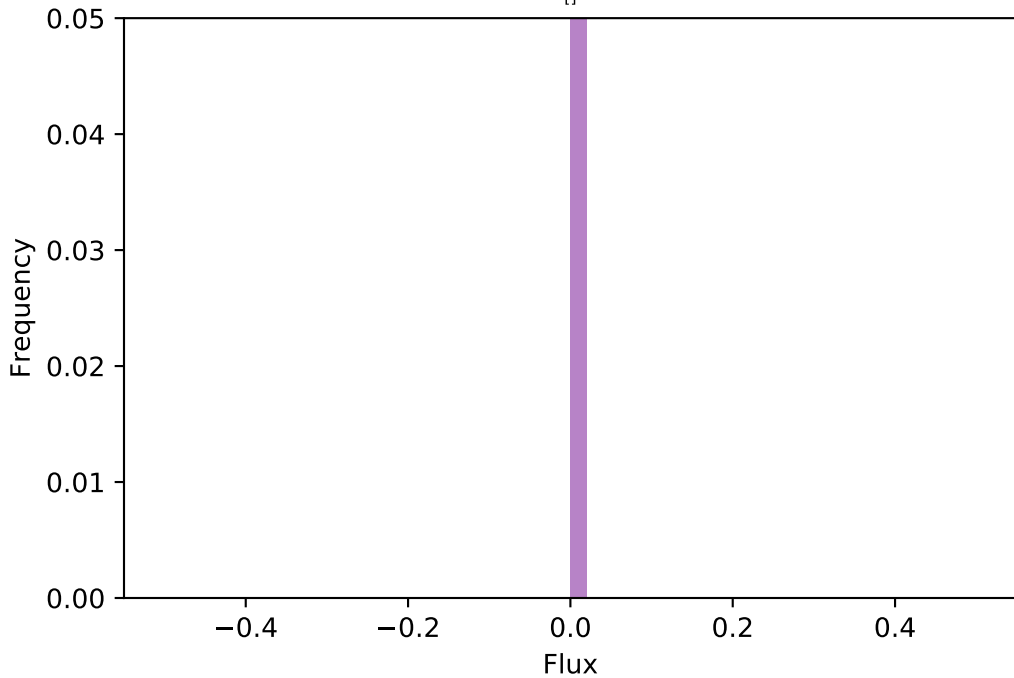
165 : ATP\_c + Asp\_c + Gln\_c + H2O\_c --> AMP\_c + Asn\_c + Glu\_c + H\_c + PPi\_c  
[ ]



166 : Glu\_c + OAA\_c --> Asp\_c + KG\_c  
[ ]

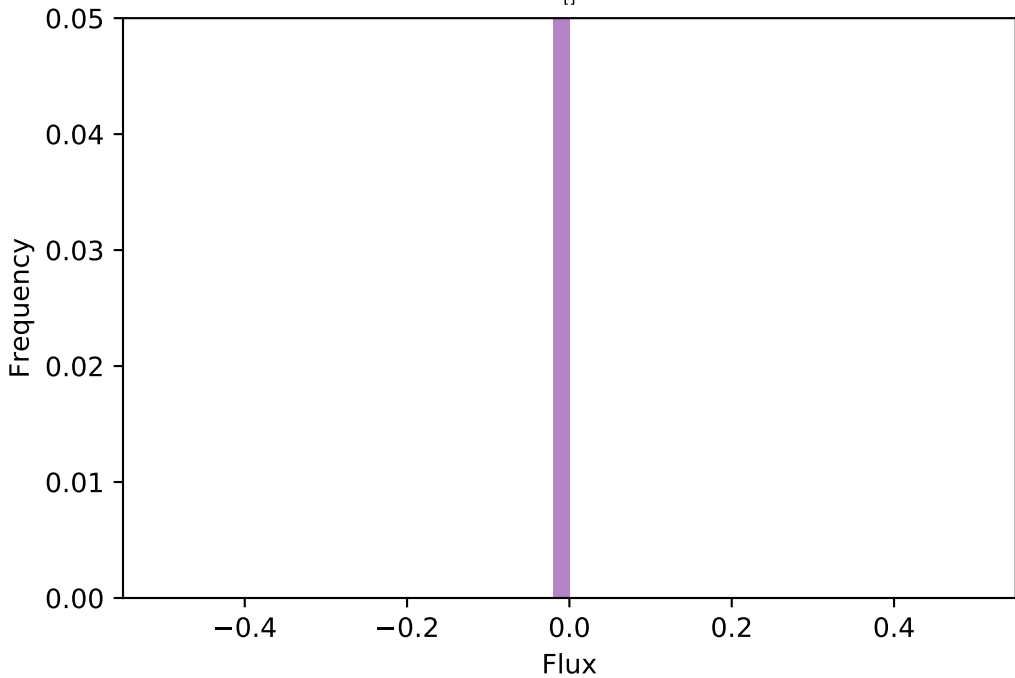


167 : Glu\_h + OAA\_h <=> Asp\_h + KG\_h  
[]

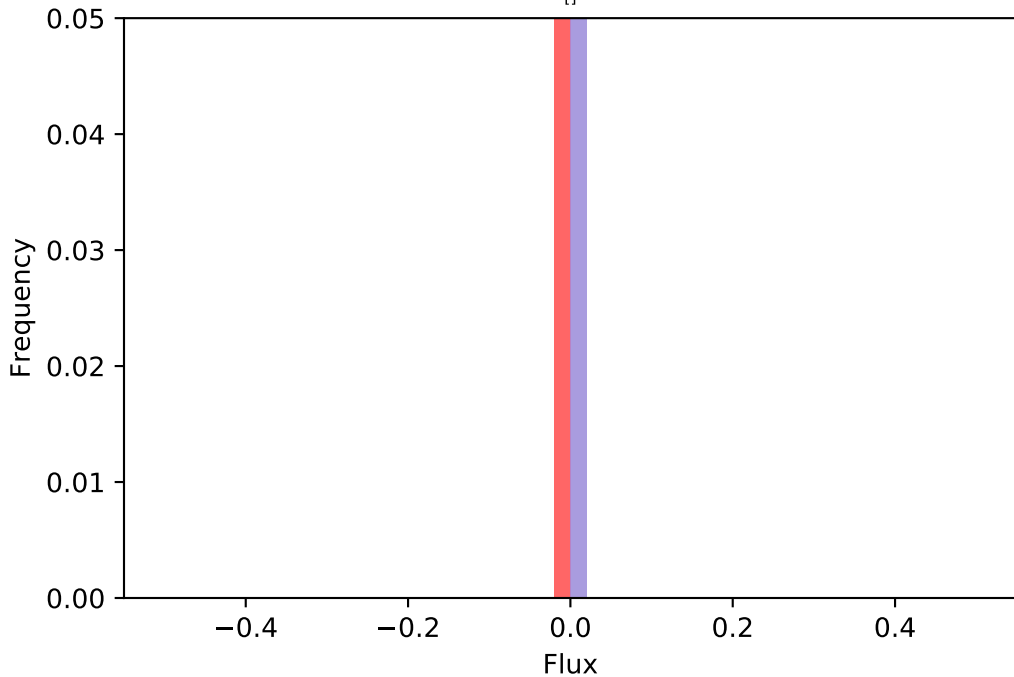




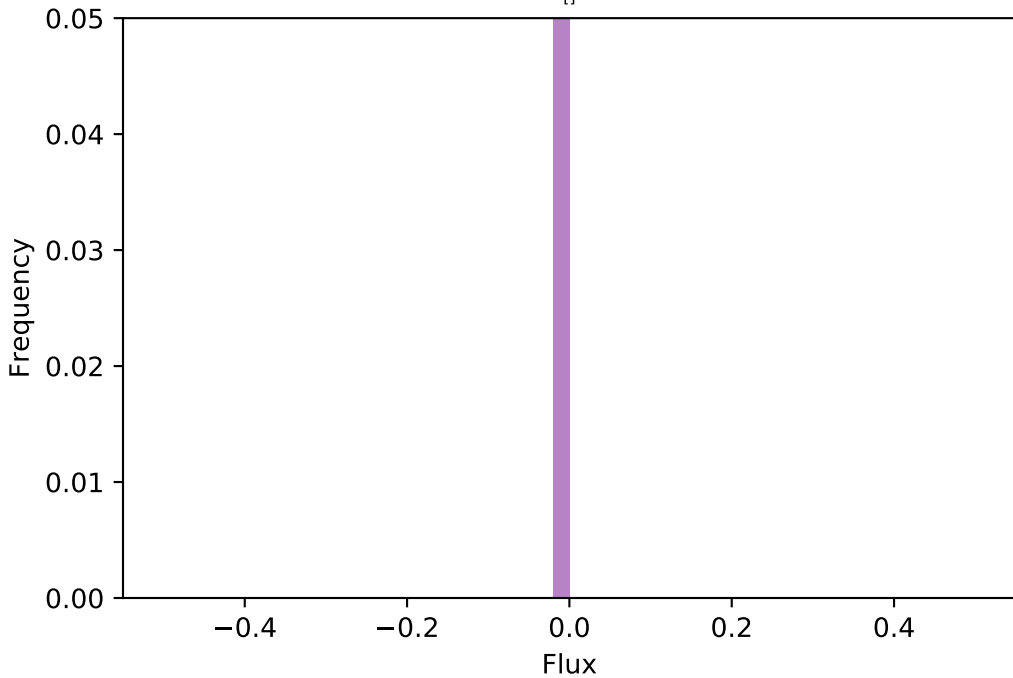
168 : Glu\_m + OAA\_m  $\leq$  Asp\_m + KG\_m  
[]



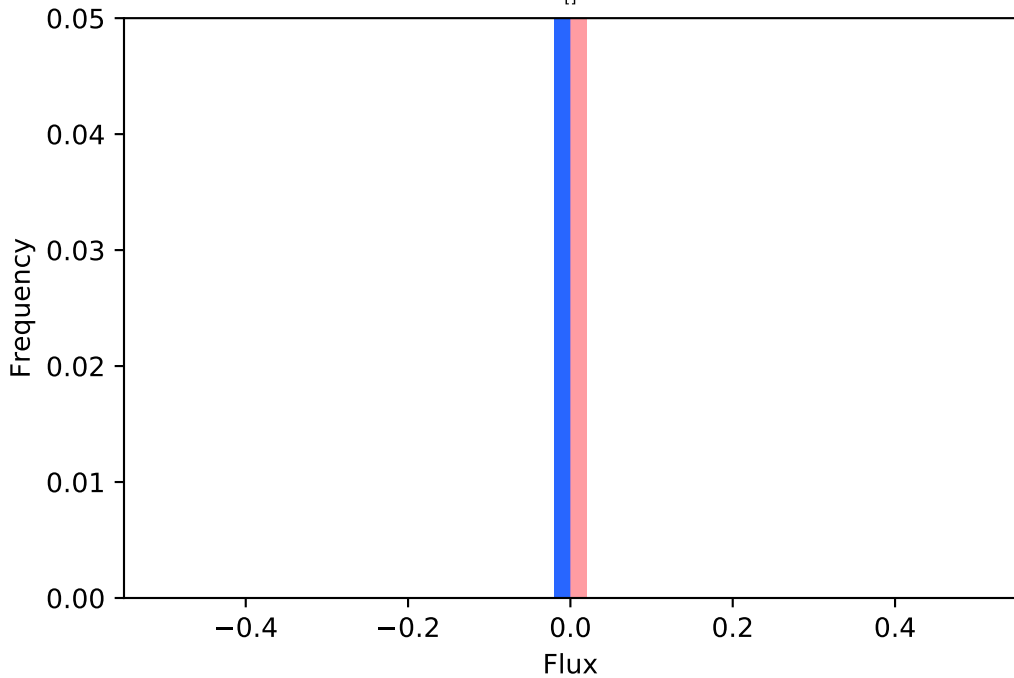
169 : Glu\_p + OAA\_p <=> Asp\_p + KG\_p  
[ ]



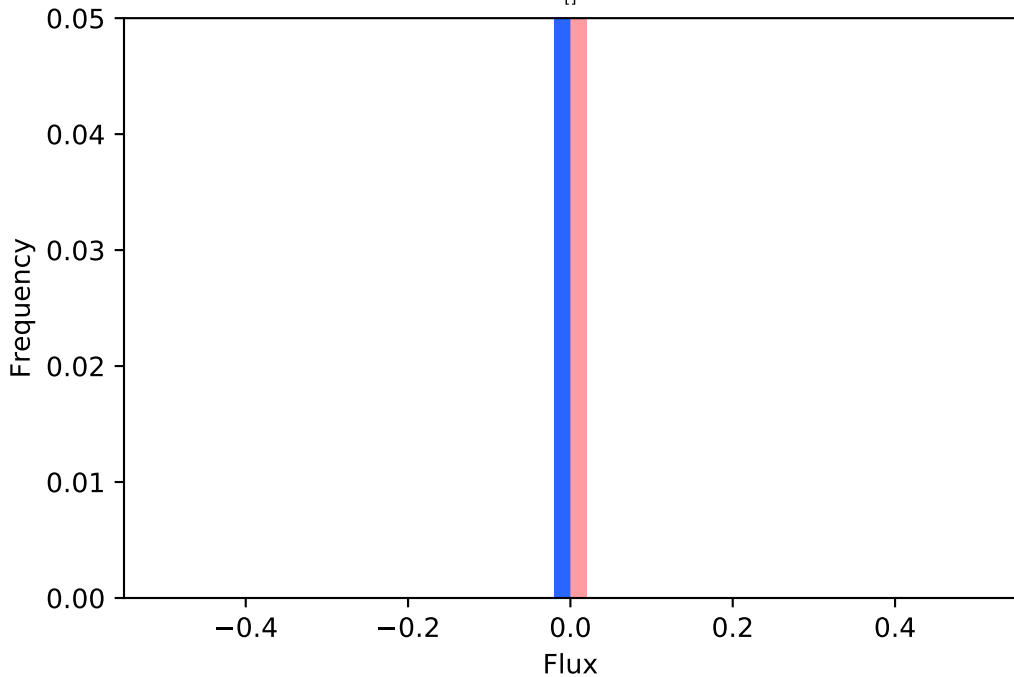
170 : Asn\_c + H2O\_c --> Asp\_c + NH4\_c  
[ ]



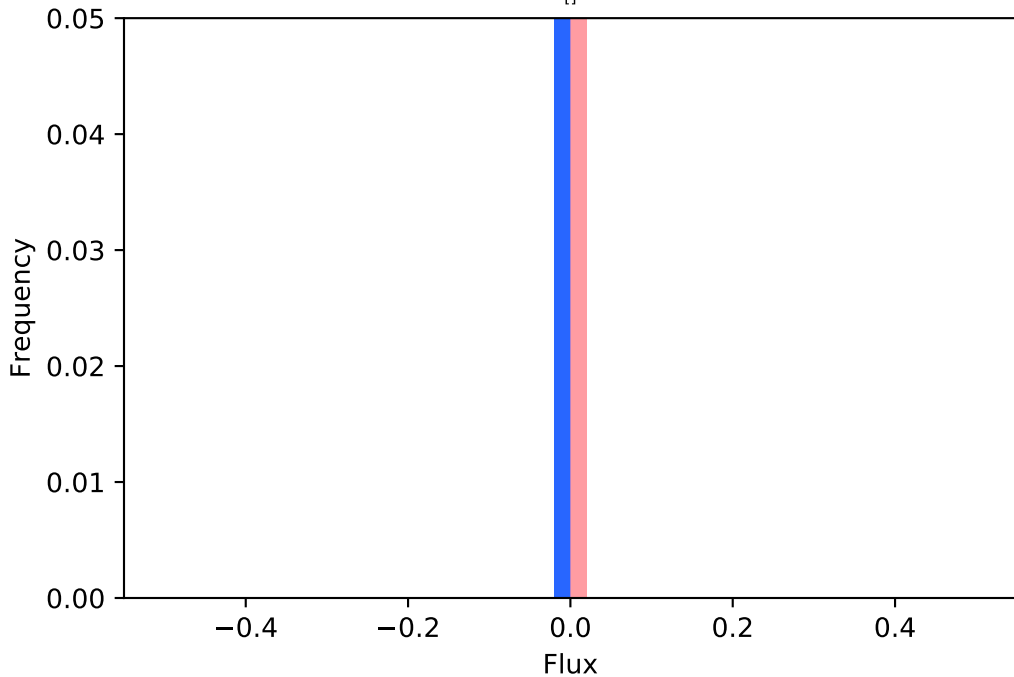
171 : A\_DASH\_CoA\_c + Ser\_c --> A\_DASH\_Ser\_c + CoA\_c  
[]



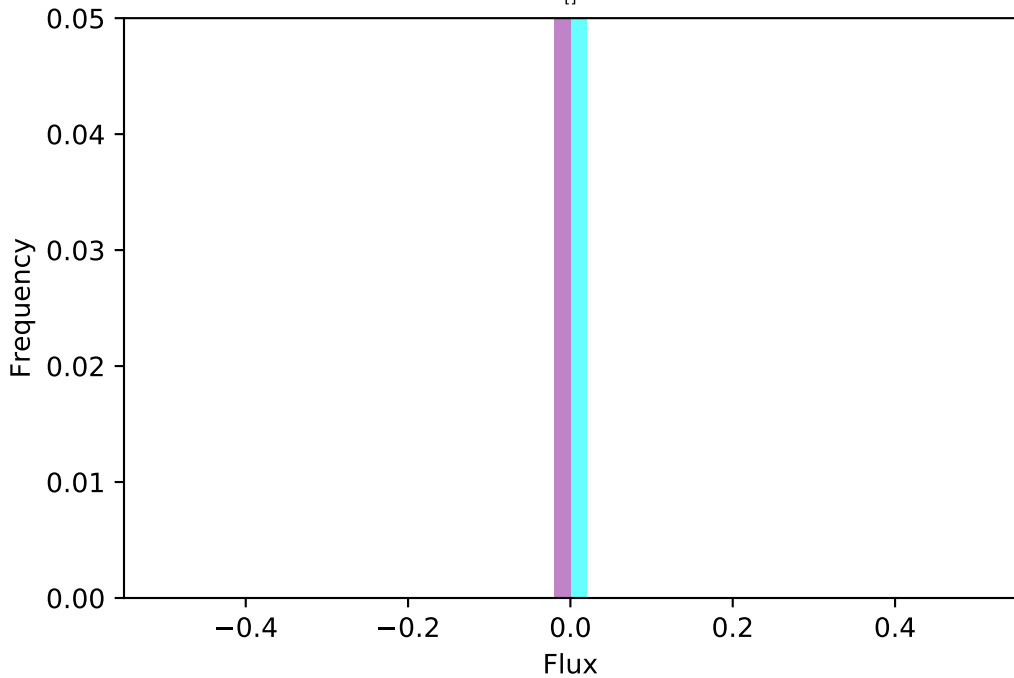
172 : A\_DASH\_CoA\_h + Ser\_h --> A\_DASH\_Ser\_h + CoA\_h  
[ ]



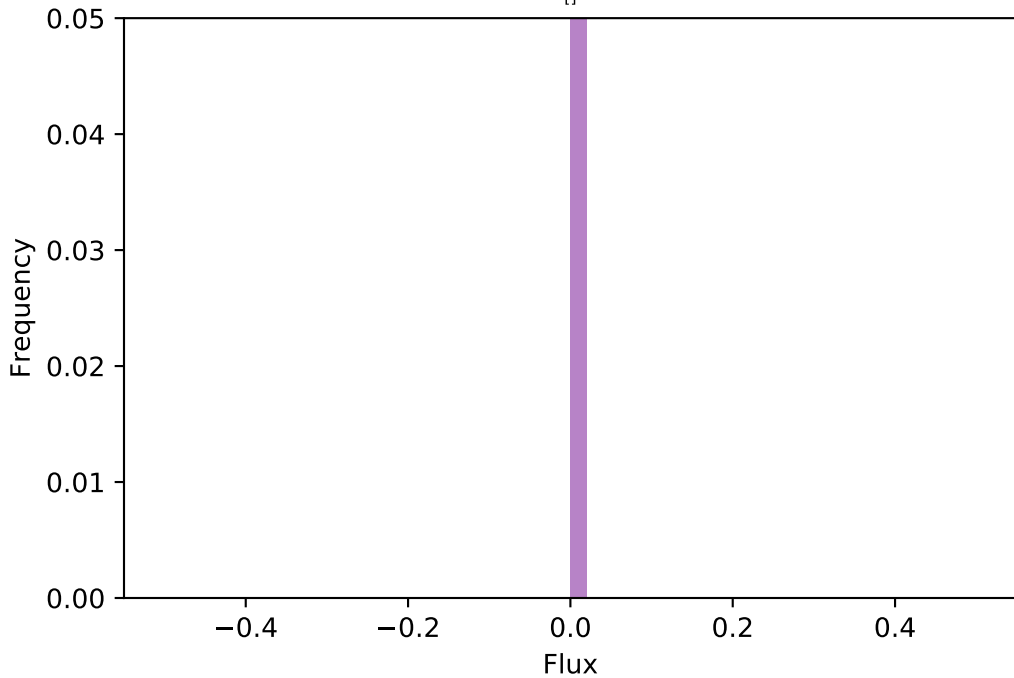
173 : A\_DASH\_CoA\_m + Ser\_m --> A\_DASH\_Ser\_m + CoA\_m  
[]



174 : A\_DASH\_Ser\_c + H2S\_c --> AC\_c + Cys\_c + H\_c  
[ ]

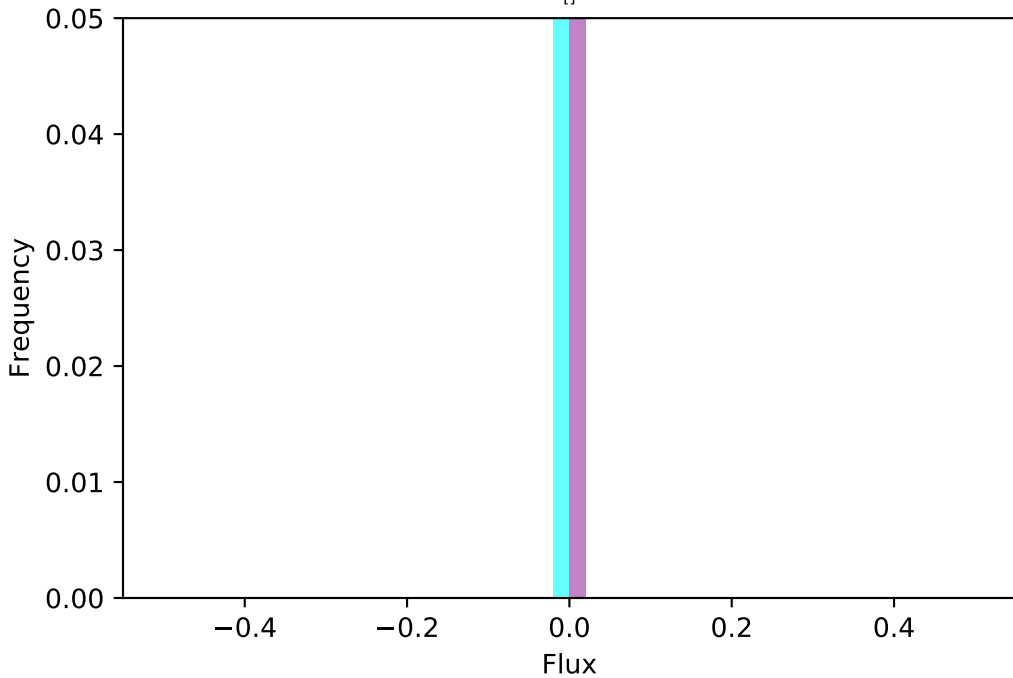


175 : A\_DASH\_Ser\_h + H2S\_h --> AC\_h + Cys\_h + H\_h  
[ ]

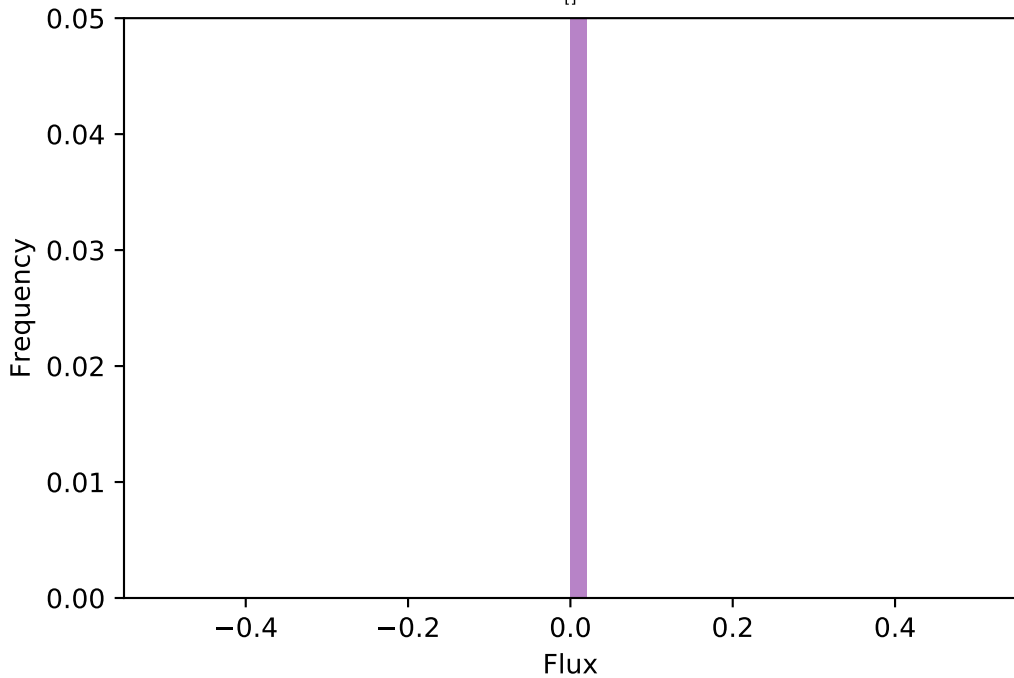




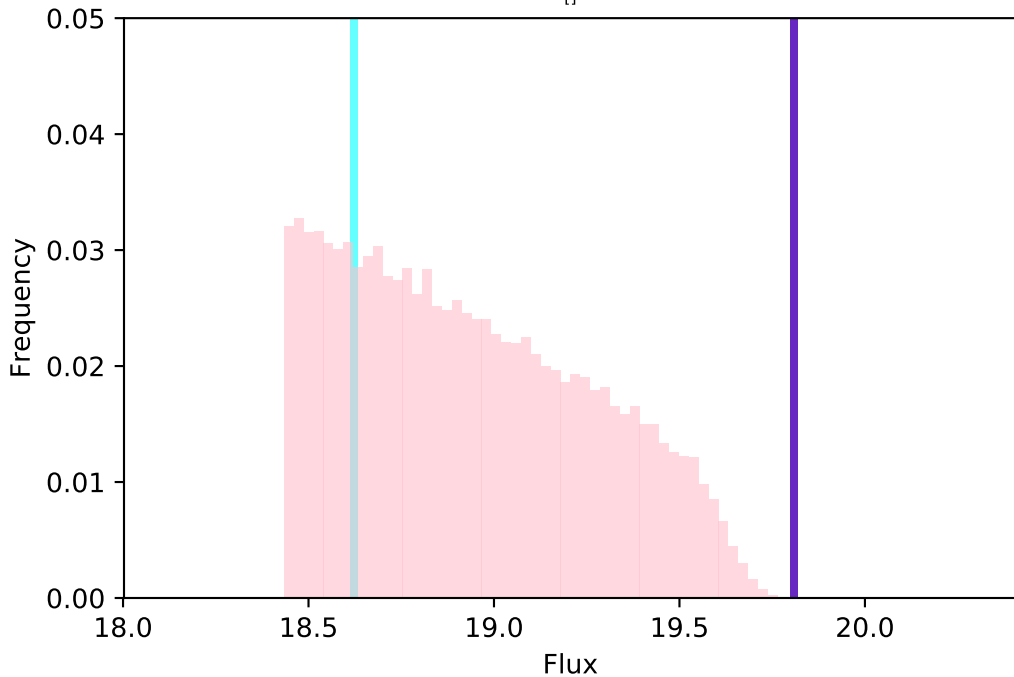
176 : A\_DASH\_Ser\_m + H2S\_m --> AC\_m + Cys\_m + H\_m  
[ ]



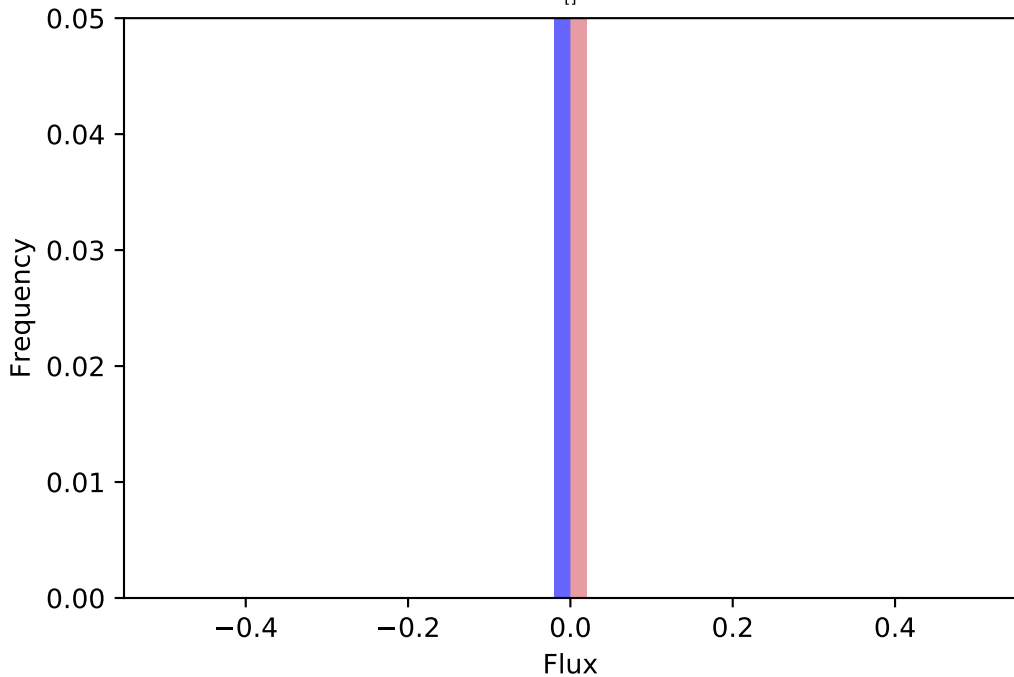
177 : Gln\_h + H\_h + KG\_h + NADPH\_h --> 2.0 Glu\_h + NADP\_h  
[]



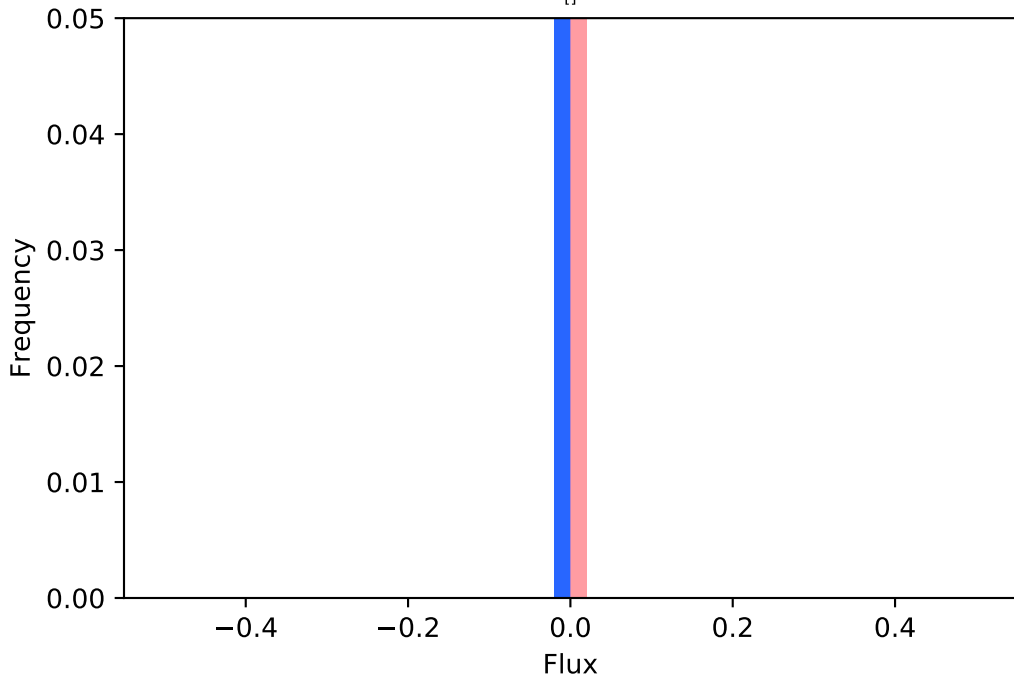
178 : Glu\_c + H2O\_c + NADP\_c --> KG\_c + NADPH\_c + NH4\_c  
[ ]



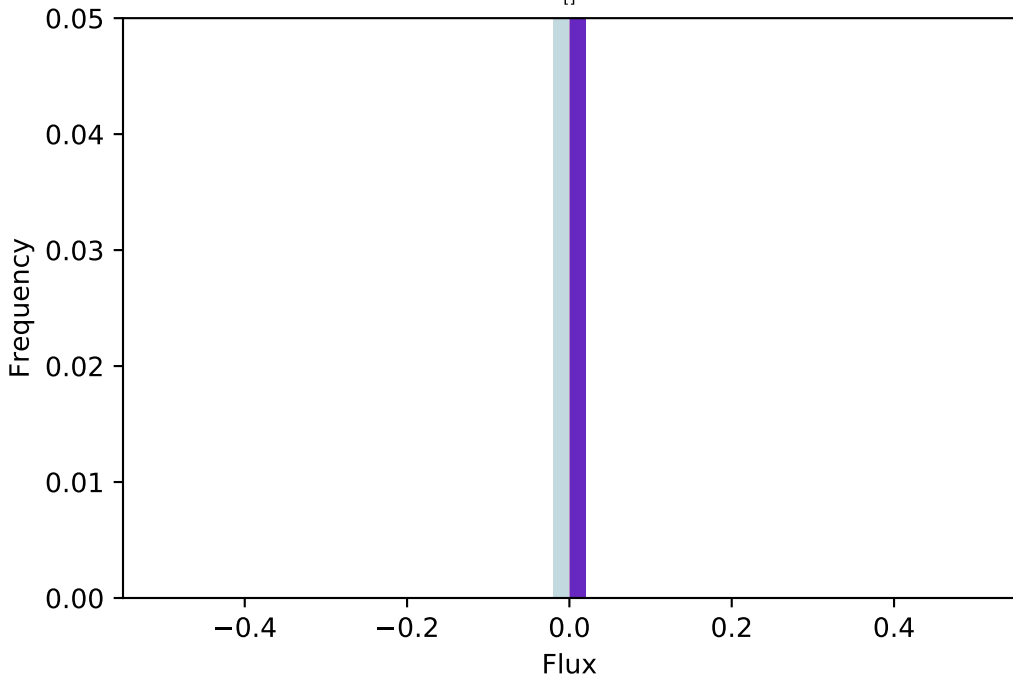
179 : Gln\_c + H2O\_c --> Glu\_c + NH4\_c  
[ ]



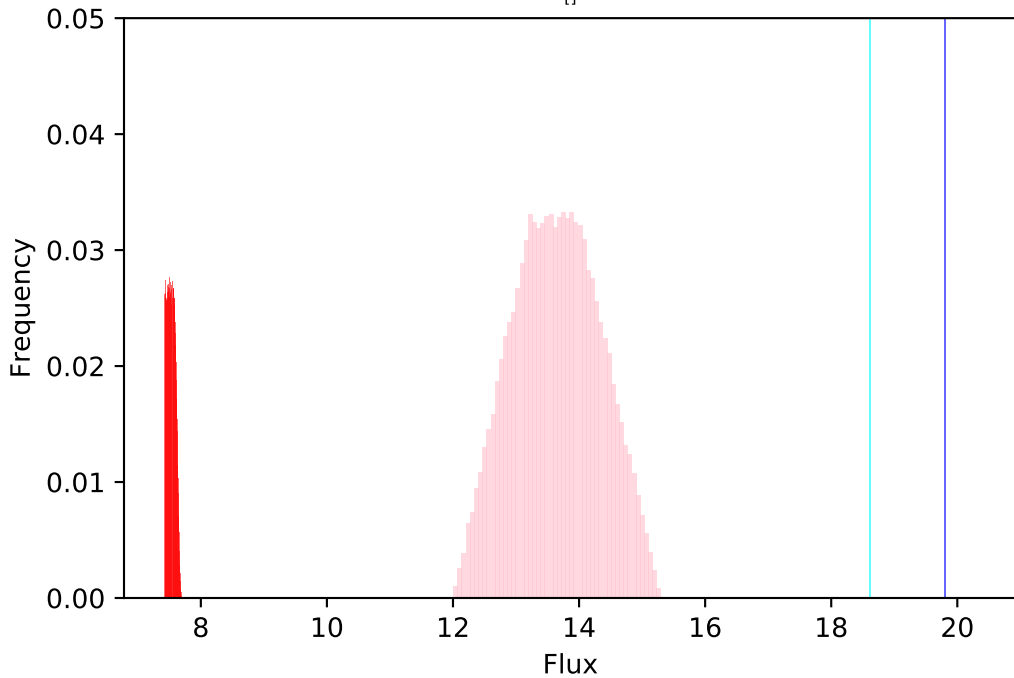
180 : Gln\_h + H\_h + KG\_h + NADH\_h --> 2.0 Glu\_h + NAD\_h  
[]



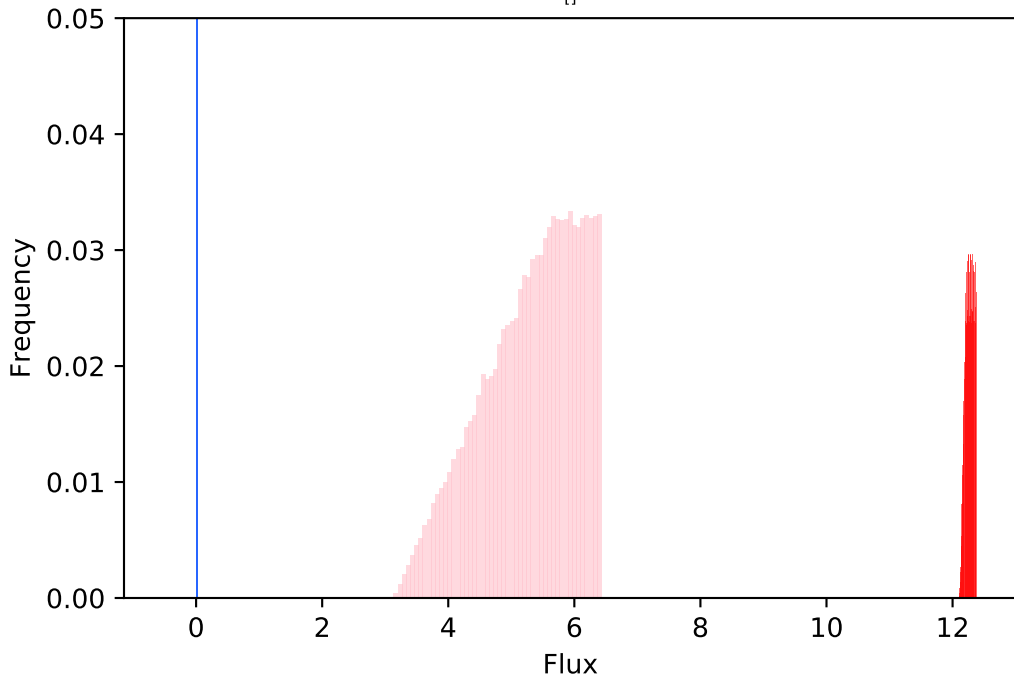
181 : 2.0 Fdrd\_h + Gln\_h + 2.0 H\_h + KG\_h --> 2.0 Fdox\_h + 2.0 Glu\_h  
[]



182 : H\_m + KG\_m + NADH\_m + NH4\_m --> Glu\_m + H2O\_m + NAD\_m  
[]

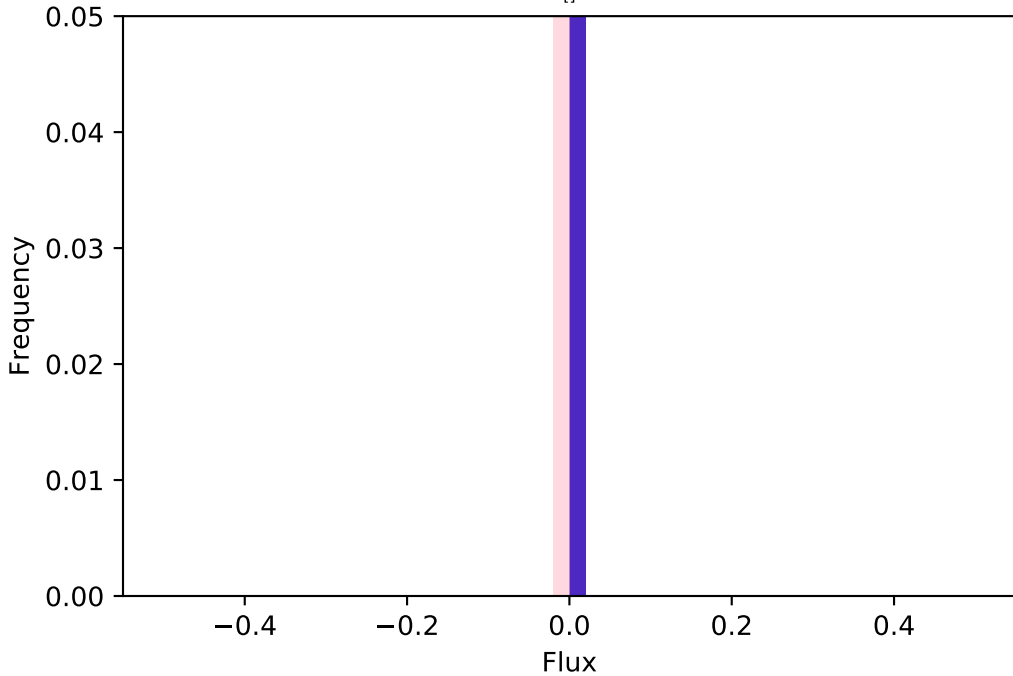


183 : H\_m + KG\_m + NADPH\_m + NH4\_m <=> Glu\_m + H2O\_m + NADP\_m  
[ ]

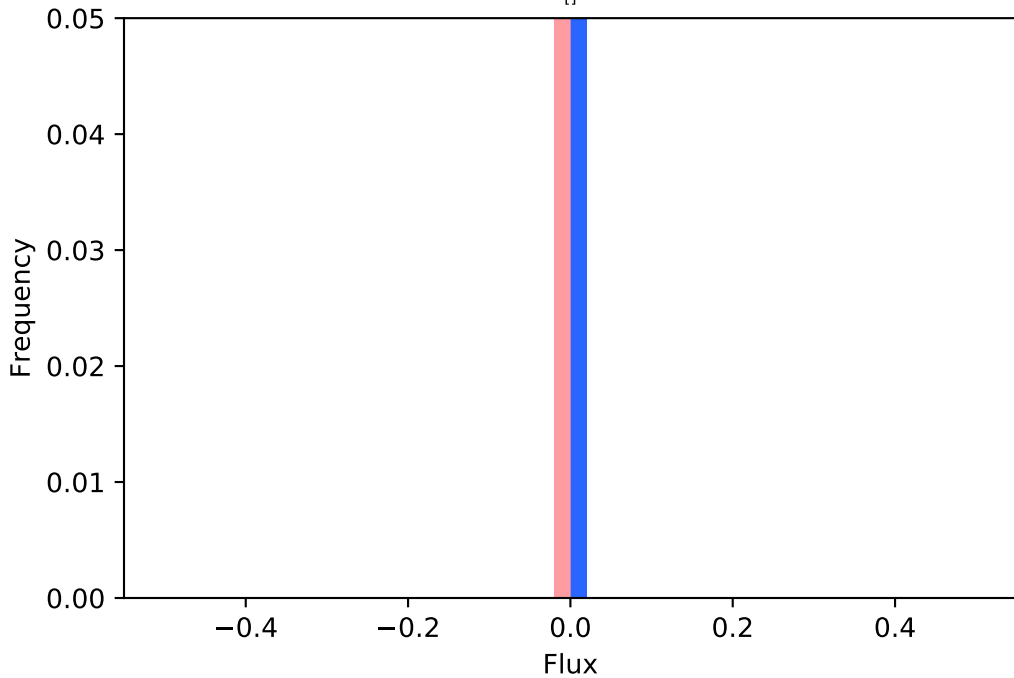




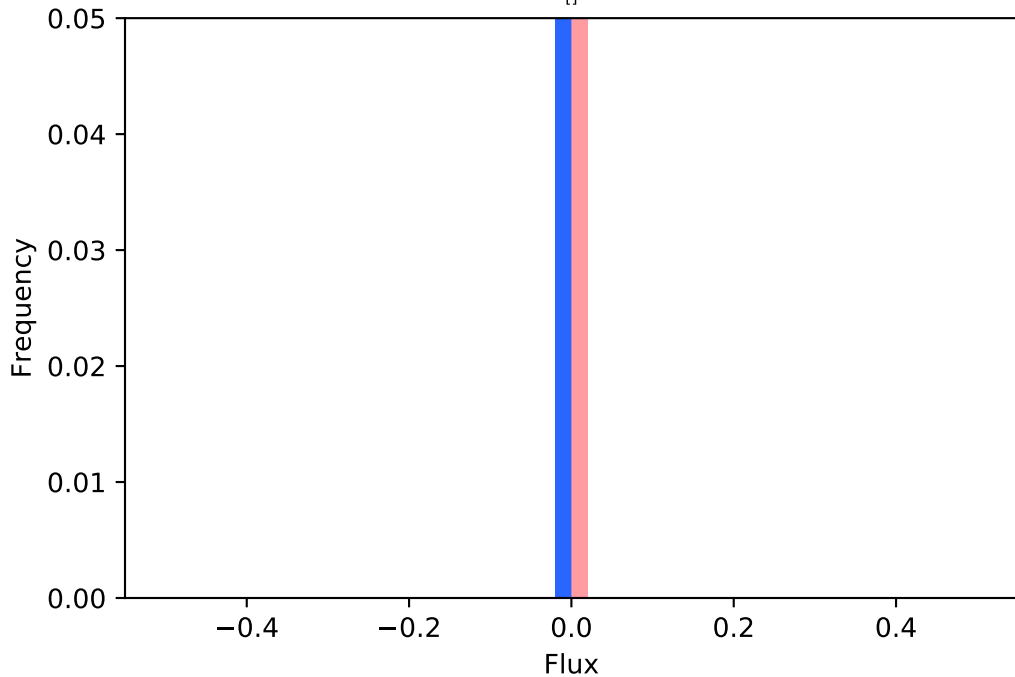
184 : Glu\_m + H2O\_m + NAD\_m --> H\_m + KG\_m + NADH\_m + NH4\_m  
[]



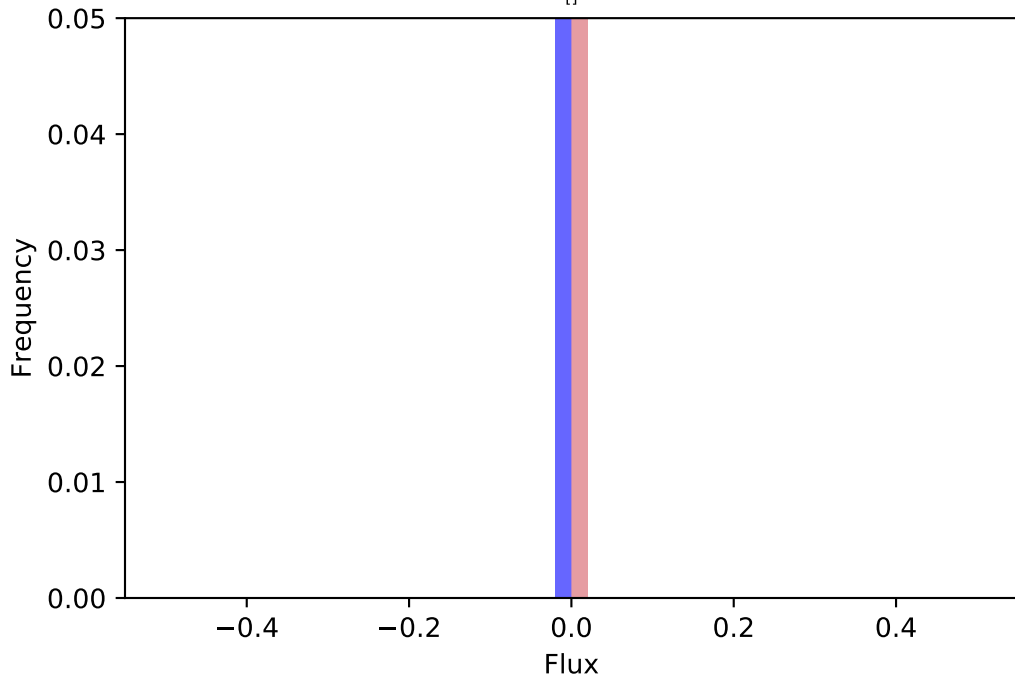
185 : Glu\_c + H\_c --> CO2\_c + GABA\_c  
[]



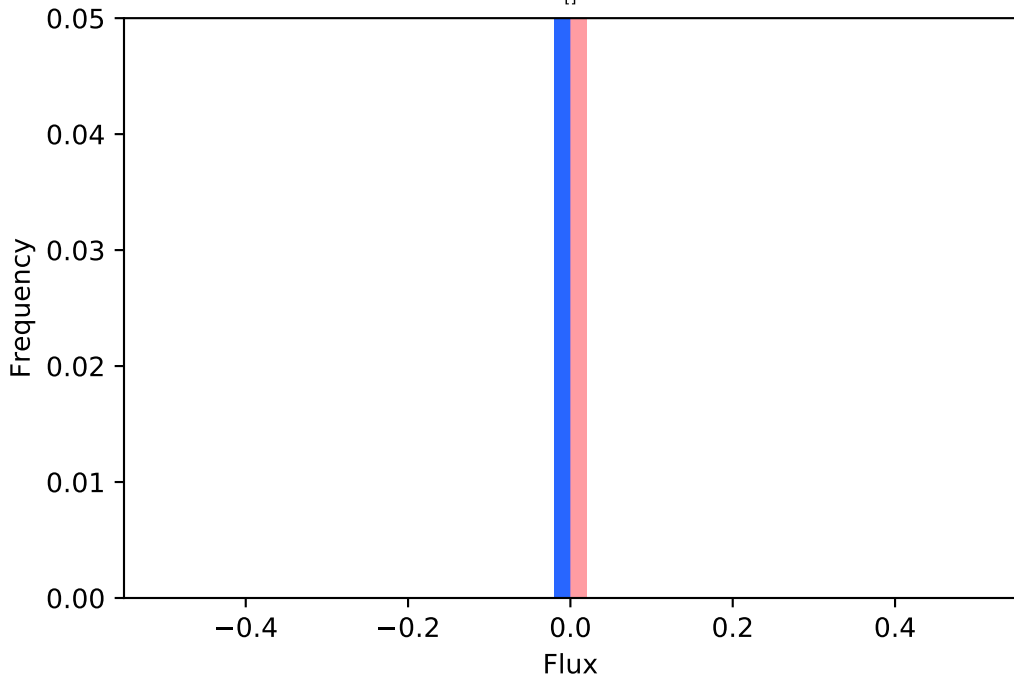
186 : GABA\_m + Pyr\_m <=> Ala\_m + SCA\_DASH\_SeA\_m  
[]



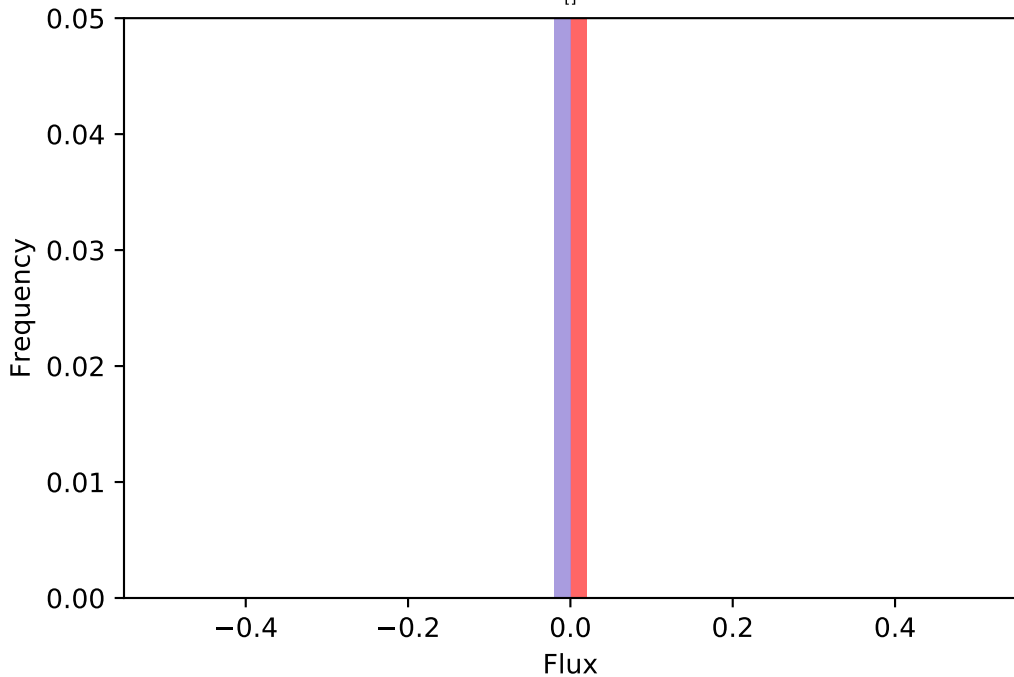
187 : GABA\_m + KG\_m --> Glu\_m + SCA\_DASH\_SeA\_m  
[]



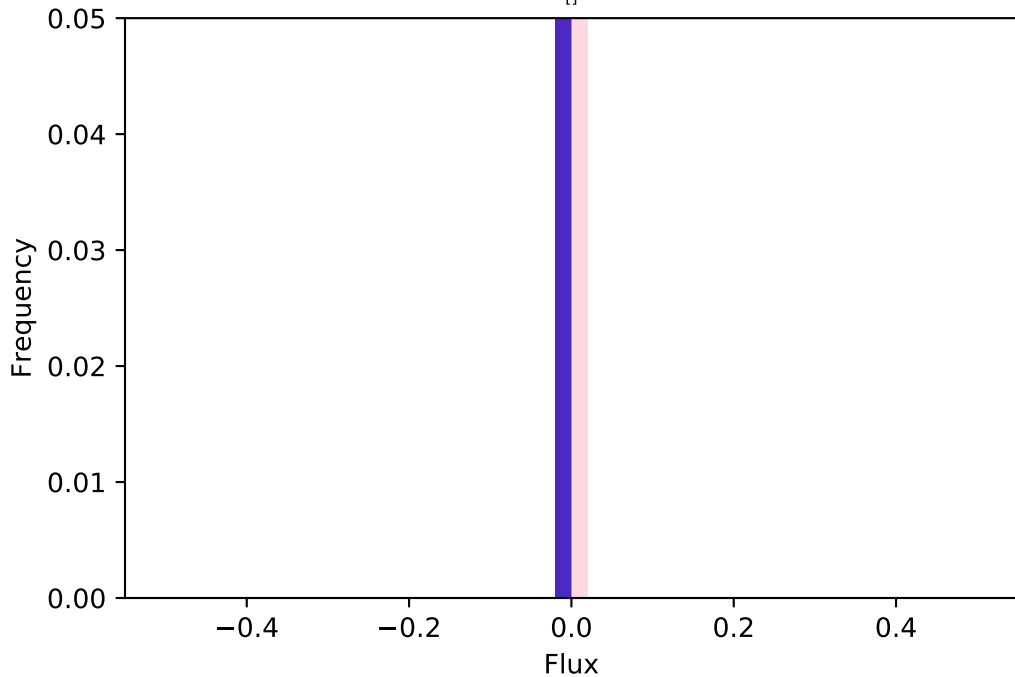
188 : H<sub>2</sub>O<sub>m</sub> + NAD<sub>m</sub> + SCA\_DASH\_SeA<sub>m</sub> --> 2.0 H<sub>m</sub> + NADH<sub>m</sub> + SCA<sub>m</sub>  
[ ]



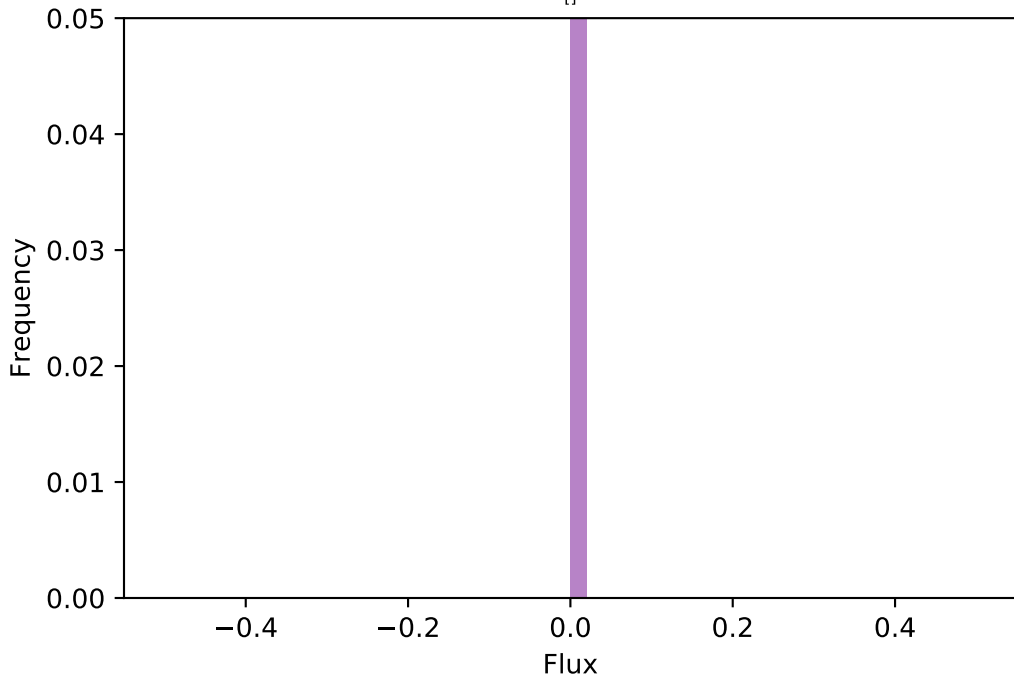
189 : ATP\_c + Glu\_c + NH4\_c --> ADP\_c + Gln\_c + H\_c + Pi\_c  
[ ]



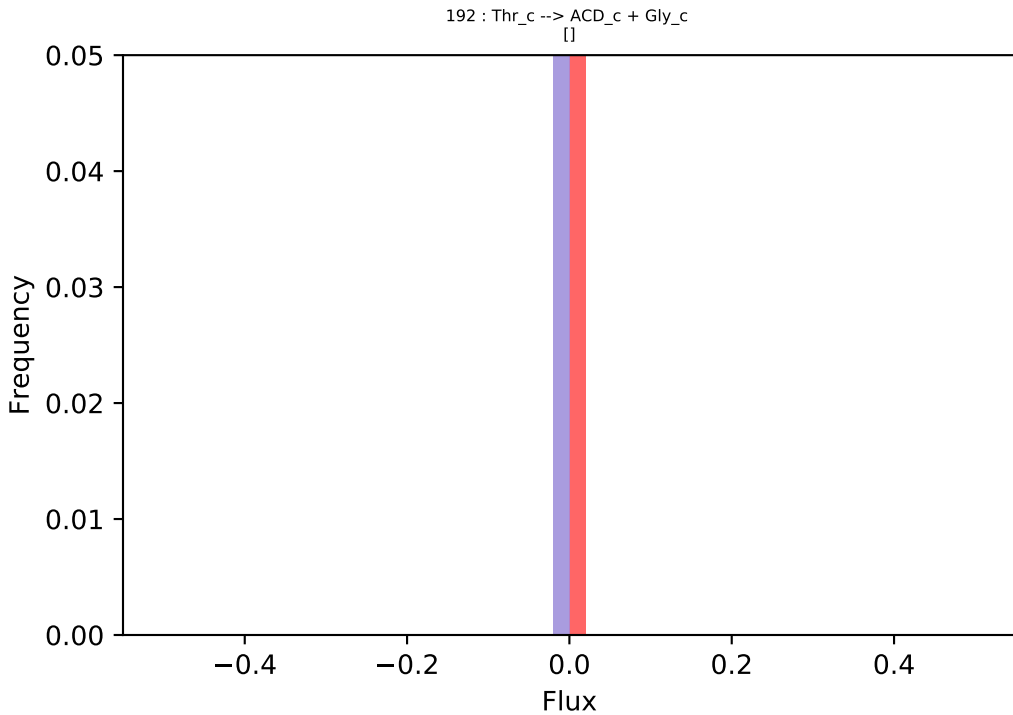
190 : ATP\_h + Glu\_h + NH4\_h --> ADP\_h + Gln\_h + H\_h + Pi\_h  
[ ]

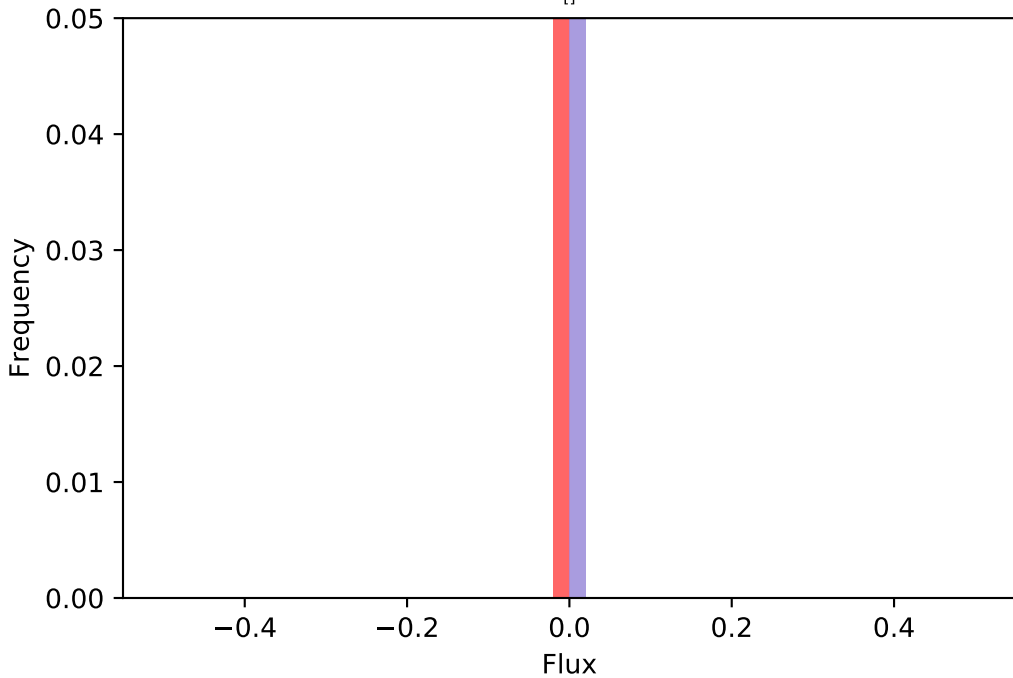
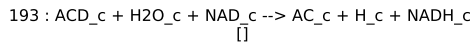


191 : ATP\_m + Glu\_m + NH4\_m --> ADP\_m + Gln\_m + H\_m + Pi\_m  
[]

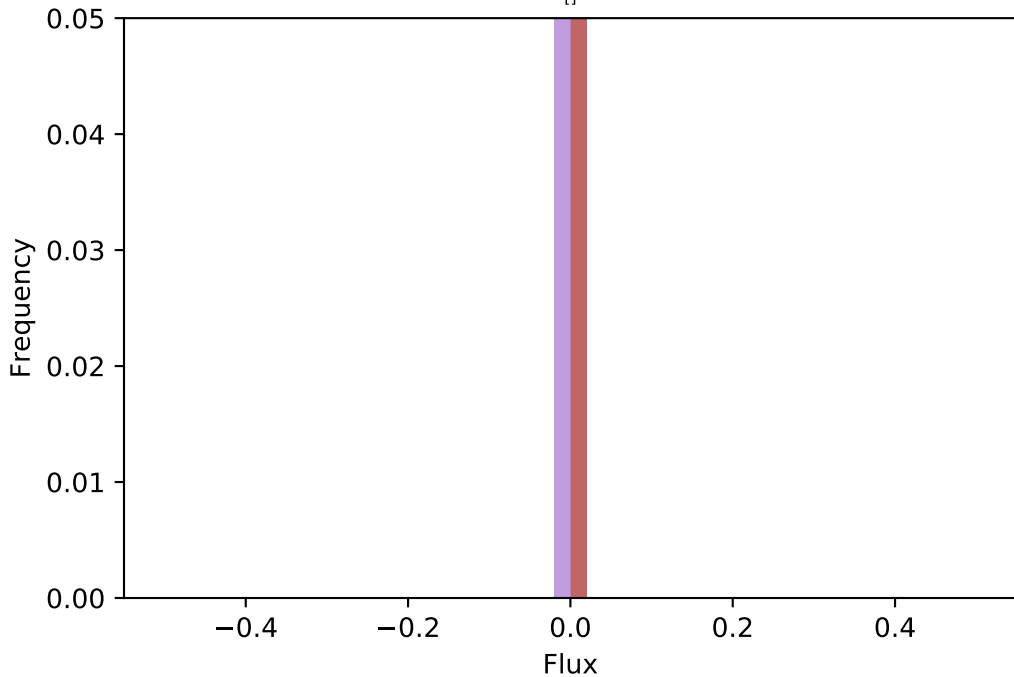




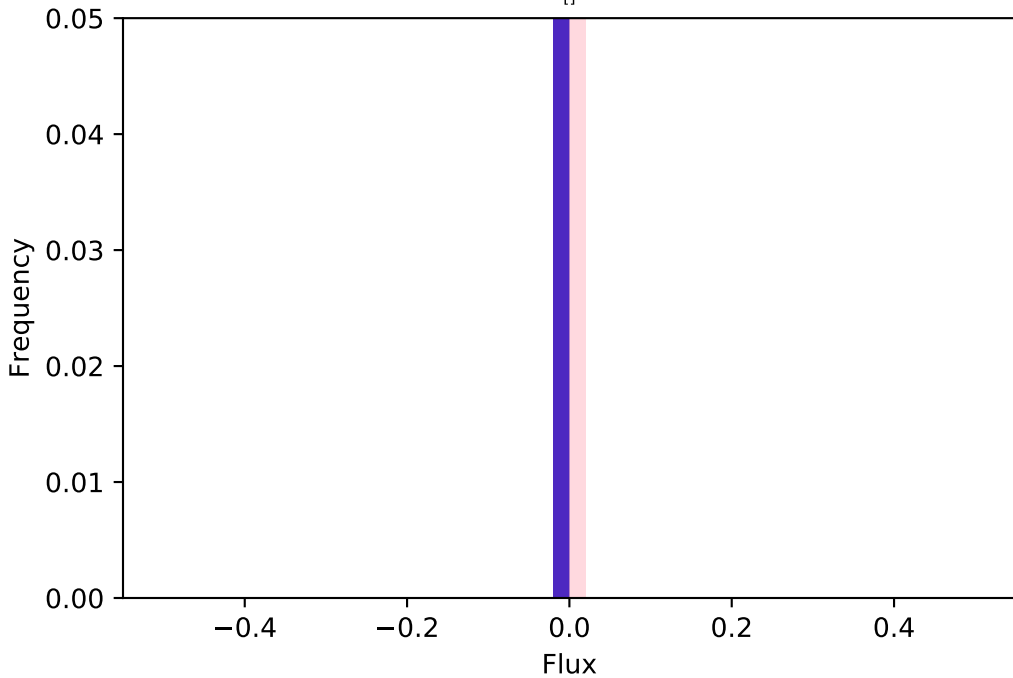




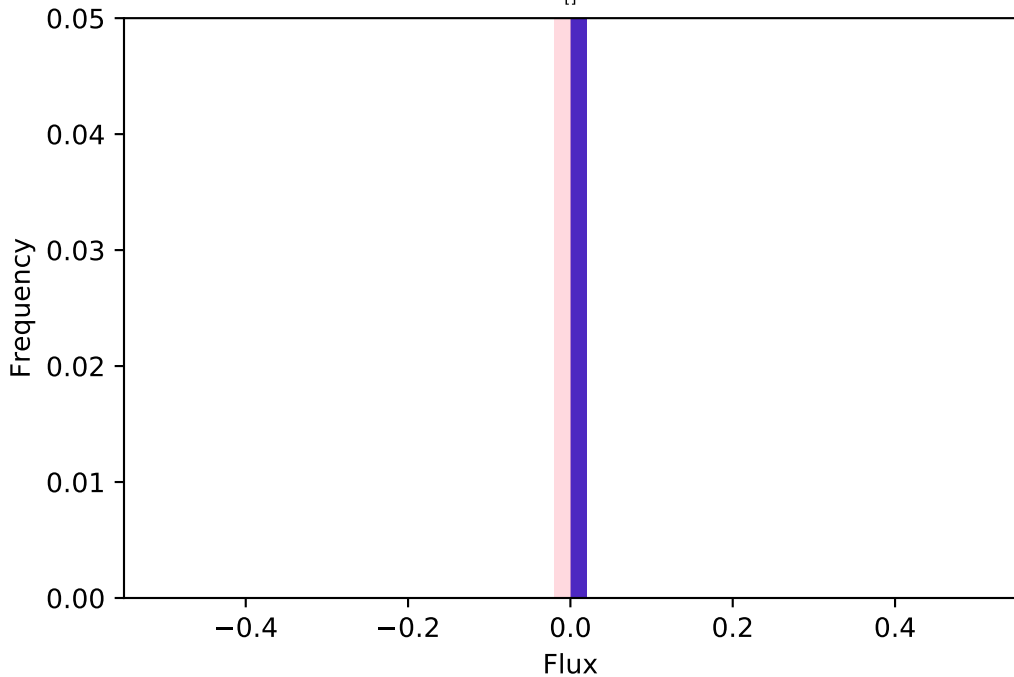
194 : GCA\_h + O2\_h --> GLX\_h + H2O2\_h  
[]



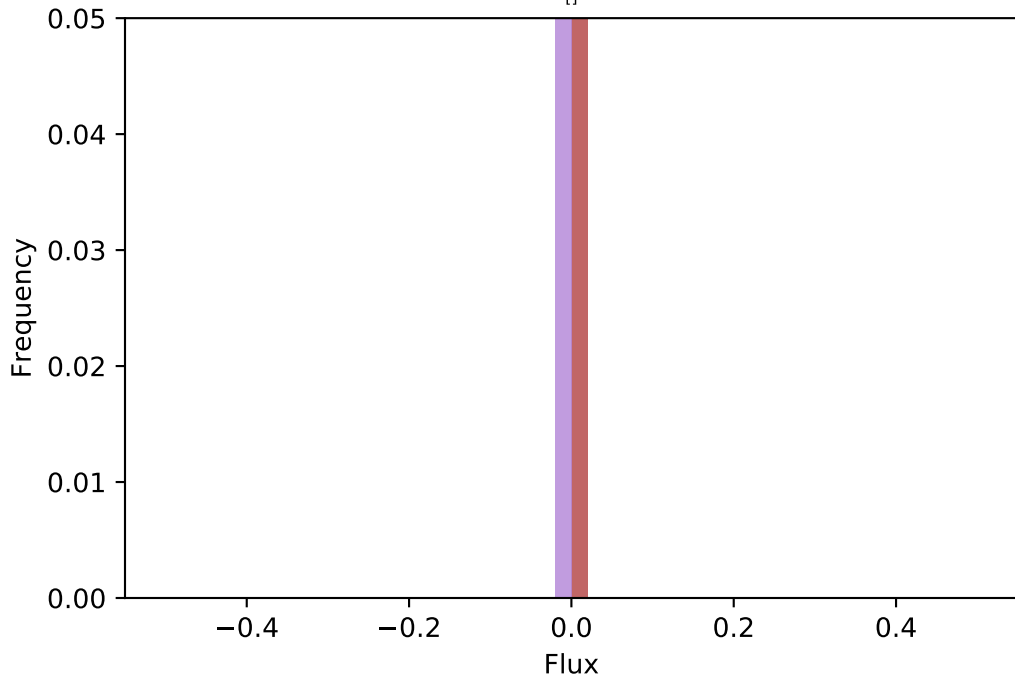
195 : 2.0 H2O2\_h --> 2.0 H2O\_h + O2\_h  
[ ]



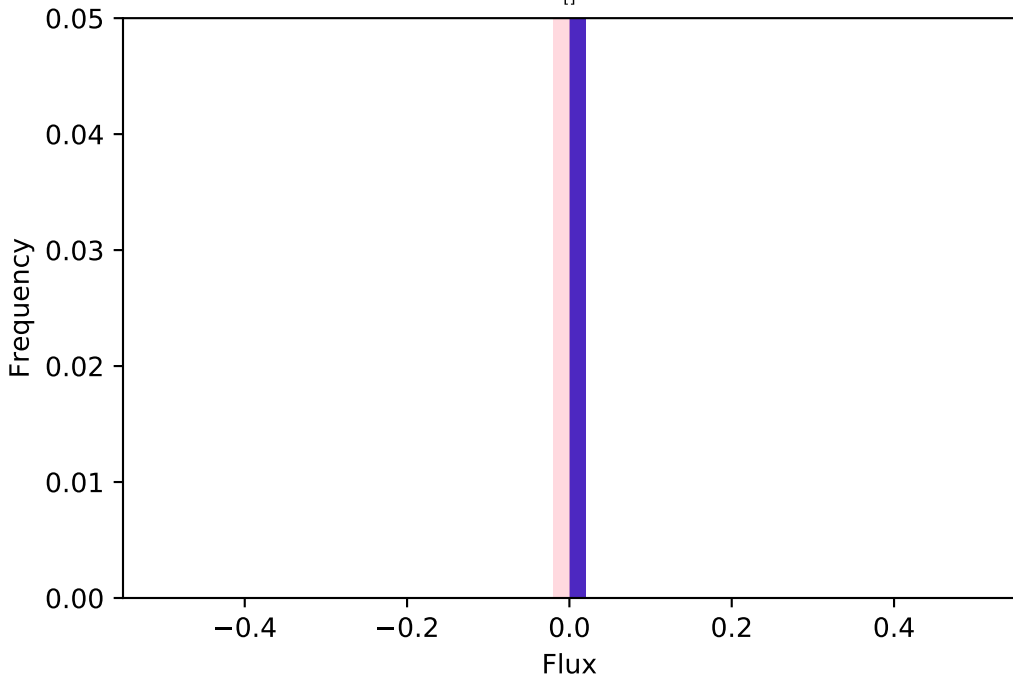
196 : GLX\_h + Ser\_h --> Gly\_h + HPR\_h  
[ ]



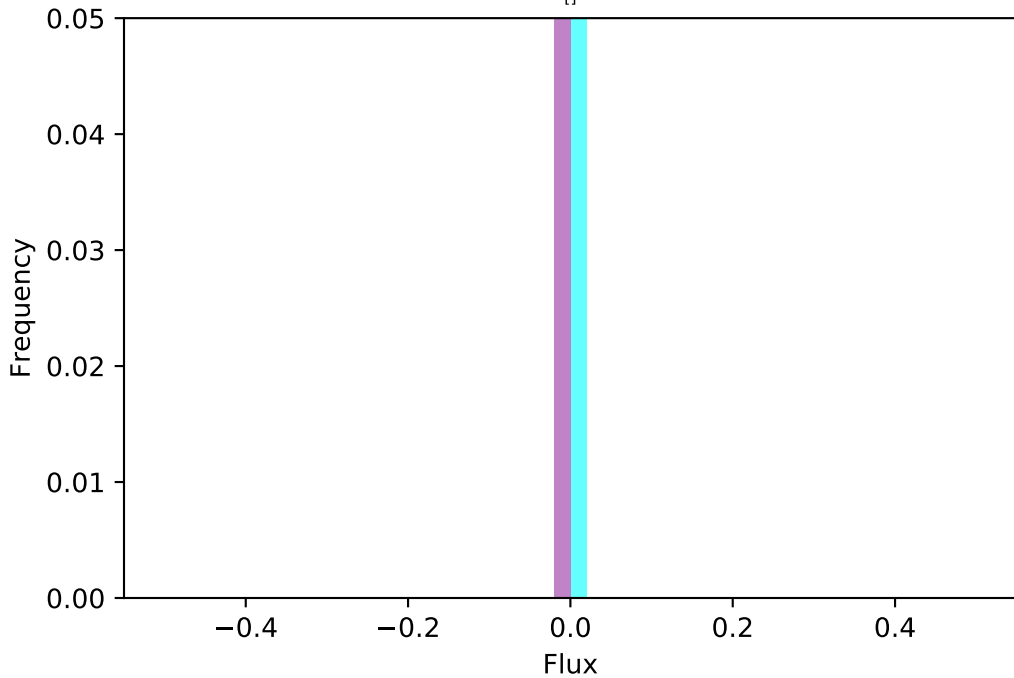
197 : HPR\_h + H\_h + NADH\_h --> GCEA\_h + NAD\_h  
[]



198 : GLX\_h + Glu\_h --> Gly\_h + KG\_h  
[ ]

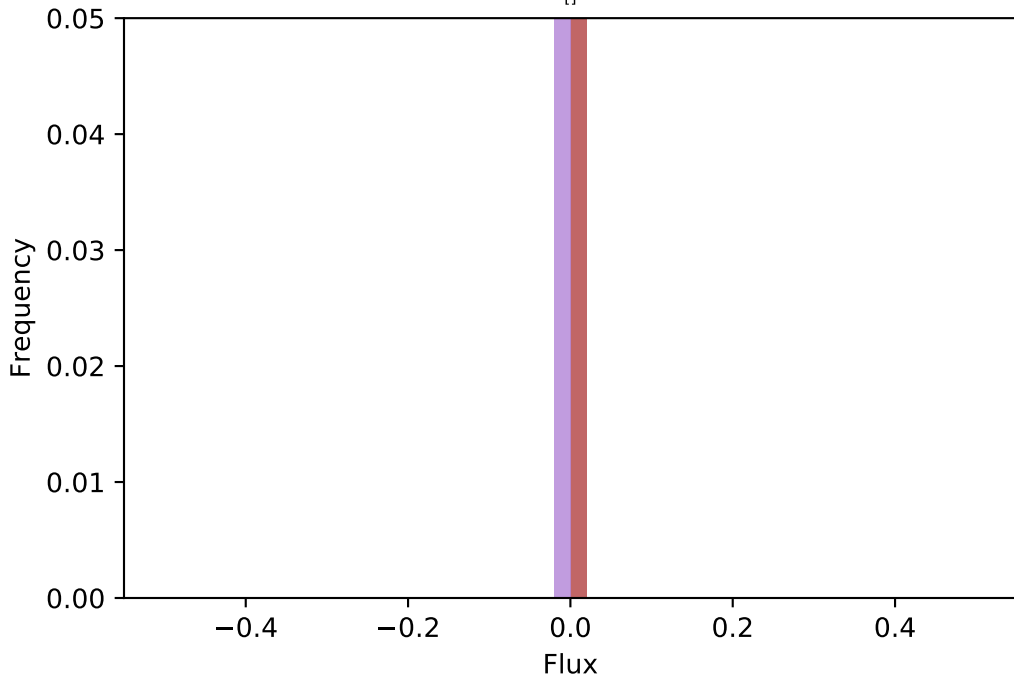


199 : ATP\_h + PRPP\_h --> H<sub>2</sub>O + PPI\_h + PR\_DASH\_ATP\_h  
[ ]

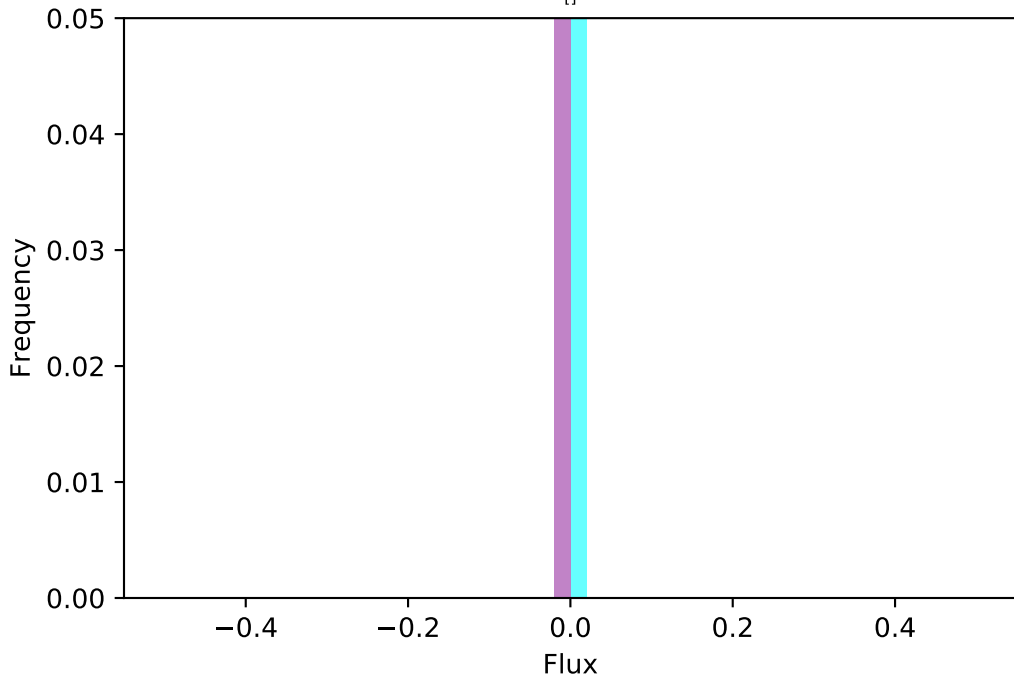




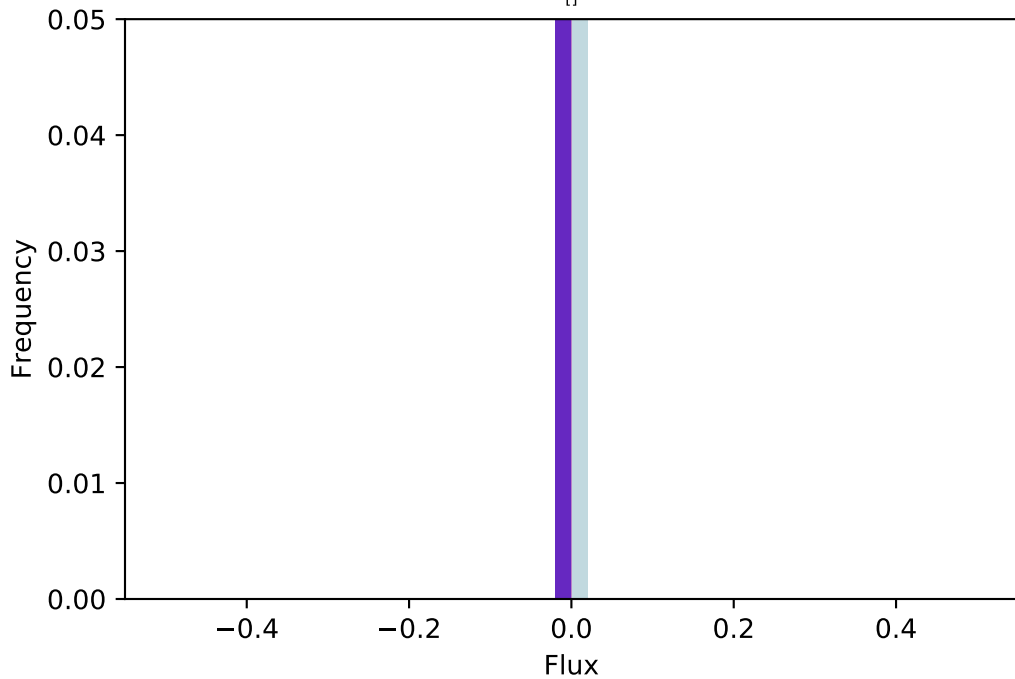
200 : H<sub>2</sub>O<sub>h</sub> + PR\_DASH\_ATP<sub>h</sub> --> 2.0 H<sub>h</sub> + PPI<sub>h</sub> + PR\_DASH\_AMP<sub>h</sub>  
[ ]



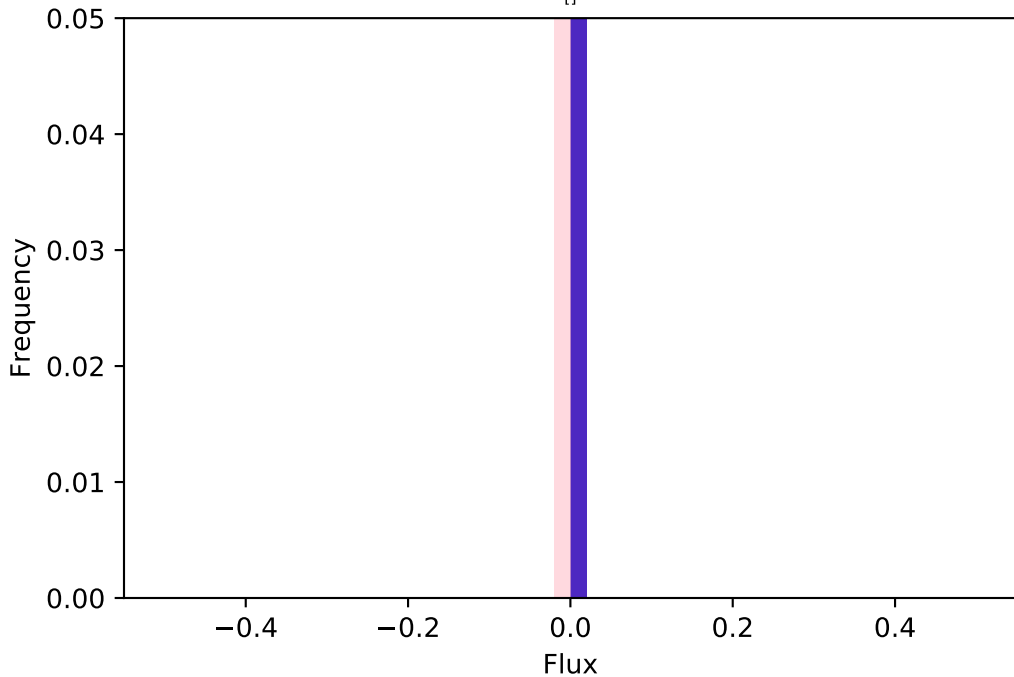
201 : H2O\_h + PR\_DASH\_AMP\_h --> P\_DASH\_AICAR\_DASH\_P\_h  
[]



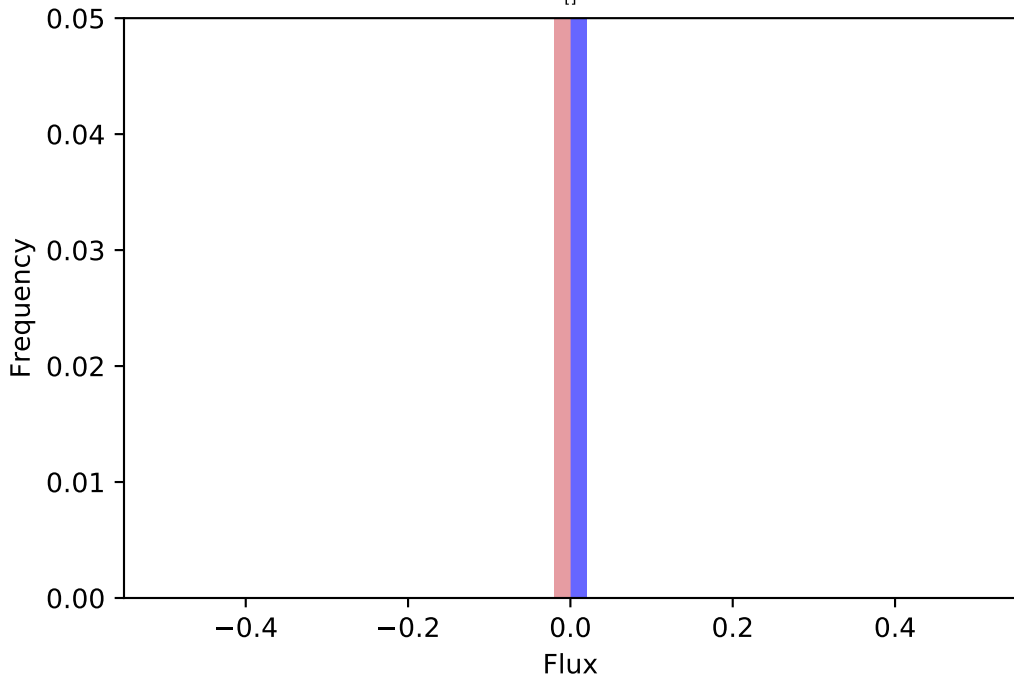
202 : P\_DASH\_AICAR\_DASH\_P\_h --> Pu\_DASH\_AICAR\_DASH\_P\_h  
[]



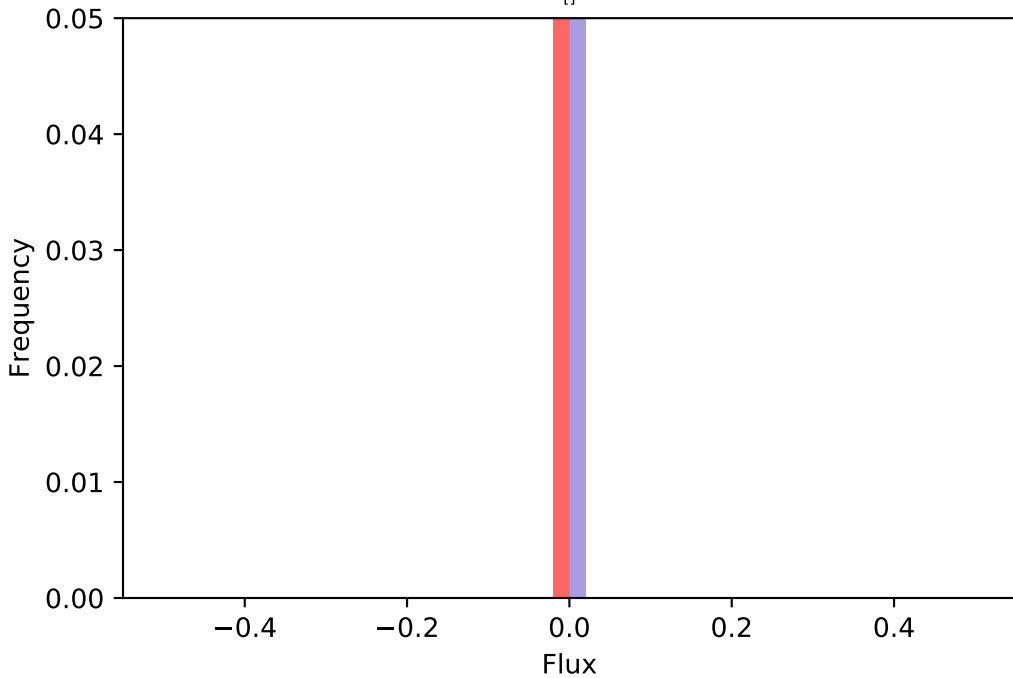
203 : Gln\_h + Pu\_DASH\_AICAR\_DASH\_P\_h --> AICAR\_h + EIGP\_h + Glu\_h  
[ ]



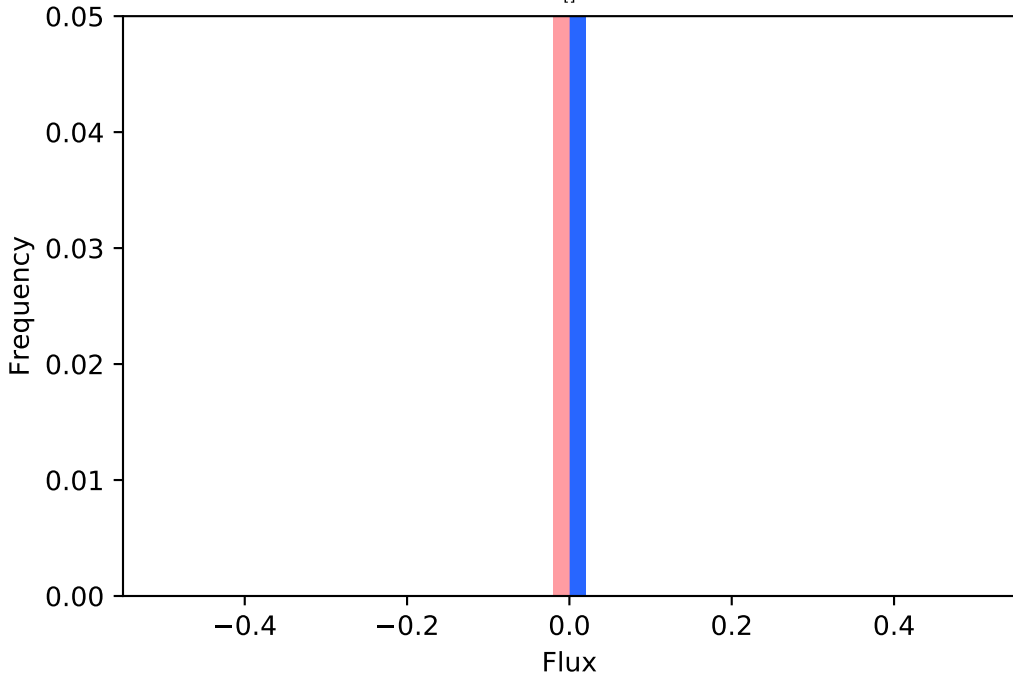
204 : EIGP\_h --> H2O\_h + IA\_DASH\_P\_h  
[]



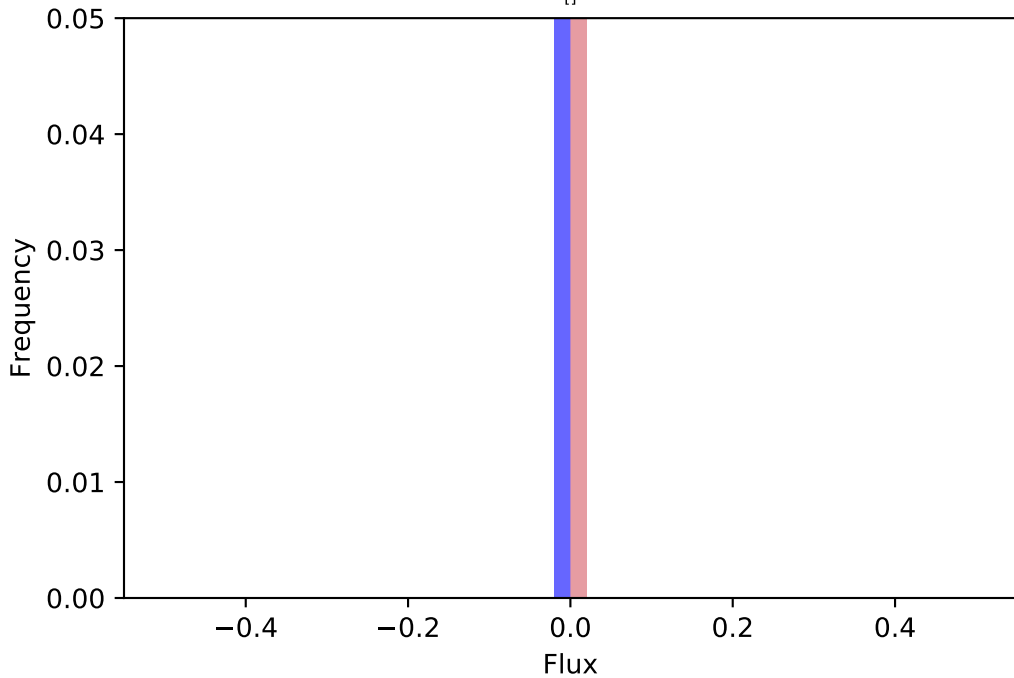
205 : Glu\_h + IA\_DASH\_P\_h --> Hisol\_DASH\_P\_h + KG\_h  
[]



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

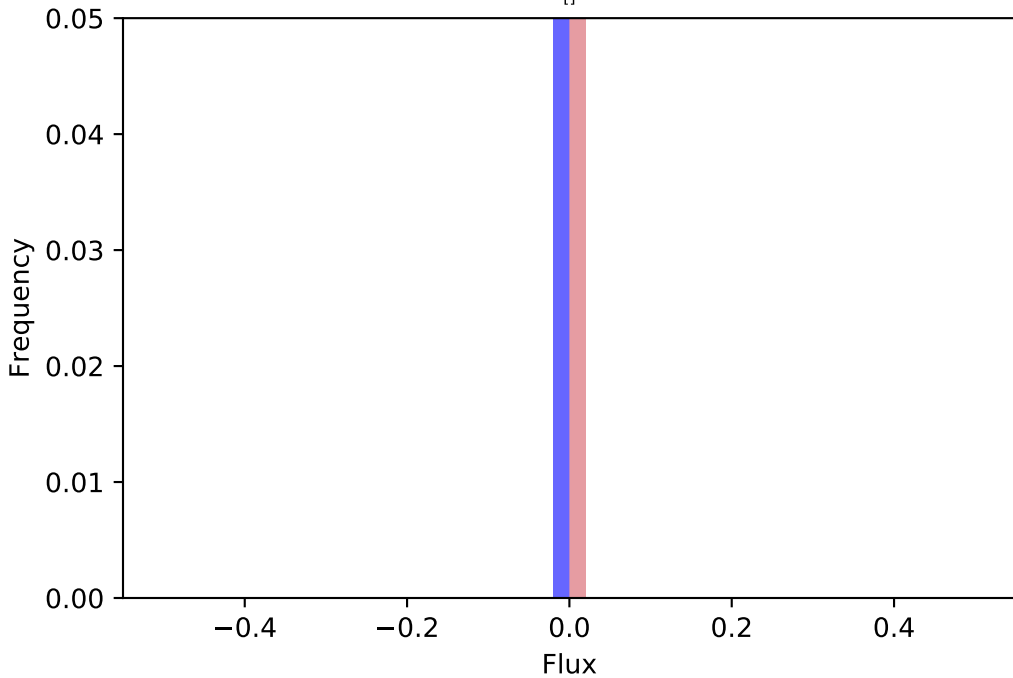


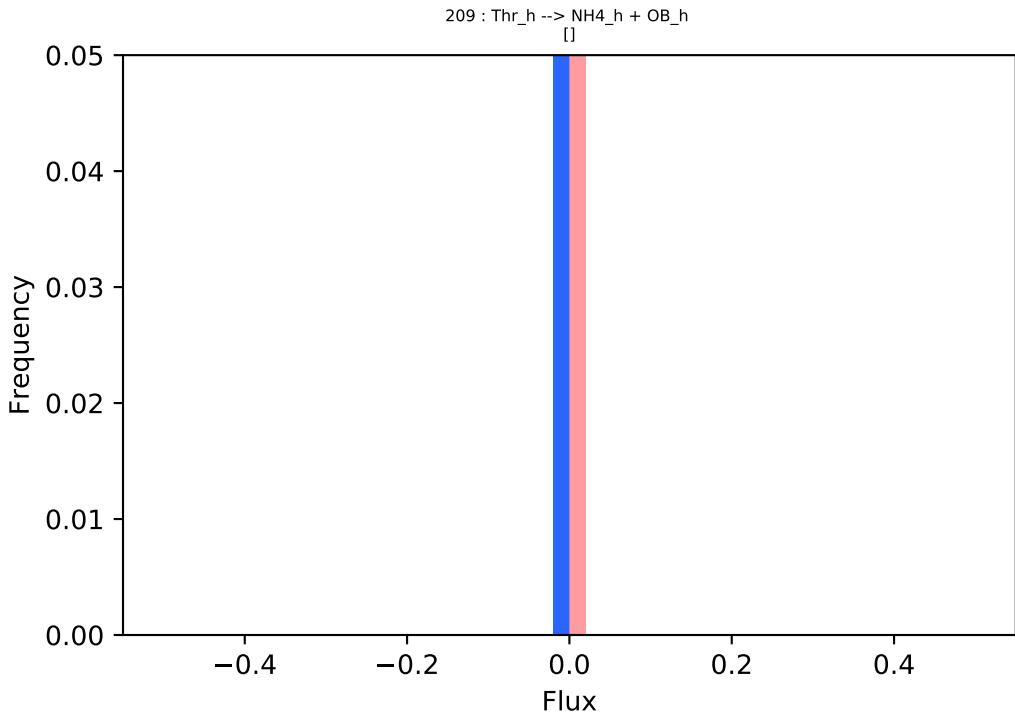
207 : Hisol\_h + NAD\_h --> 2.0 H\_h + Hisal\_h + NADH\_h  
[ ]



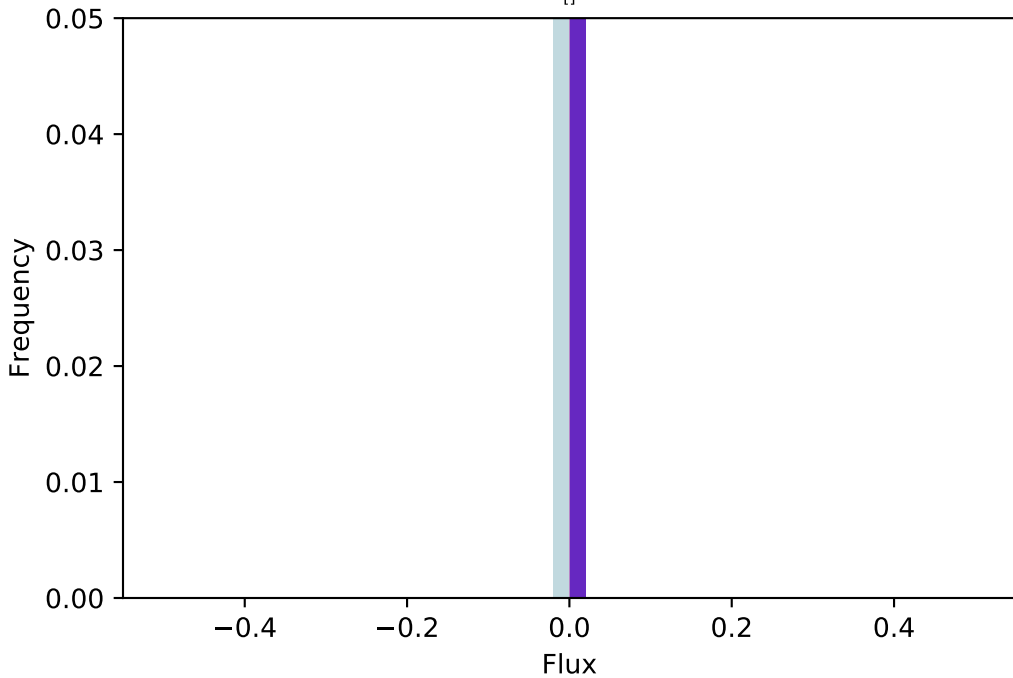


208 : H<sub>2</sub>O<sub>h</sub> + Hisal<sub>h</sub> + NAD<sub>h</sub> --> H<sub>h</sub> + His<sub>h</sub> + NADH<sub>h</sub>  
[ ]

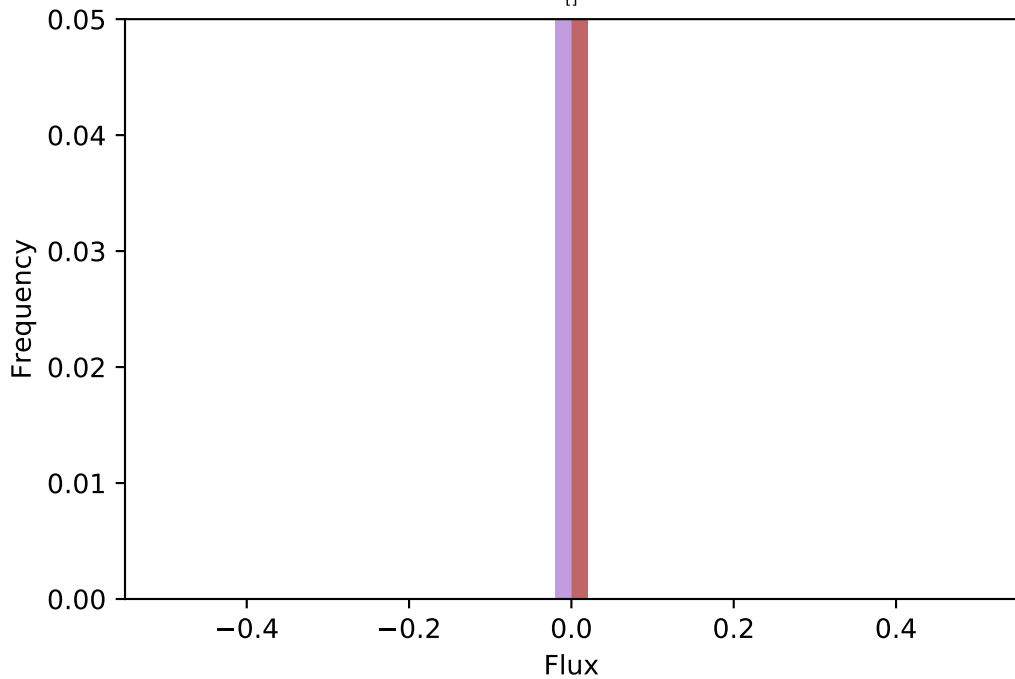




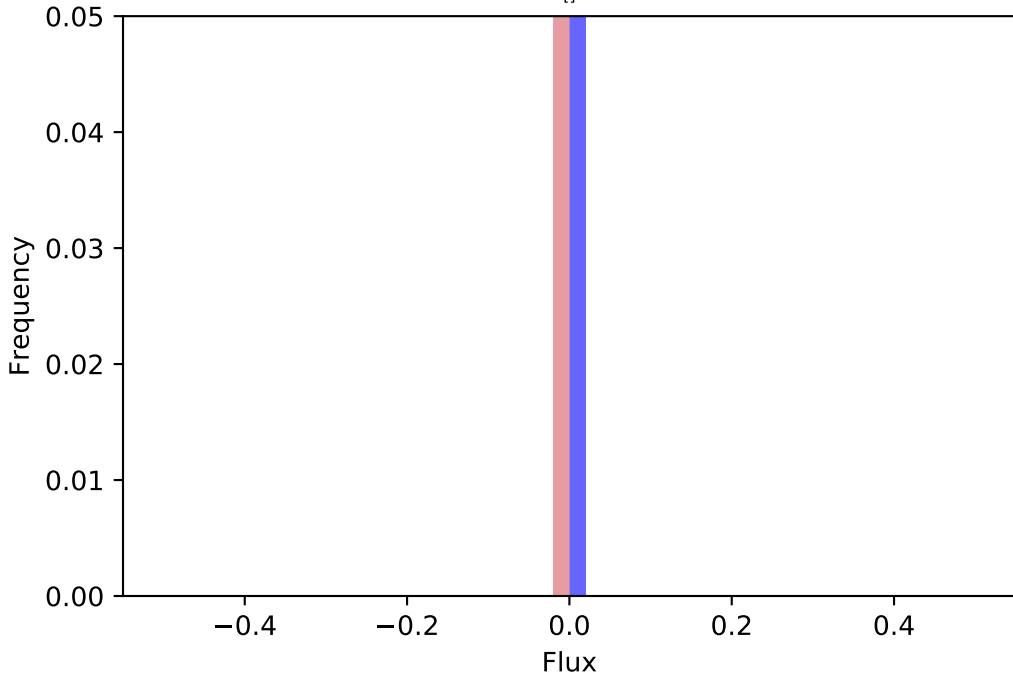
210 : H\_h + Pyr\_h + ThPP\_h --> CO2\_h + H\_DASH\_Eth\_DASH\_ThPP\_h  
[]



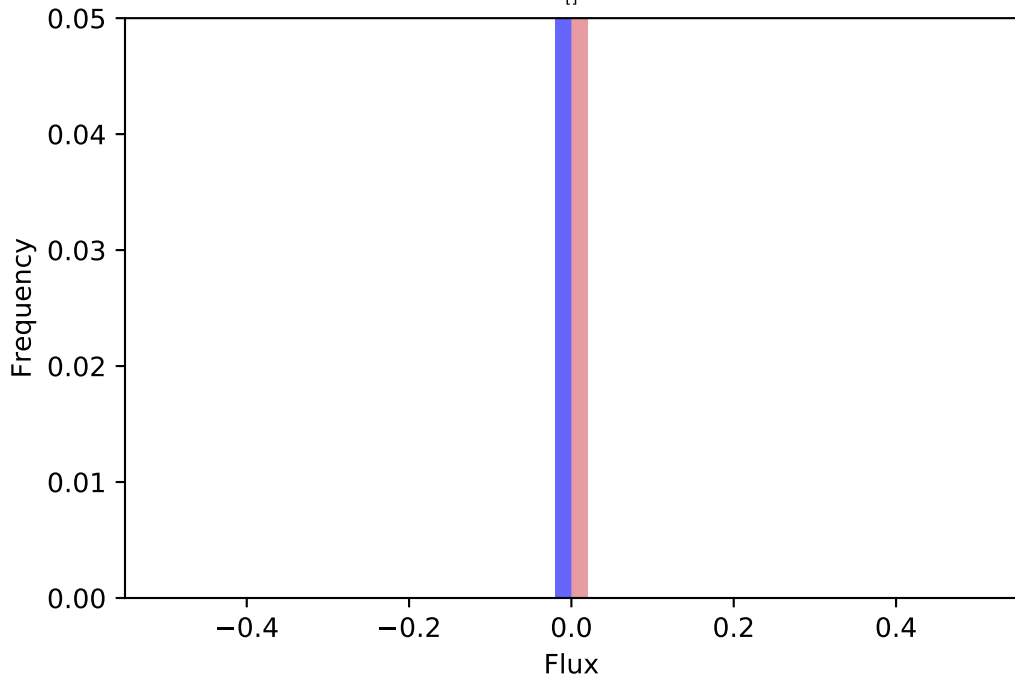
211 : H\_DASH\_Eth\_DASH\_ThPP\_h + OB\_h --> AHB\_h + ThPP\_h  
[ ]



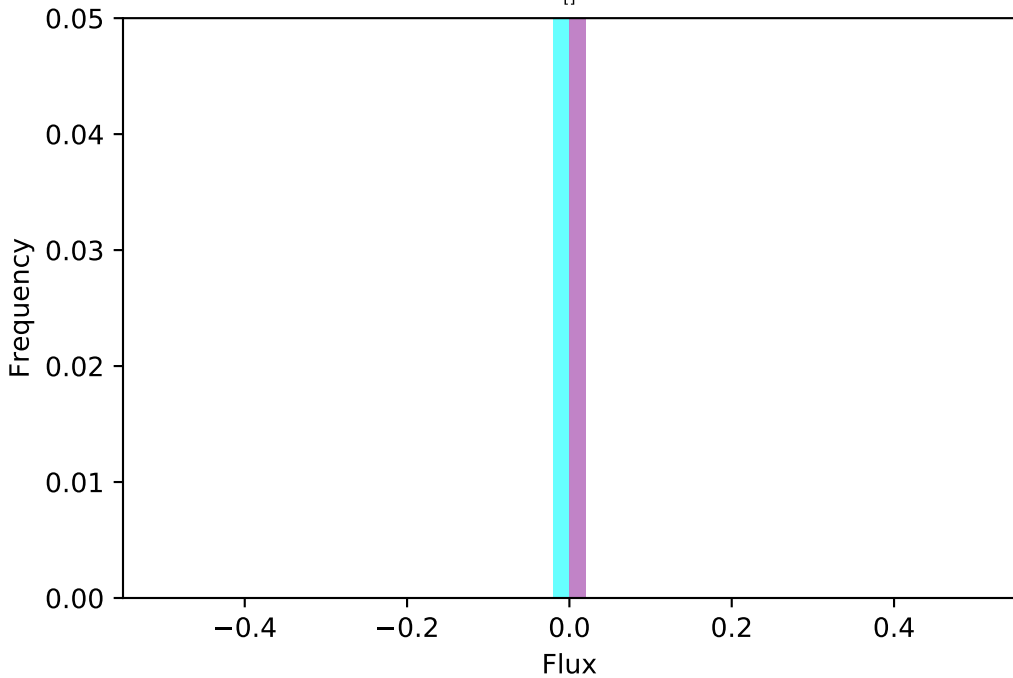
212 : AHB\_h --> HMOP\_h  
[]



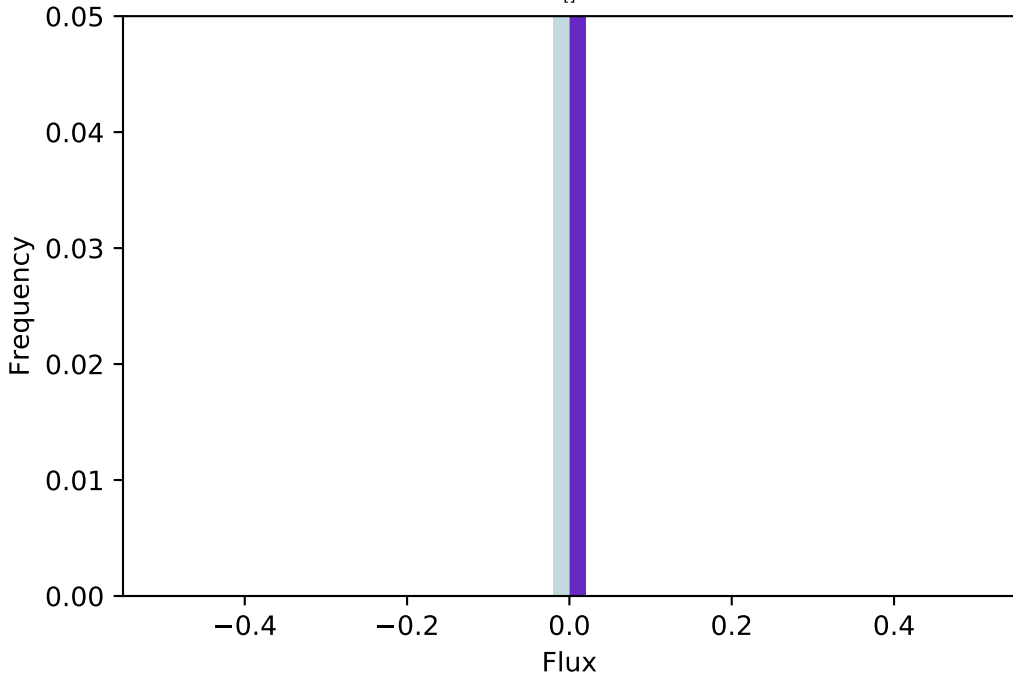
213 : HMOP\_h + H\_h + NADPH\_h --> DHMP\_h + NADP\_h  
[]



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

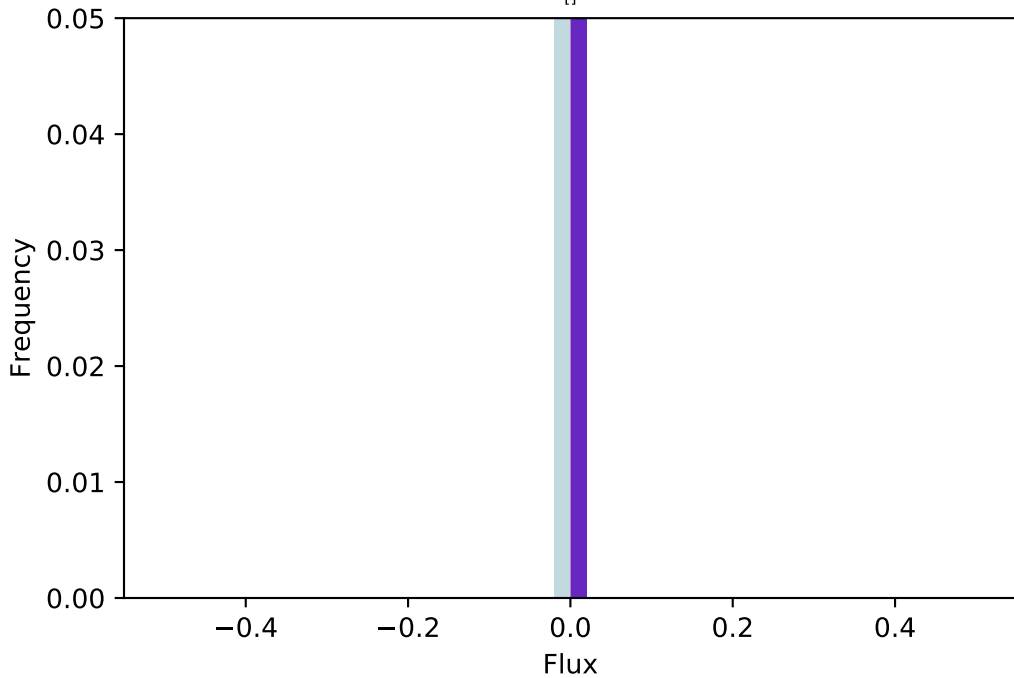


215 : Glu\_h + MOP\_h --> Ile\_h + KG\_h  
[]

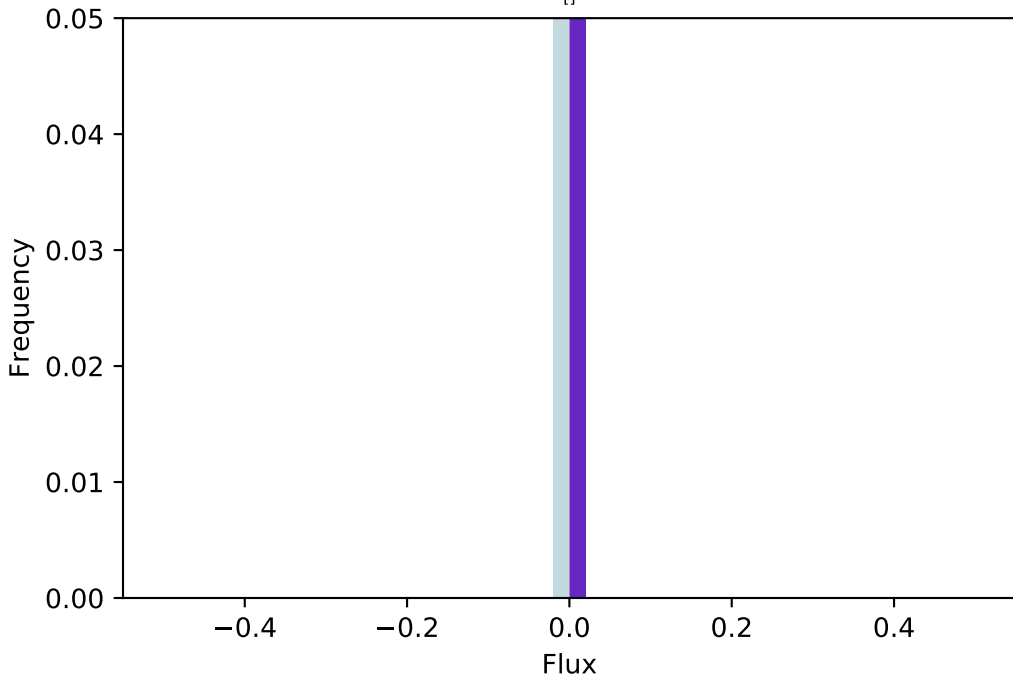




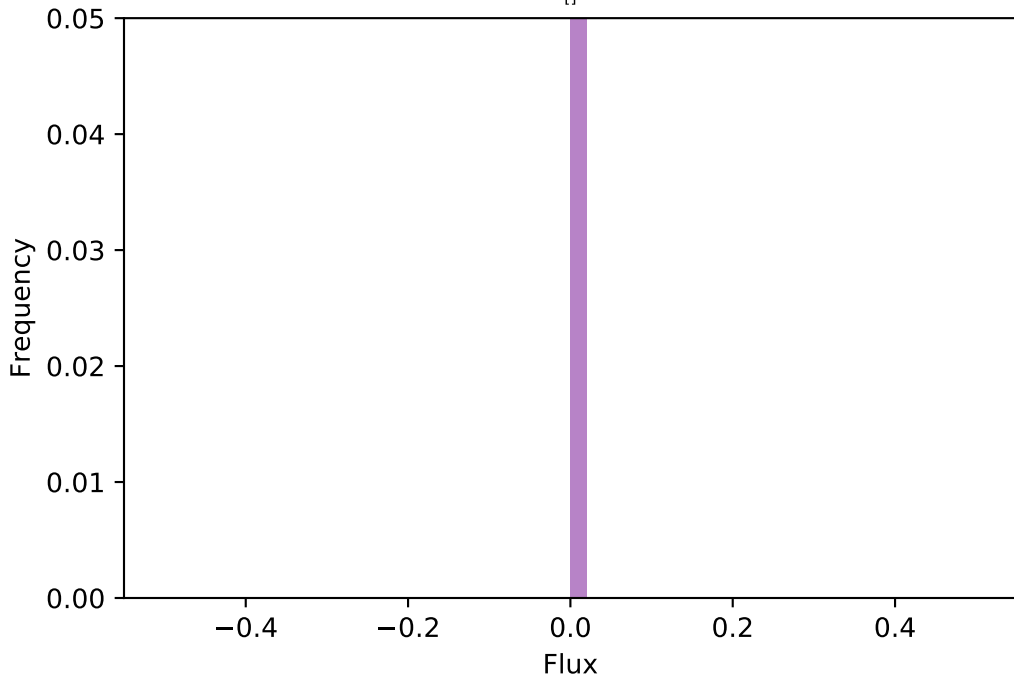
216 : H\_DASH\_Eth\_DASH\_ThPP\_h + Pyr\_h --> AL\_h + ThPP\_h  
[ ]



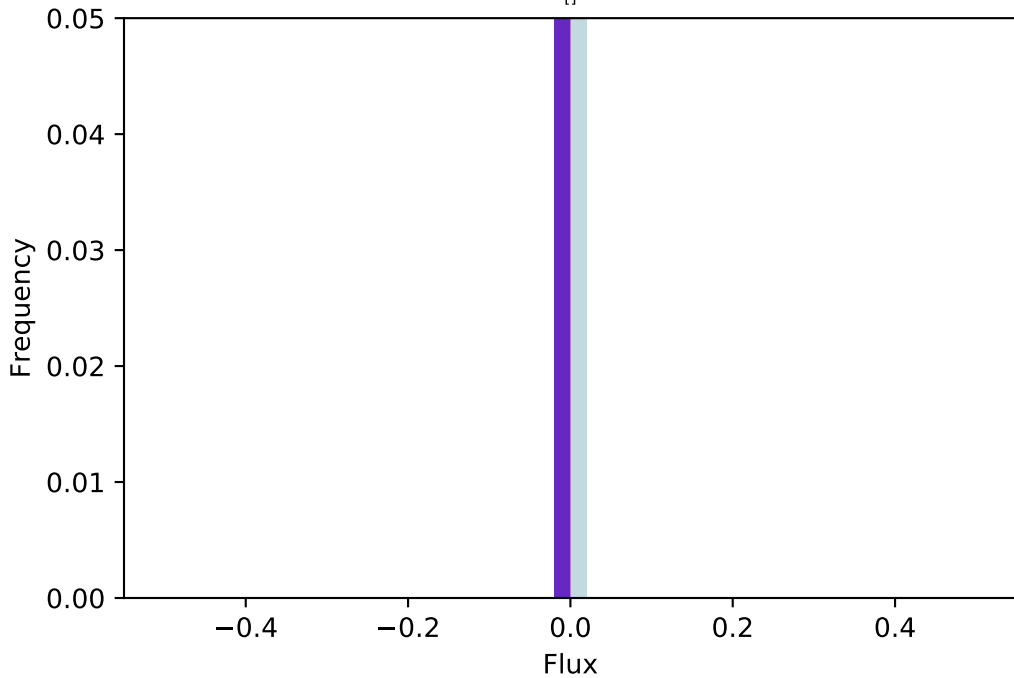
217 : AL\_h --> HMOB\_h  
[]



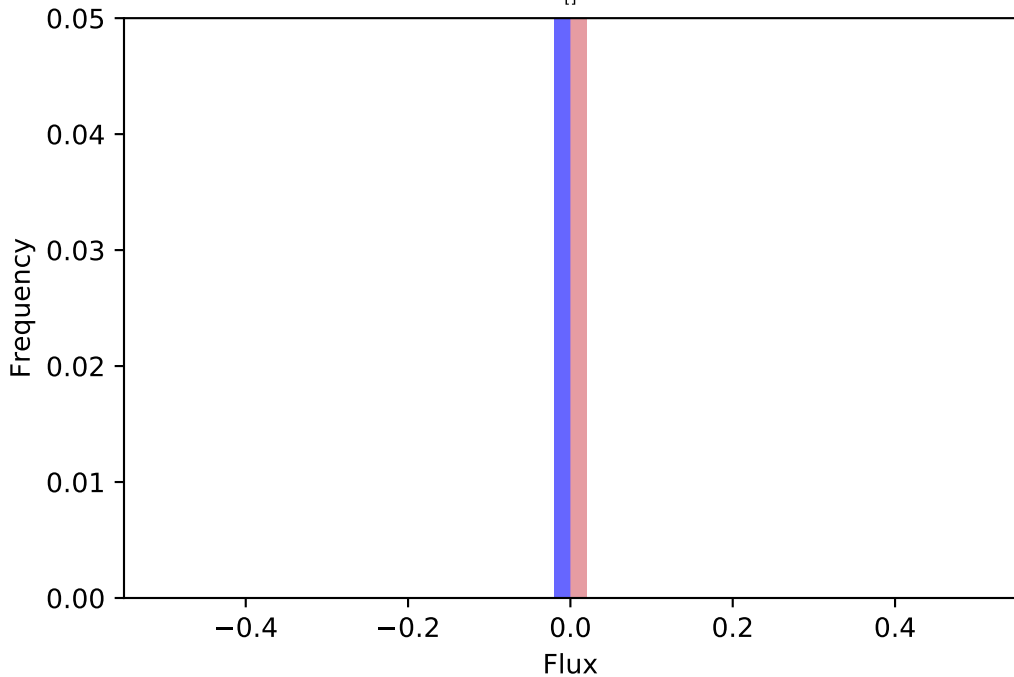
218 : HMOB\_h + H\_h + NADPH\_h --> DHMB\_h + NADP\_h  
[]



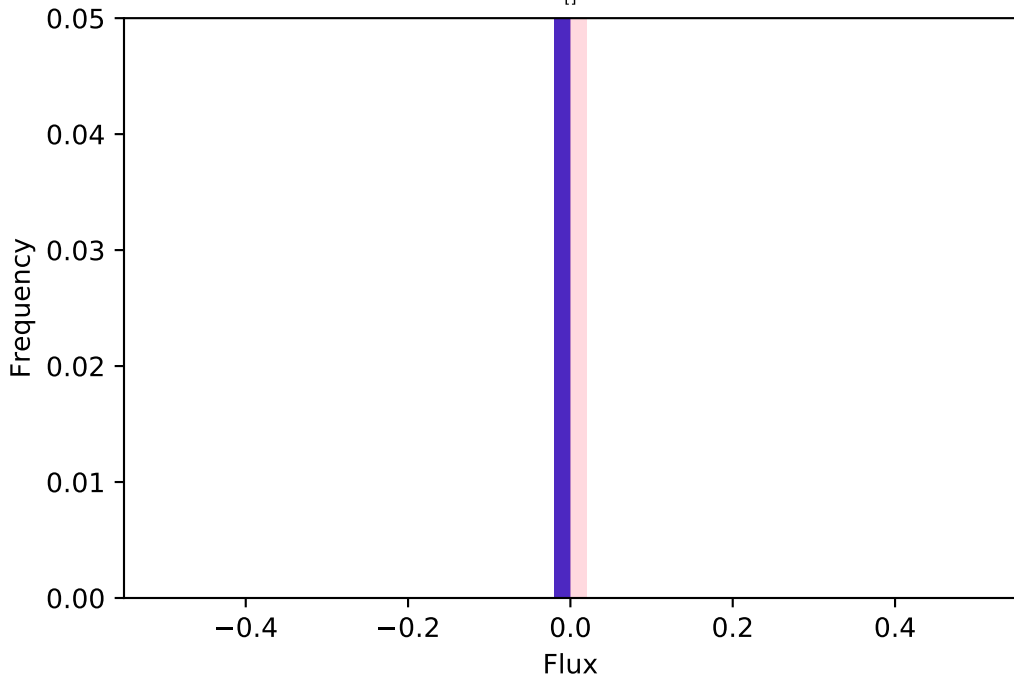
219 : DHMB\_h --> H2O\_h + MOB\_h  
[ ]



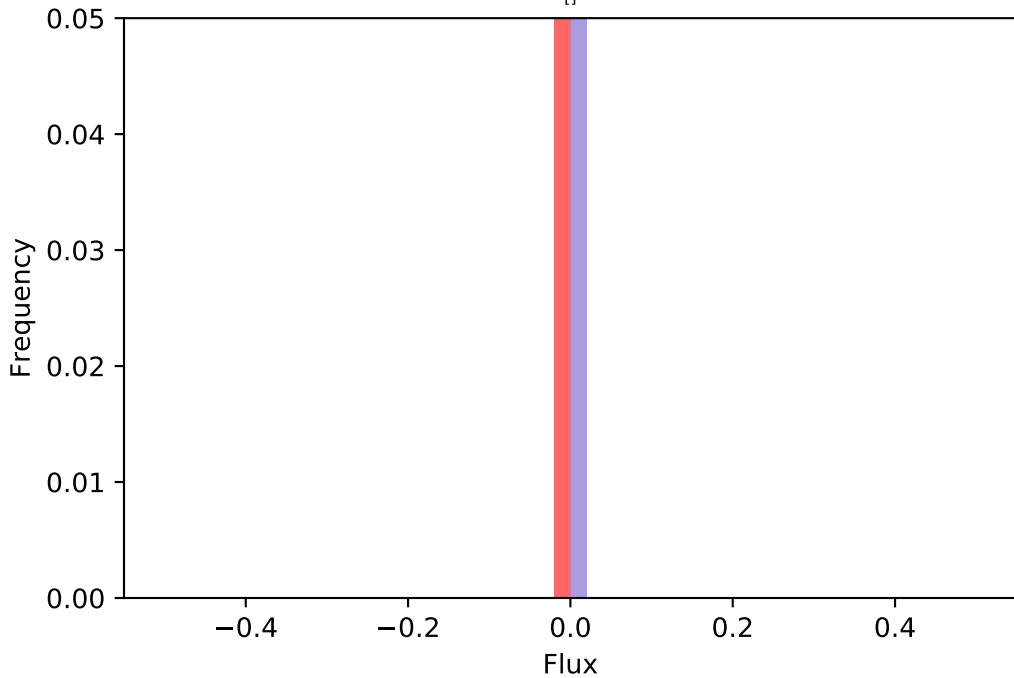
220 : A\_DASH\_CoA\_h + H2O\_h + MOB\_h --> 2IPM\_h + CoA\_h + H\_h  
[ ]



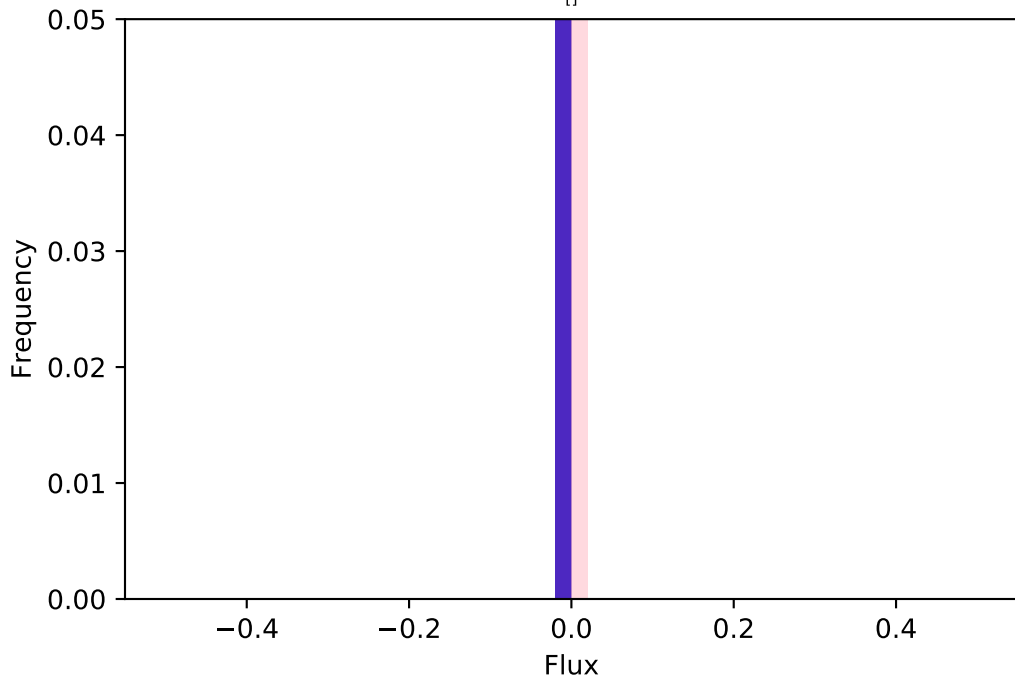
221 : 2IPM\_h --> H2O\_h + IPM\_h  
[]



222 : H2O\_h + IPM\_h --> 3IPM\_h  
[]

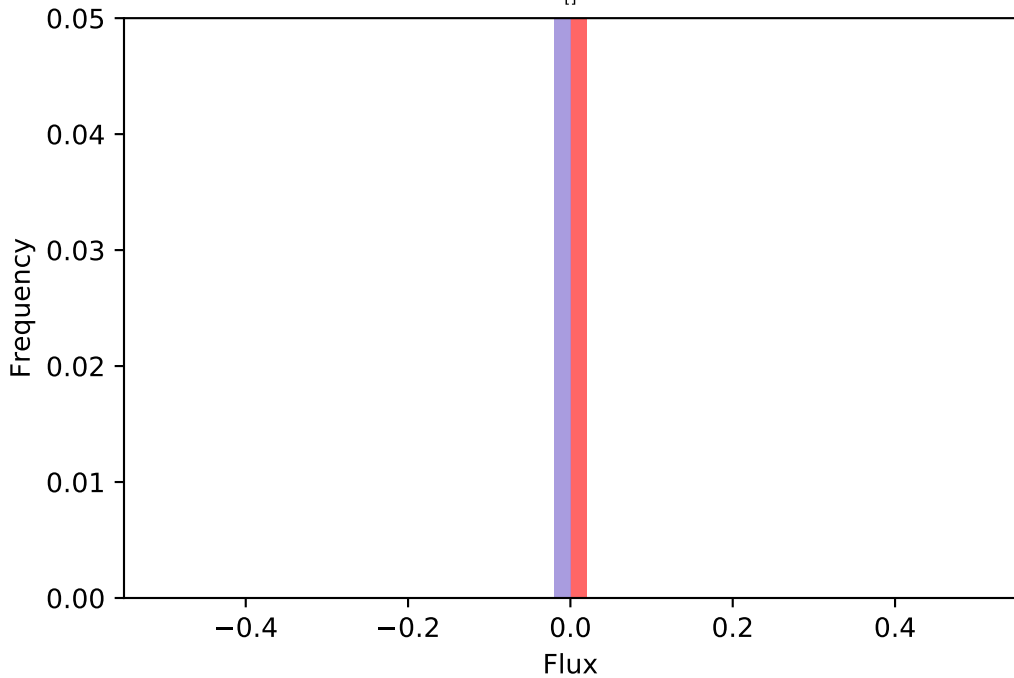


223 : 3IPM\_h + NAD\_h --> H\_h + IPO\_h + NADH\_h  
[ ]

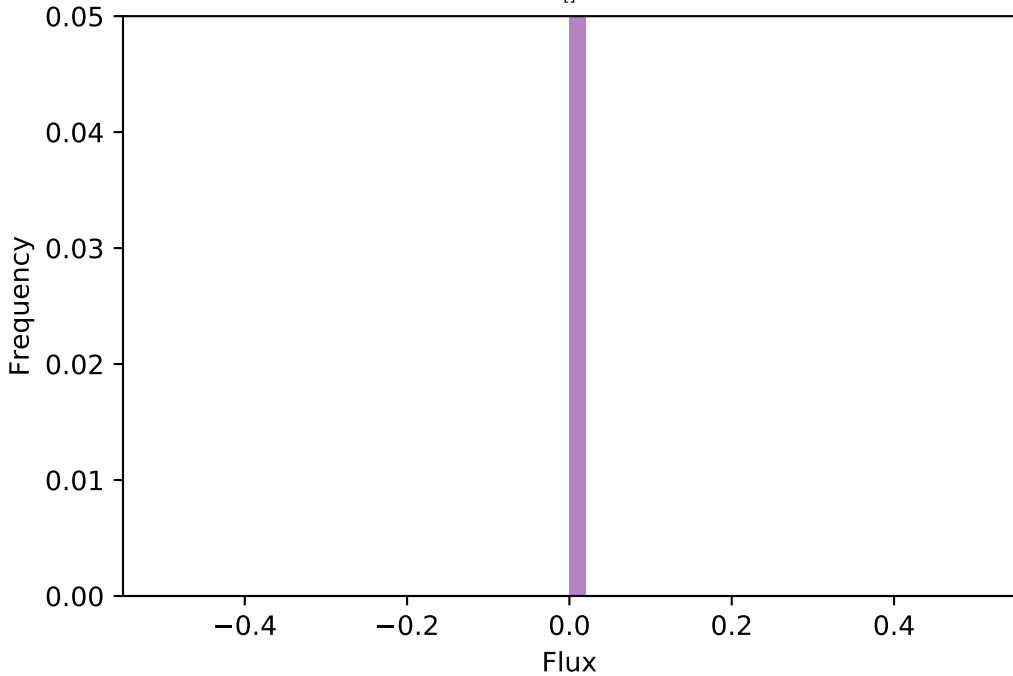




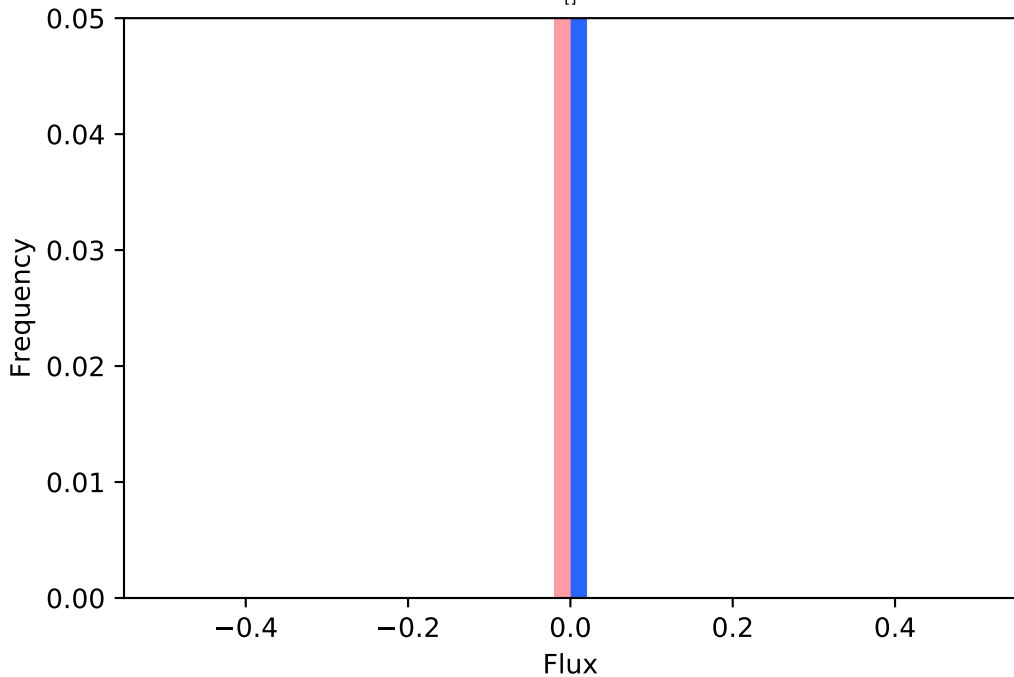
224 : H\_h + IPO\_h --> 4MOP\_h + CO2\_h  
[]



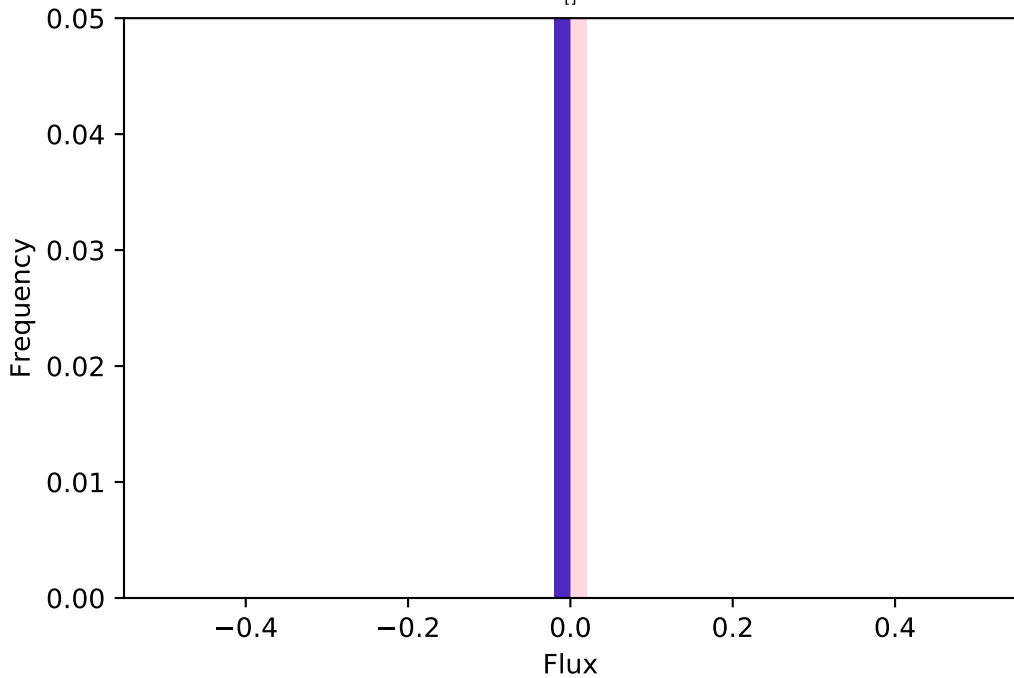
225 : 4MOP\_h + Glu\_h --> KG\_h + Leu\_h  
[]



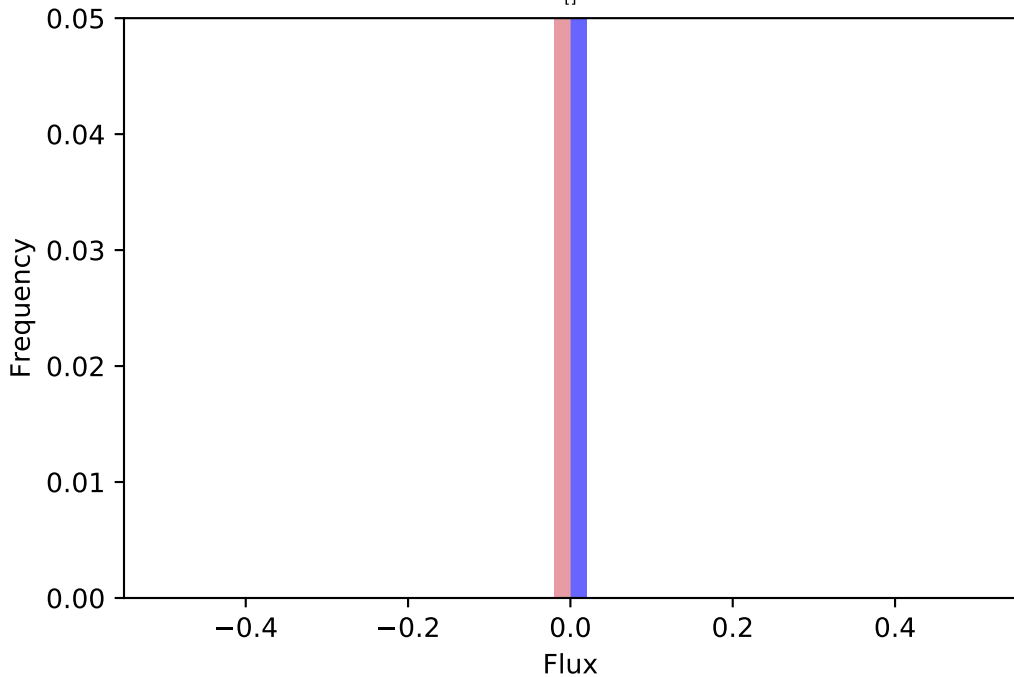
226 : ATP\_h + Asp\_h --> ADP\_h + AspP\_h  
[ ]



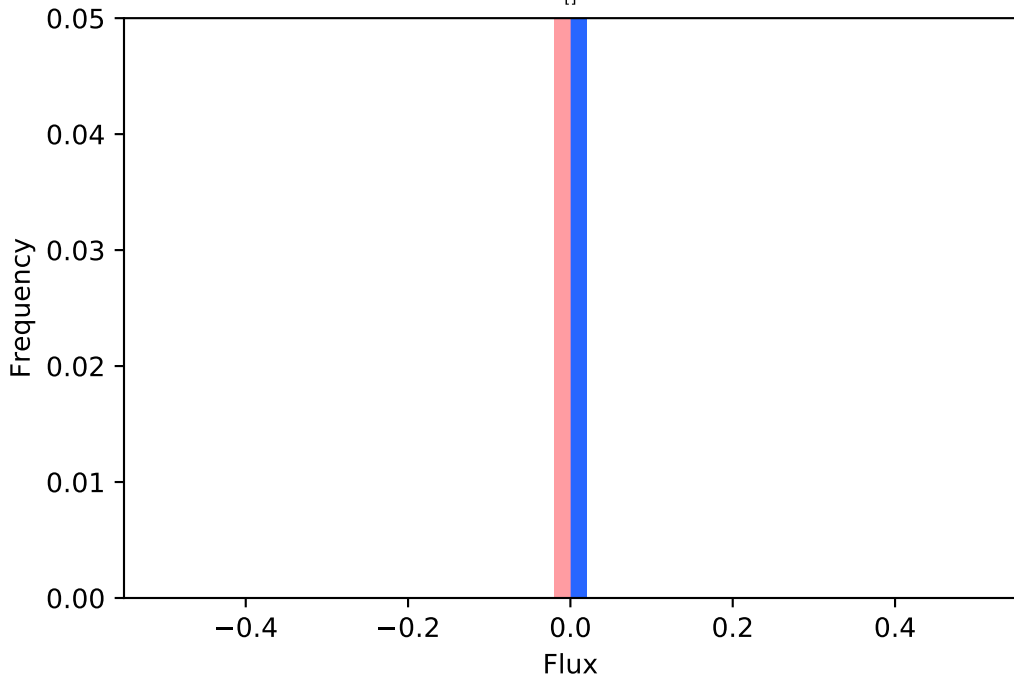
227 : AspP\_h + H\_h + NADPH\_h --> Asp\_DASH\_SeA\_h + NADP\_h + Pi\_h  
[ ]



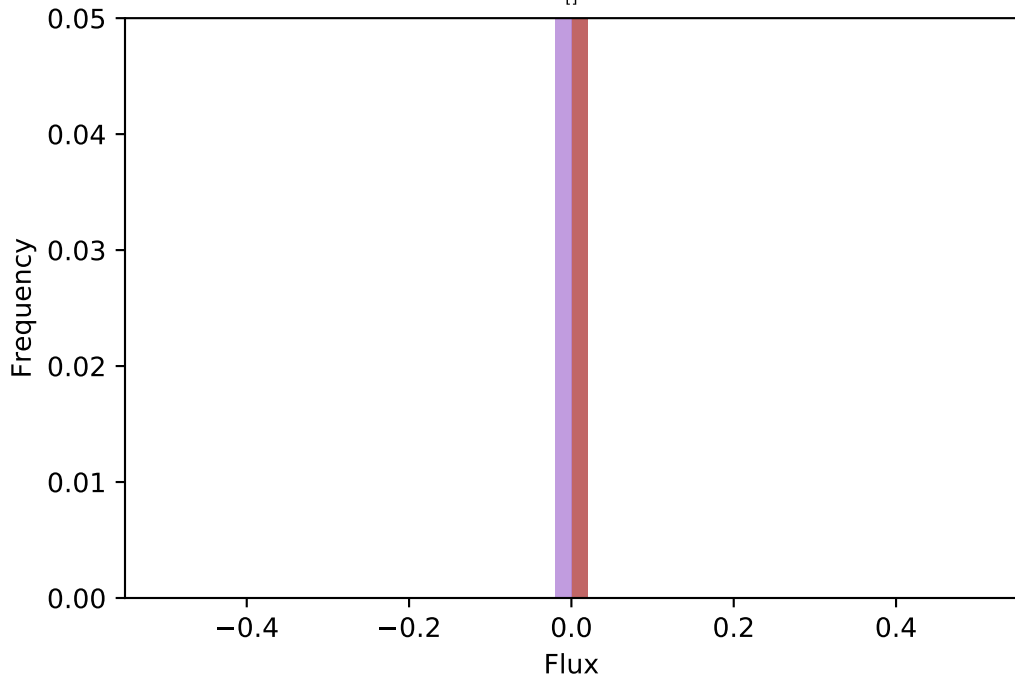
228 : Asp\_DASH\_SeA\_h + Pyr\_h --> DHD\_h + 2.0 H2O\_h + H\_h  
[ ]



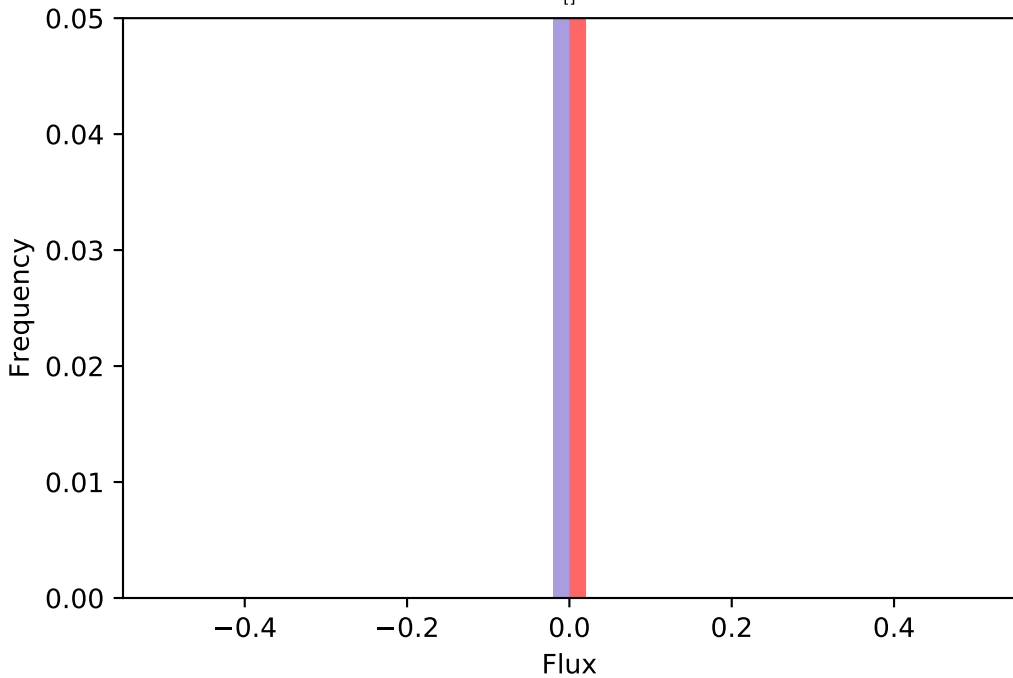
229 : DHD\_h + H\_h + NADH\_h --> NAD\_h + THD\_h  
[]



230 : DHD\_h + H\_h + NADPH\_h --> NADP\_h + THD\_h  
[]

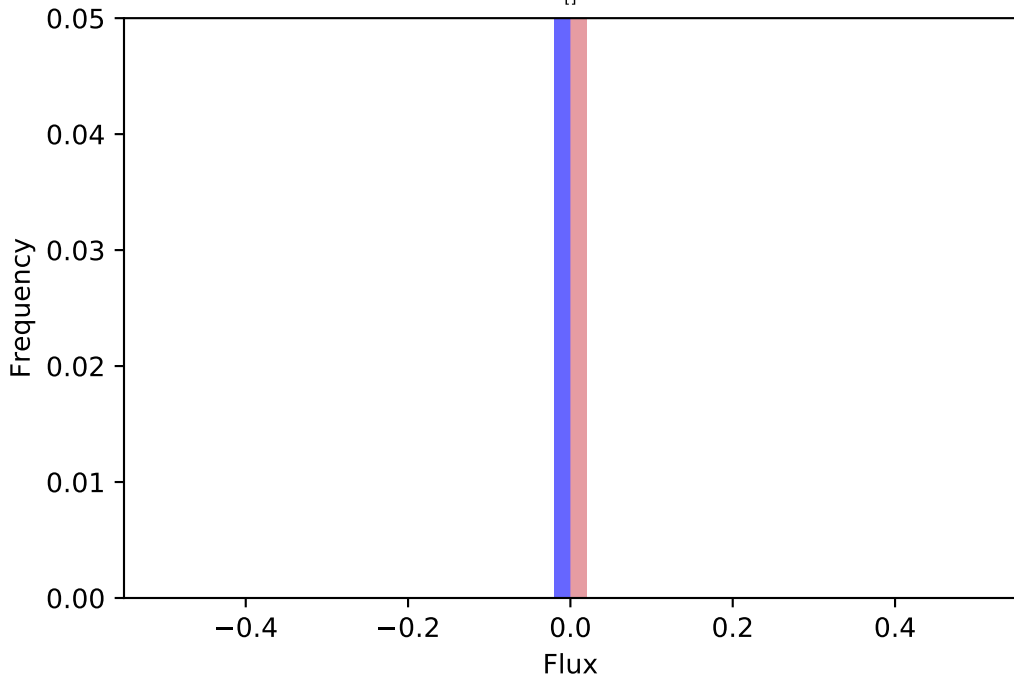


231 : Glu\_h + H2O\_h + H\_h + THD\_h --> DAP\_h + KG\_h  
[ ]

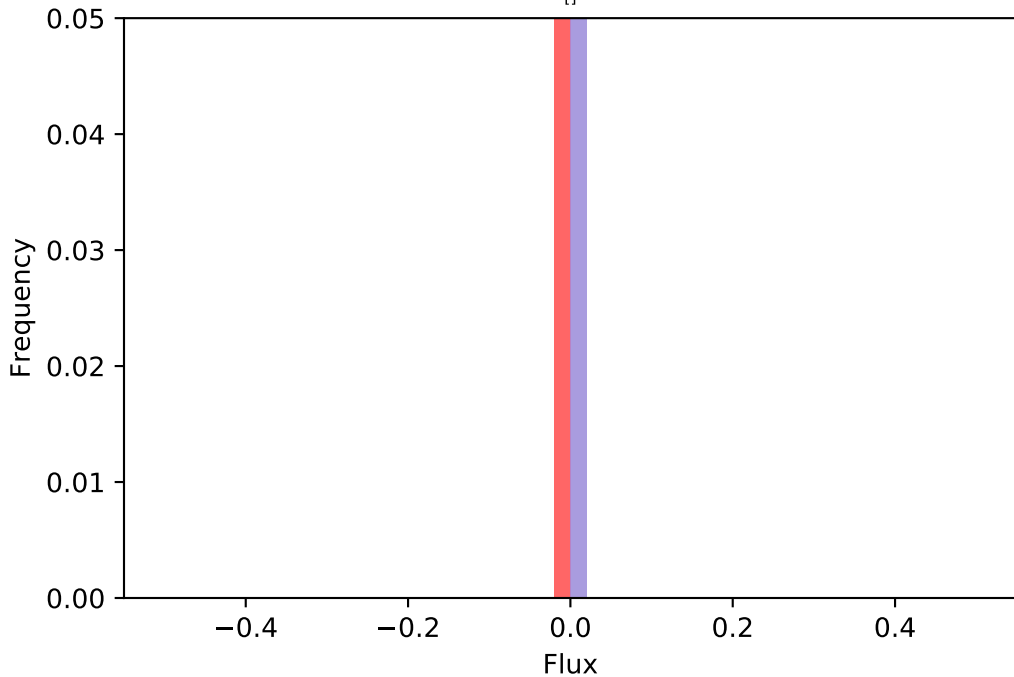




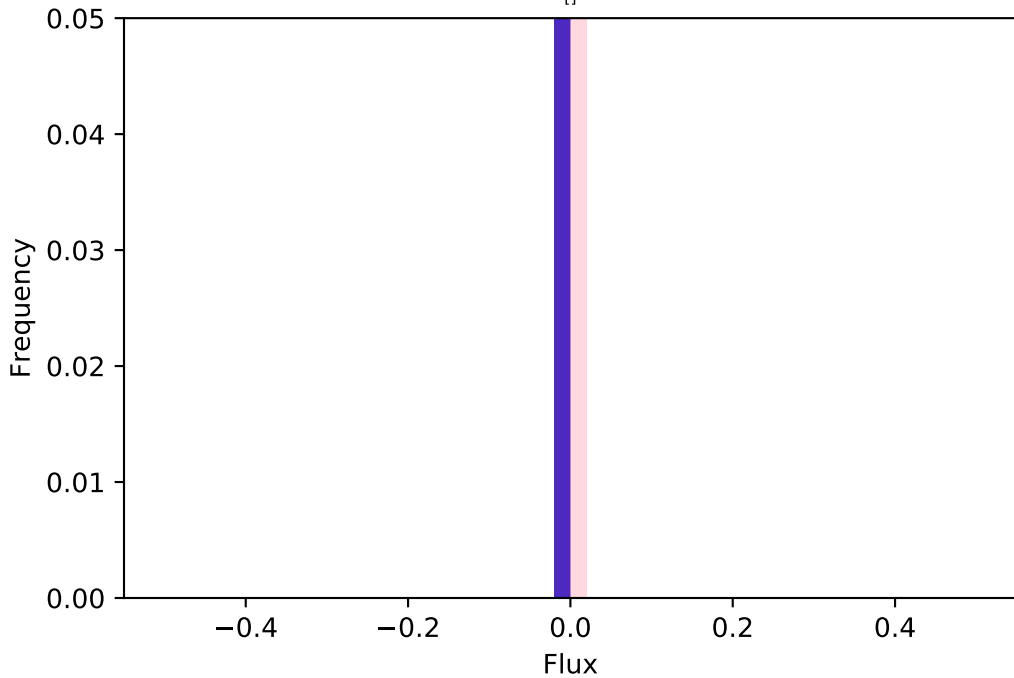
232 : DAP\_h --> mDAP\_h  
[]



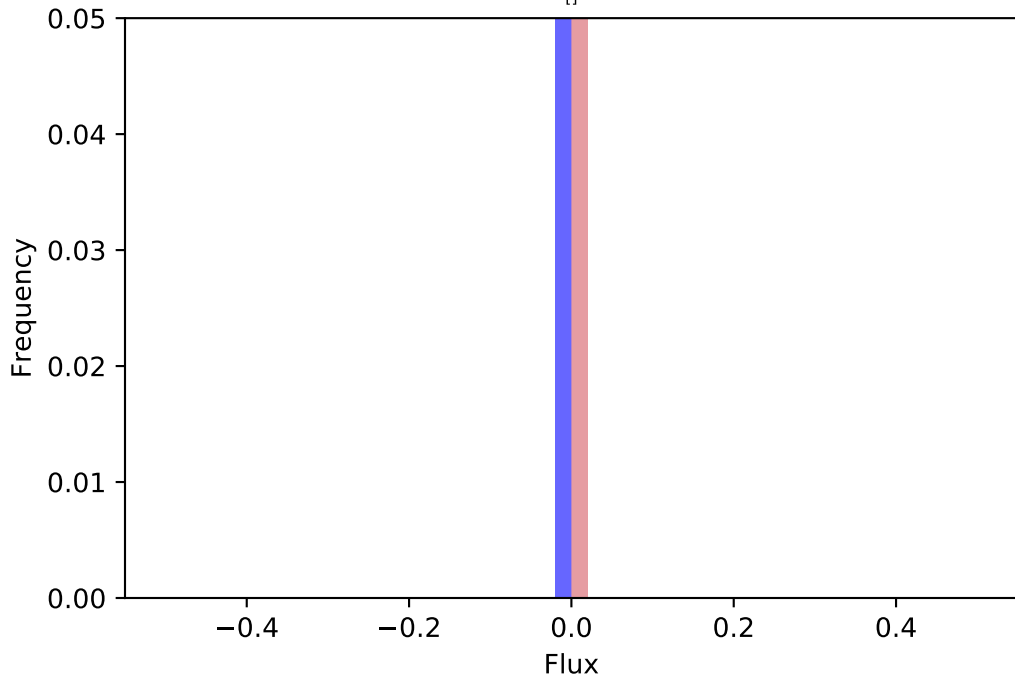
233 : H\_h + mDAP\_h --> CO2\_h + Lys\_h  
[ ]



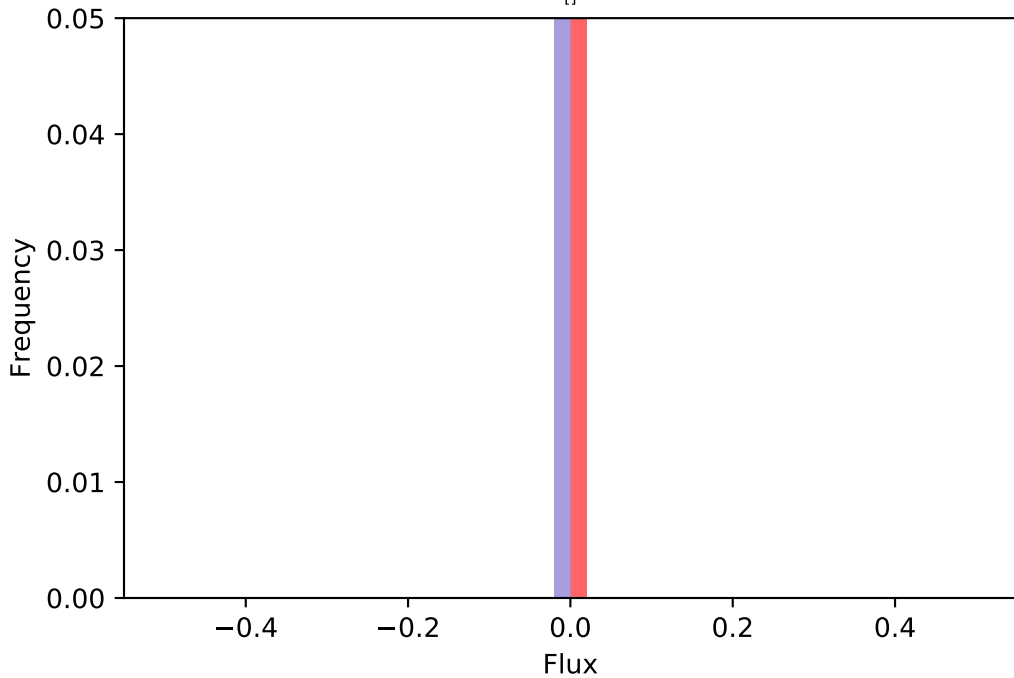
234 : Asp\_DASH\_SeA\_h + H\_h + NADPH\_h --> H\_DASH\_Ser\_h + NADP\_h  
[]



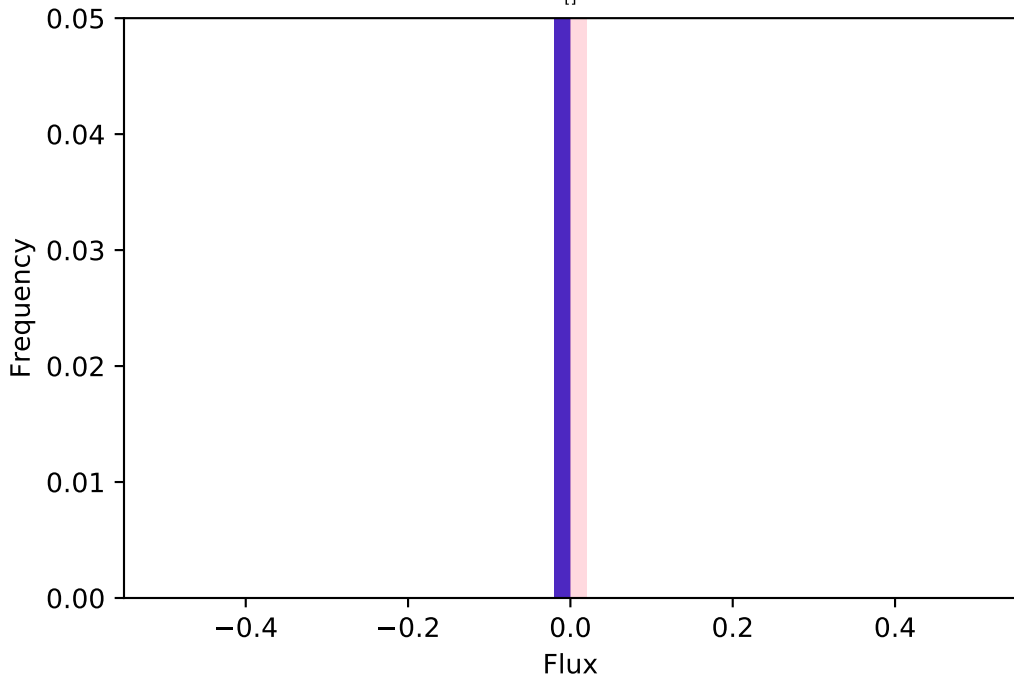
235 : Asp\_DASH\_SeA\_h + H\_h + NADH\_h --> H\_DASH\_Ser\_h + NAD\_h  
[]



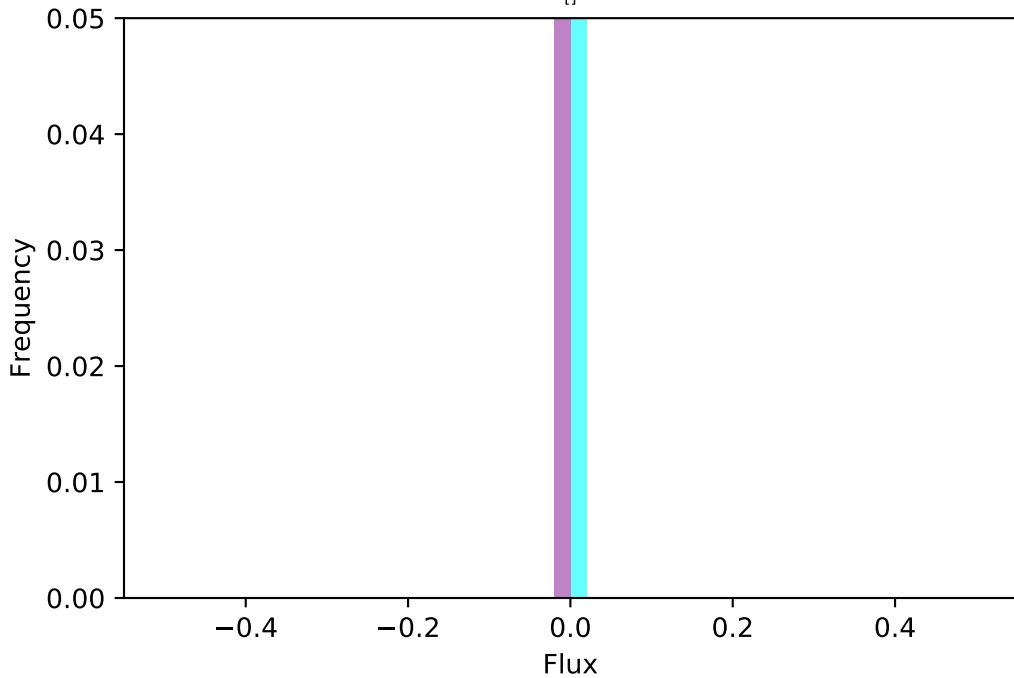
236 : ATP\_h + H\_DASH\_Ser\_h --> ADP\_h + H\_h + PH\_DASH\_Ser\_h  
[ ]



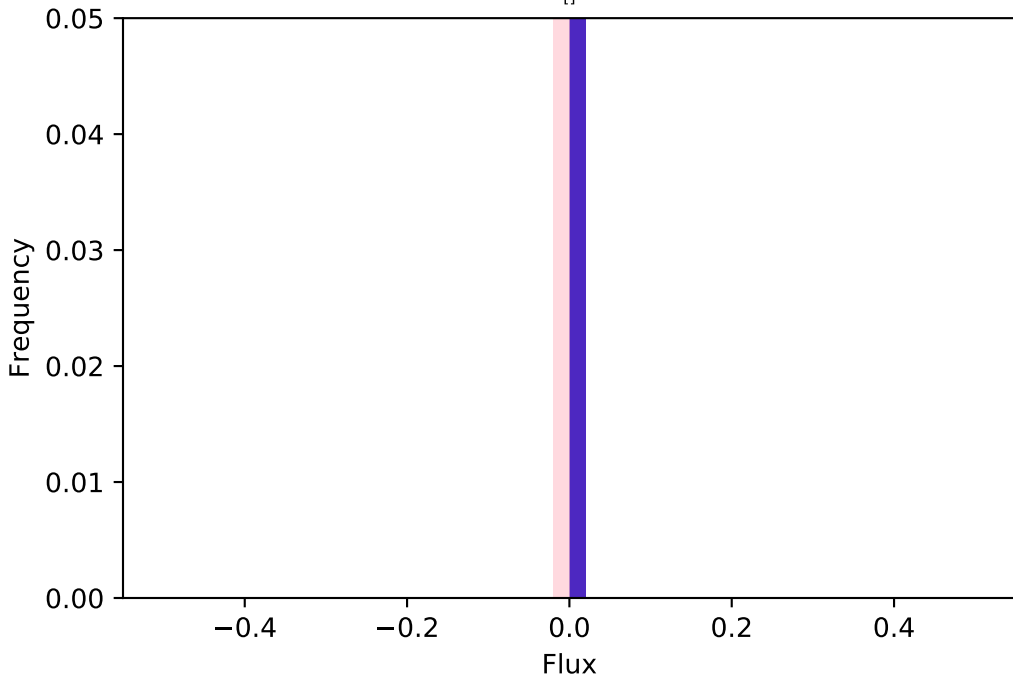
237 : Cys\_h + PH\_DASH\_Ser\_h --> CTH\_h + Pi\_h  
[ ]



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

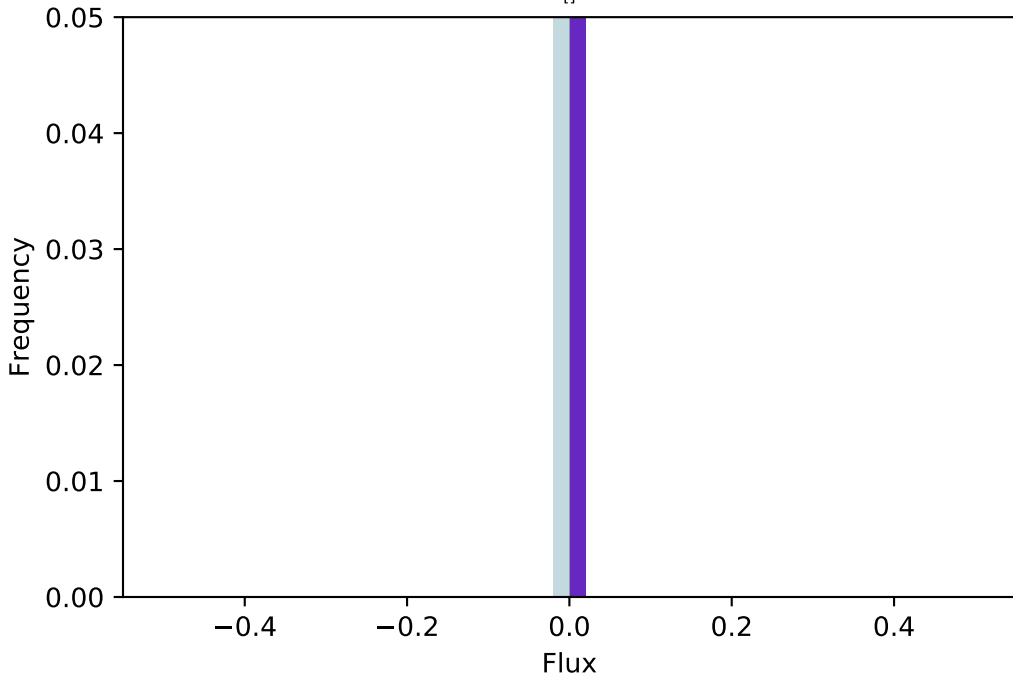


239 : M\_DASH\_THF\_c + NADH\_c --> 5M\_DASH\_THF\_c + NAD\_c  
[ ]

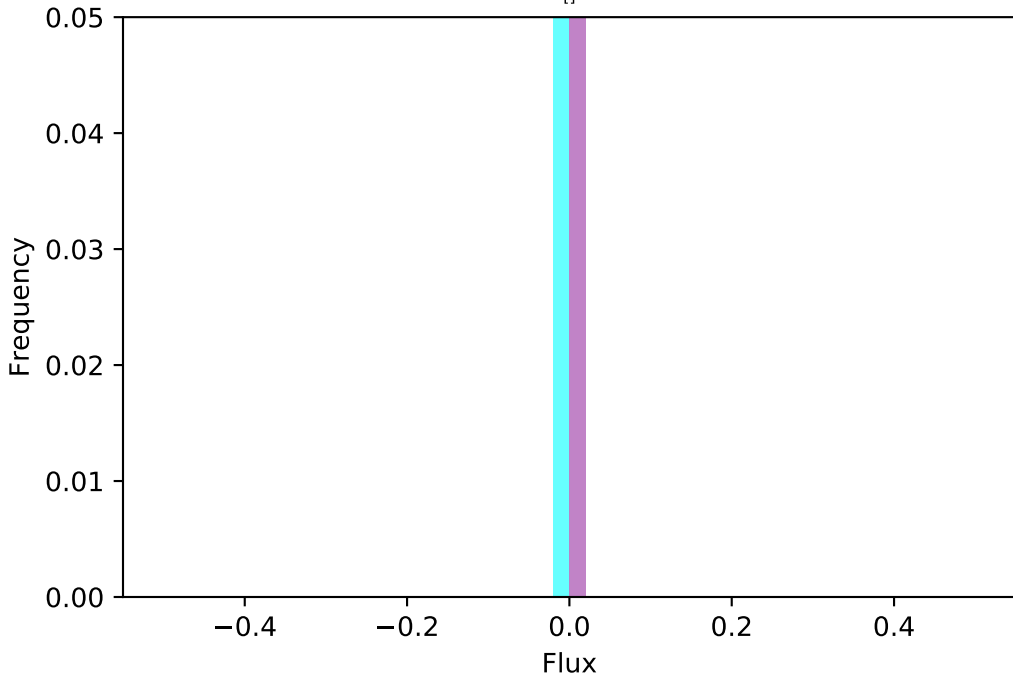




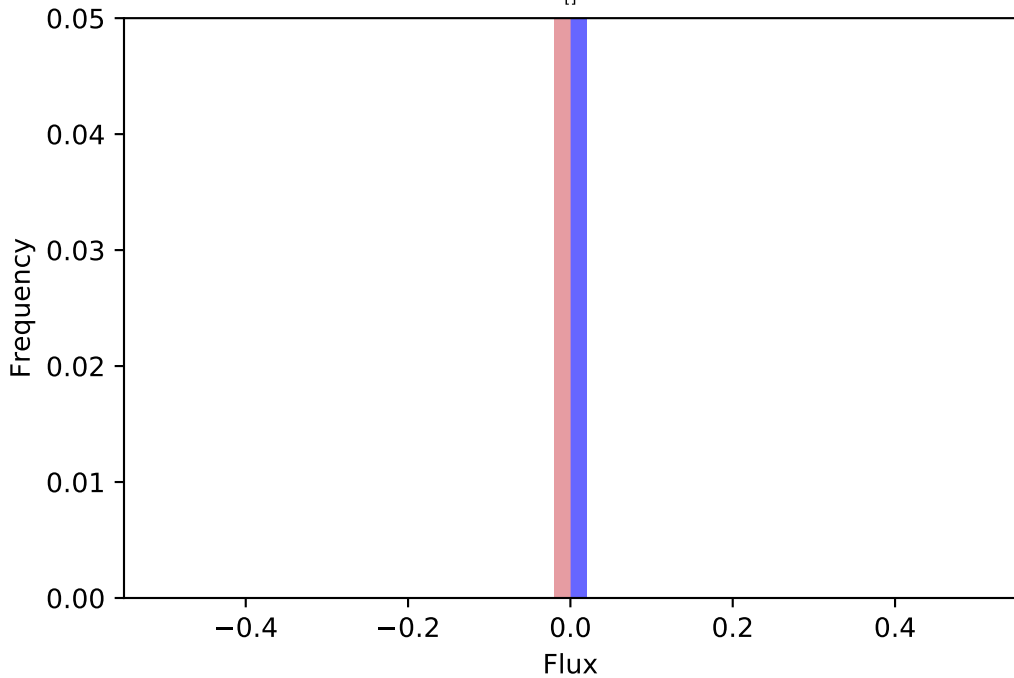
240 : 5M\_DASH\_THF\_c + H\_DASH\_Cys\_c --> Met\_c + THF\_c  
[]



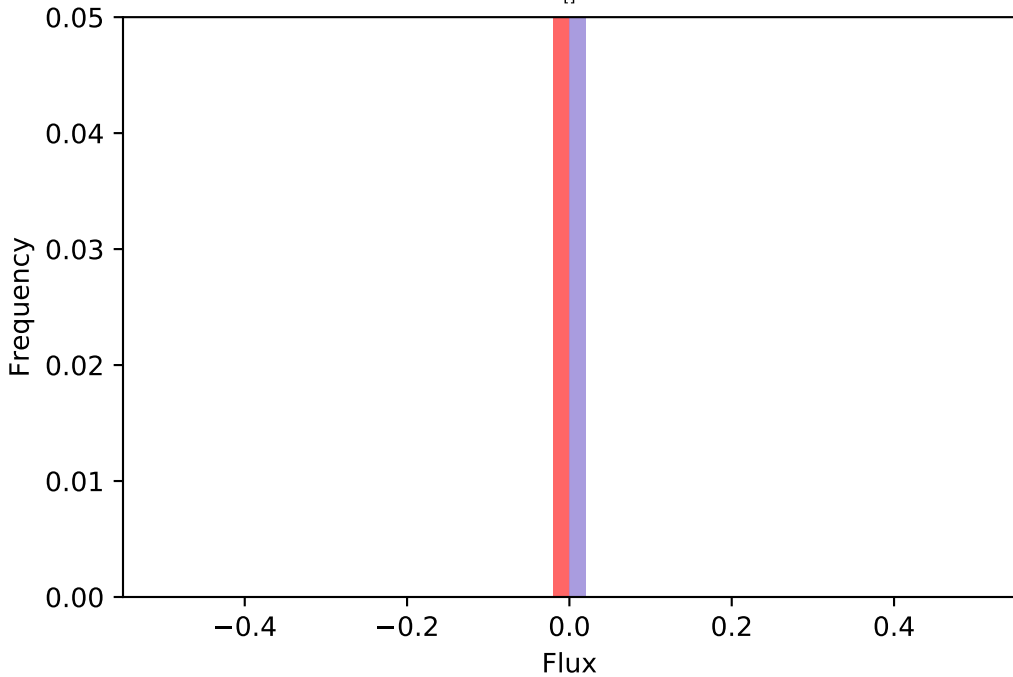
241 : Gly\_c + H2O\_c + M\_DASH\_THF\_c <=> Ser\_c + THF\_c  
[ ]



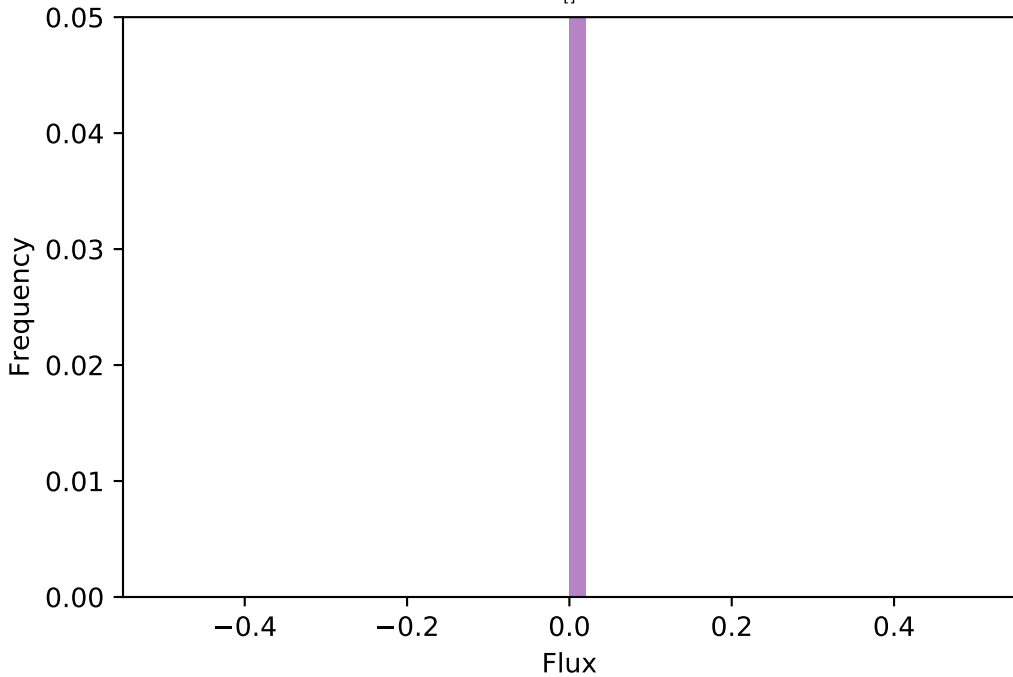
242 : ATP\_c + H2O\_c + Met\_c --> H\_c + PPi\_c + Pi\_c + aMet\_c  
[ ]



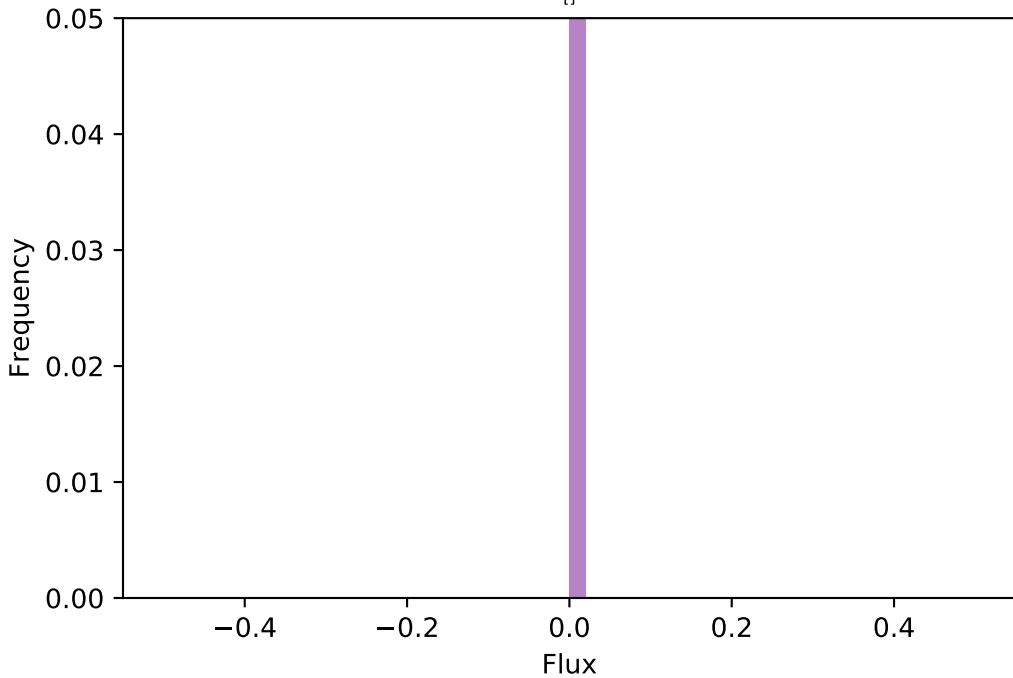
243 : H\_DASH\_Cys\_c + aMet\_c --> Met\_c + aH\_DASH\_Cys\_c  
[ ]



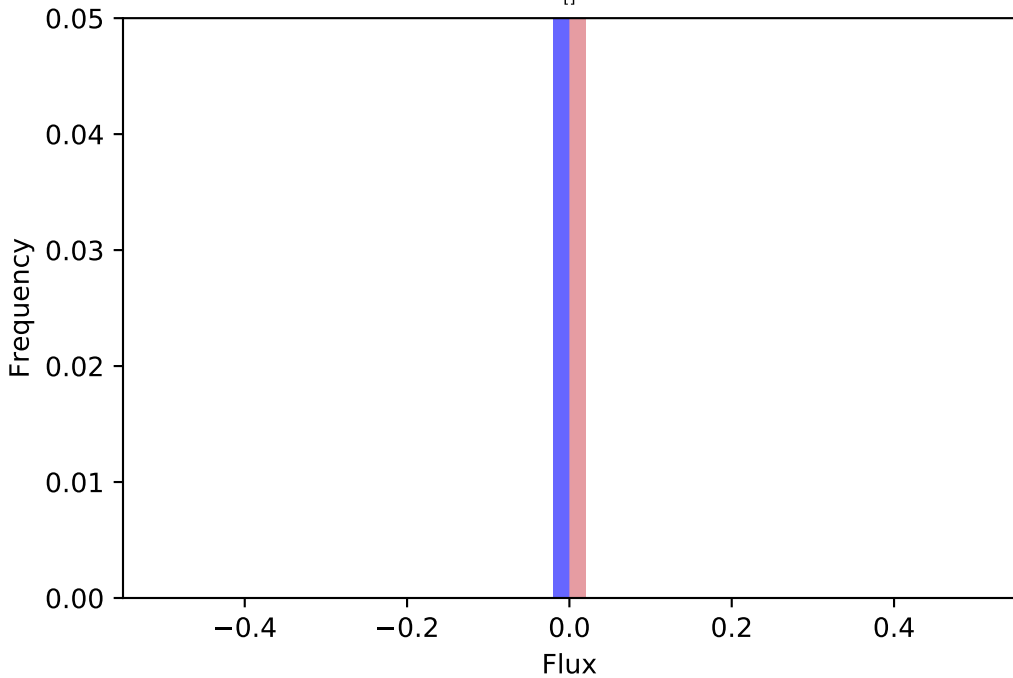
244 : H2O\_c + aH\_DASH\_Cys\_c <=> ADN\_c + H\_DASH\_Cys\_c  
[ ]



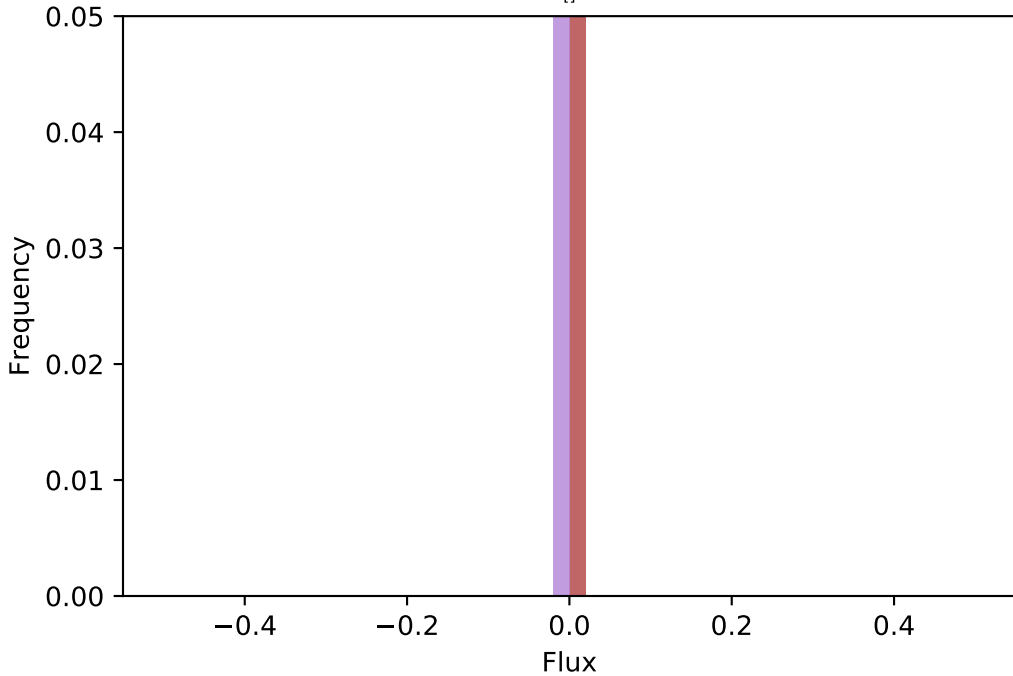
245 : CHR\_h --> PRE\_h  
[]



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

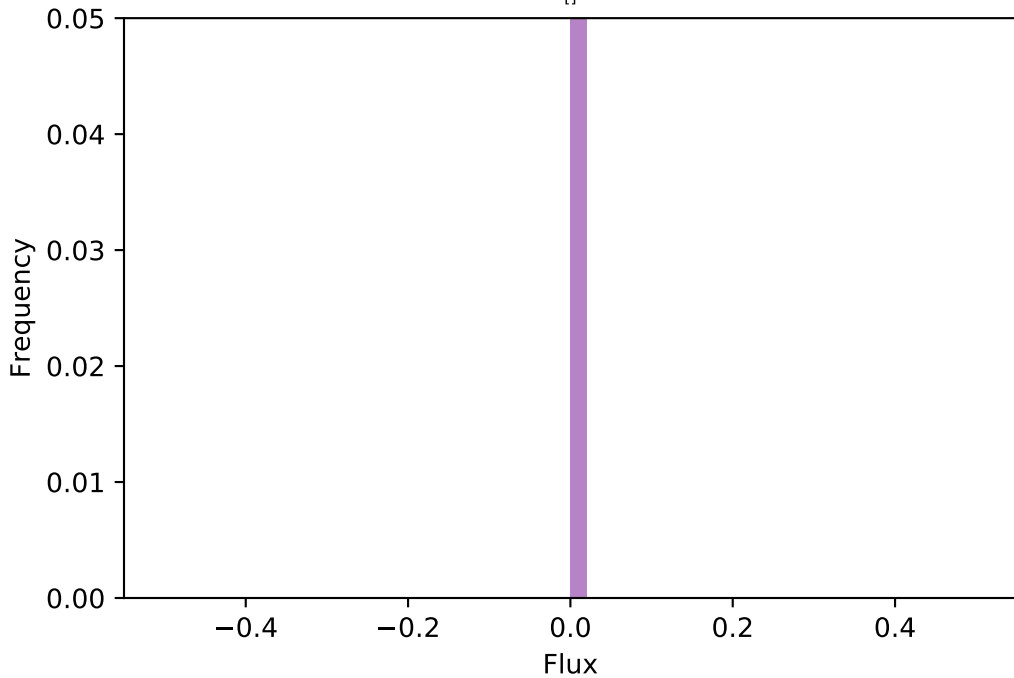


247 : AGN\_h + H\_h --> CO2\_h + H2O\_h + Phe\_h  
[ ]

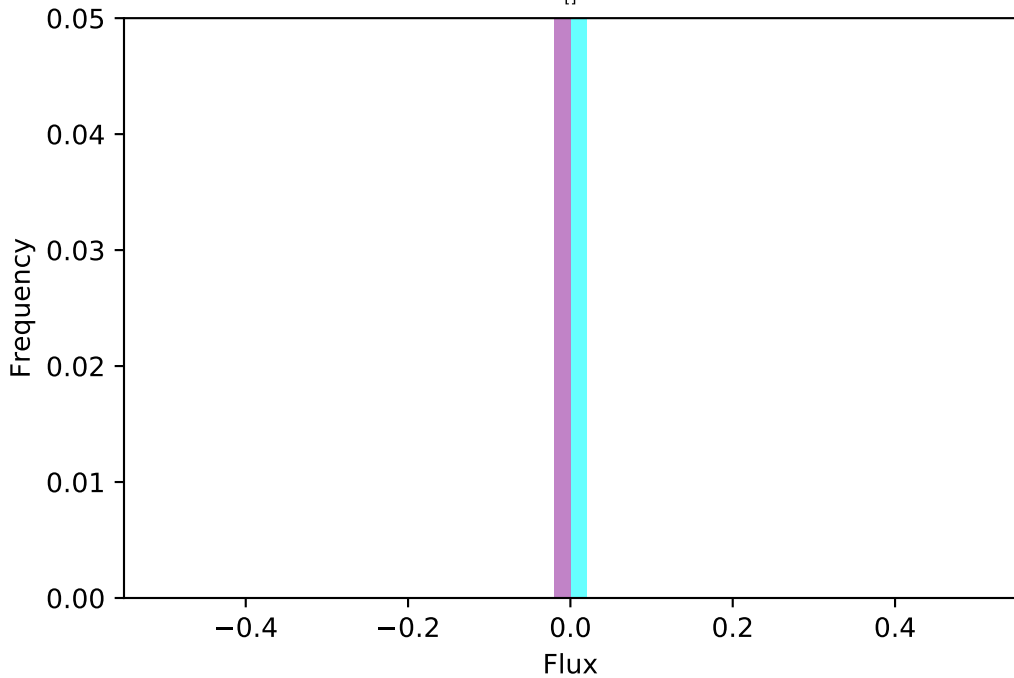




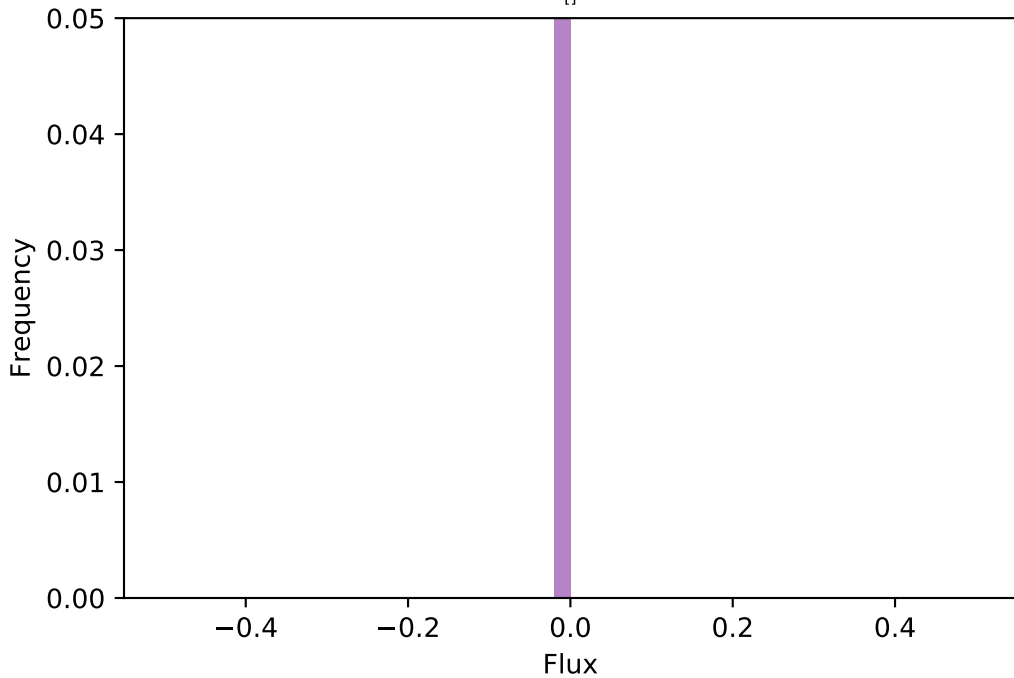
248 : Arg\_m + H2O\_m + H\_m --> Orn\_m + urea\_m  
[]



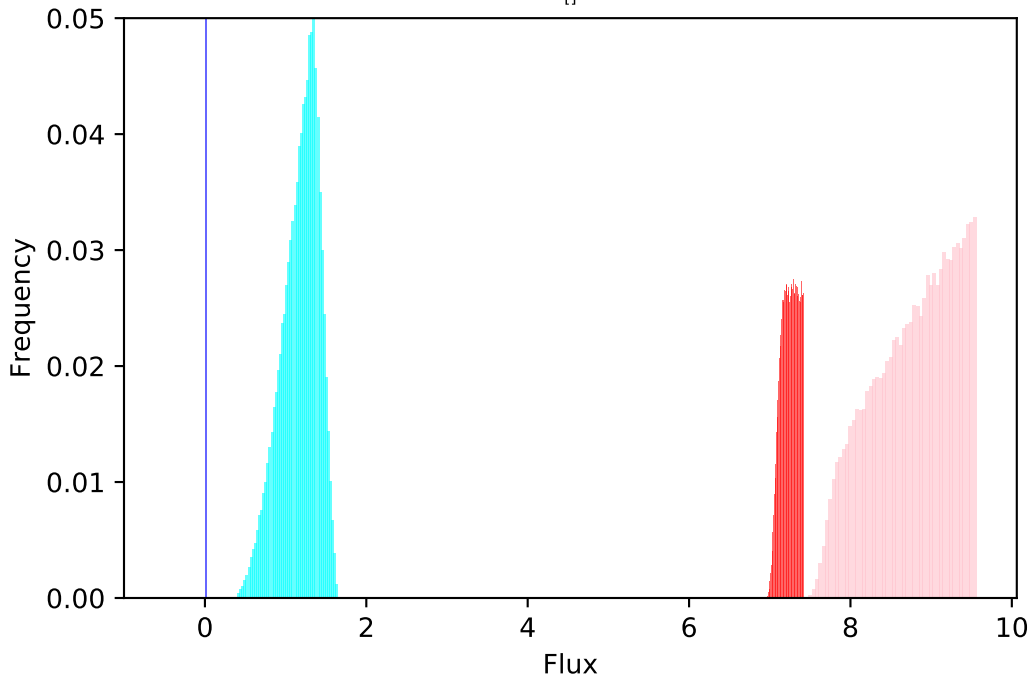
249 : H2O\_m + H\_m + urea\_m --> CO2\_m + 2.0 NH4\_m  
[ ]



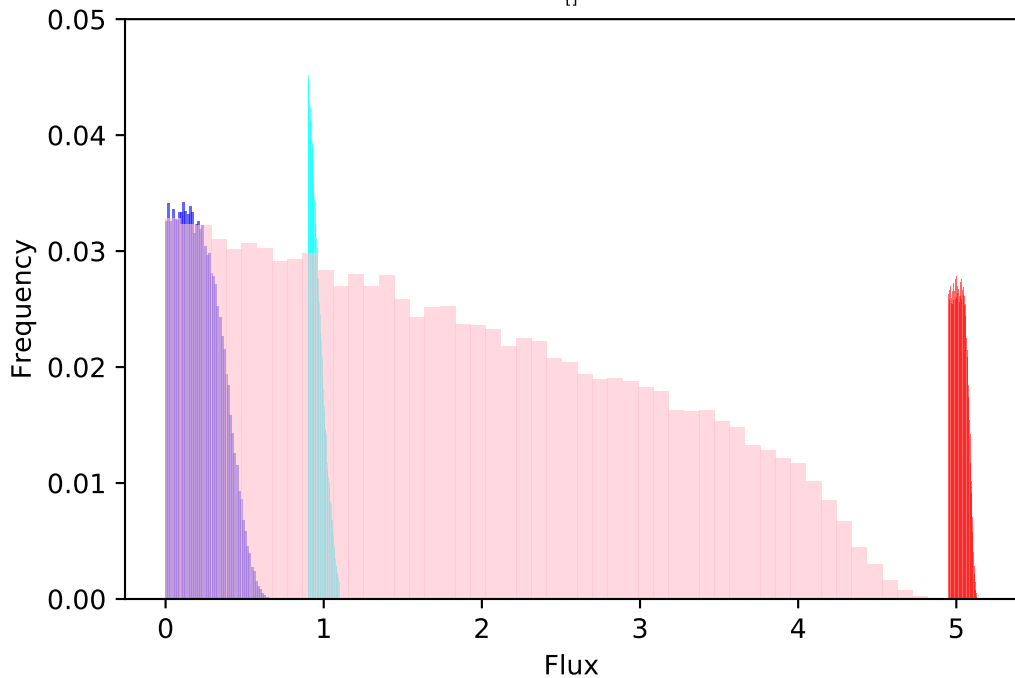
250 : KG\_m + Orn\_m <=> Glu\_DASH\_SeA\_m + Glu\_m  
[]



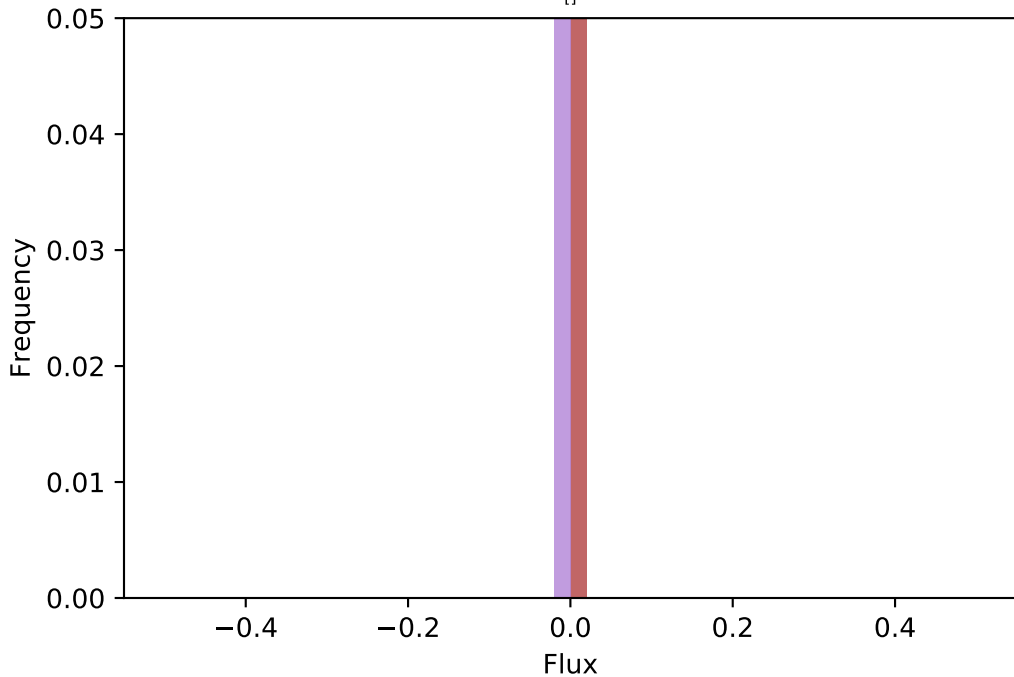
251 : ATP\_c + Glu\_c --> ADP\_c + GluP\_c  
[]



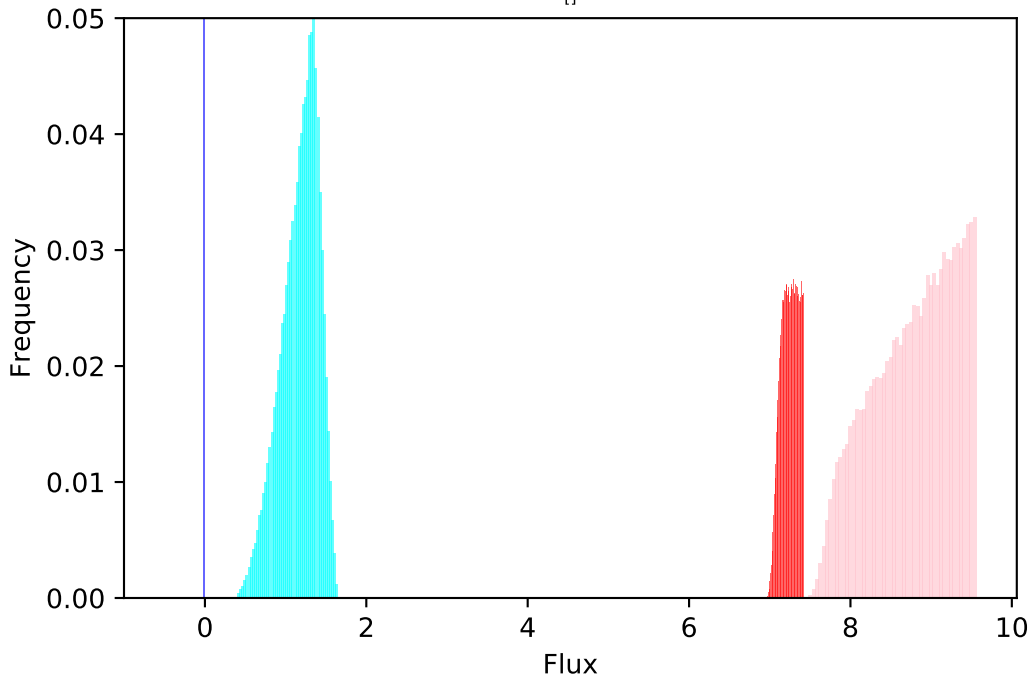
252 : ATP\_h + Glu\_h --> ADP\_h + GluP\_h  
[]



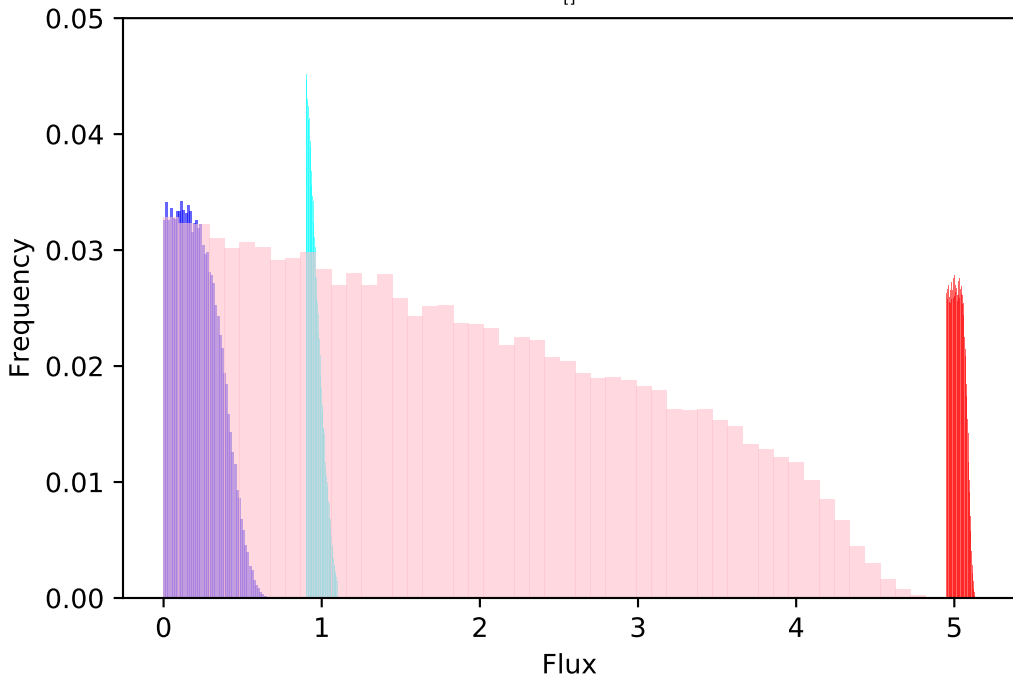
253 : ATP\_m + Glu\_m --> ADP\_m + GluP\_m  
[]



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

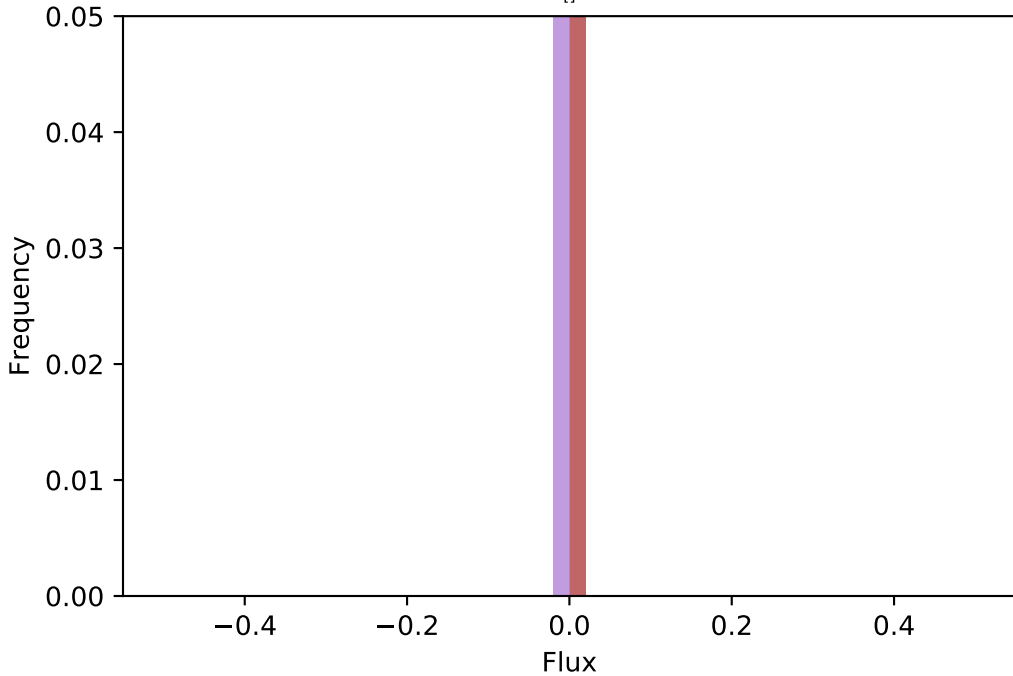


255 : GluP\_h + H\_h + NADPH\_h --> Glu\_DASH\_SeA\_h + NADP\_h + Pi\_h  
[]

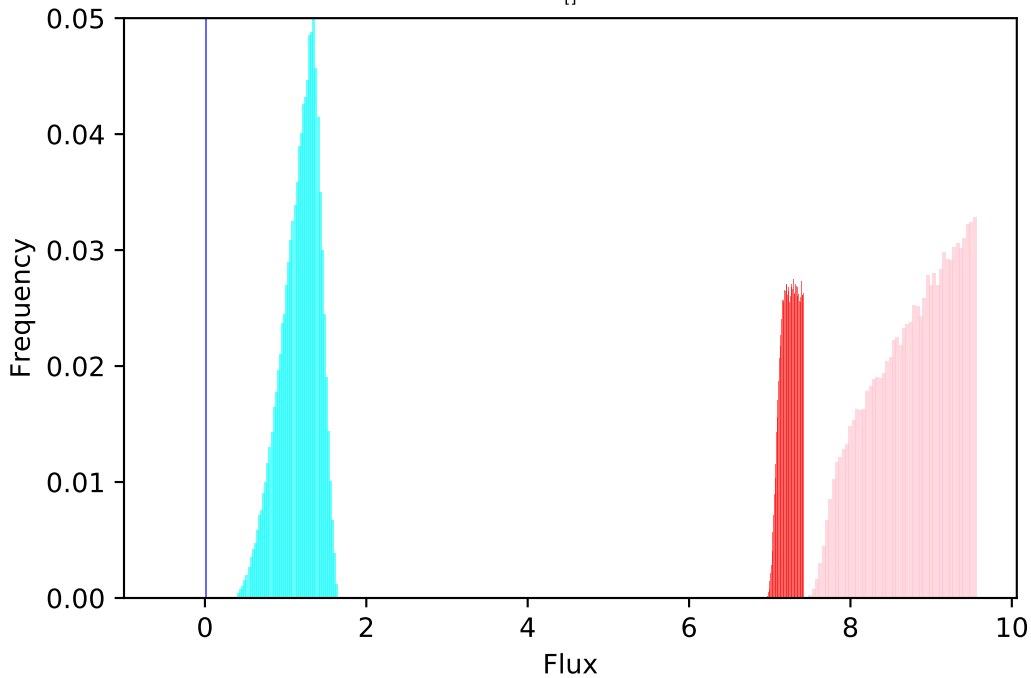




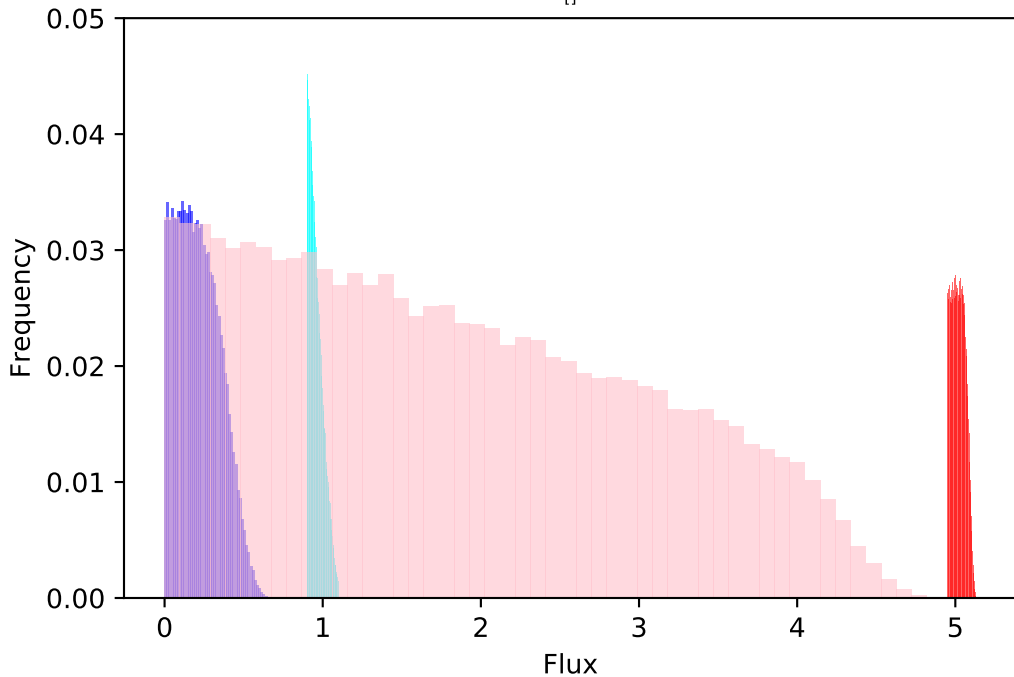
256 : GluP\_m + H\_m + NADPH\_m --> Glu\_DASH\_SeA\_m + NADP\_m + Pi\_m  
[]



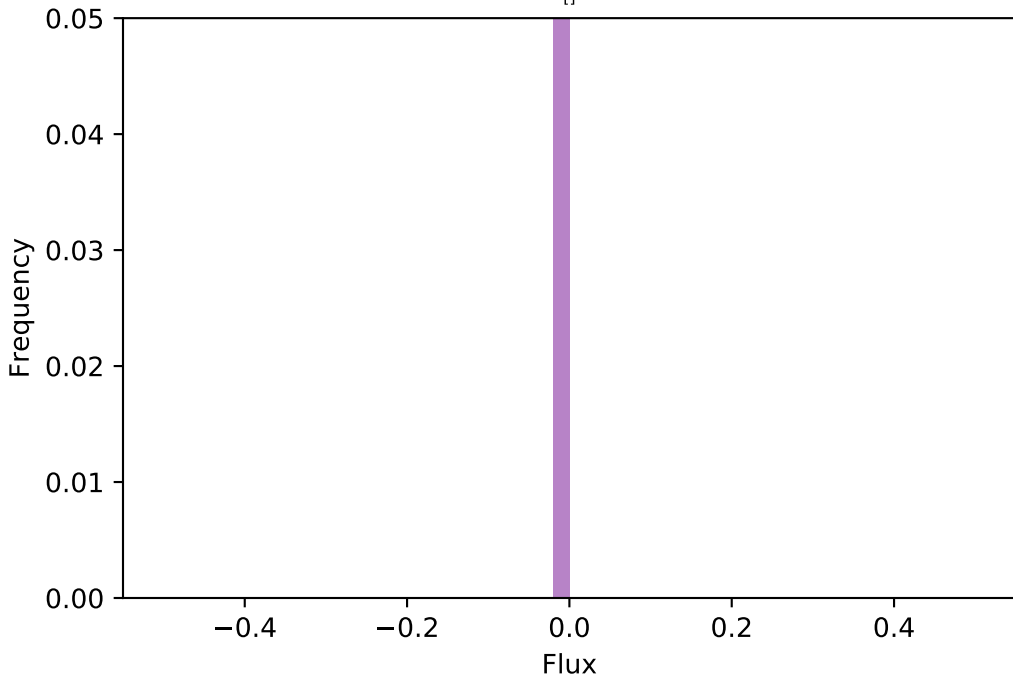
257 : Glu\_DASH\_SeA\_c --> H2O\_c + H\_c + P5C\_c  
[]



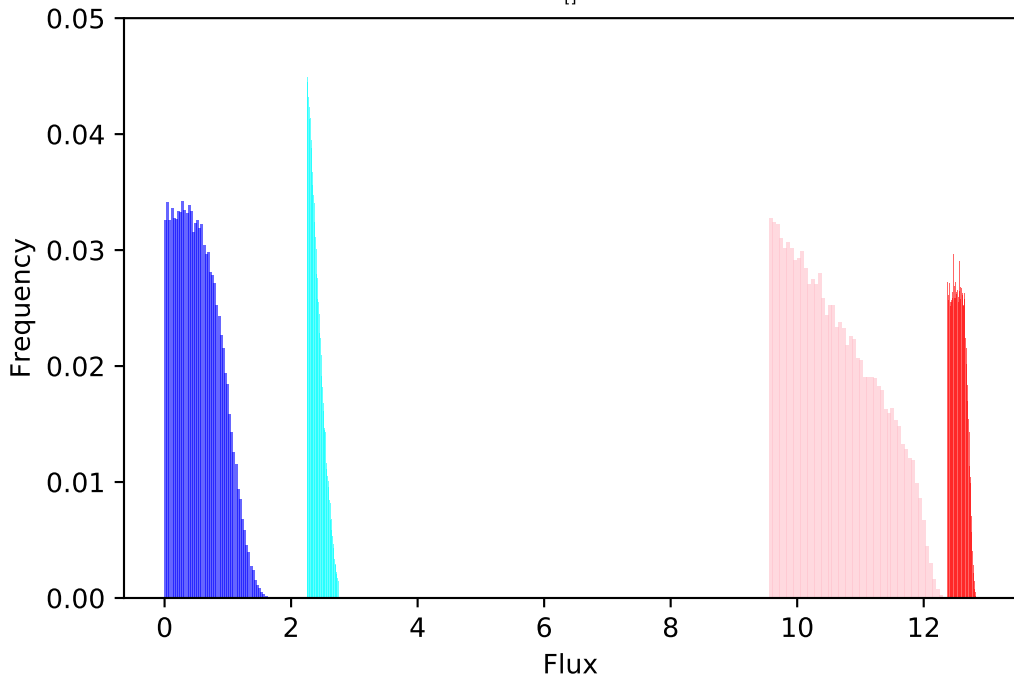
258 : Glu\_DASH\_SeA\_h --> H2O\_h + H\_h + P5C\_h  
[]



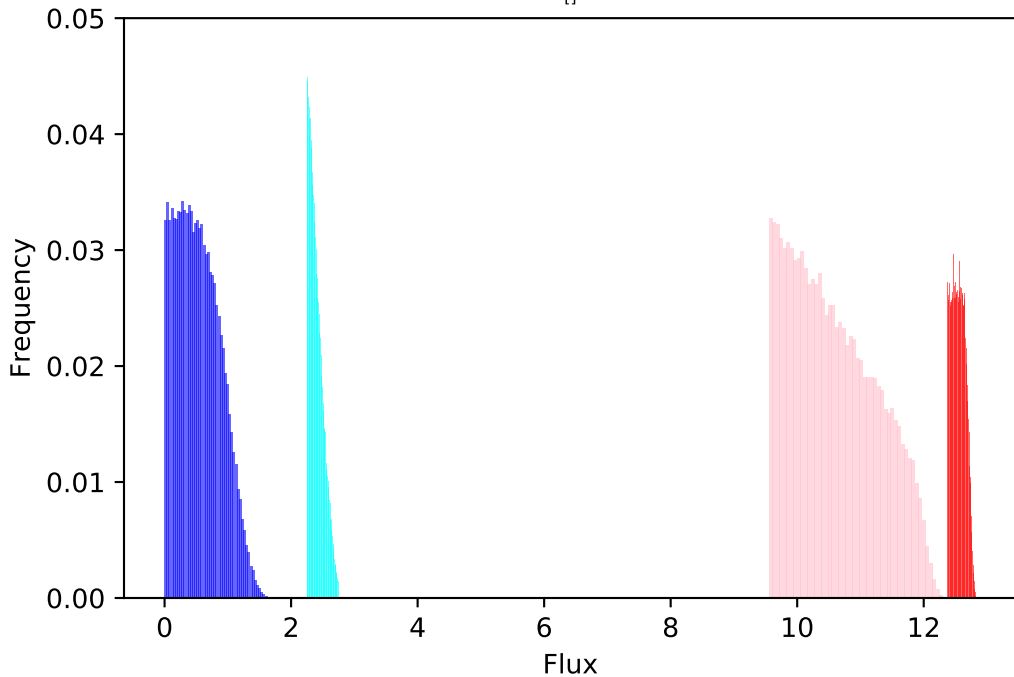
259 : Glu\_DASH\_SeA\_m --> H2O\_m + H\_m + P5C\_m  
[]



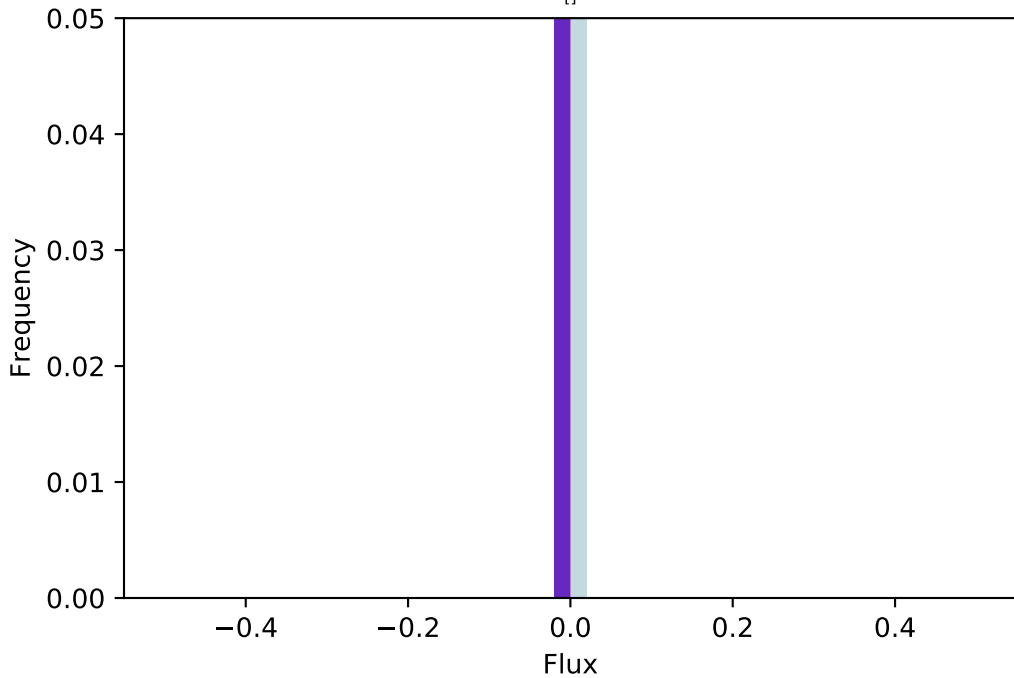
260 : H\_c + NADH\_c + P5C\_c --> NAD\_c + Pro\_c  
[]



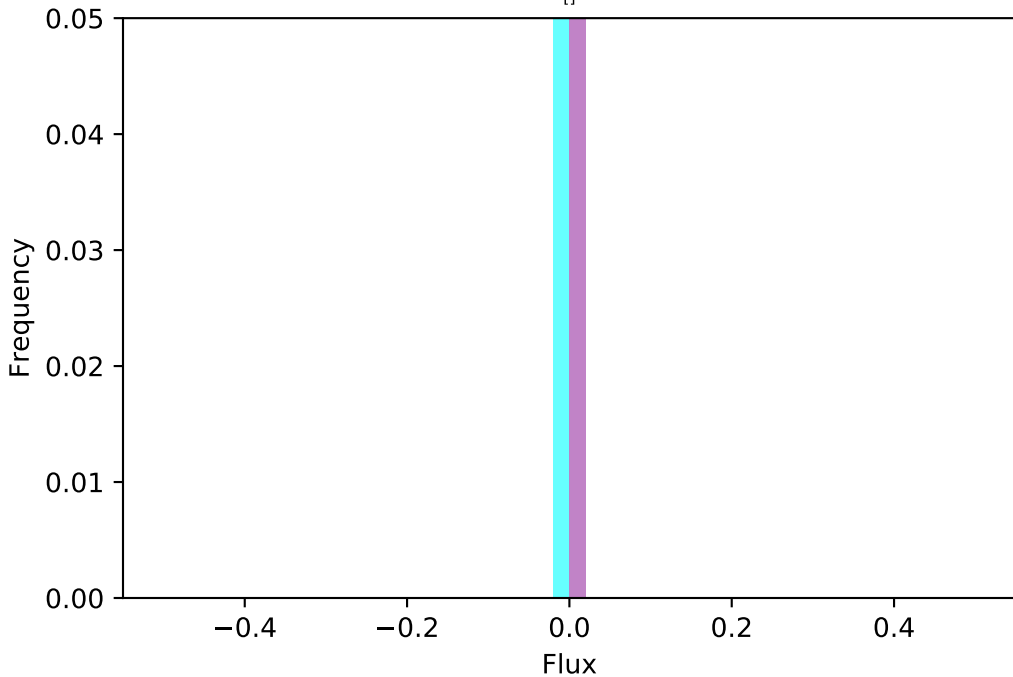
261 : NAD\_m + Pro\_m --> 2.0 H\_m + NADH\_m + P5C\_m  
[]



262 : NADP\_m + Pro\_m --> 2.0 H\_m + NADPH\_m + P5C\_m  
[ ]

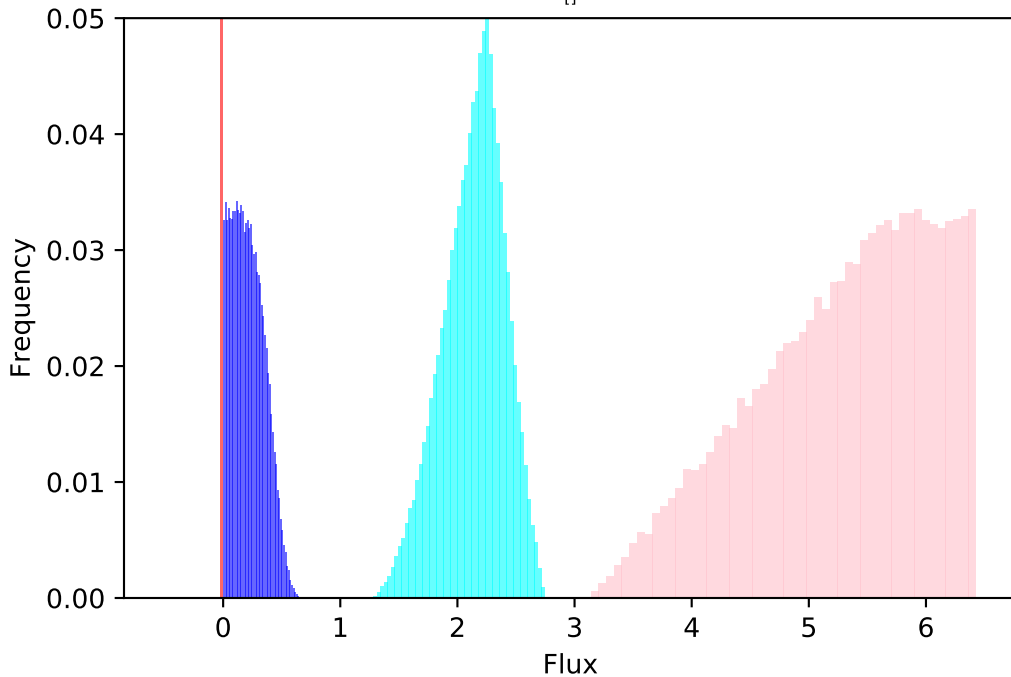


263 : 2.0 H2O\_h + NAD\_h + P5C\_h --> Glu\_h + H\_h + NADH\_h  
[ ]

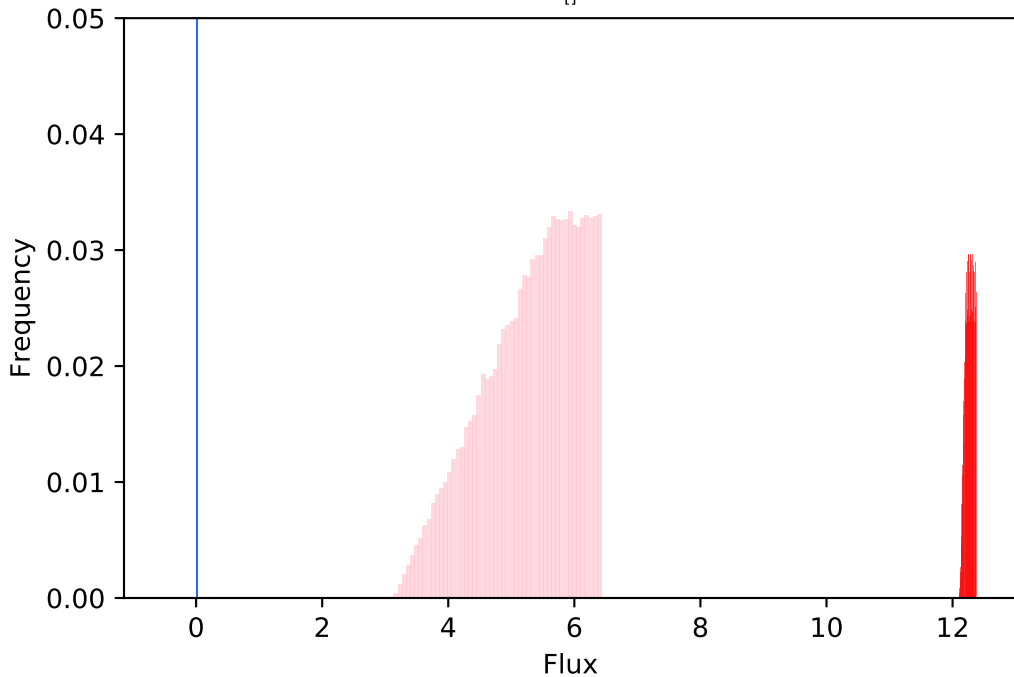




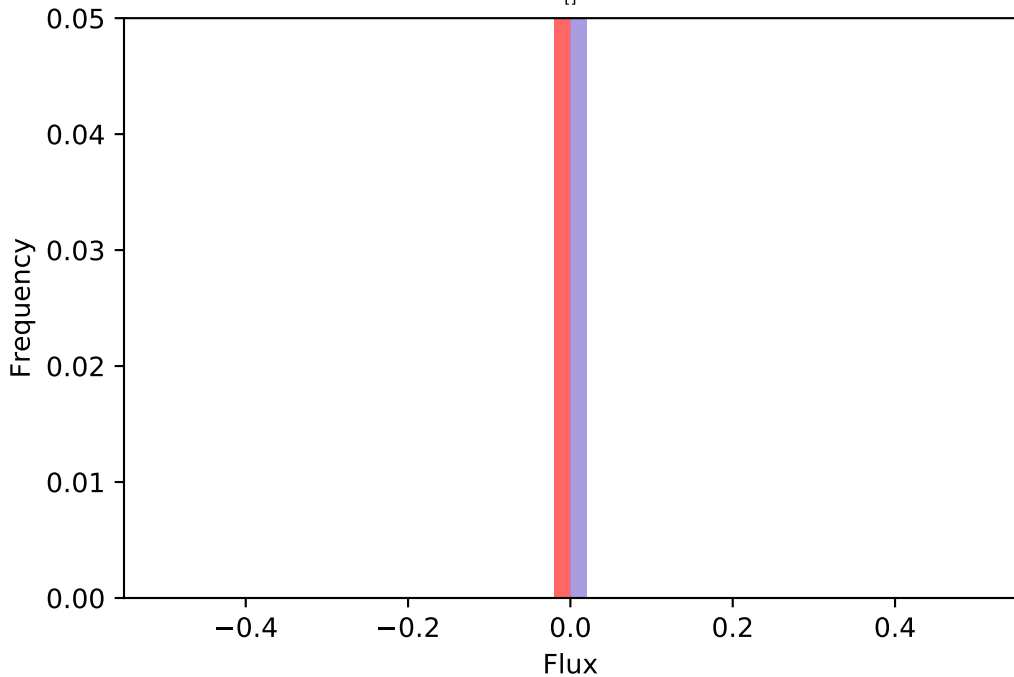
264 : 2.0 H<sub>2</sub>O<sub>m</sub> + NAD<sub>m</sub> + P5C<sub>m</sub> --> Glu<sub>m</sub> + H<sub>m</sub> + NADH<sub>m</sub>  
[ ]



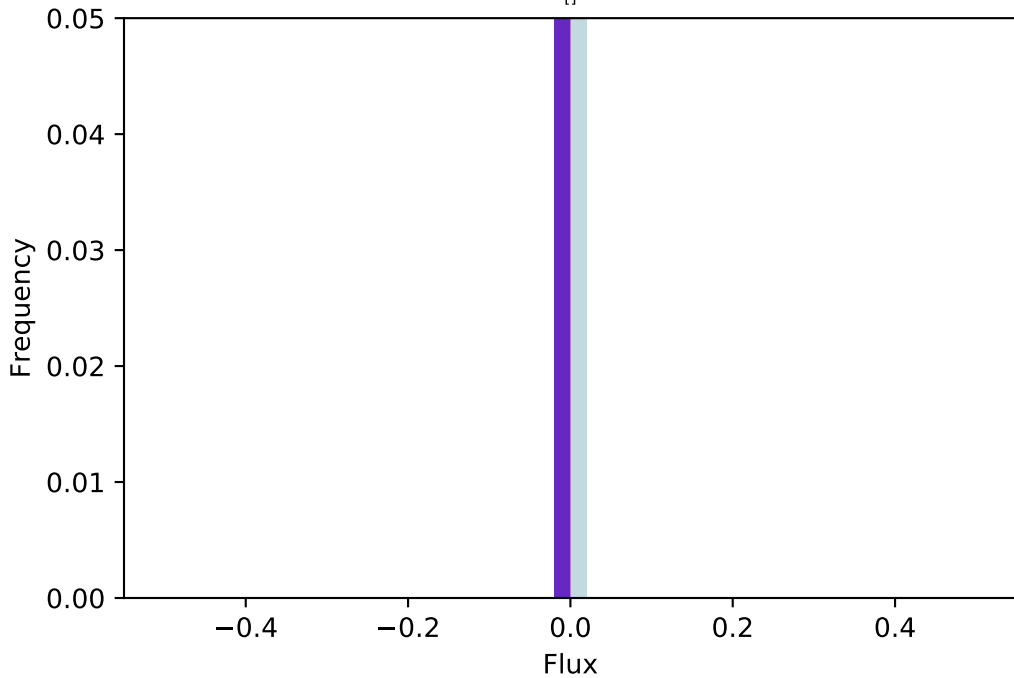
265 : 2.0 H2O\_m + NADP\_m + P5C\_m --> Glu\_m + H\_m + NADPH\_m  
[ ]



266 : NAD\_h + PGA\_h <=> H\_h + NADH\_h + P\_DASH\_HPR\_h  
[ ]

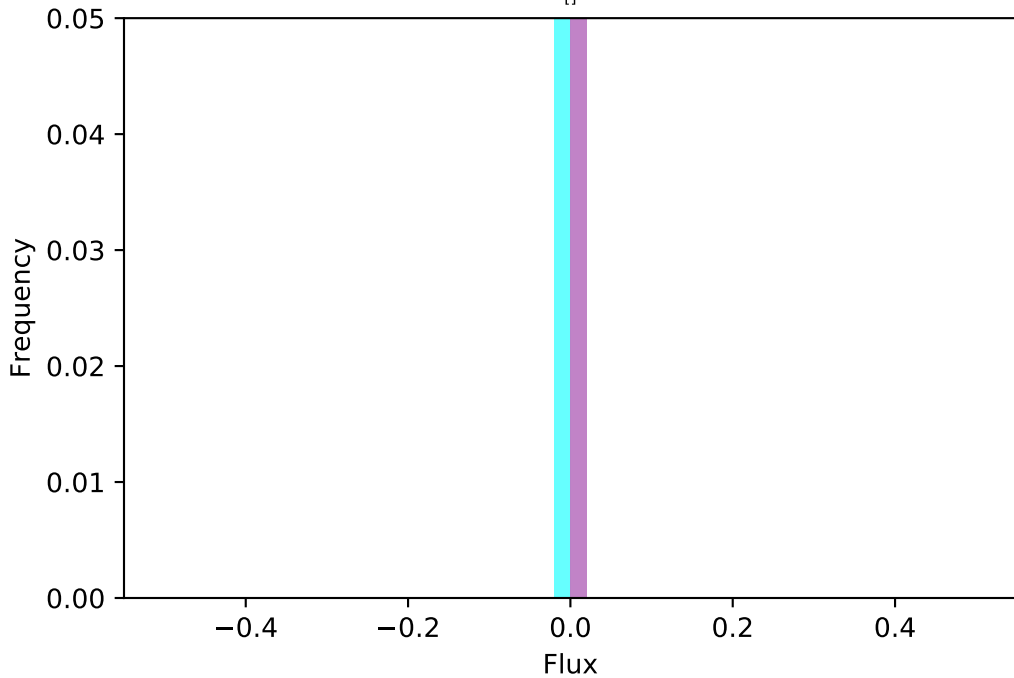


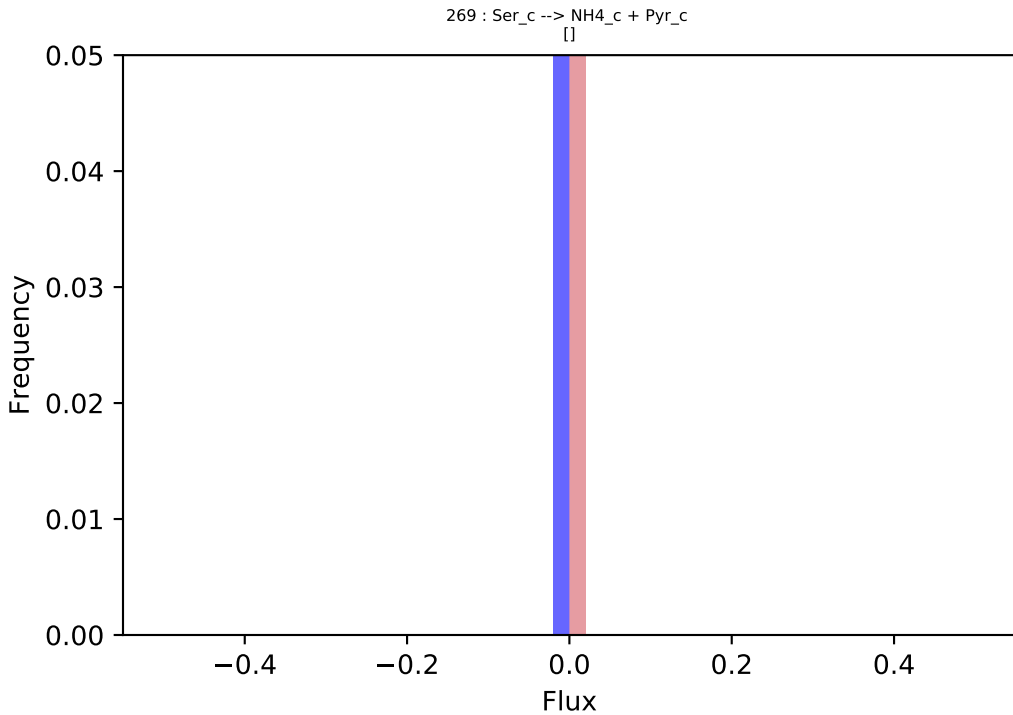
267 : Glu\_h + P\_DASH\_HPR\_h --> KG\_h + PSer\_h  
[]



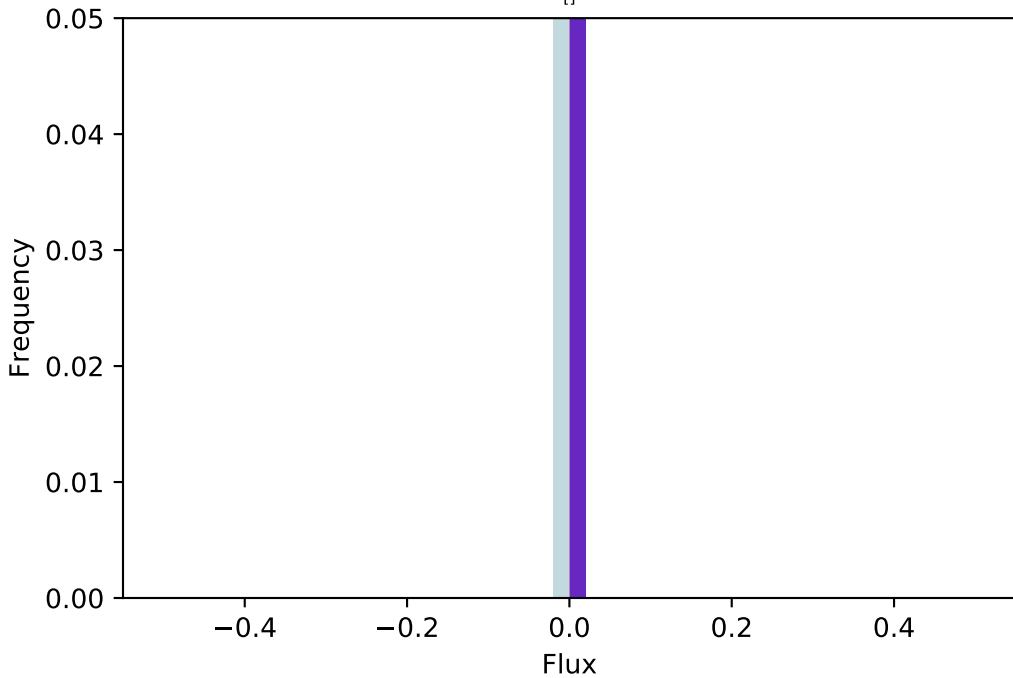
268 : H2O\_h + PSer\_h --> Pi\_h + Ser\_h

[ ]

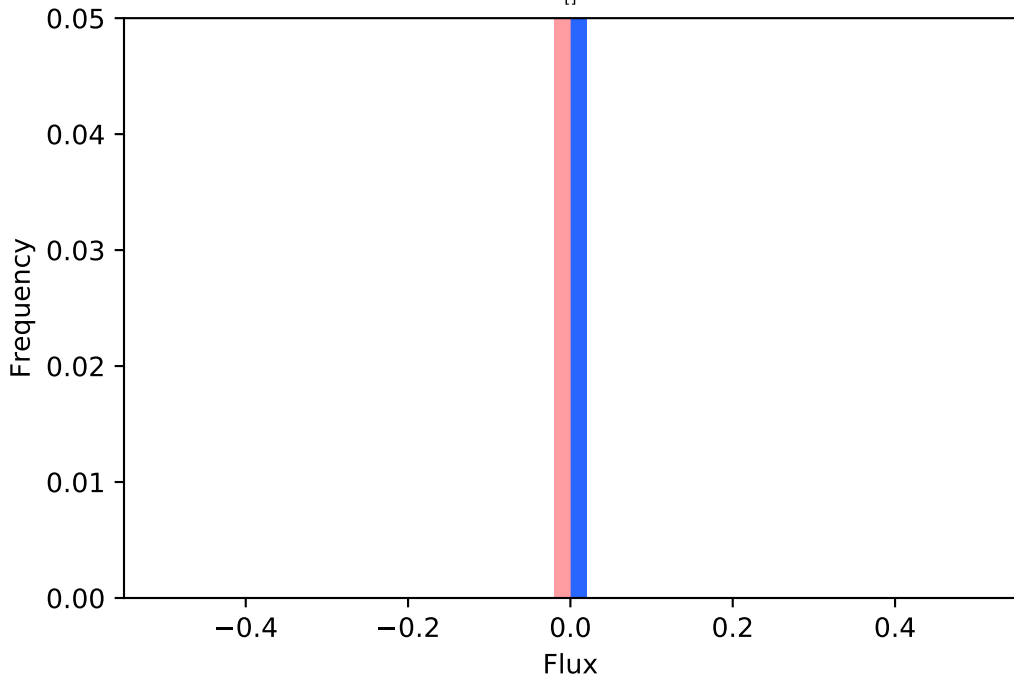




270 : H2O\_h + PH\_DASH\_Ser\_h --> Pi\_h + Thr\_h  
[ ]

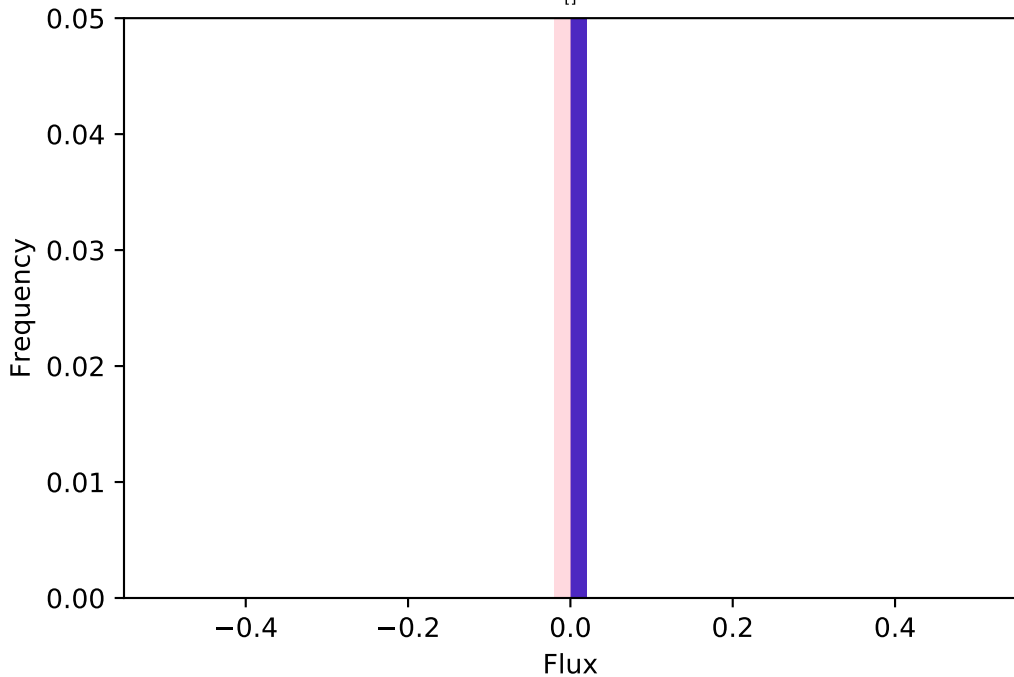


271 : CHR\_h + Gln\_h --> ANT\_h + Glu\_h + H\_h + Pyr\_h  
[]

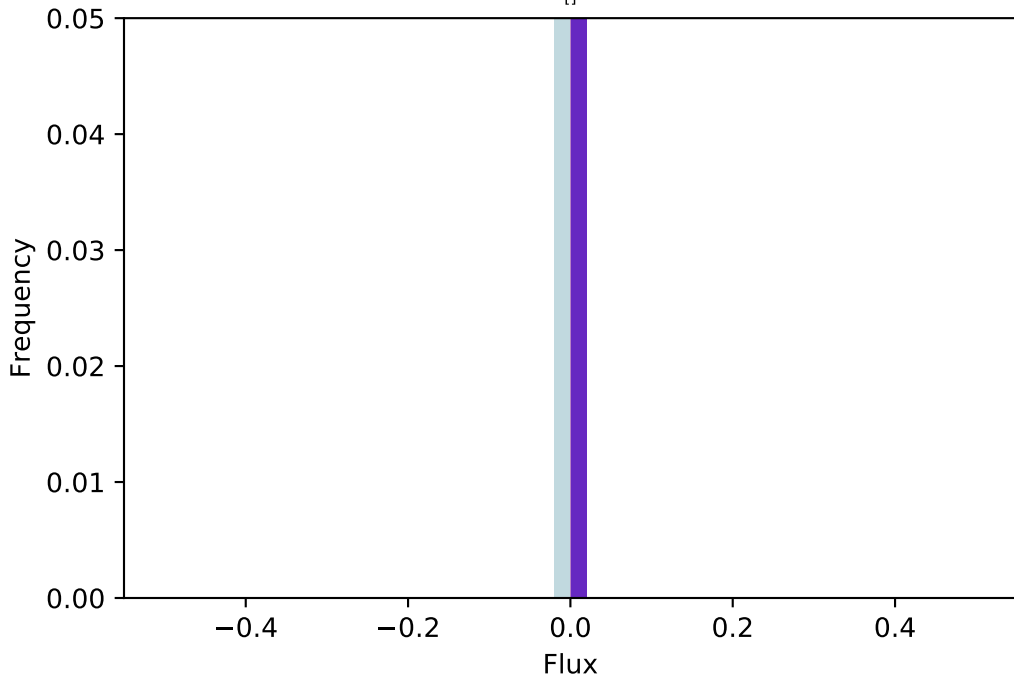




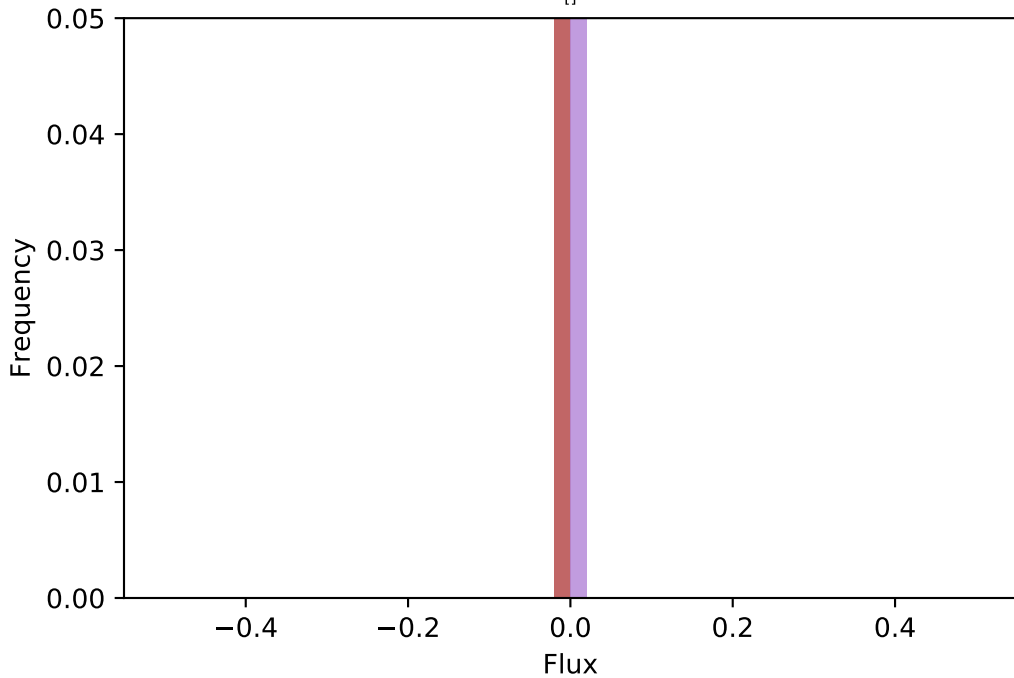
272 : ANT\_h + PRPP\_h --> H<sub>2</sub> + PPI\_h + PR\_DASH\_ANT\_h  
[ ]



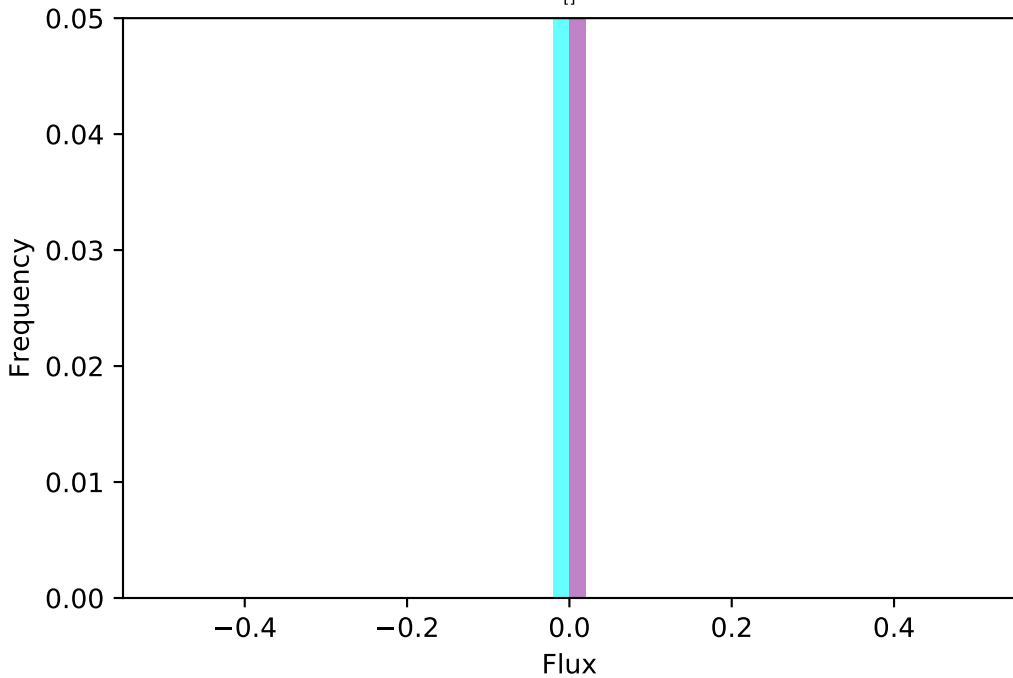
273 : PR\_DASH\_ANT\_h --> CPD\_DASH\_Ru5P\_h  
[]



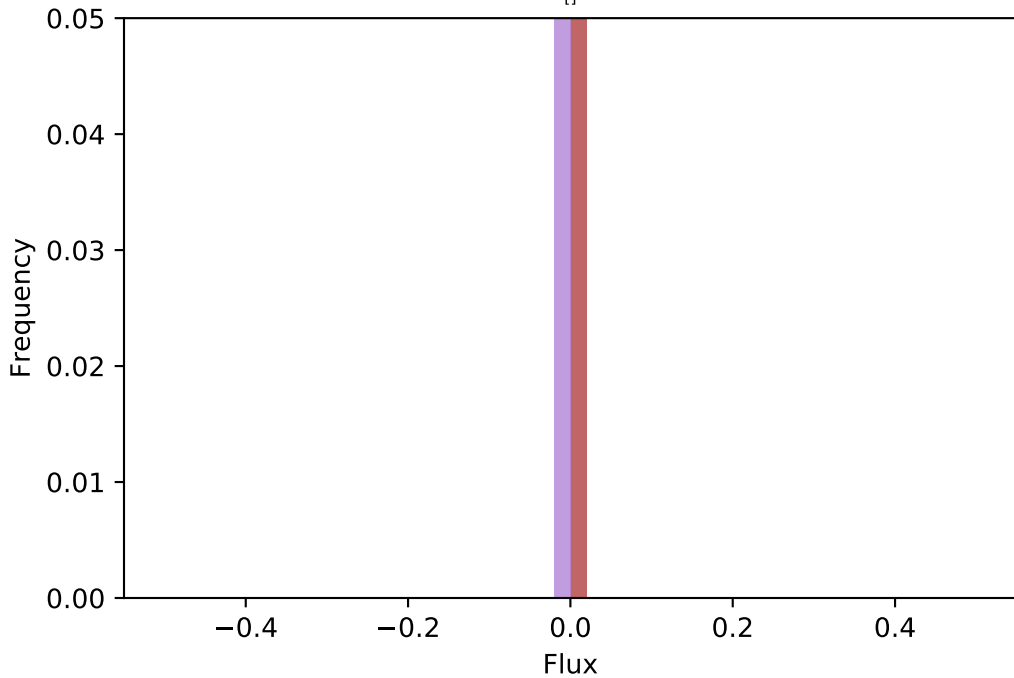
274 : CPD\_DASH\_Ru5P\_h + H\_h --> CO2\_h + H2O\_h + Ind\_DASH\_GP\_h  
[]



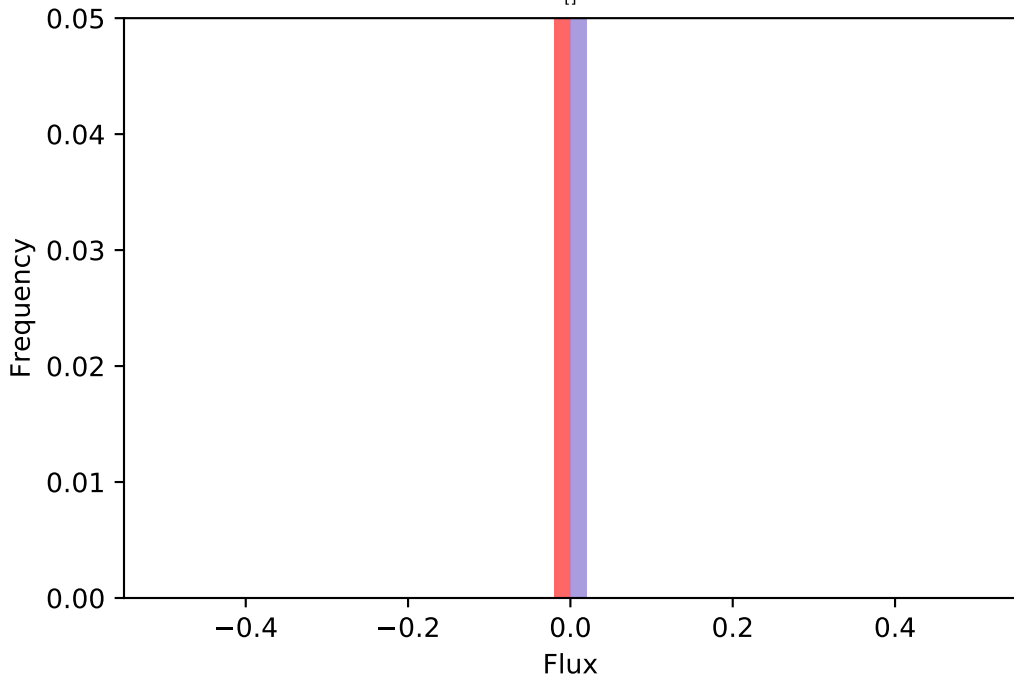
275 : Ind\_DASH\_GP\_h --> GAP\_h + Ind\_h  
[]



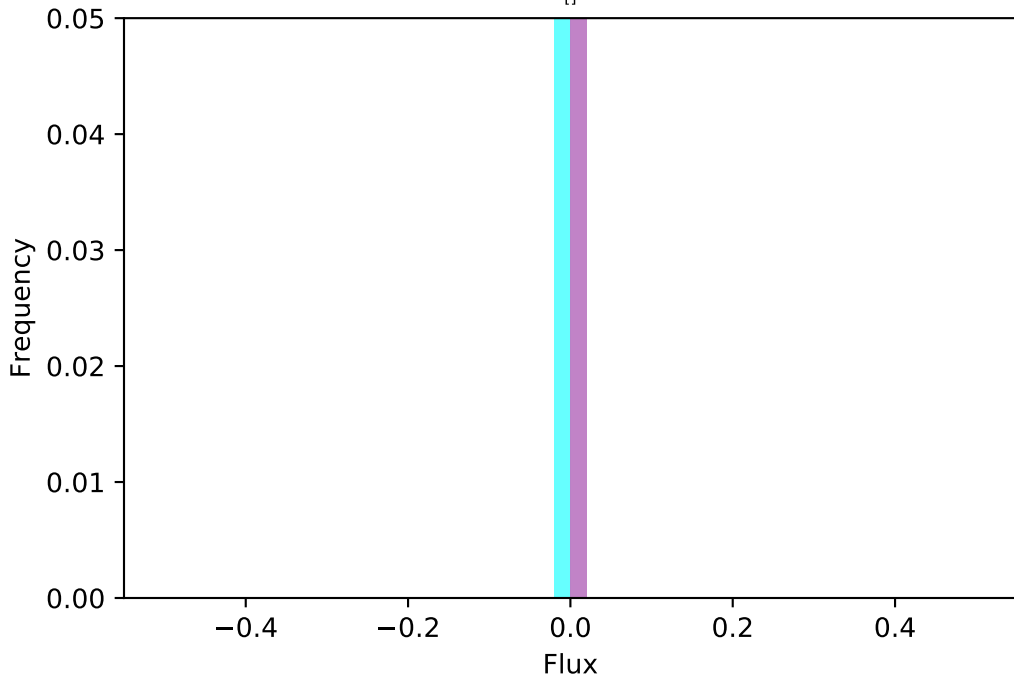
276 : Ind\_h + Ser\_h --> H2O\_h + Trp\_h  
[]



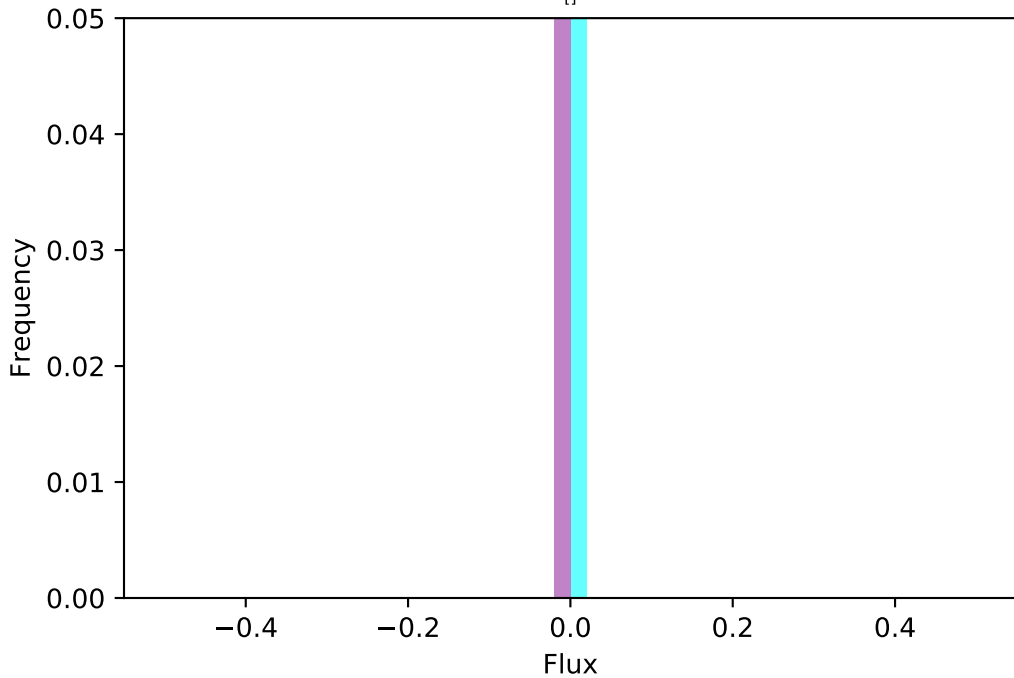
277 : AGN\_h + NADP\_h --> CO2\_h + NADPH\_h + Tyr\_h  
[ ]



278 : Glu\_h + MOB\_h --> KG\_h + Val\_h  
[ ]

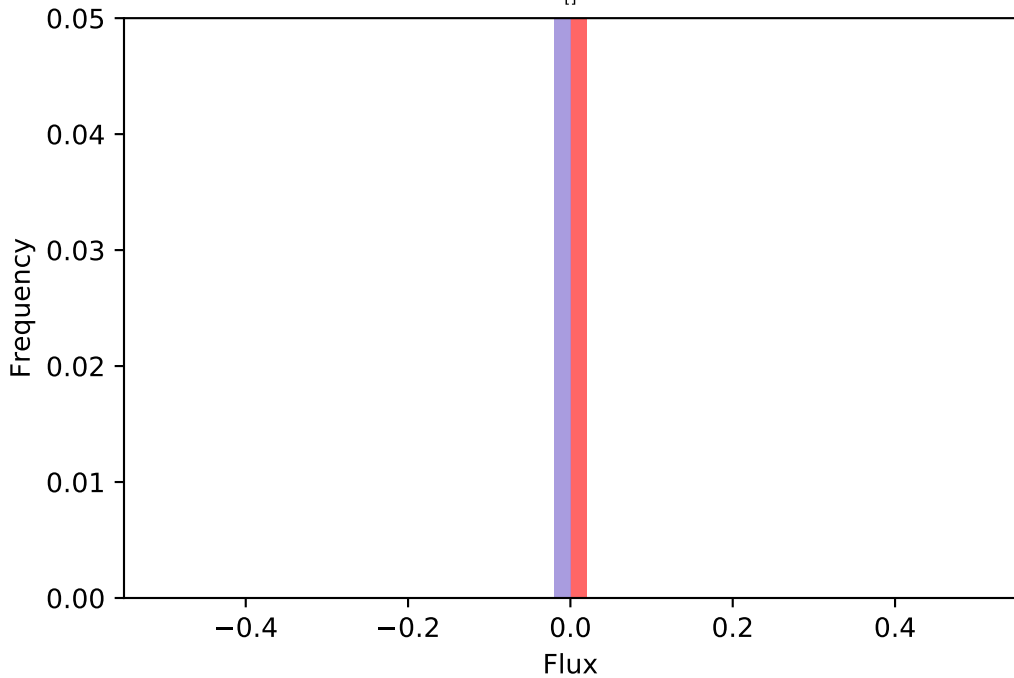


279 : Gln\_h + H2O\_h + PRPP\_h --> Glu\_h + H\_h + PPI\_h + PRA\_h  
[ ]

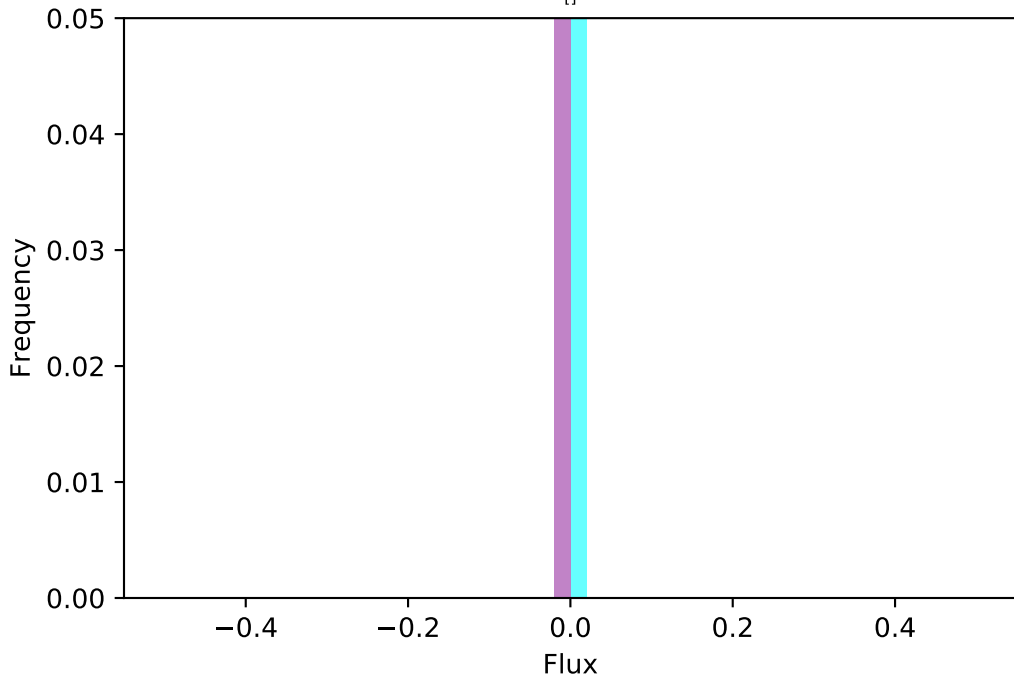




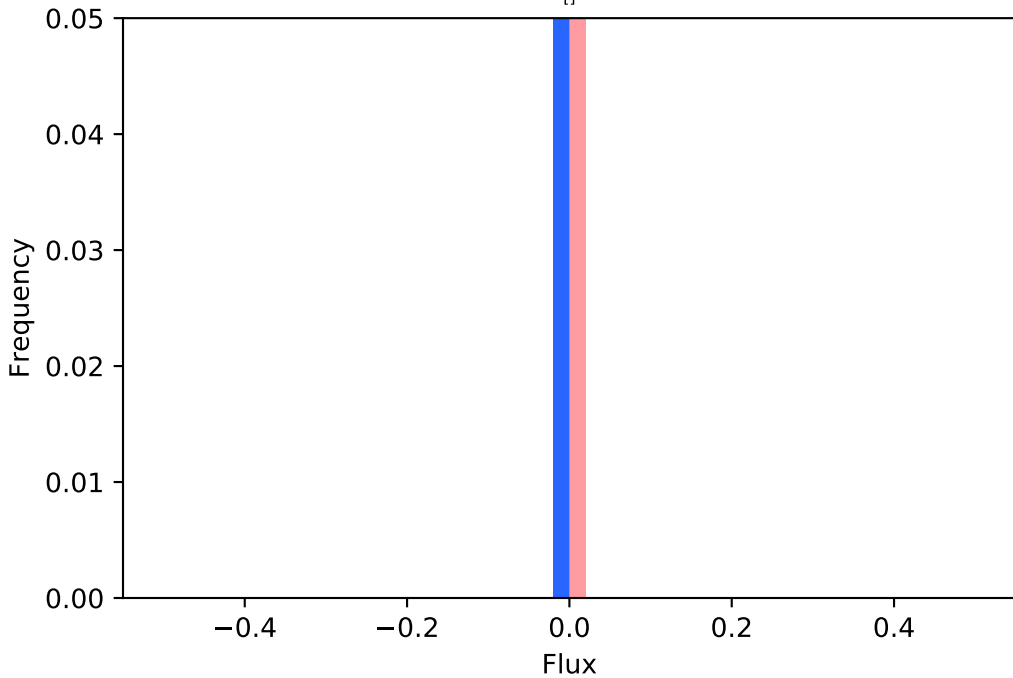
280 : ATP\_h + Gly\_h + PRA\_h --> ADP\_h + GAR\_h + H\_h + Pi\_h  
[ ]



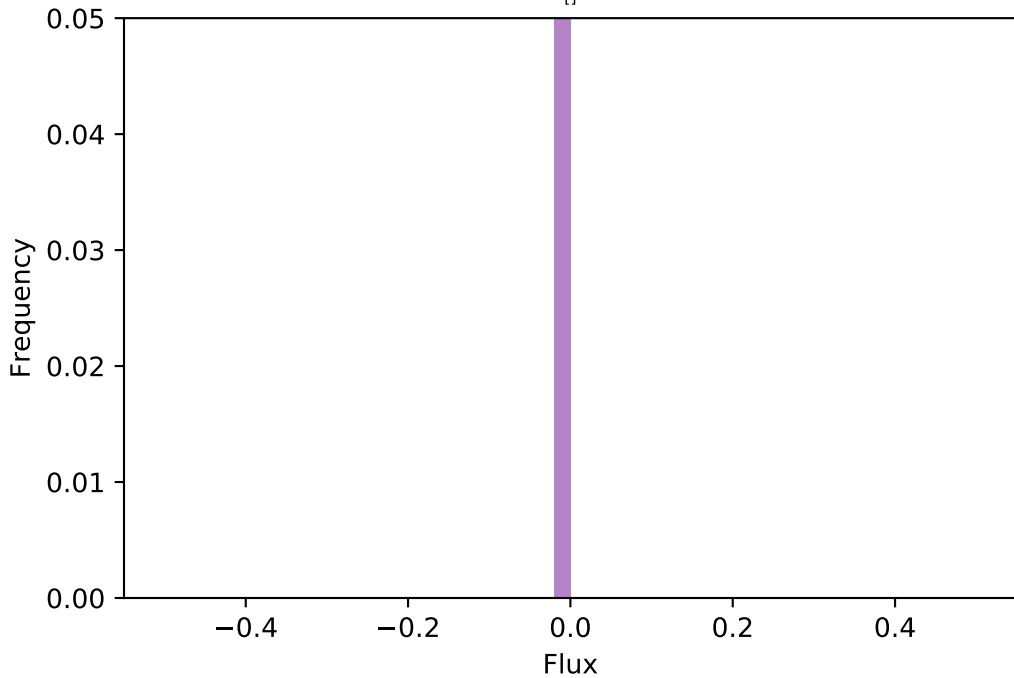
281 : F\_DASH\_THF\_h + GAR\_h --> FGAR\_h + 2.0 H\_h + THF\_h  
[]



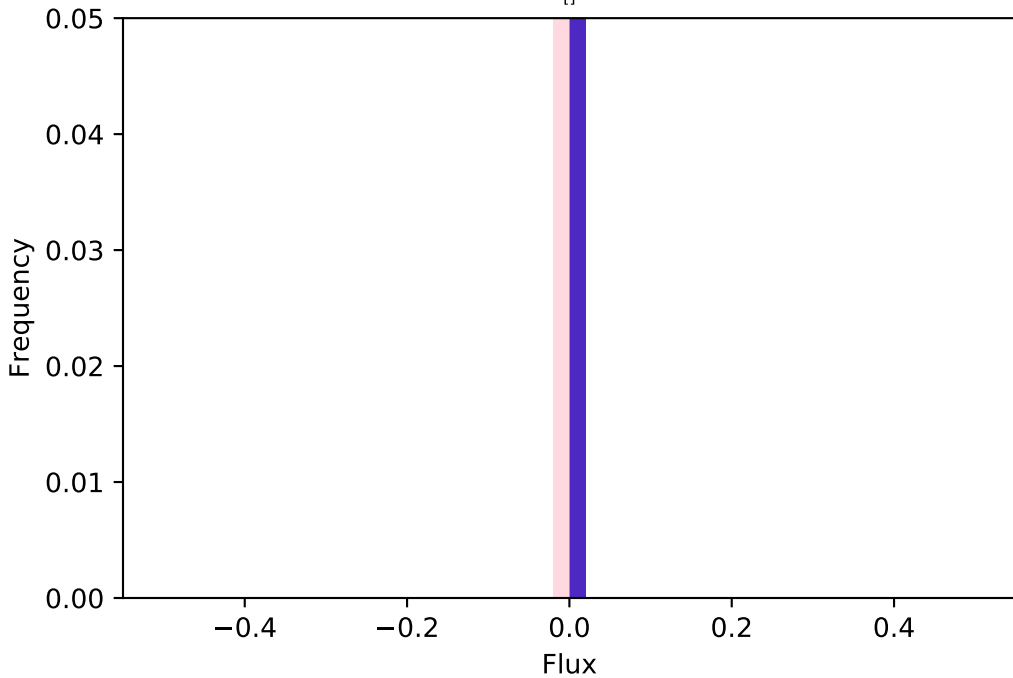
282 : ATP\_h + FGAR\_h + Gln\_h + H2O\_h --> ADP\_h + FGAM\_h + Glu\_h + 2.0 H\_h + Pi\_h  
[ ]



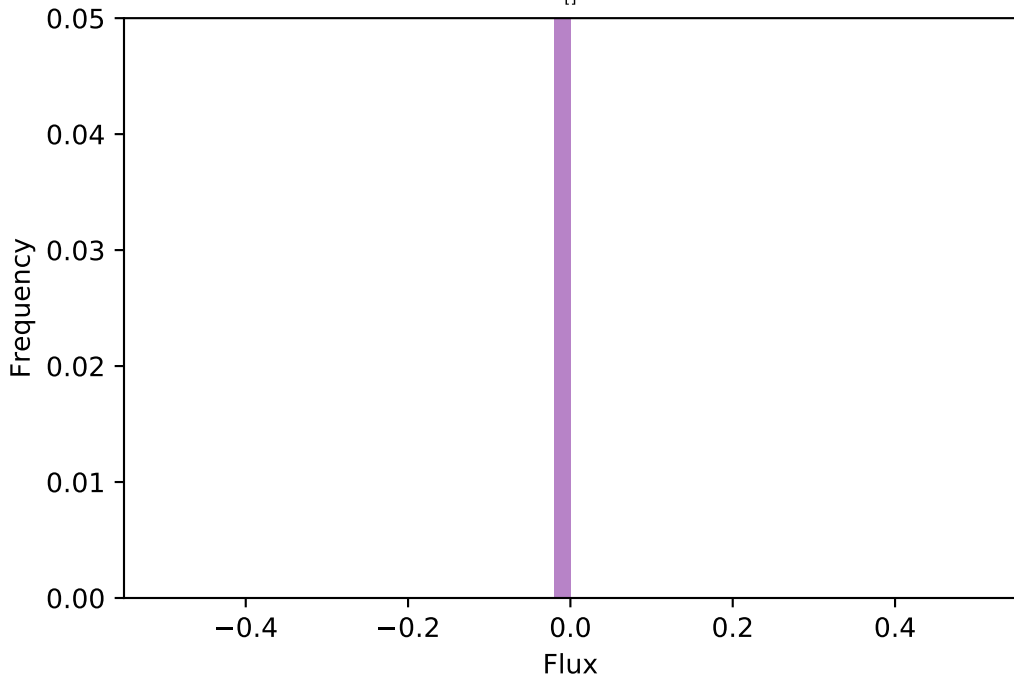
283 : ATP\_h + FGAM\_h --> ADP\_h + AIR\_h + H\_h + Pi\_h  
[]



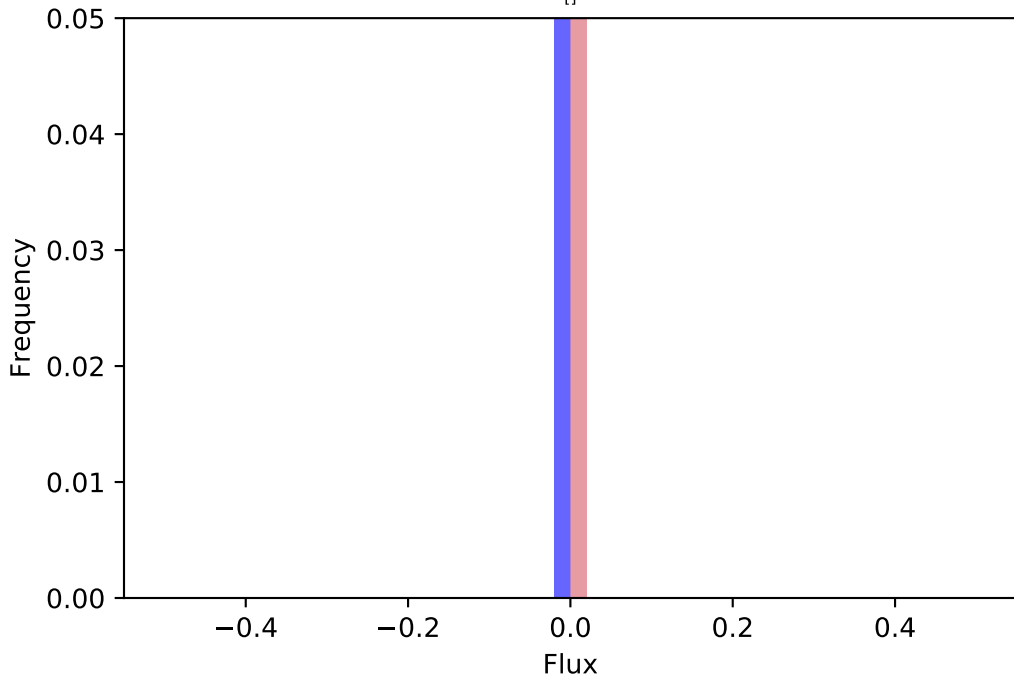
284 : AIR\_h + CO2\_h --> CAIR\_h + H\_h  
[ ]



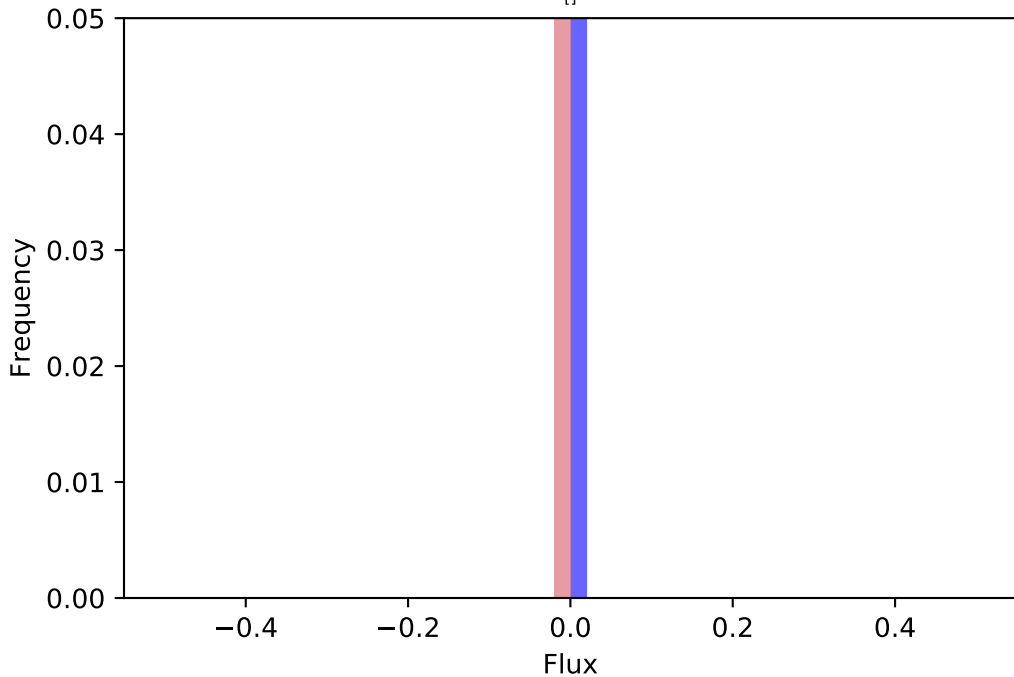
285 : ATP\_h + Asp\_h + CAIR\_h --> ADP\_h + H\_h + Pi\_h + SAICAR\_h  
[ ]



286 : H\_h + SAICAR\_h --> AICAR\_h + Fum\_h  
[ ]

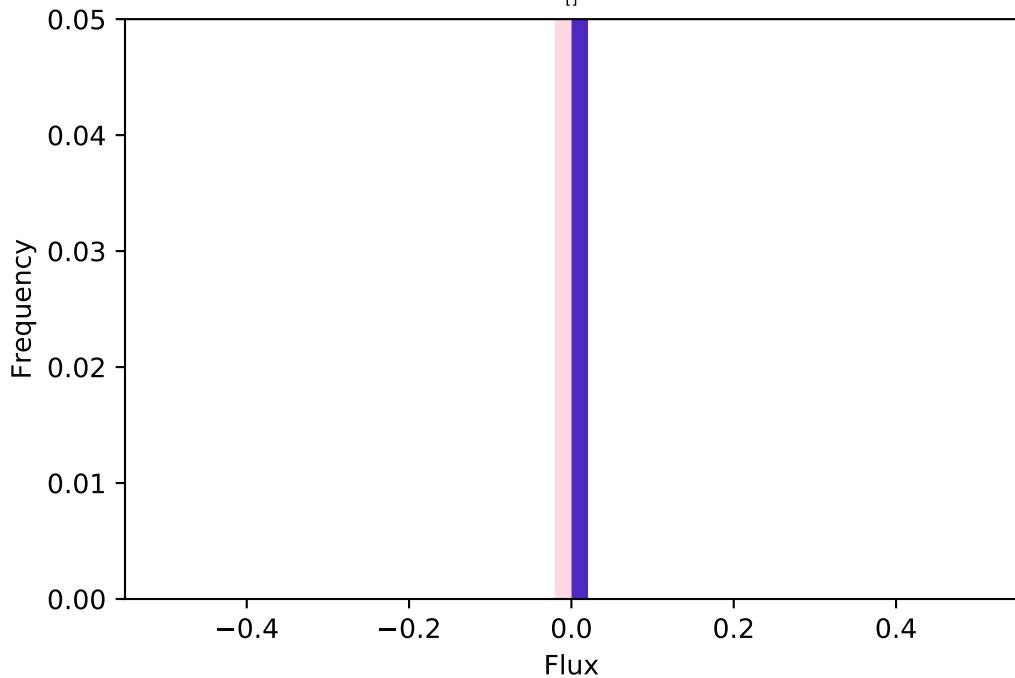


287 : AICAR\_h + F\_DASH\_THF\_h --> FAICAR\_h + 2.0 H\_h + THF\_h  
[ ]

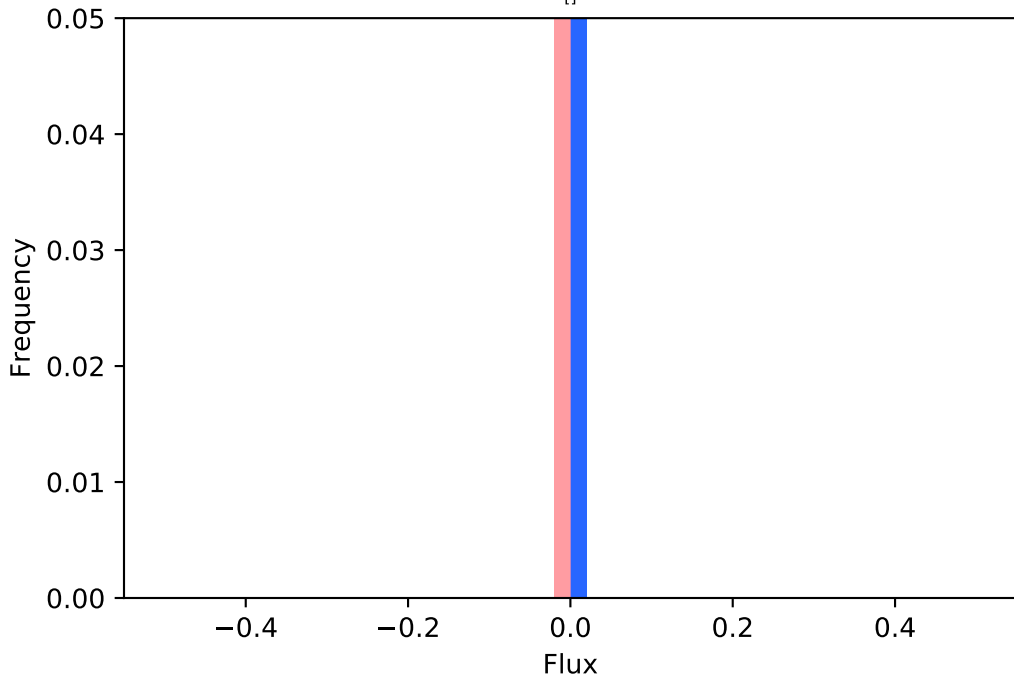




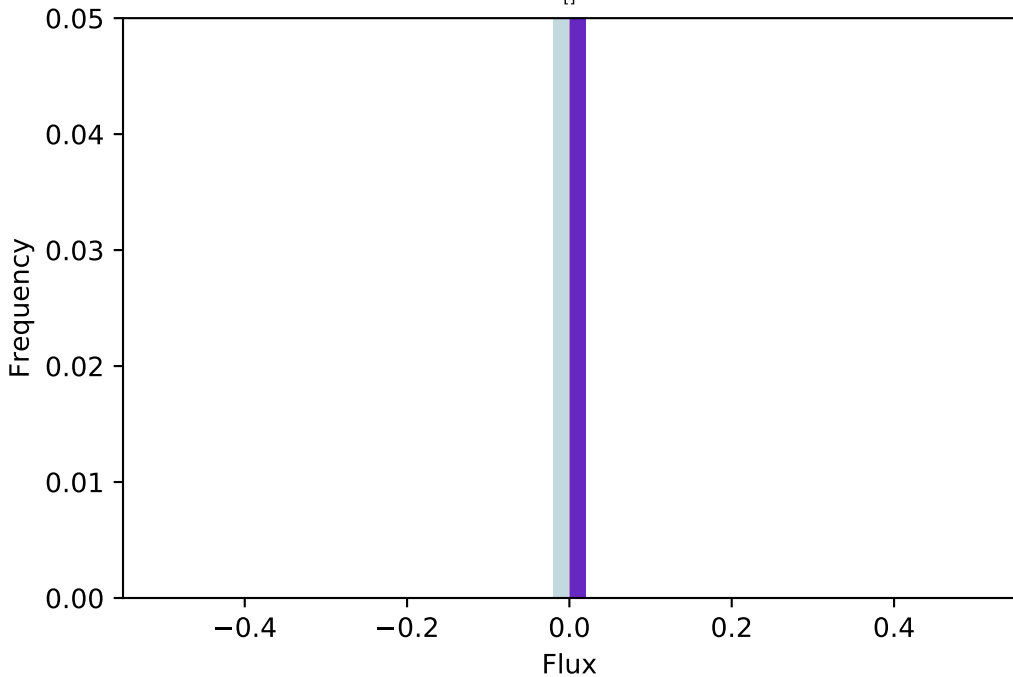
288 : FAICAR\_h --> H2O\_h + IMP\_h  
[]



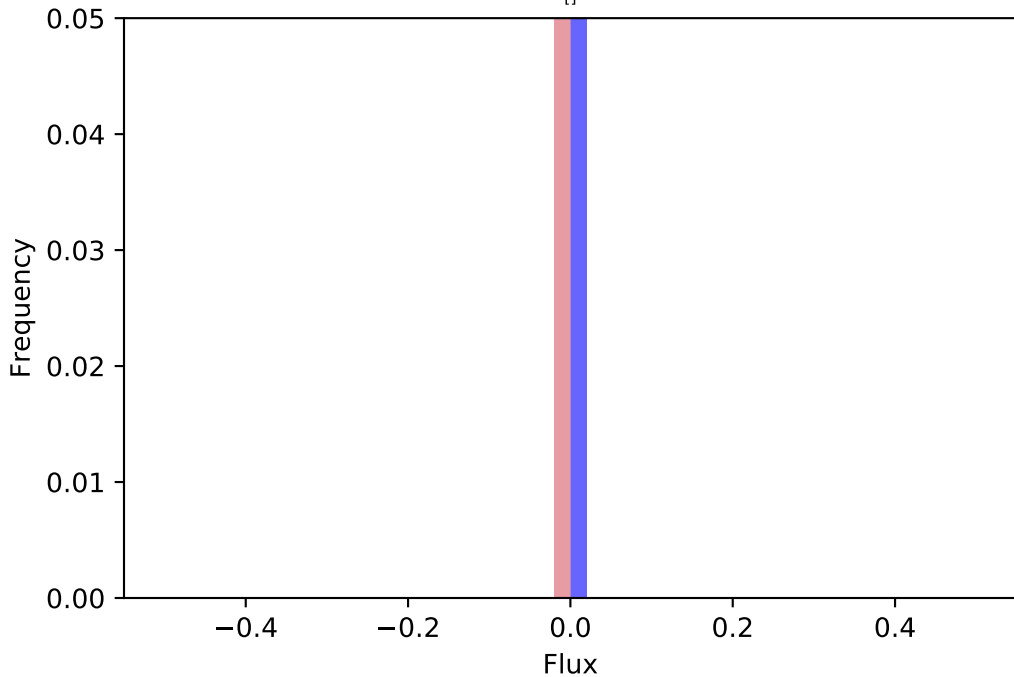
289 : AMP\_c + H2O\_c + H\_c --> IMP\_c + NH4\_c  
[ ]



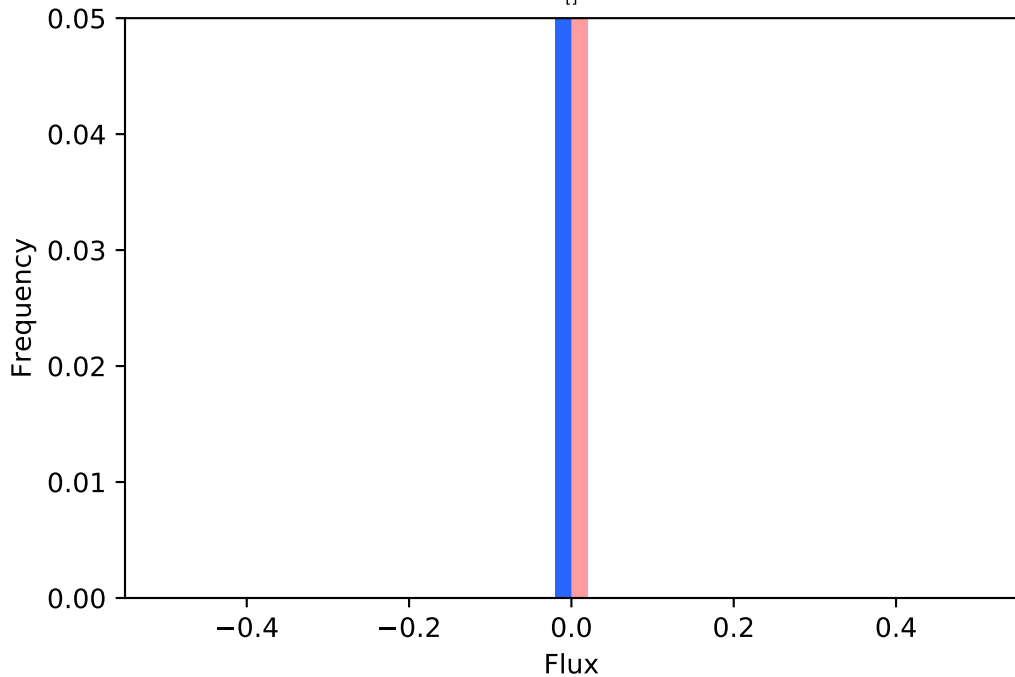
290 : H2O\_c + IMP\_c + NAD\_c --> NADH\_c + XMP\_c  
[]



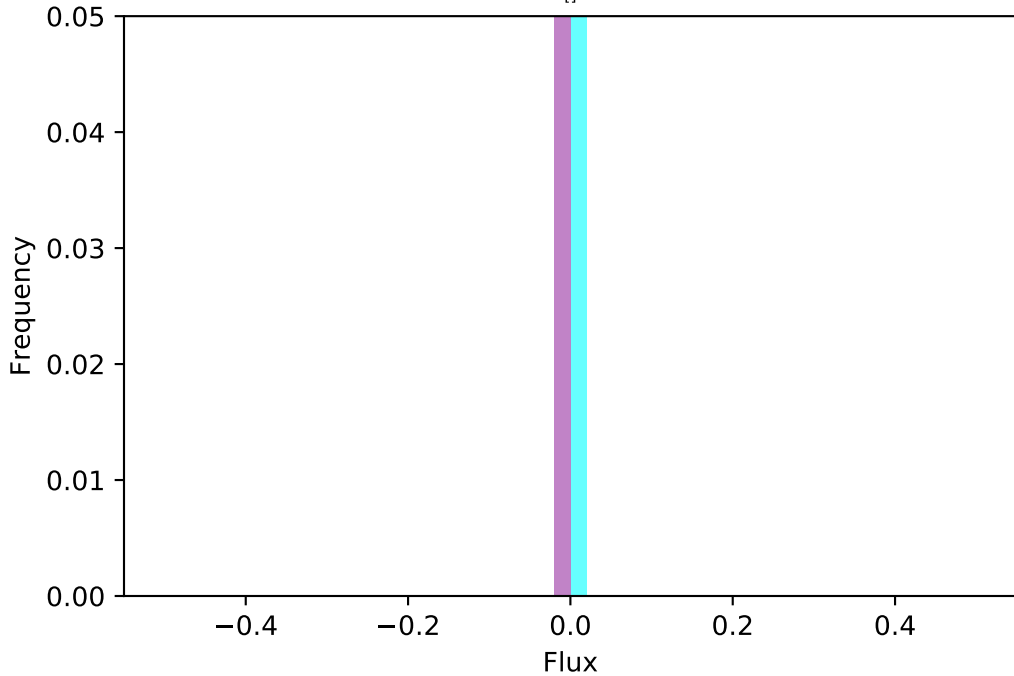
291 : ATP\_c + Gln\_c + H2O\_c + XMP\_c --> AMP\_c + GMP\_c + Glu\_c + H\_c + PPi\_c  
[ ]



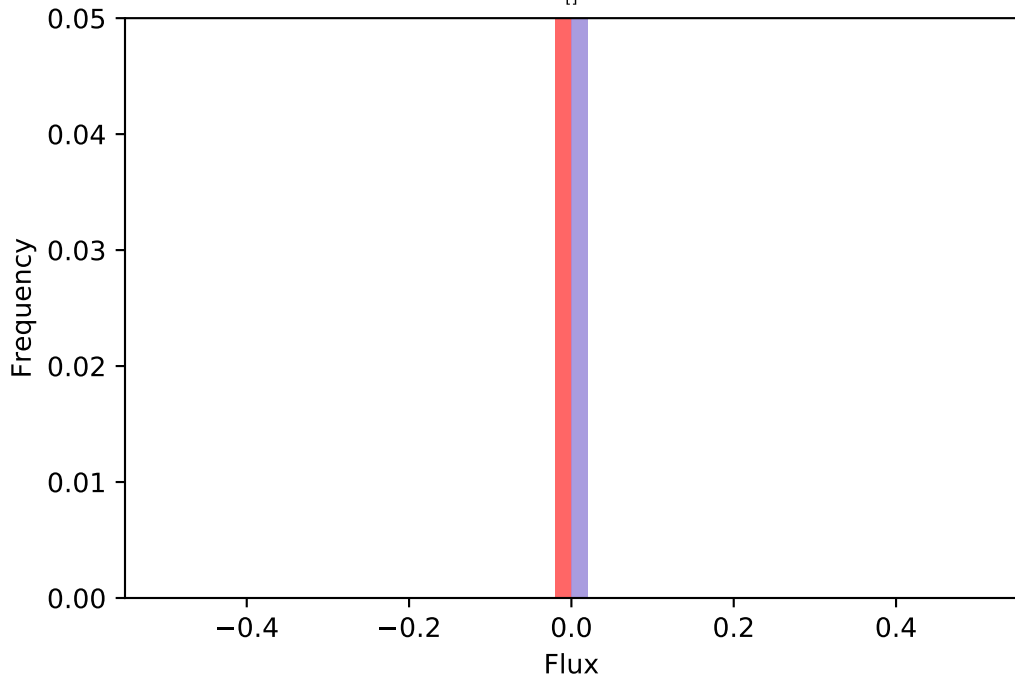
292 : Asp\_h + GTP\_h + IMP\_h --> DC\_DASH\_AMP\_h + GDP\_h + H\_h + Pi\_h  
[ ]



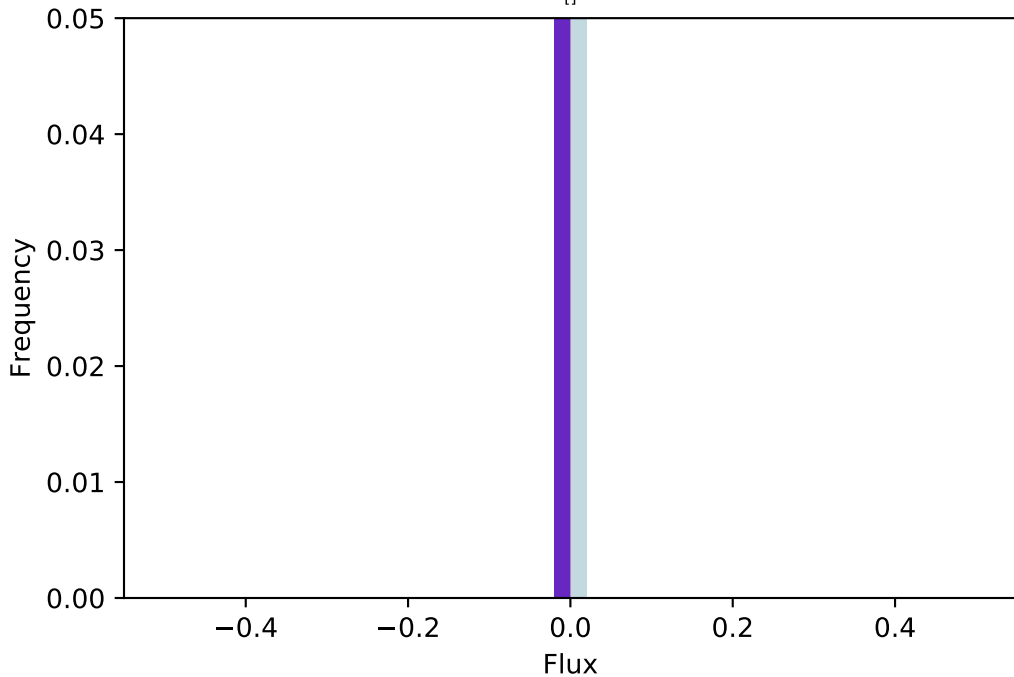
293 : DC\_DASH\_AMP\_h --> AMP\_h + Fum\_h  
[]



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

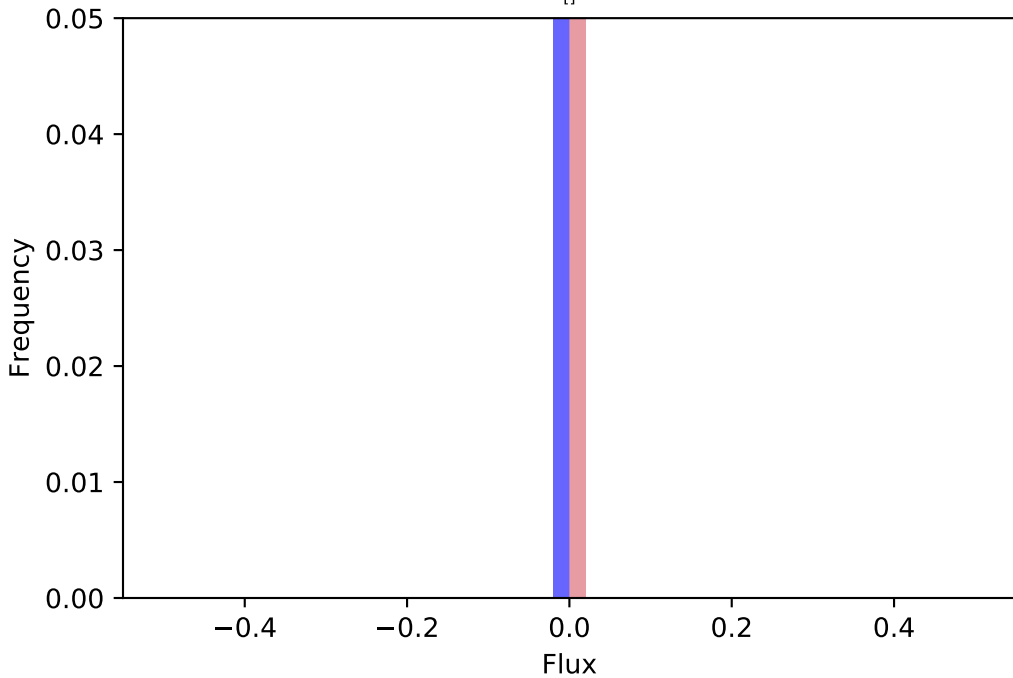


295 : CB\_DASH\_Asp\_h --> DHO\_h + H2O\_h  
[ ]

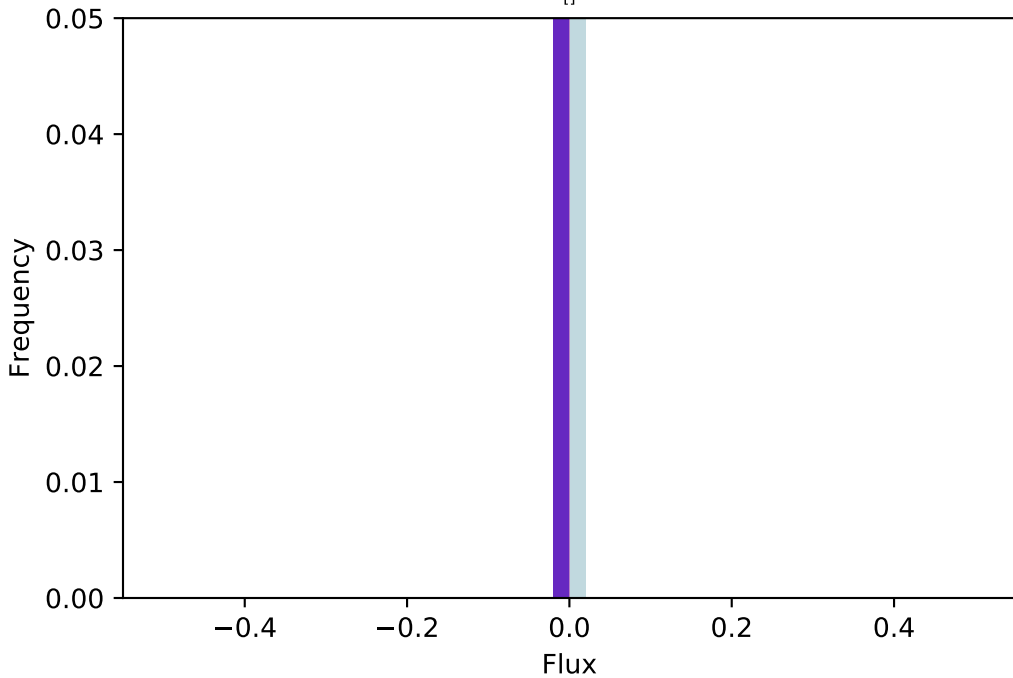




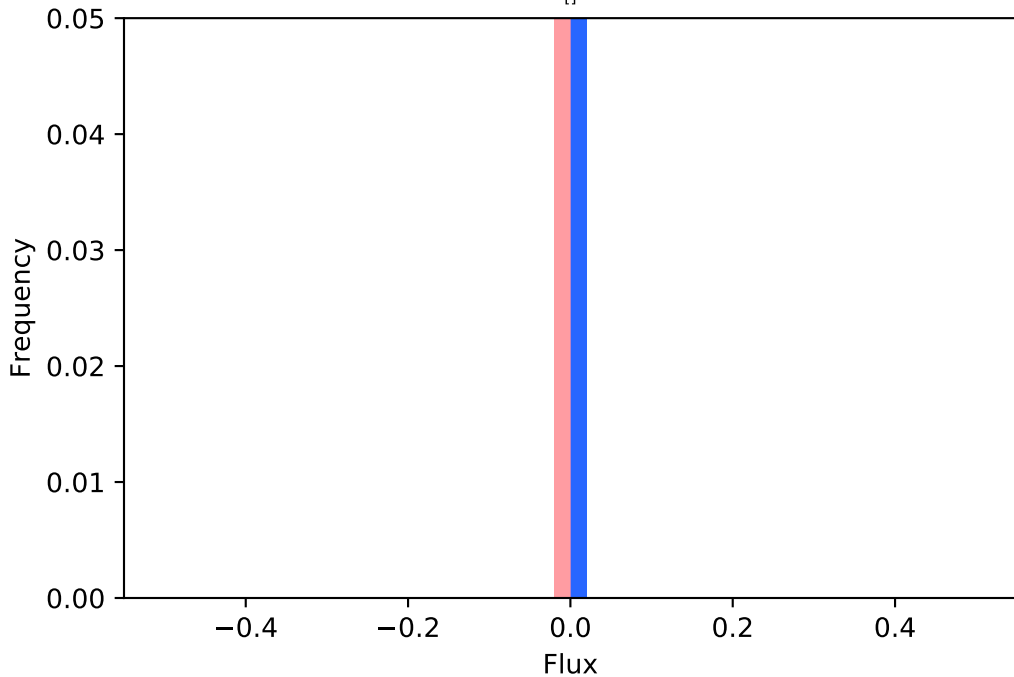
296 : DHO\_m + H\_m + Q\_m --> QH2\_m + orO\_m  
[ ]



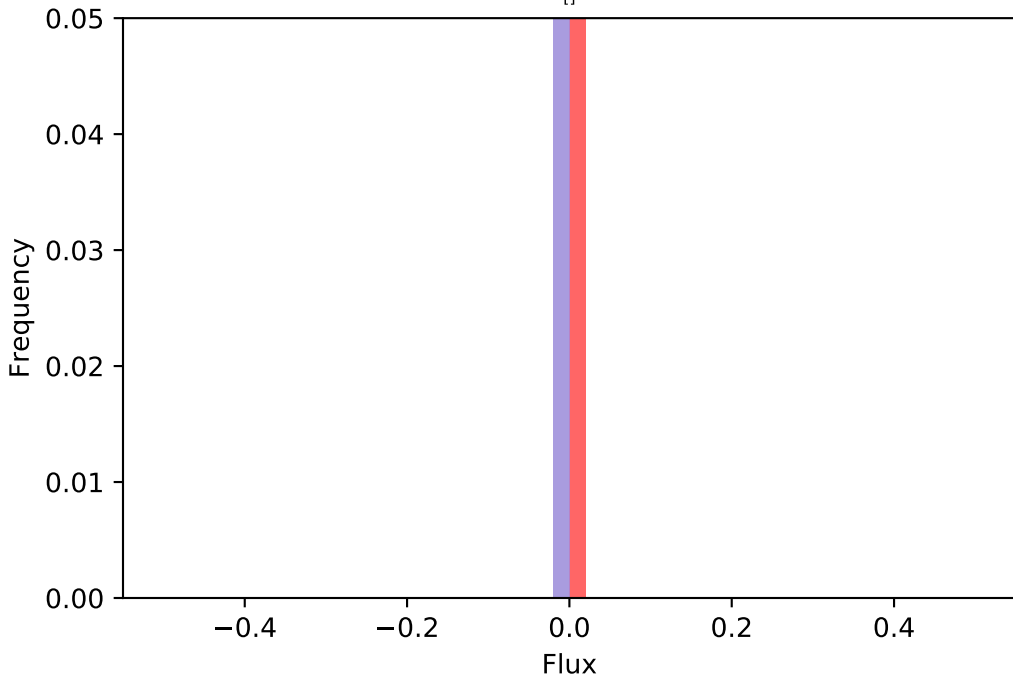
297 : PRPP\_c + orO\_c --> H\_c + OMP\_c + PPI\_c  
[ ]



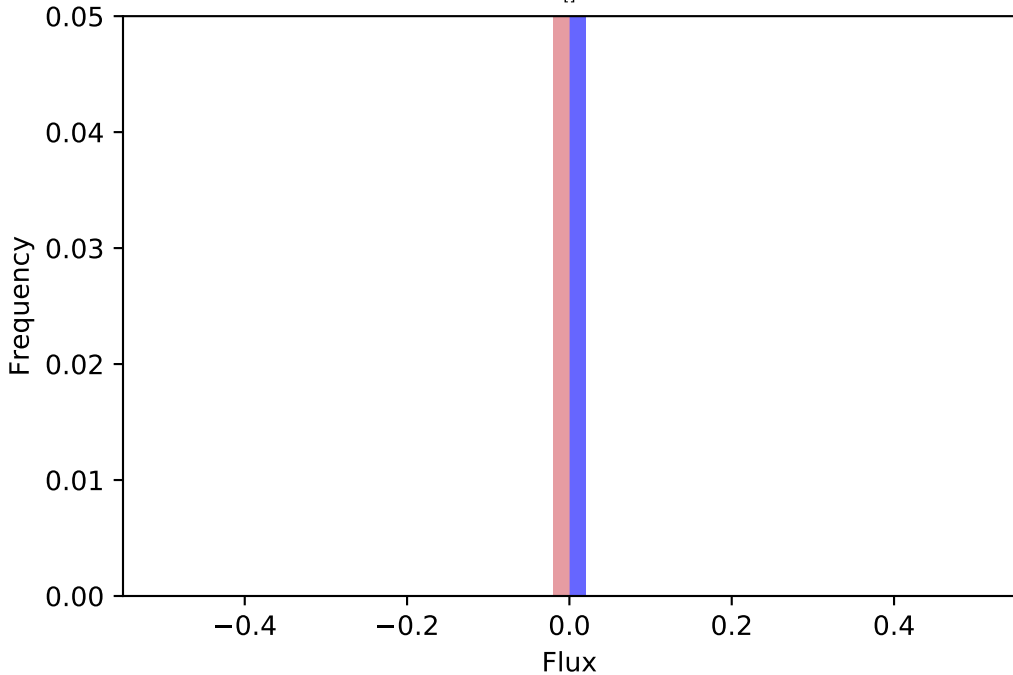
298 : H<sub>c</sub> + OMP<sub>c</sub> --> CO2<sub>c</sub> + UMP<sub>c</sub>  
[ ]



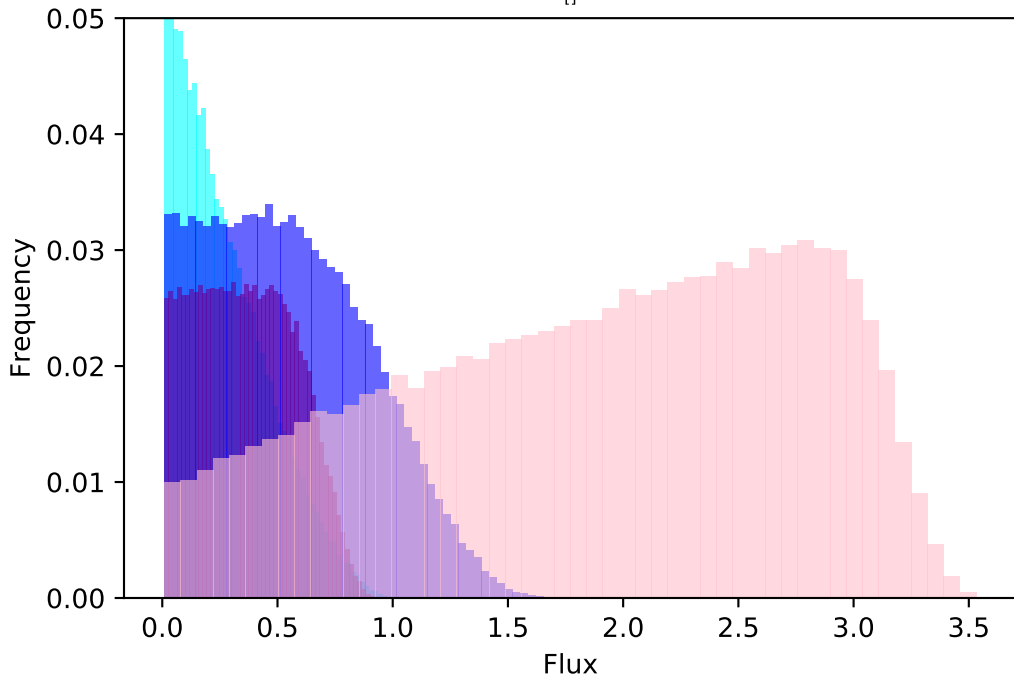
299 : ATP\_c + Gln\_c + H2O\_c + UTP\_c --> ADP\_c + CTP\_c + Glu\_c + 2.0 H\_c + Pi\_c  
[ ]



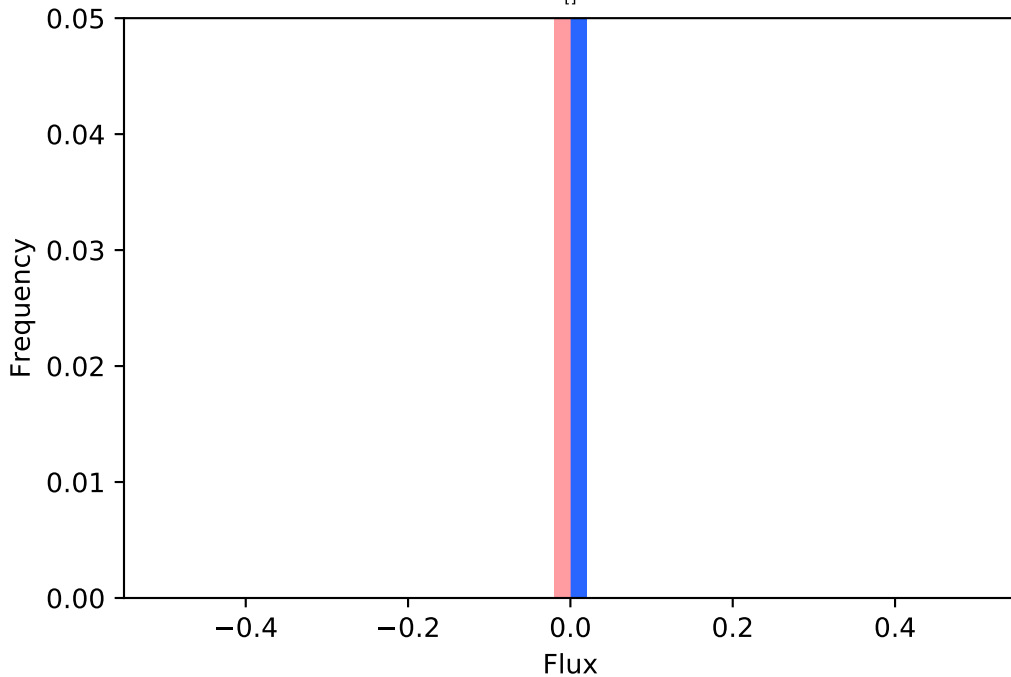
300 : AMP\_c + ATP\_c --> 2.0 ADP\_c  
[ ]



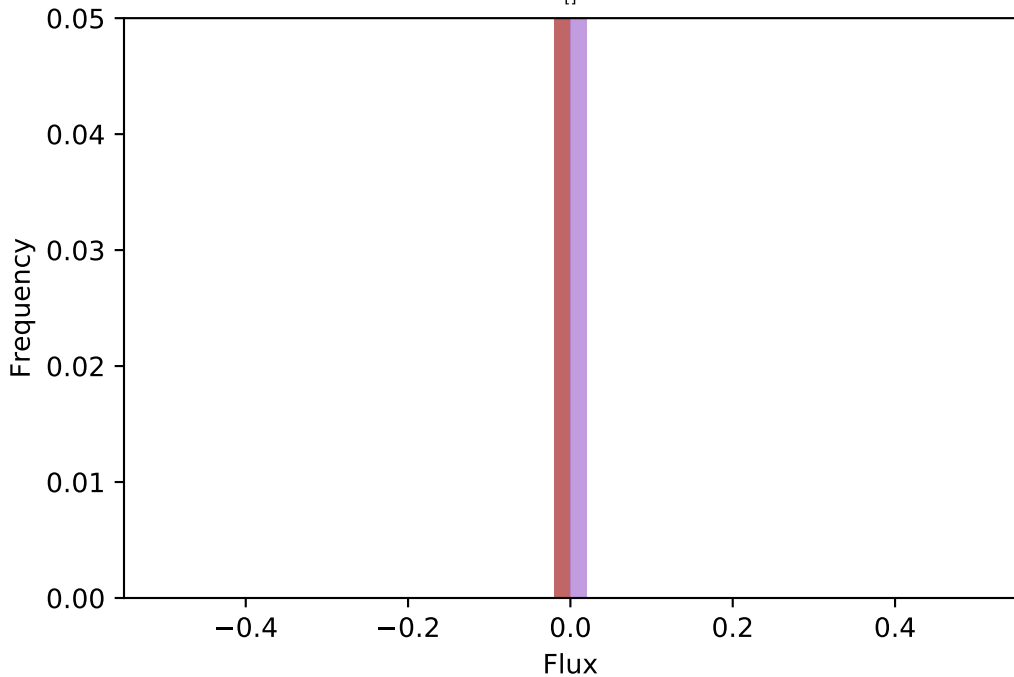
301 : AMP\_h + ATP\_h --> 2.0 ADP\_h  
[ ]



302 : ATP\_c + GMP\_c + H\_c --> ADP\_c + GDP\_c  
[ ]

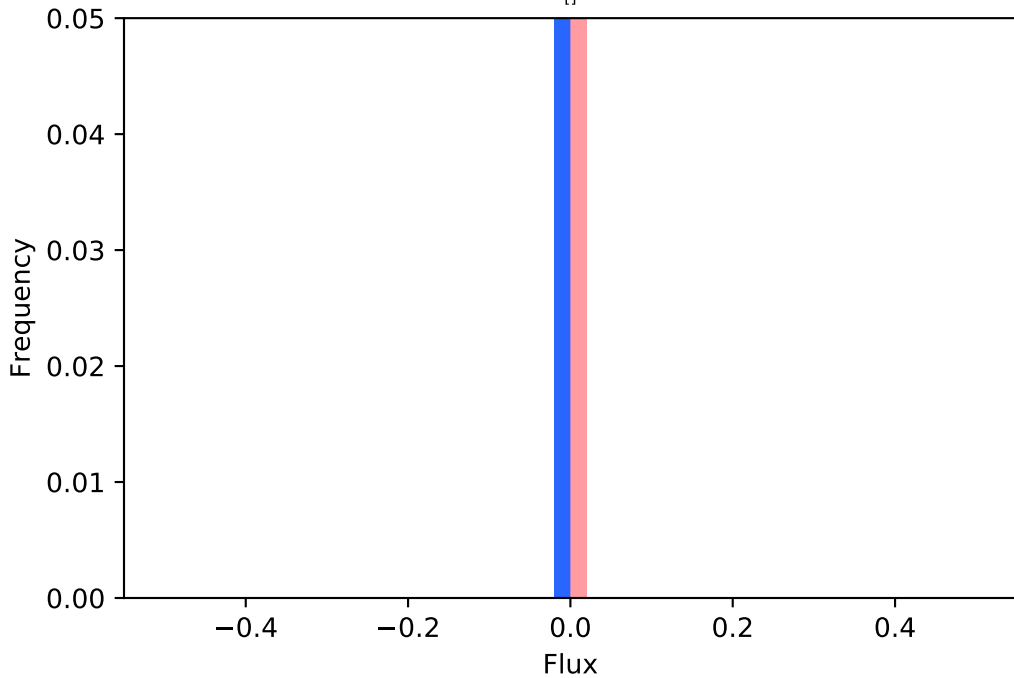


303 : ATP\_c + H\_c + UMP\_c --> ADP\_c + UDP\_c  
[]

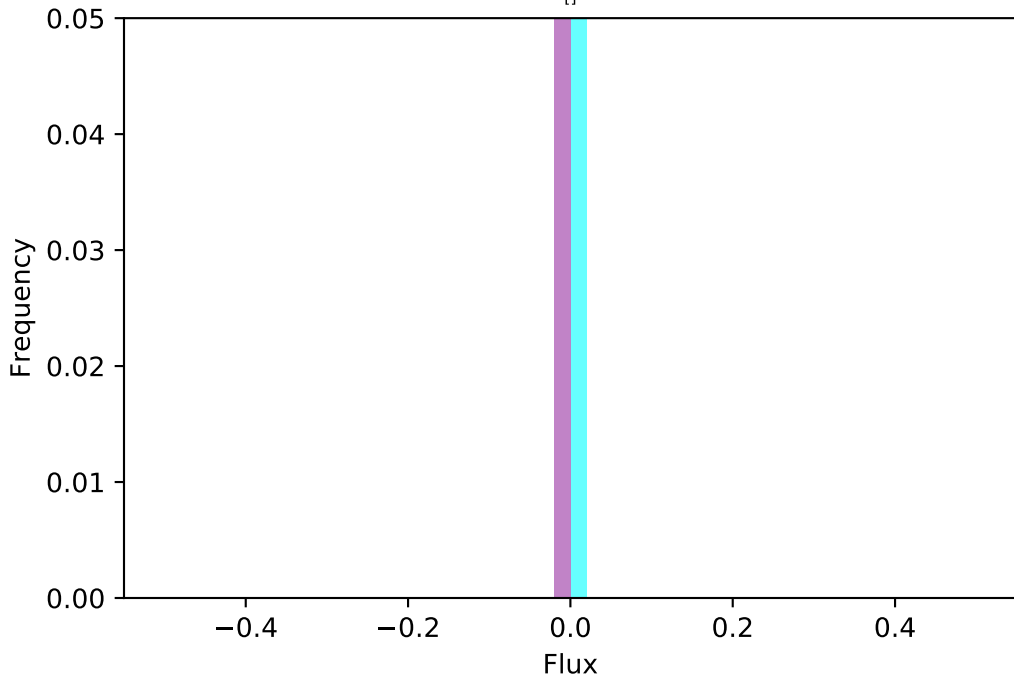




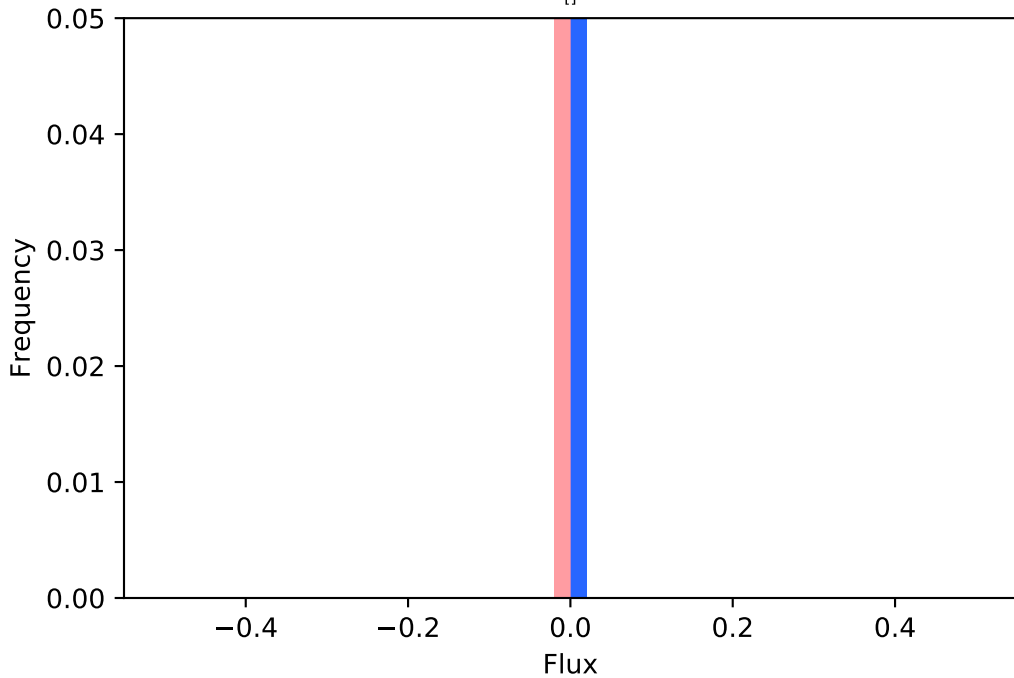
304 : CTP\_c + H2O\_c --> CDP\_c + Pi\_c  
[]



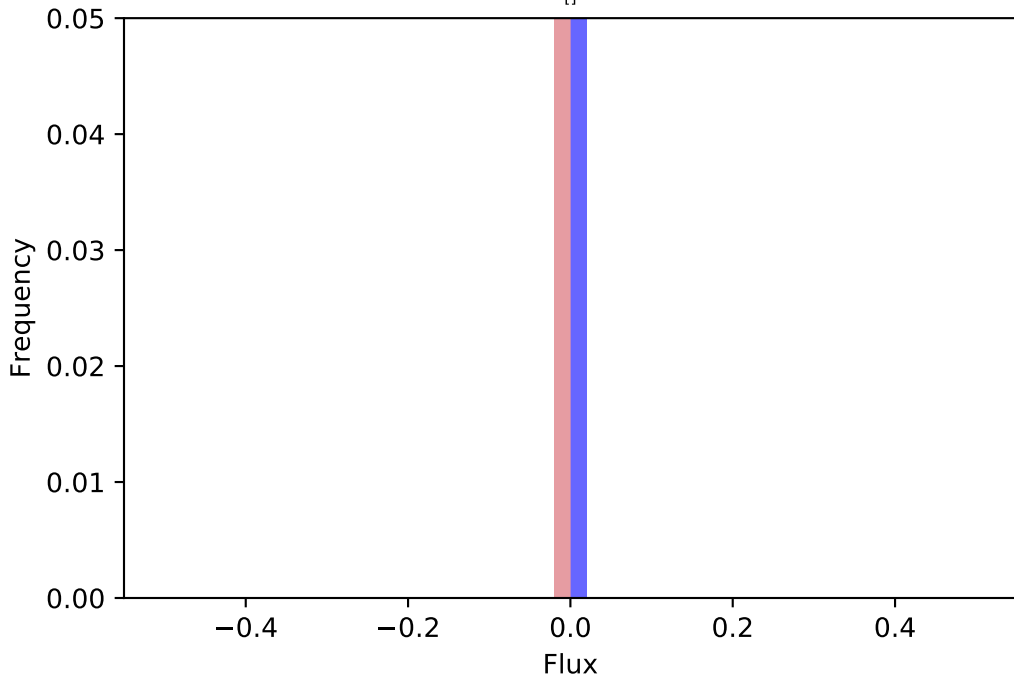
305 : ADP\_c + H\_c + TRXrd\_c --> H2O\_c + TRXox\_c + dADP\_c  
[ ]



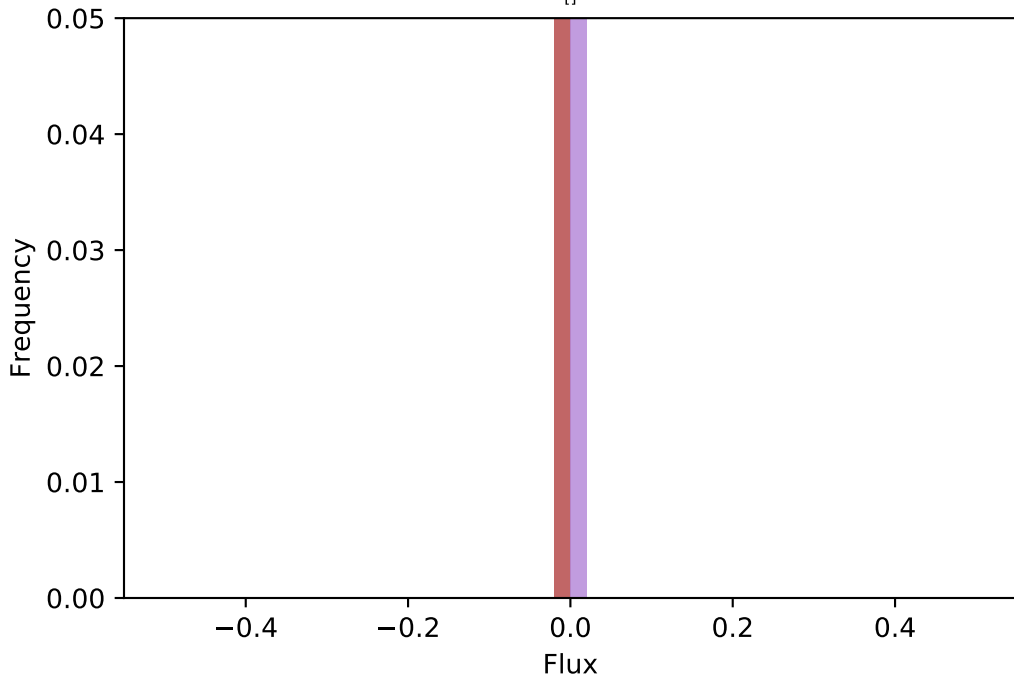
306 : CDP\_c + TRXrd\_c --> H2O\_c + TRXox\_c + dCDP\_c  
[]



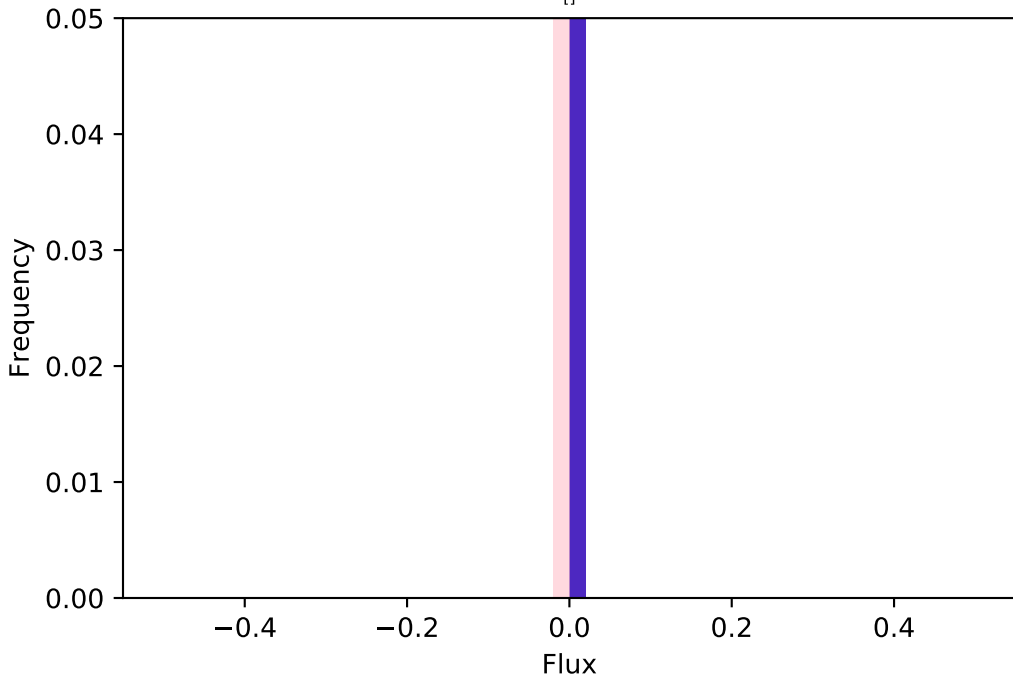
307 : GDP\_c + TRXrd\_c --> H2O\_c + TRXox\_c + dGDP\_c  
[]



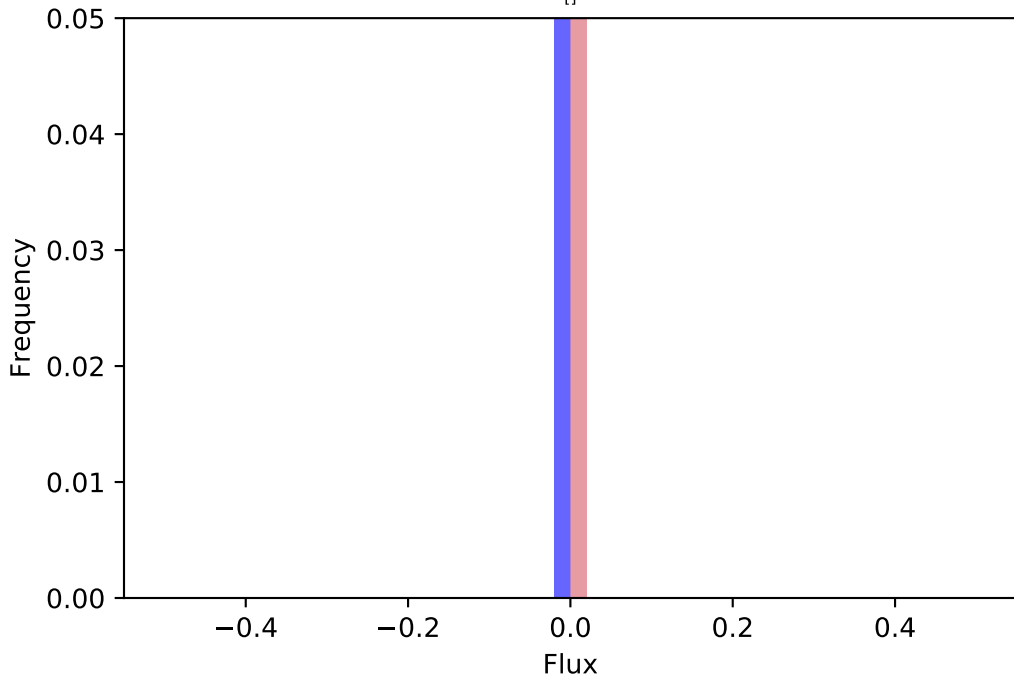
308 : TRXrd\_c + UDP\_c --> H2O\_c + TRXox\_c + dUDP\_c  
[]



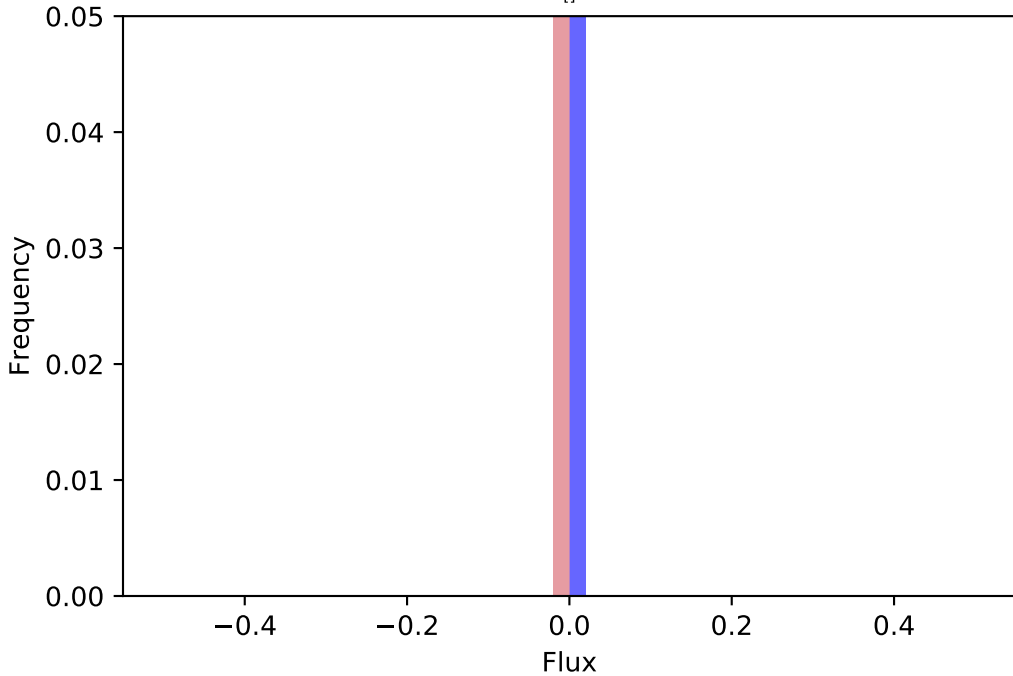
309 : H<sub>2</sub>O\_c + dUTP\_c --> 2.0 H\_c + PPi\_c + dUMP\_c  
[ ]



310 : M\_DASH\_THF\_c + dUMP\_c --> DHF\_c + dTMP\_c  
[]

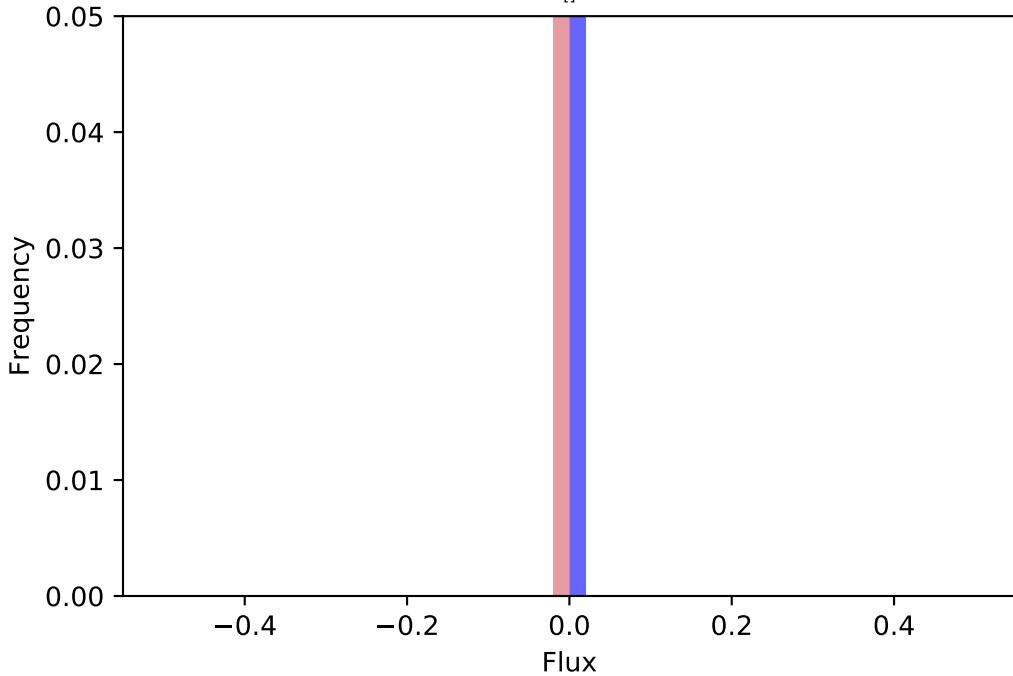


311 : ATP\_c + H\_c + dTMP\_c --> ADP\_c + dTDP\_c  
[]

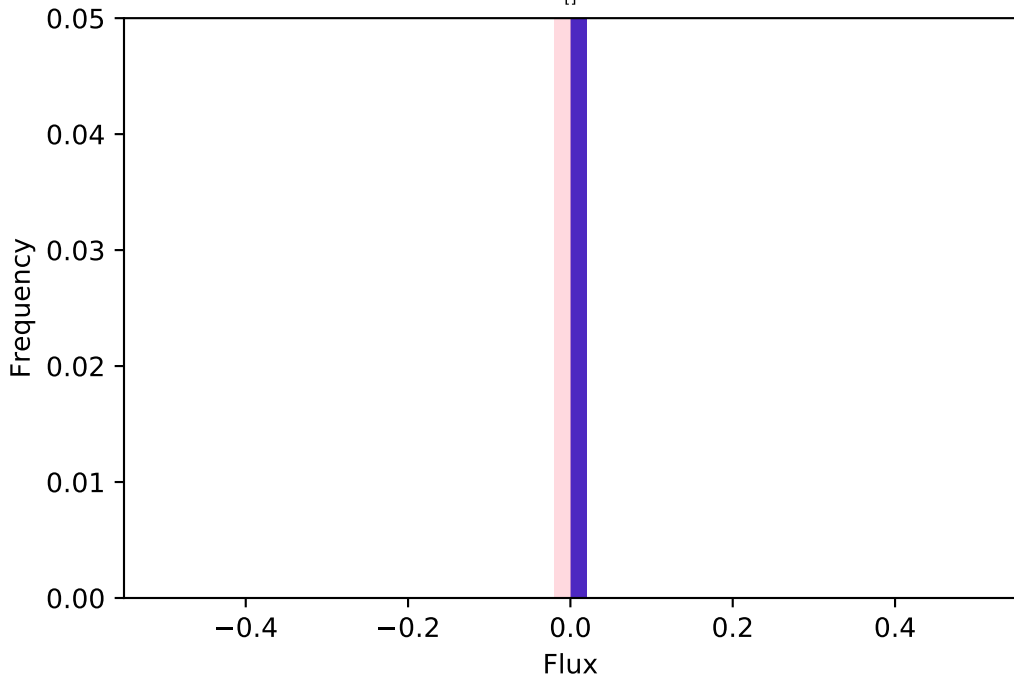


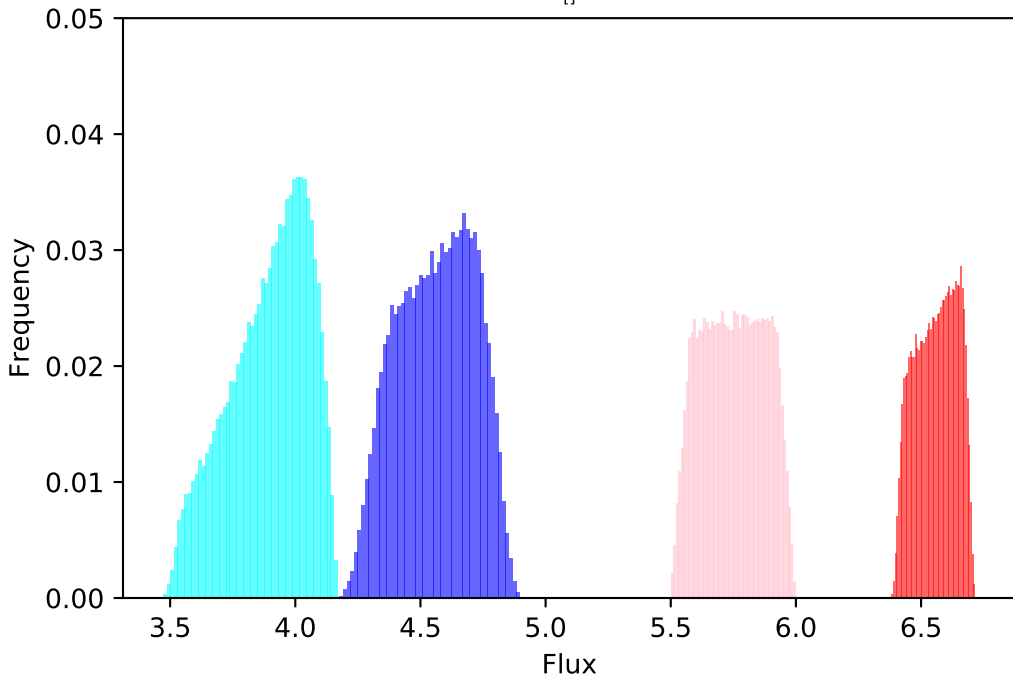
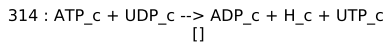


312 : ATP\_c + GDP\_c --> ADP\_c + GTP\_c + H\_c  
[ ]

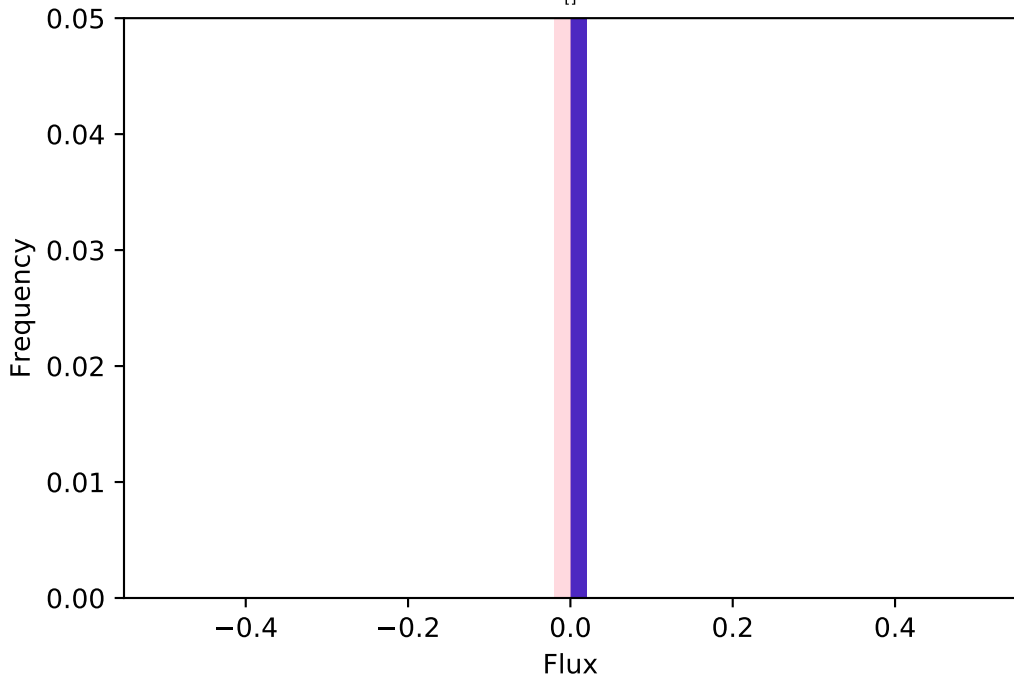


313 : ATP\_h + GDP\_h --> ADP\_h + GTP\_h + H\_h  
[ ]

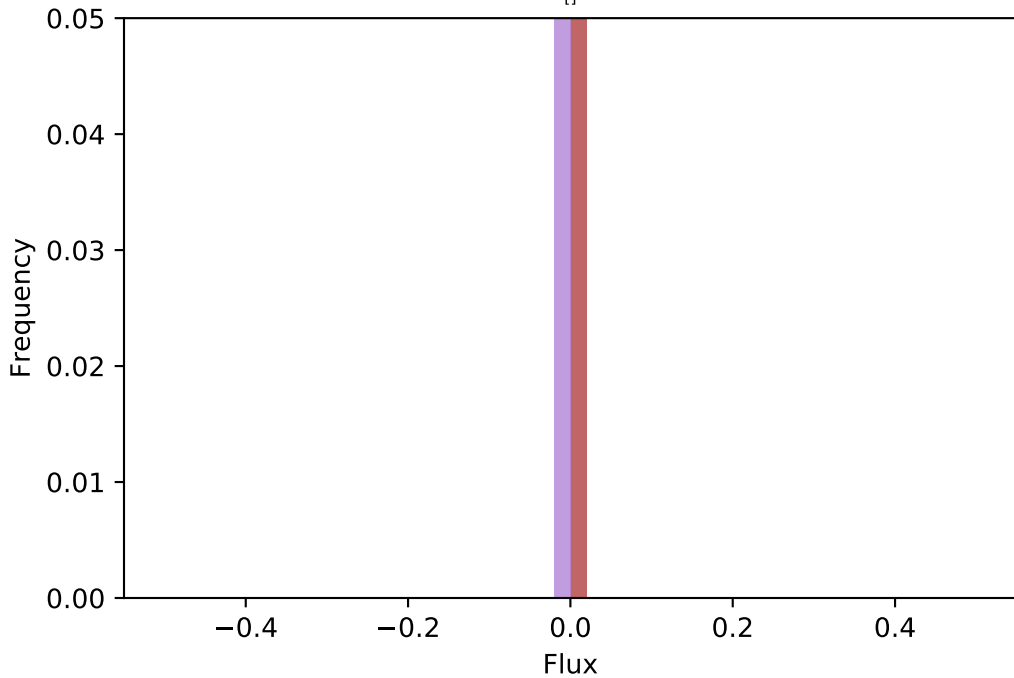




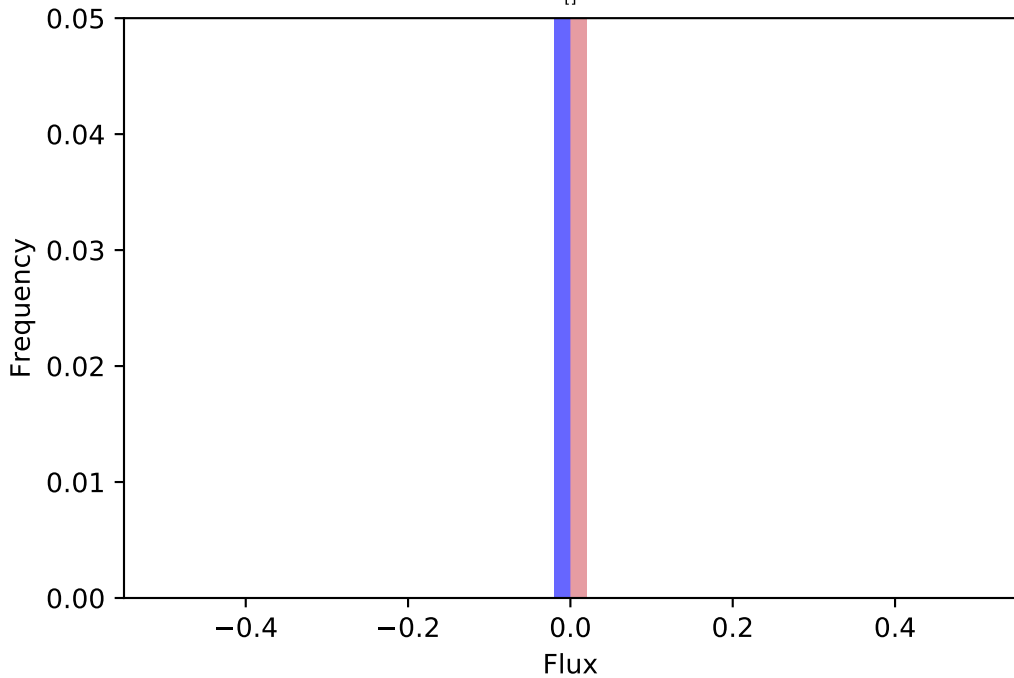
315 : ATP\_c + dADP\_c --> ADP\_c + dATP\_c  
[ ]



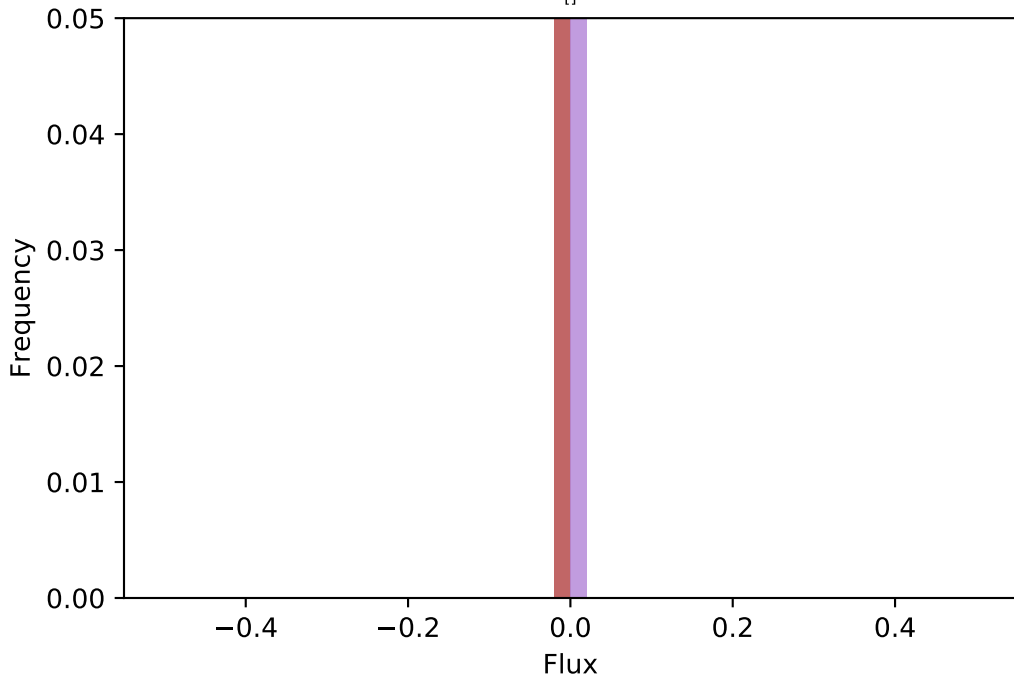
316 : ATP\_c + dCDP\_c --> ADP\_c + dCTP\_c  
[ ]



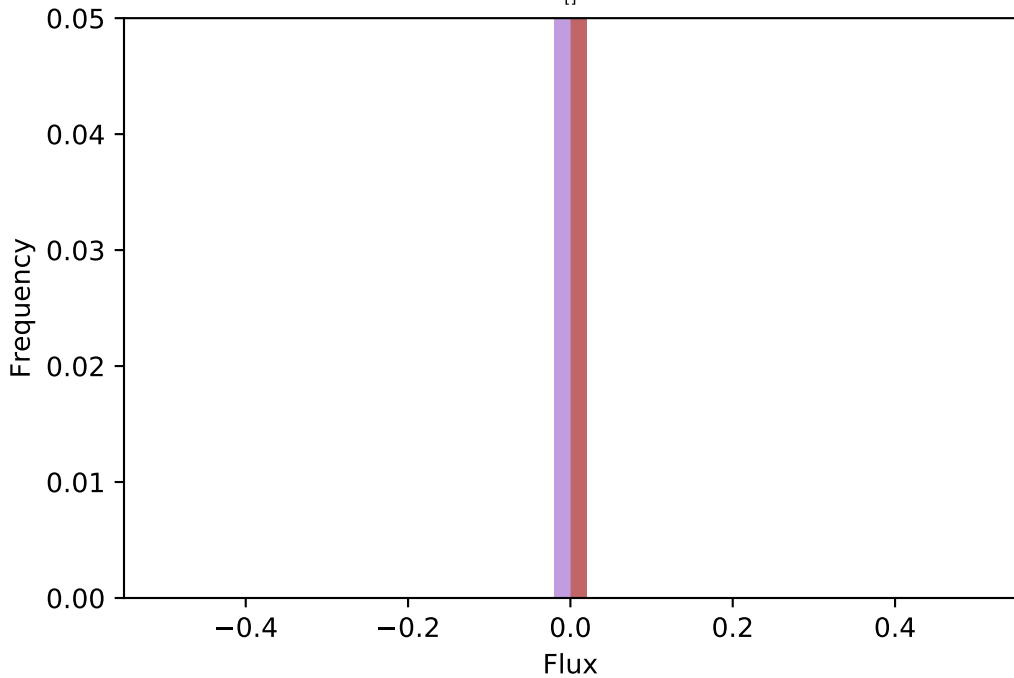
317 : ATP\_c + dGDP\_c --> ADP\_c + dGTP\_c  
[ ]



318 : ATP\_c + dTDP\_c --> ADP\_c + dTTP\_c  
[ ]

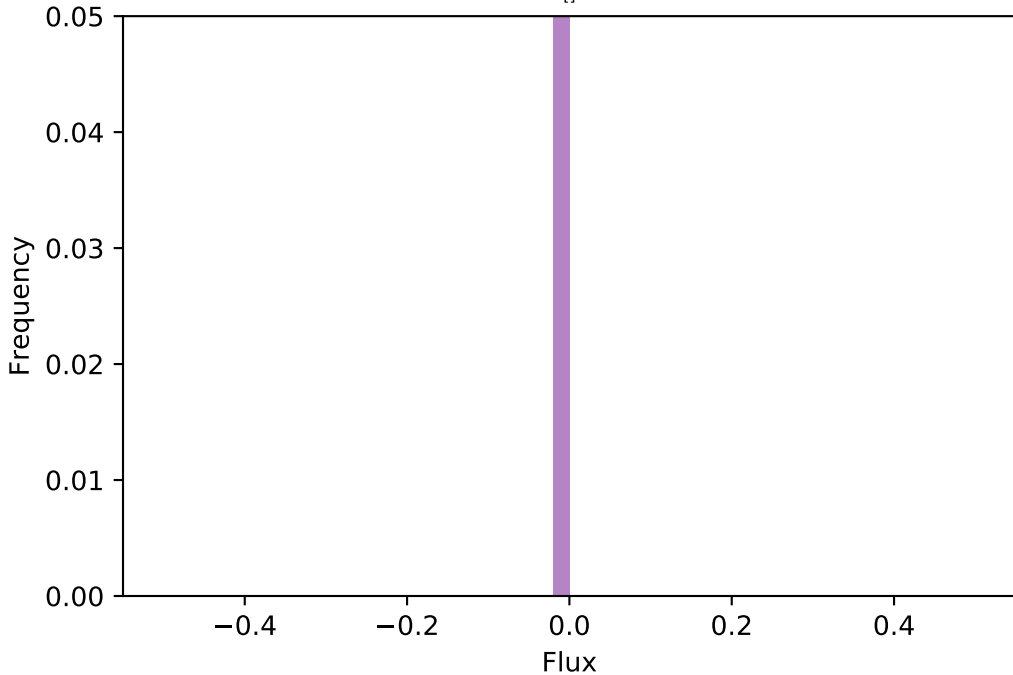


319 : ATP\_c + dUDP\_c --> ADP\_c + dUTP\_c  
[ ]

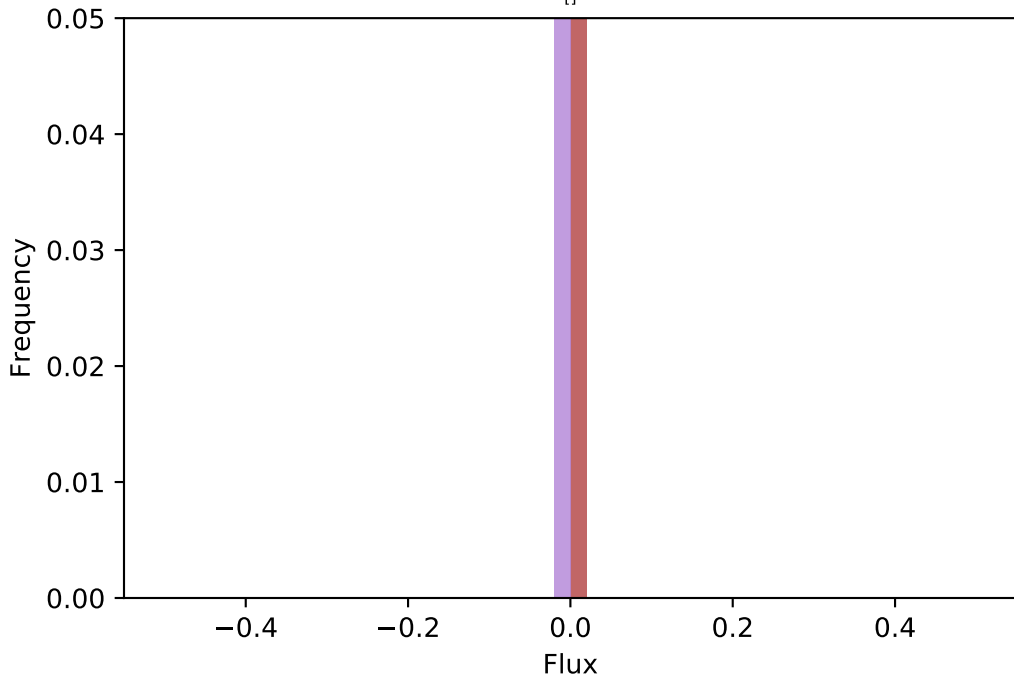




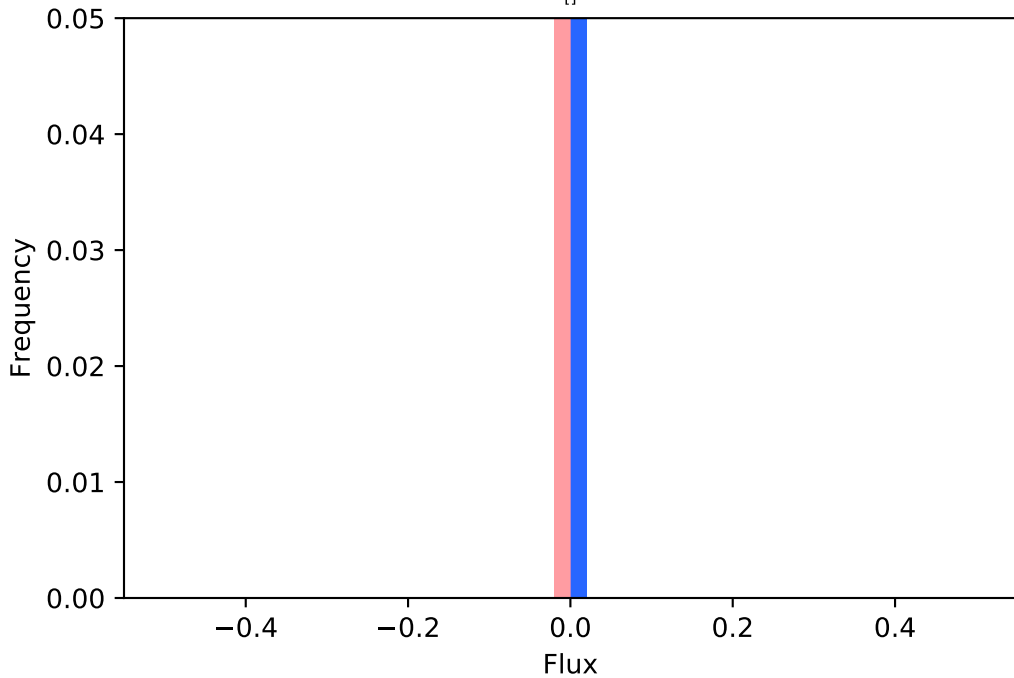
320 : SO4\_c <=> SO4\_h  
[]



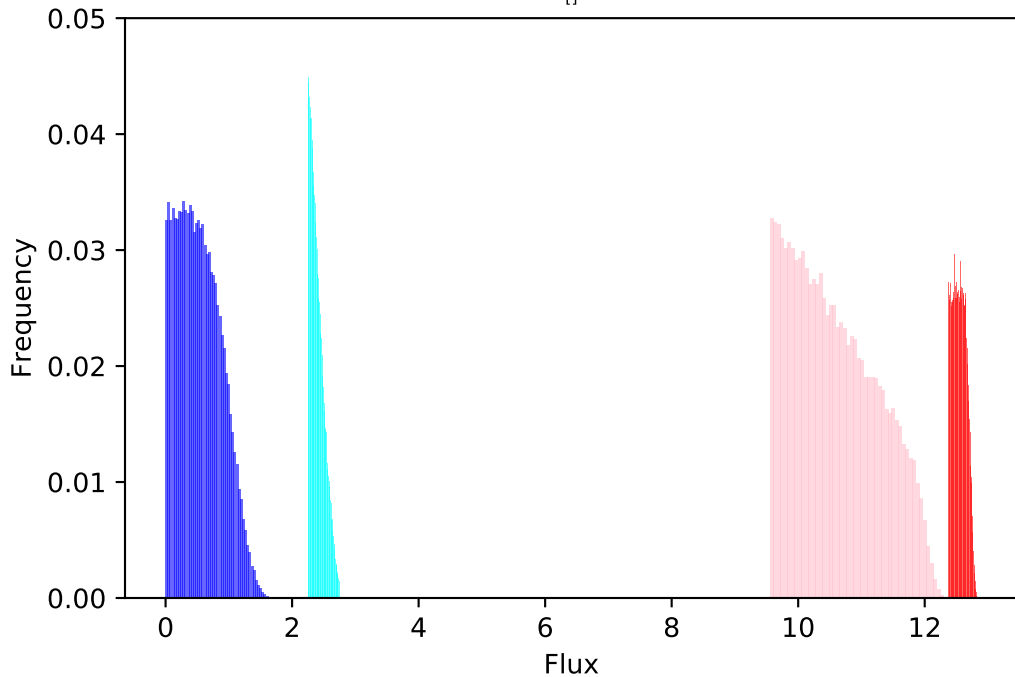
321 : NO2\_c --> NO2\_h  
[]



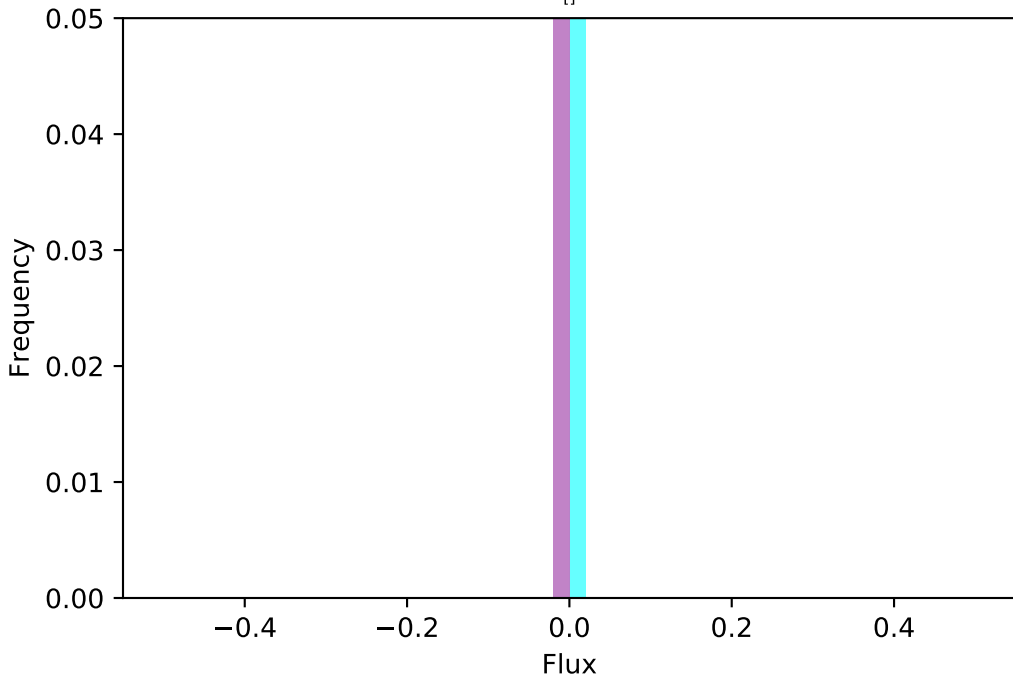
322 : ADP\_h + ATP\_c + Pi\_h --> ADP\_c + ATP\_h + Pi\_c  
[]



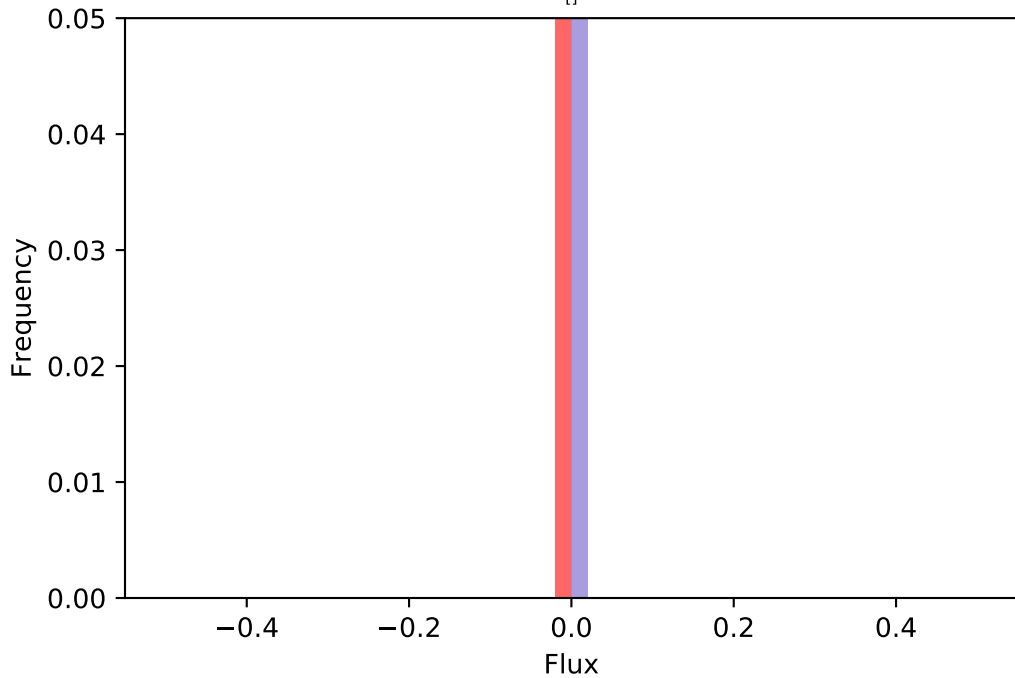
323 : ADP\_c + ATP\_m + Pi\_c --> ADP\_m + ATP\_c + Pi\_m  
[]



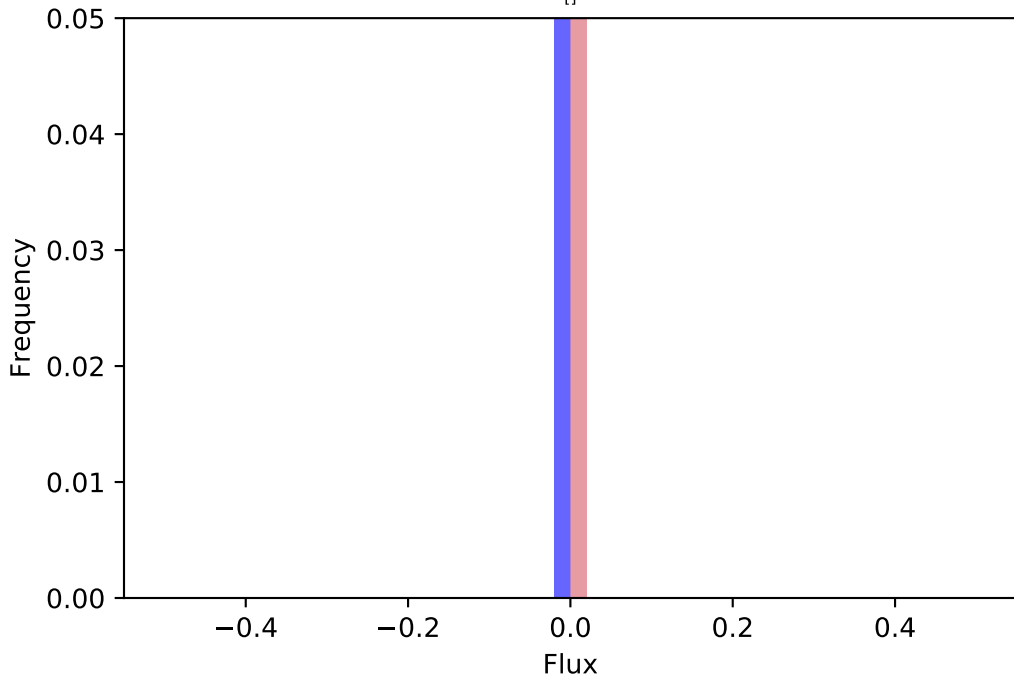
324 : AMP\_h --> AMP\_c  
[]



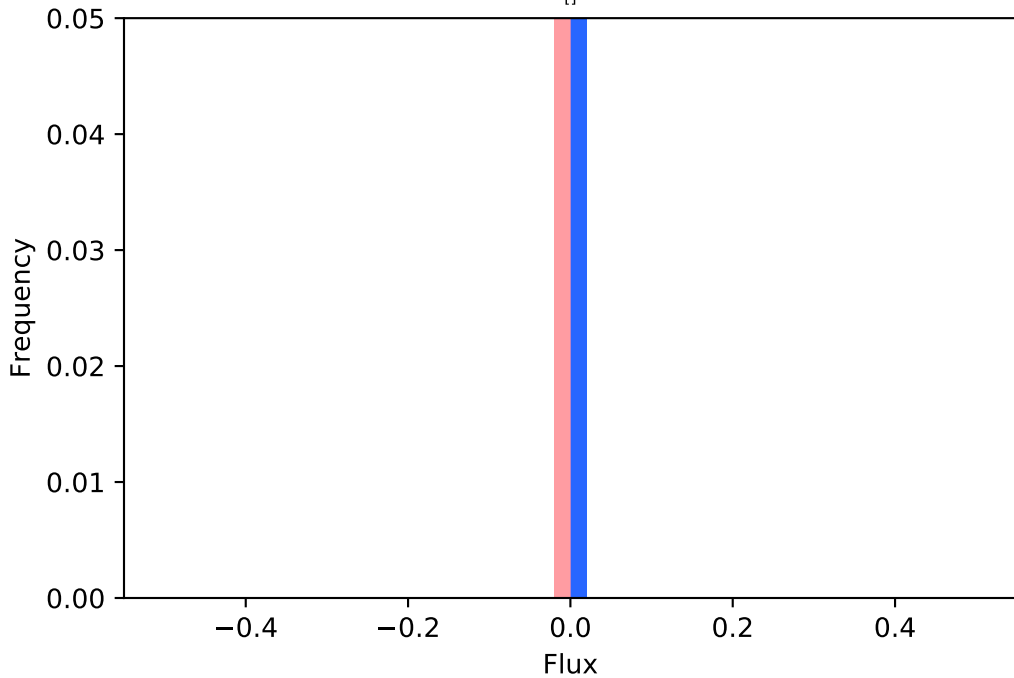
325 : ADP\_h --> ADP\_c  
[]



326 : ATP\_h --> ATP\_c  
[ ]

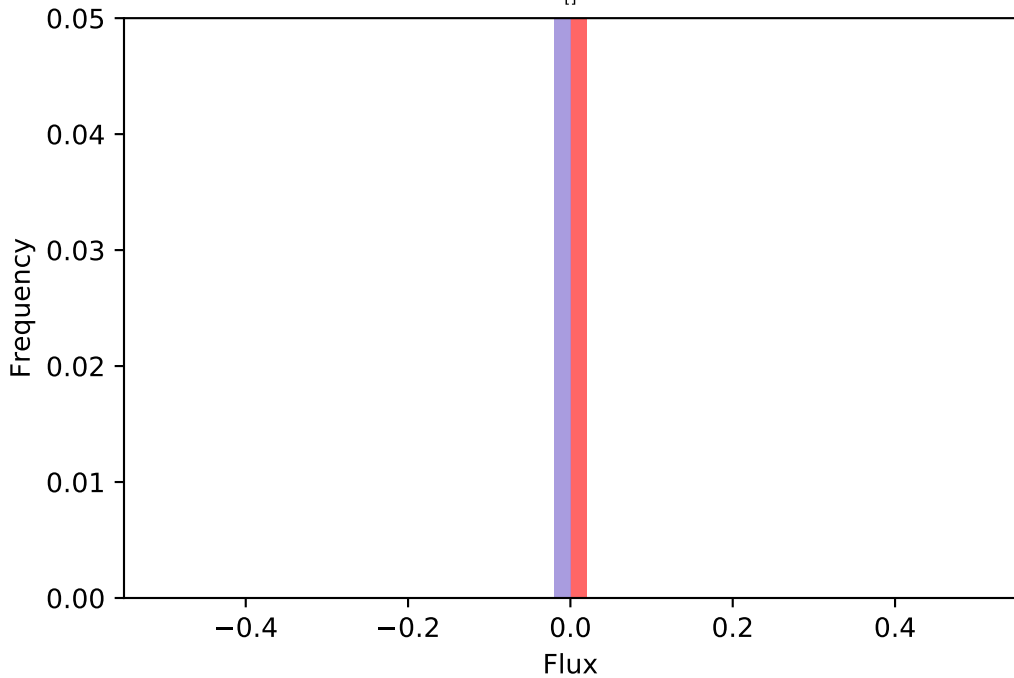


327 : AMP\_h + NAD\_c --> AMP\_c + NAD\_h  
[ ]

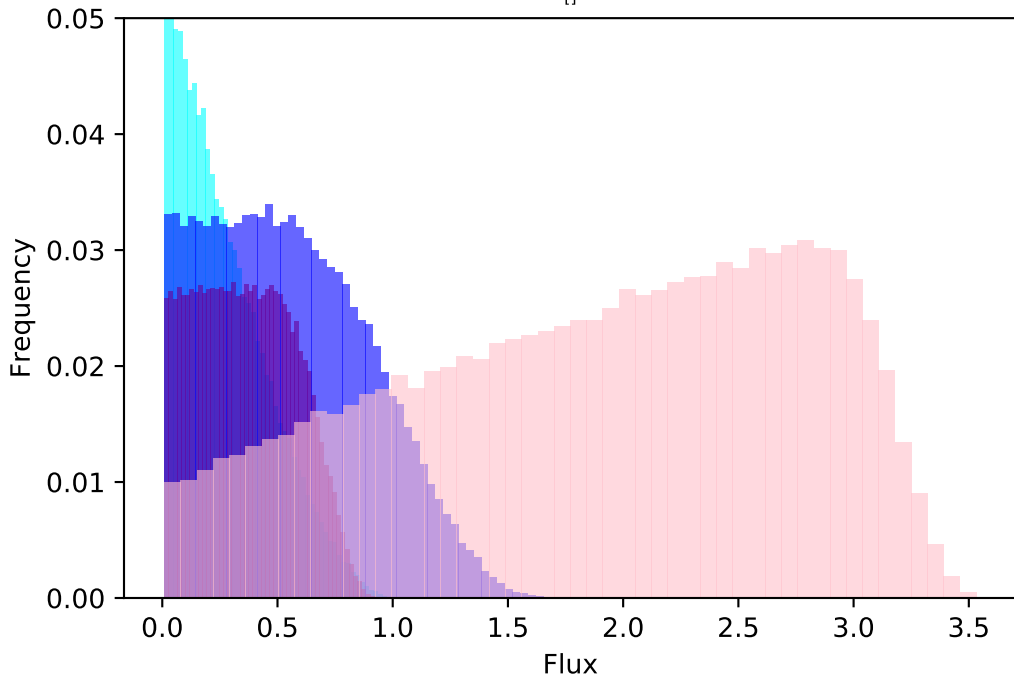




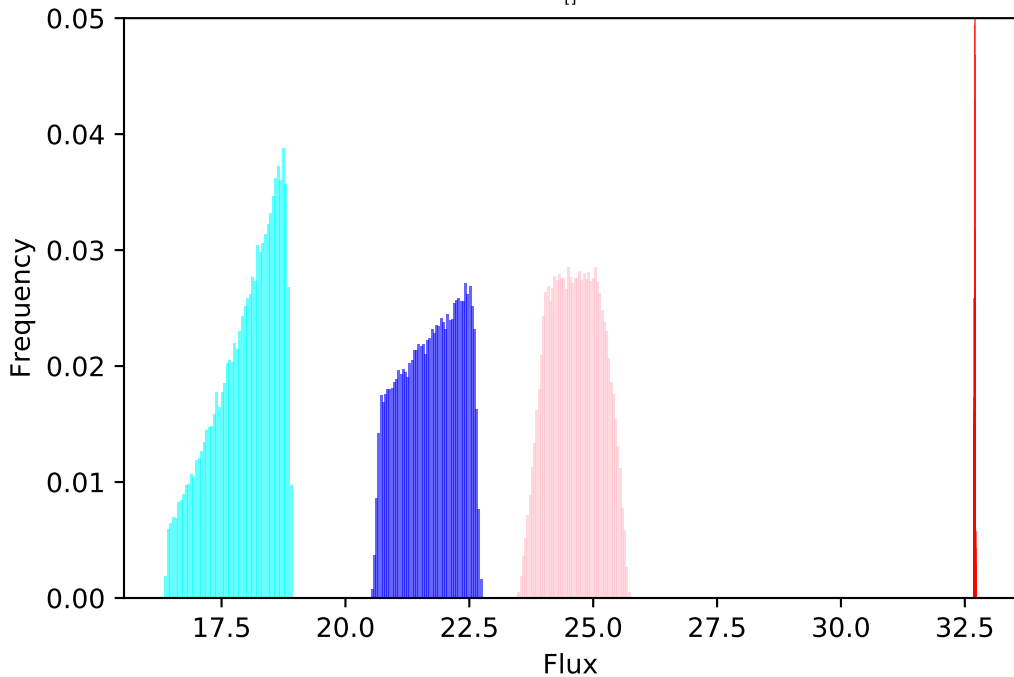
328 : ADP\_h + NAD\_c <=> ADP\_c + NAD\_h  
[ ]



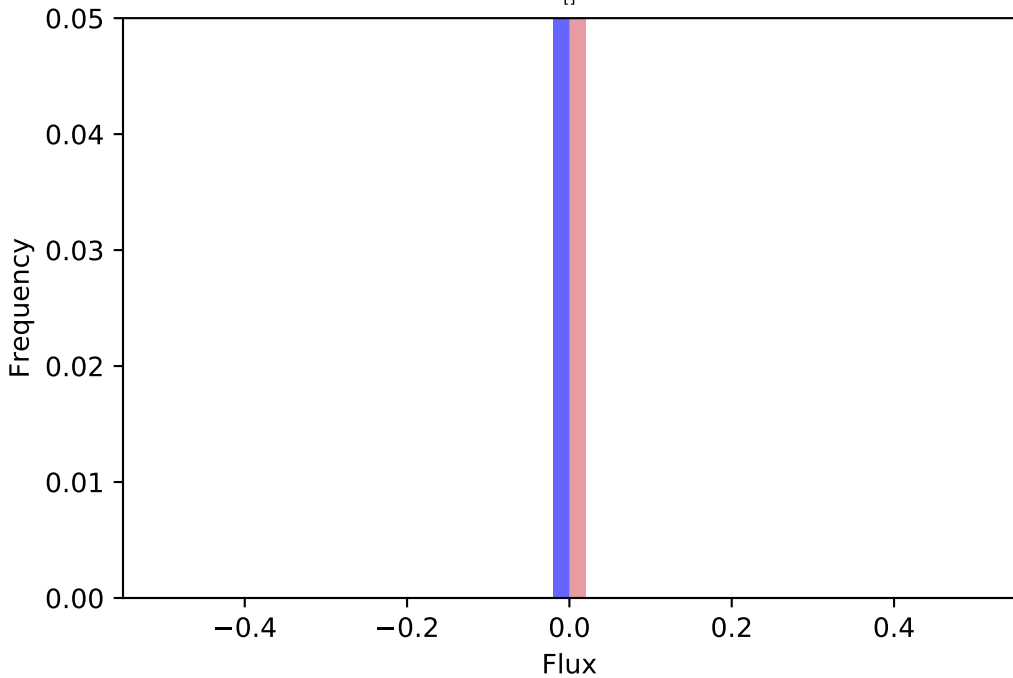
329 : PGA\_h + Pi\_c --> PGA\_c + Pi\_h  
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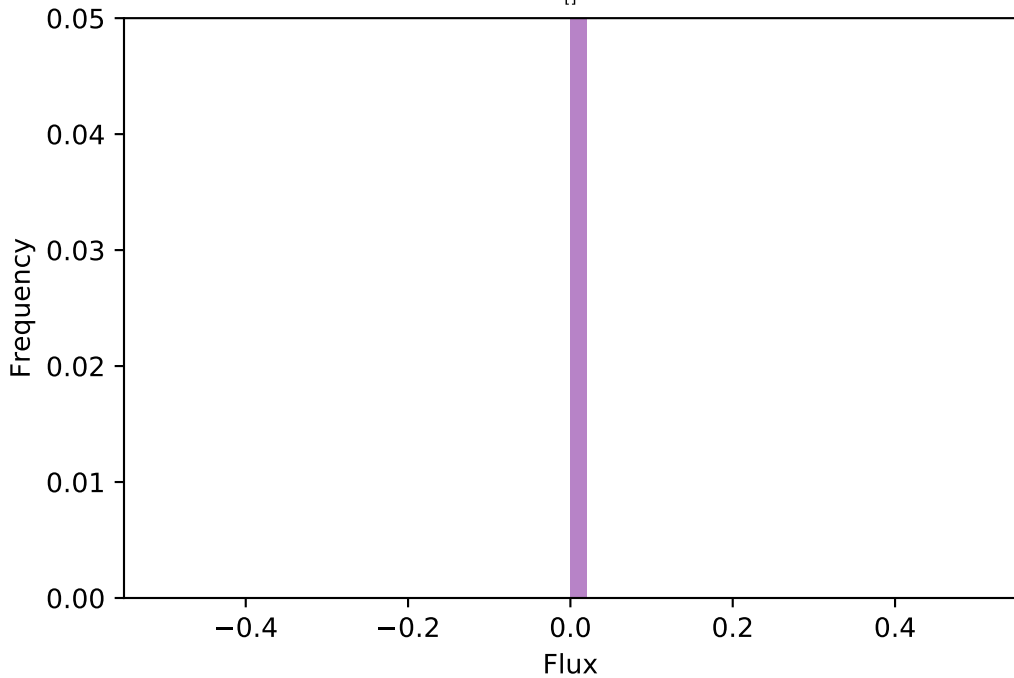
330 : GAP\_h + Pi\_c --> GAP\_c + Pi\_h  
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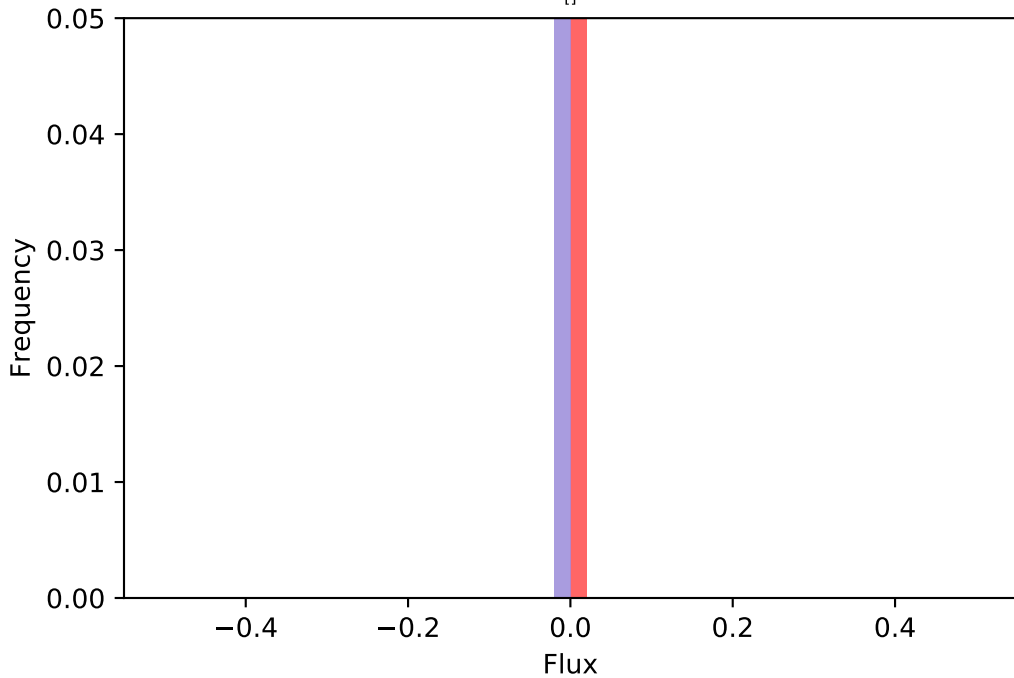
331 : DHAP\_h + Pi\_c --> DHAP\_c + Pi\_h  
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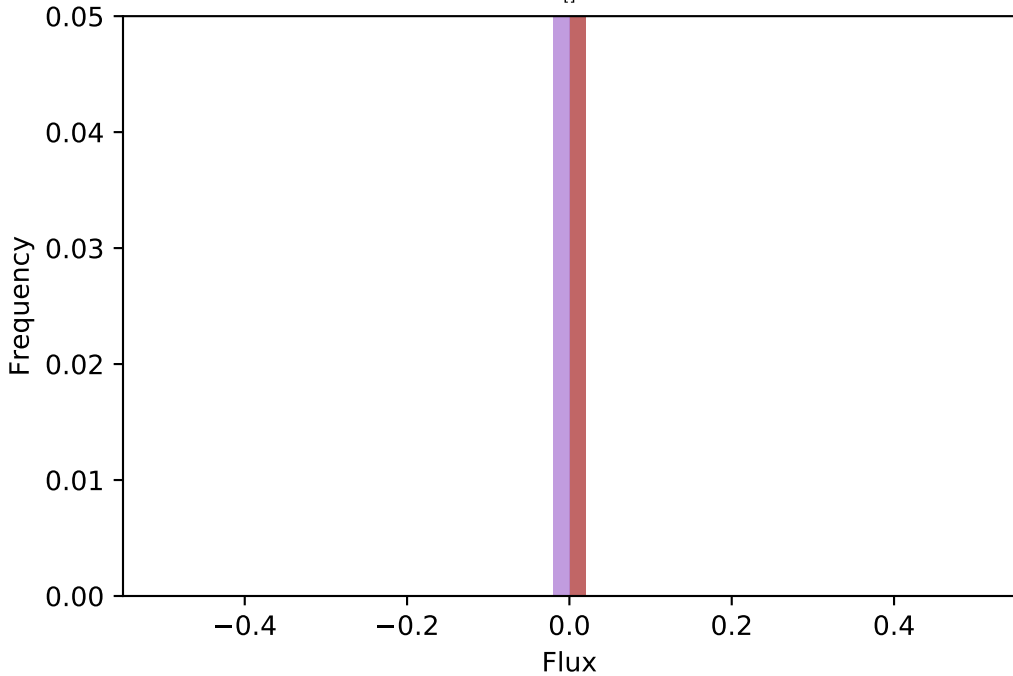
332 : PEP\_c + Pi\_h --> PEP\_h + Pi\_c  
[]



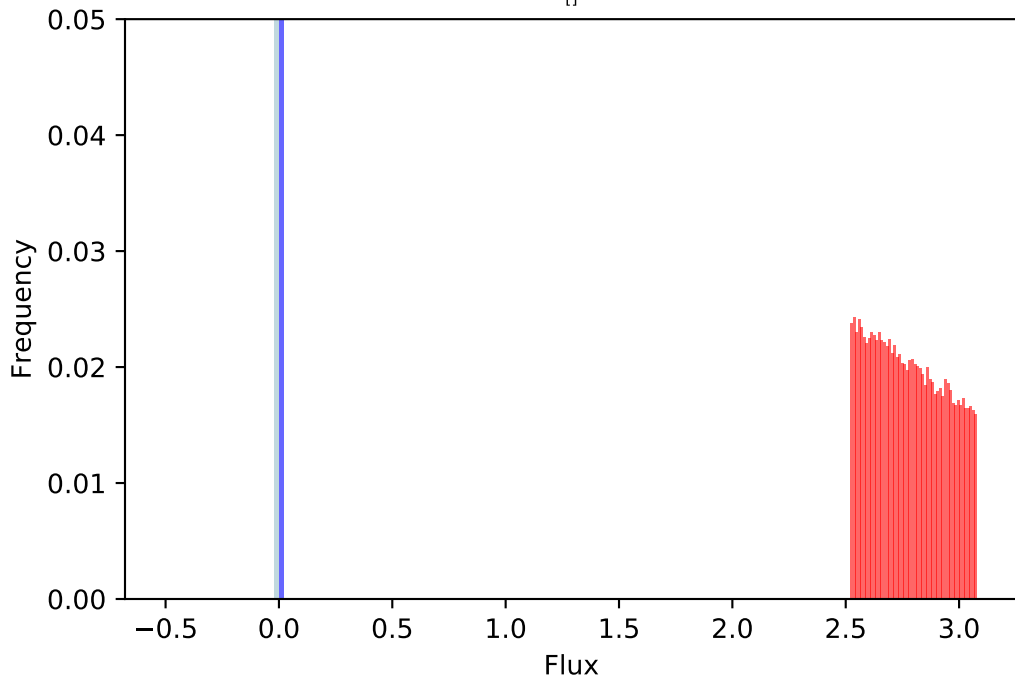
333 : GCA\_h --> GCA\_c  
[]



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

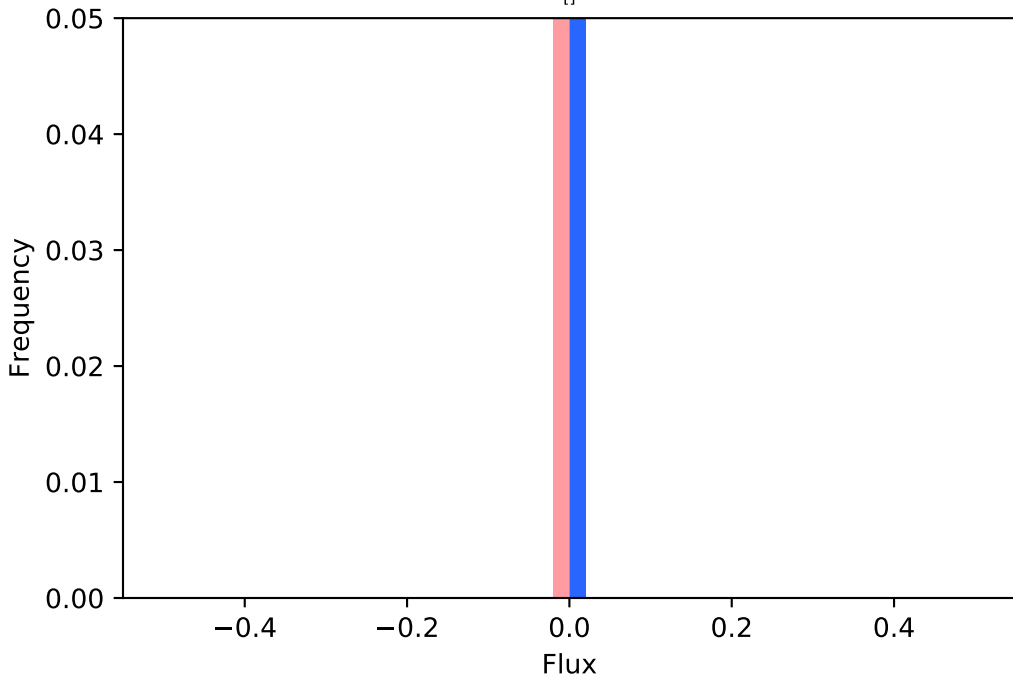


335 : G6P\_c + Pi\_h --> G6P\_h + Pi\_c  
[]

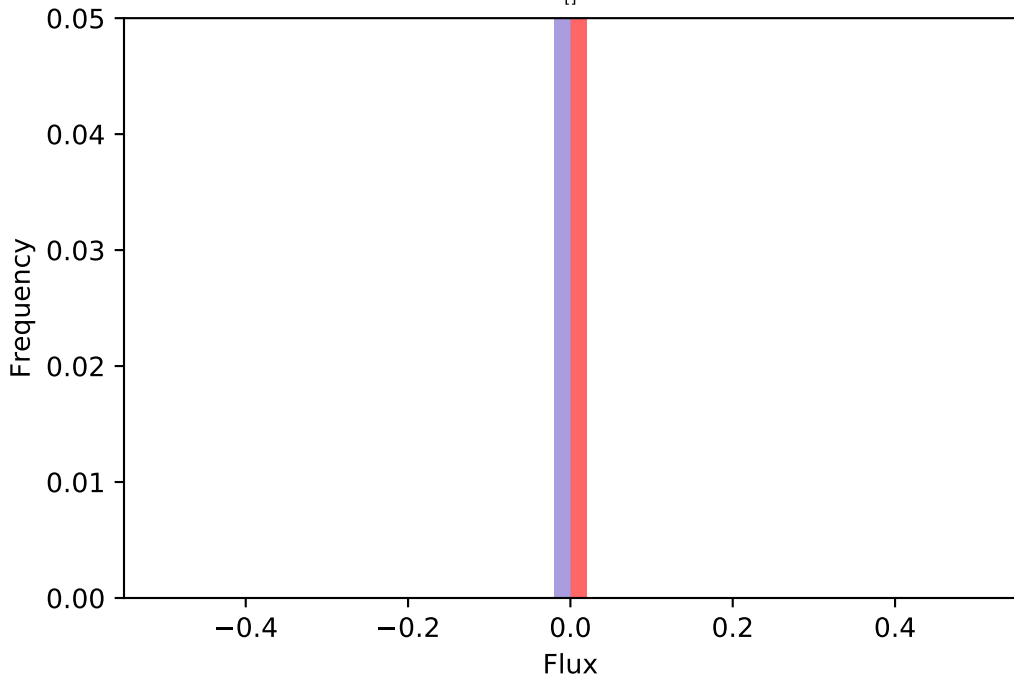


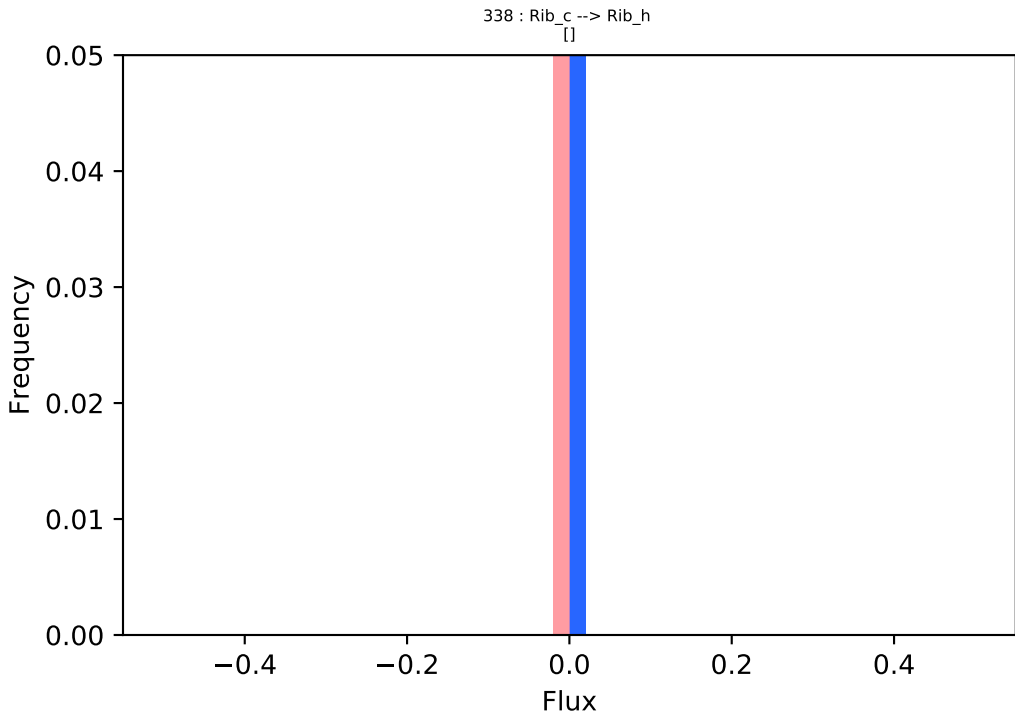


336 : Glc\_h --> Glc\_c  
[]

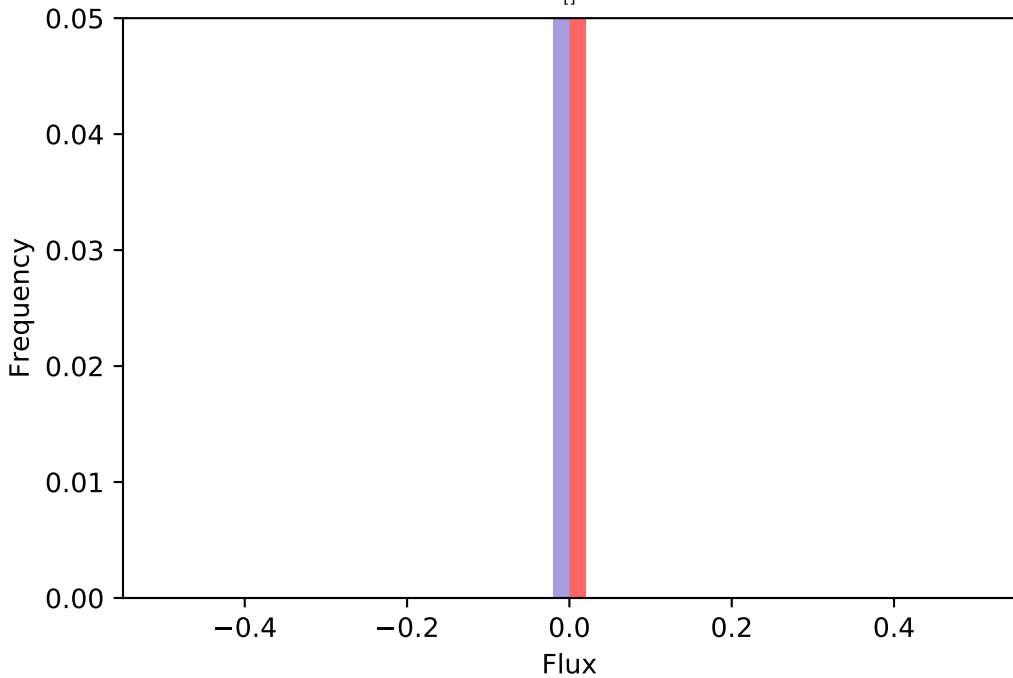


337 : Mas\_h --> Mas\_c  
[]

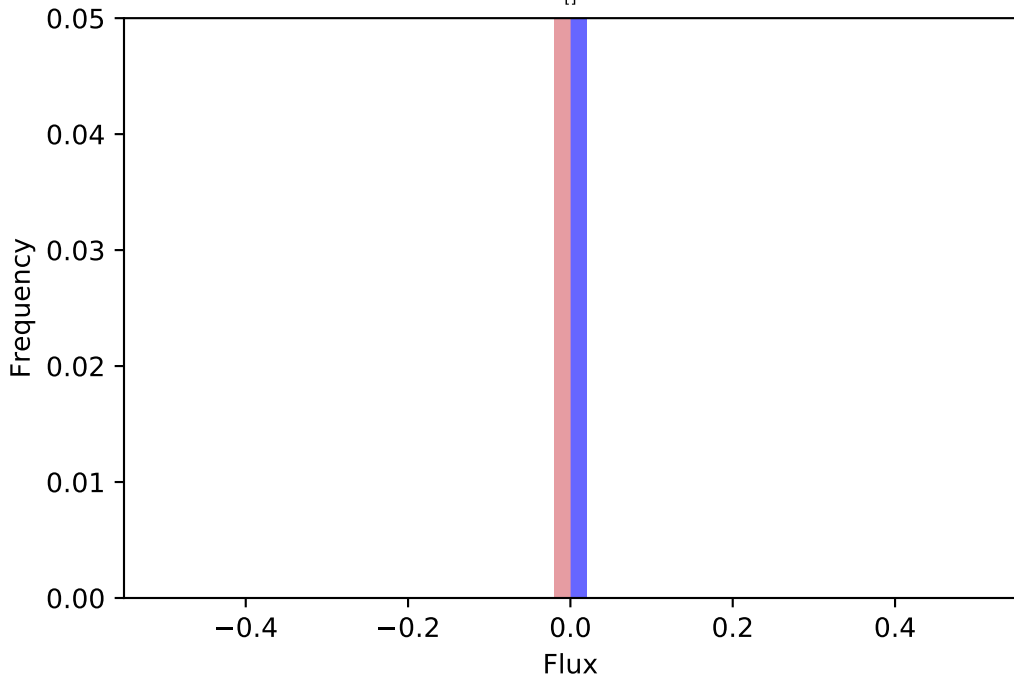




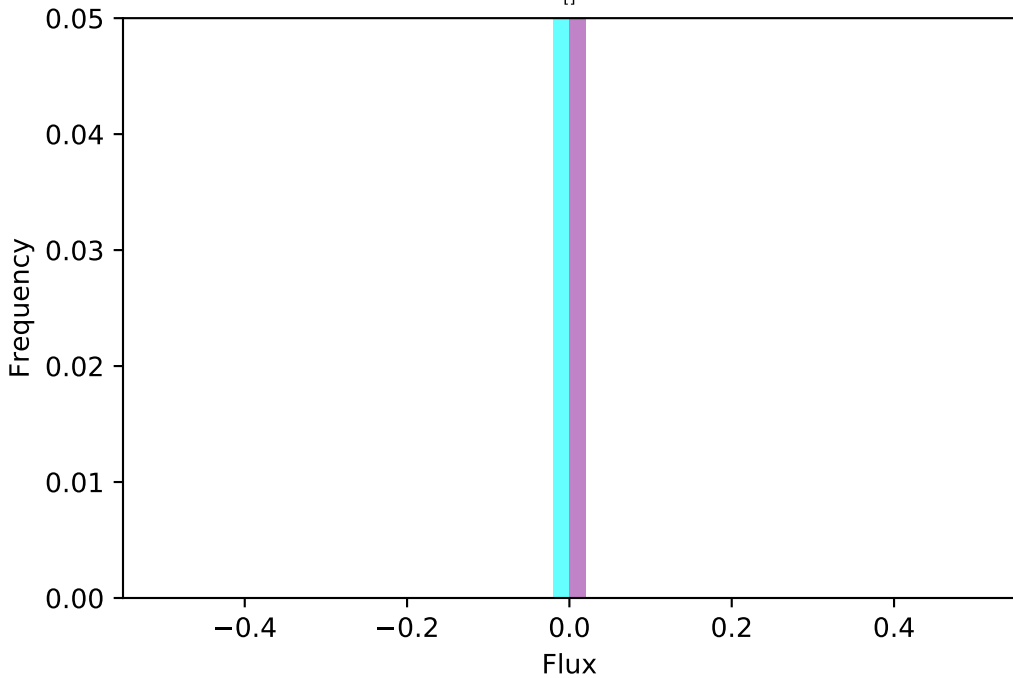
339 : Mal\_c + Pi\_m <=> Mal\_m + Pi\_c  
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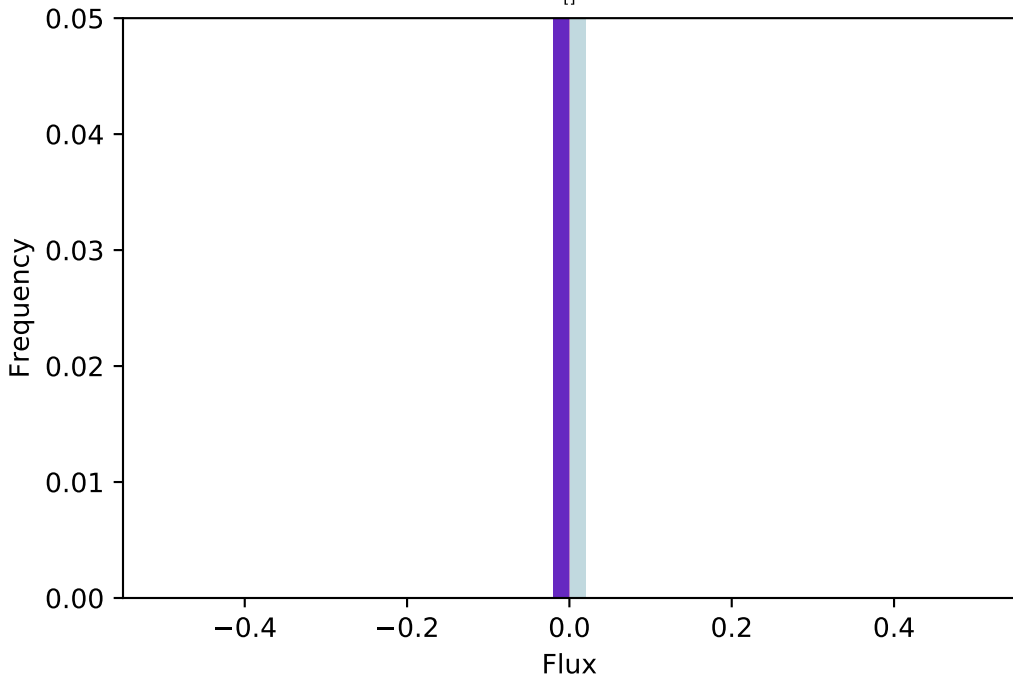
340 : Pi\_m + SCA\_c <=> Pi\_c + SCA\_m  
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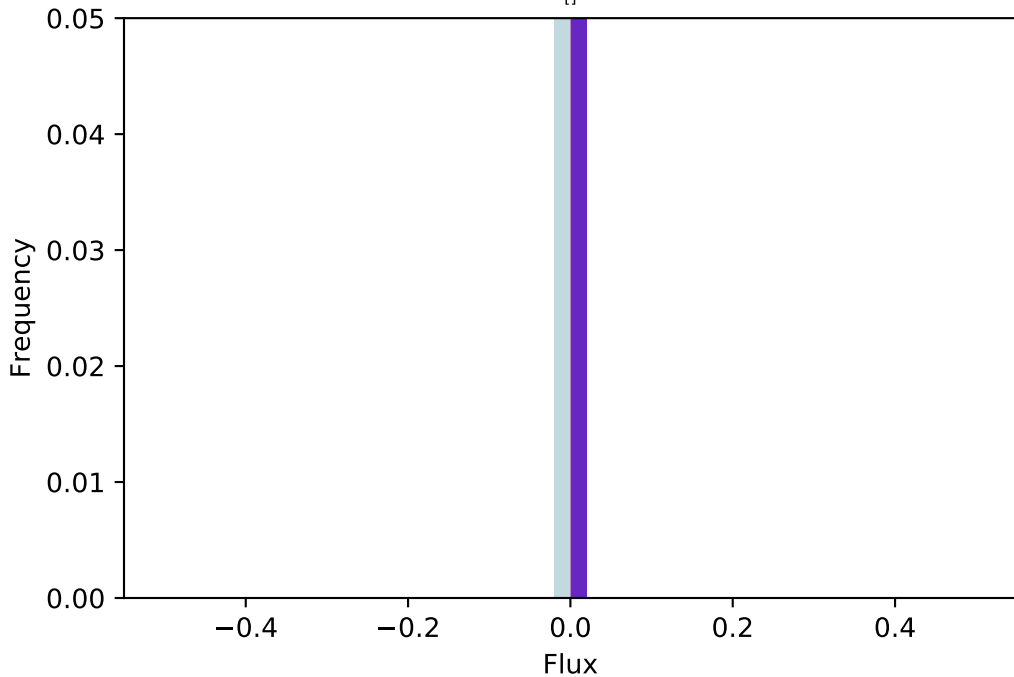
341 : KG\_c + Mal\_h --> KG\_h + Mal\_c  
[]



342 : Glu\_h + Mal\_c --> Glu\_c + Mal\_h  
[ ]

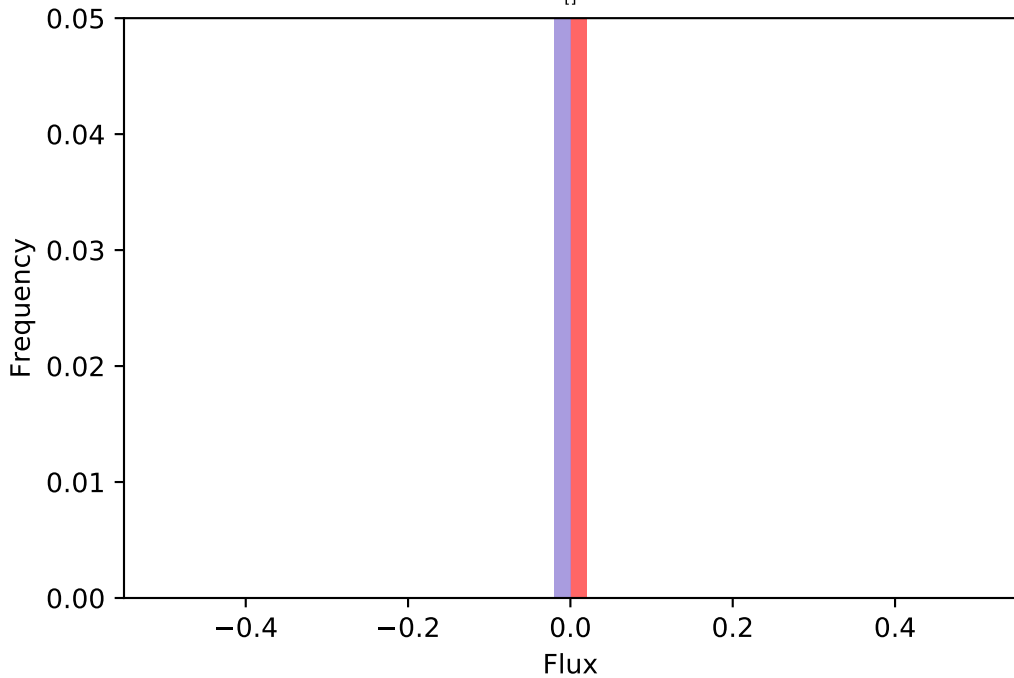


343 : Cit\_m + KG\_c --> Cit\_c + KG\_m  
[]

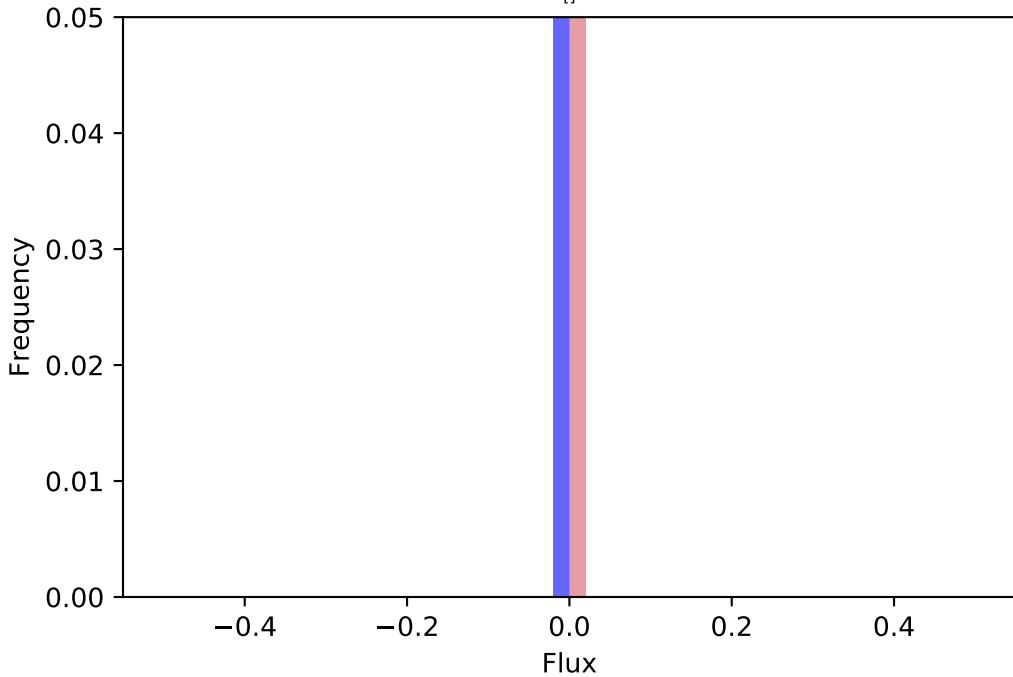




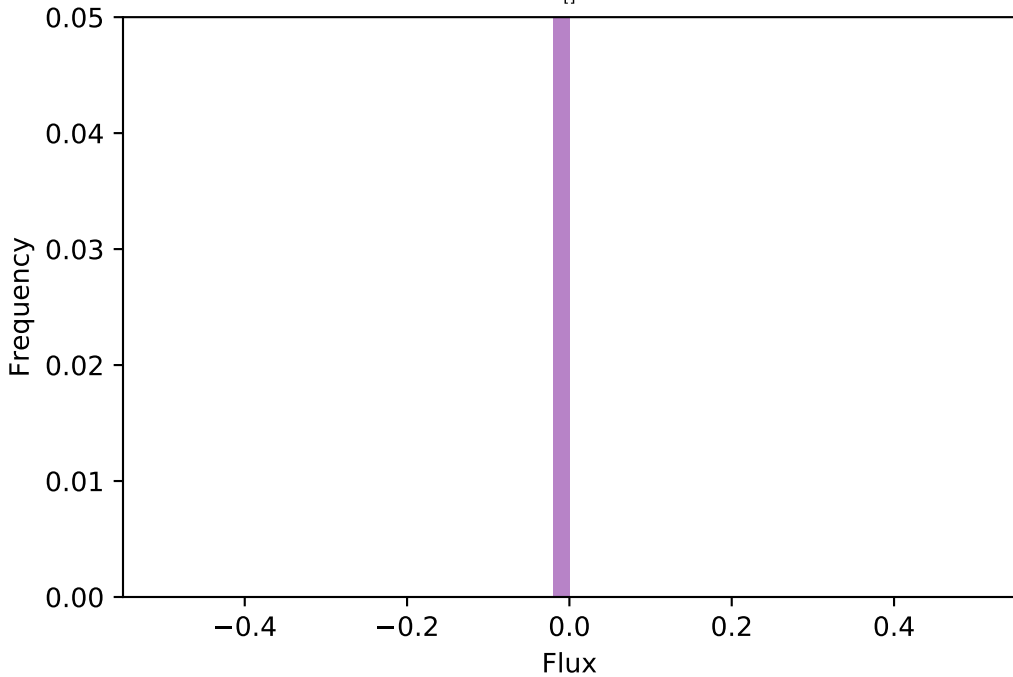
344 : KG\_c + iCit\_m --> KG\_m + iCit\_c  
[]



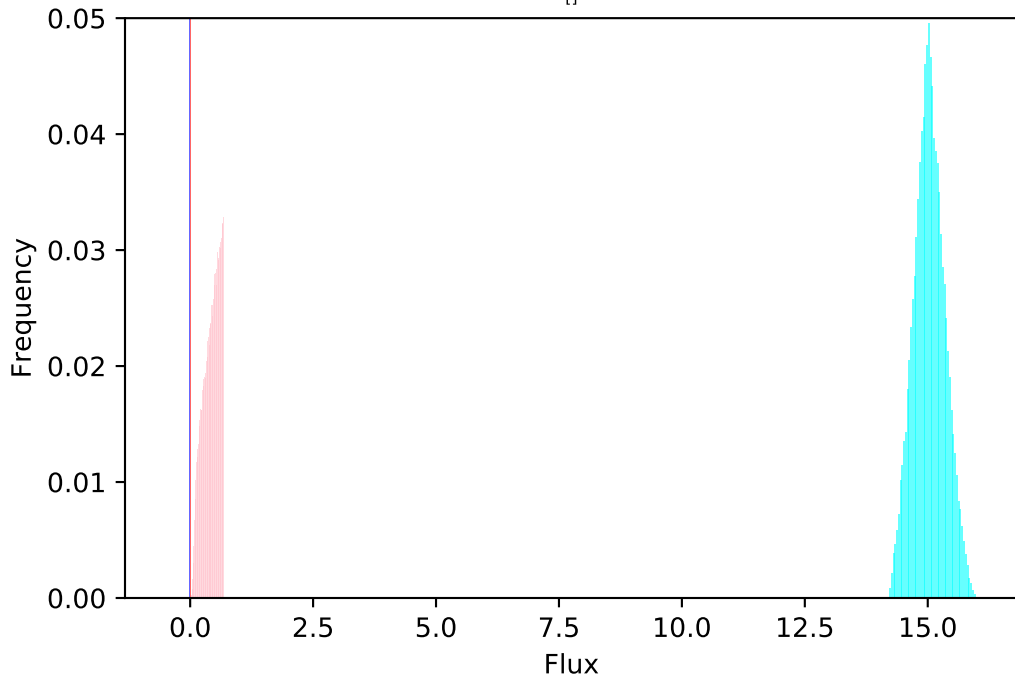
345 : KG\_c + cACN\_m --> KG\_m + cACN\_c  
[]



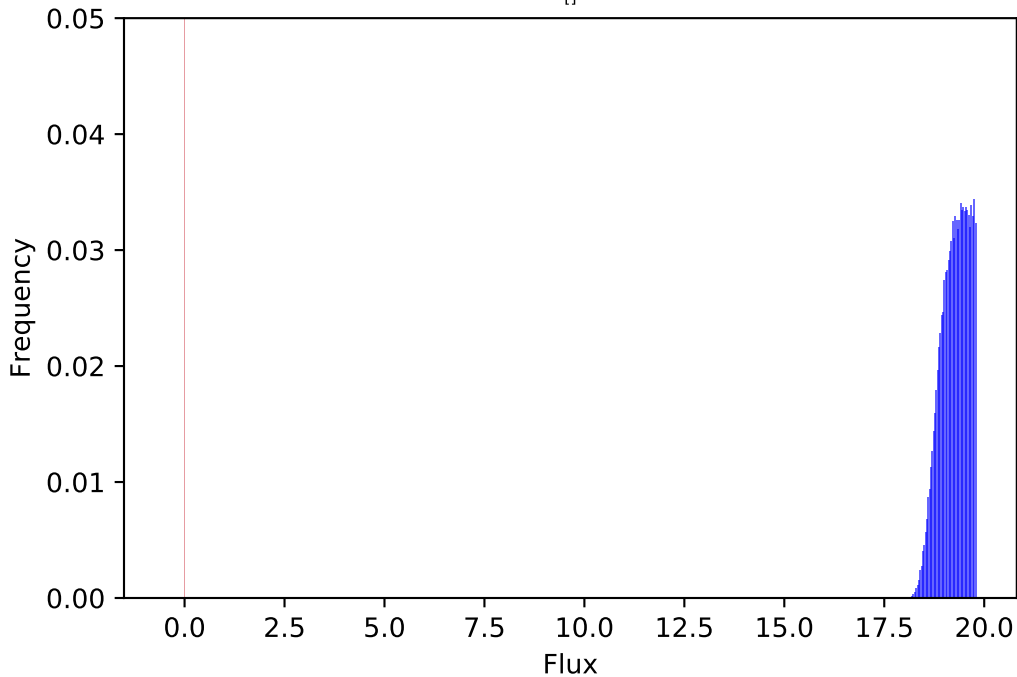
346 : Cit\_m + Mal\_c --> Cit\_c + Mal\_m  
[]



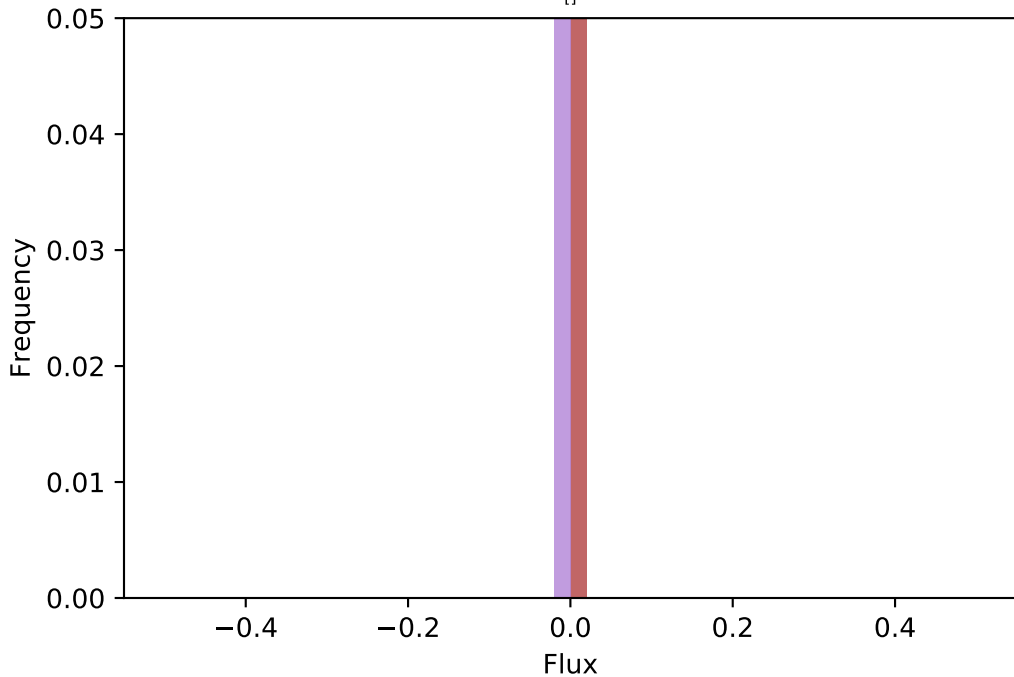
347 : Mal\_c + iCit\_m <=> Mal\_m + iCit\_c  
[]



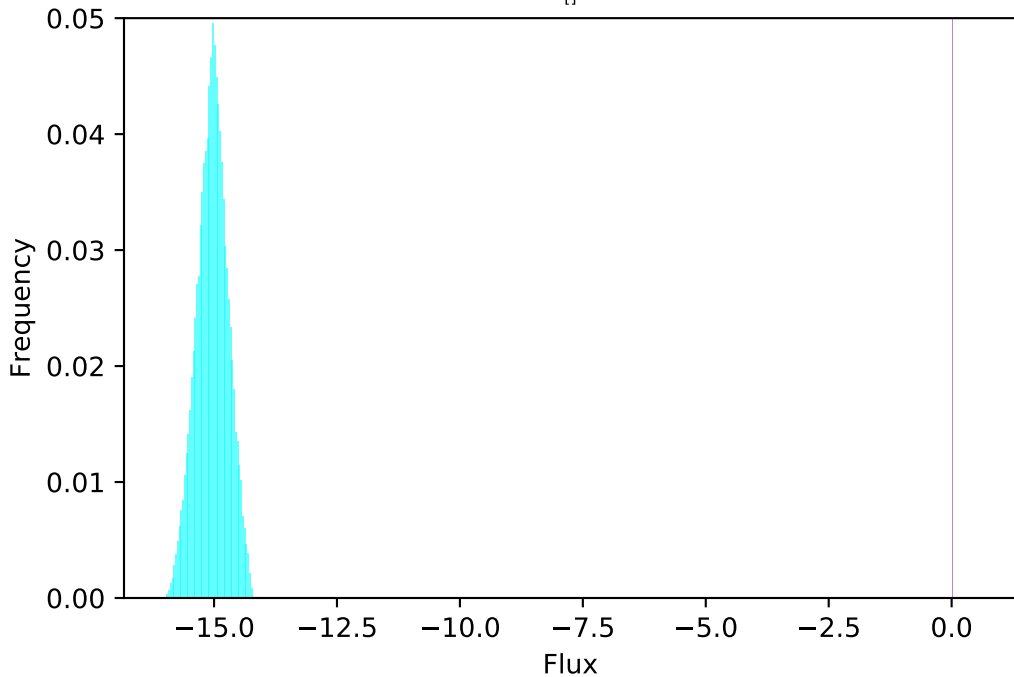
348 : Mal\_c + cACN\_m <=> Mal\_m + cACN\_c  
[]



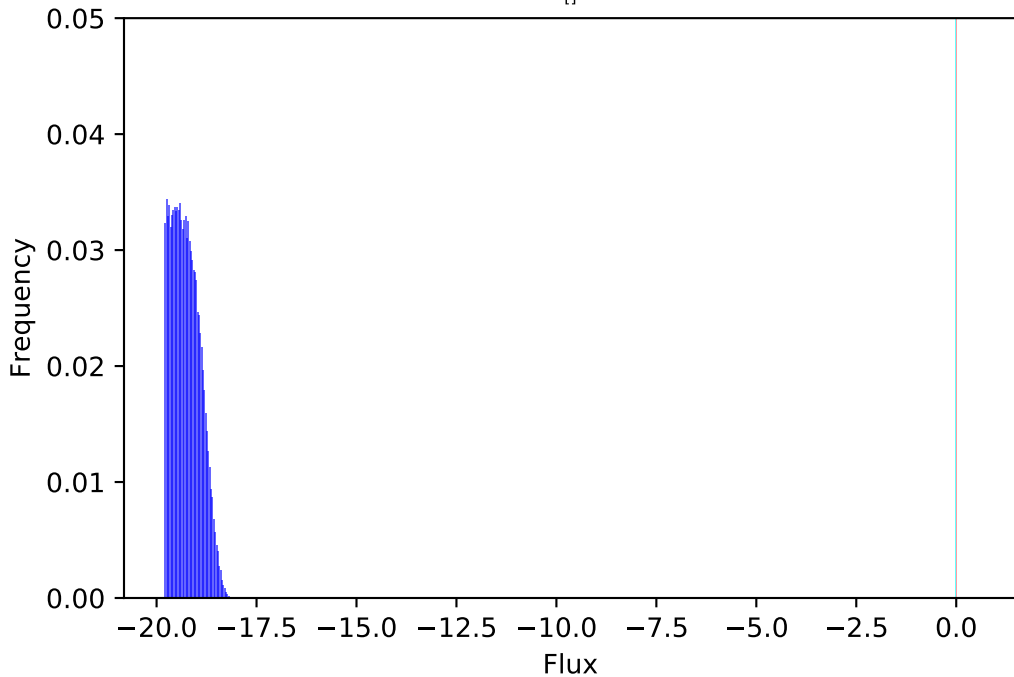
349 : Cit\_m + OAA\_c <=> Cit\_c + OAA\_m  
[ ]



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

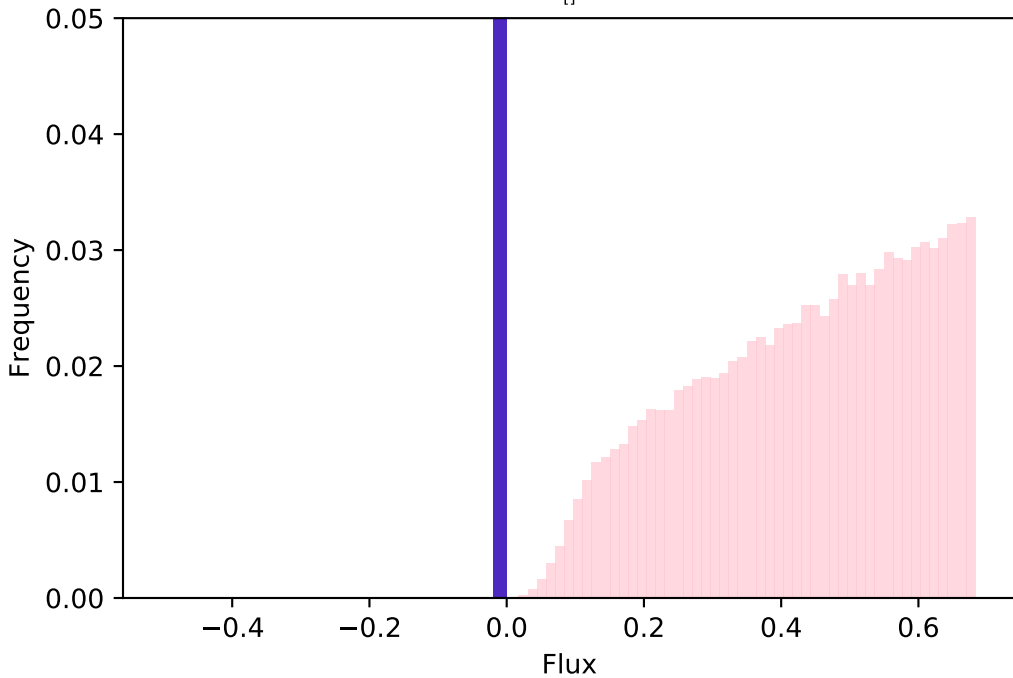


351 : OAA\_c + cACN\_m <=> OAA\_m + cACN\_c  
[]

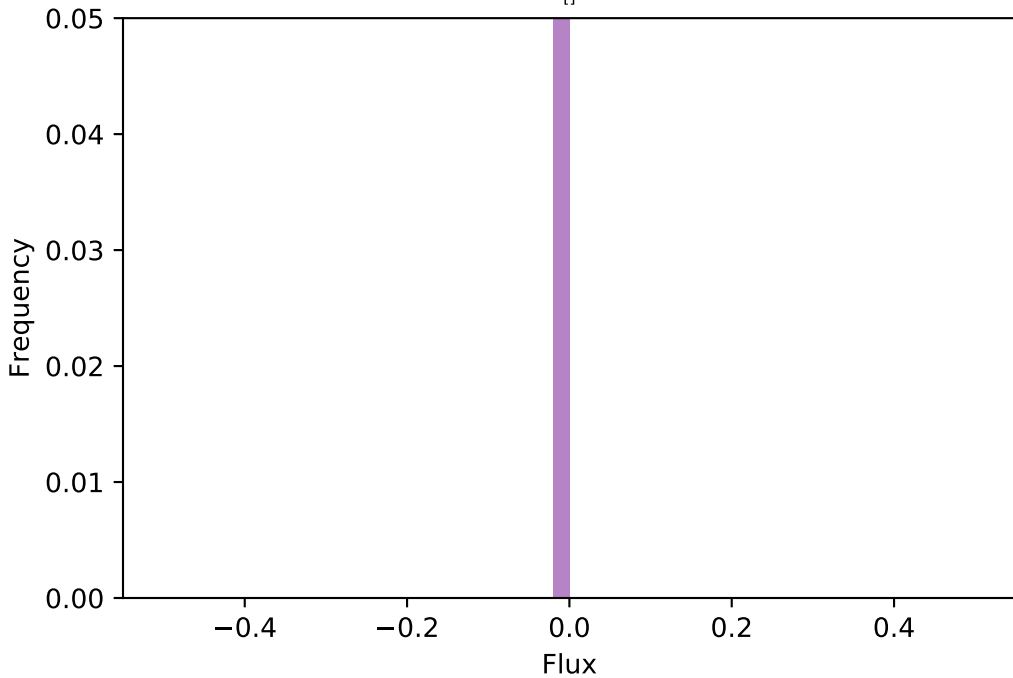




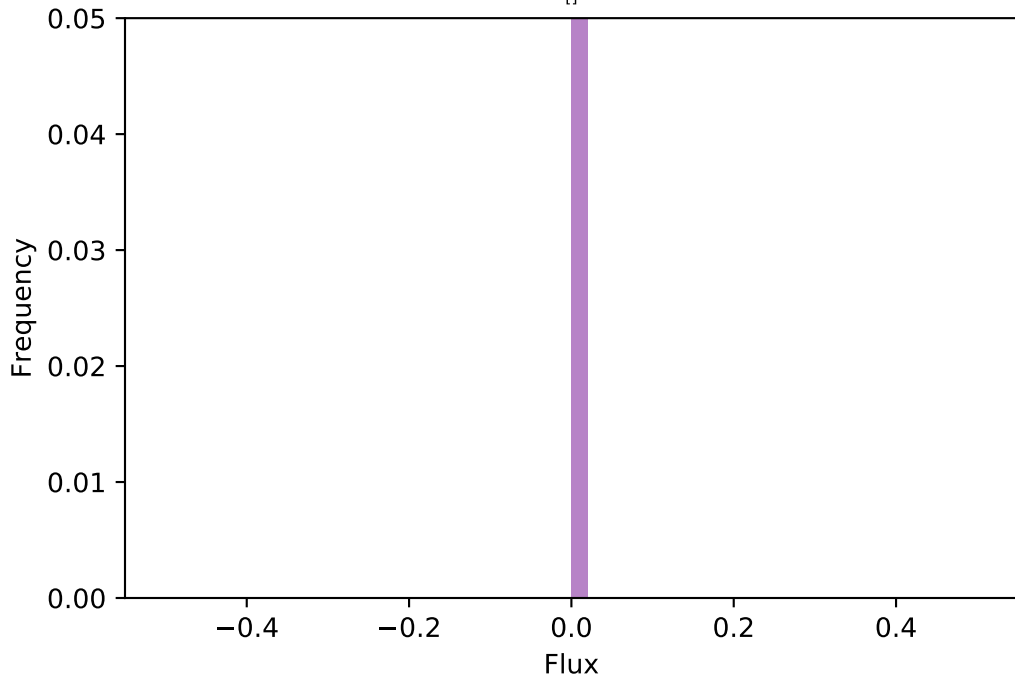
352 : Cit\_m + SCA\_c --> Cit\_c + SCA\_m  
[]



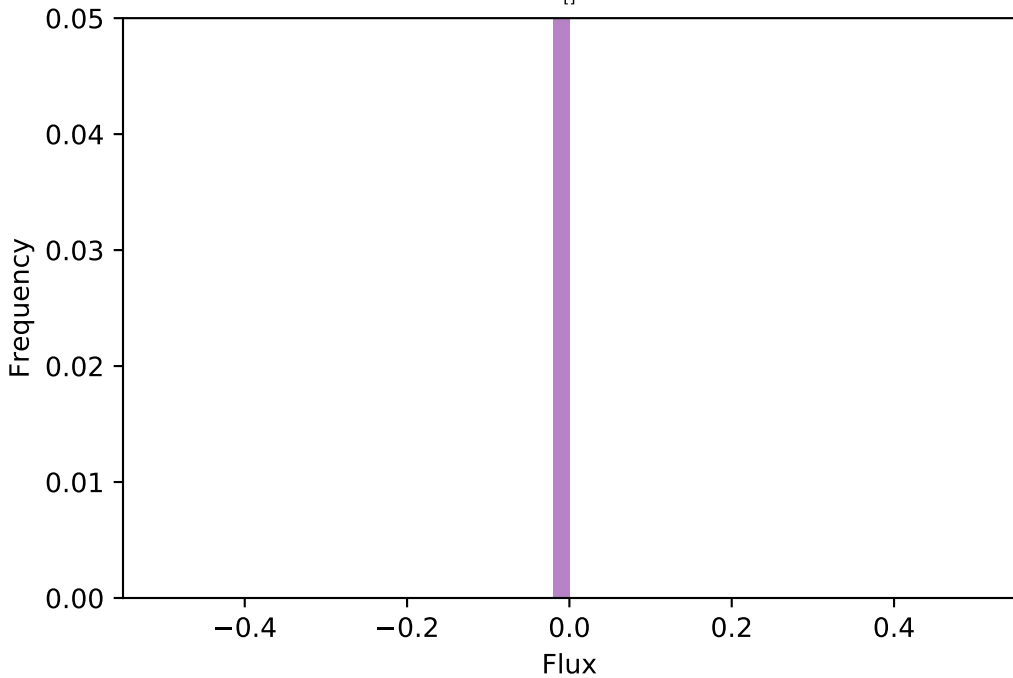
353 : SCA\_c + iCit\_m --> SCA\_m + iCit\_c  
[]



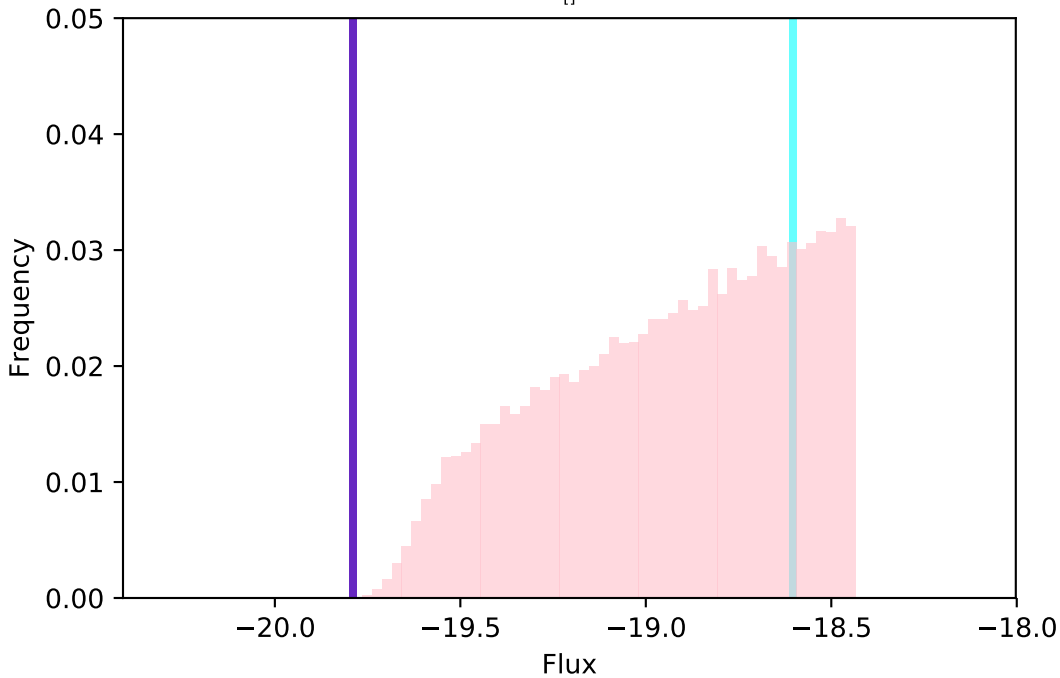
354 : SCA\_c + cACN\_m --> SCA\_m + cACN\_c  
[]



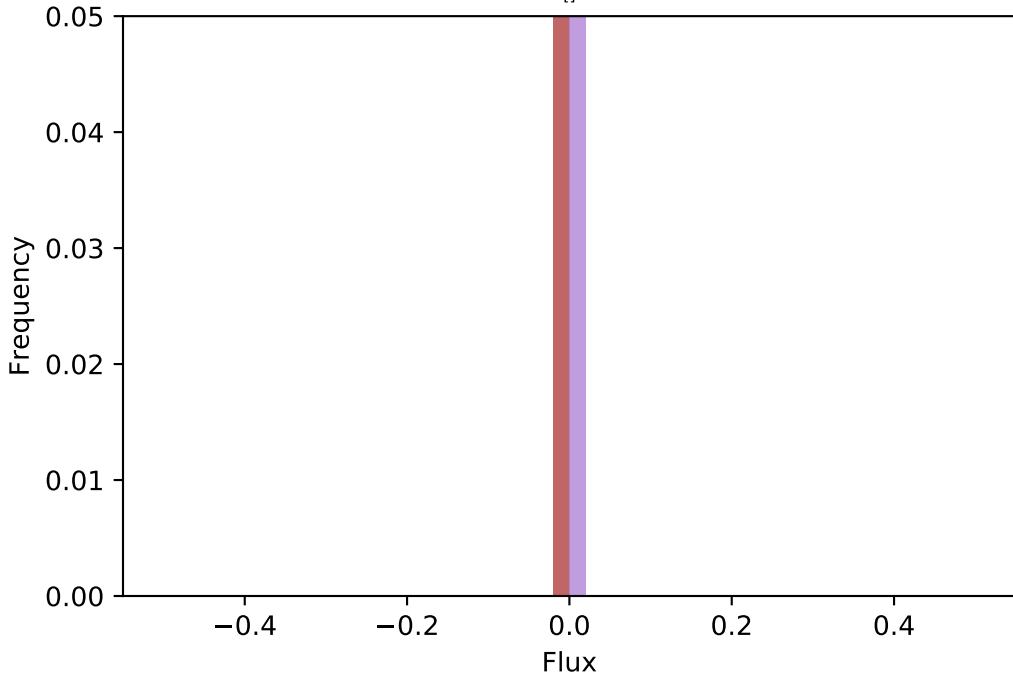
355 : Fum\_m + SCA\_c --> Fum\_c + SCA\_m  
[]



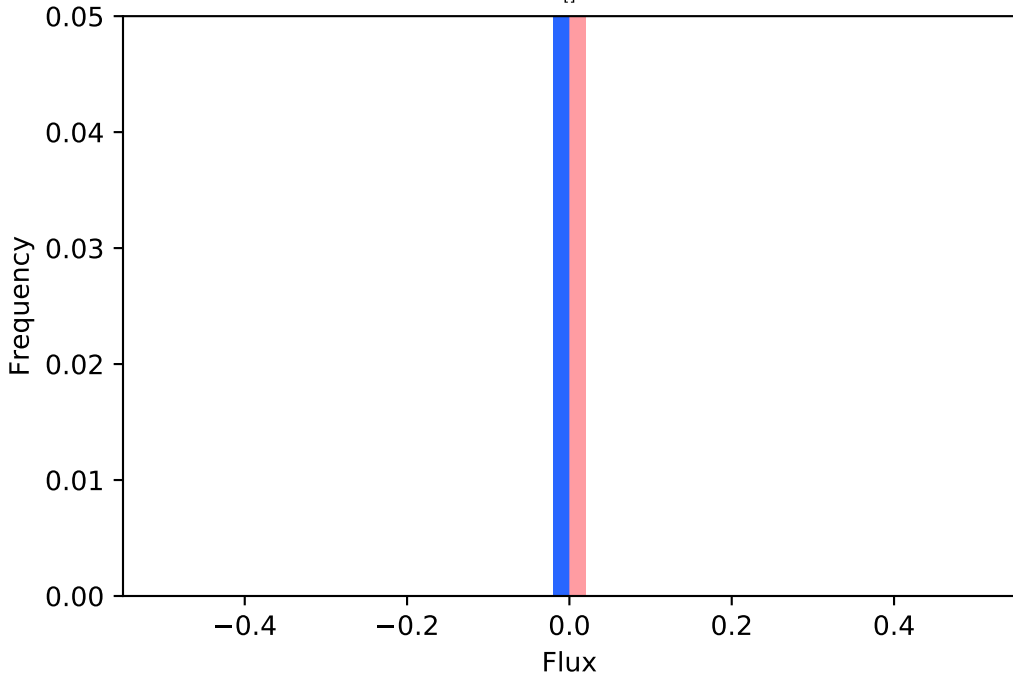
356 : Ala\_c <=> Ala\_m  
[]



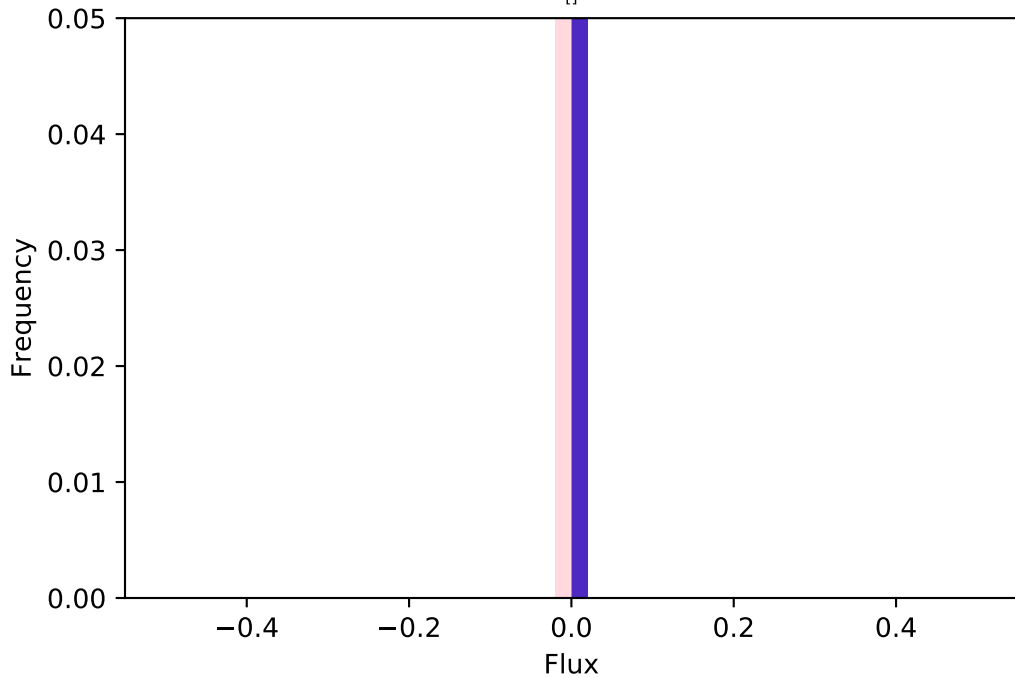
357 : Arg\_c <=> Arg\_m  
[]



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

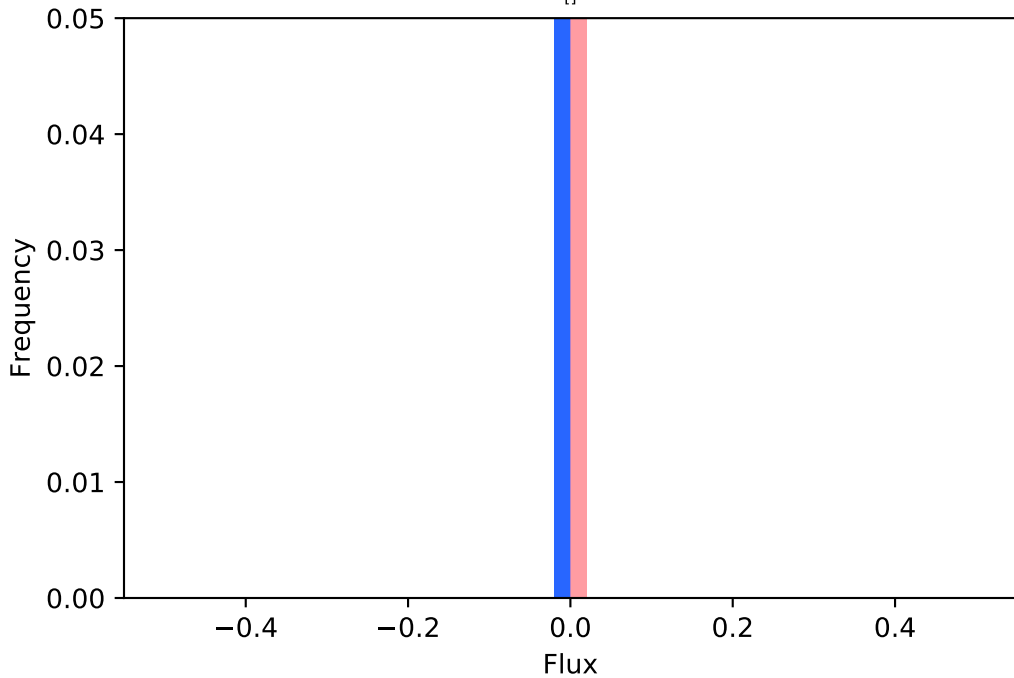


359 : Lys\_c --> Lys\_m  
[]

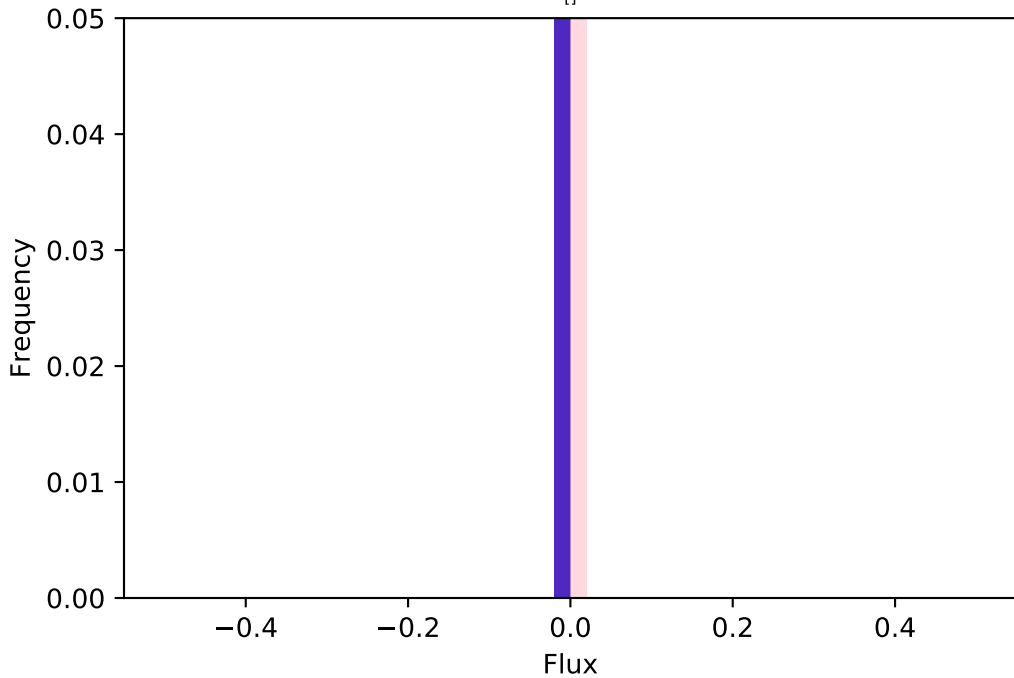




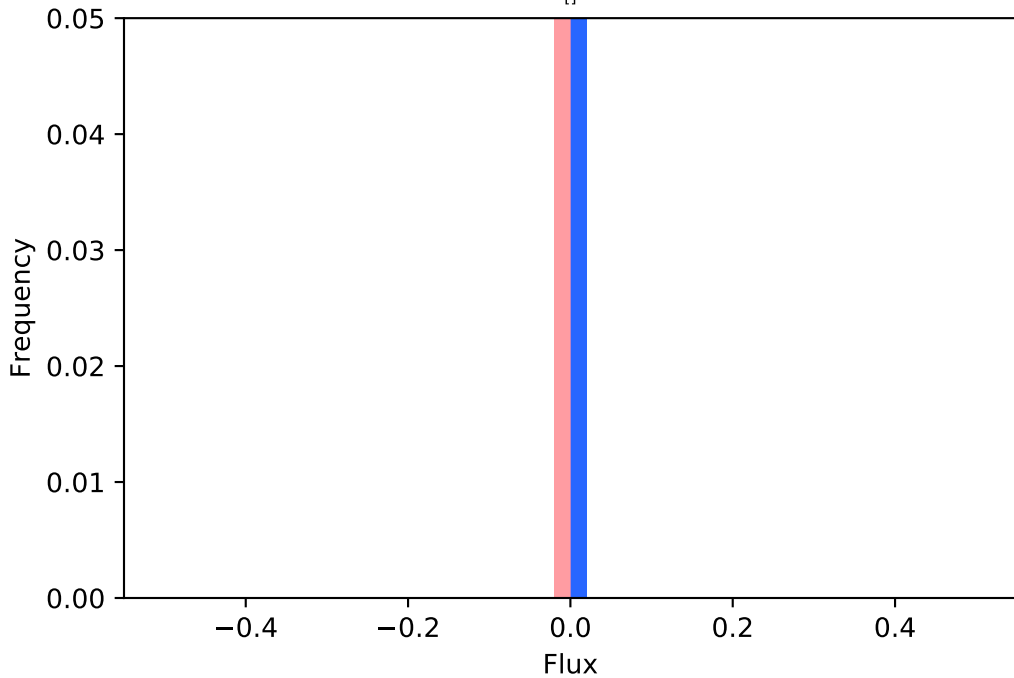
360 : GABA\_c <=> GABA\_m  
[]



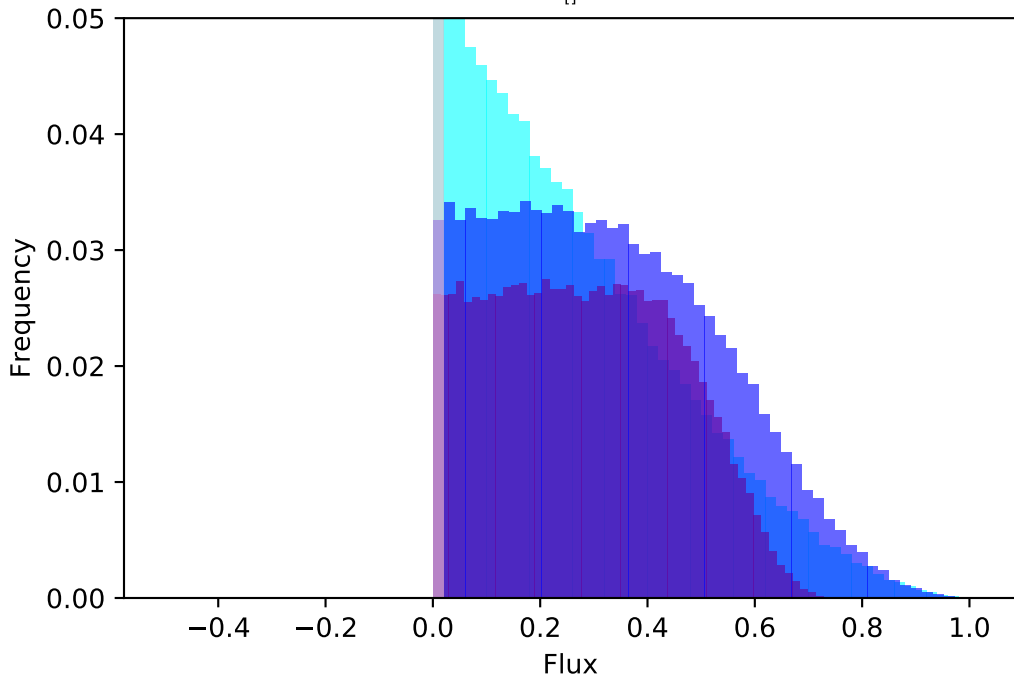
361 : Arg\_c + His\_m --> Arg\_m + His\_c  
[ ]



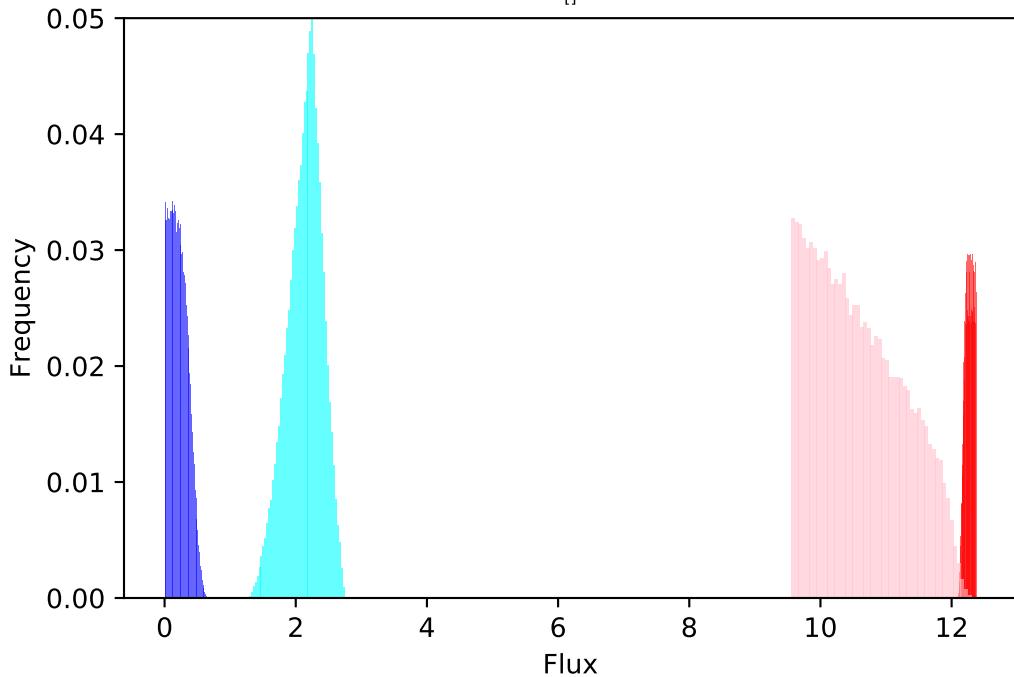
362 : Arg\_c + Lys\_m --> Arg\_m + Lys\_c  
[]



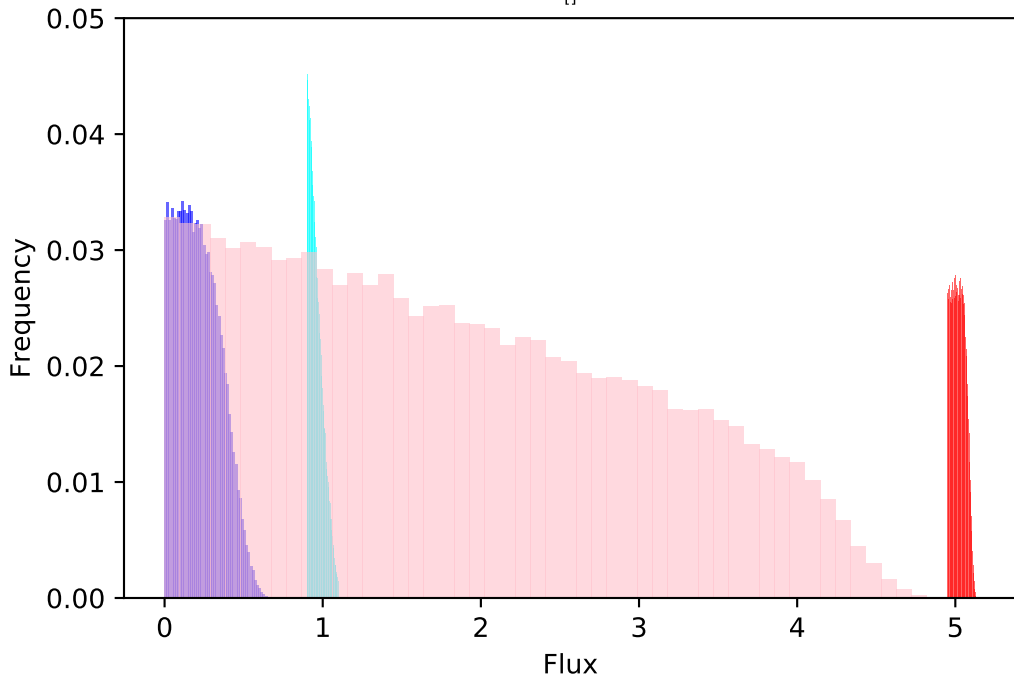
363 : Pro\_c --> Pro\_m  
[]



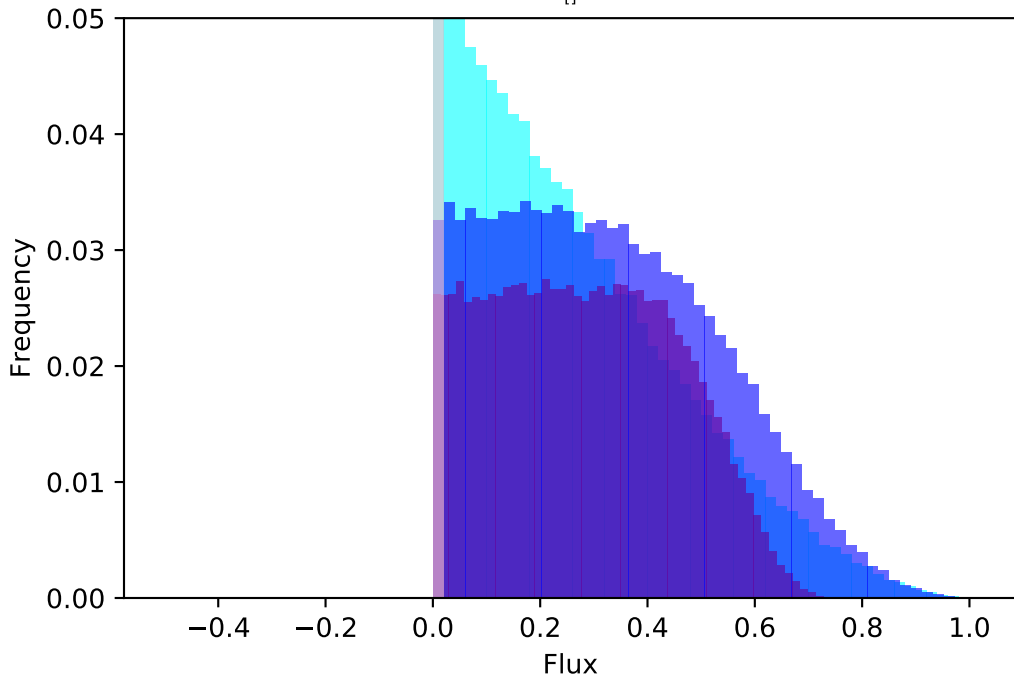
364 : Glu\_m + Pro\_c --> Glu\_c + Pro\_m  
[]



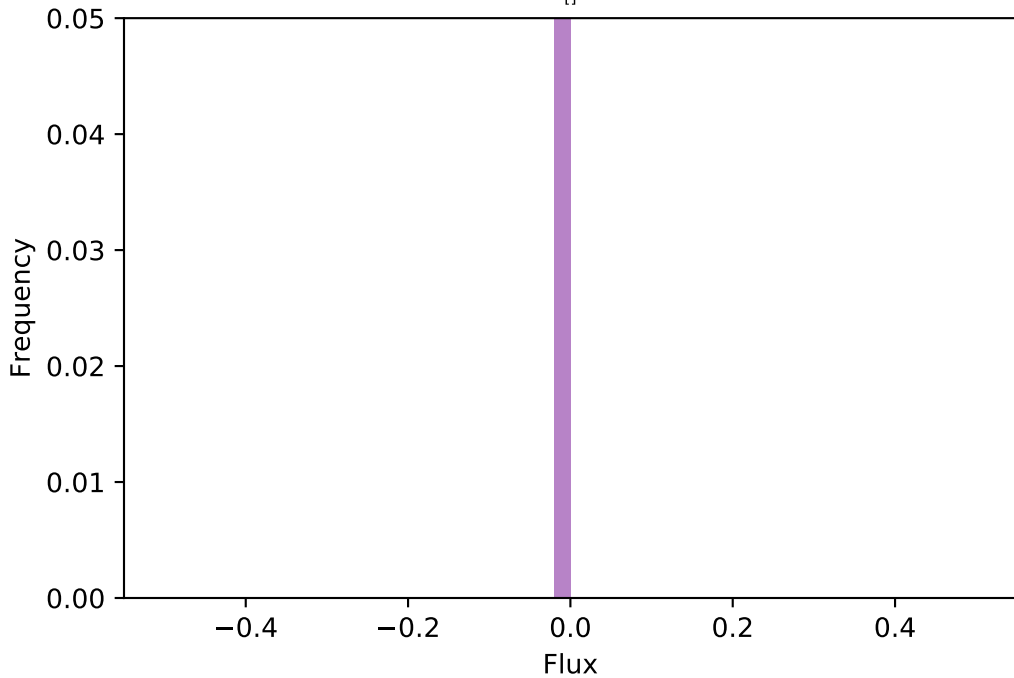
365 : P5C\_h --> P5C\_c  
[]



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

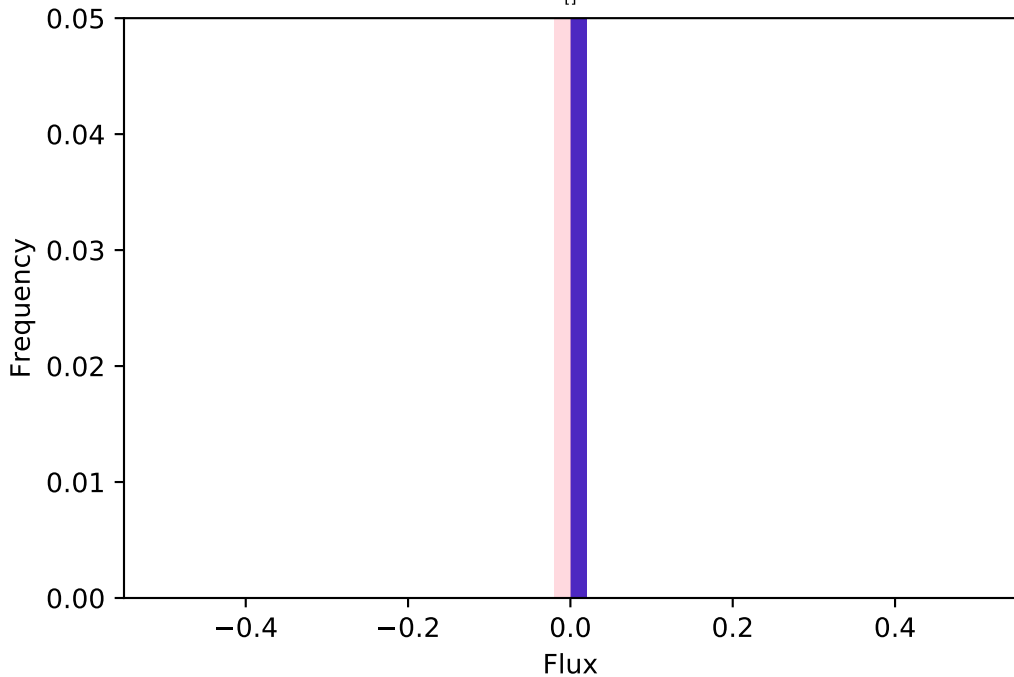


367 : H\_h + PRPP\_h --> PRPP\_c  
[]

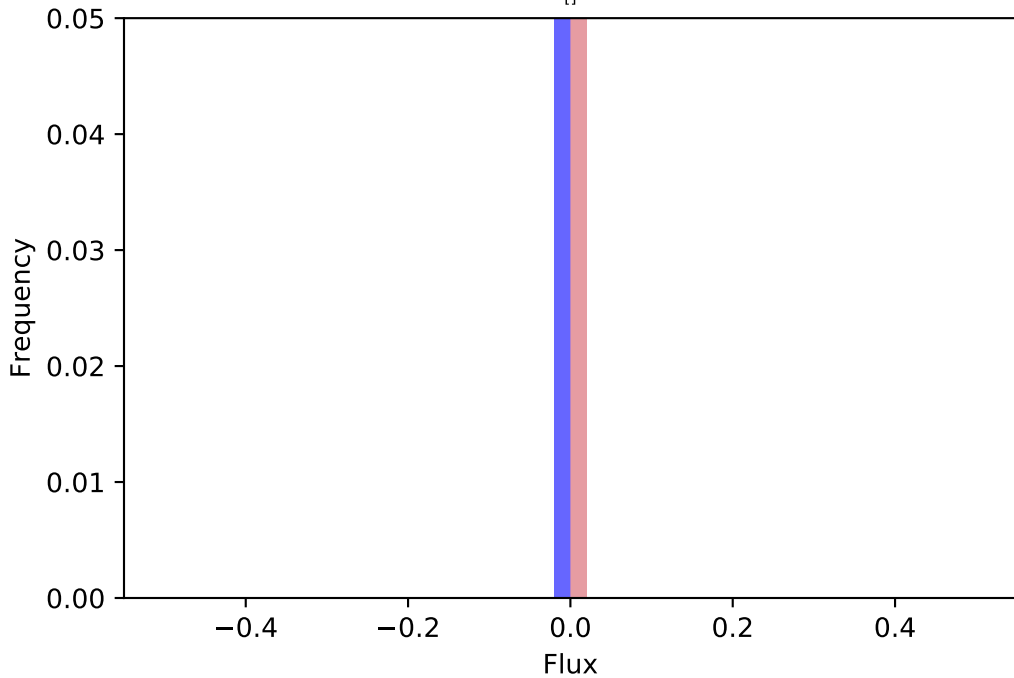




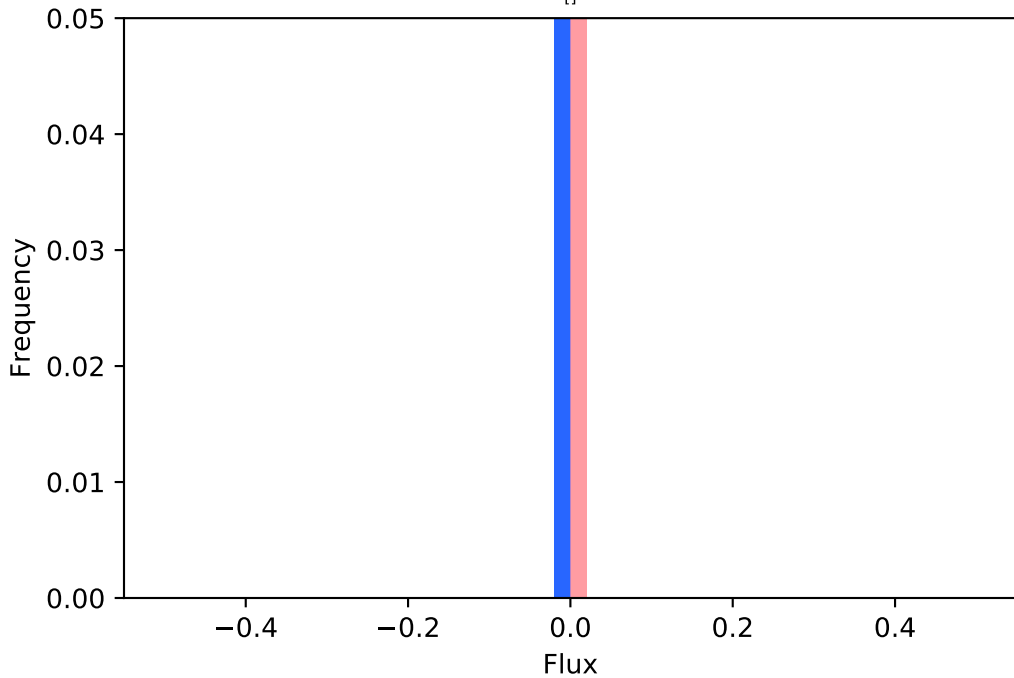
368 : Fum\_h --> Fum\_c  
[]



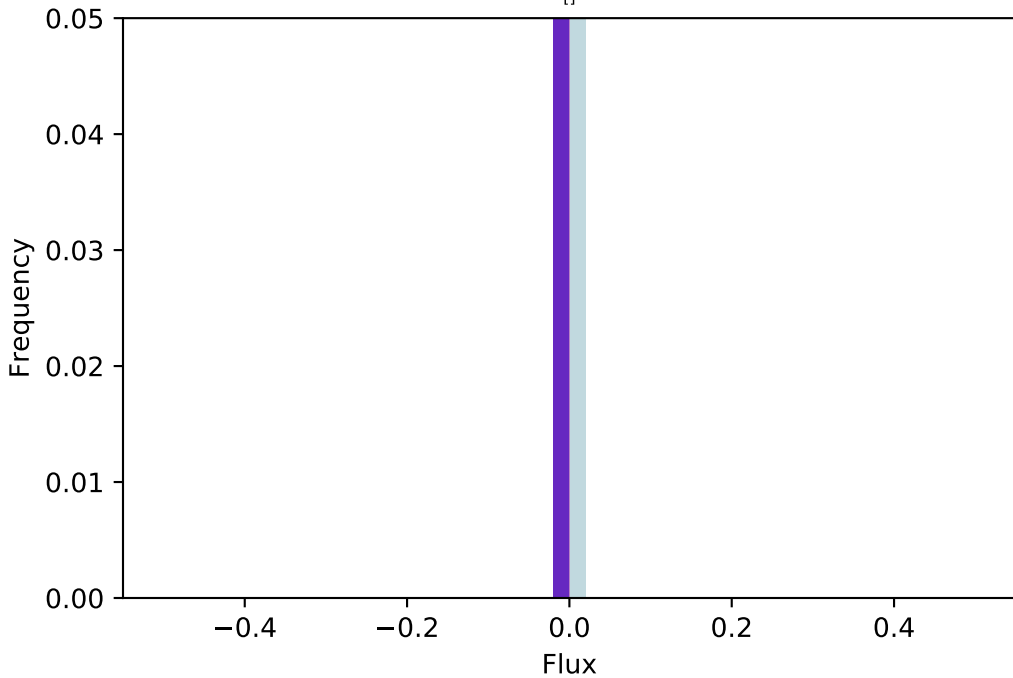
369 : H\_DASH\_Cys\_h --> H\_DASH\_Cys\_c  
[]



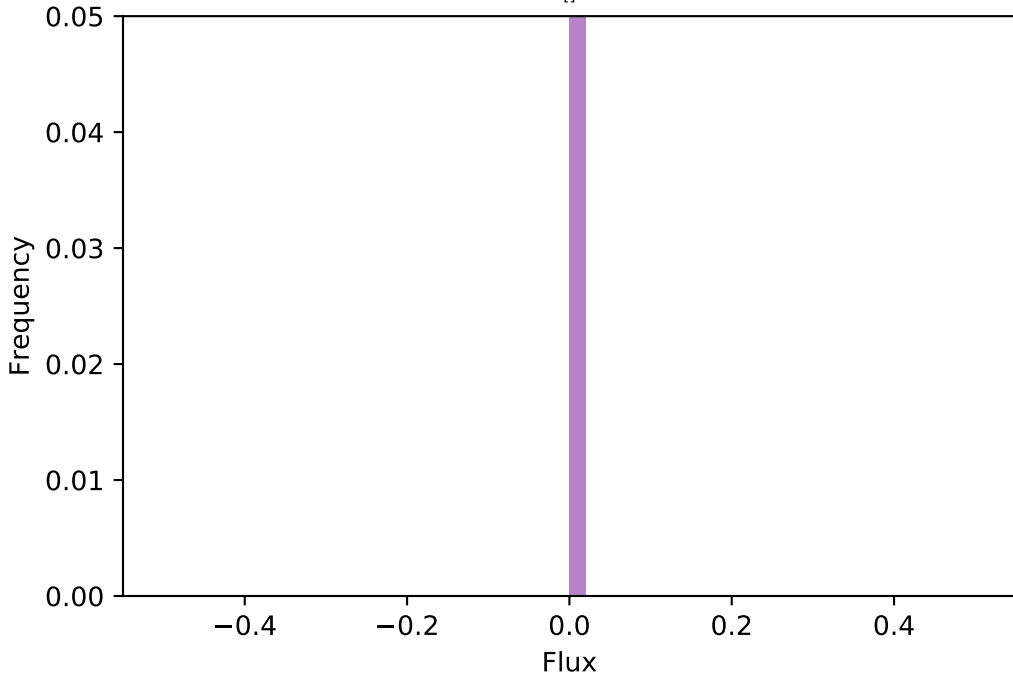
370 : orO\_m --> orO\_c  
[]



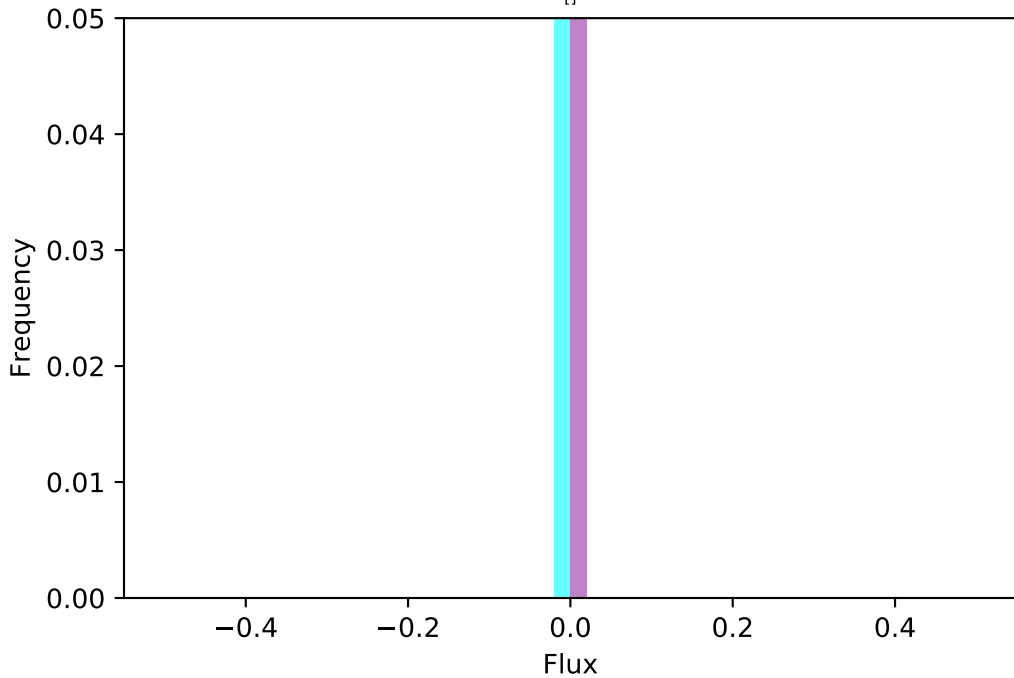
371 : DHO\_h --> DHO\_c  
[]



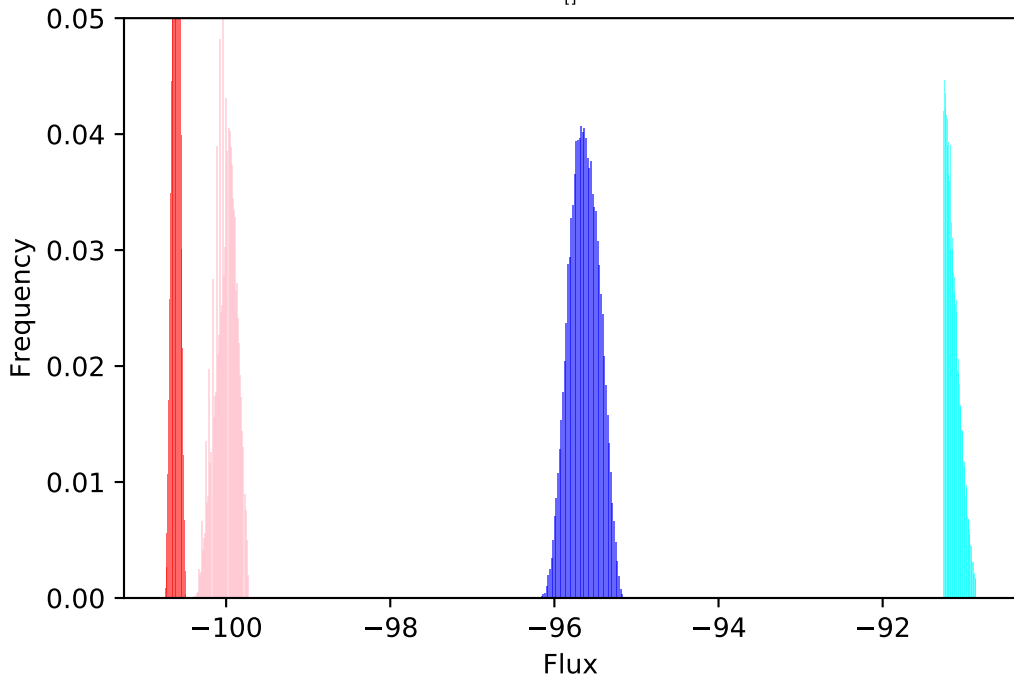
372 : DHO\_c --> DHO\_m  
[]



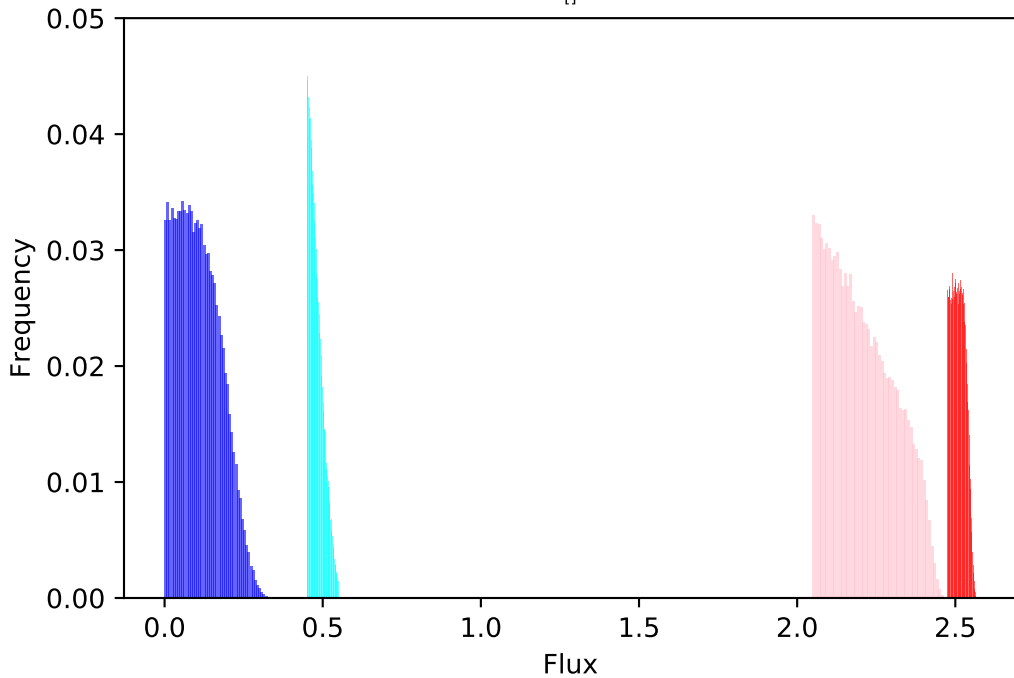
373 : Gly\_c + Ser\_m --> Gly\_m + Ser\_c  
[]



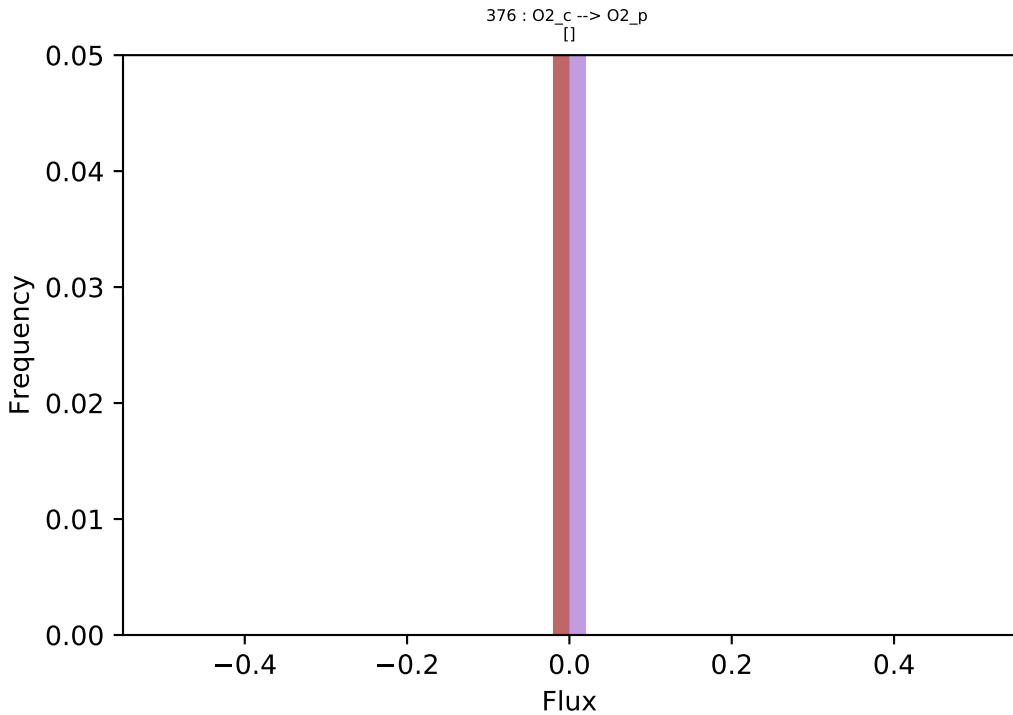
374 : O2\_c <=> O2\_h  
[]



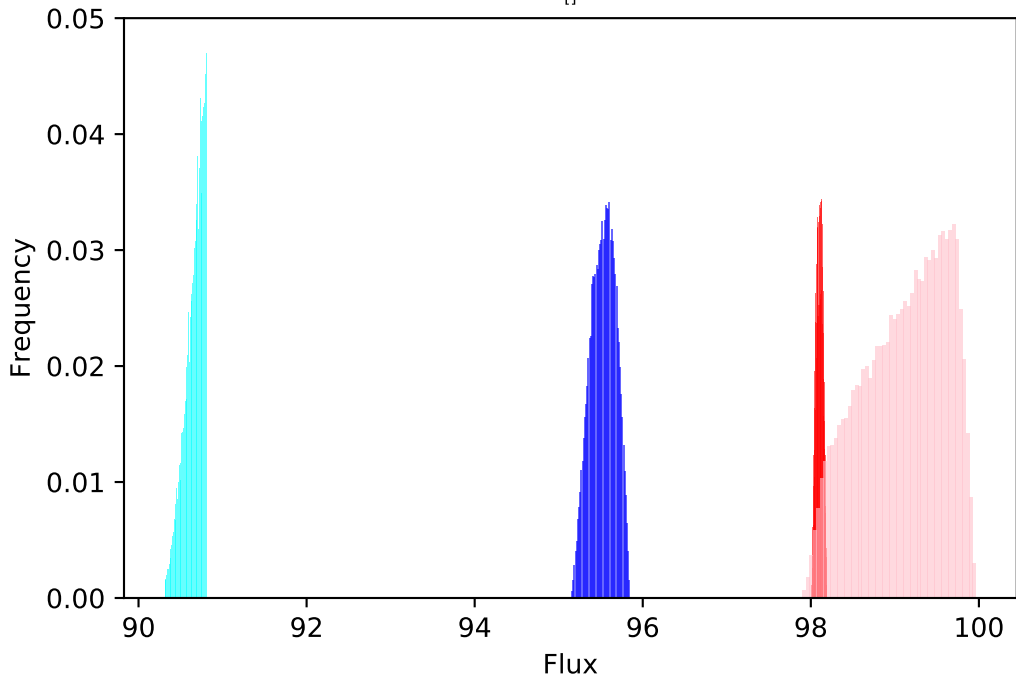
375 : O2\_c <=> O2\_m  
[]



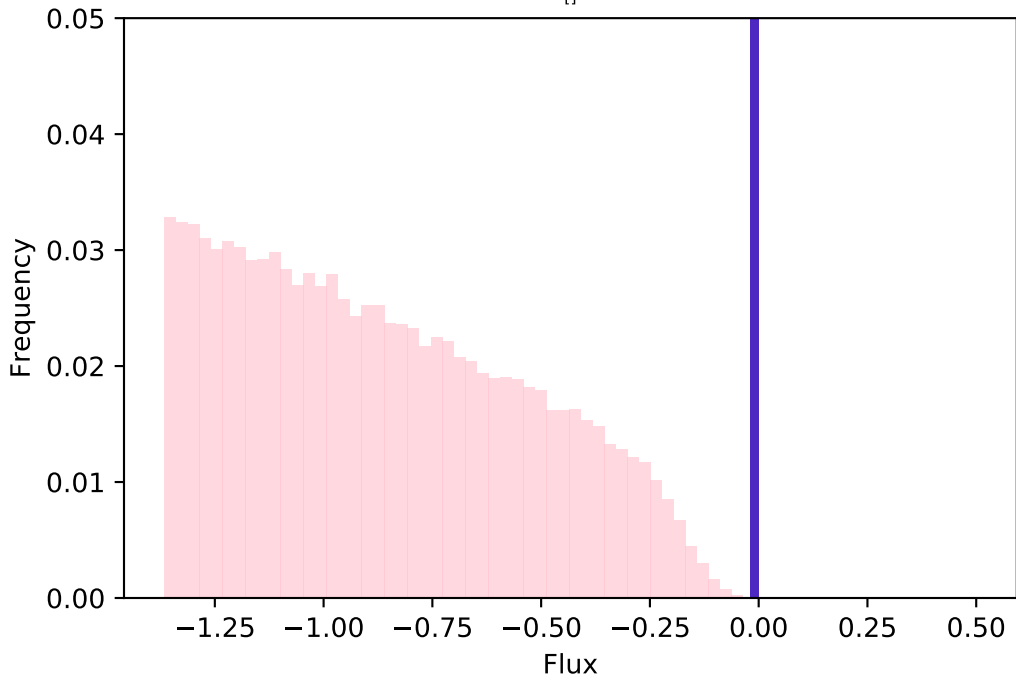




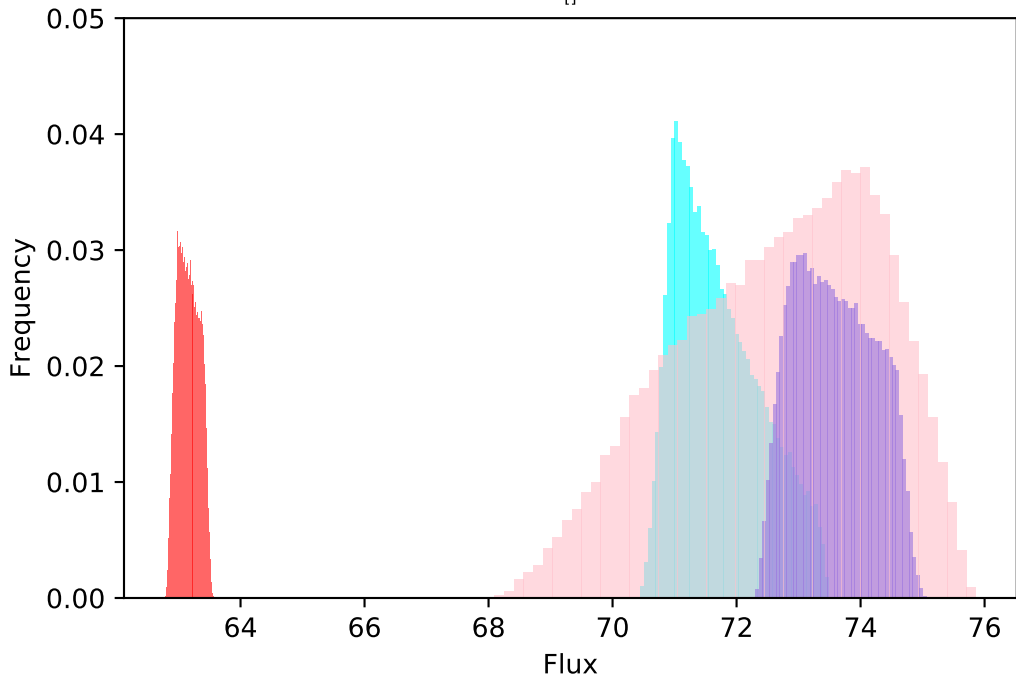
377 : CO2\_c <=> CO2\_h  
[]



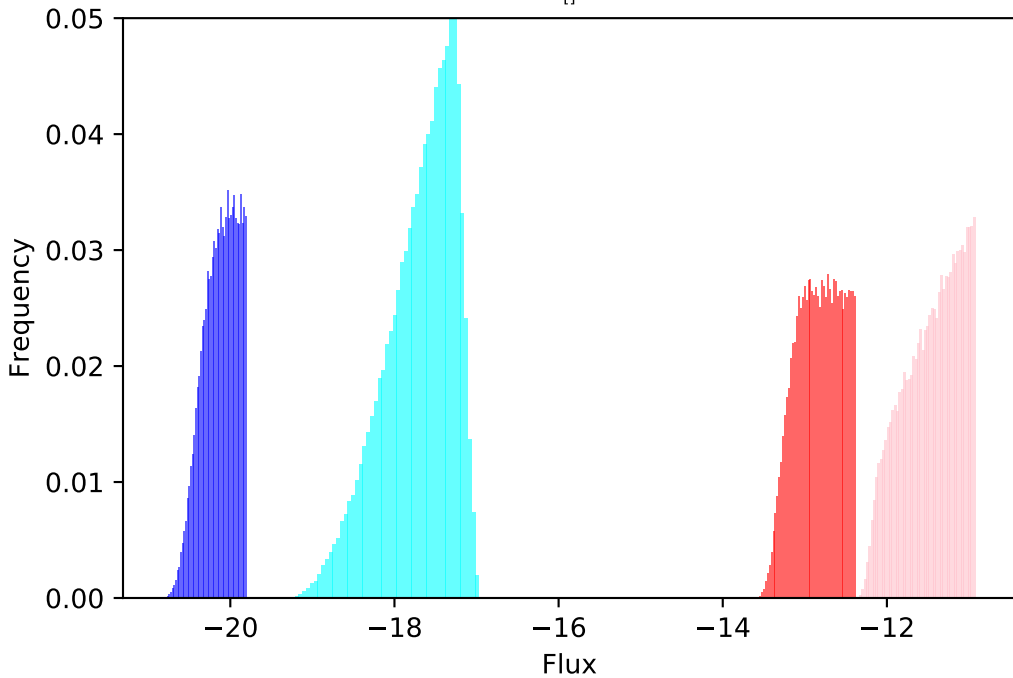
378 : CO2\_c <=> CO2\_m  
[]



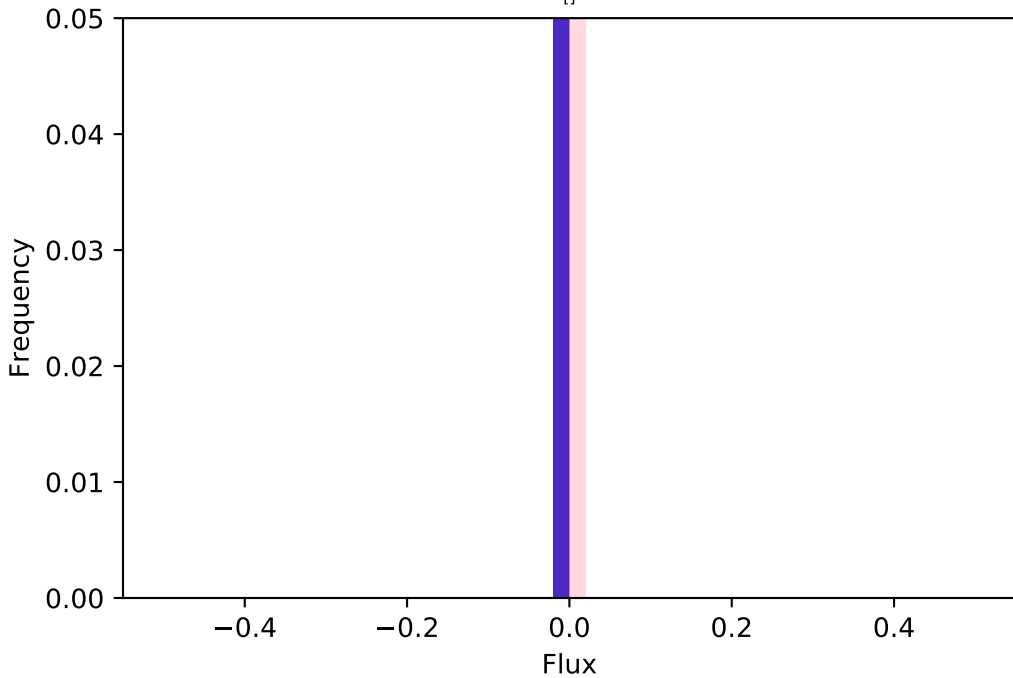
379 : H2O\_c <=> H2O\_h  
[]



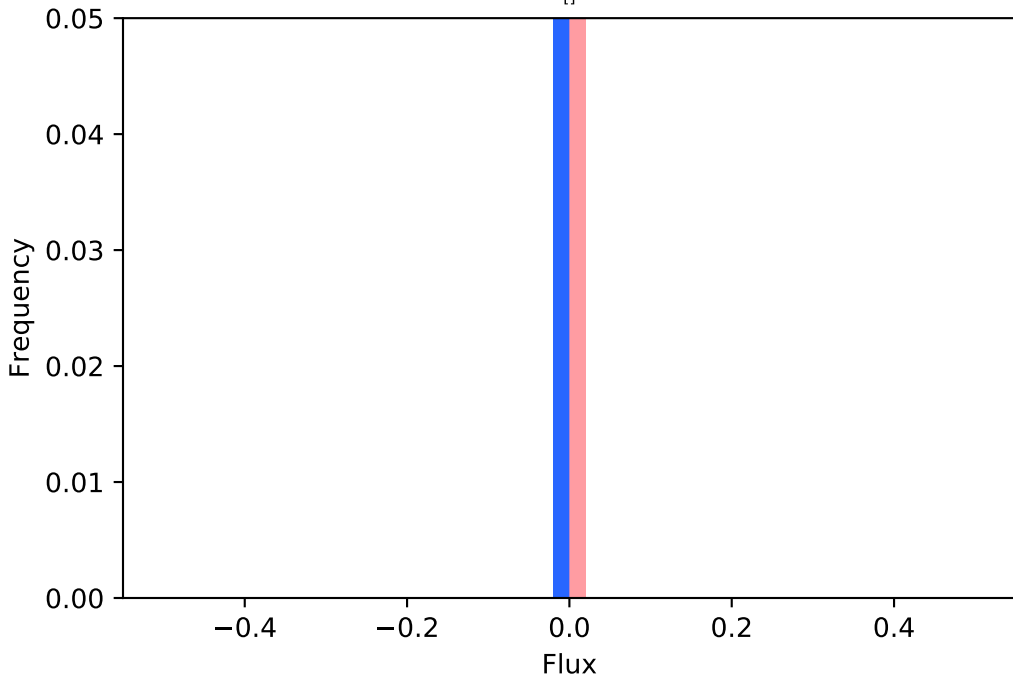
380 : H2O\_c <=> H2O\_m  
[]



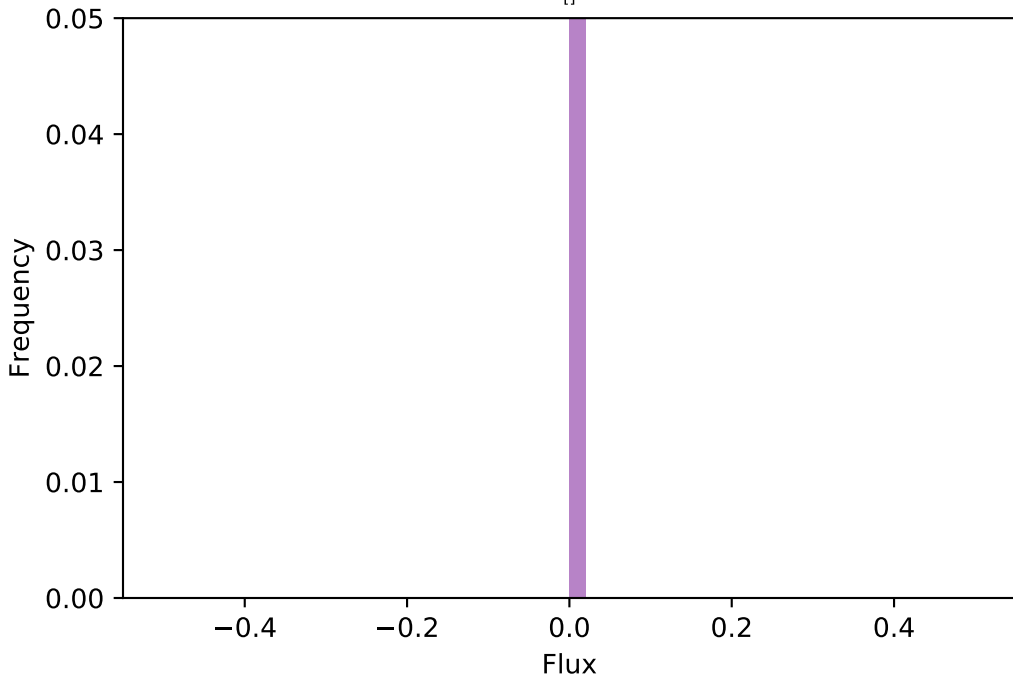
381 : H2O\_c --> H2O\_p  
[]



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

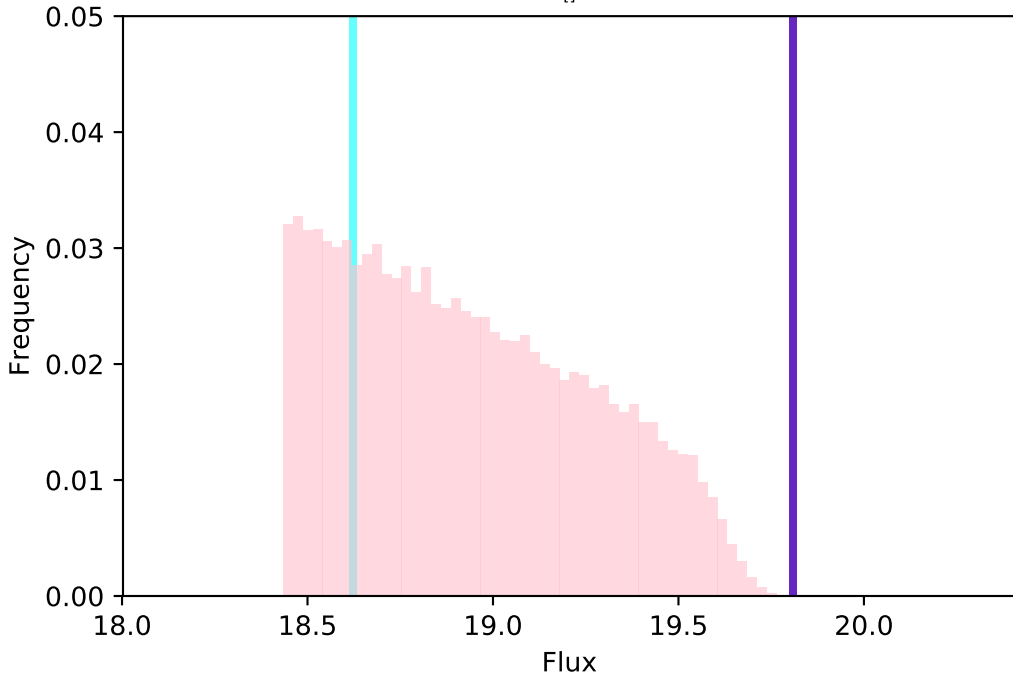


383 : NH4\_c <=> NH4\_h  
[]

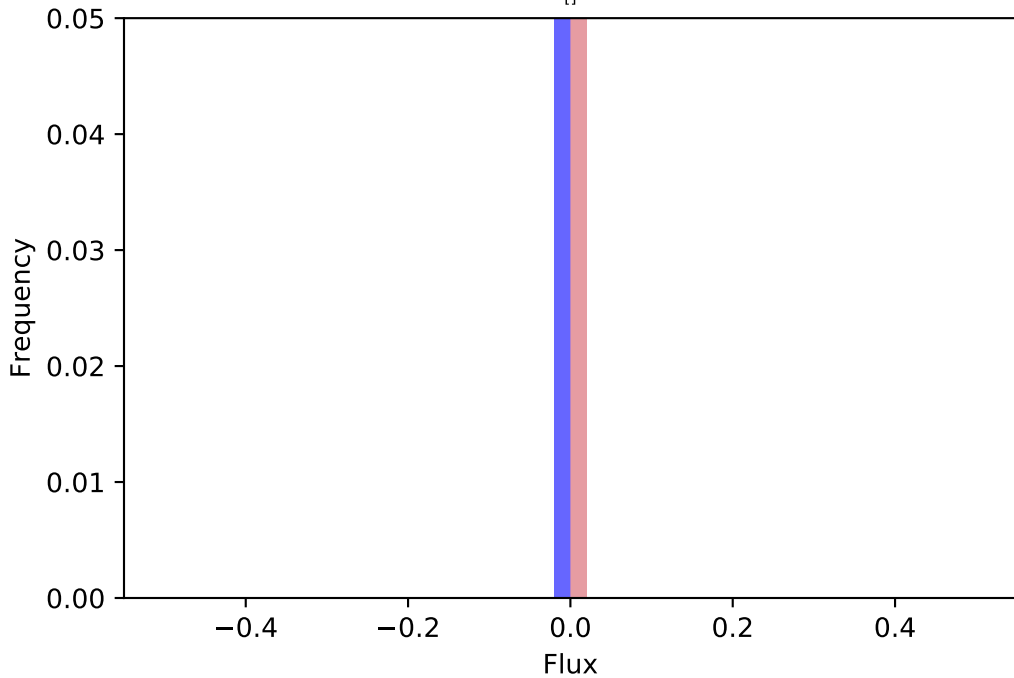




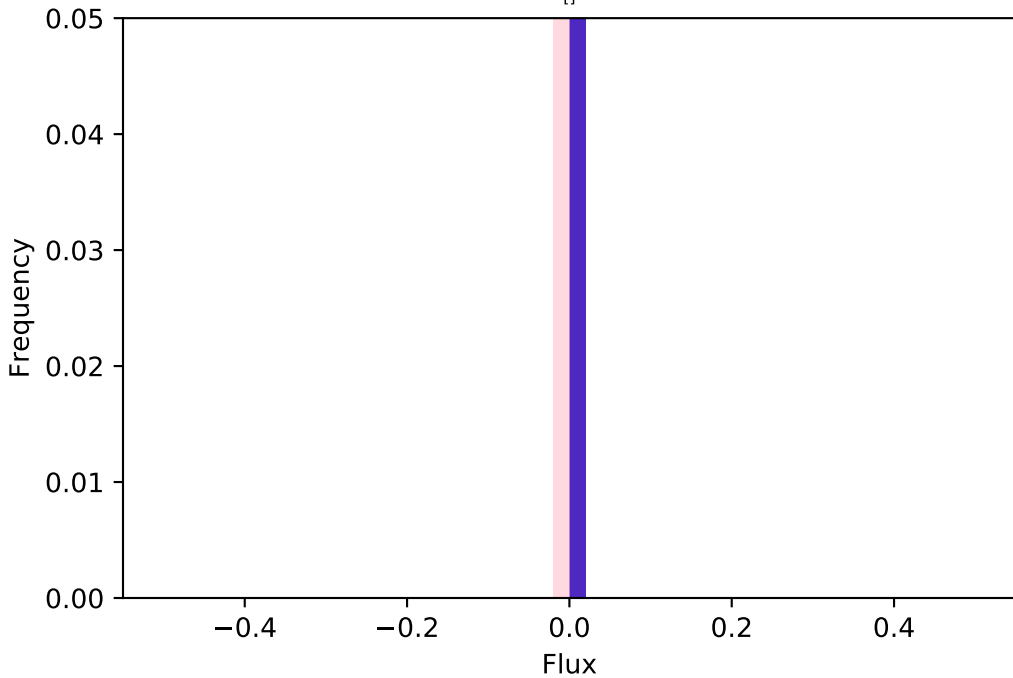
384 : NH4\_c <=> NH4\_m  
[]



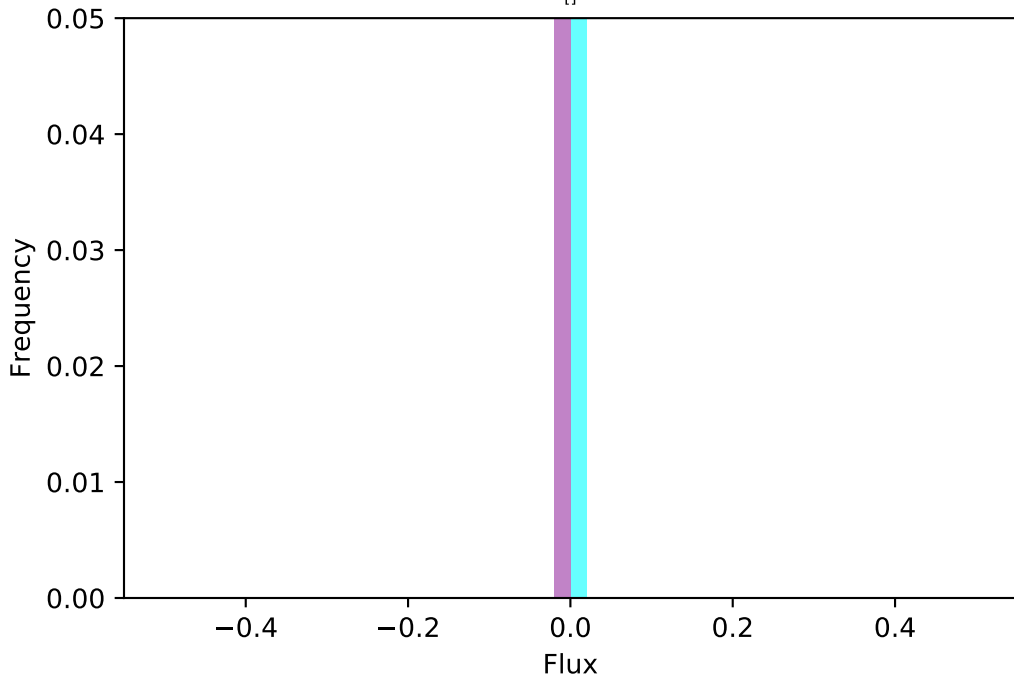
385 : H2S\_c <=> H2S\_h  
[]



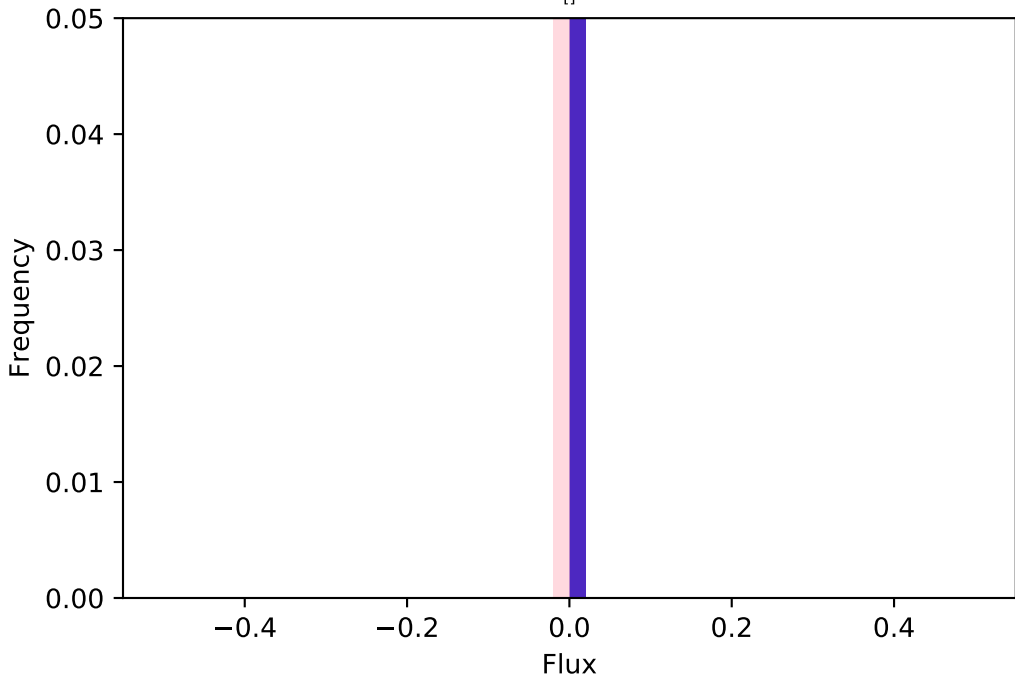
386 : H2S\_c --> H2S\_m  
[]



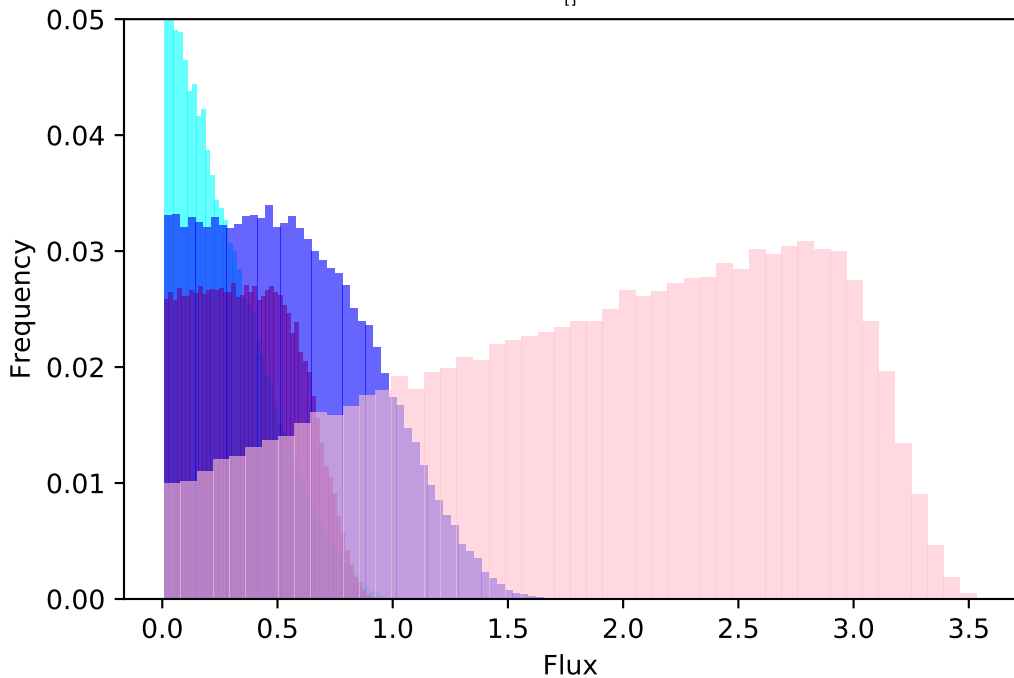
387 : AC\_c <=> AC\_h  
[]



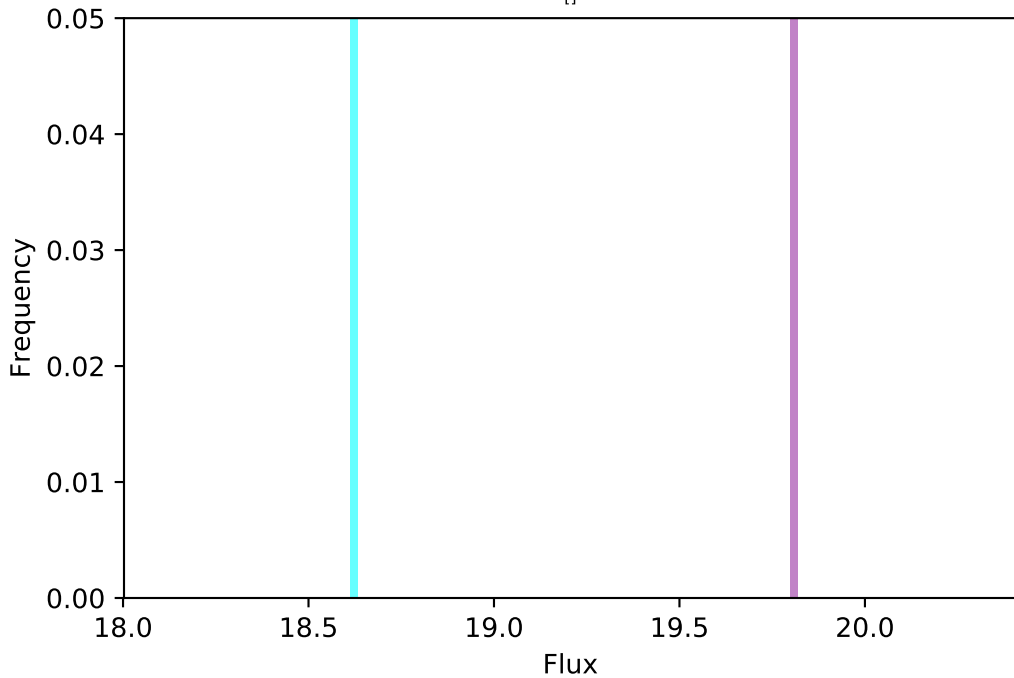
388 : AC\_c --> AC\_m  
[]



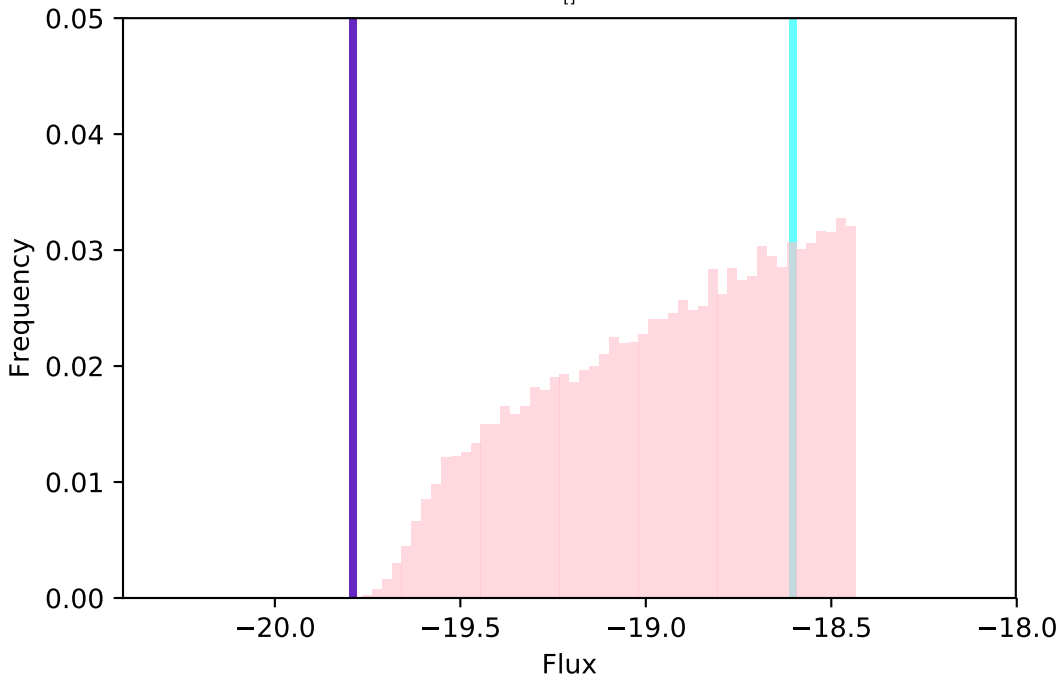
389 : Pyr\_c <=> Pyr\_h  
[]



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

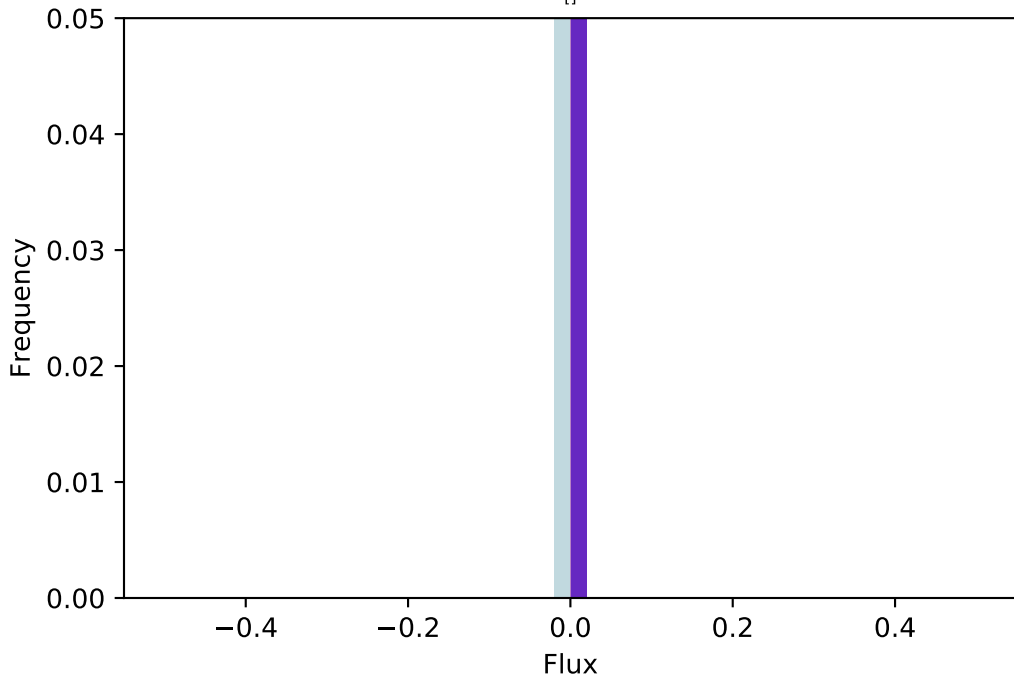


391 : Pyr\_c <=> Pyr\_p  
[]

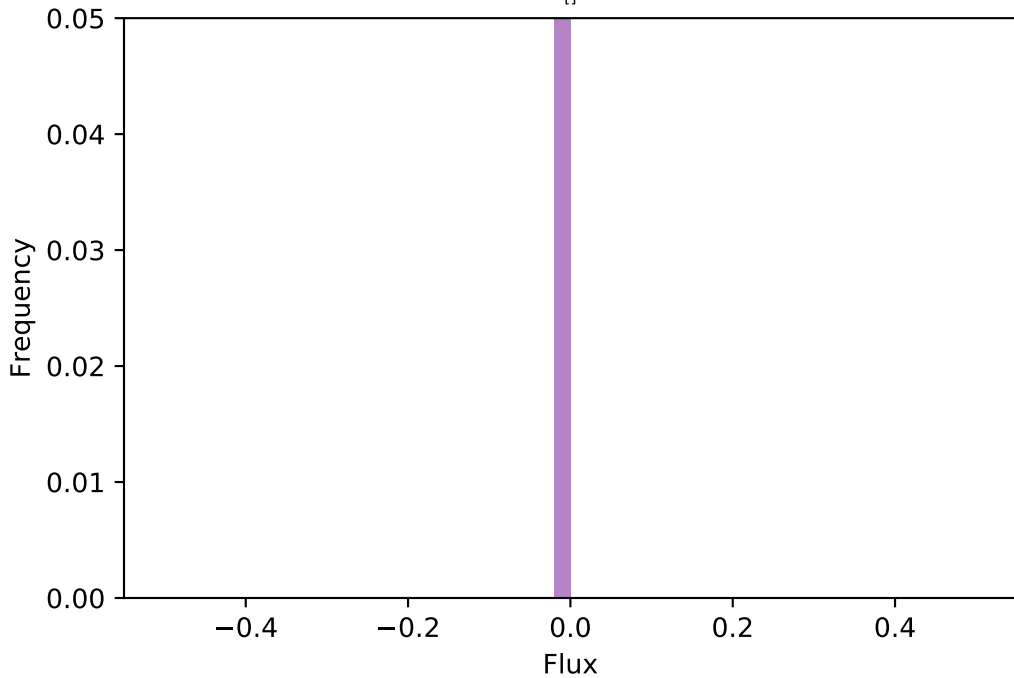




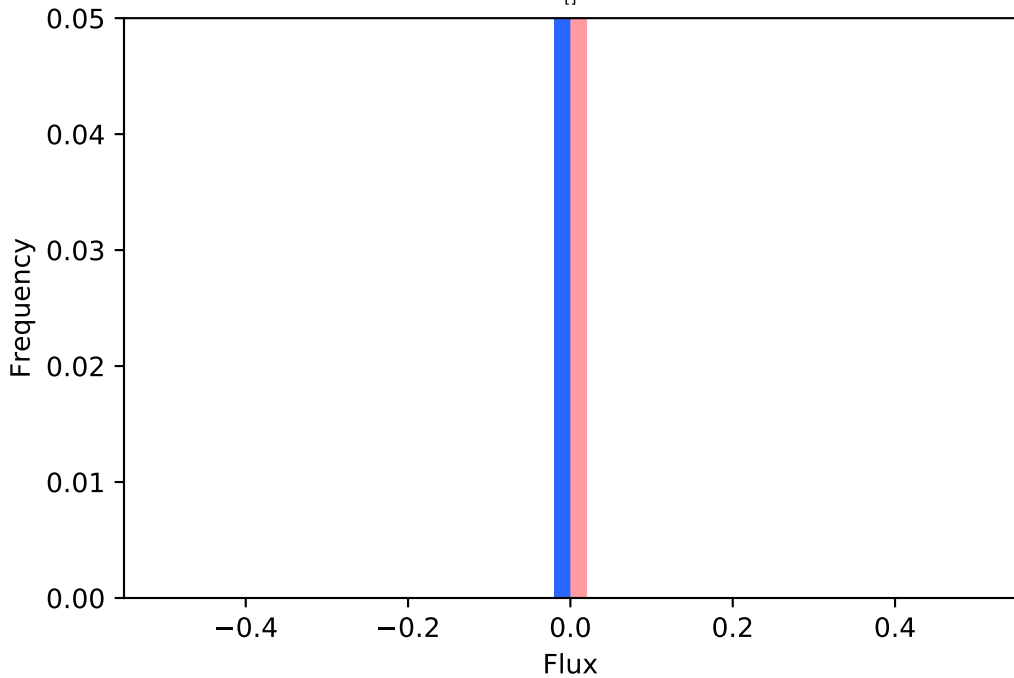
392 : GCA\_c <=> GCA\_p  
[]



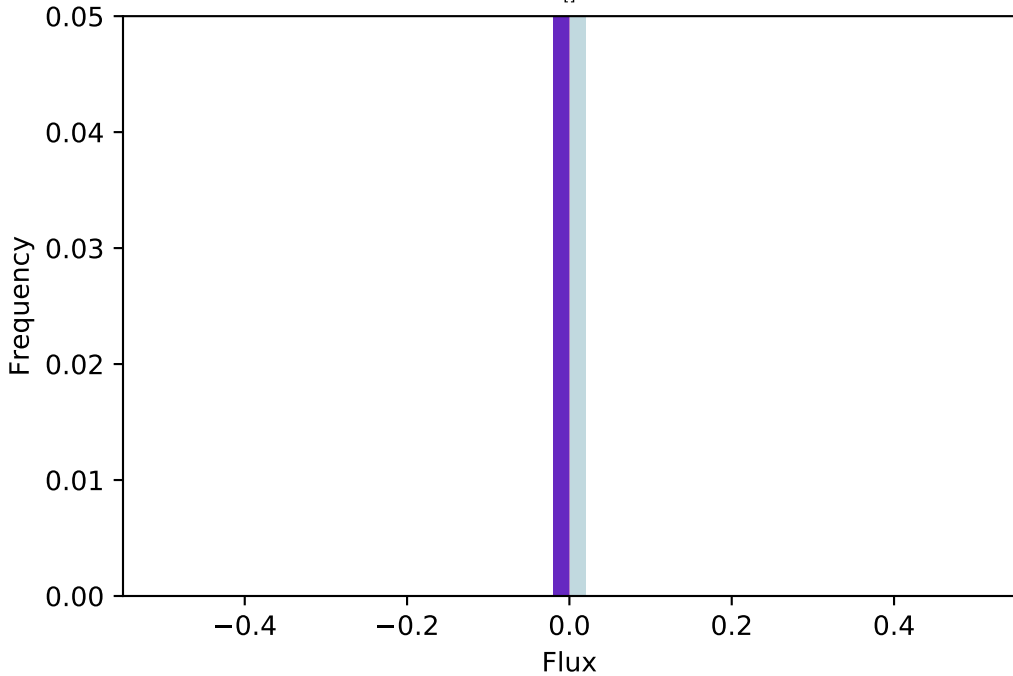
393 : GCEA\_c <=> GCEA\_p  
[]



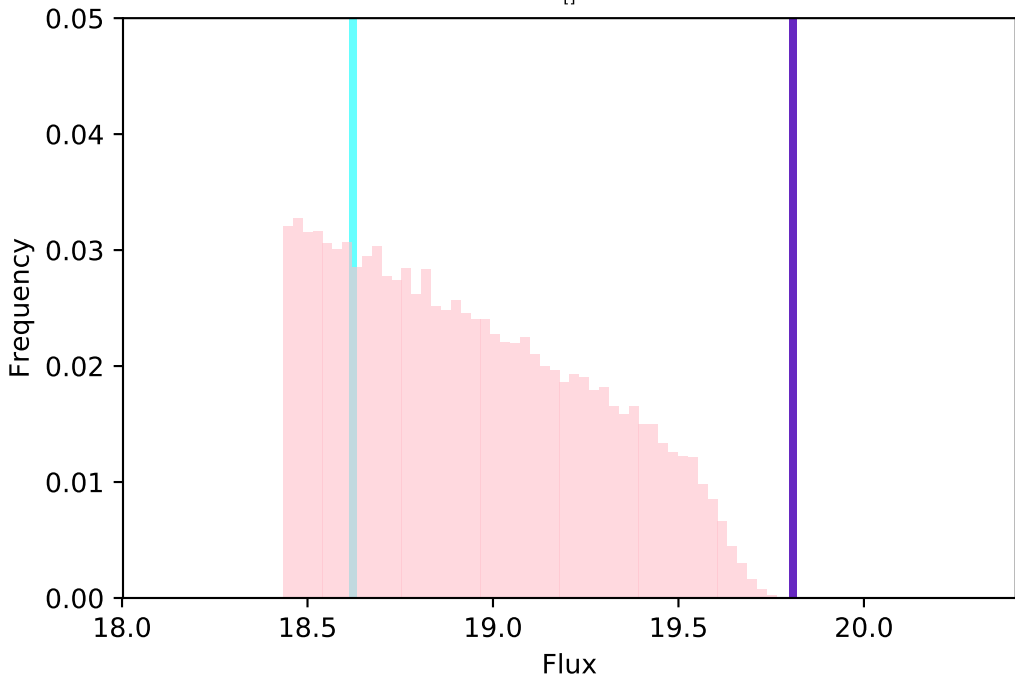
394 : Mal\_c <=> Mal\_p  
[]



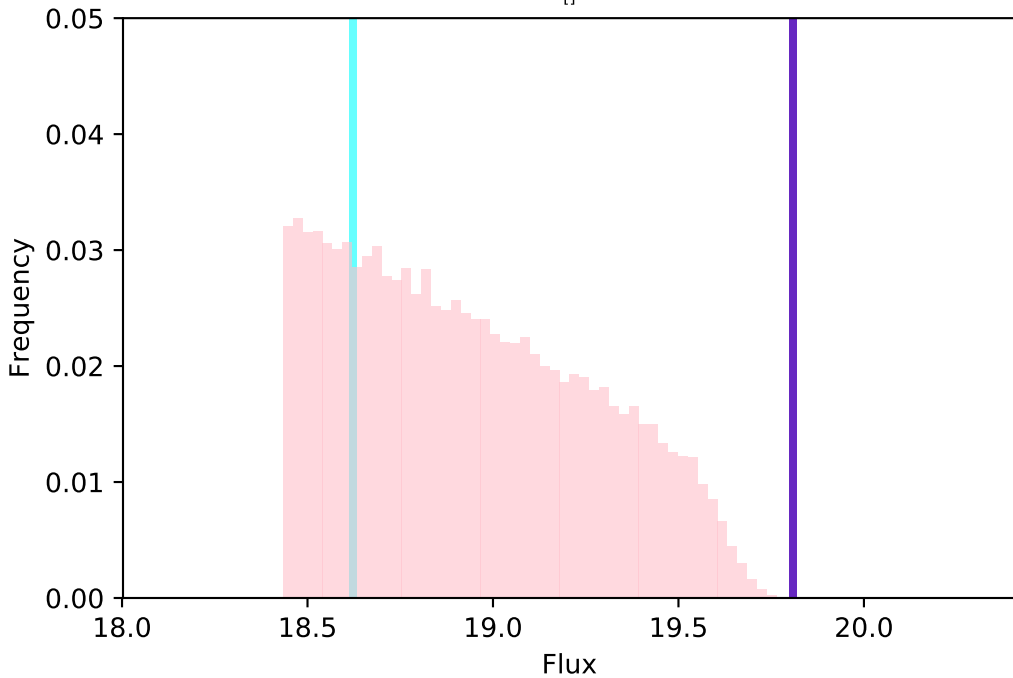
395 : OAA\_c <=> OAA\_p  
[]



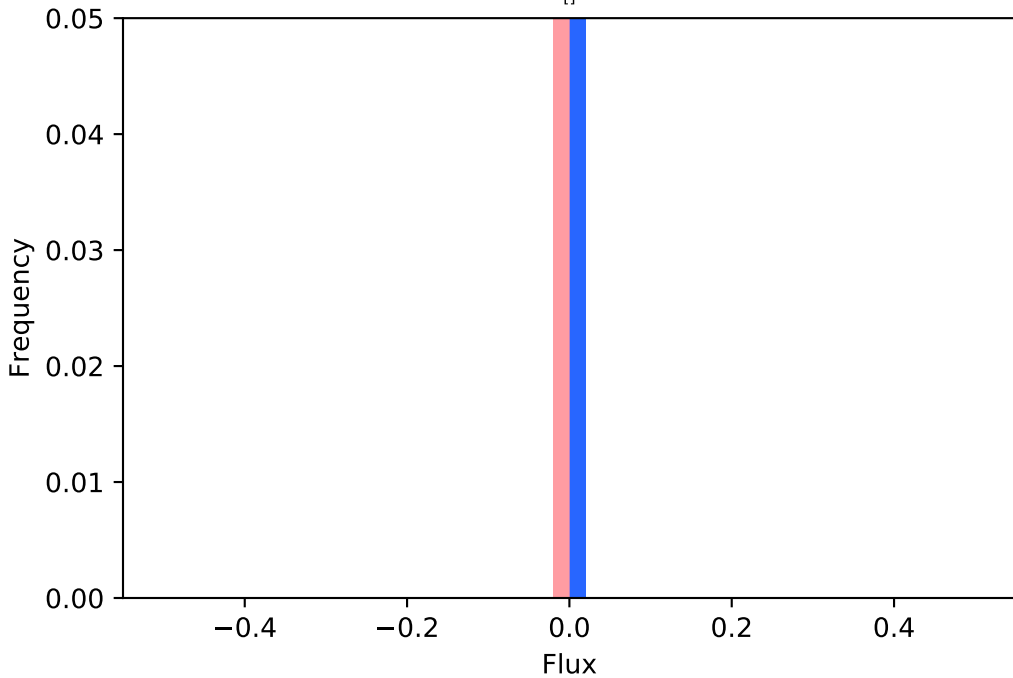
396 : KG\_c --> KG\_p  
[]



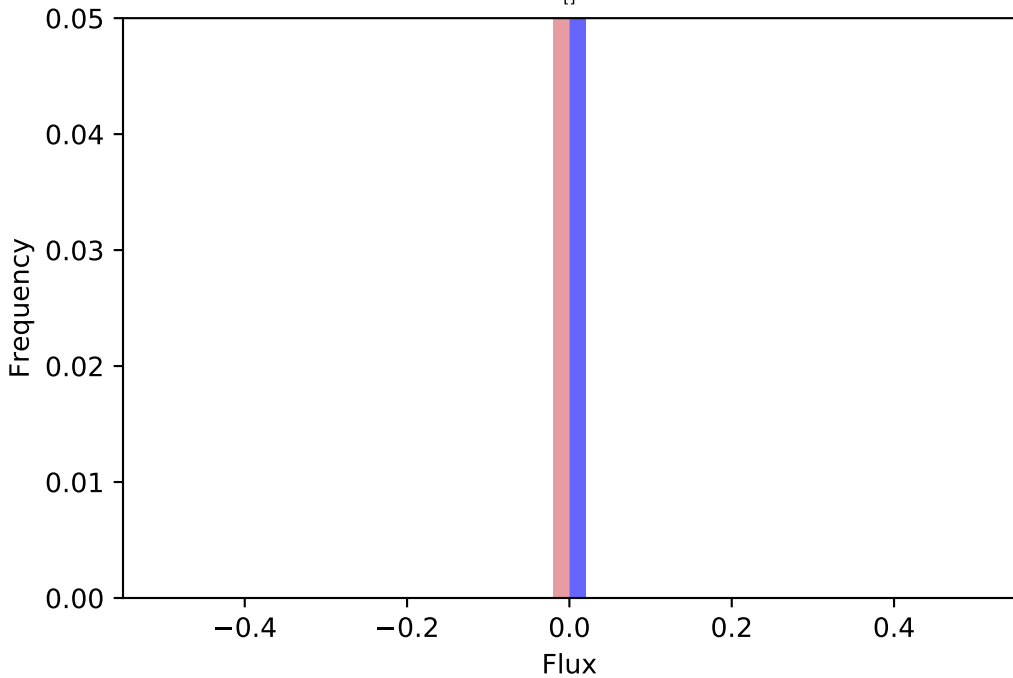
397 : Ala\_c <=> Ala\_p  
[]



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

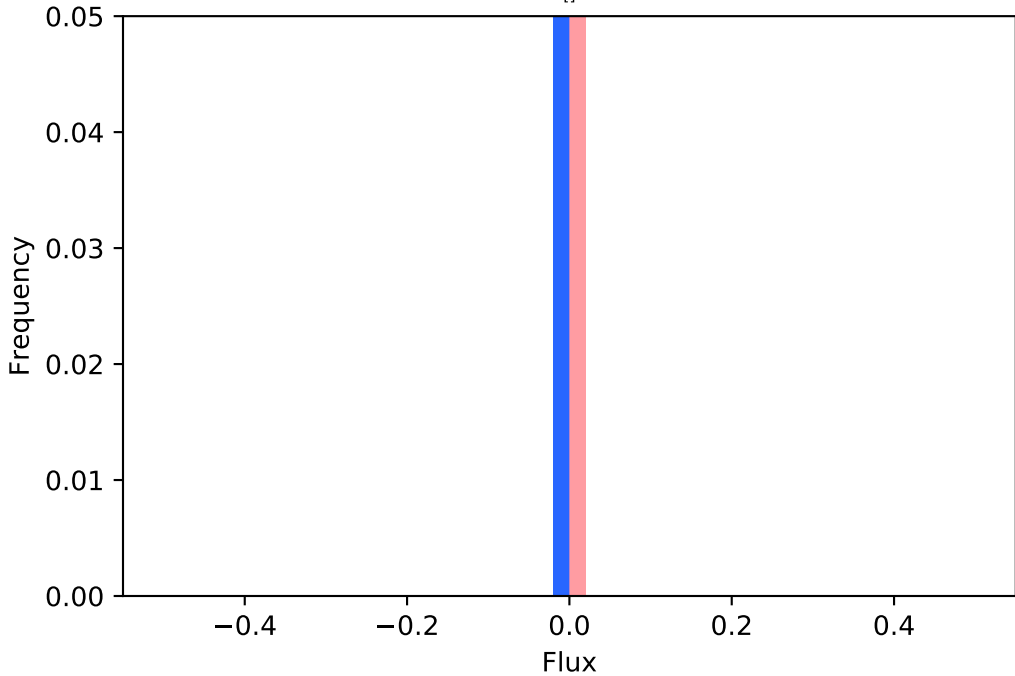


399 : Asn\_c --> Asn\_p + H\_p  
[]

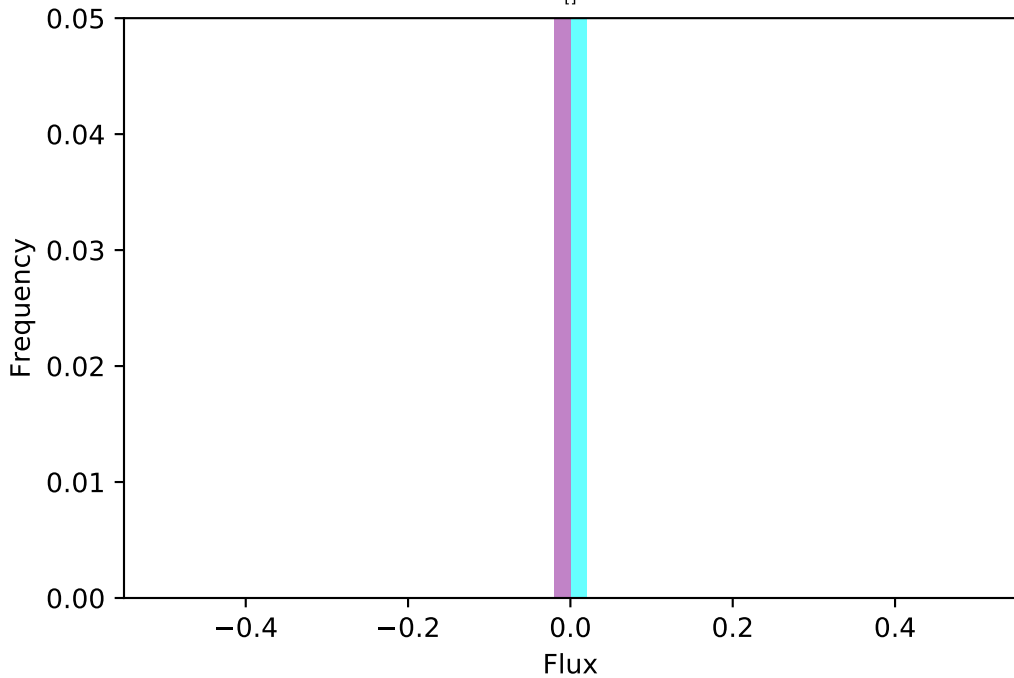




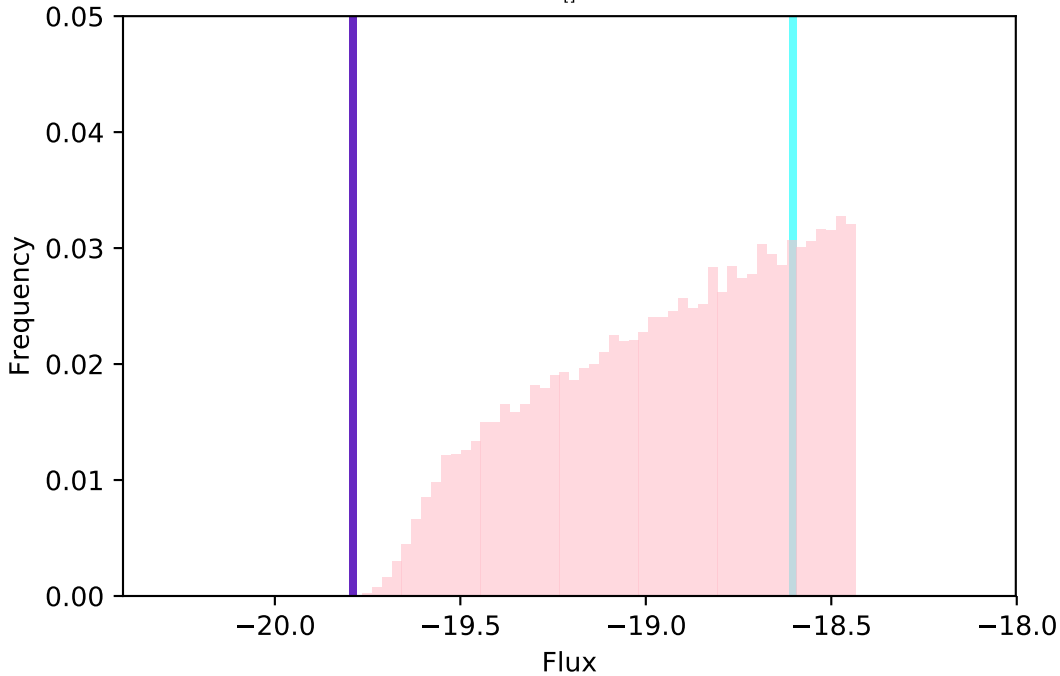
400 : Asp\_c <=> Asp\_p  
[]



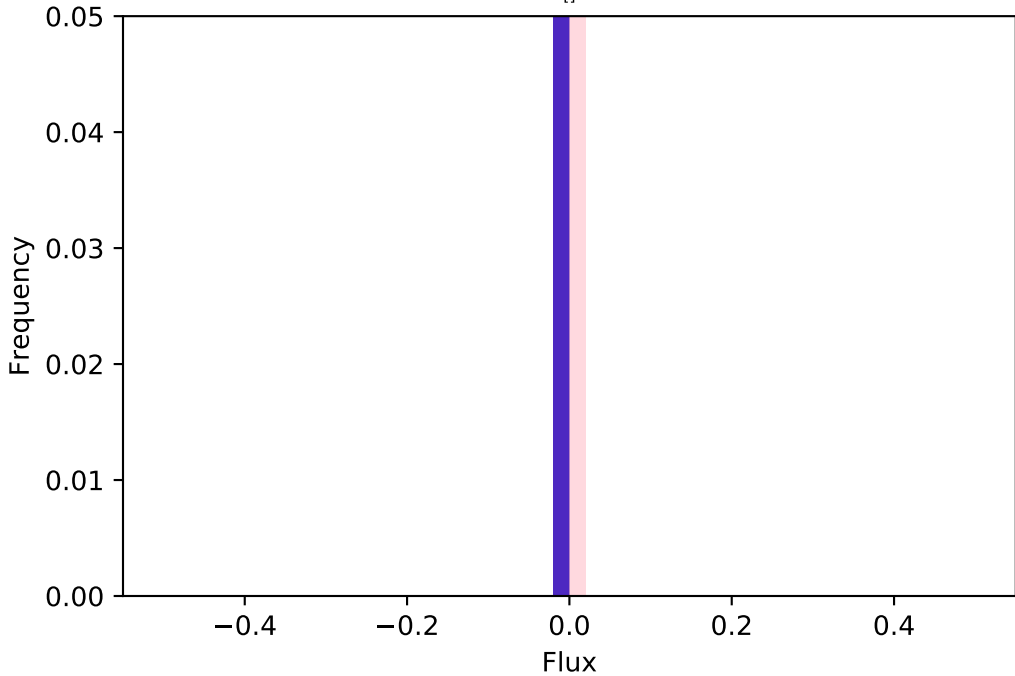
401 : Cys\_c --> Cys\_p  
[]



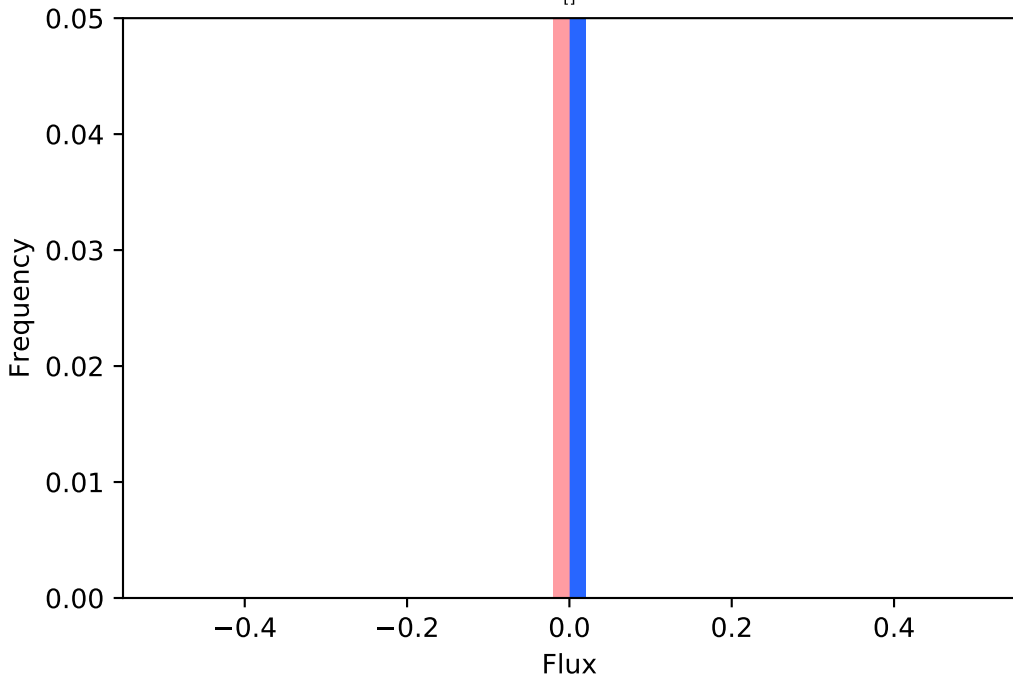
402 : Glu\_c --> Glu\_p  
[ ]



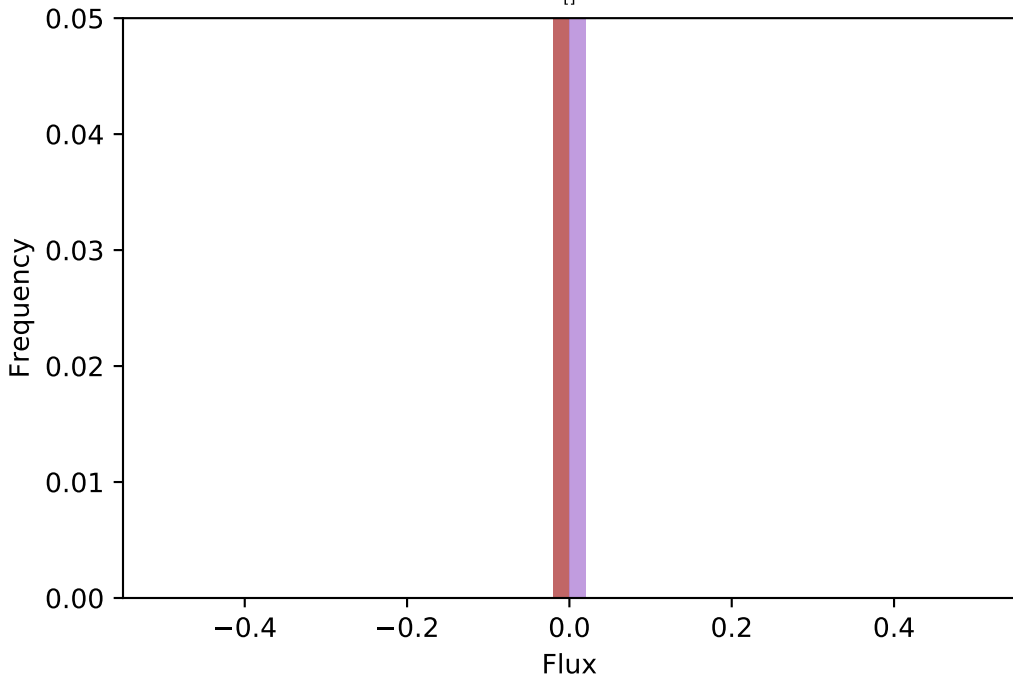
403 : Gln\_c --> Gln\_p + H\_p  
[]



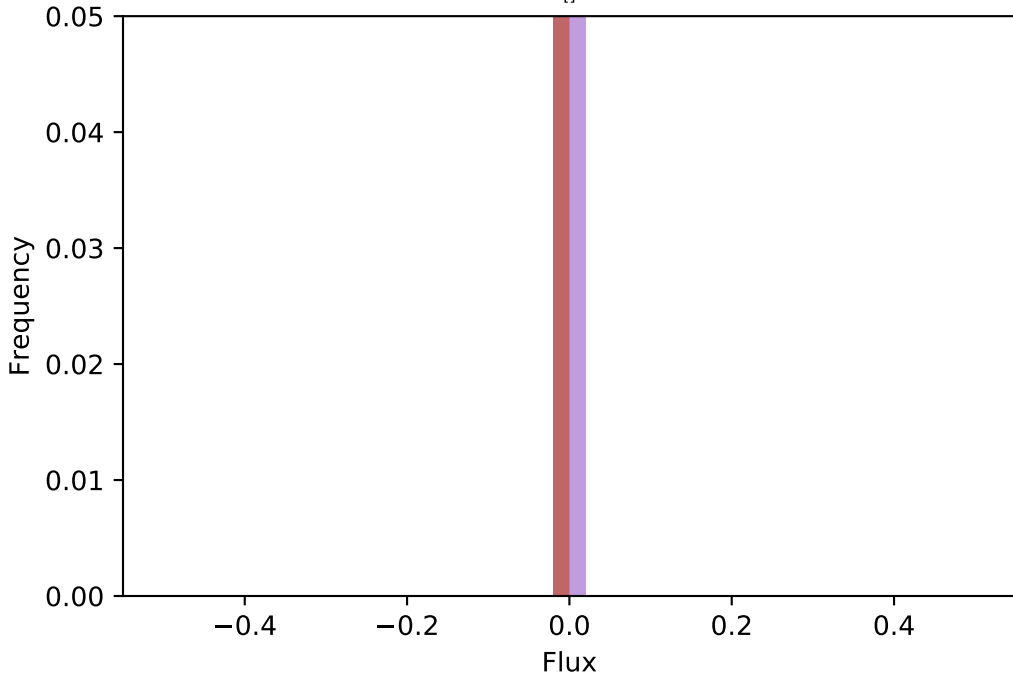
404 : Gly\_c <=> Gly\_p  
[]



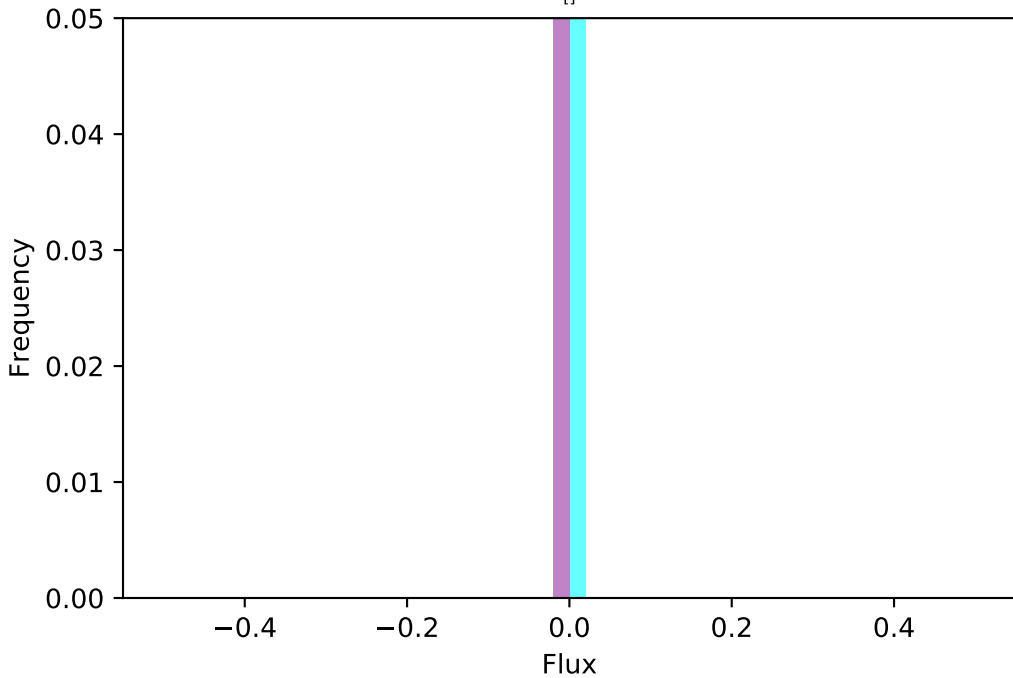
405 : His\_c --> His\_p  
[]



406 : Ile\_c --> Ile\_p  
[]

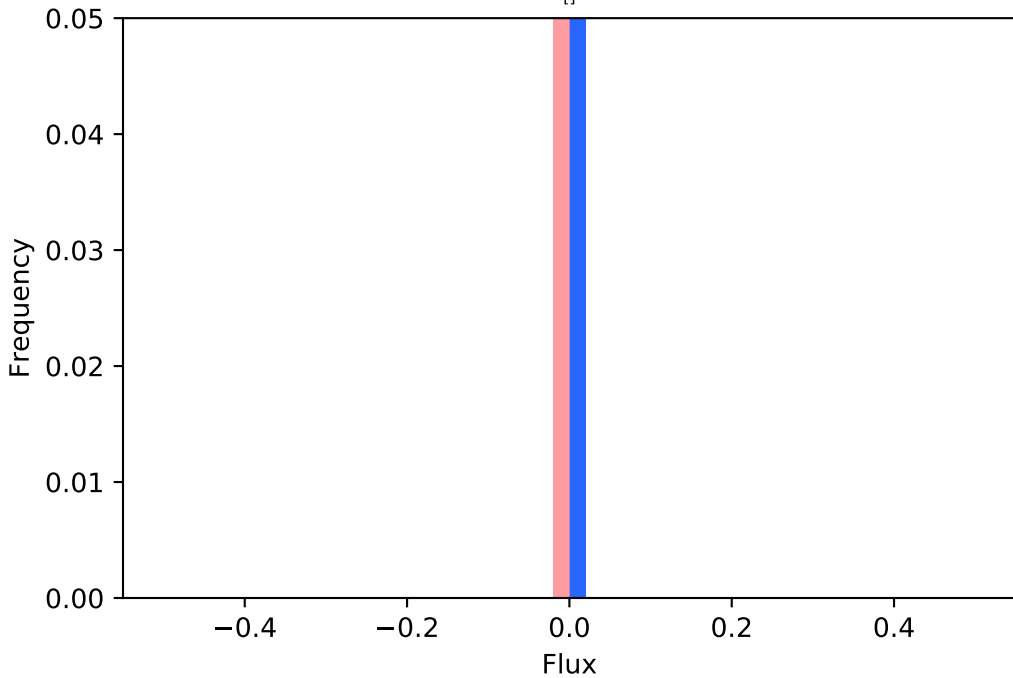


407 : Leu\_c --> Leu\_p  
[]

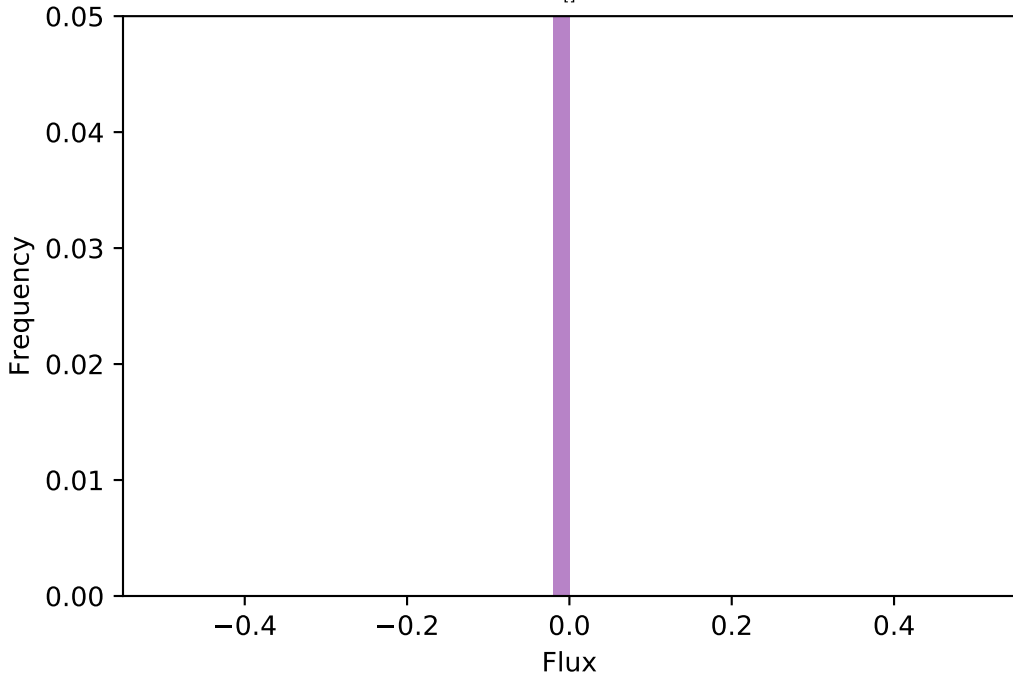




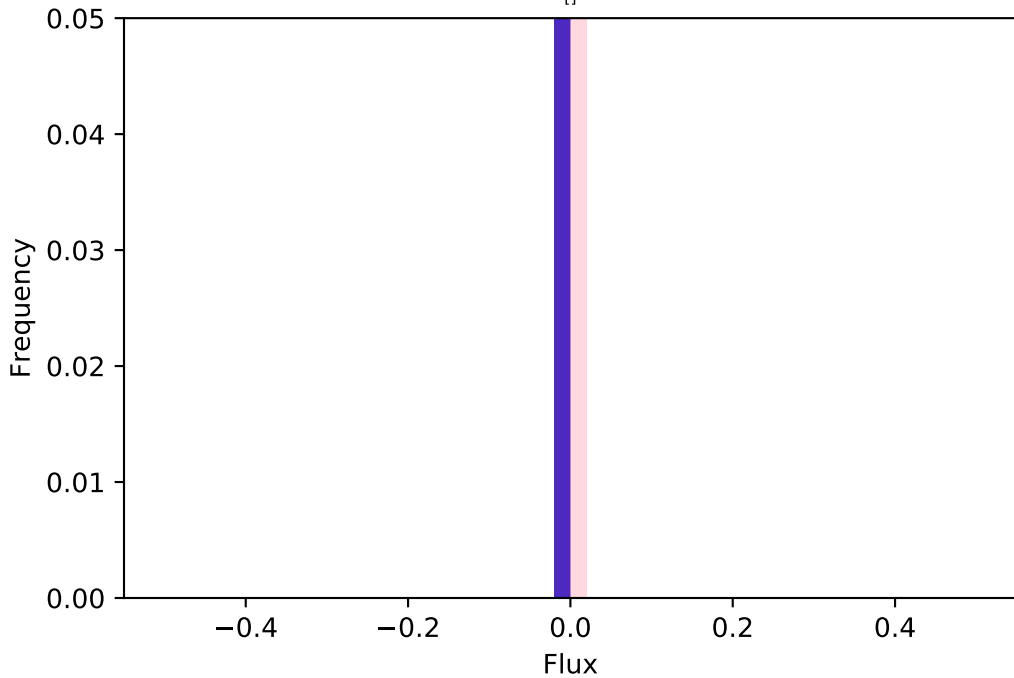
408 : Lys\_c --> Lys\_p  
[]



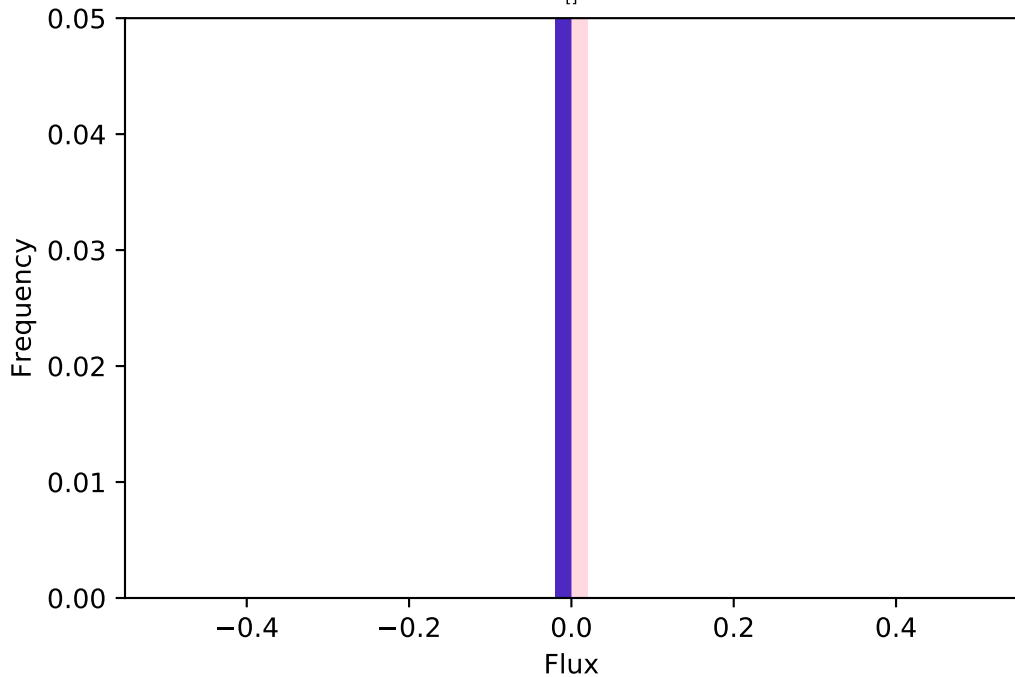
409 : Met\_c <=> Met\_p  
[]



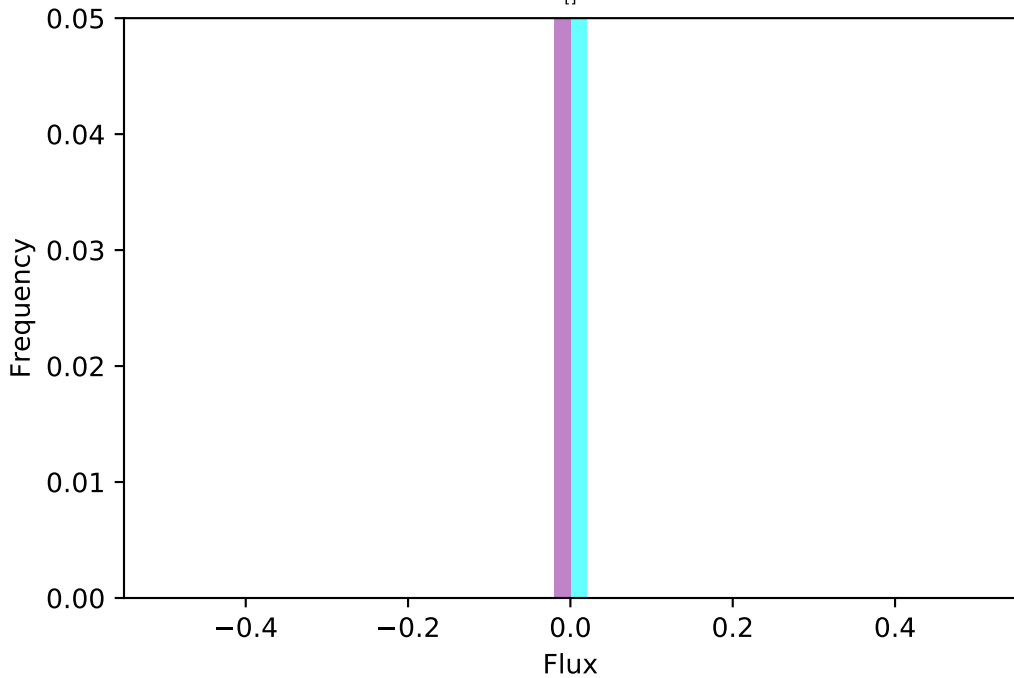
410 : Phe\_c --> Phe\_p  
[]



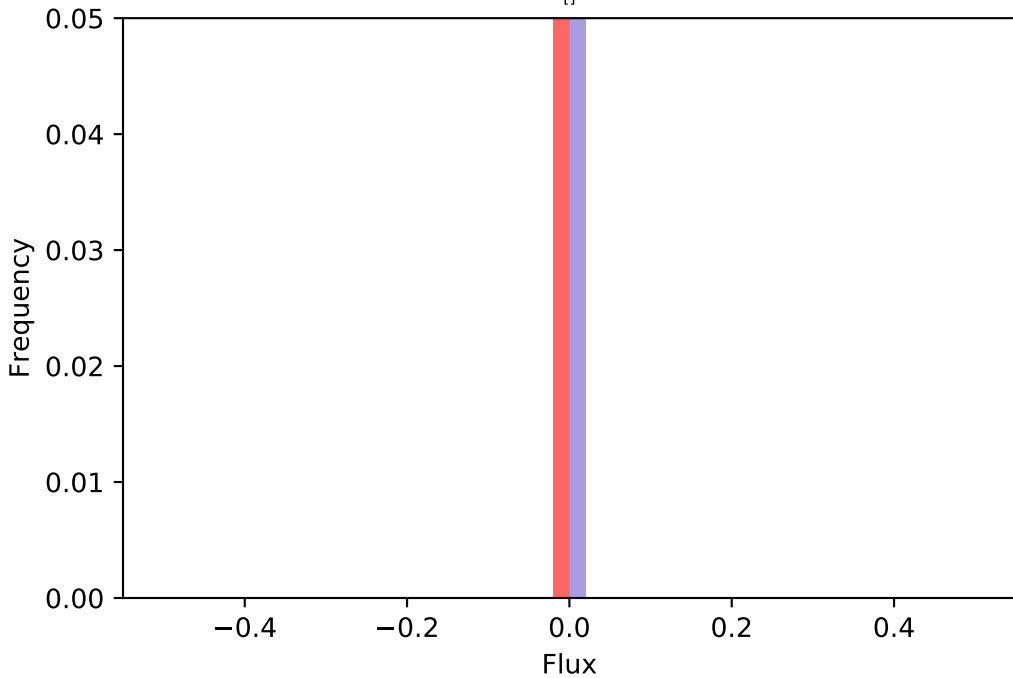
411 : Pro\_c --> Pro\_p  
[]



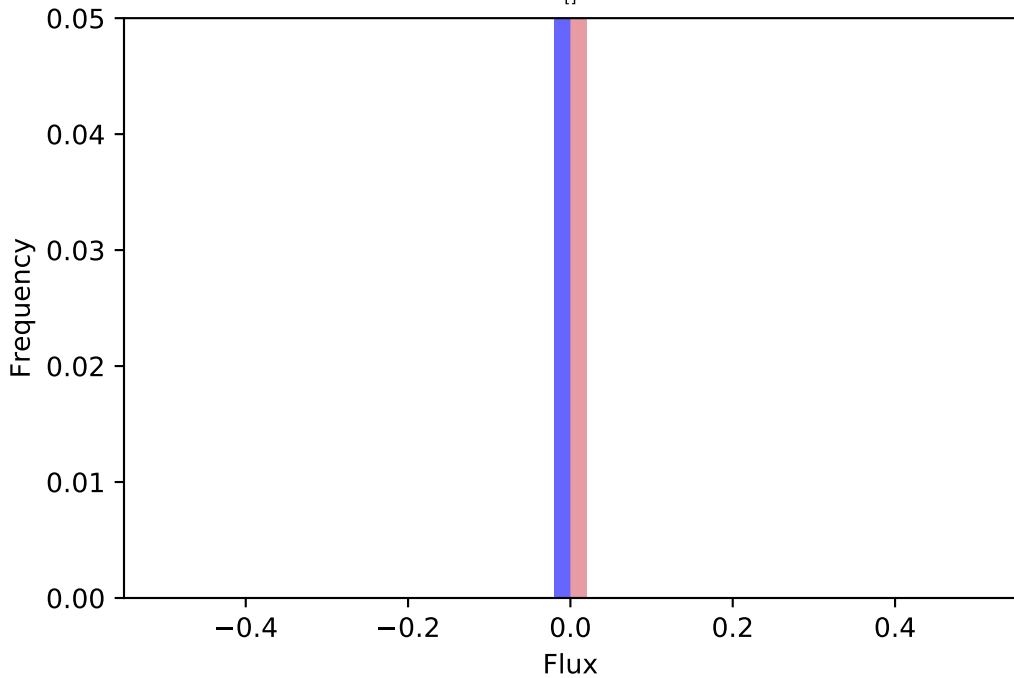
412 : Ser\_c <=> Ser\_p  
[]



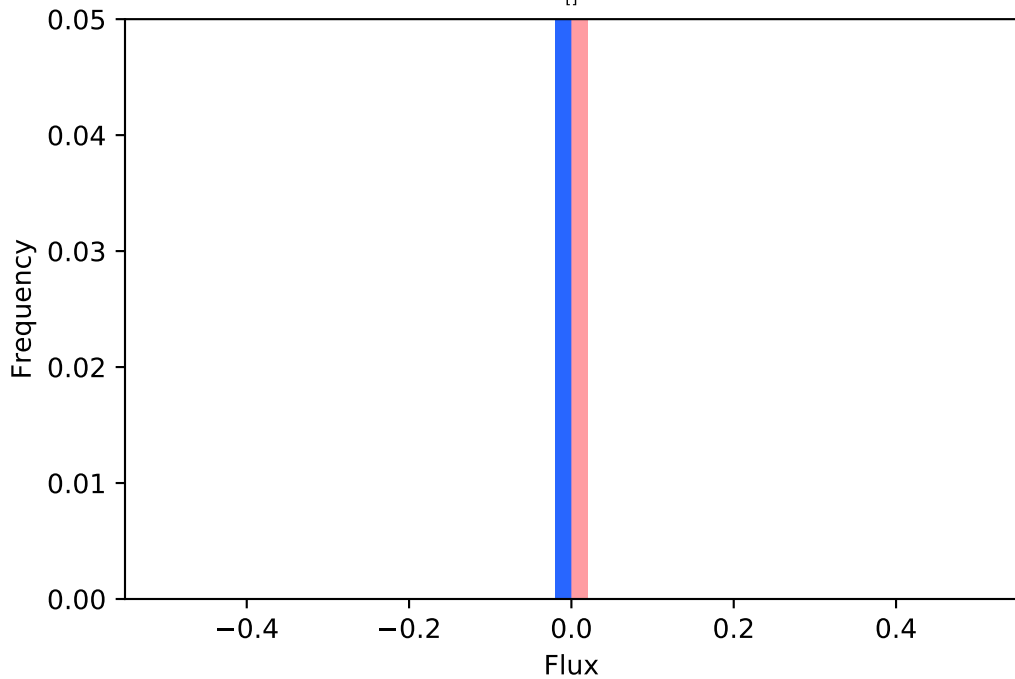
413 : Thr\_c --> Thr\_p  
[]



414 : Trp\_c --> Trp\_p  
[]

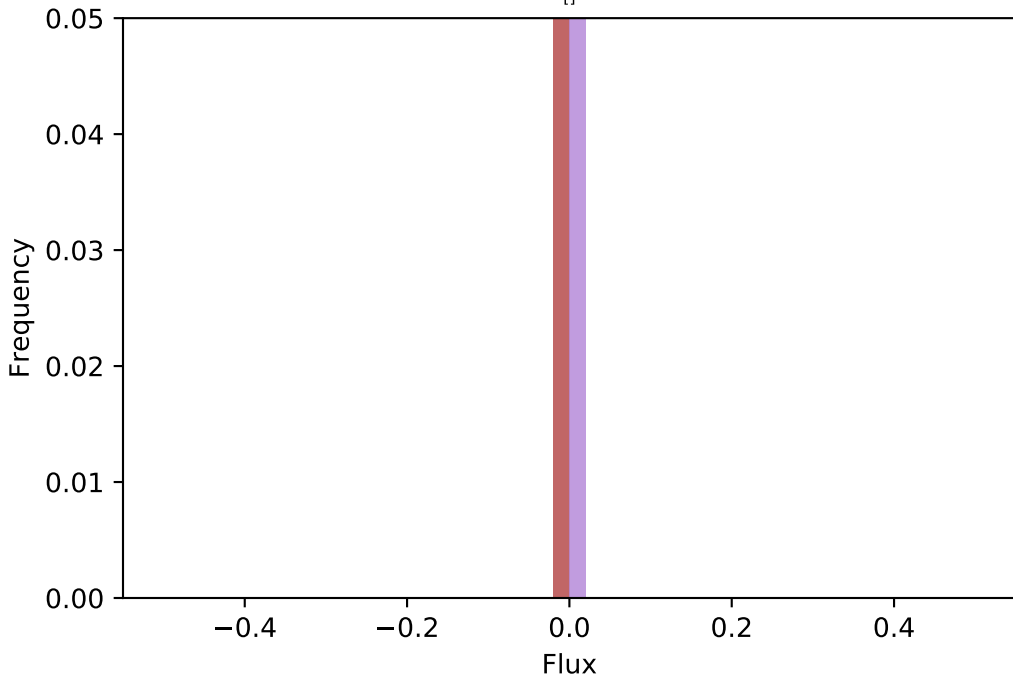


415 : Tyr\_c --> Tyr\_p  
[]

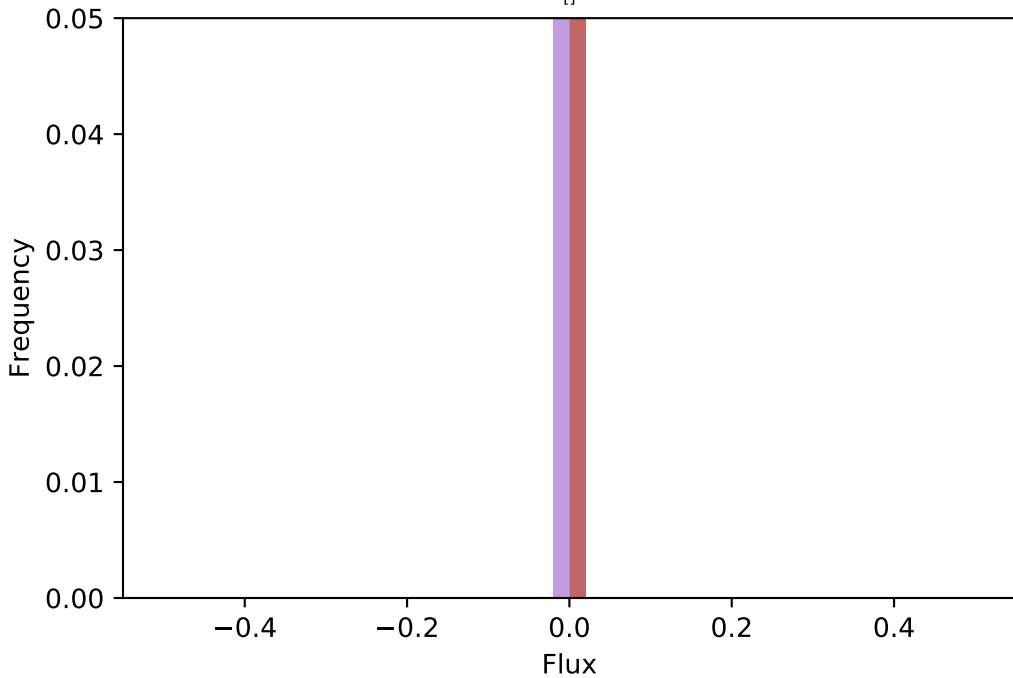


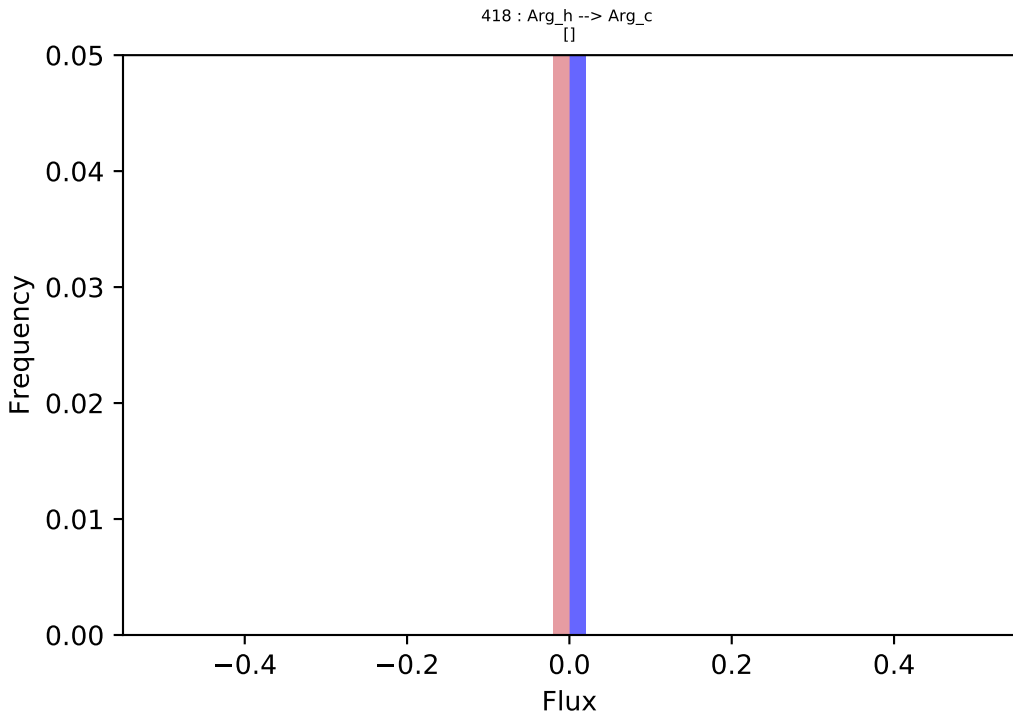


416 : Val\_c --> Val\_p  
[]

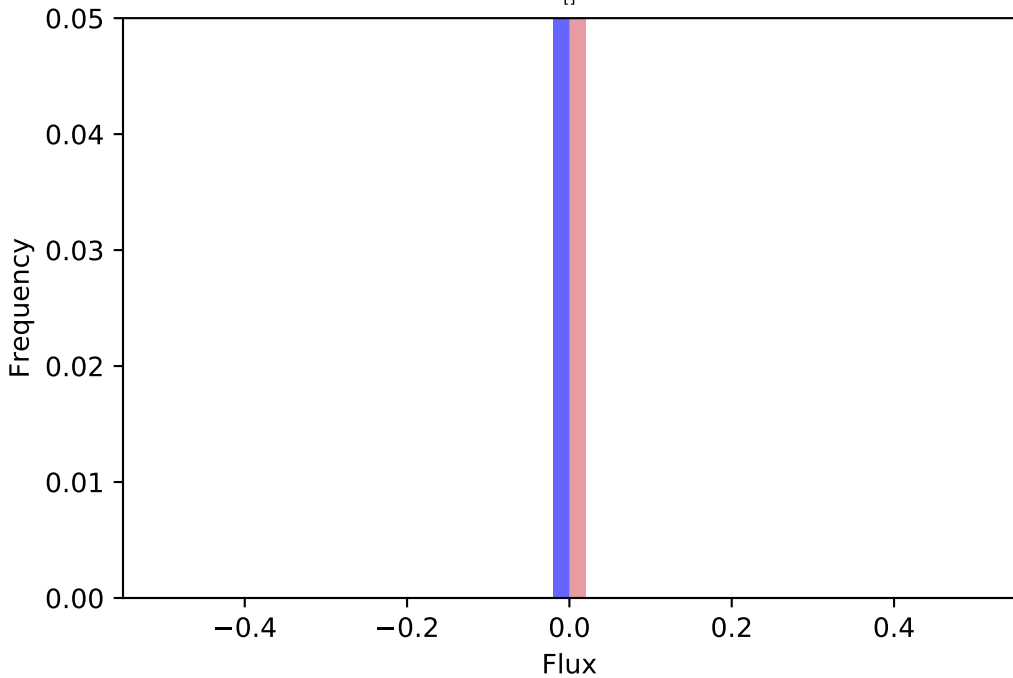


417 : Ala\_h --> Ala\_c  
[]

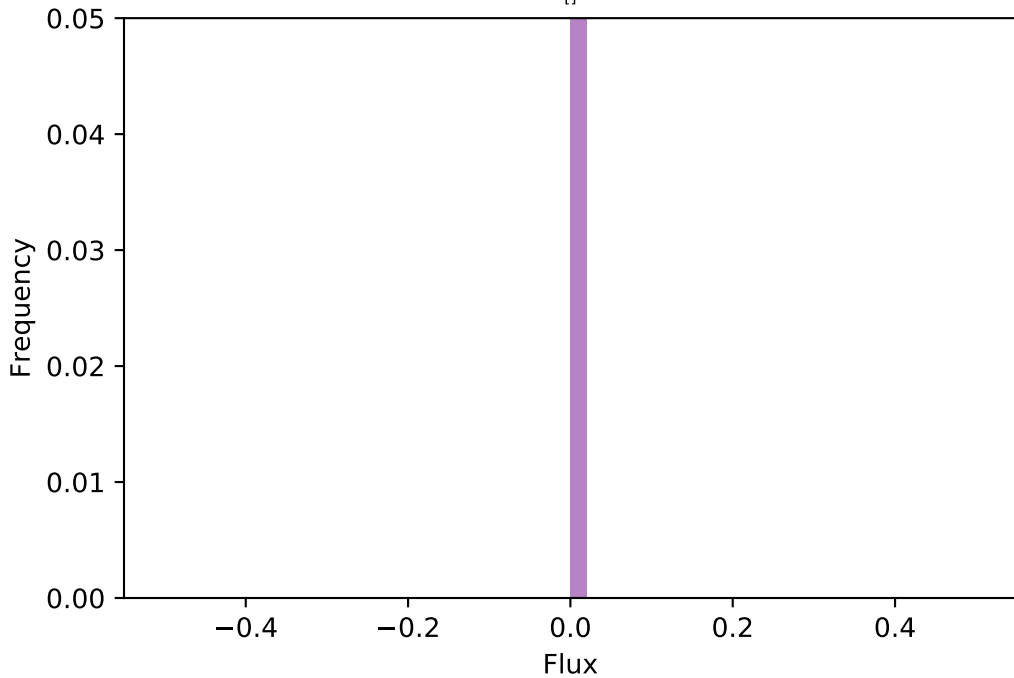




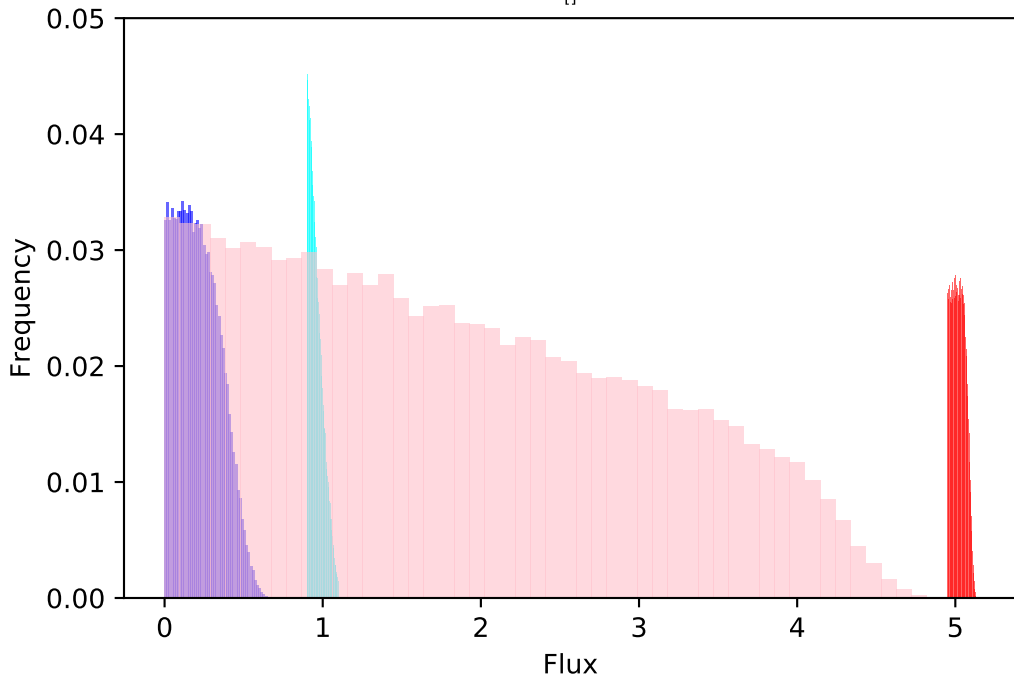
419 : Asn\_c --> Asn\_h + H\_h  
[]



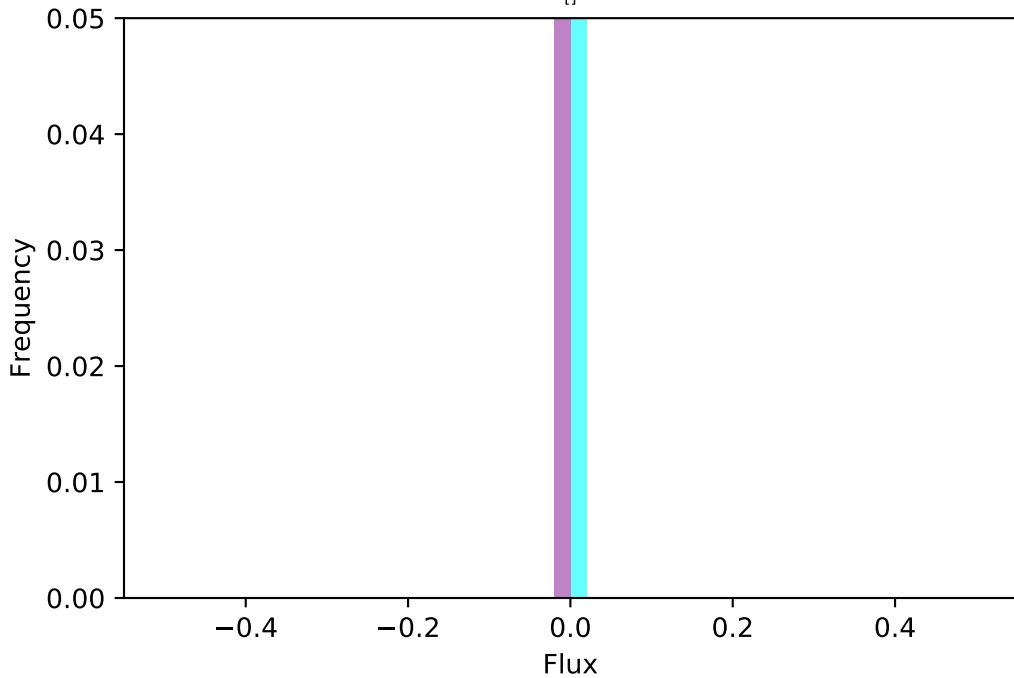
420 : Asn\_c --> Asn\_m  
[]



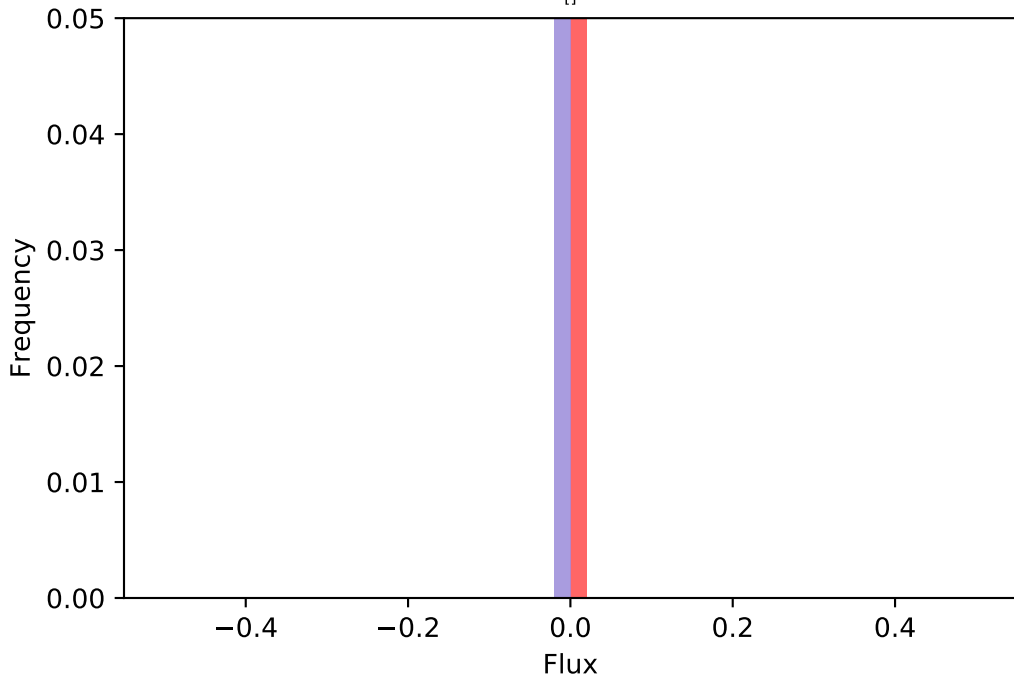
421 : Glu\_c --> Glu\_h  
[]



422 : His\_h --> His\_c  
[]

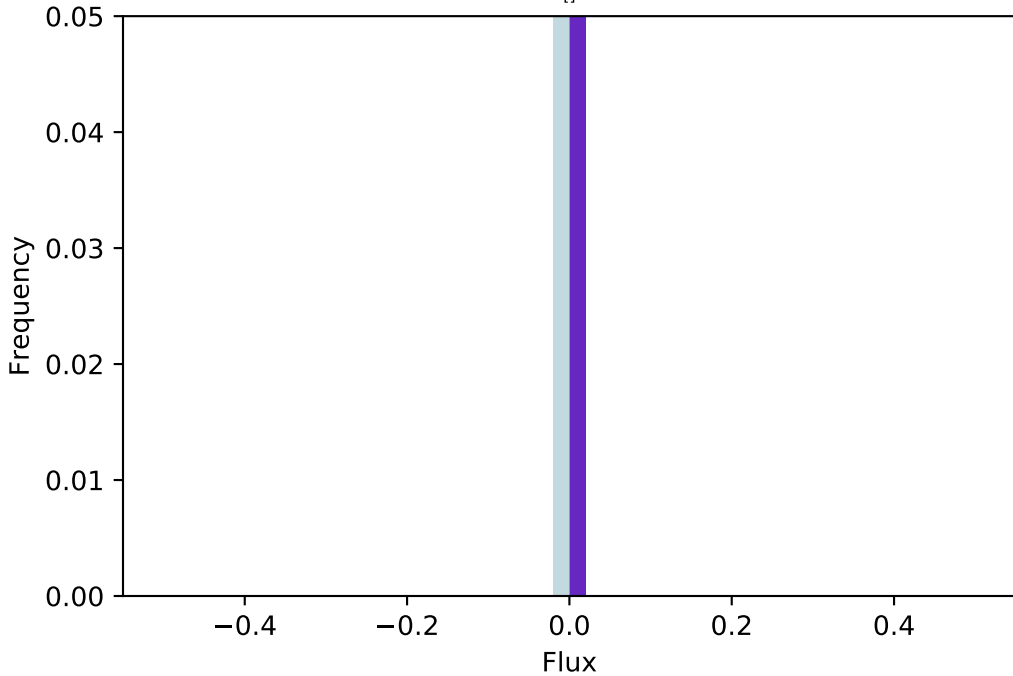


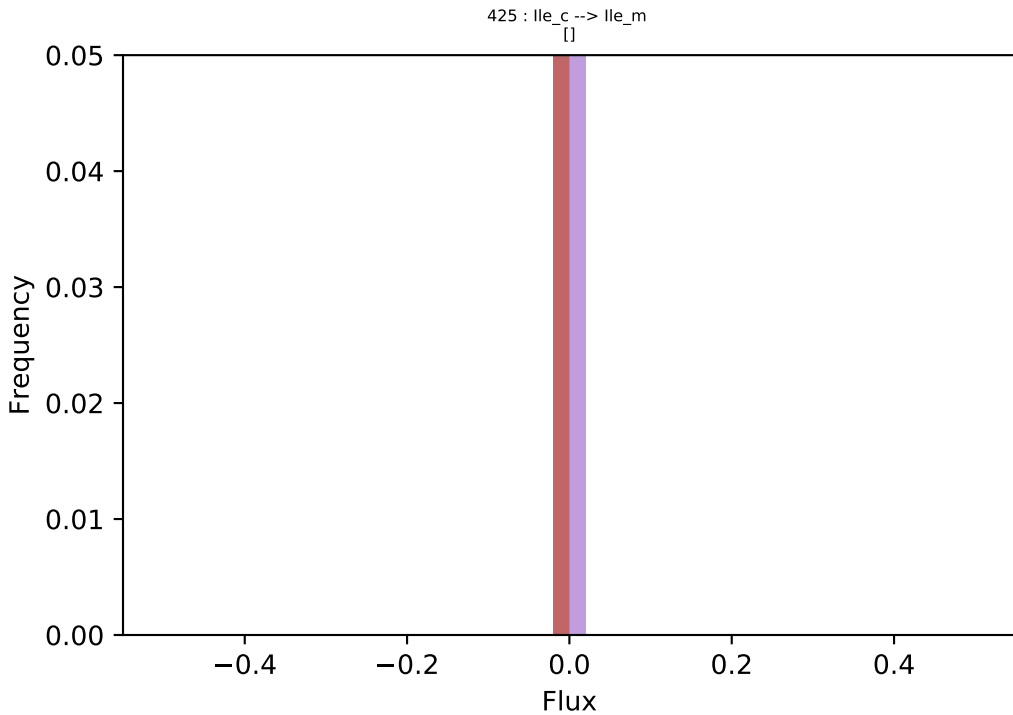
423 : His\_c --> His\_m  
[]



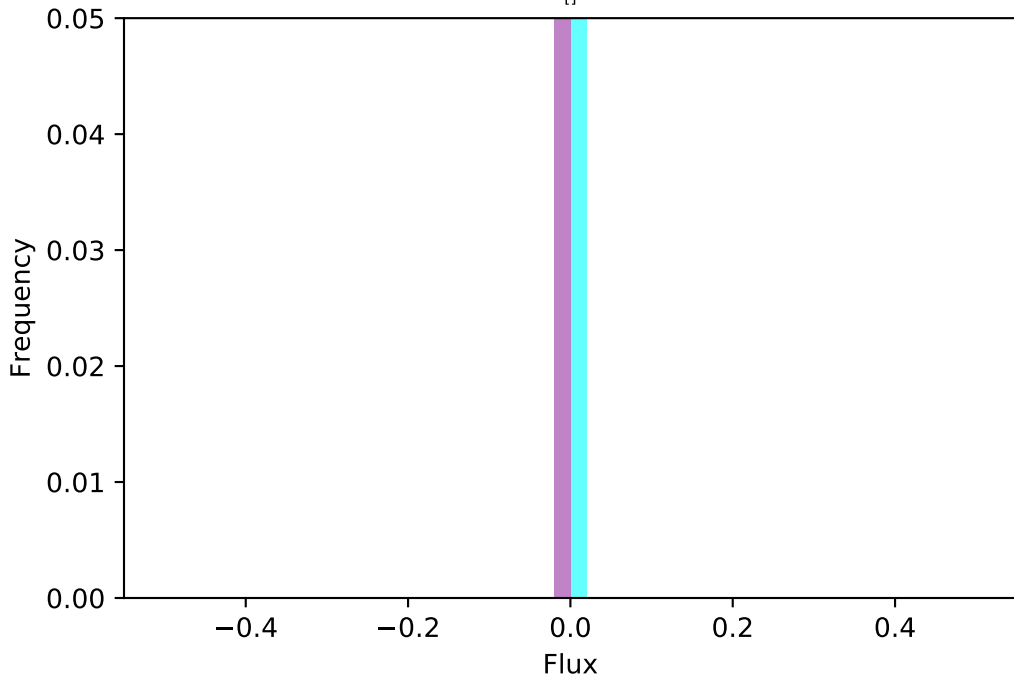


424 : lle\_h --> lle\_c  
[]

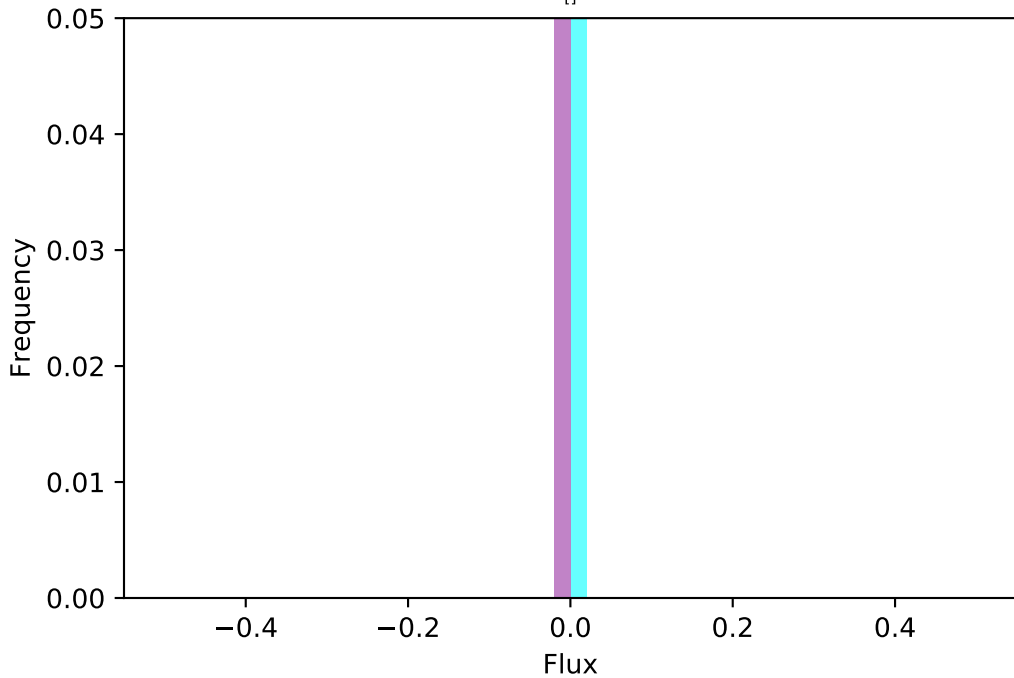




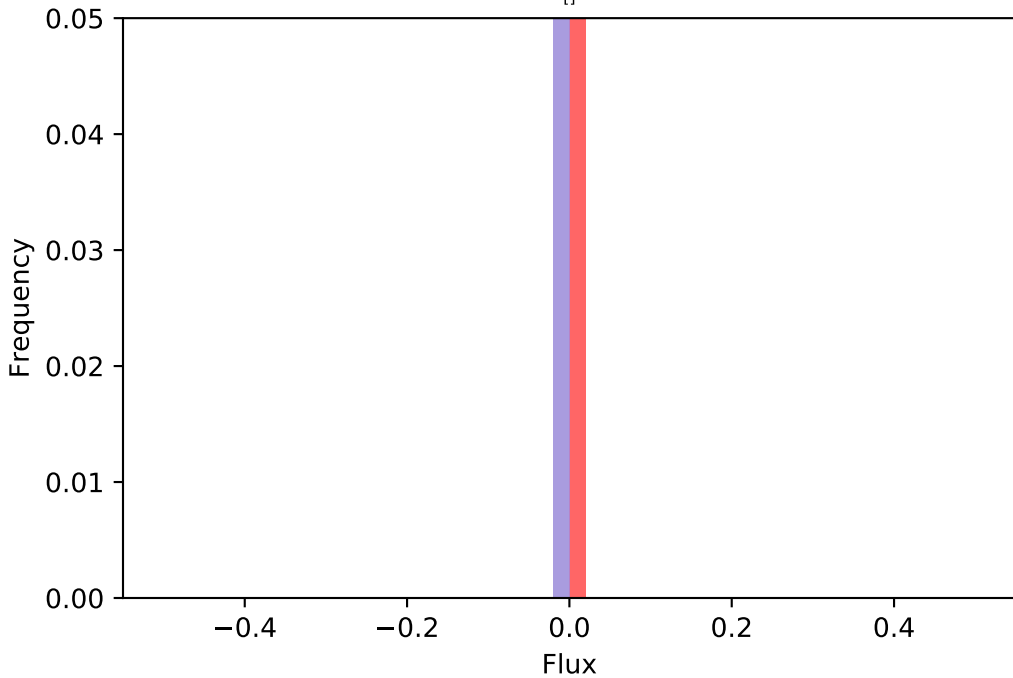
426 : Leu\_h --> Leu\_c  
[]



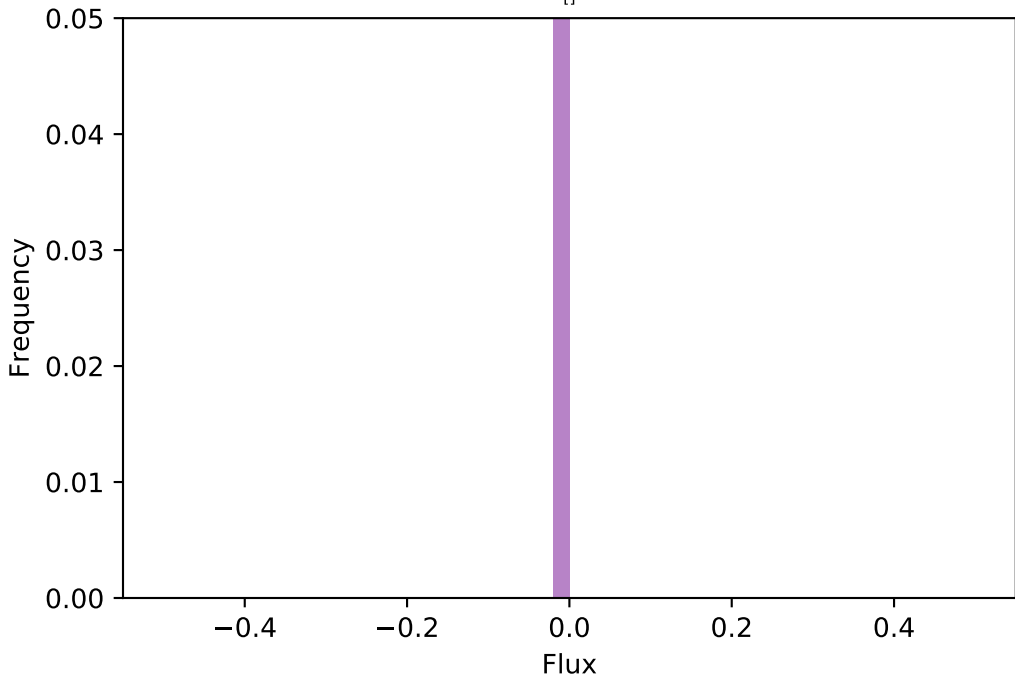
427 : Leu\_c --> Leu\_m  
[]



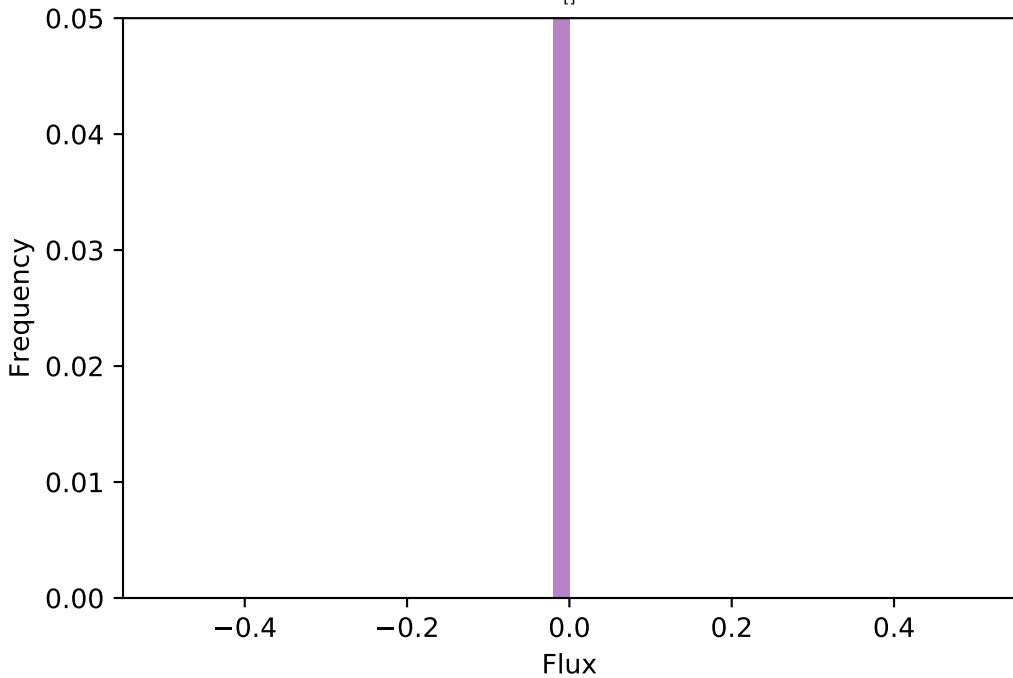
428 : Lys\_h --> Lys\_c  
[]



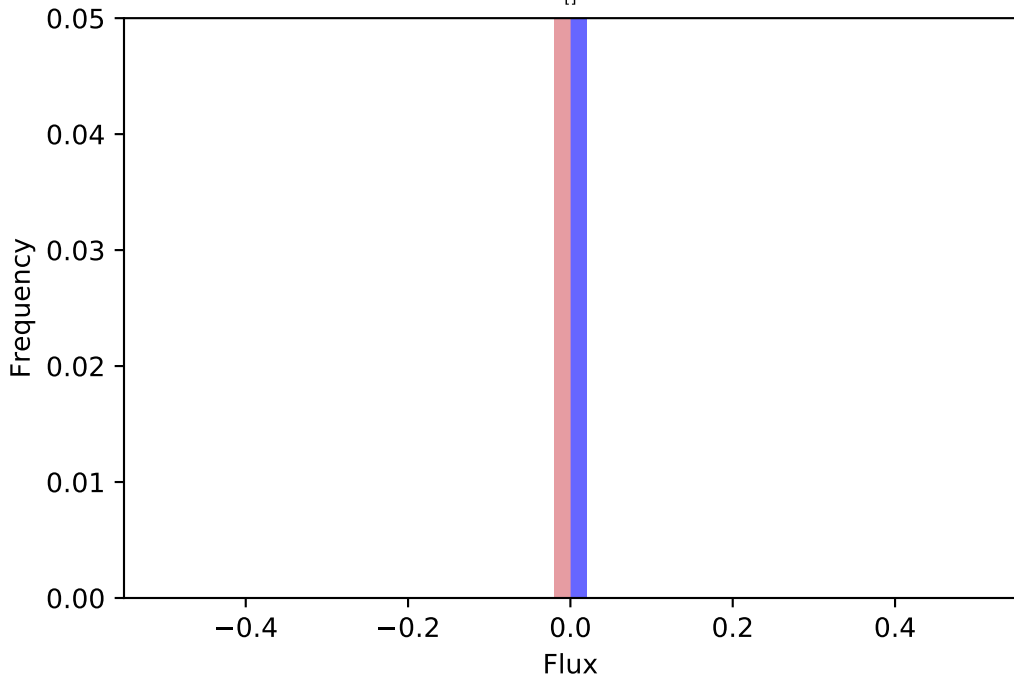
429 : Met\_c --> Met\_h  
[]



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

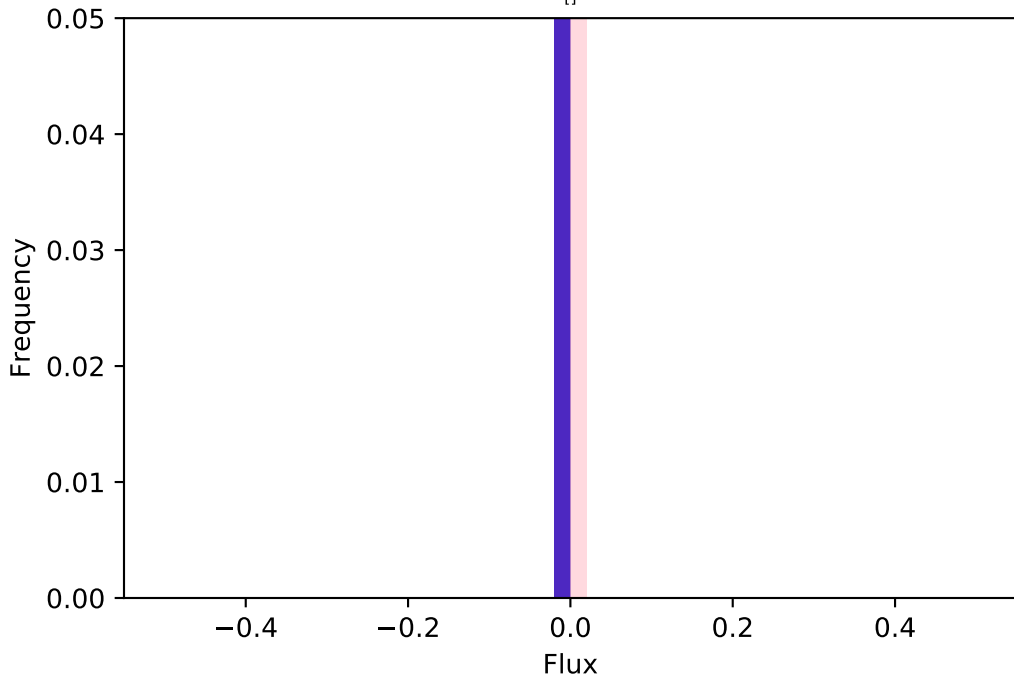


431 : Phe\_h --> Phe\_c  
[]

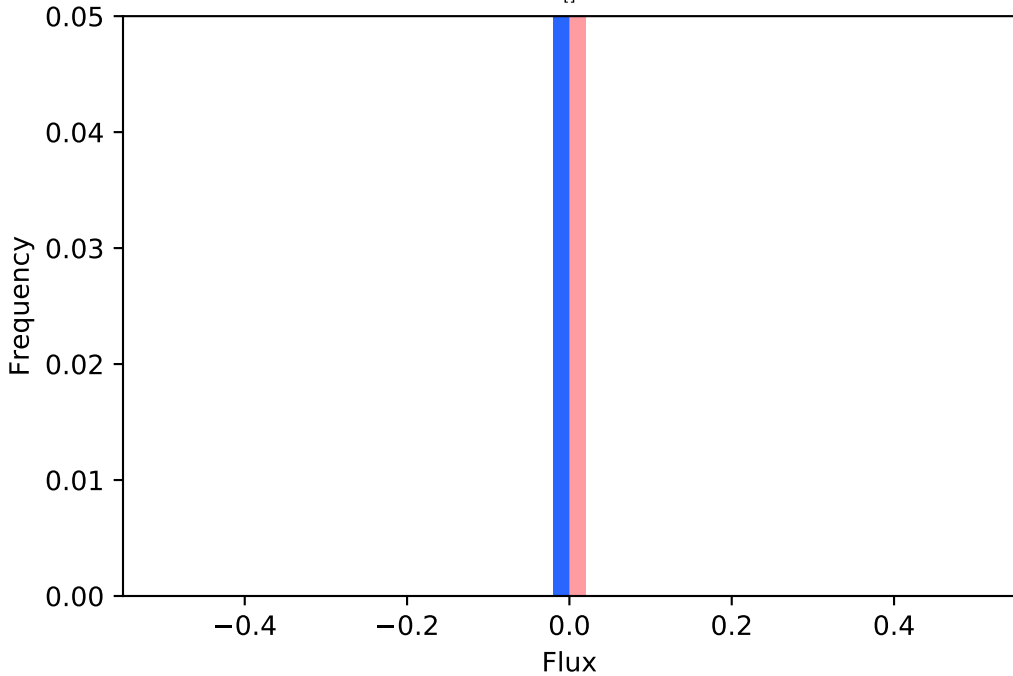




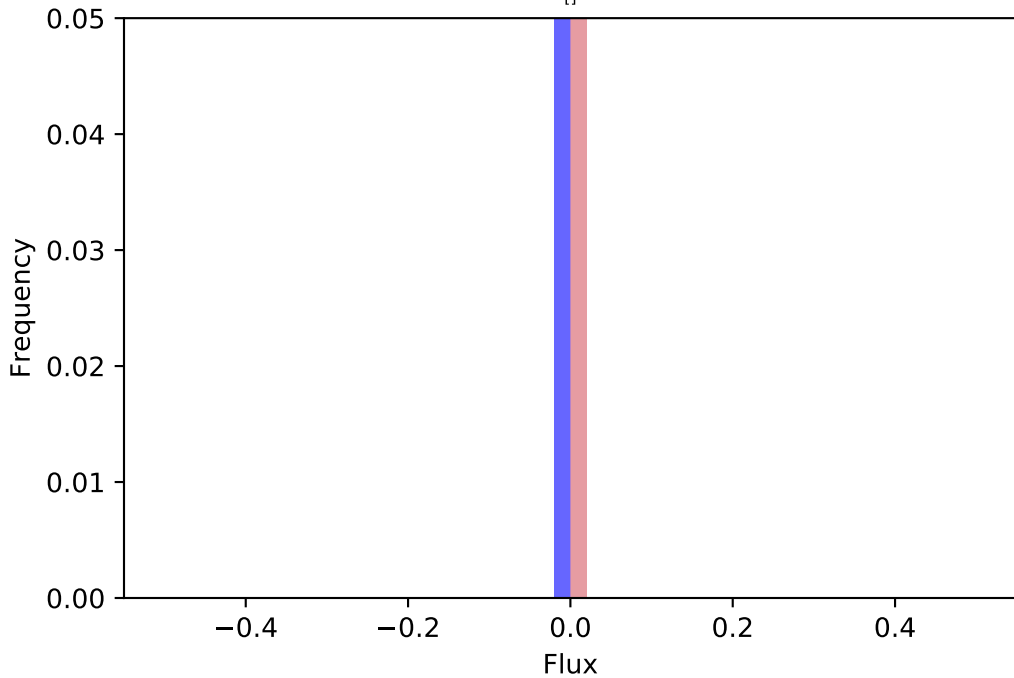
432 : Phe\_c --> Phe\_m  
[]



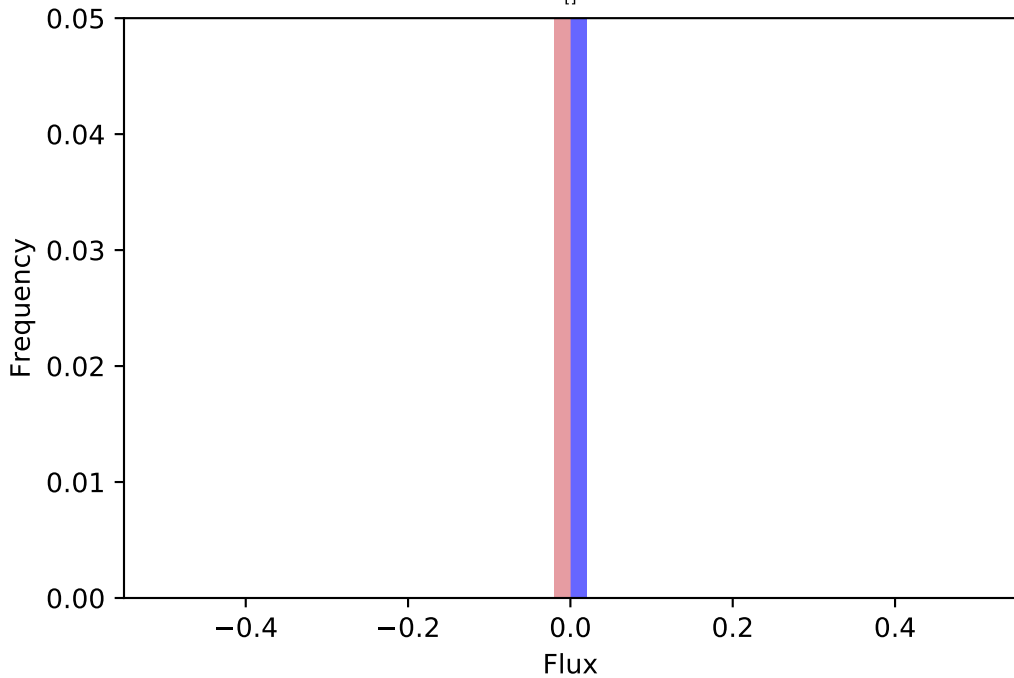
433 : Pro\_c --> Pro\_h  
[]



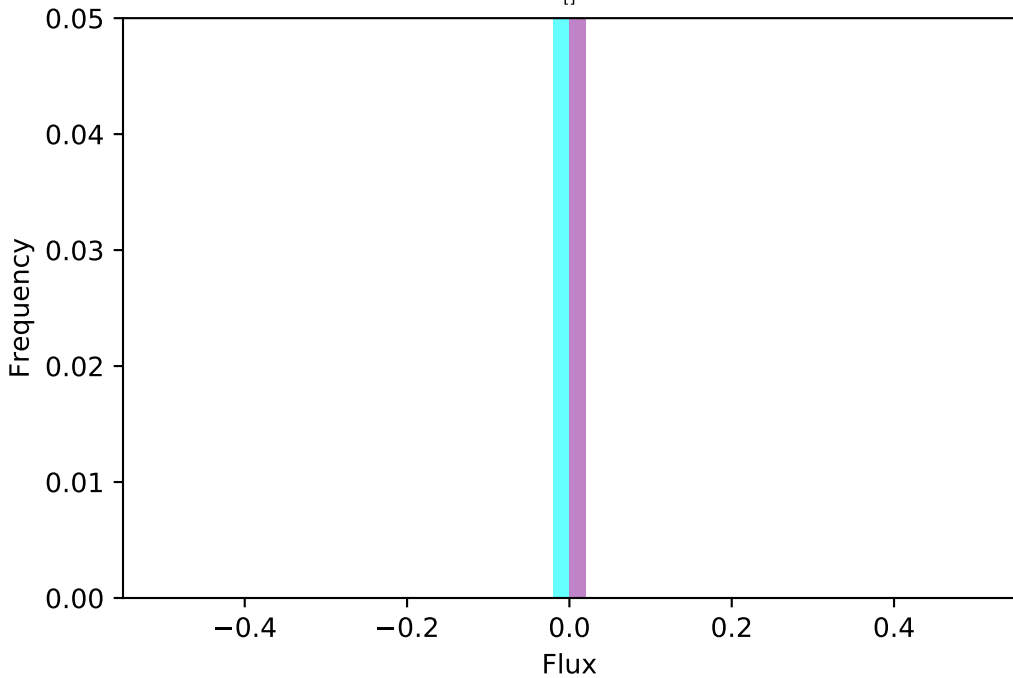
434 : Ser\_h --> Ser\_c  
[]



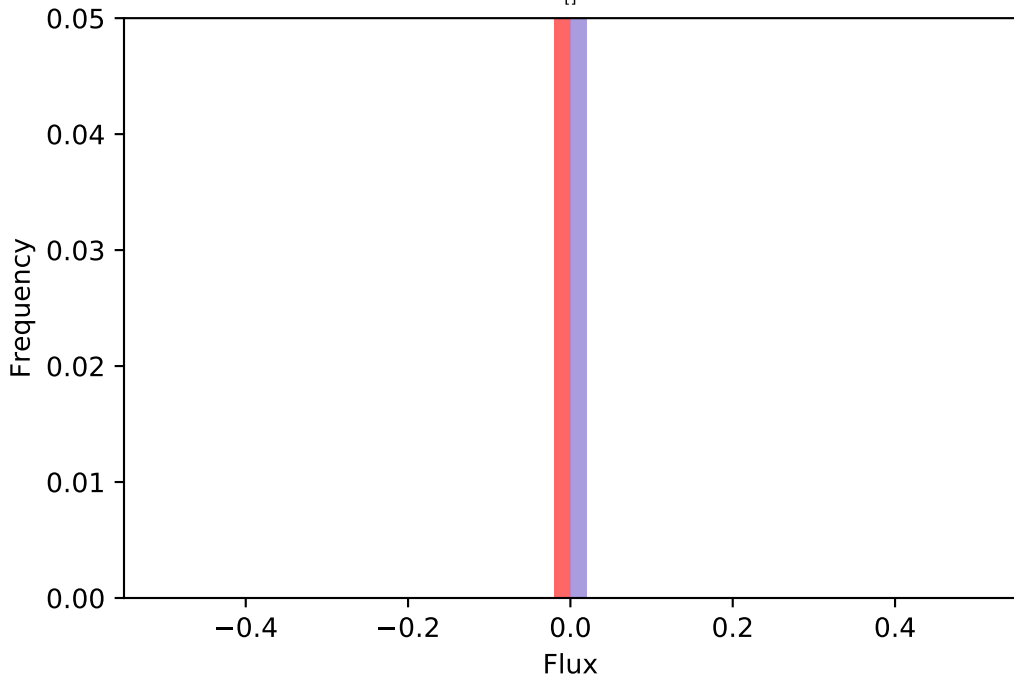
435 : Ser\_c --> Ser\_m  
[]



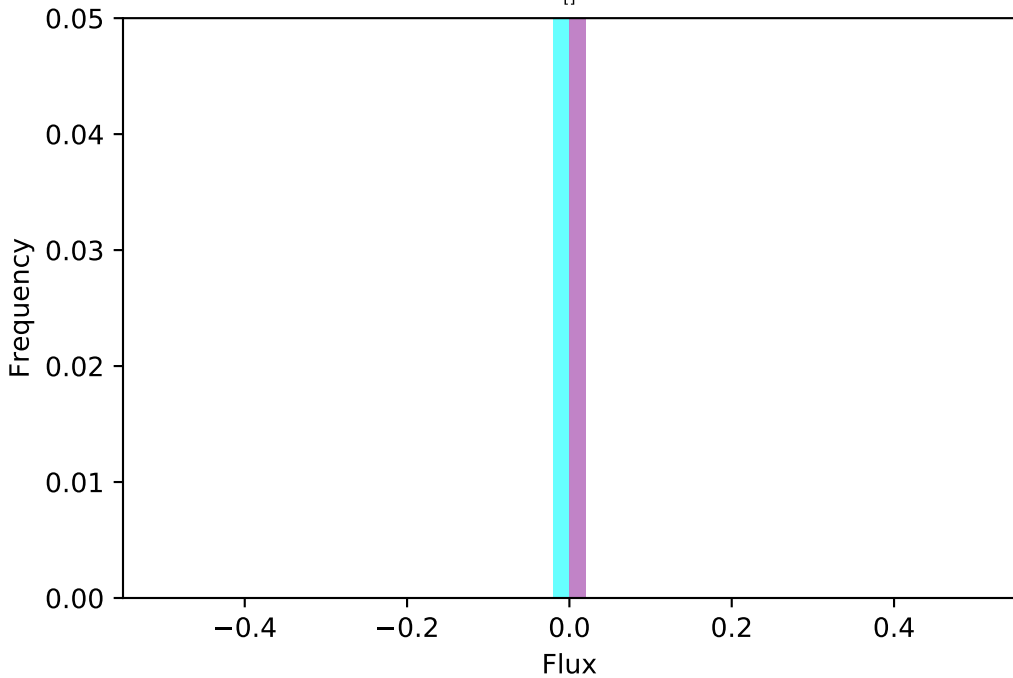
436 : Thr\_h --> Thr\_c  
[]



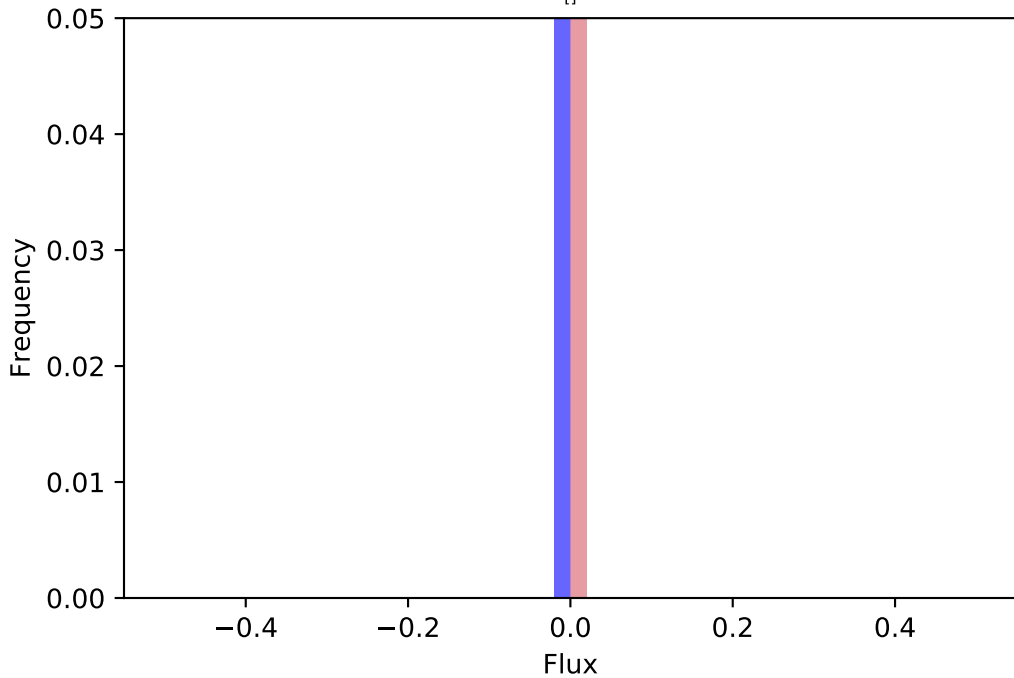
437 : Thr\_c --> Thr\_m  
[]



438 : Trp\_h --> Trp\_c  
[]

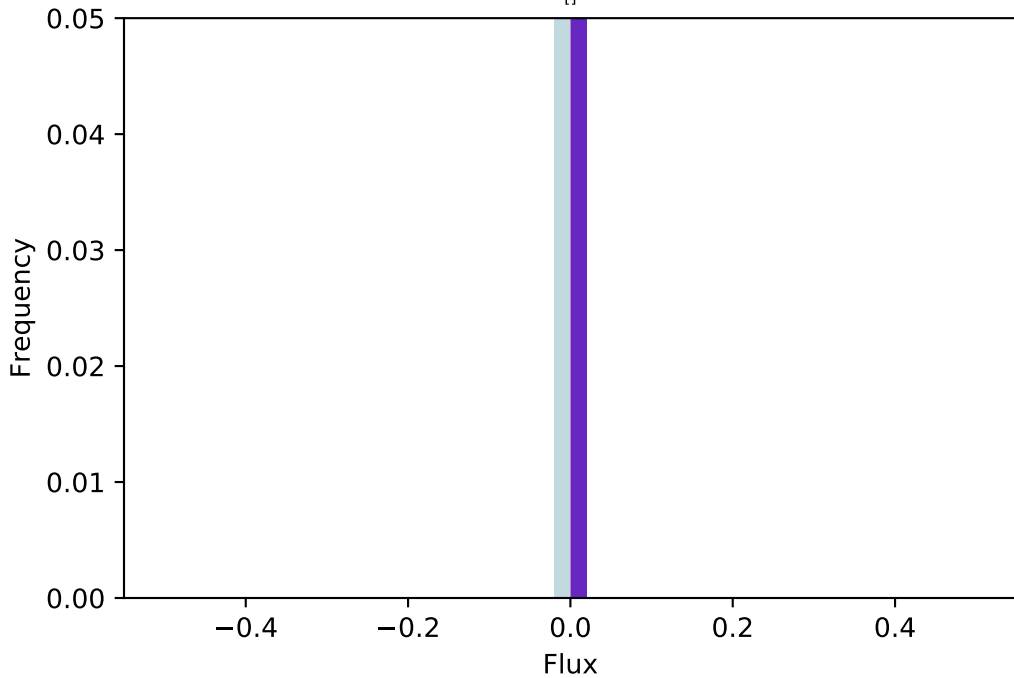


439 : Trp\_c --> Trp\_m  
[]

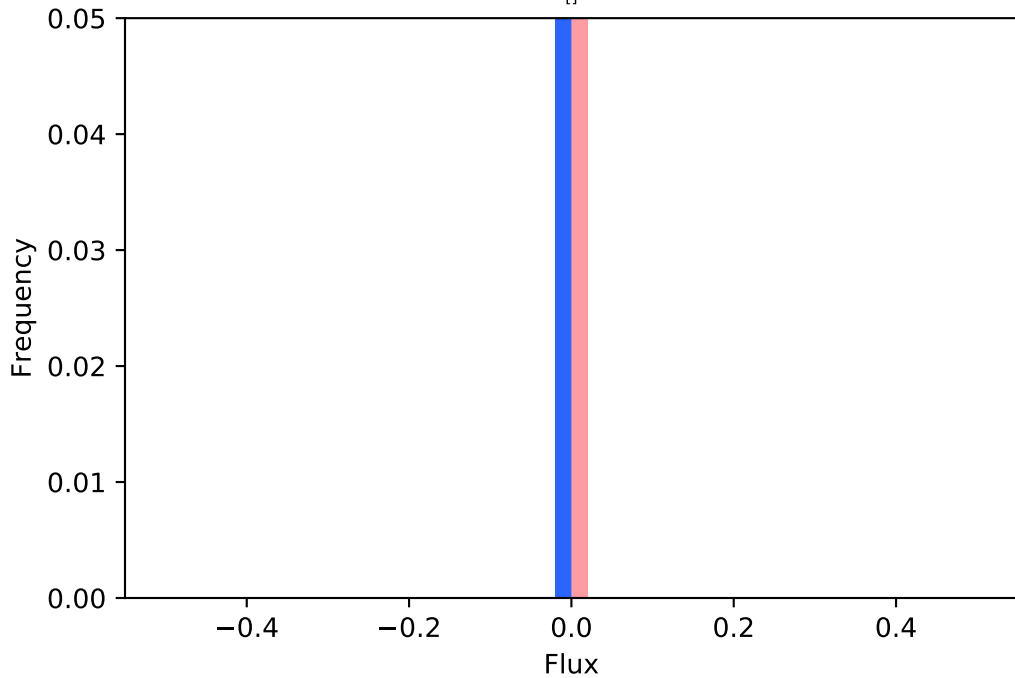




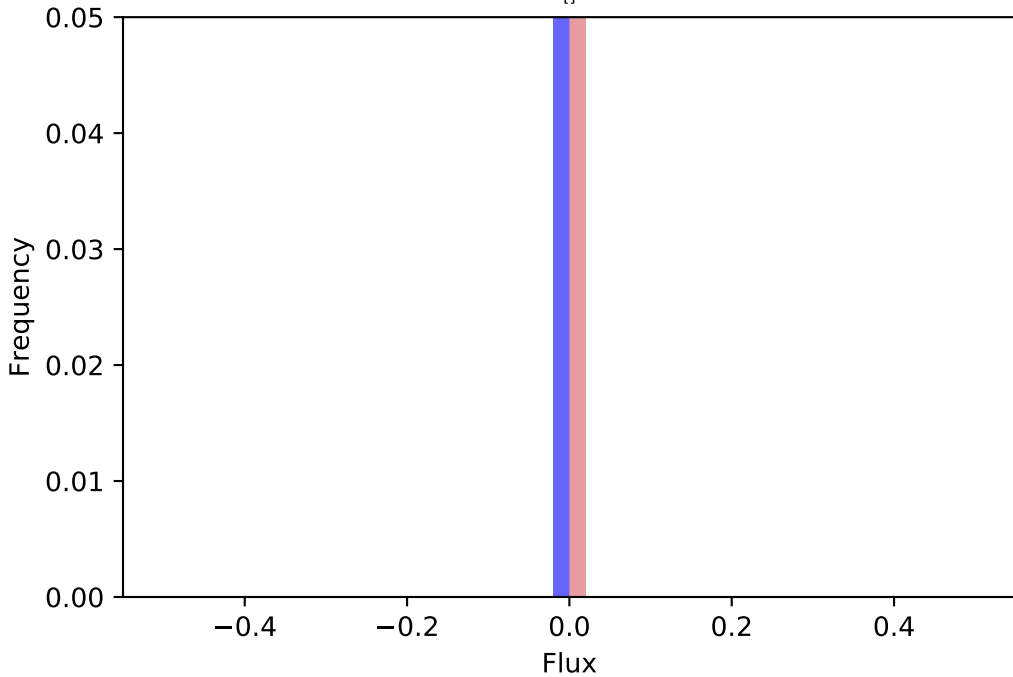
440 : Tyr\_h --> Tyr\_c  
[]



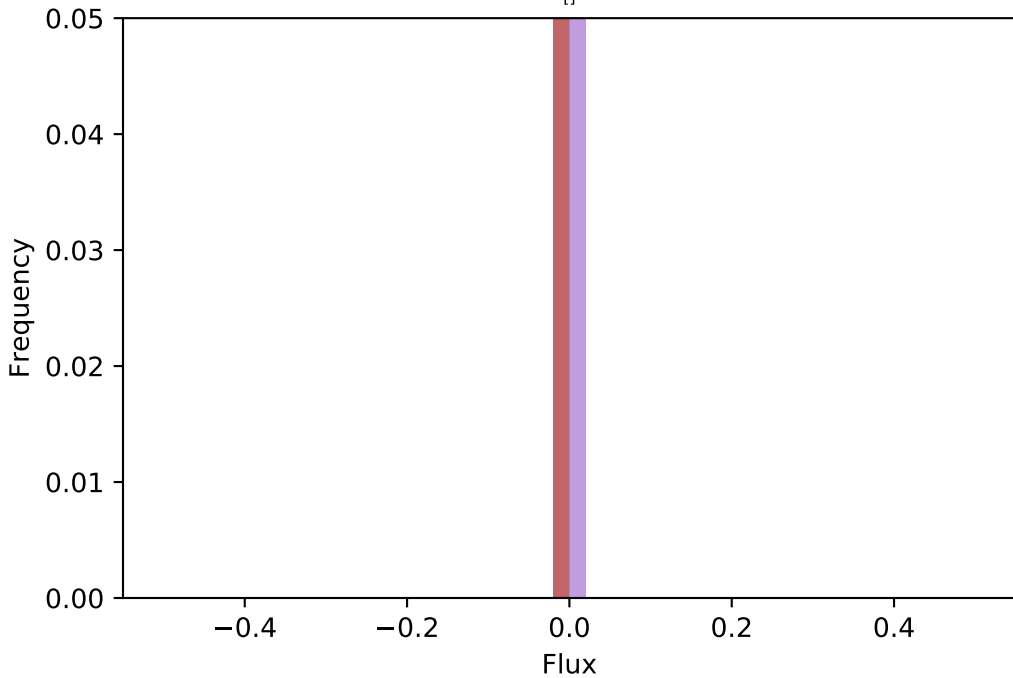
441 : Tyr\_c --> Tyr\_m  
[]



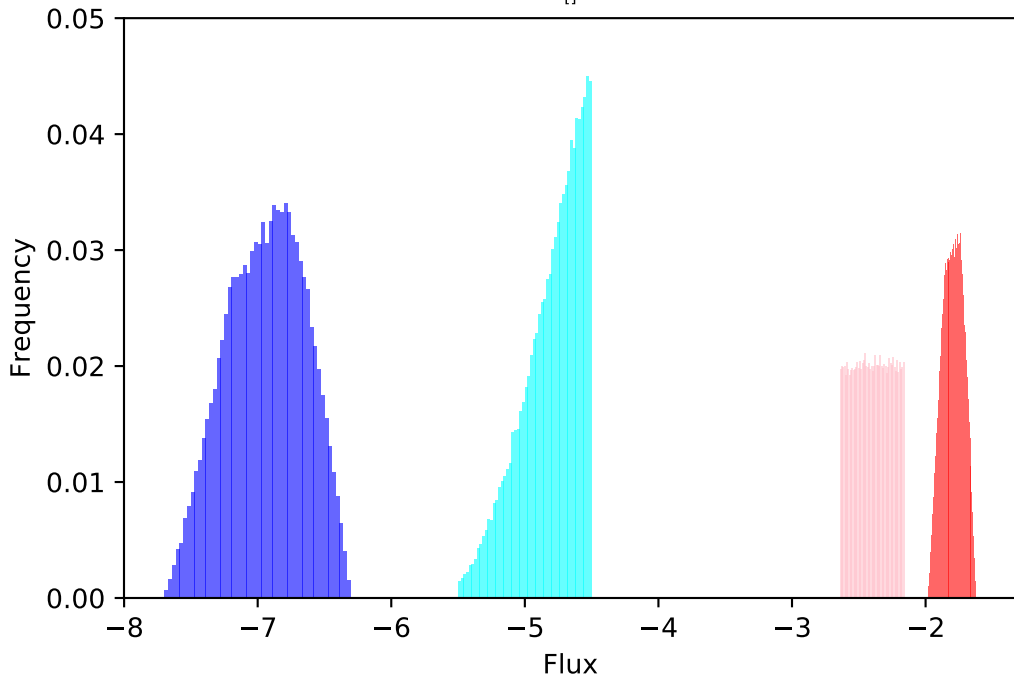
442 : Val\_h --> Val\_c  
[]



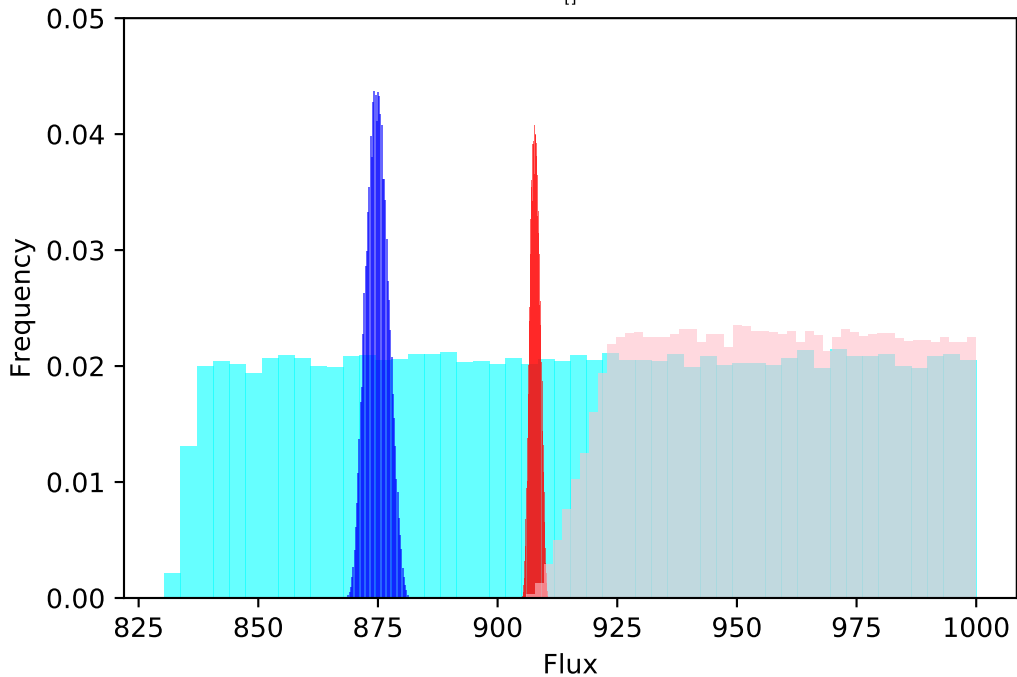
443 : Val\_c --> Val\_m  
[]



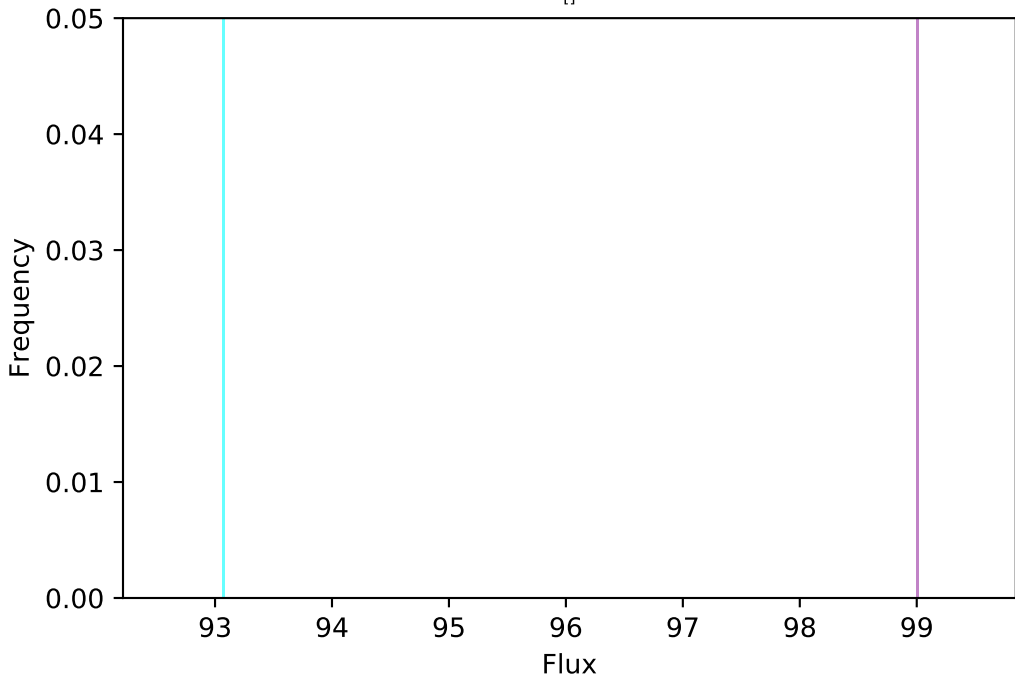
444 :  $\leq$  H<sub>c</sub>  
[]



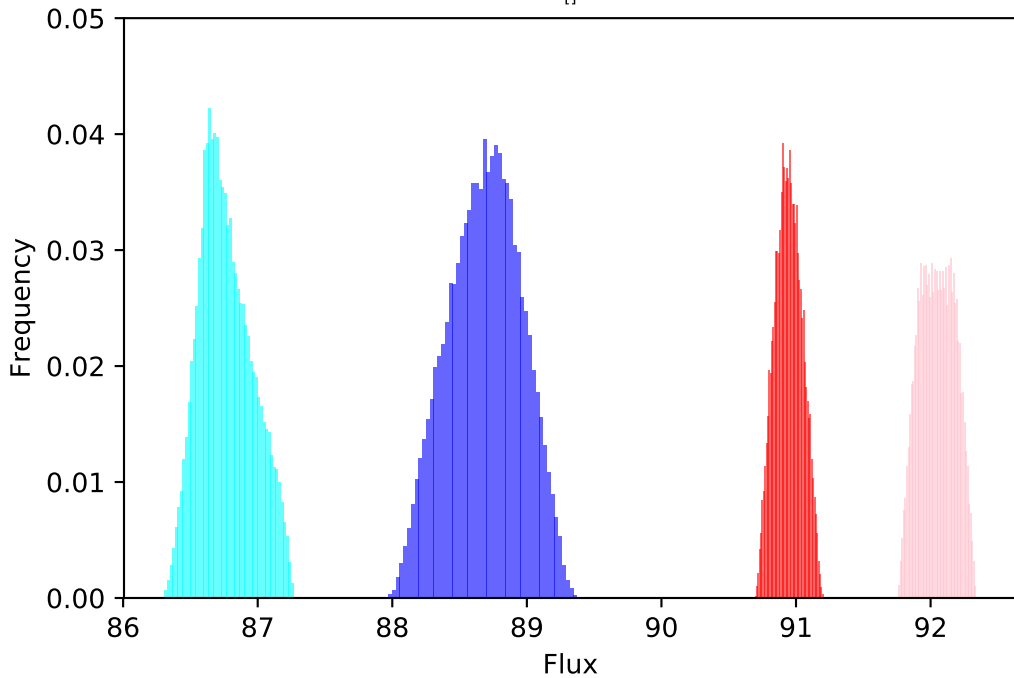
445 : --> hnu\_h  
[]



446 : --> CO2\_c  
[]

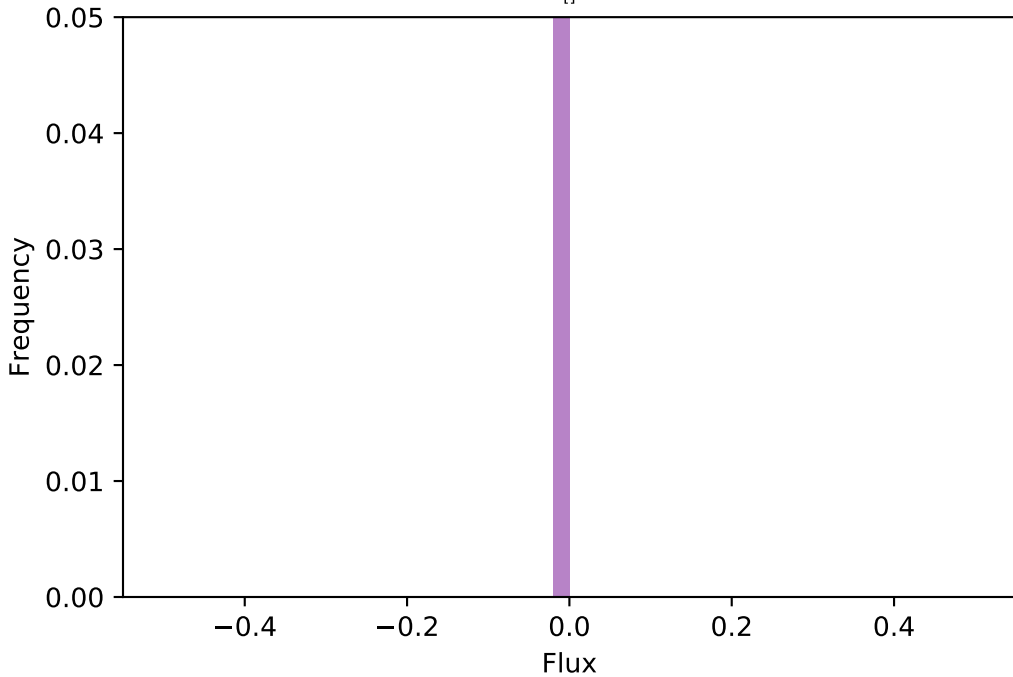


447 : --> H2O\_c  
[]

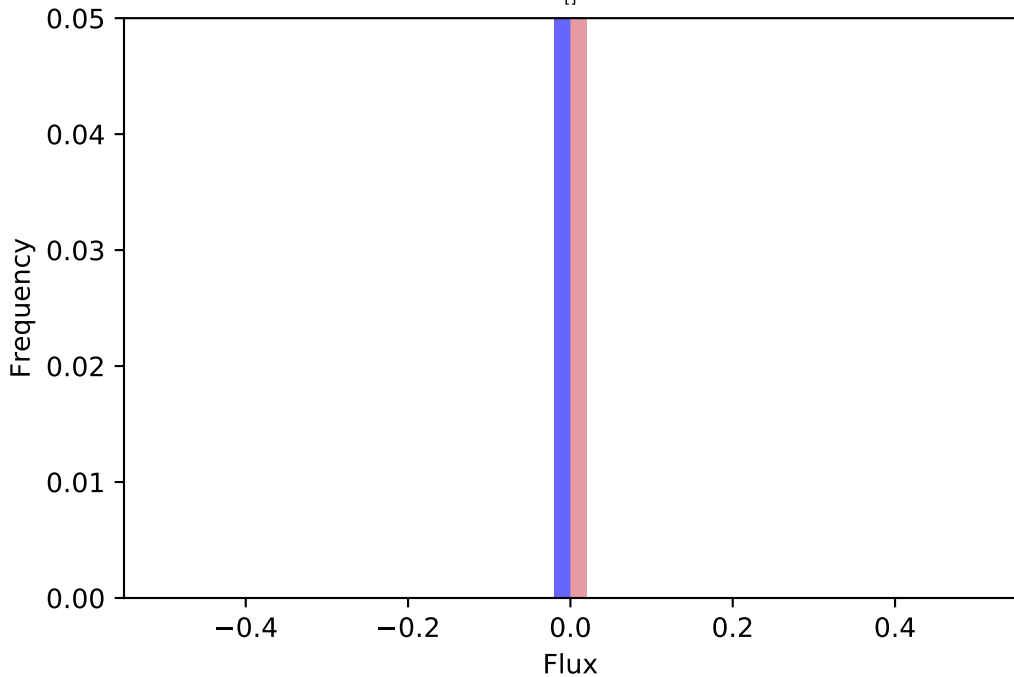


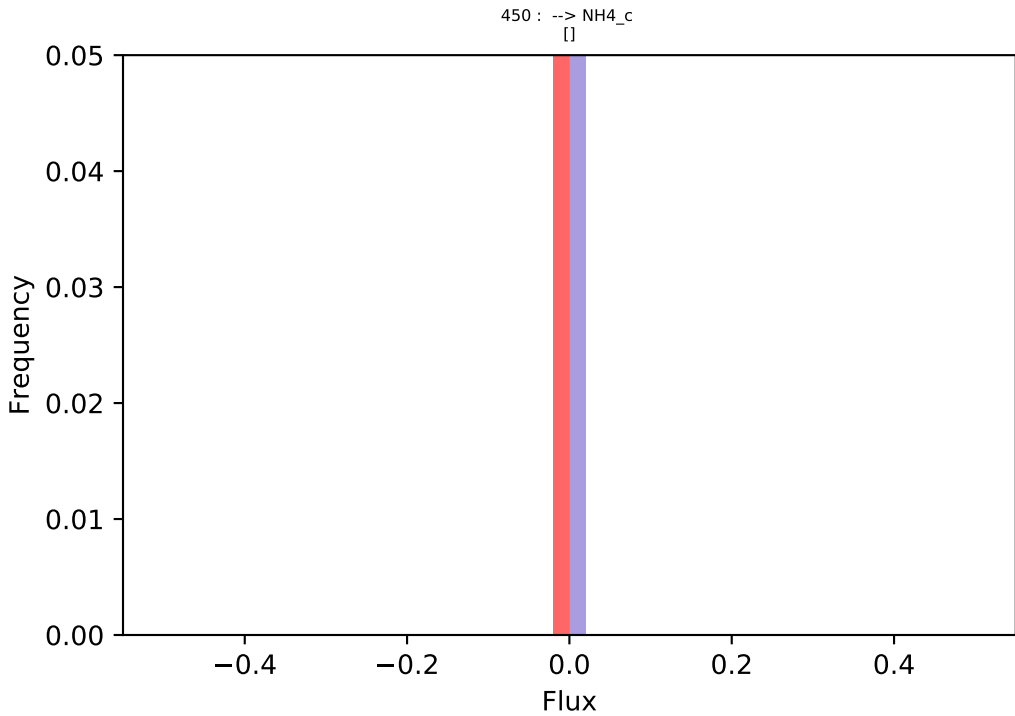


448 : 3.0 ATP\_c + 3.0 H2O\_c --> 3.0 ADP\_c + 2.0 H\_h + 3.0 Pi\_c + Pi\_h  
[]

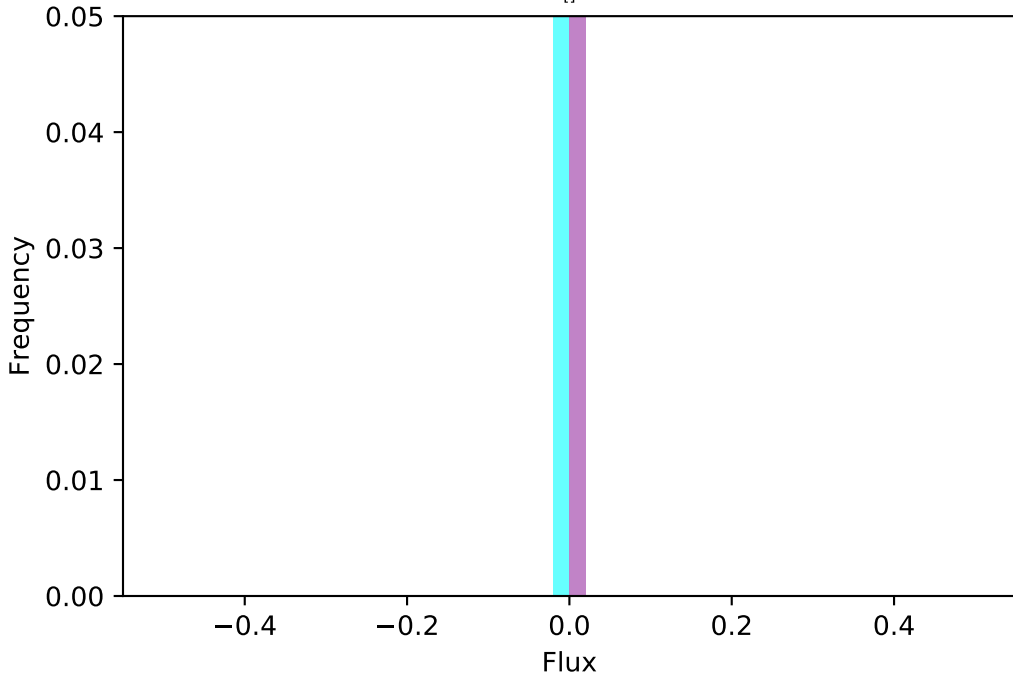


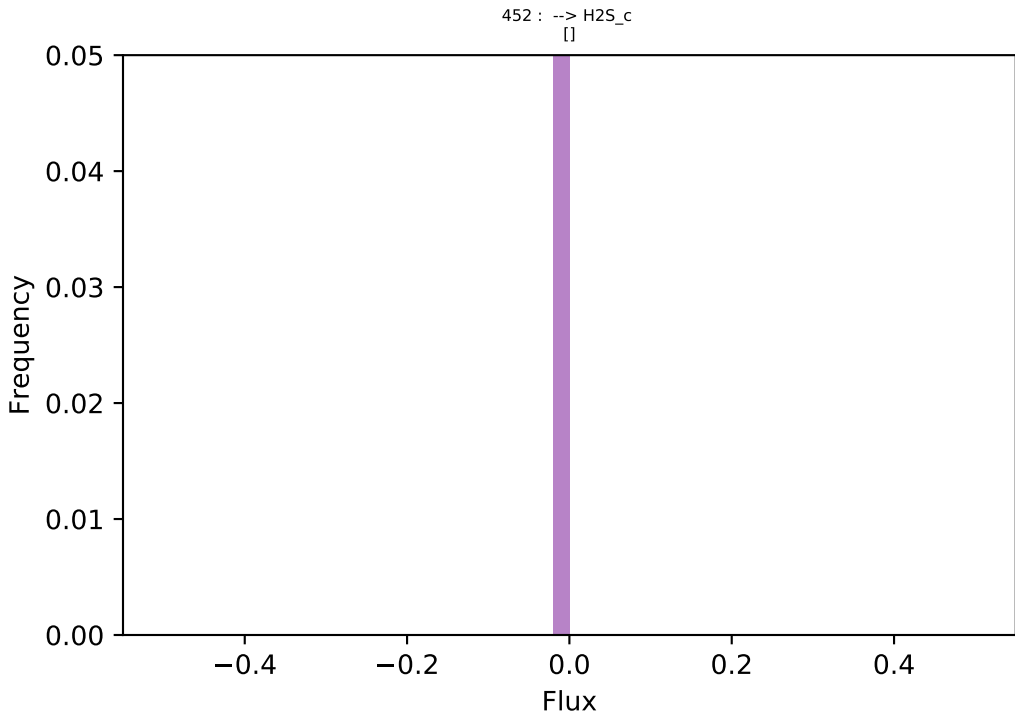
449 : 2.0 ATP\_c + 2.0 H2O\_c --> 2.0 ADP\_c + 2.0 H\_c + NO3\_c + 2.0 Pi\_c  
[ ]



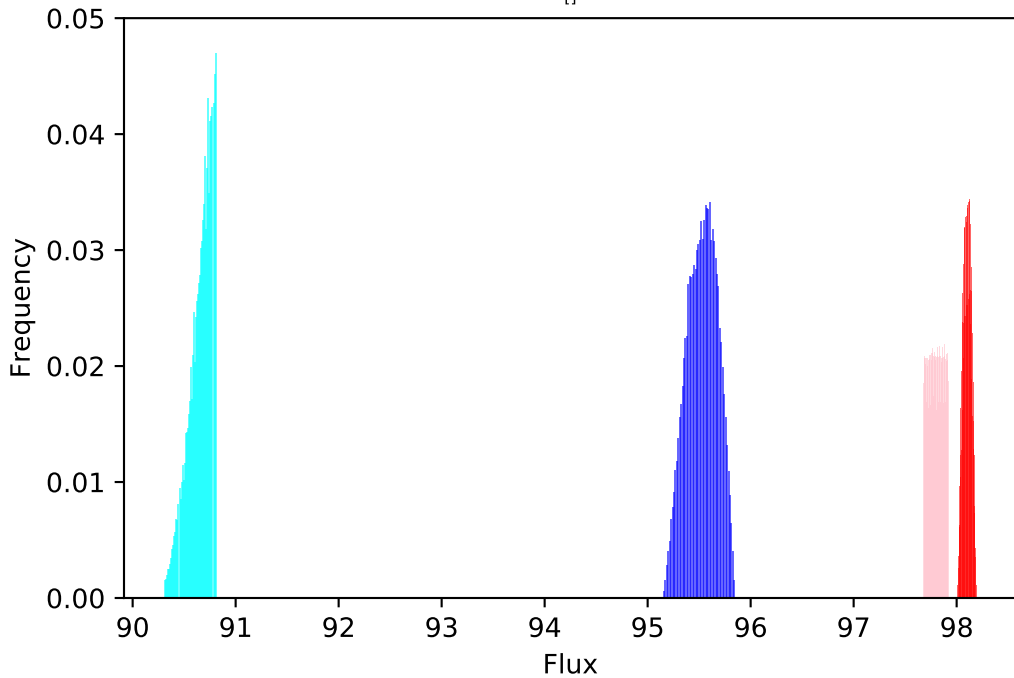


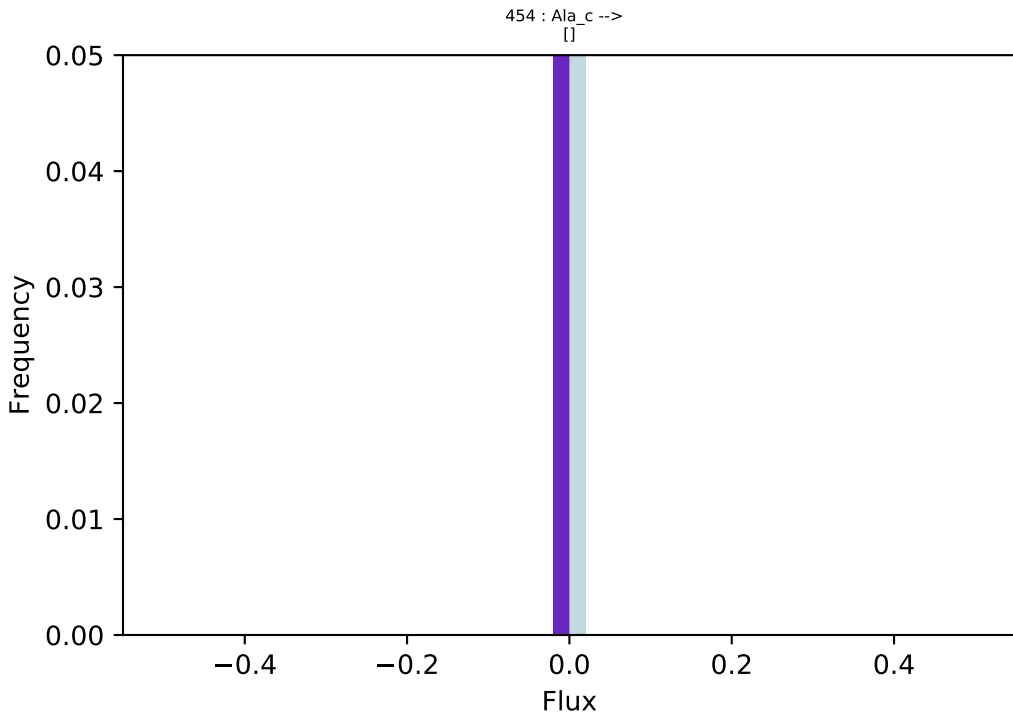
451 : 3.0 ATP\_c + 3.0 H2O\_c --> 3.0 ADP\_c + 3.0 H\_c + 3.0 Pi\_c + SO4\_c  
[ ]

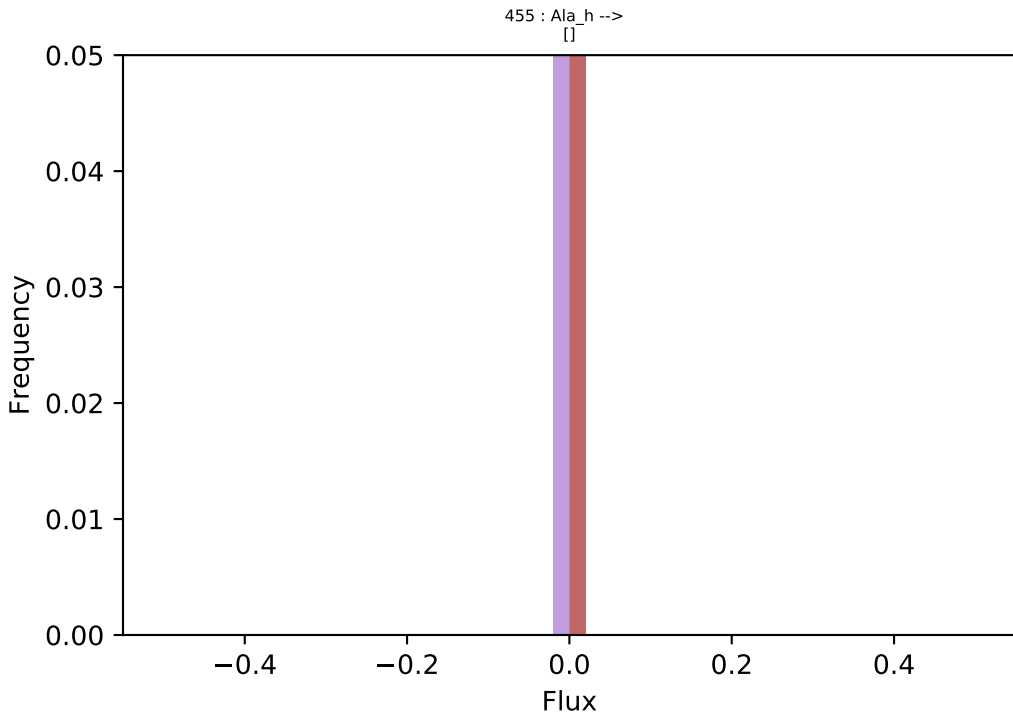




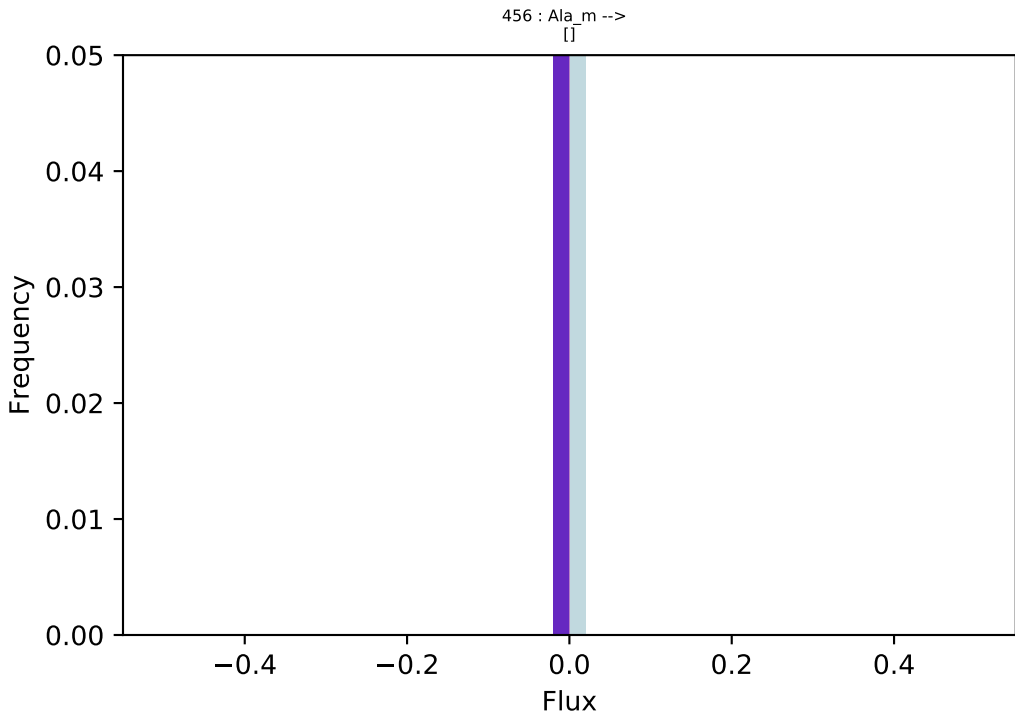
453 : O2\_c -->  
[ ]

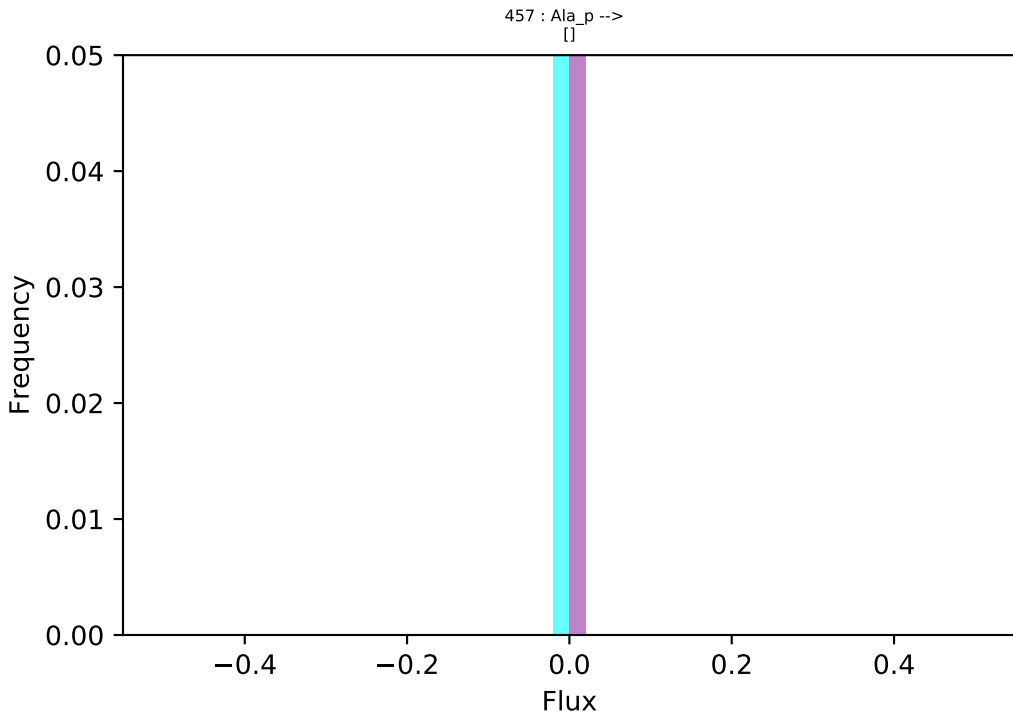


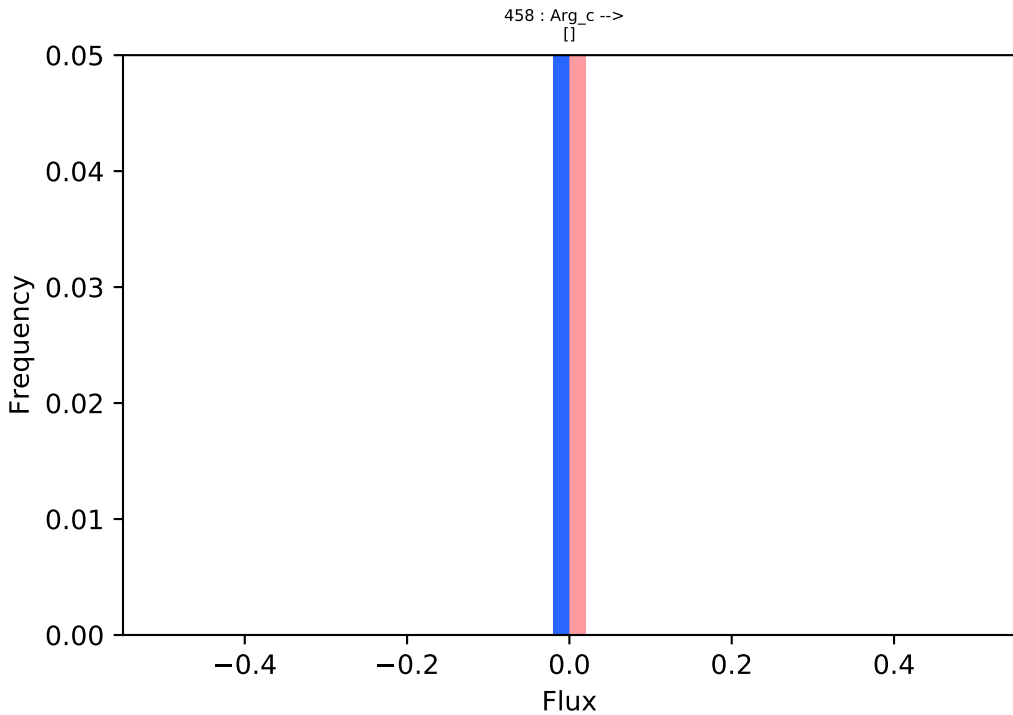


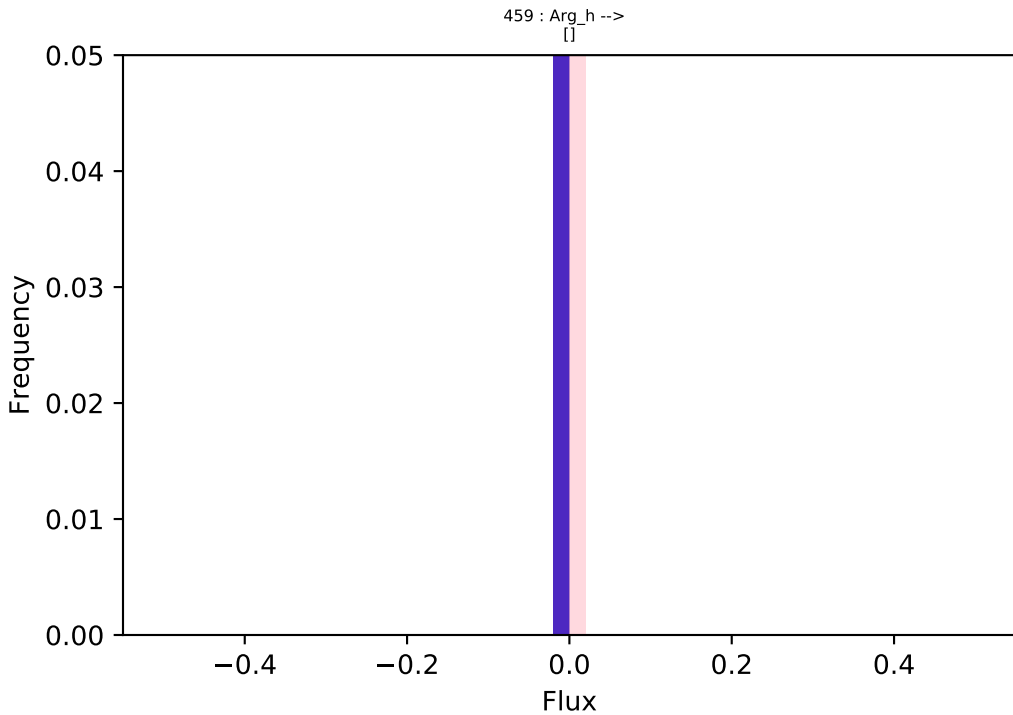


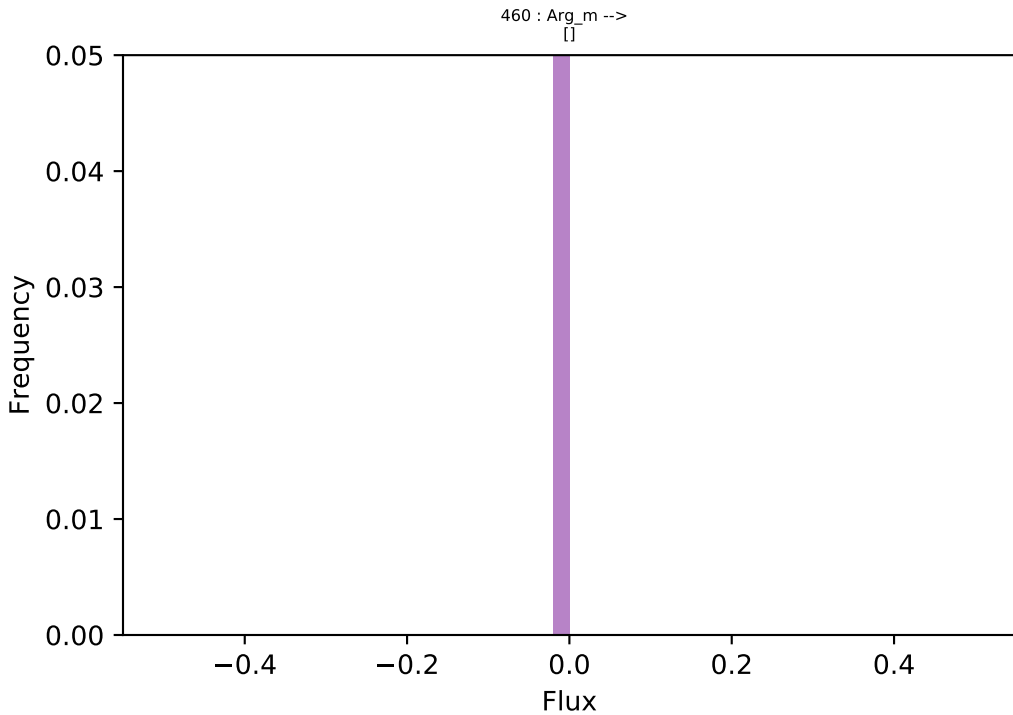


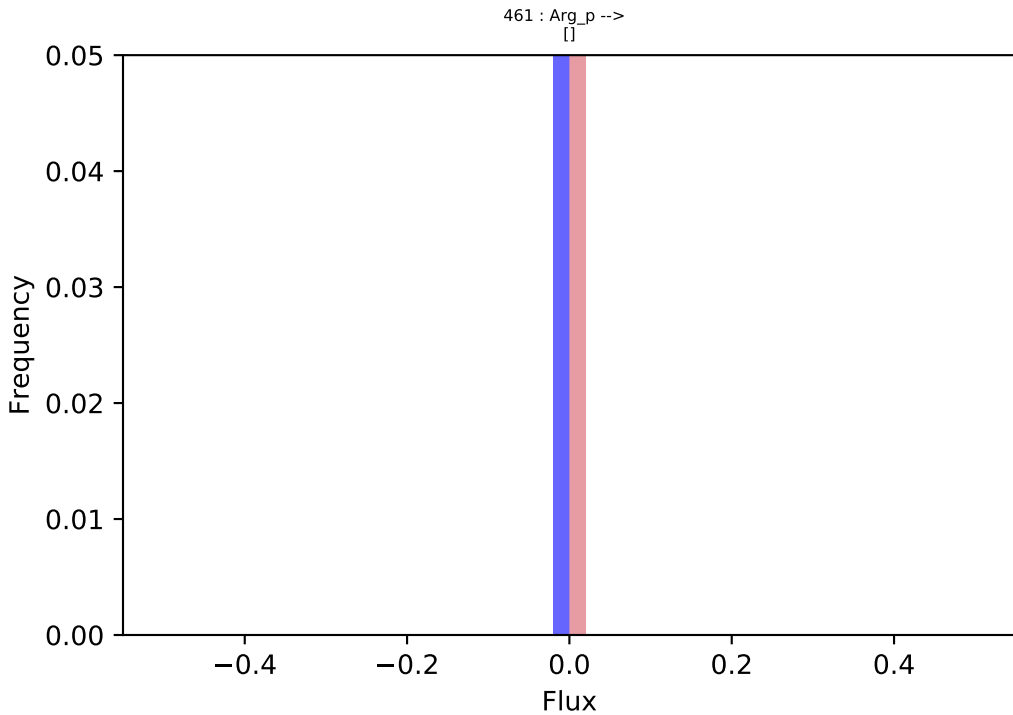


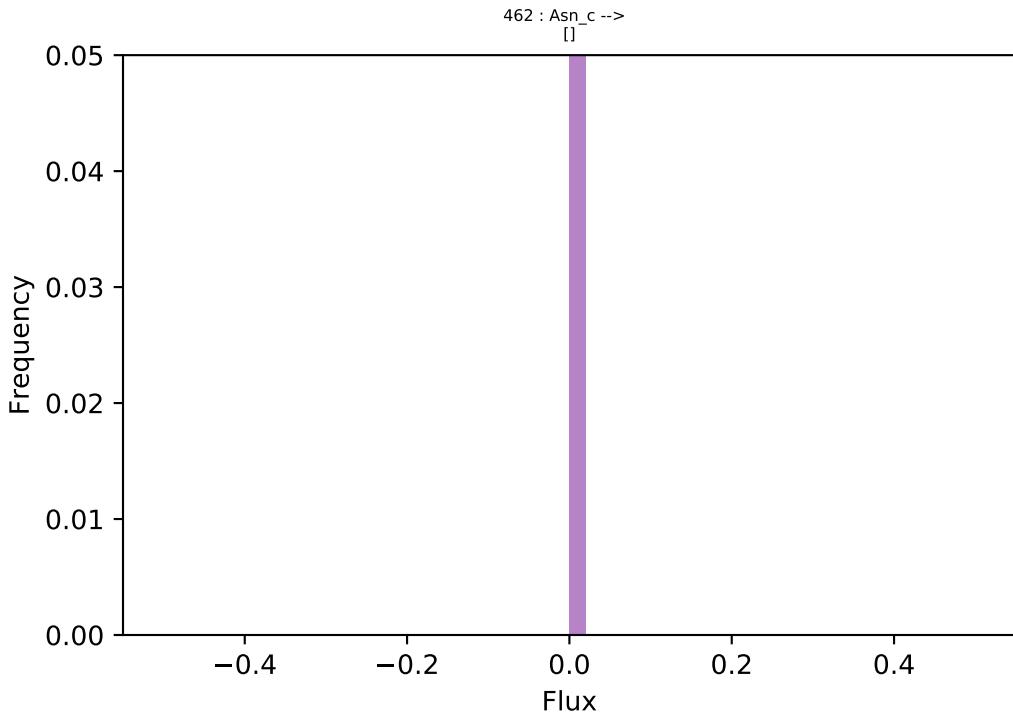


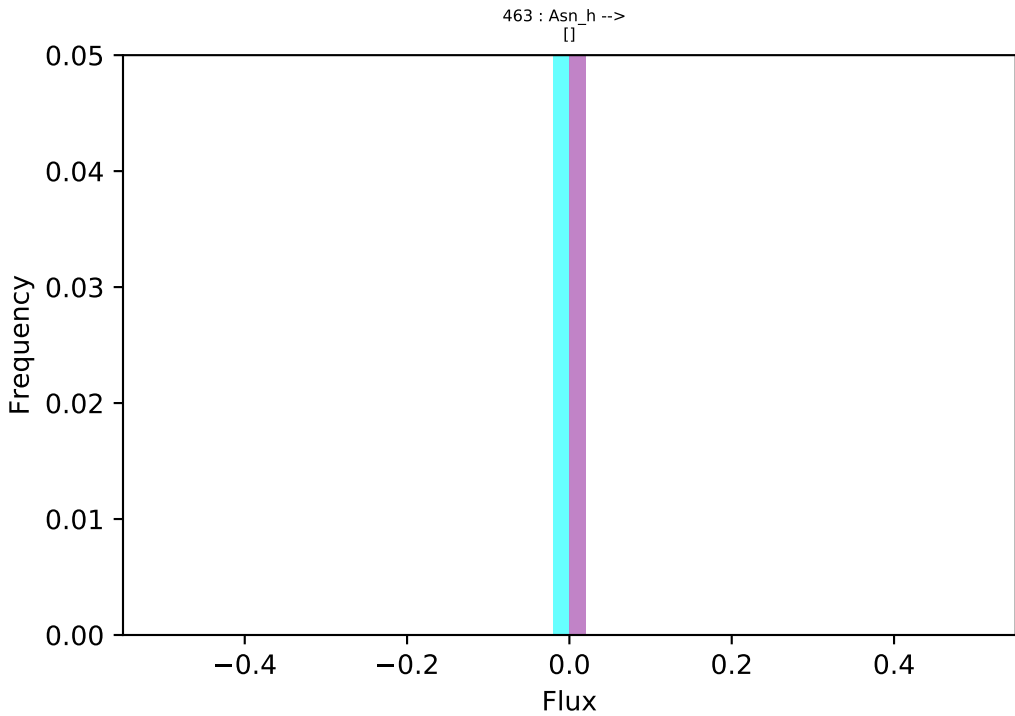




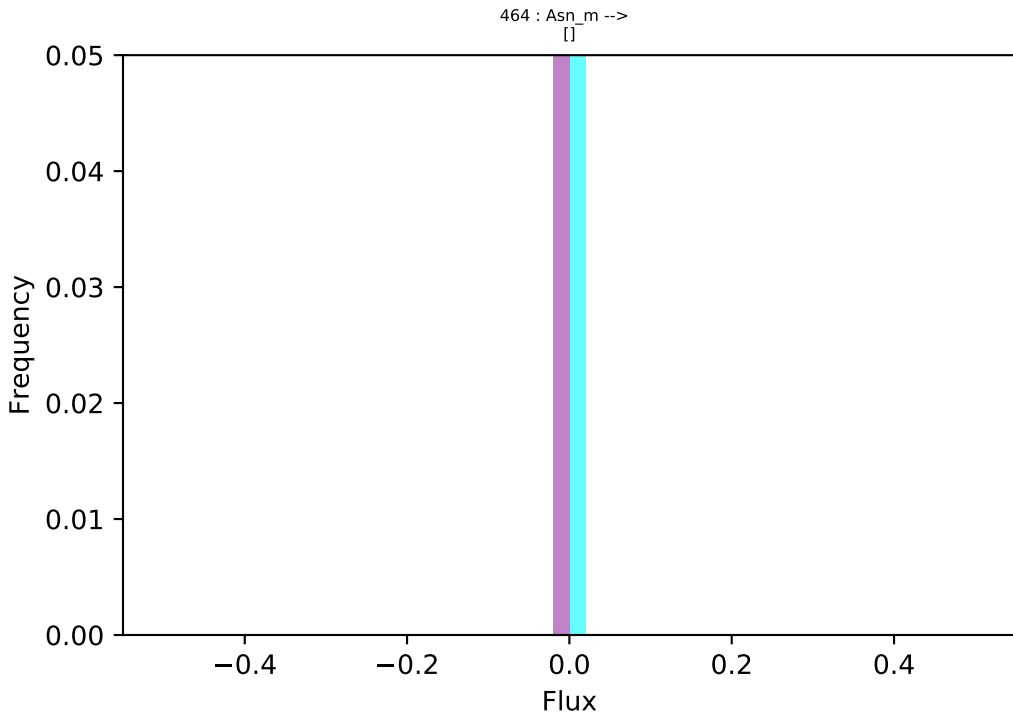


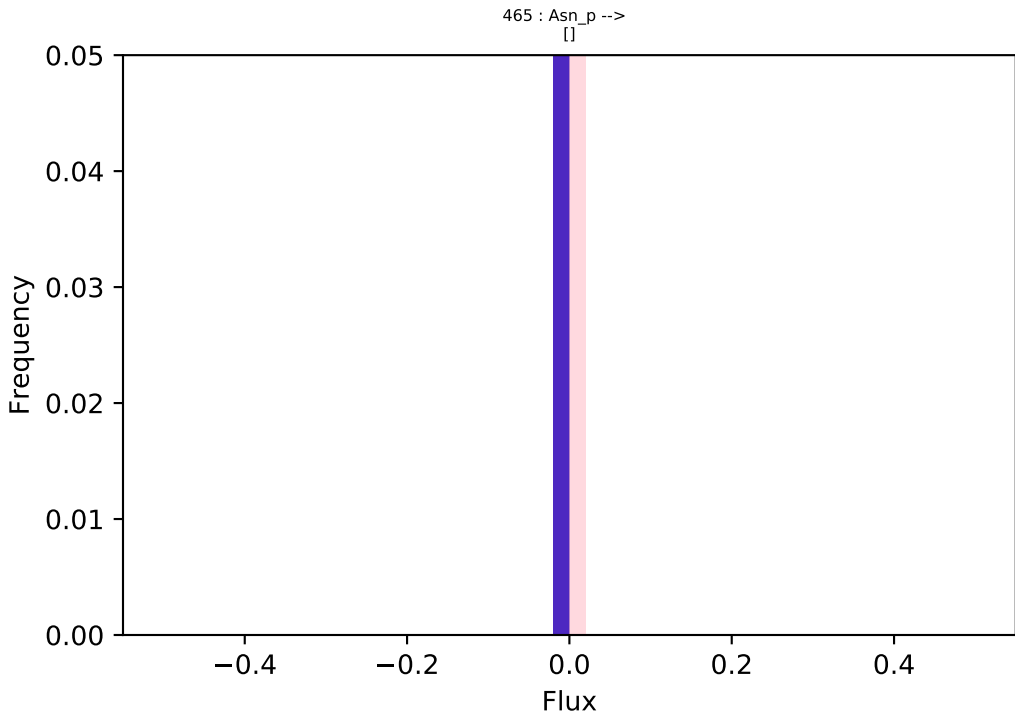


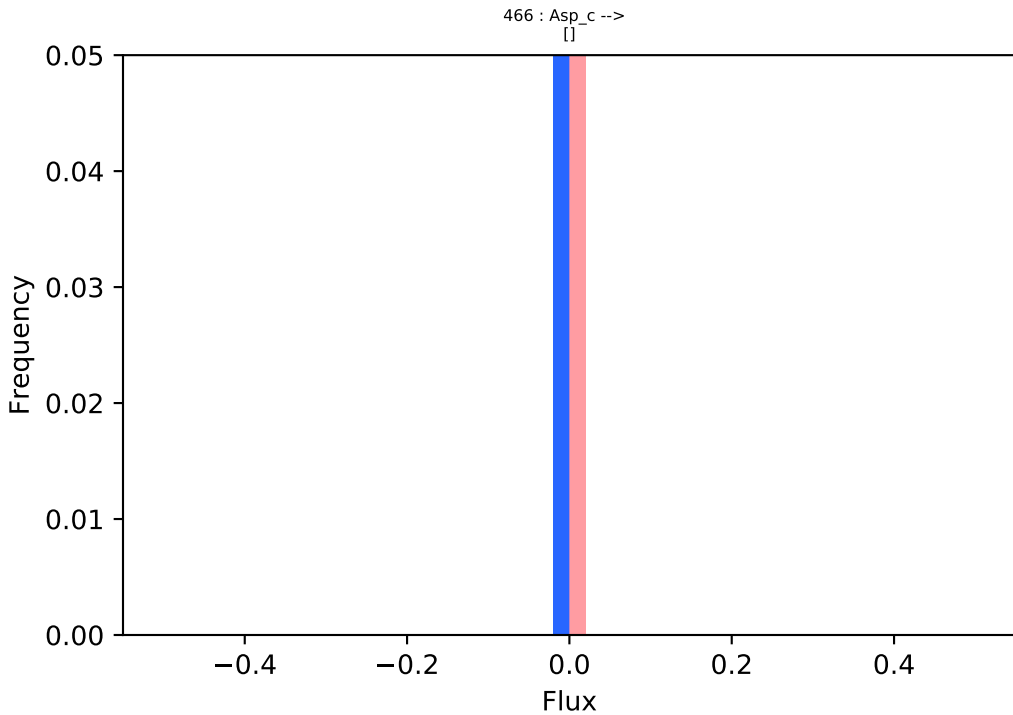




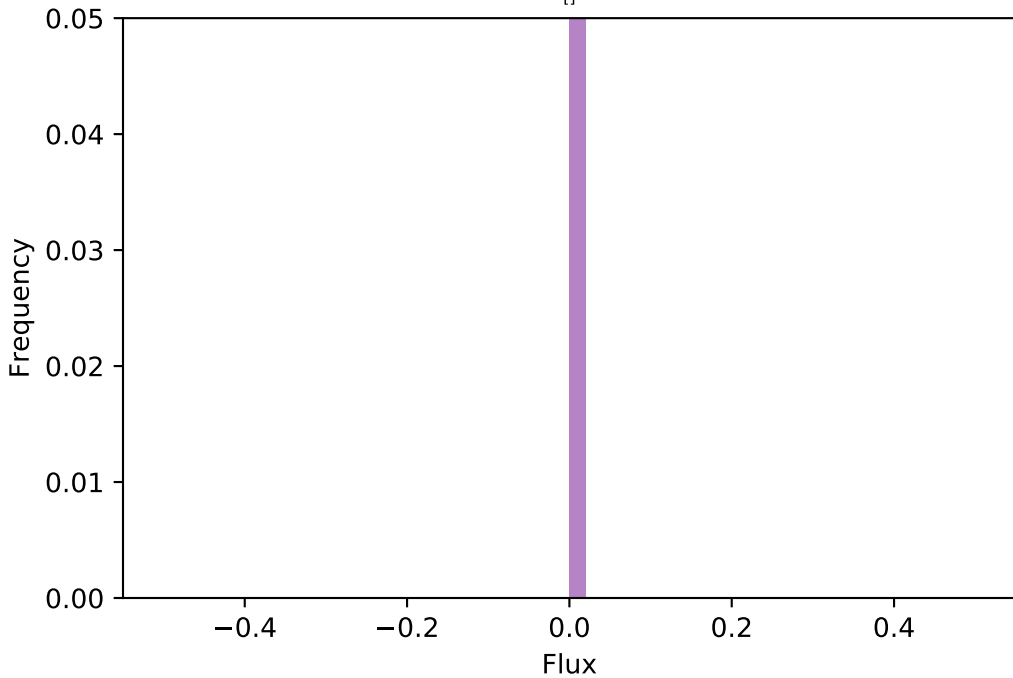


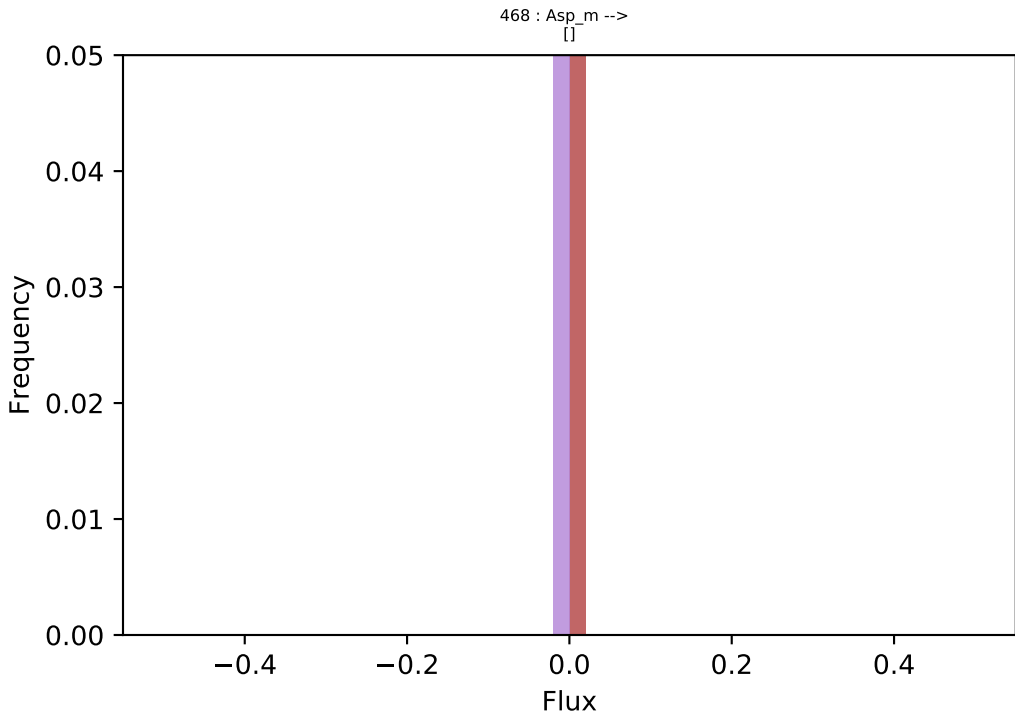


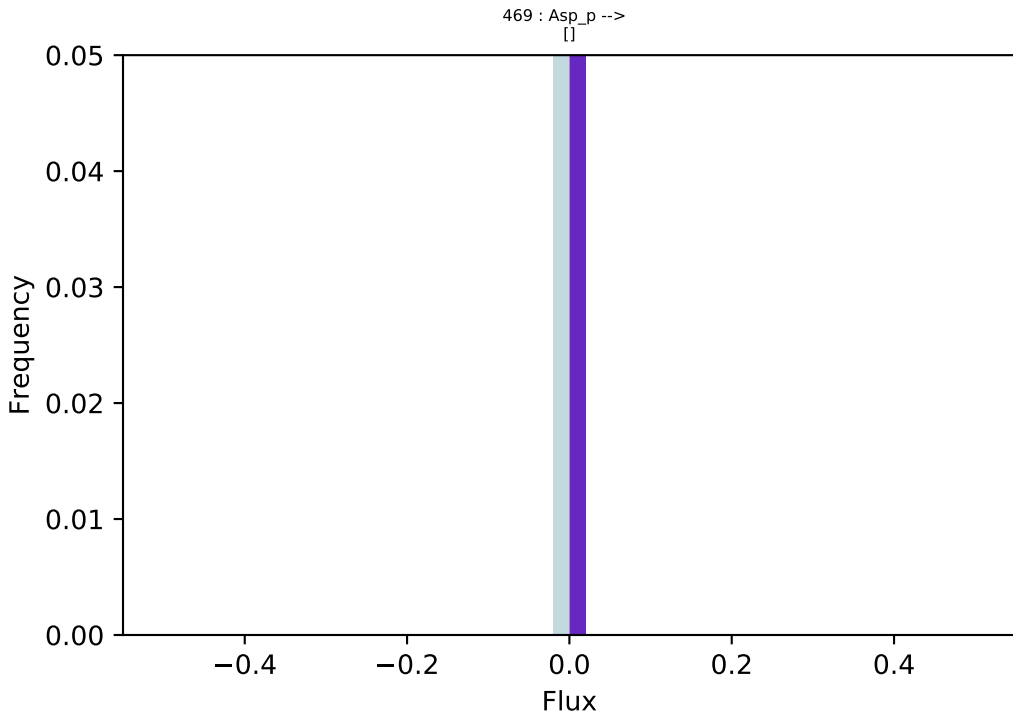


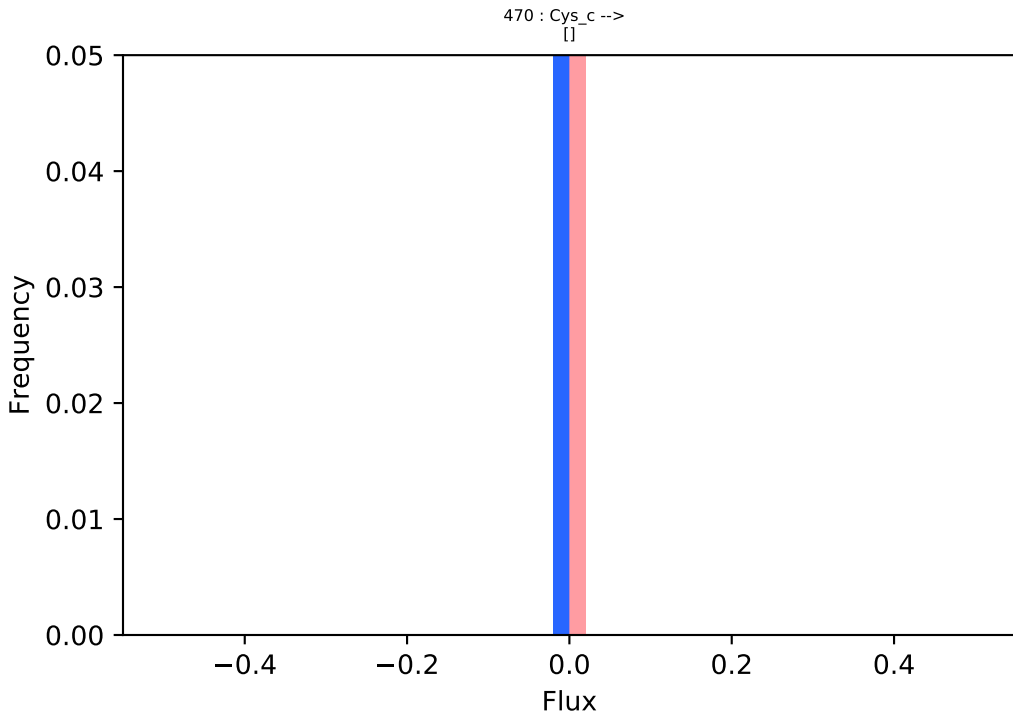


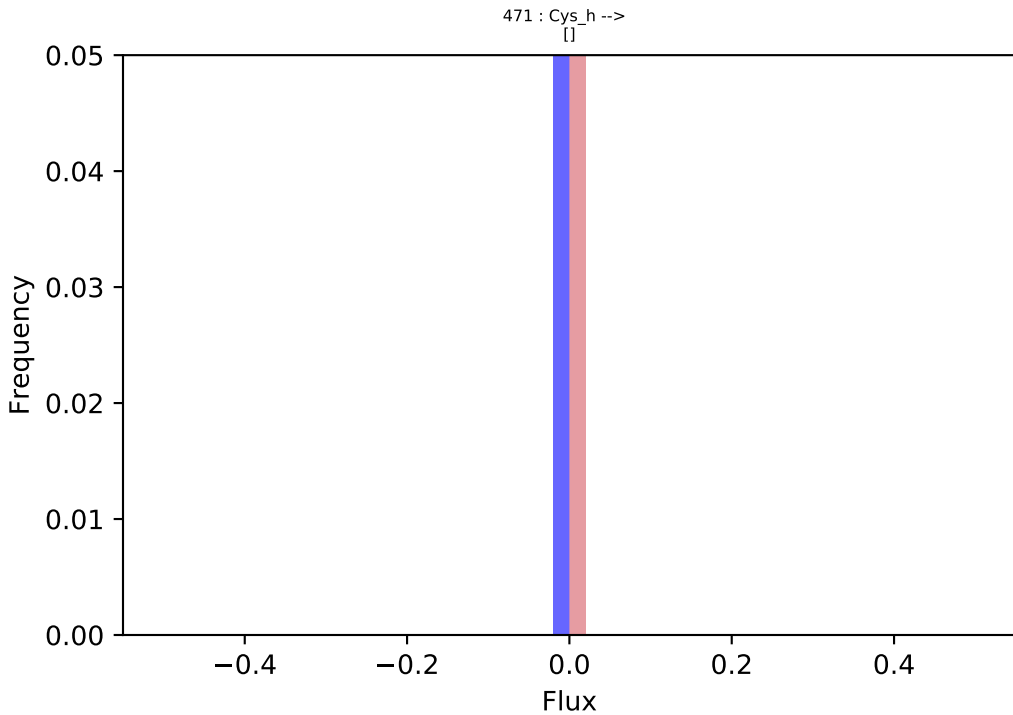
467 : Asp\_h -->  
[]



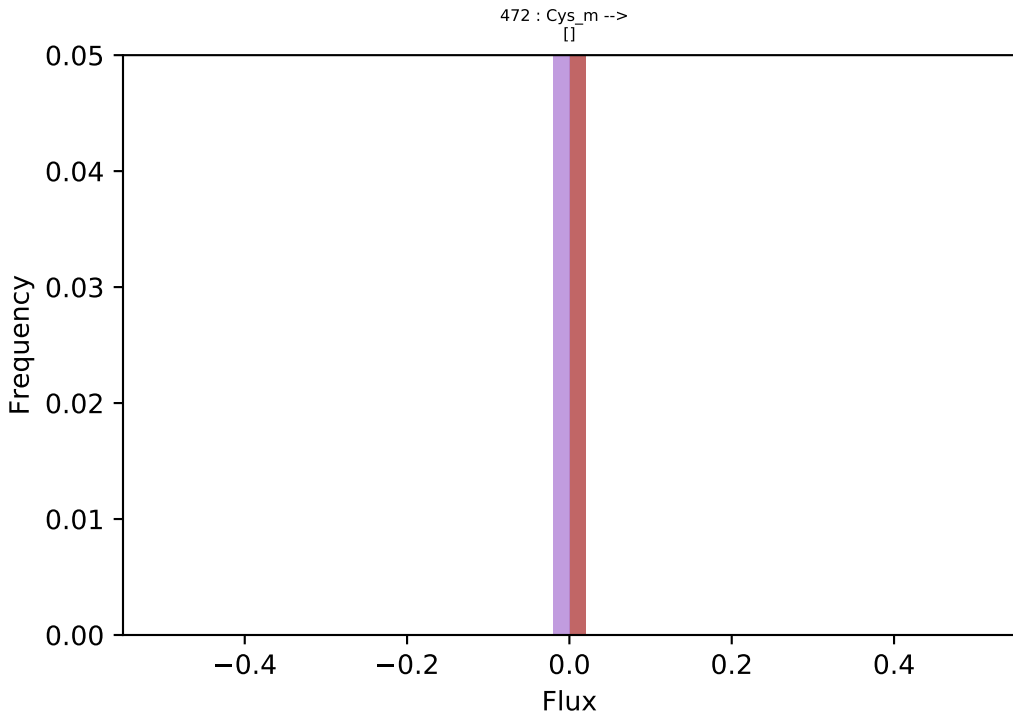


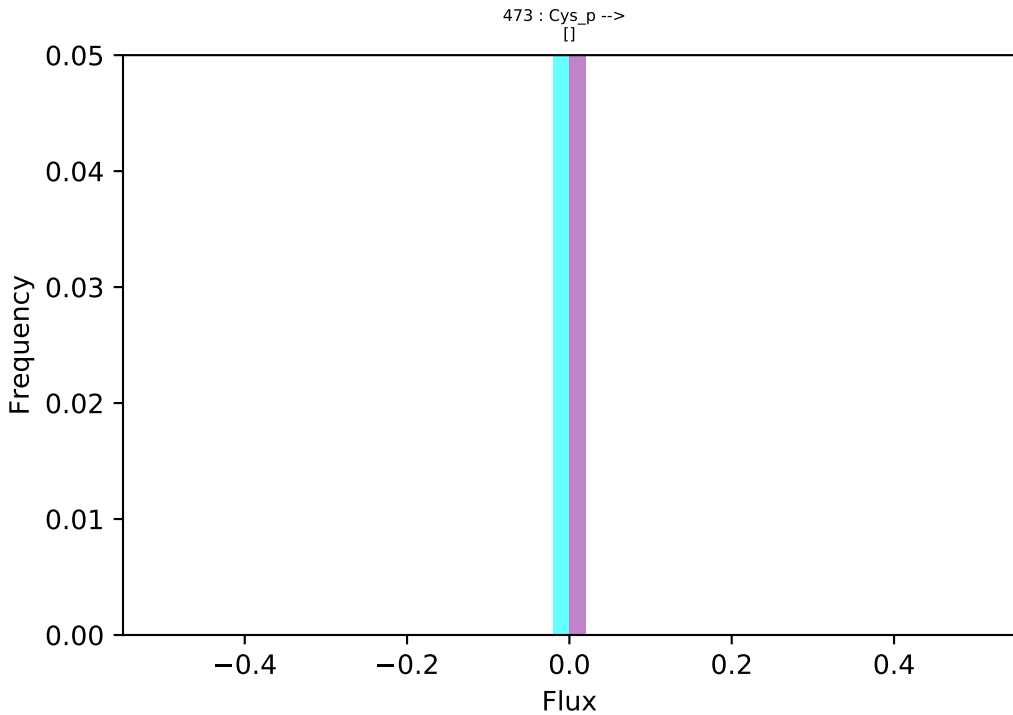




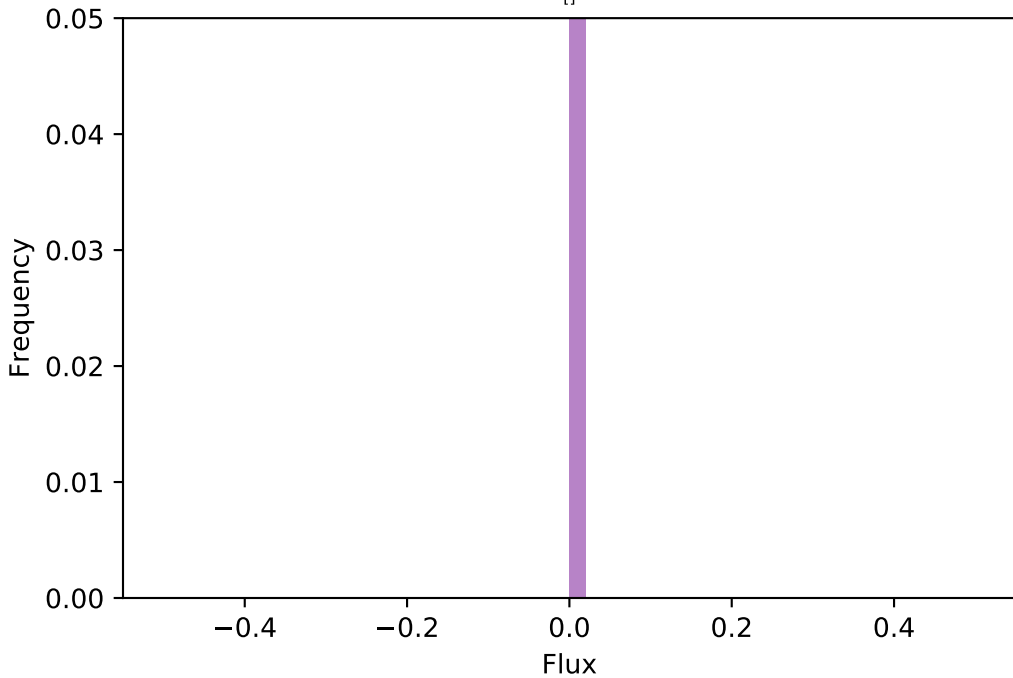


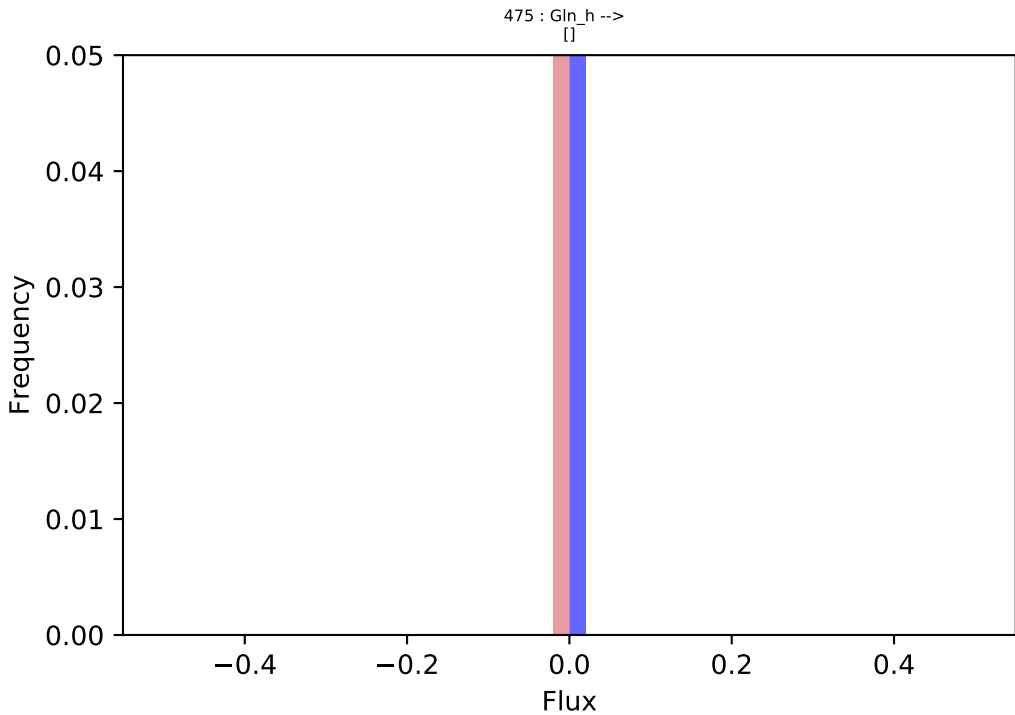




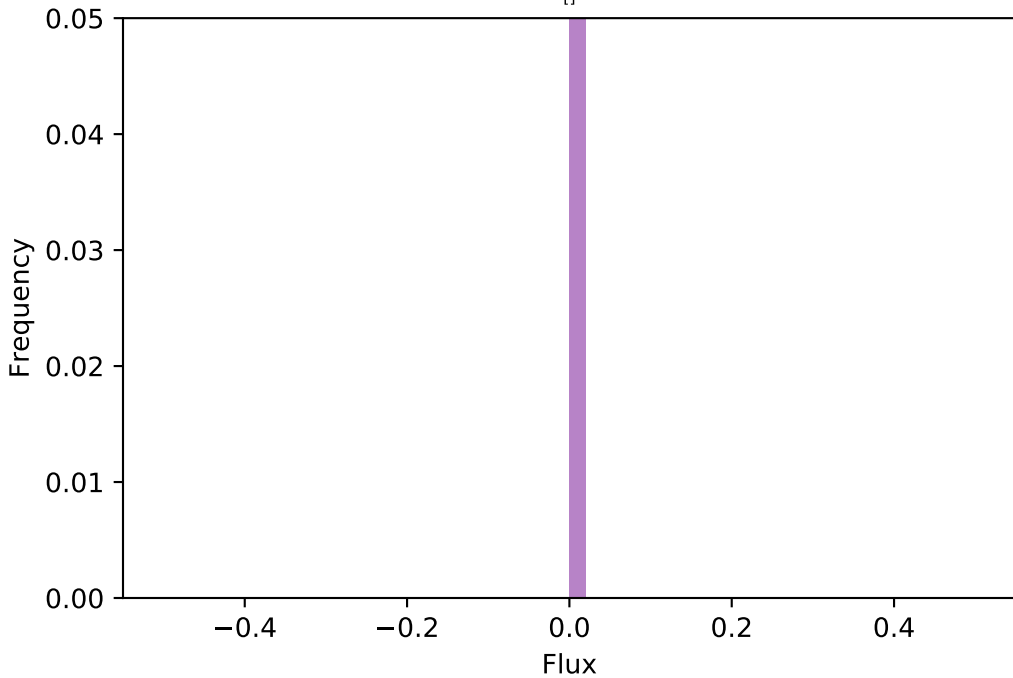


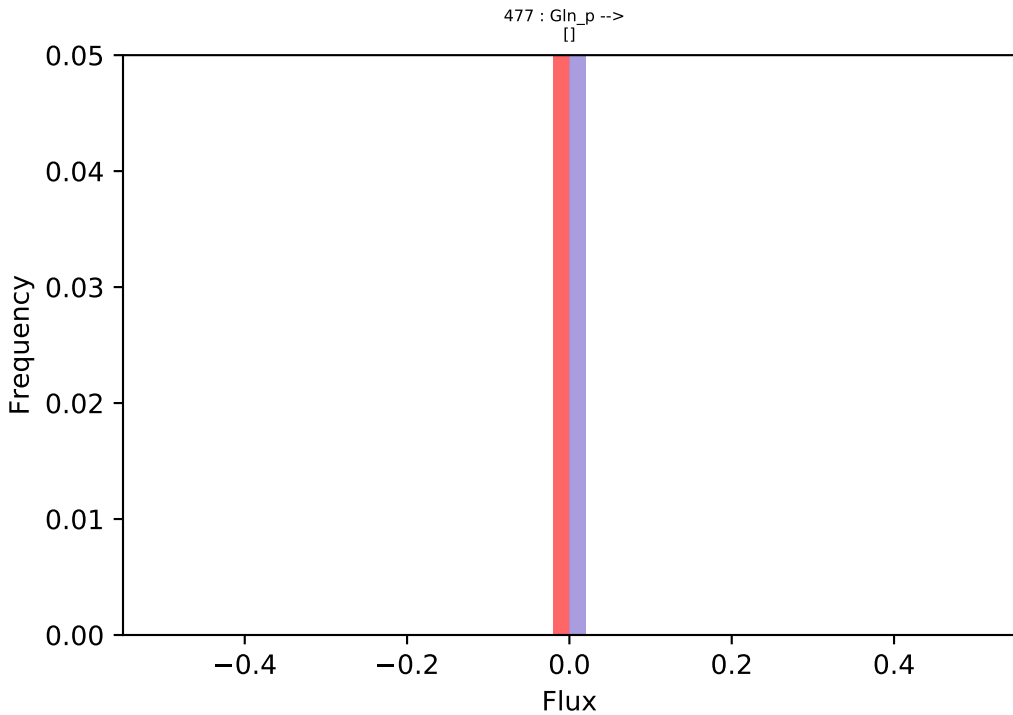
474 : Gln\_c -->  
[ ]

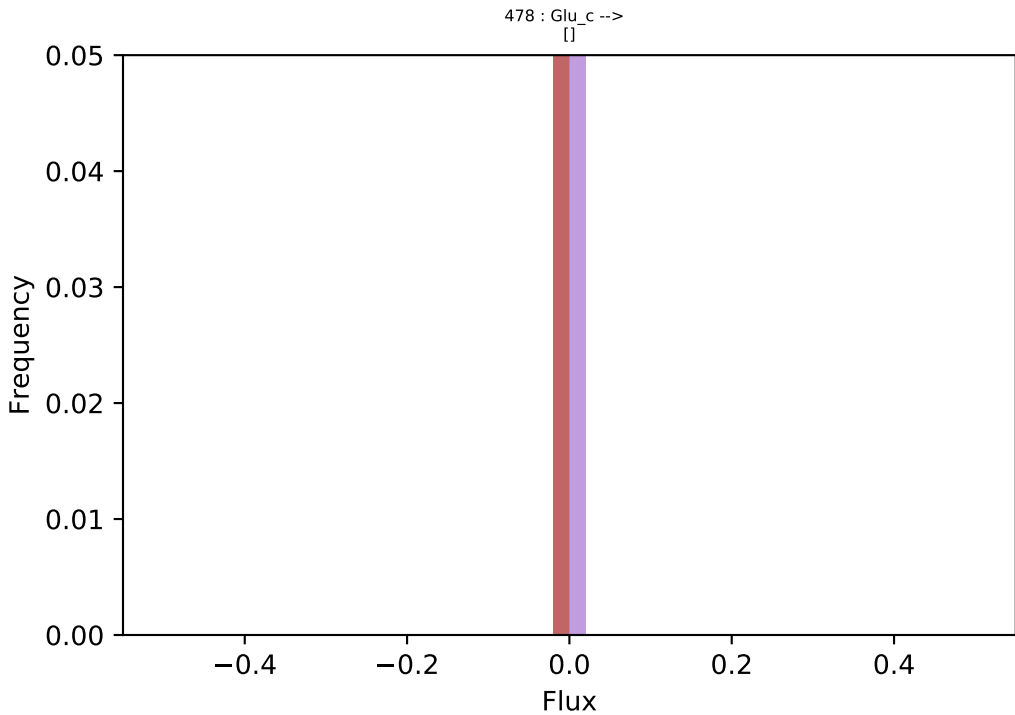




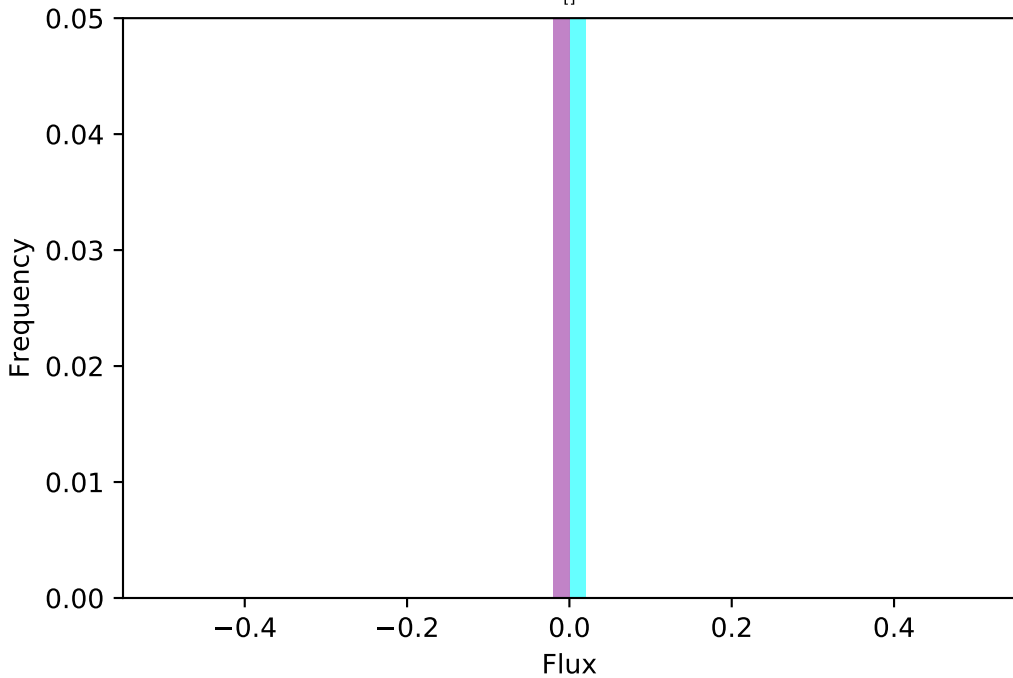
476 : Gln\_m -->  
[]



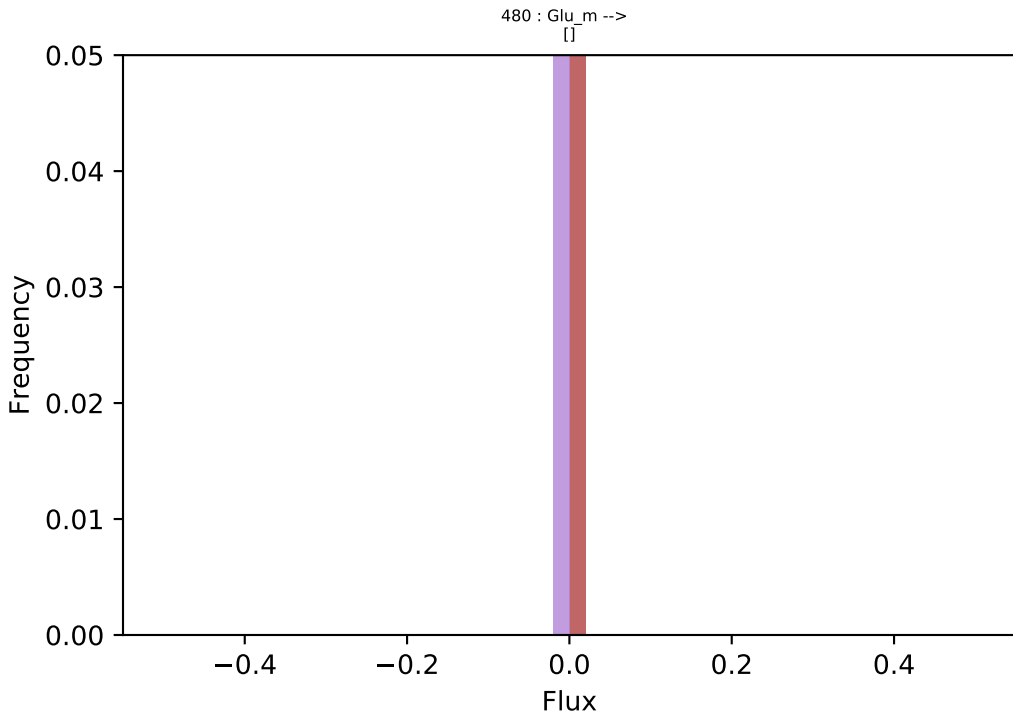


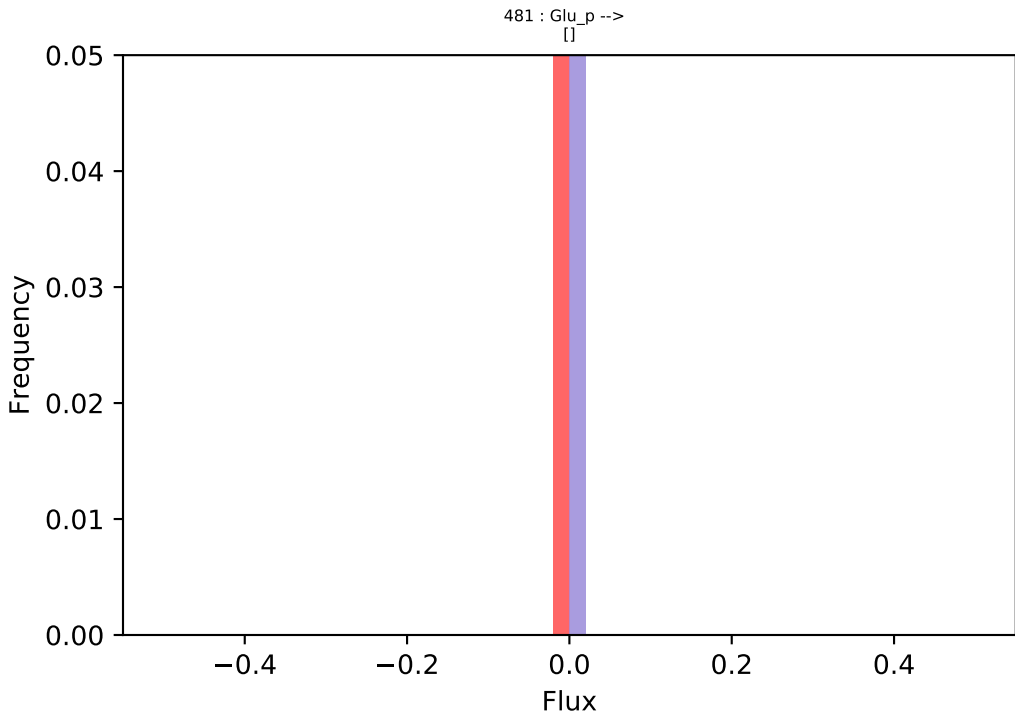


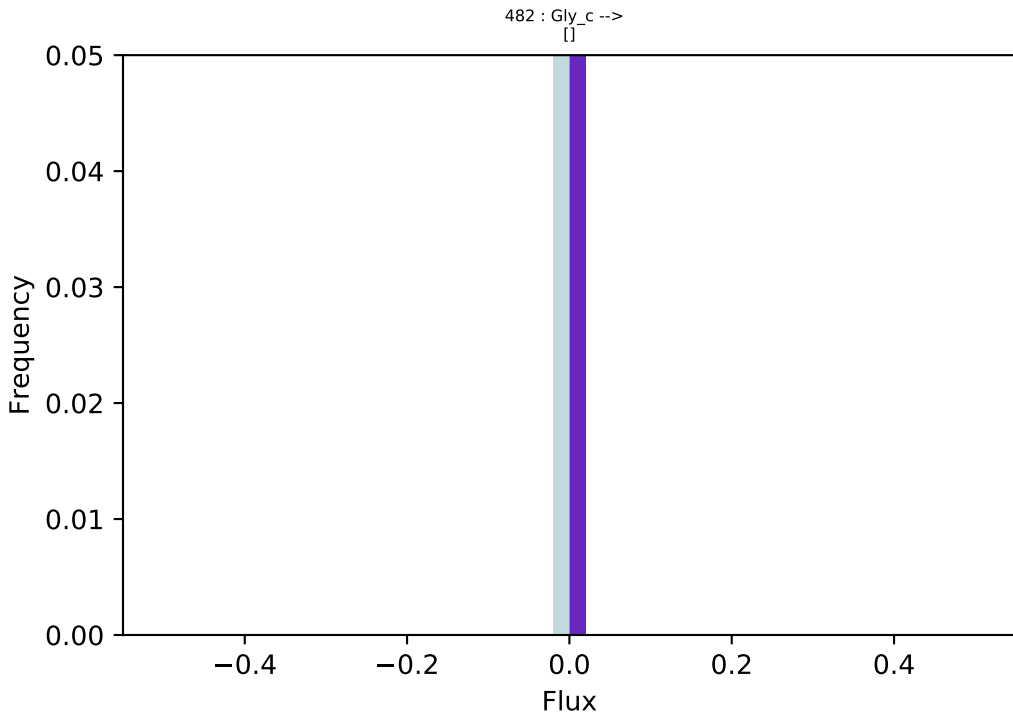
479 : Glu\_h -->  
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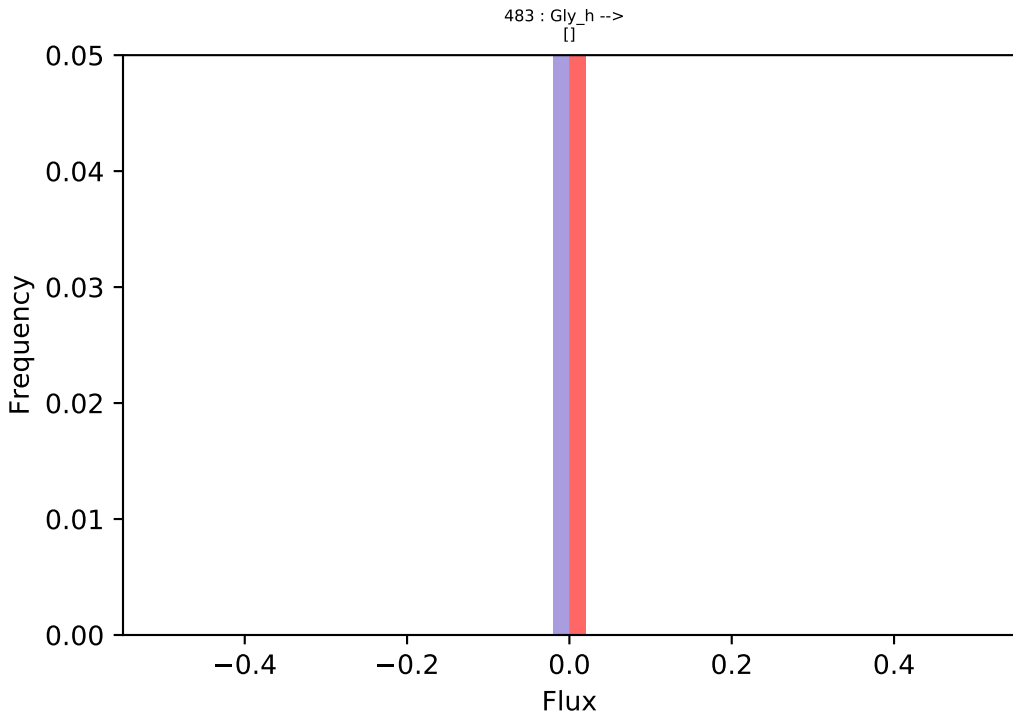


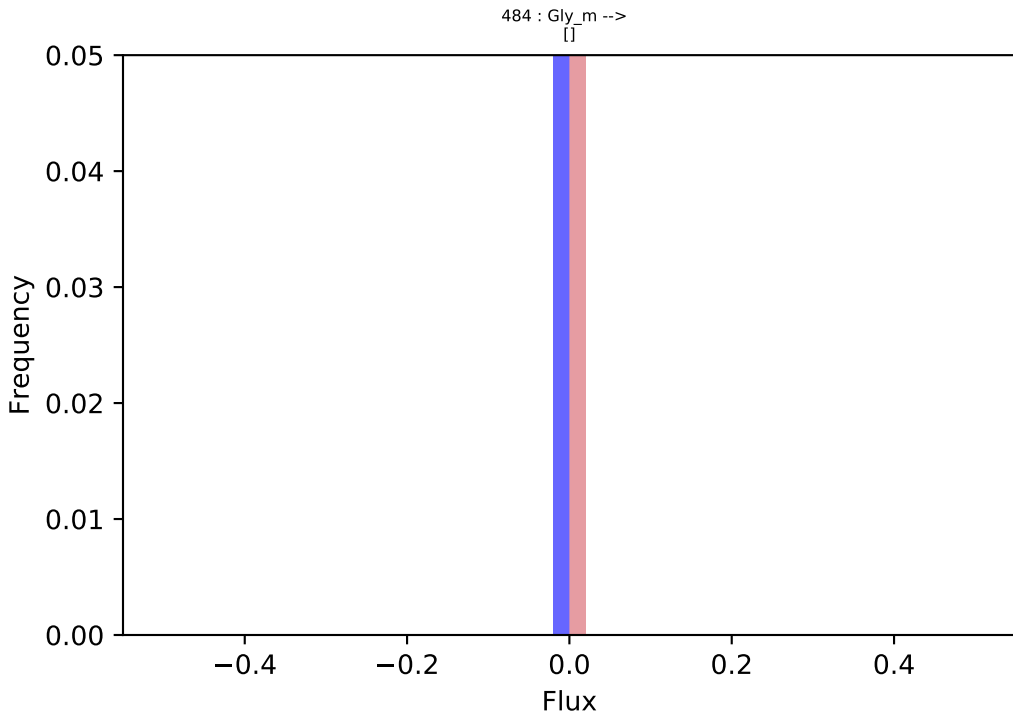


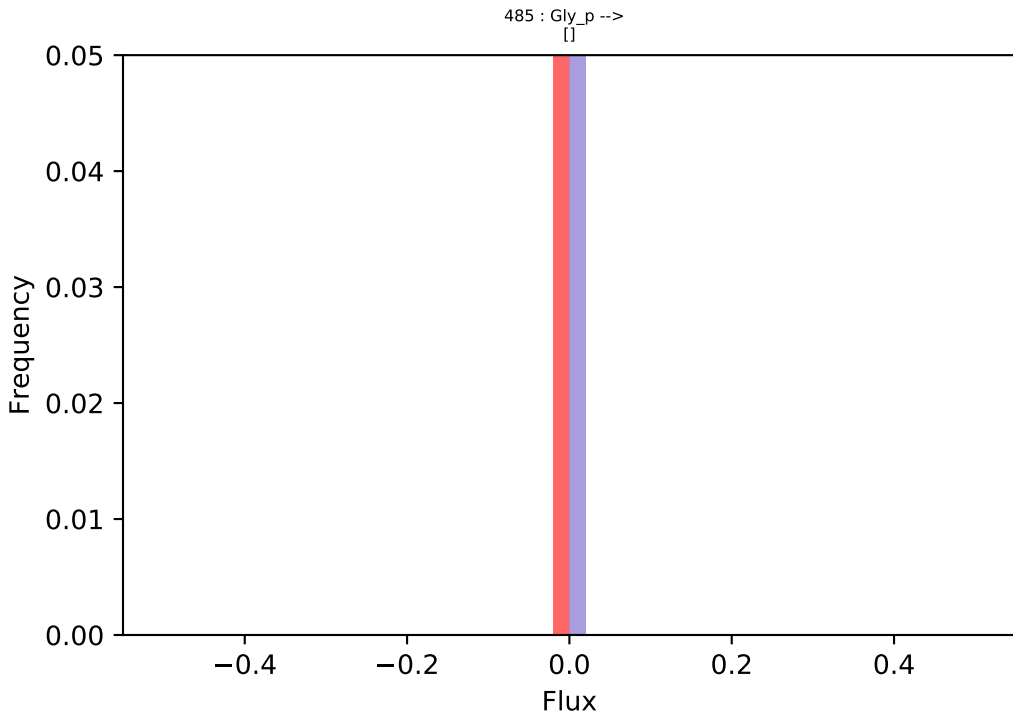




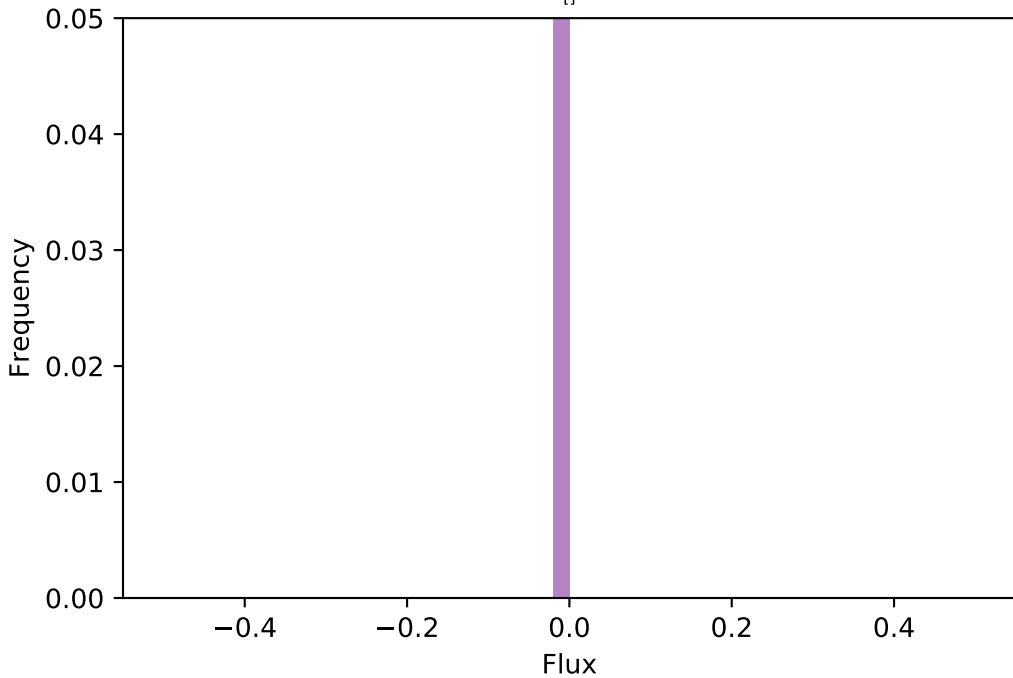


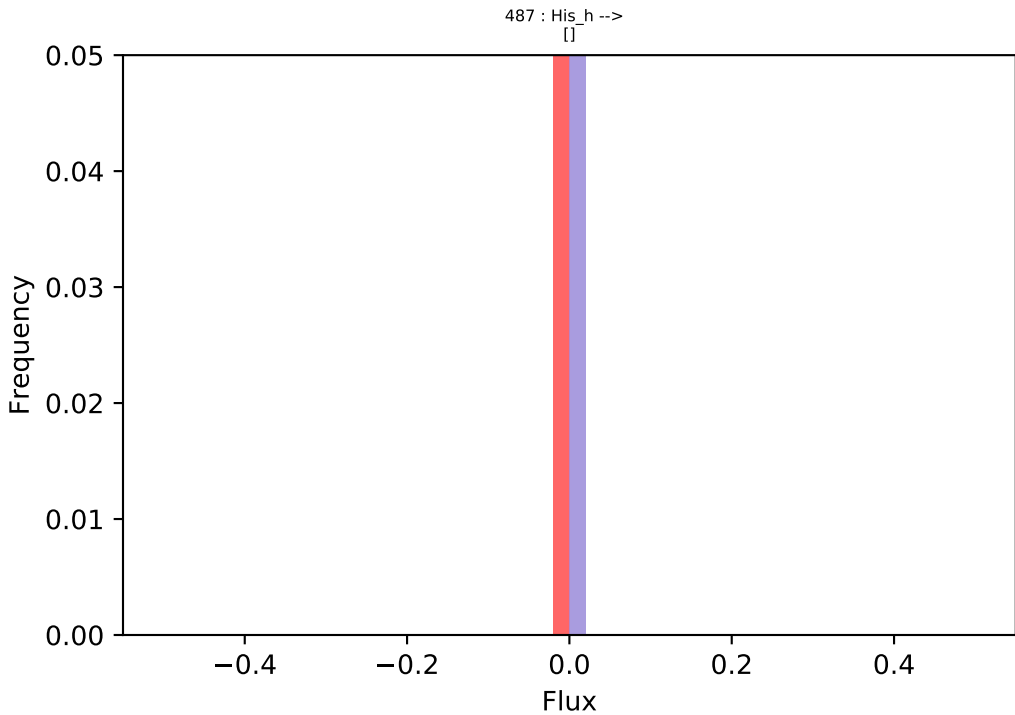




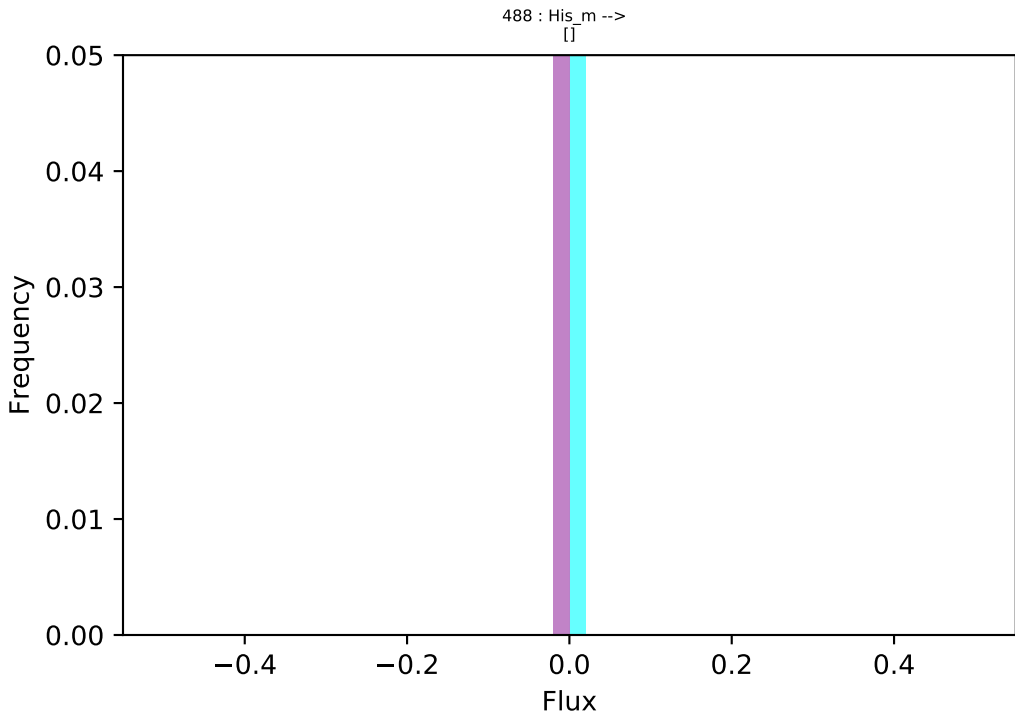


486 : His\_c -->  
[ ]

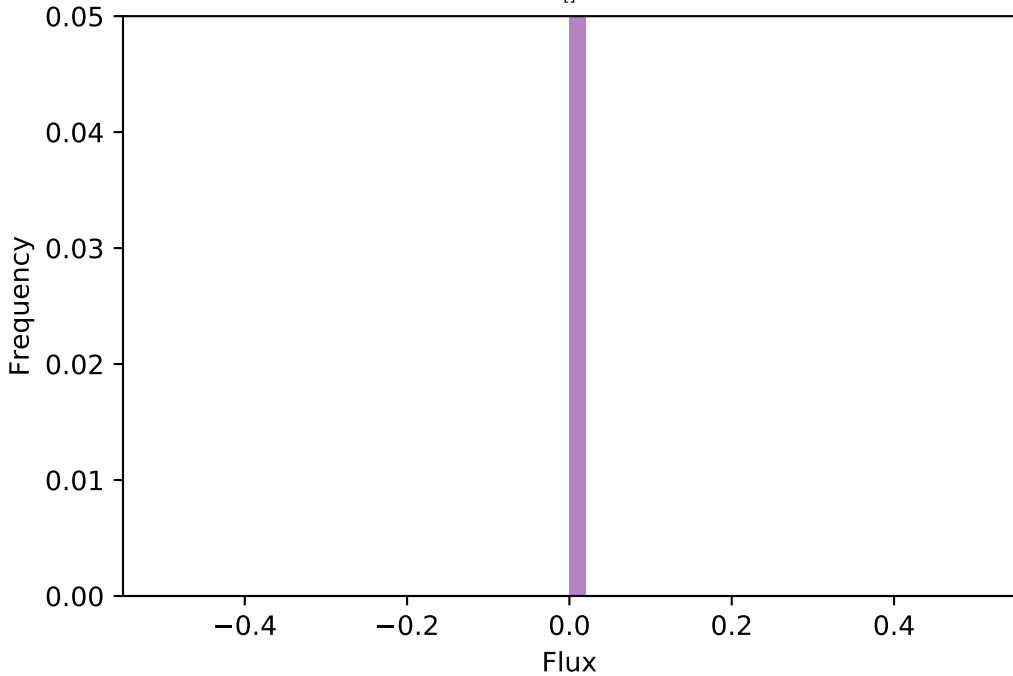


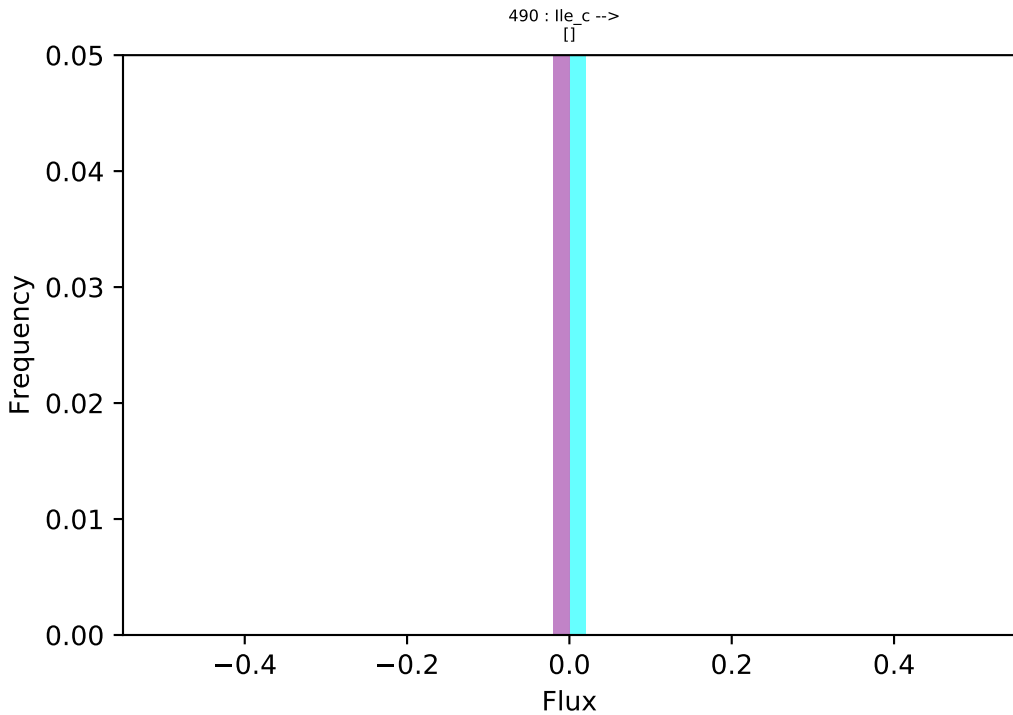


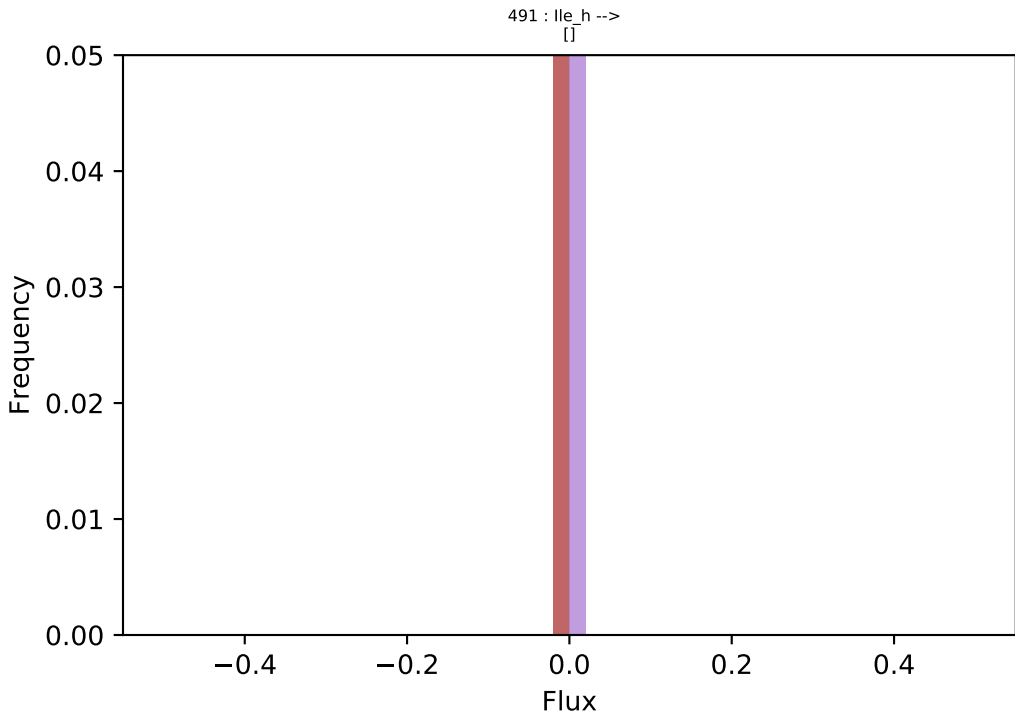


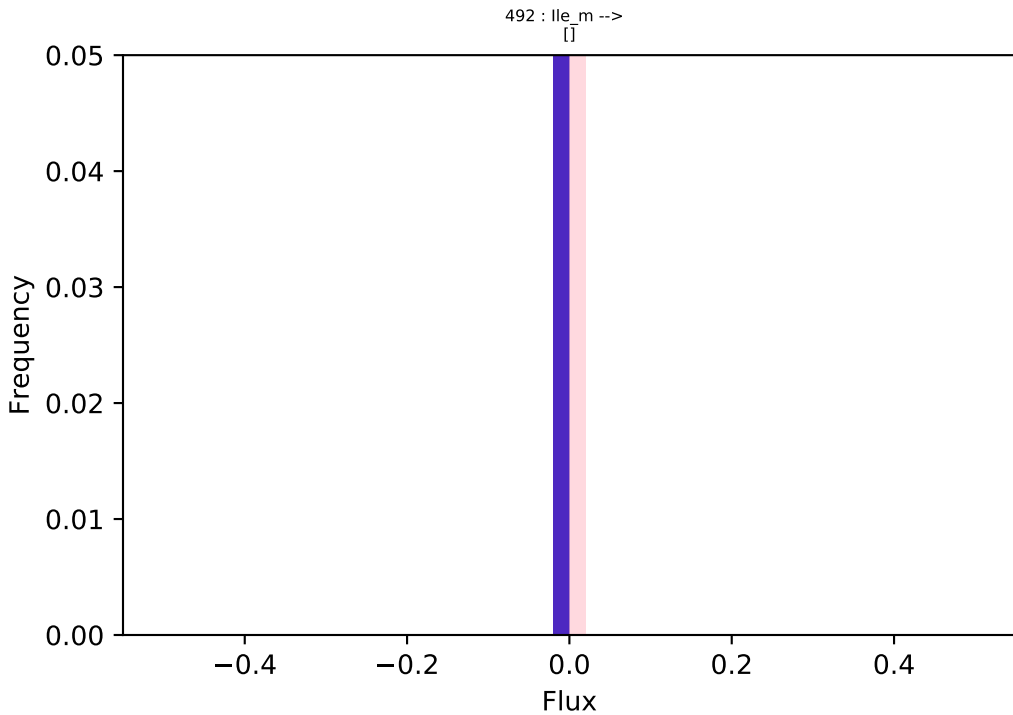


489 : His\_p -->  
[]

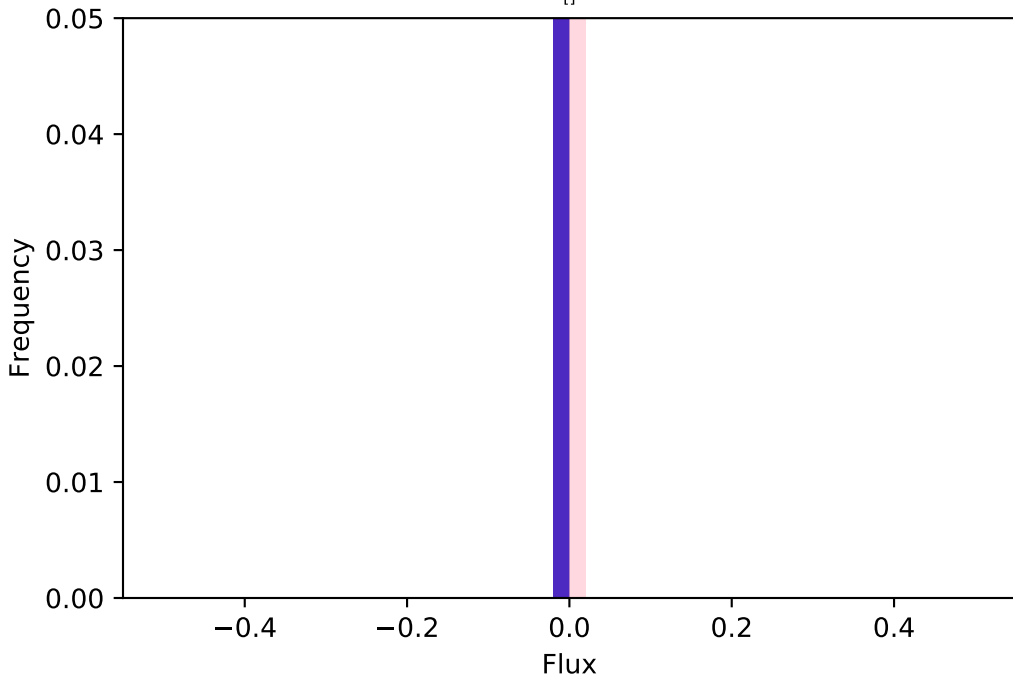


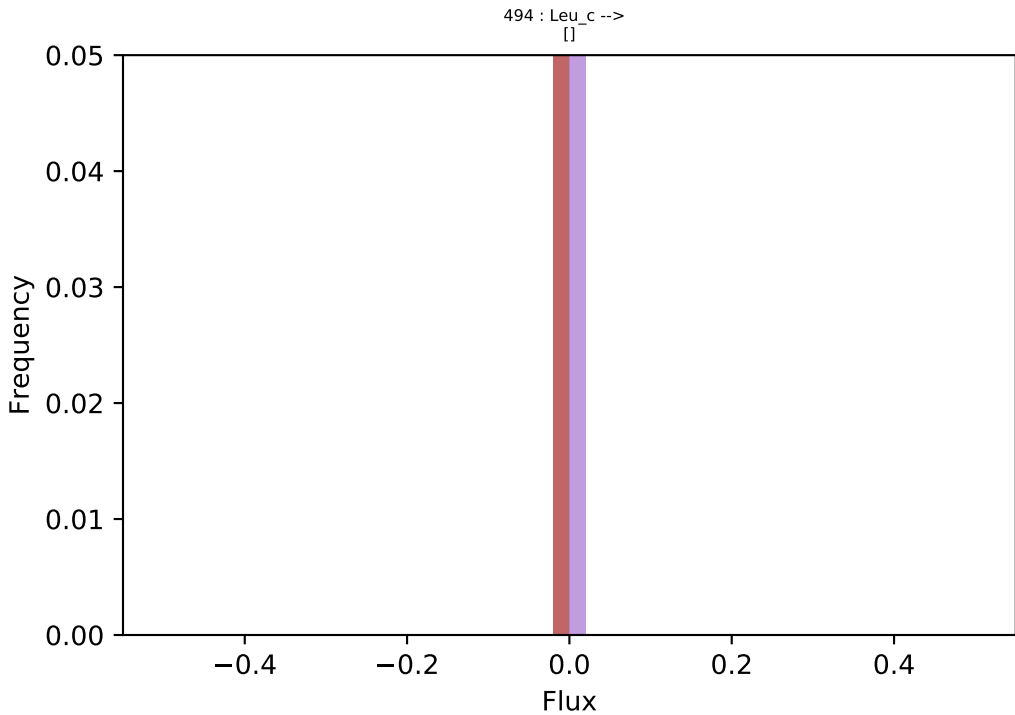




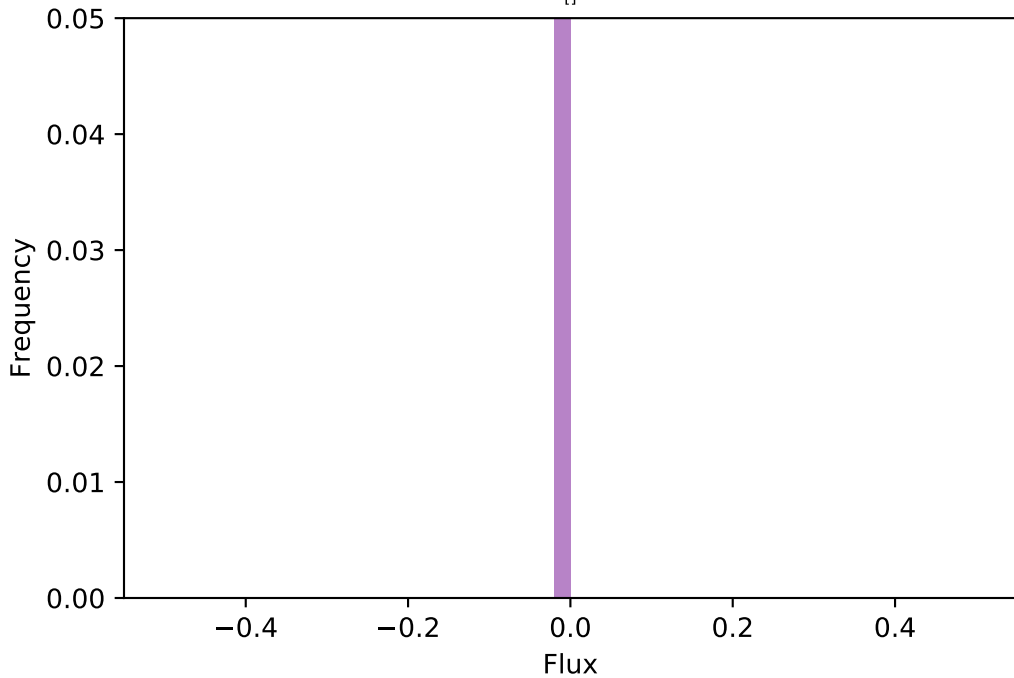


493 : lle\_p -->  
[ ]

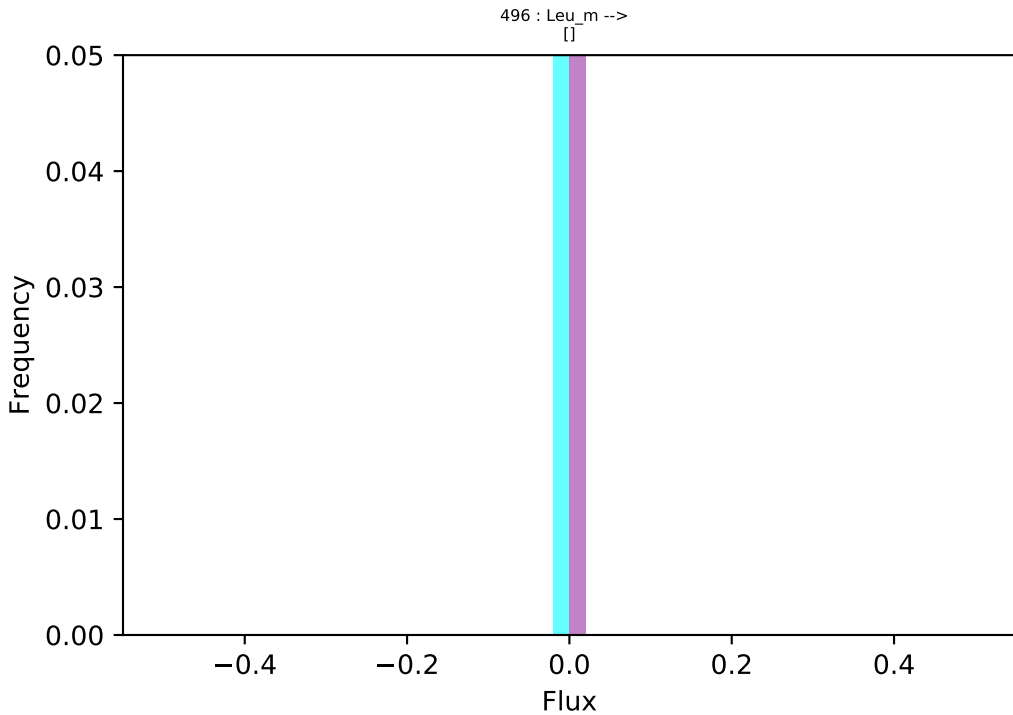


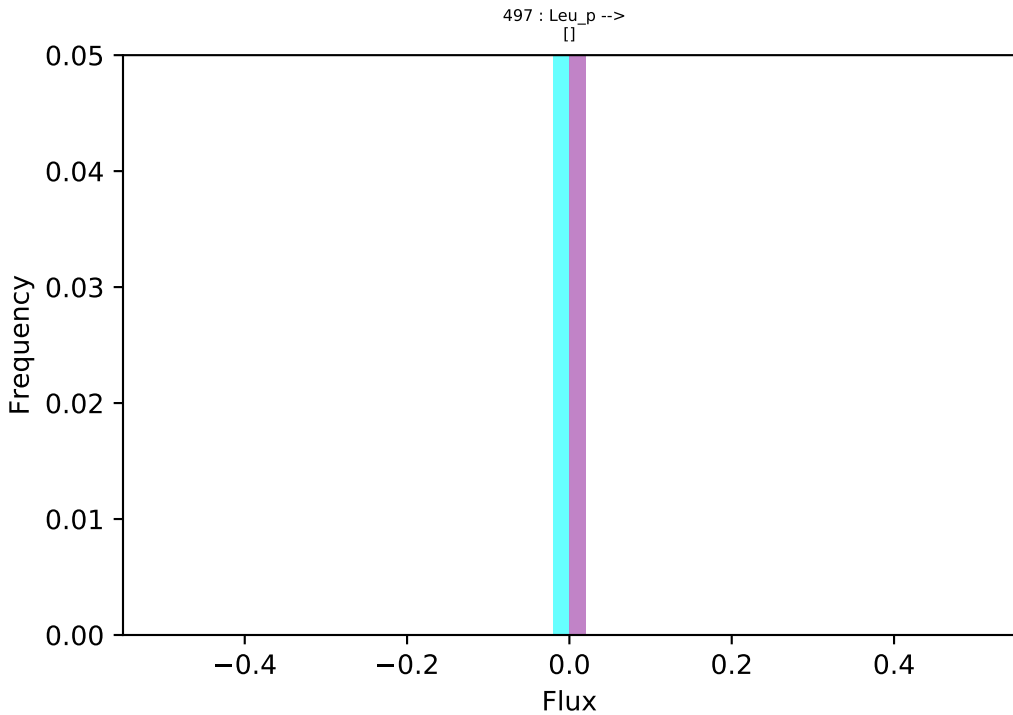


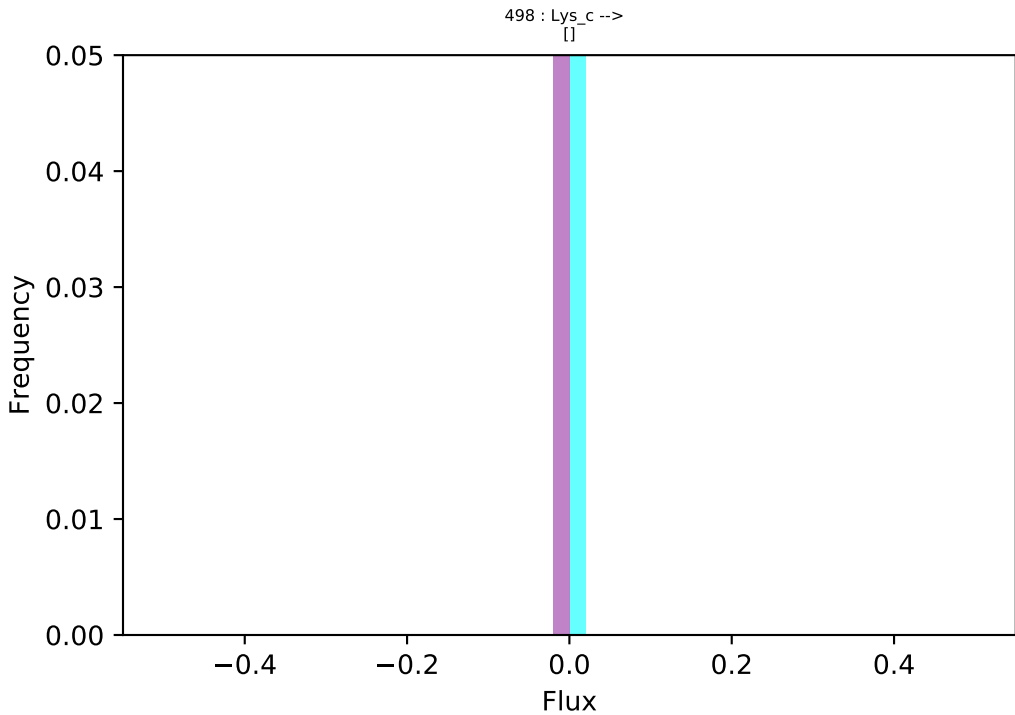
495 : Leu\_h -->  
[]

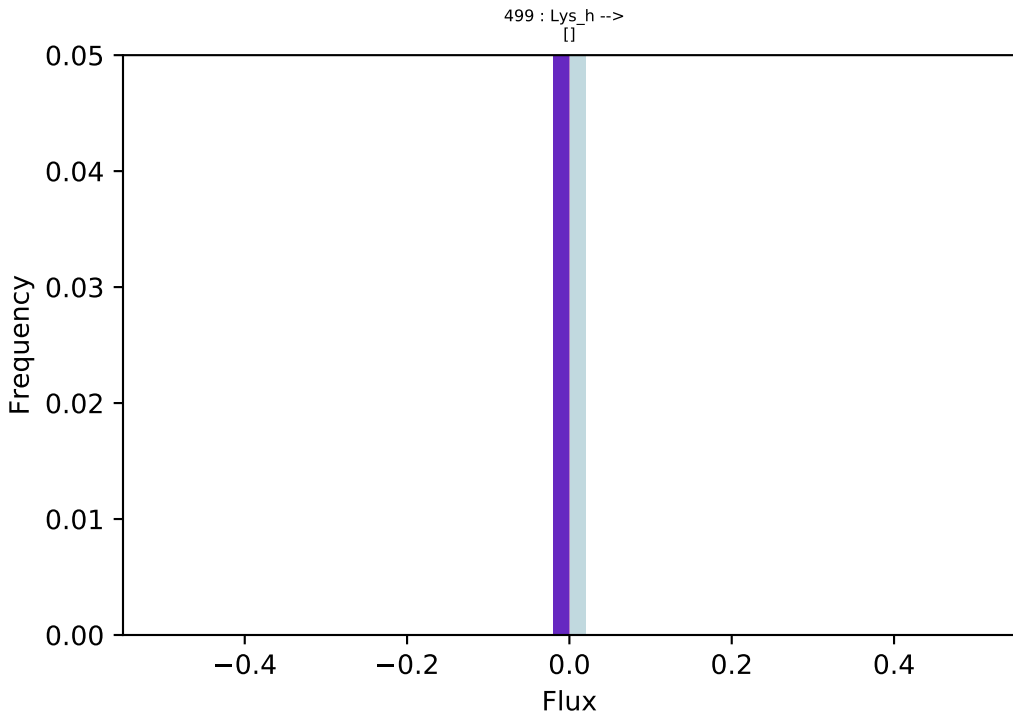


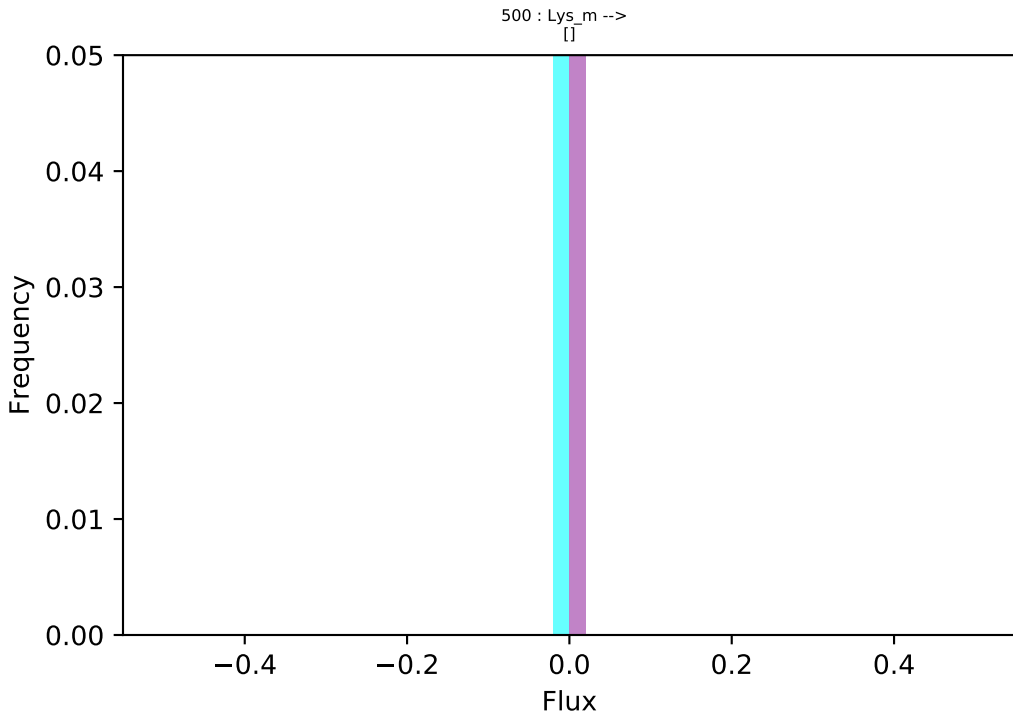


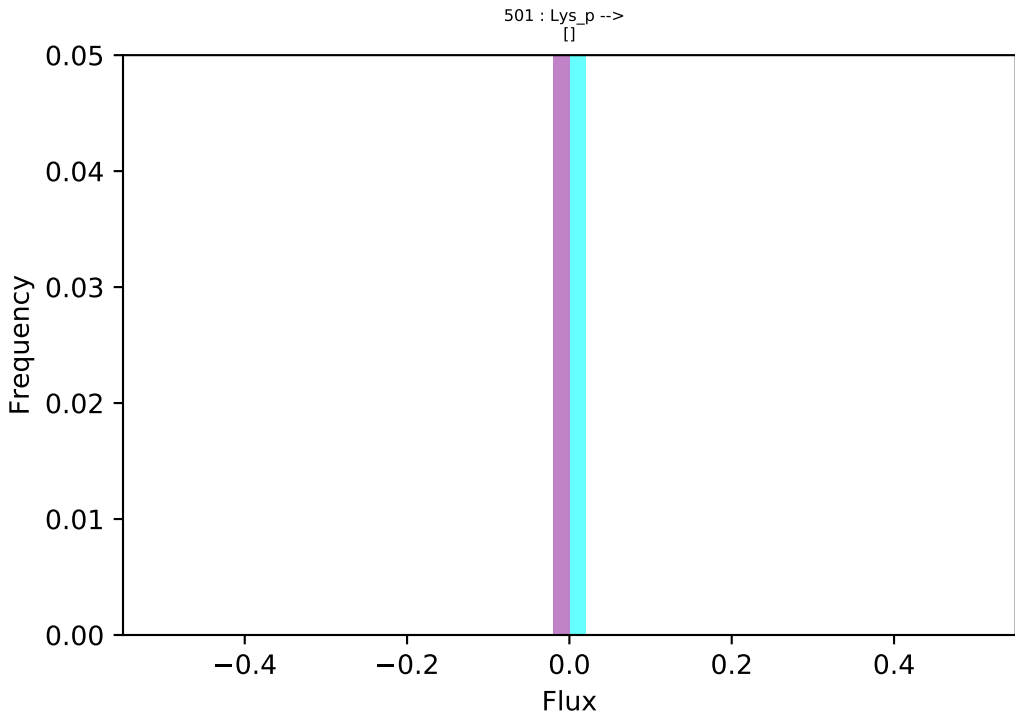


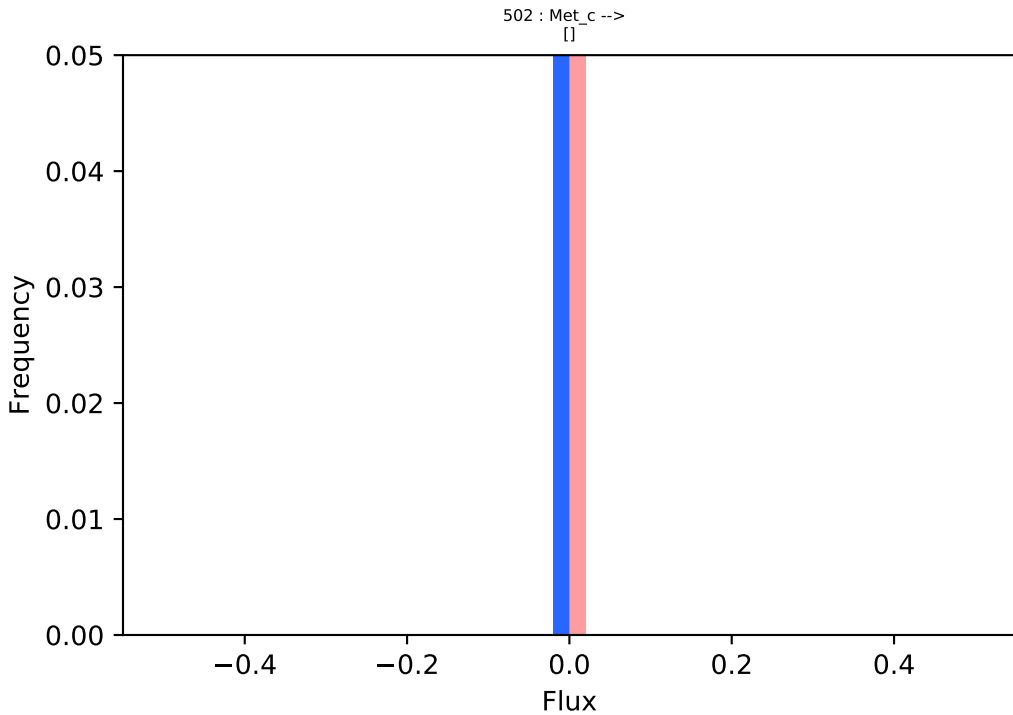


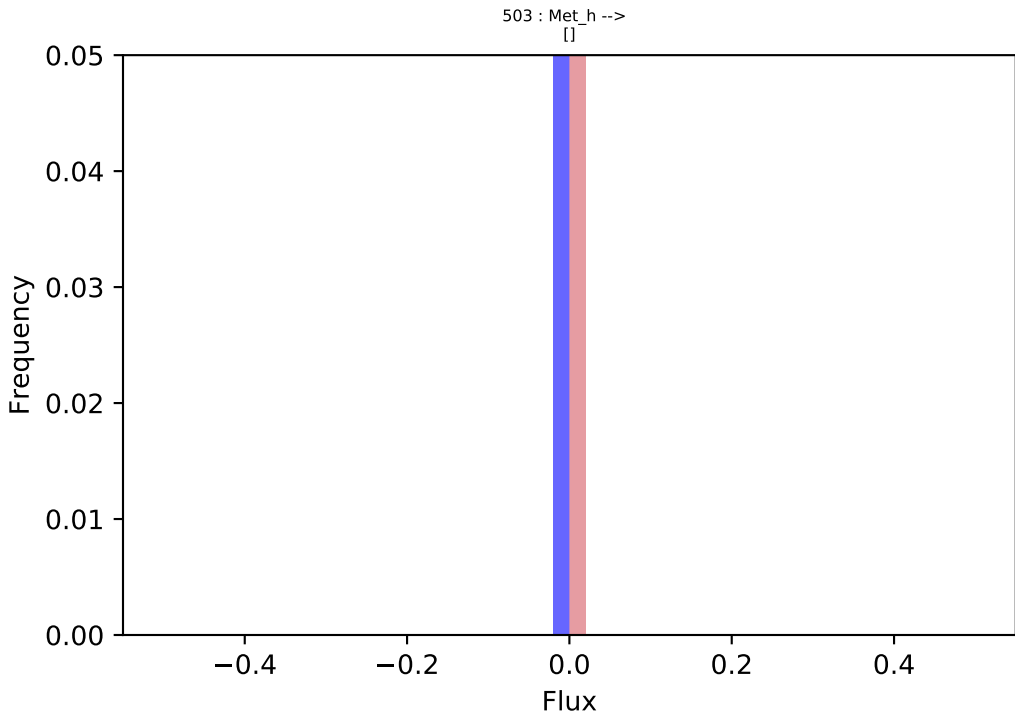




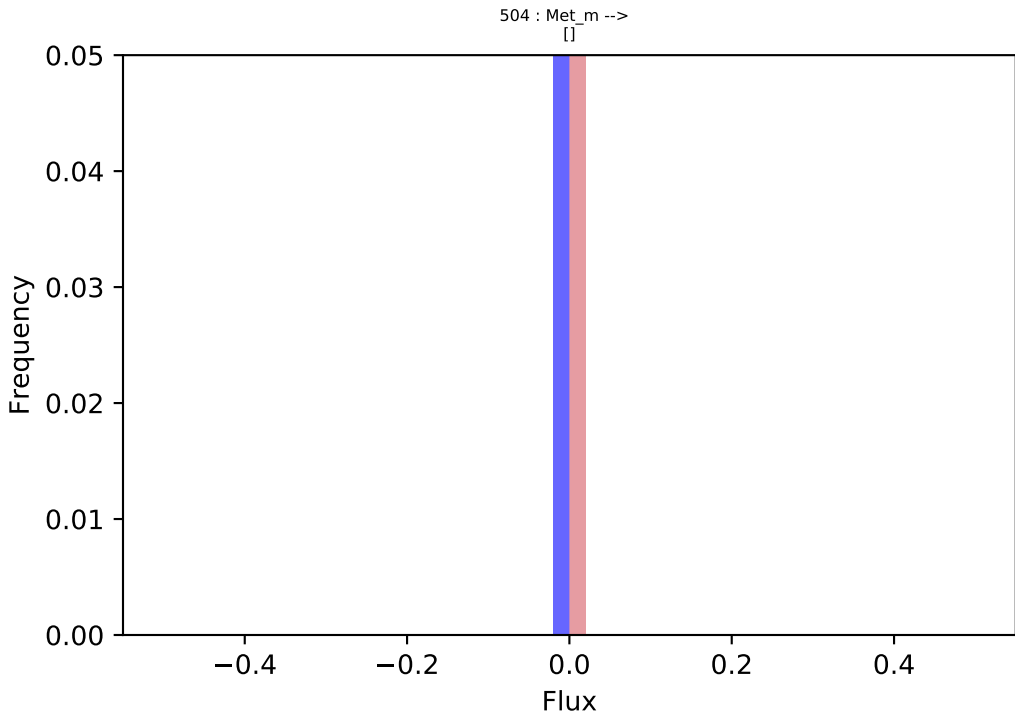


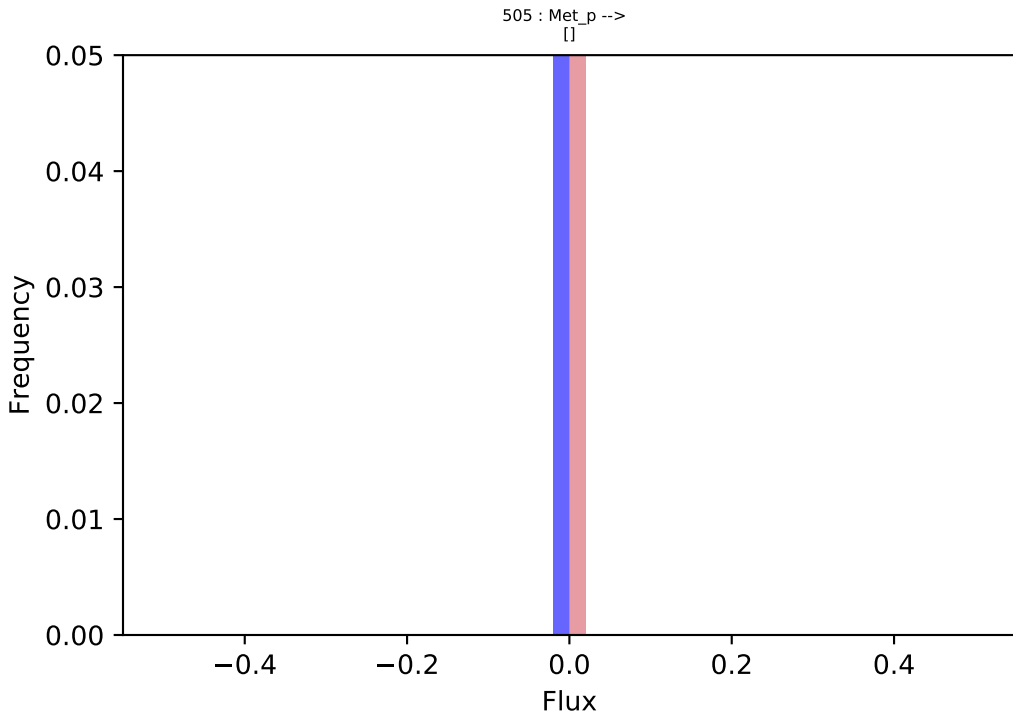


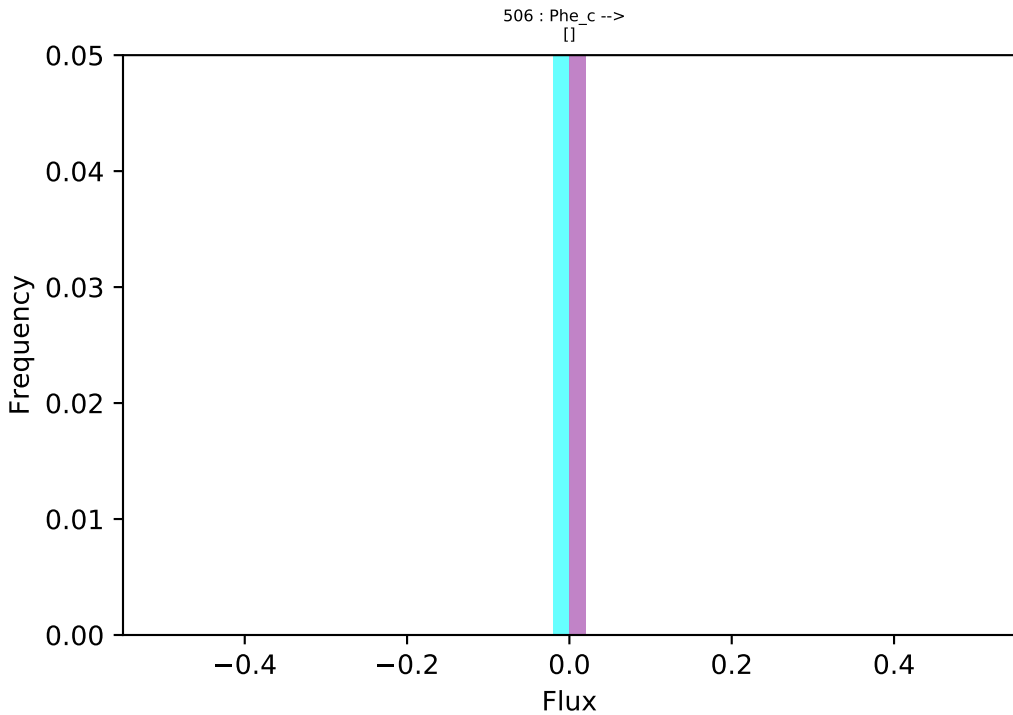


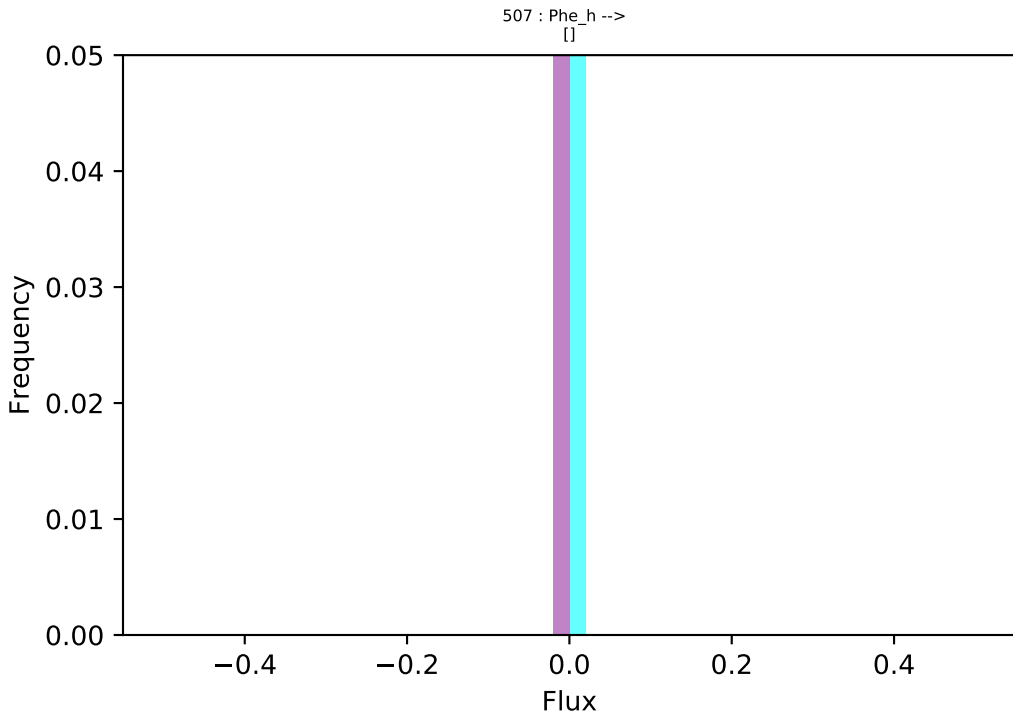


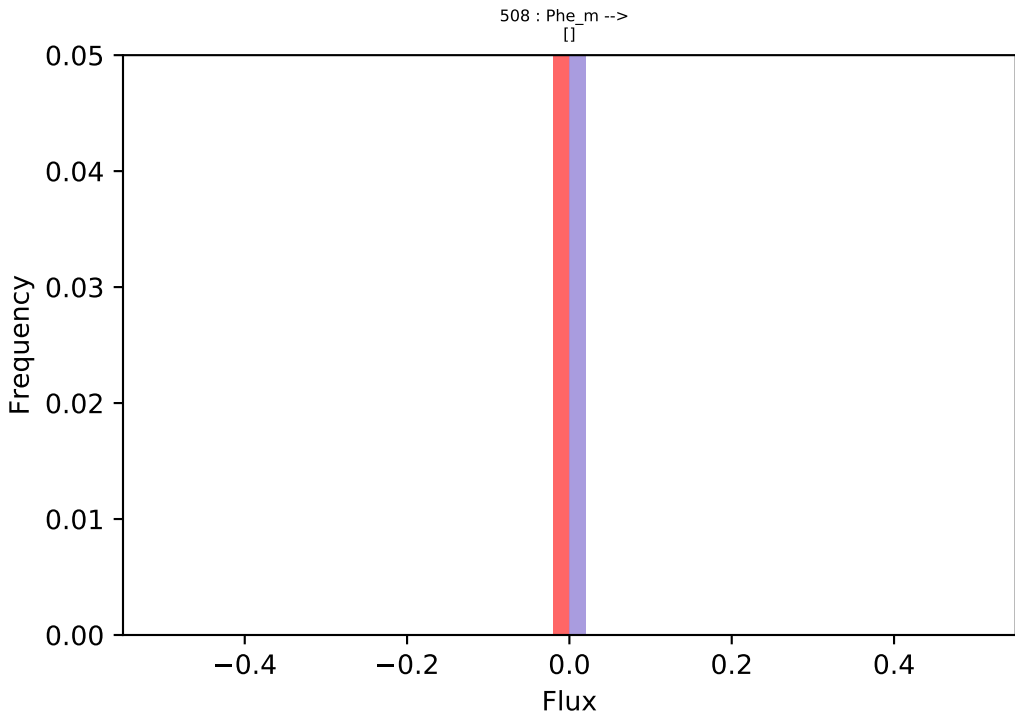


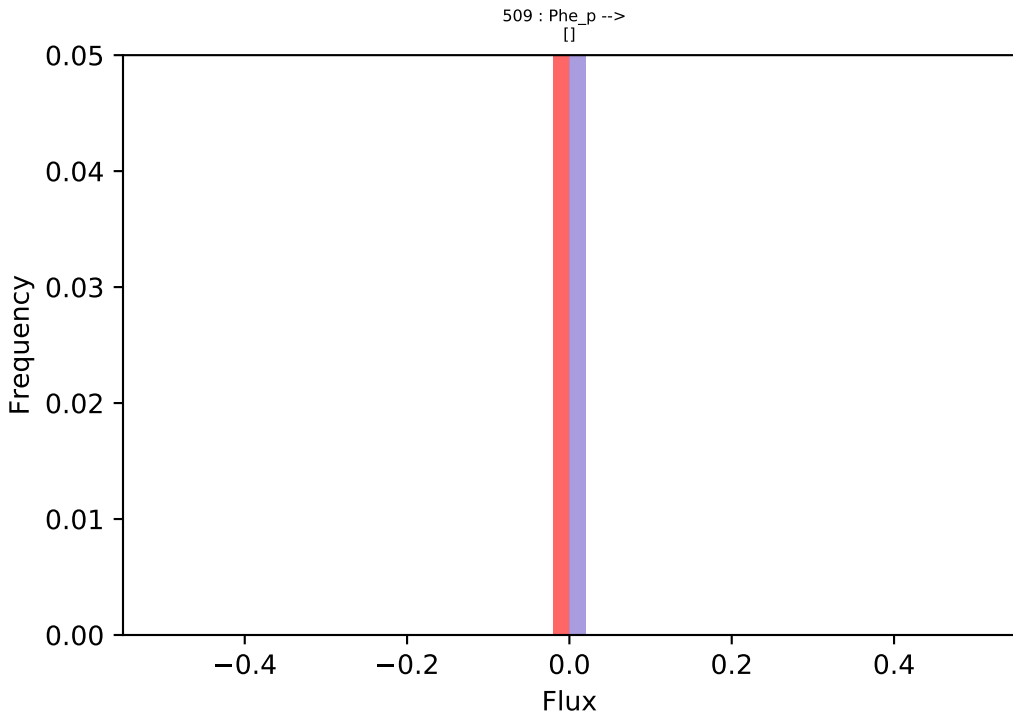


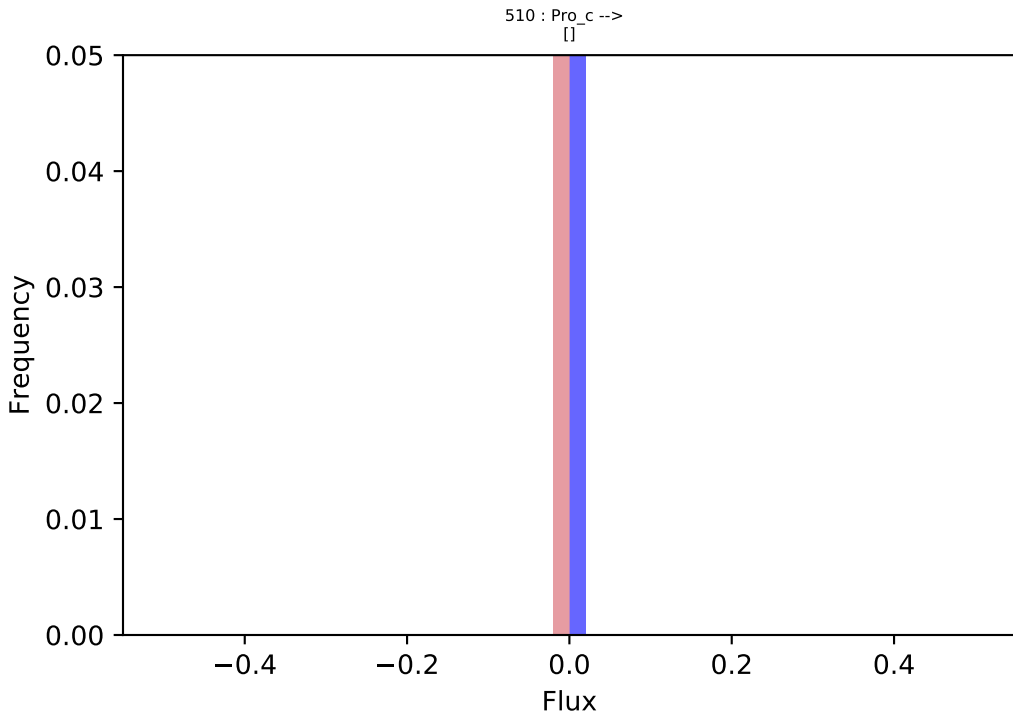


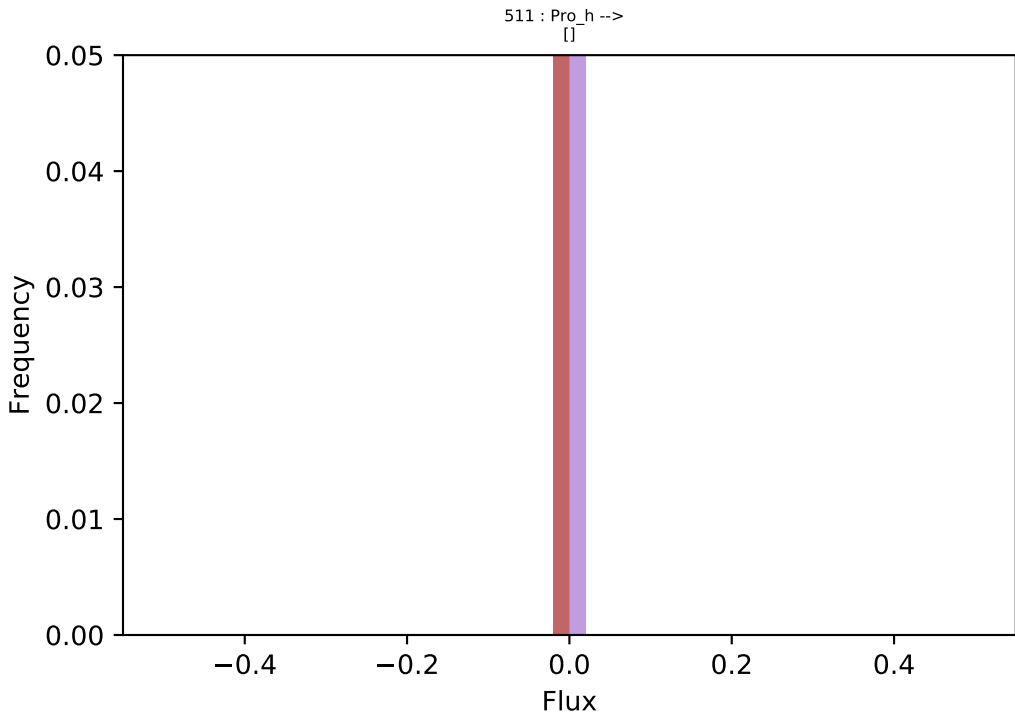




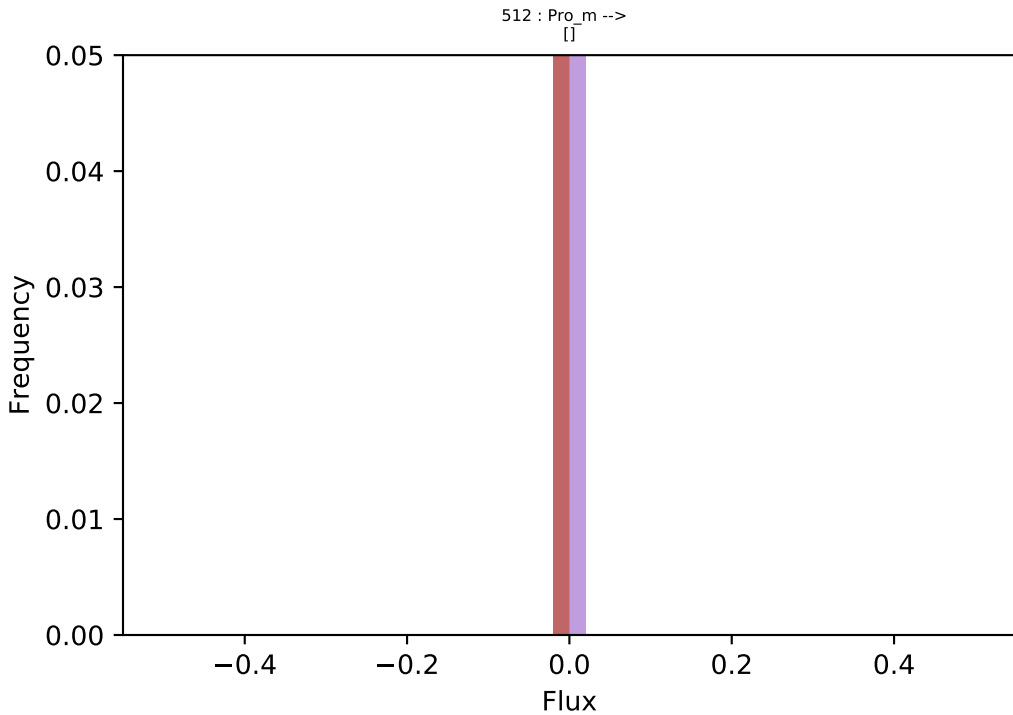


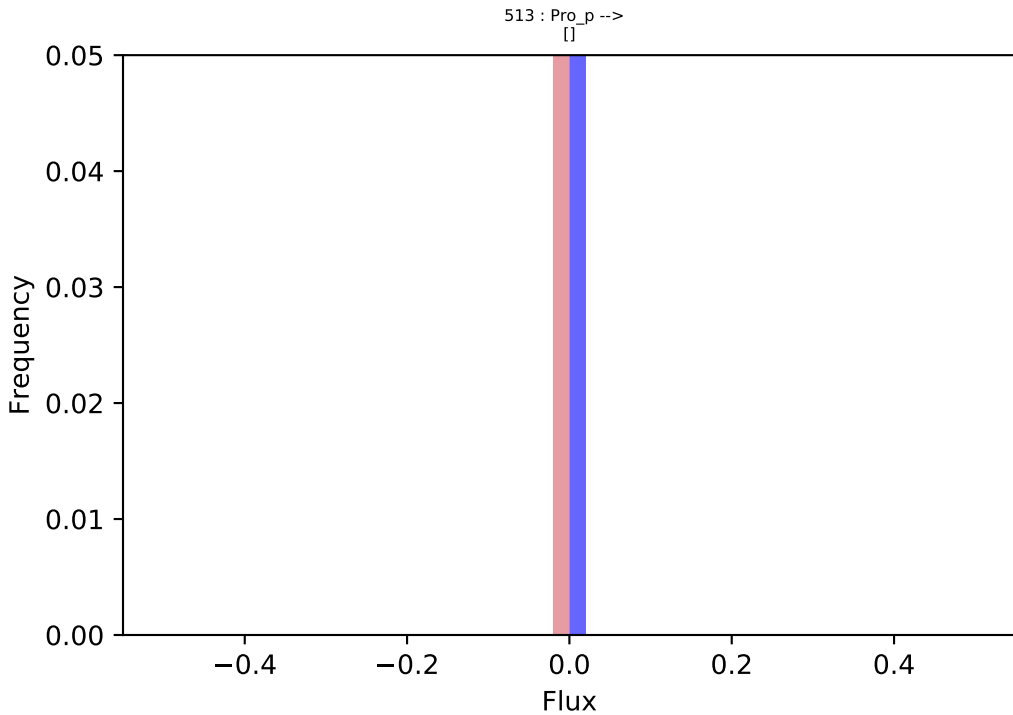


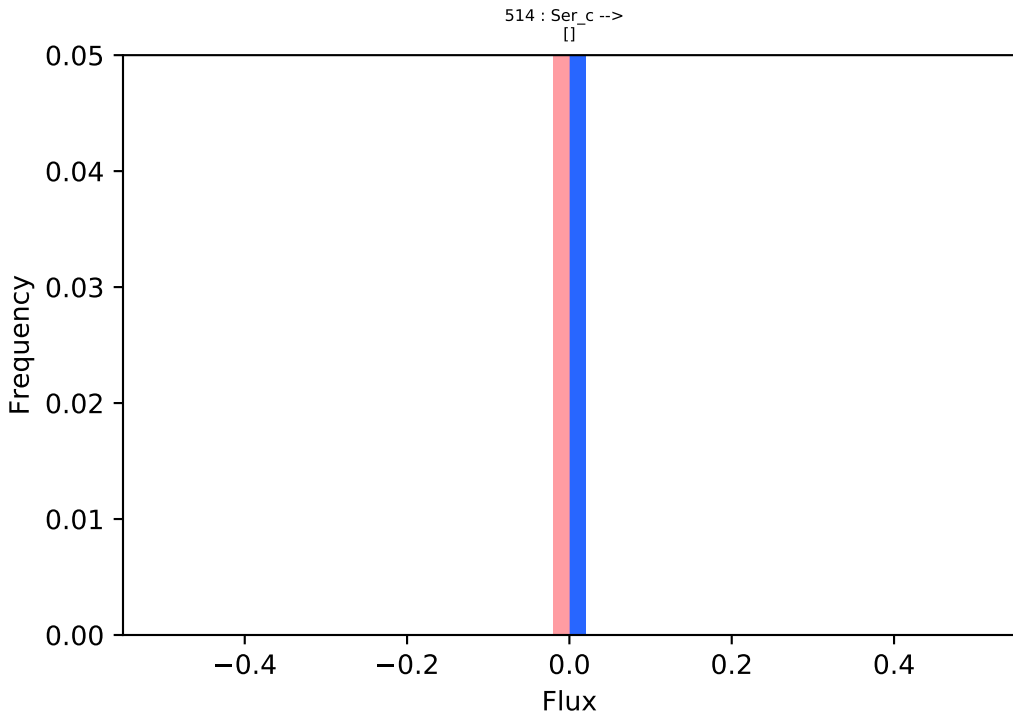




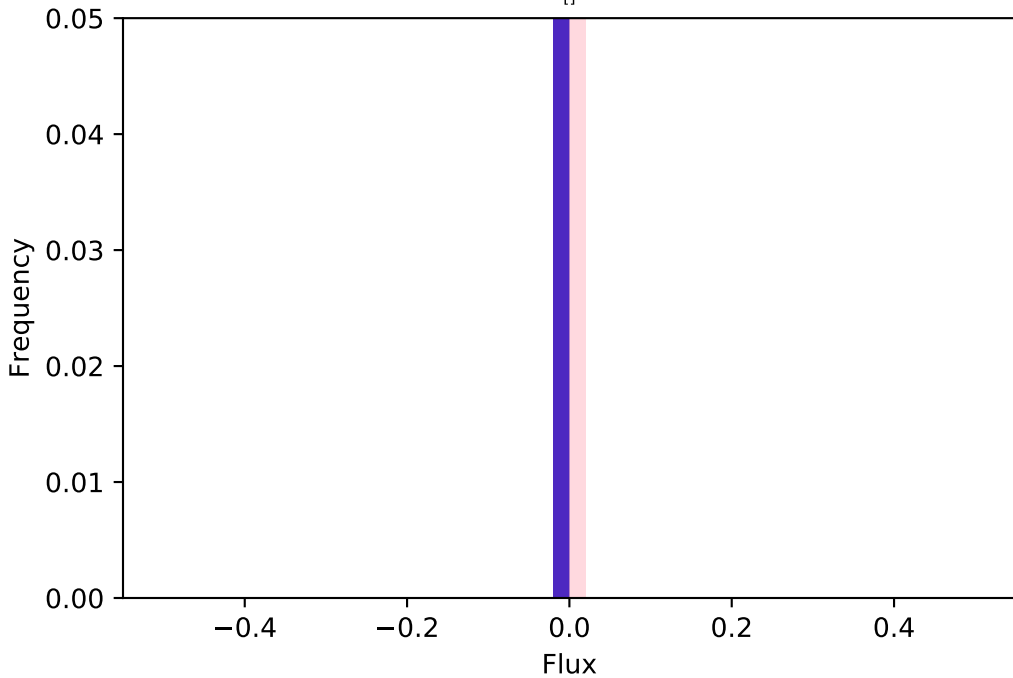


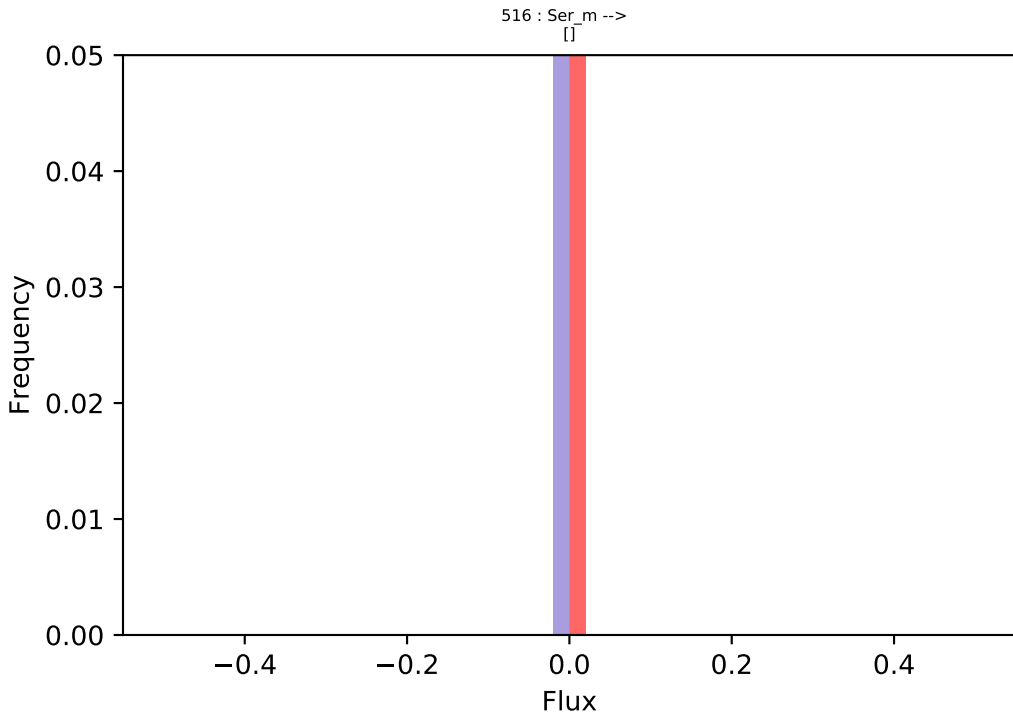


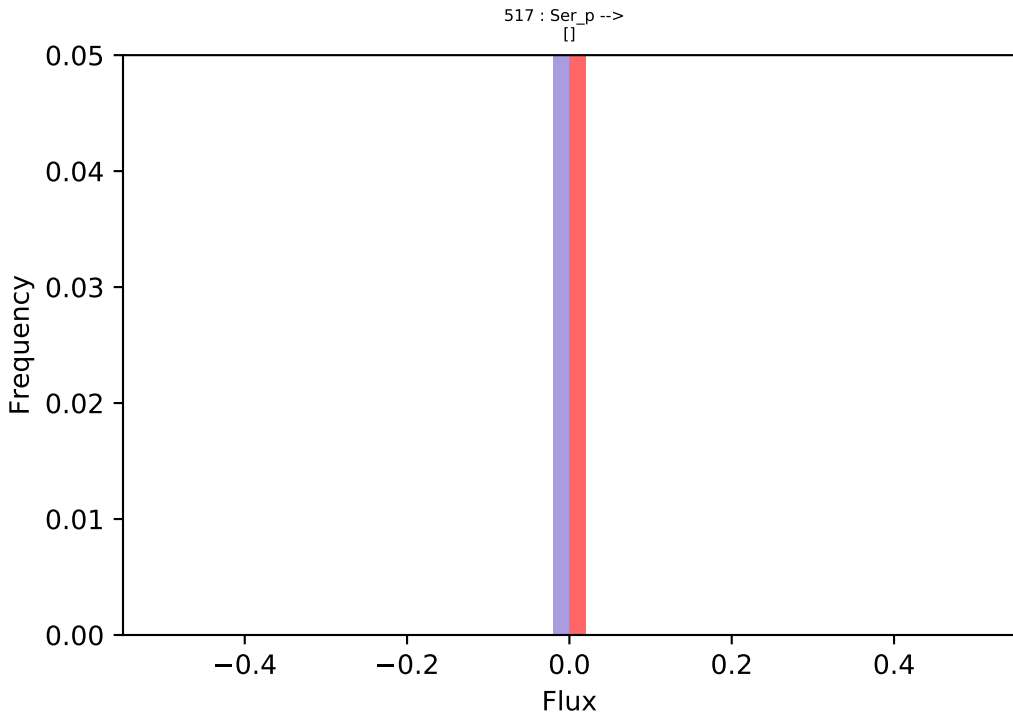


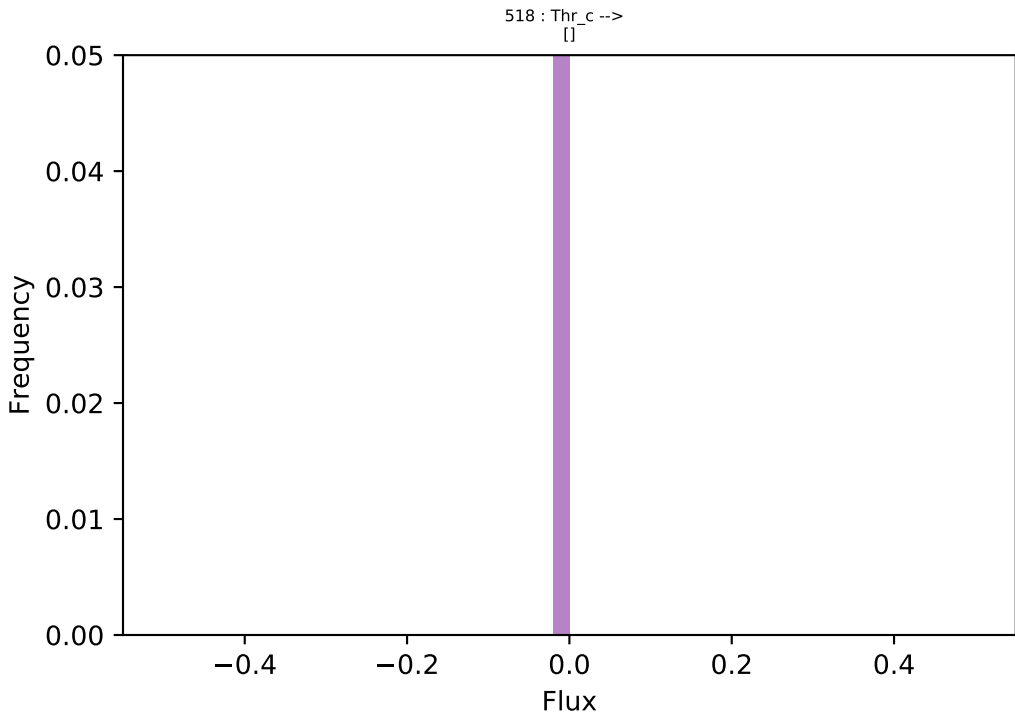


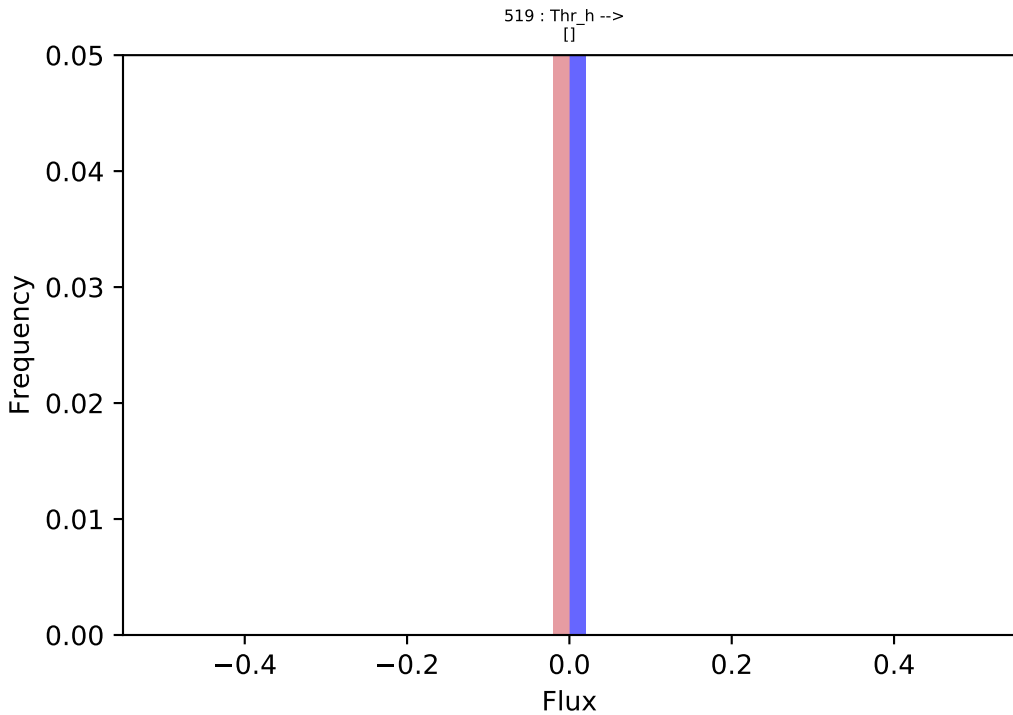
515 : Ser\_h -->  
[]



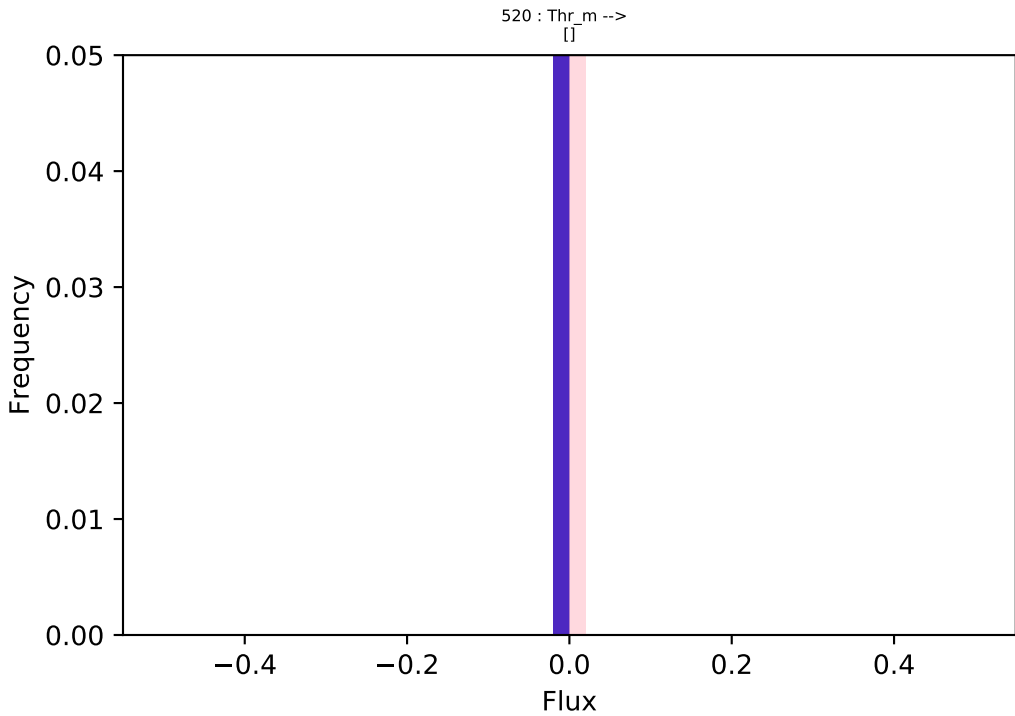


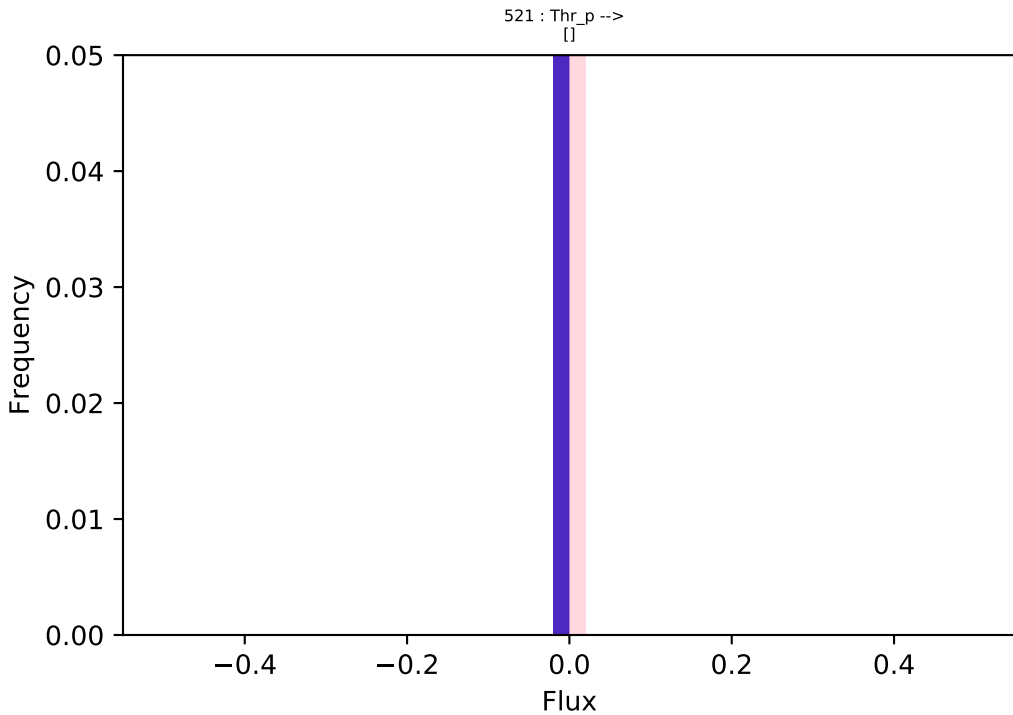


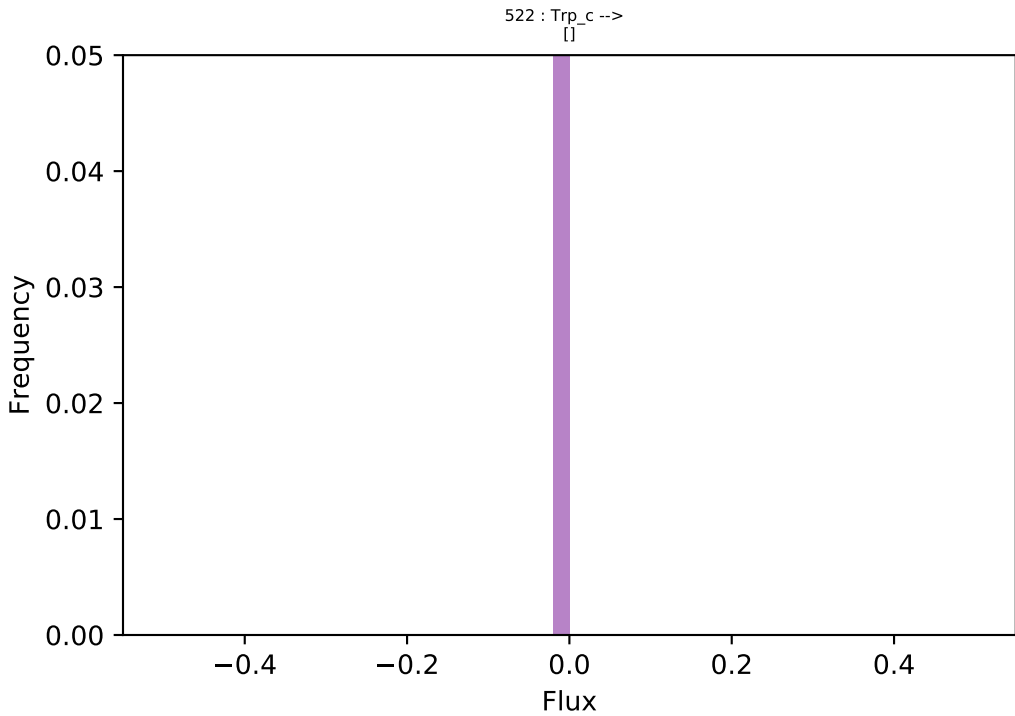


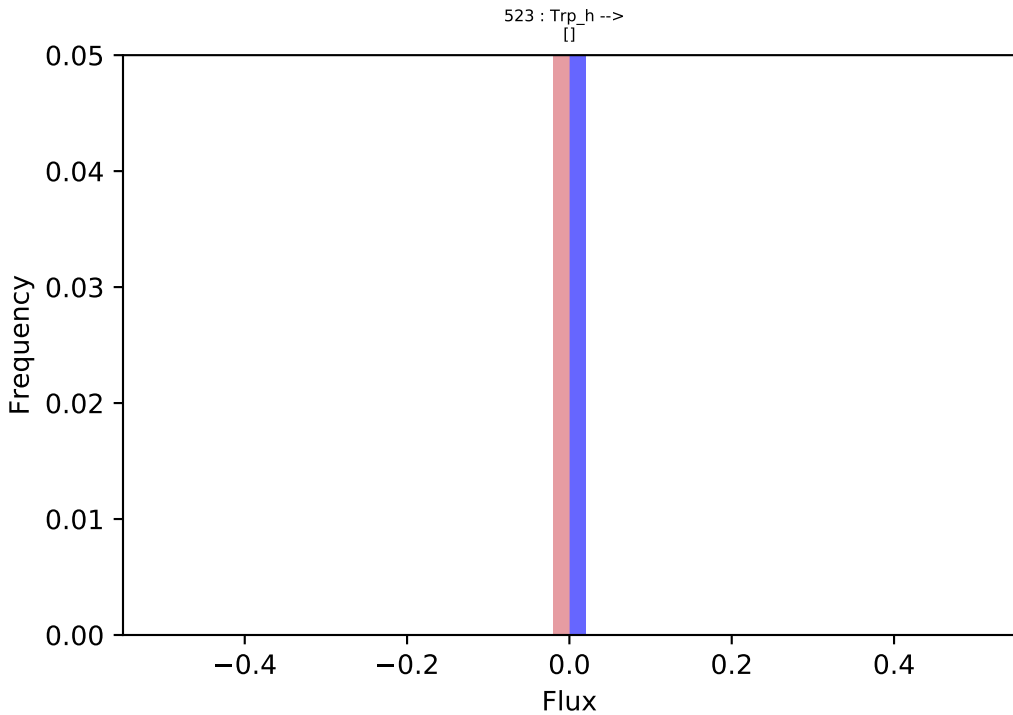




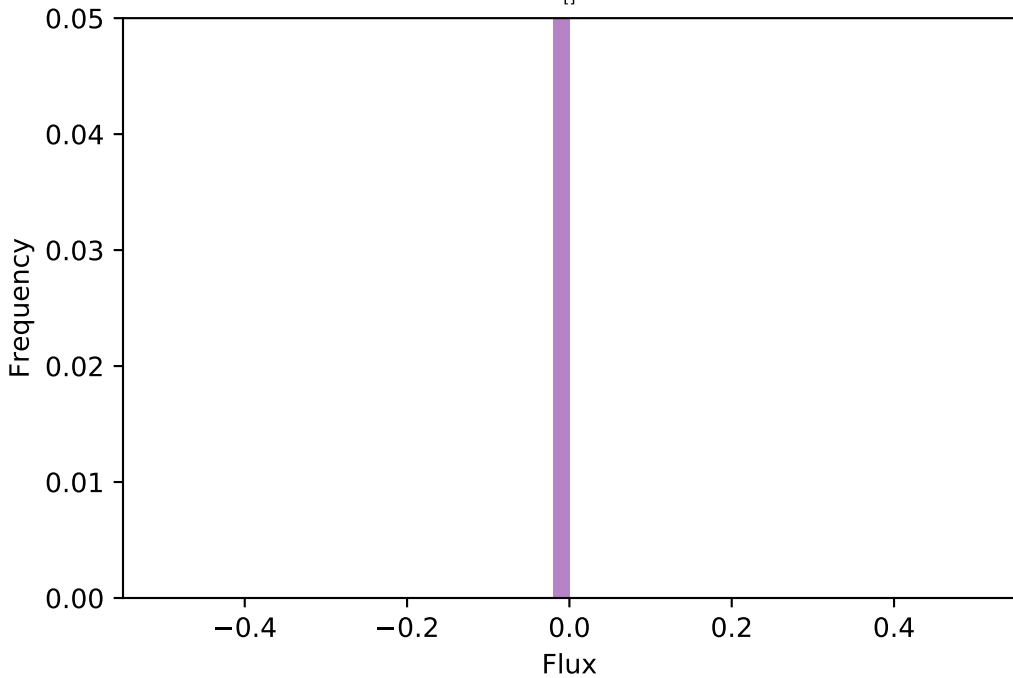


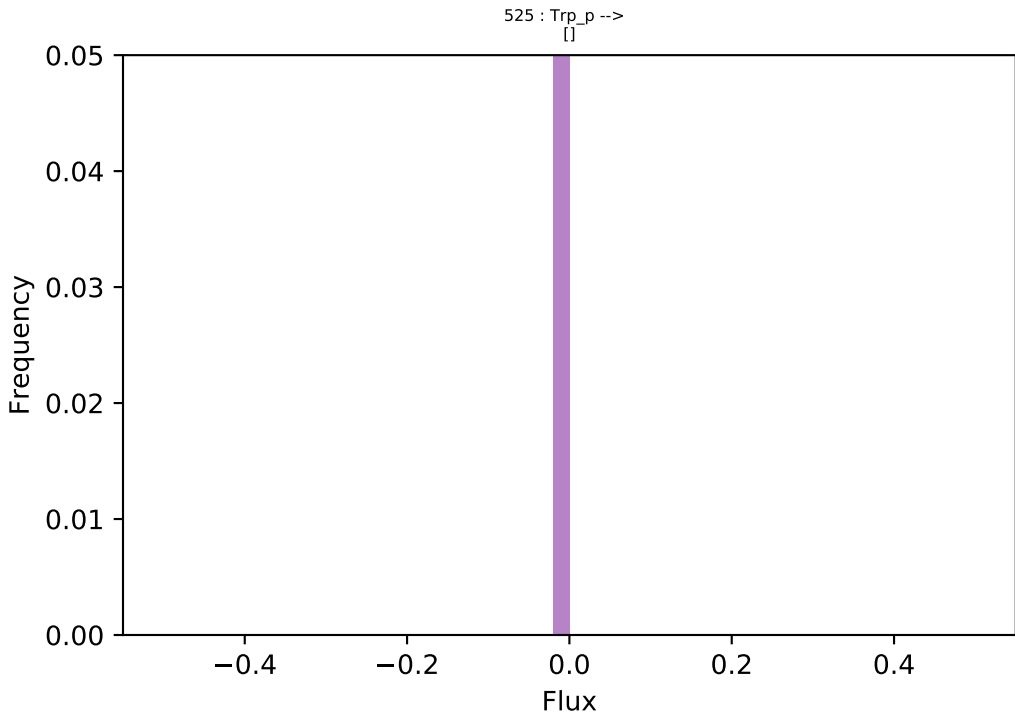


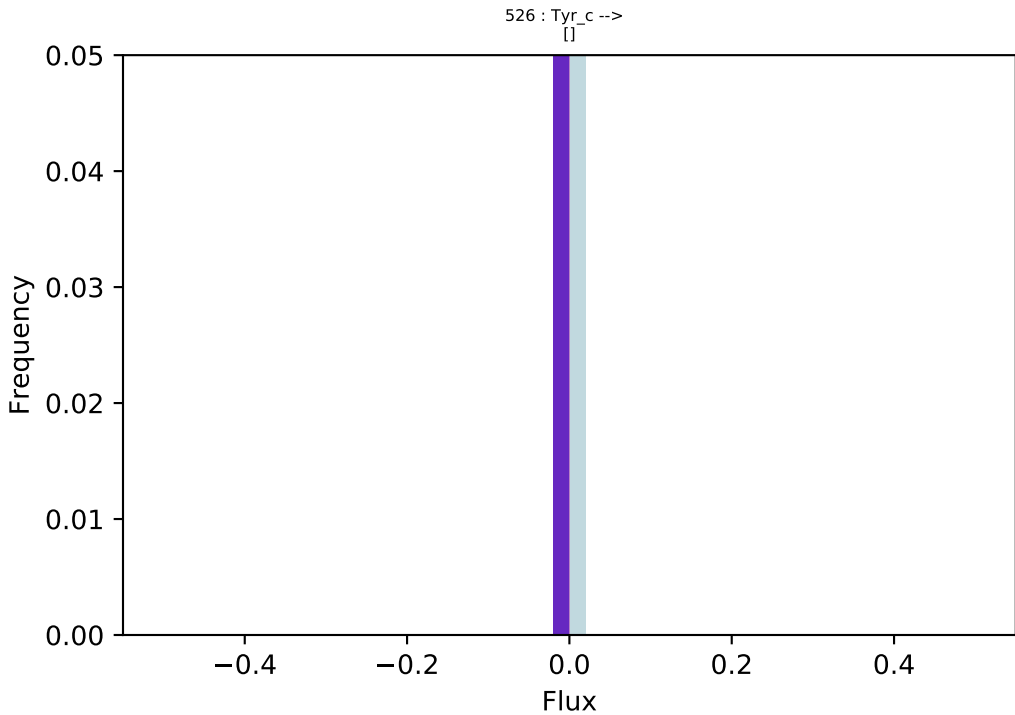




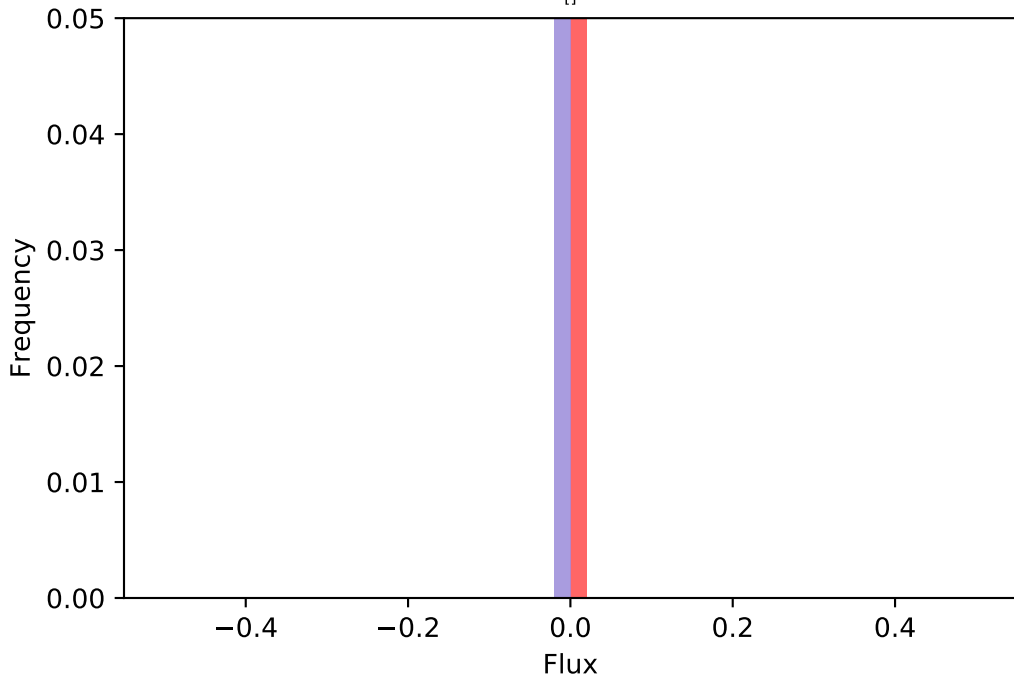
524 : Trp\_m -->  
[]



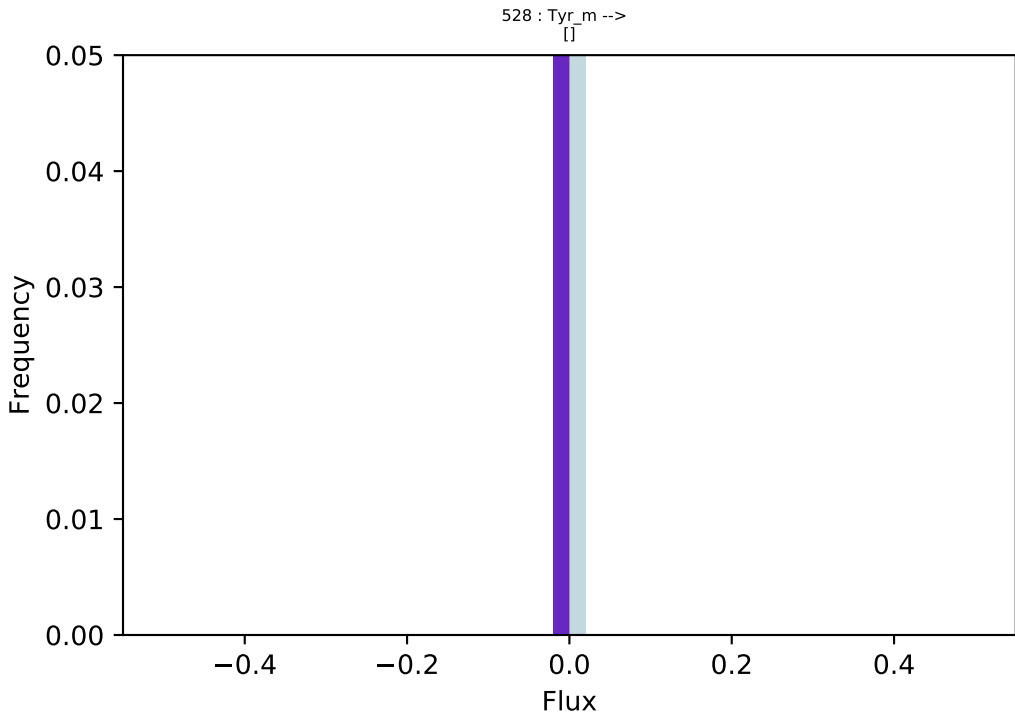


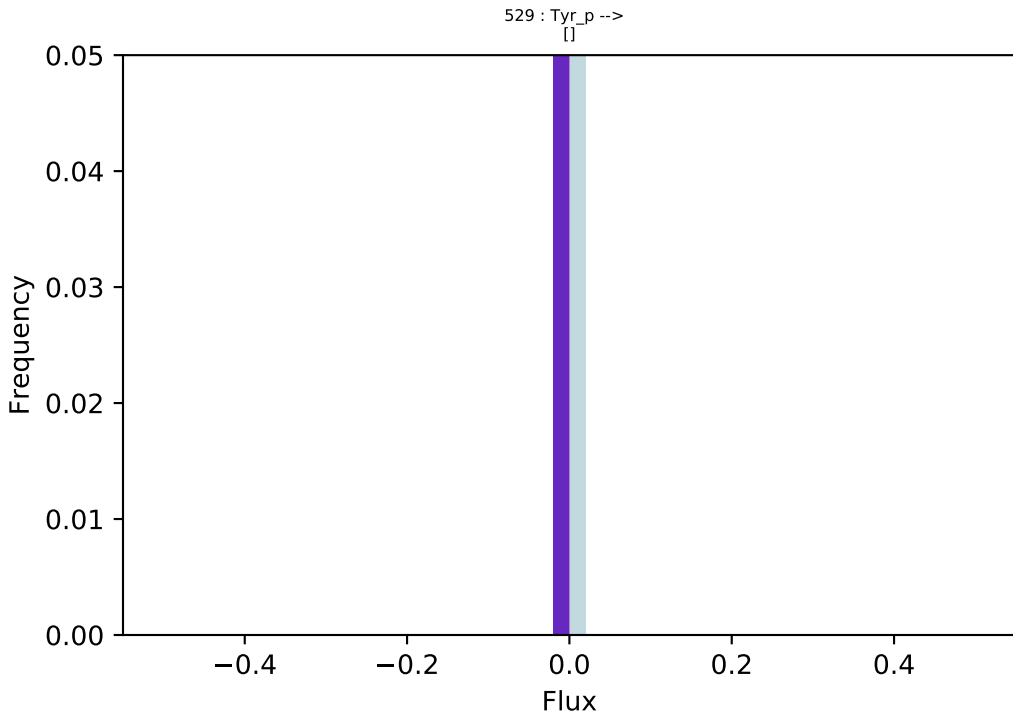


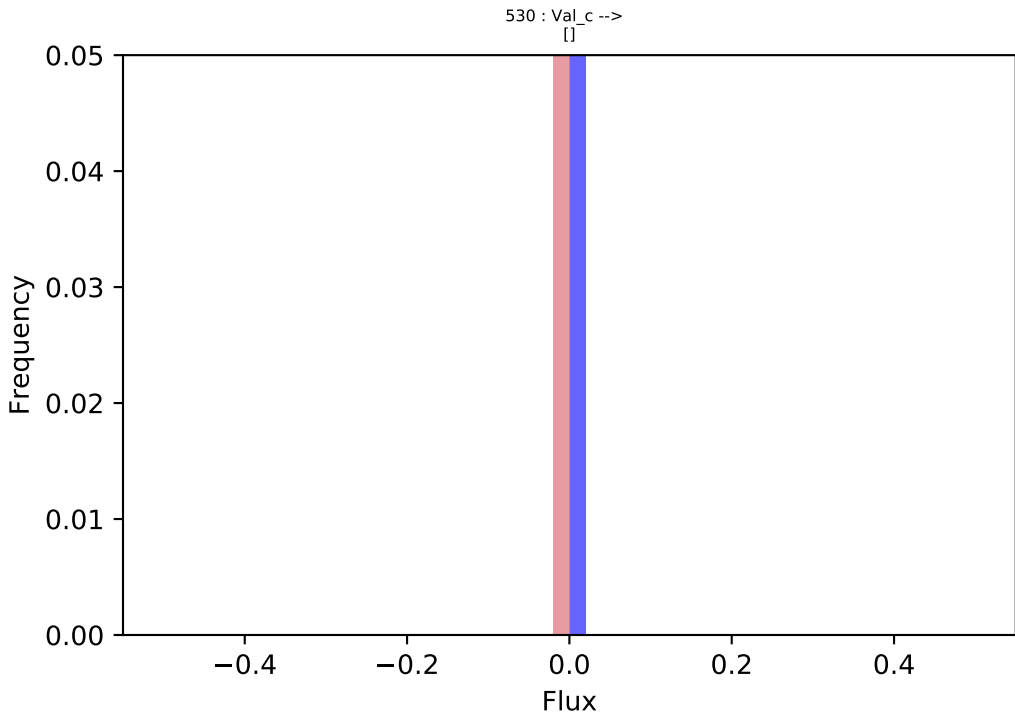
527 : Tyr\_h -->  
[]

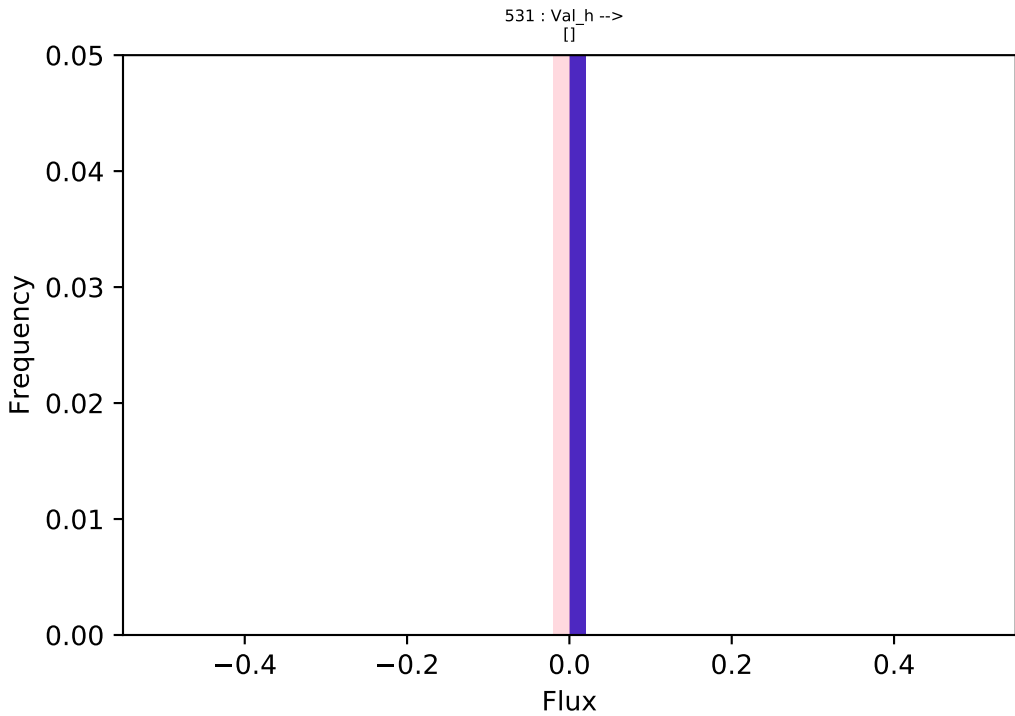


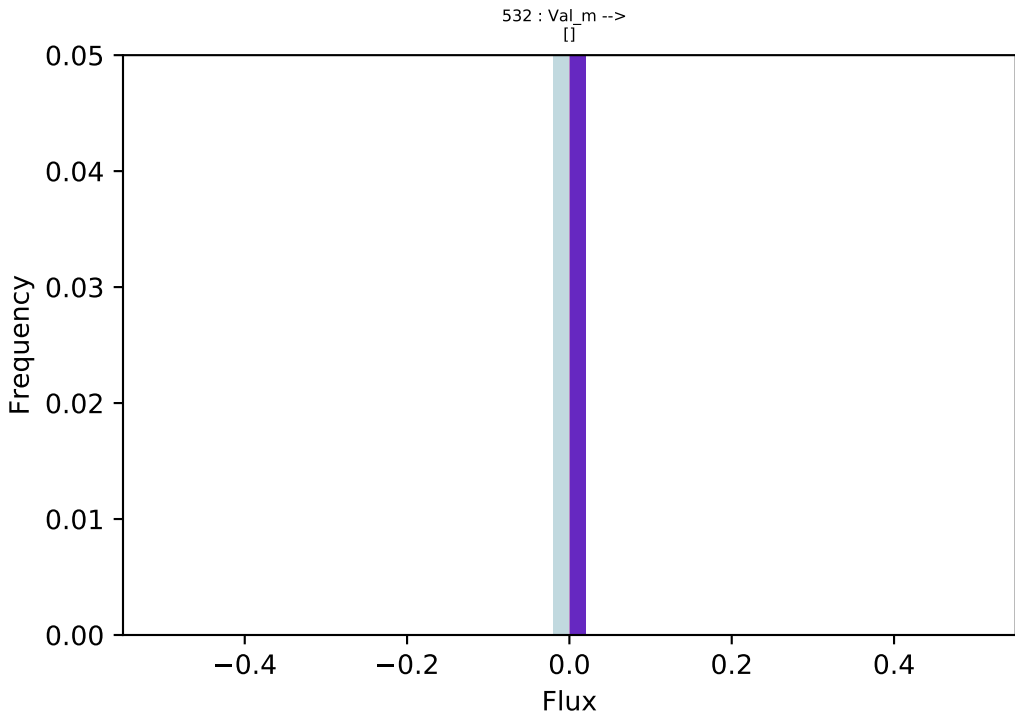




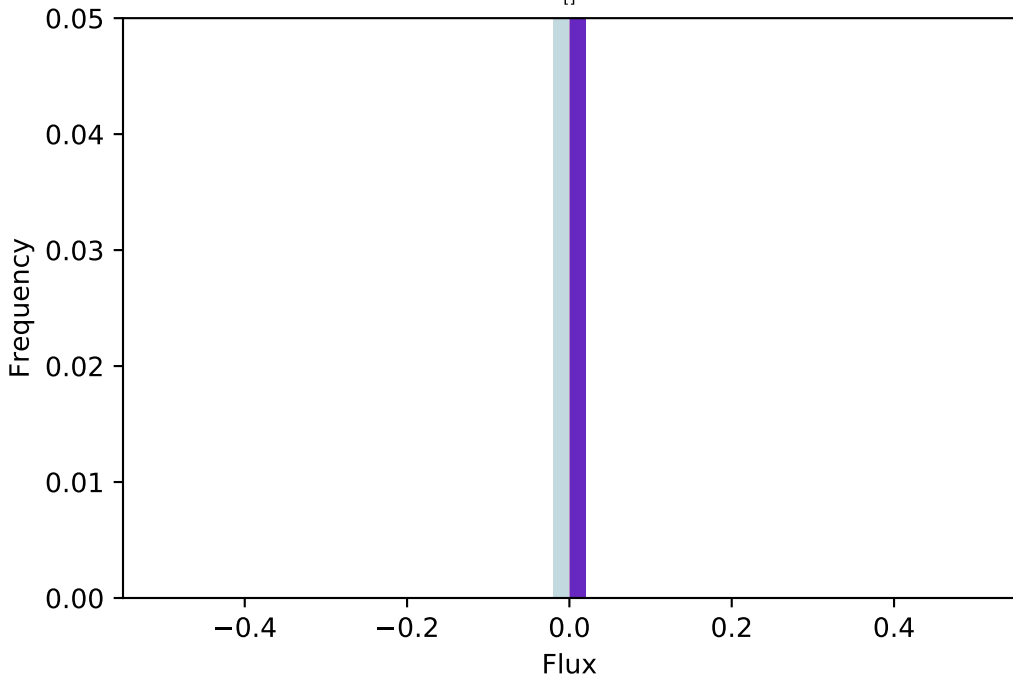




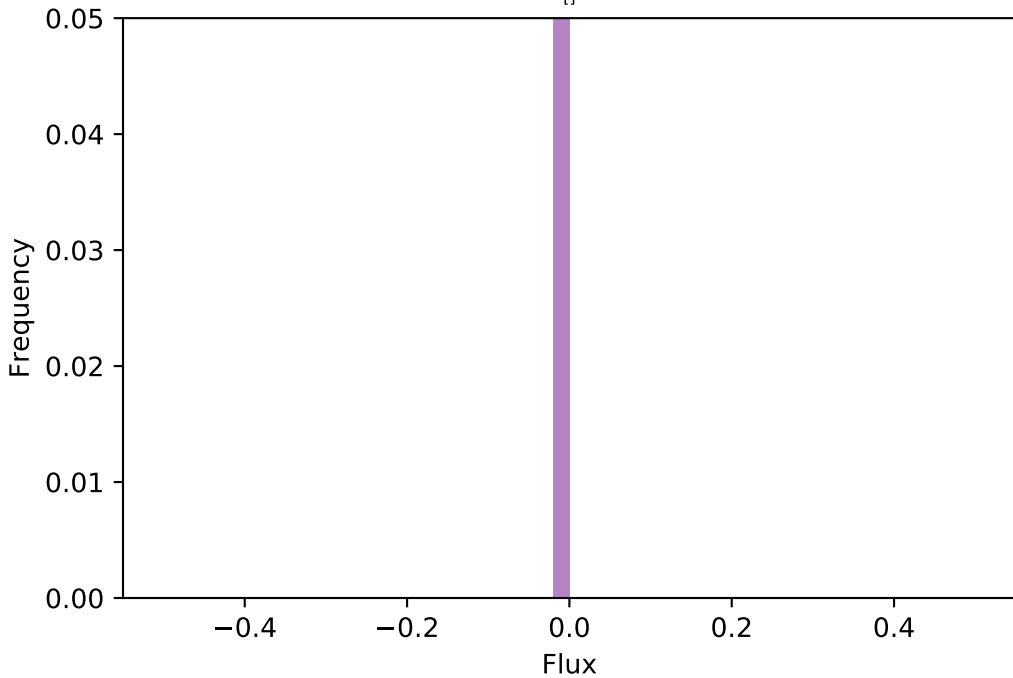


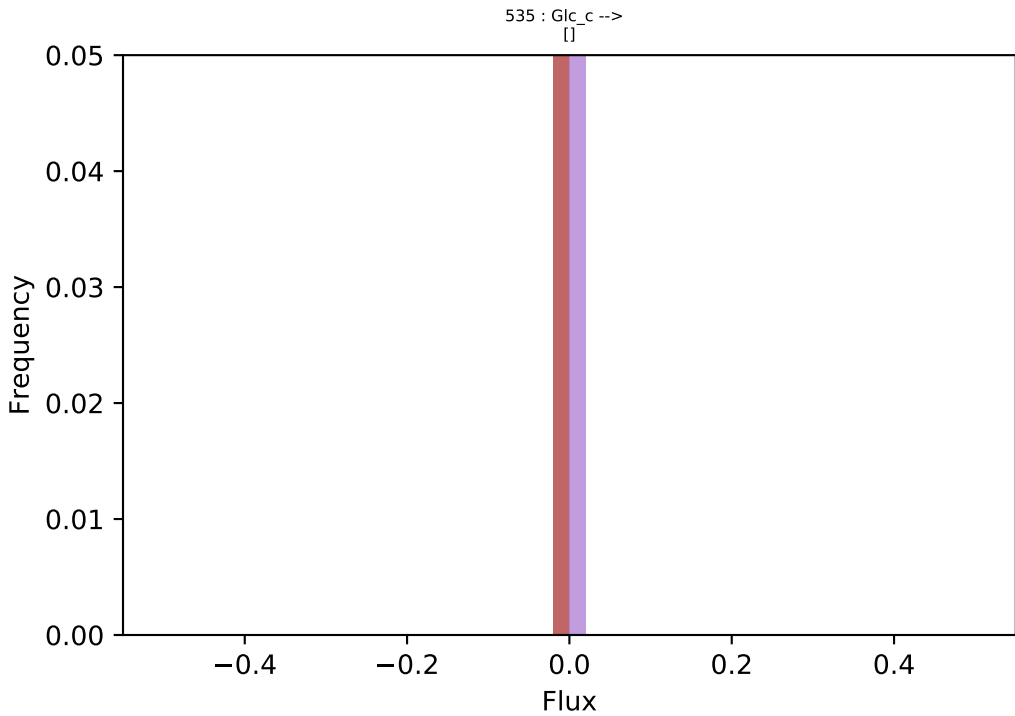


533 : Val\_p -->  
[]

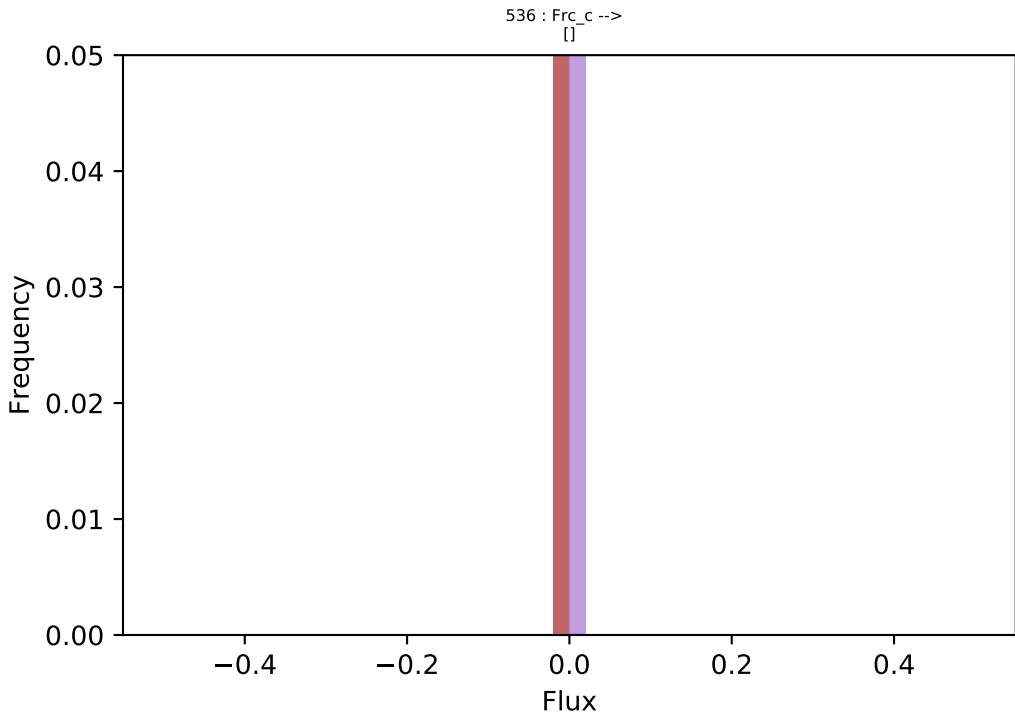


534 : starch3\_h -->  
[]

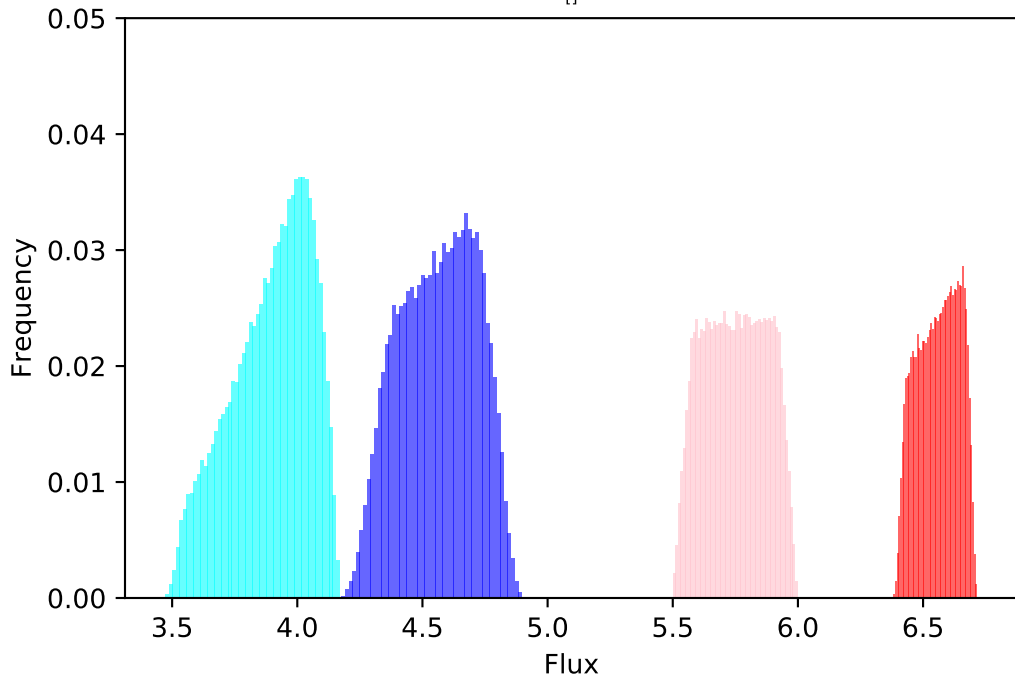




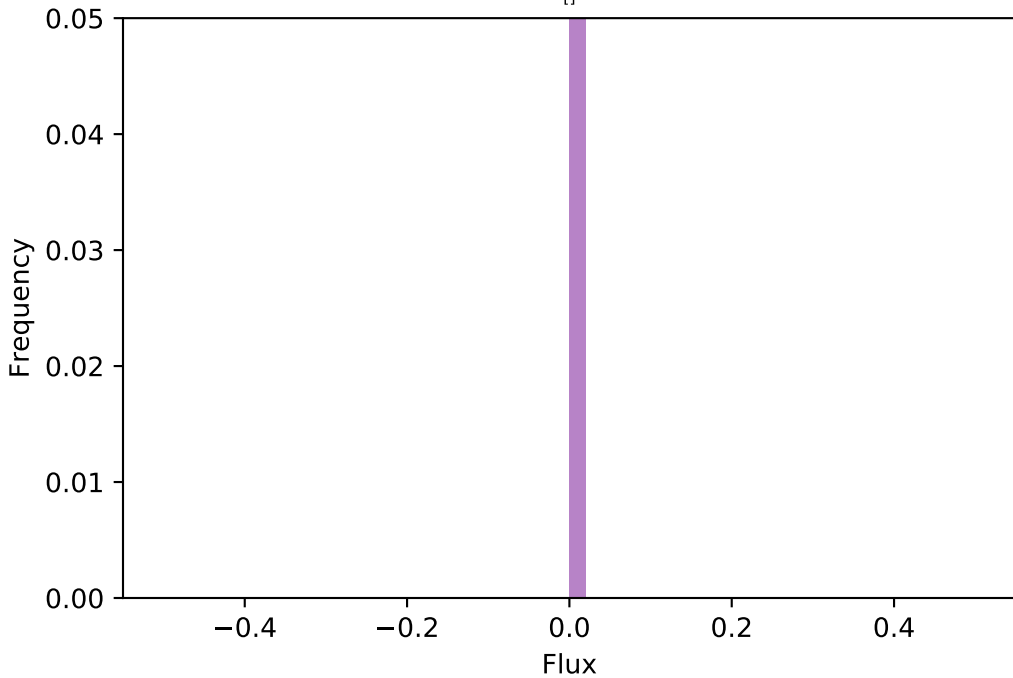


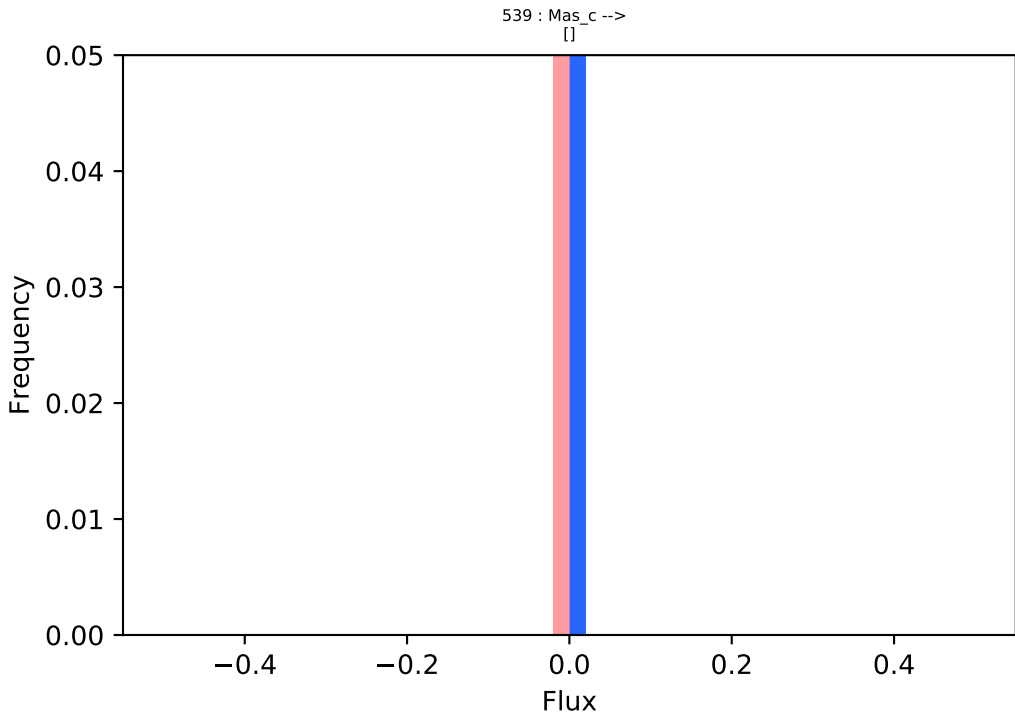


537 : Suc\_c -->  
[]

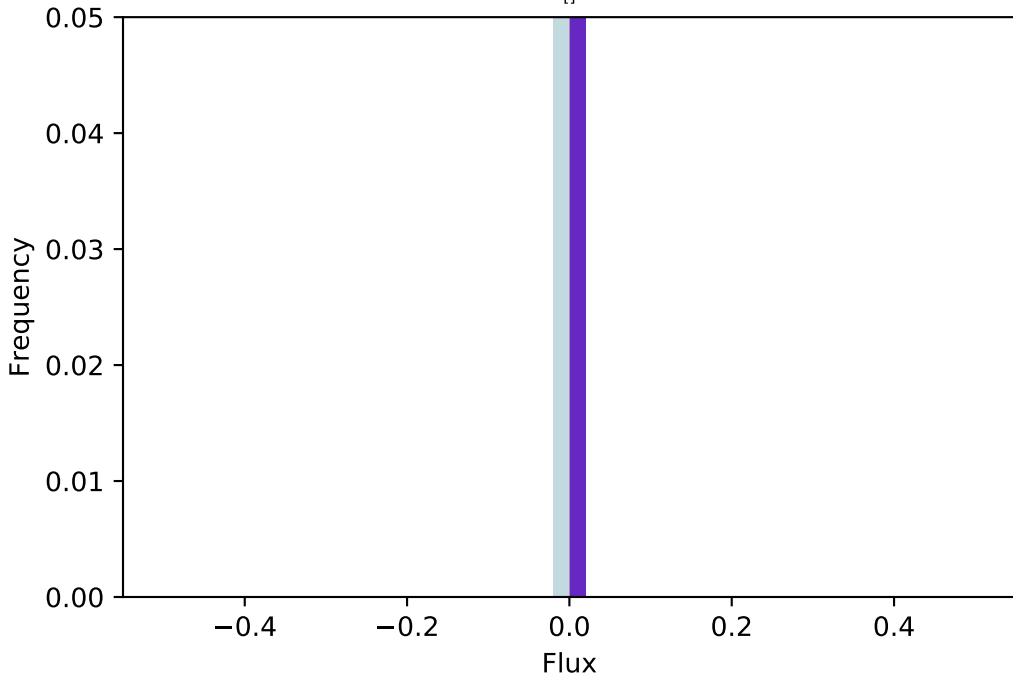


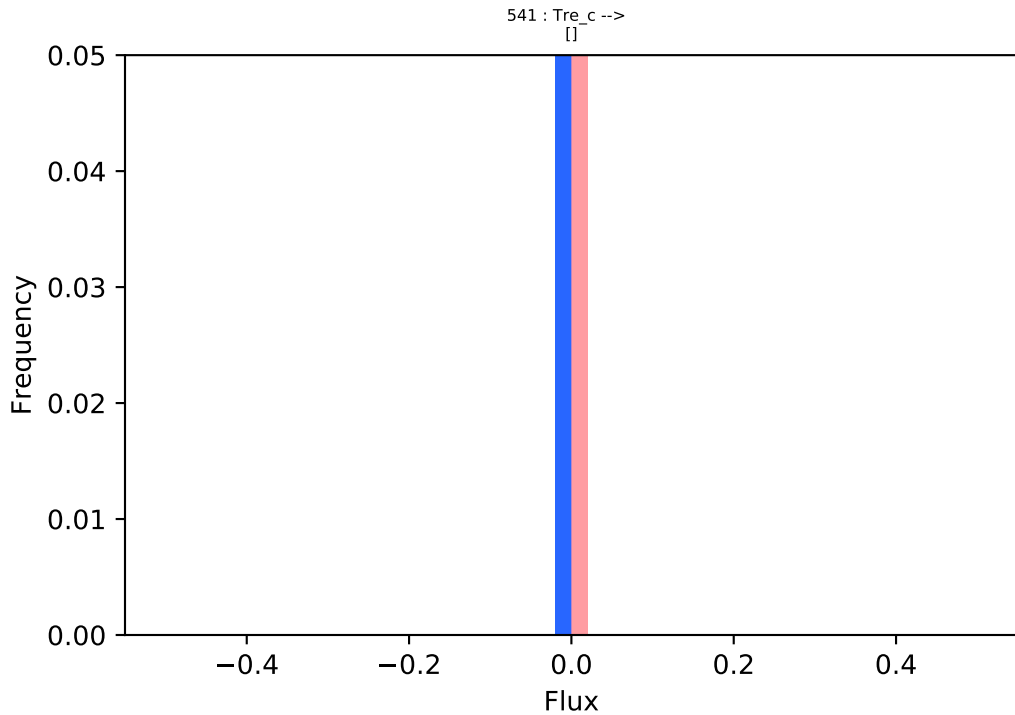
538 : cellulose3\_c -->  
[]



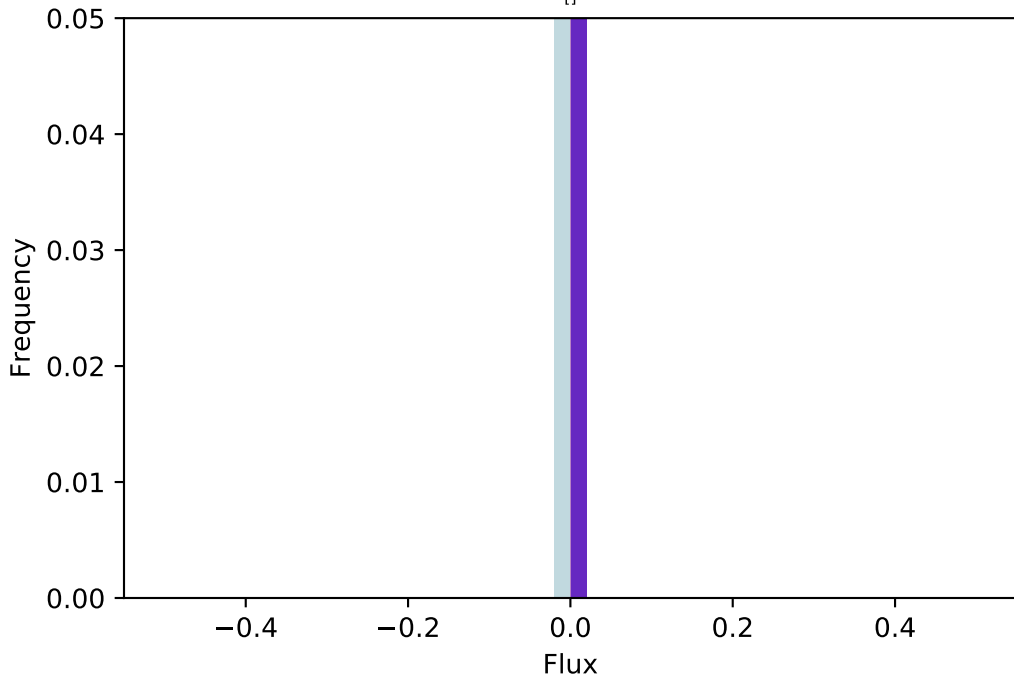


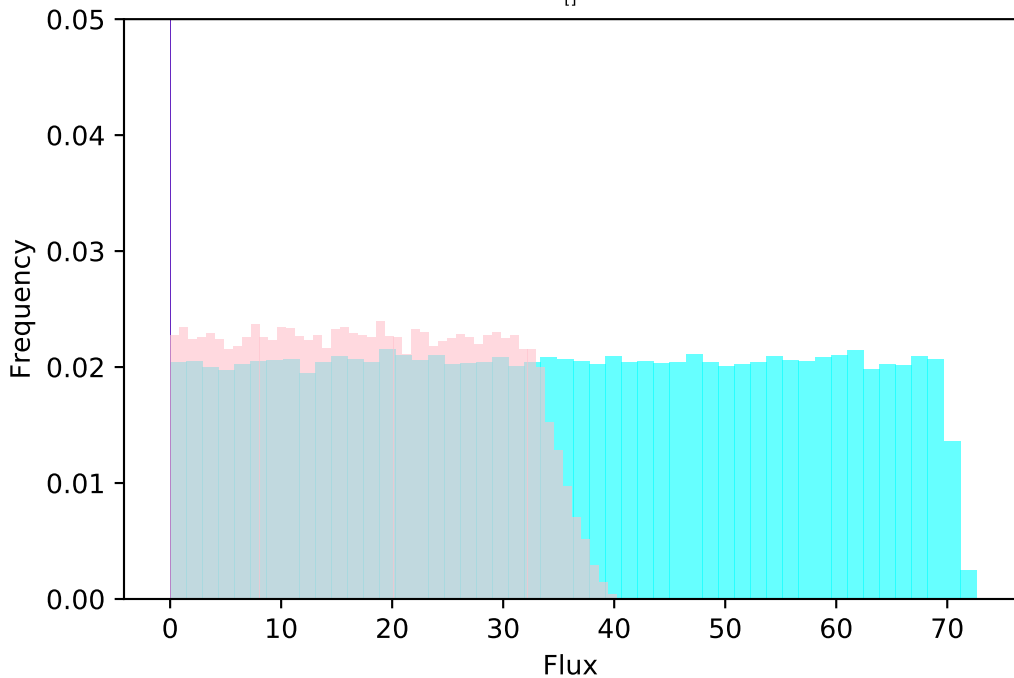
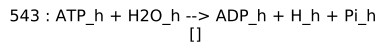
540 : M\_DASH\_ACP\_h --> ACP\_h + H\_h  
[ ]





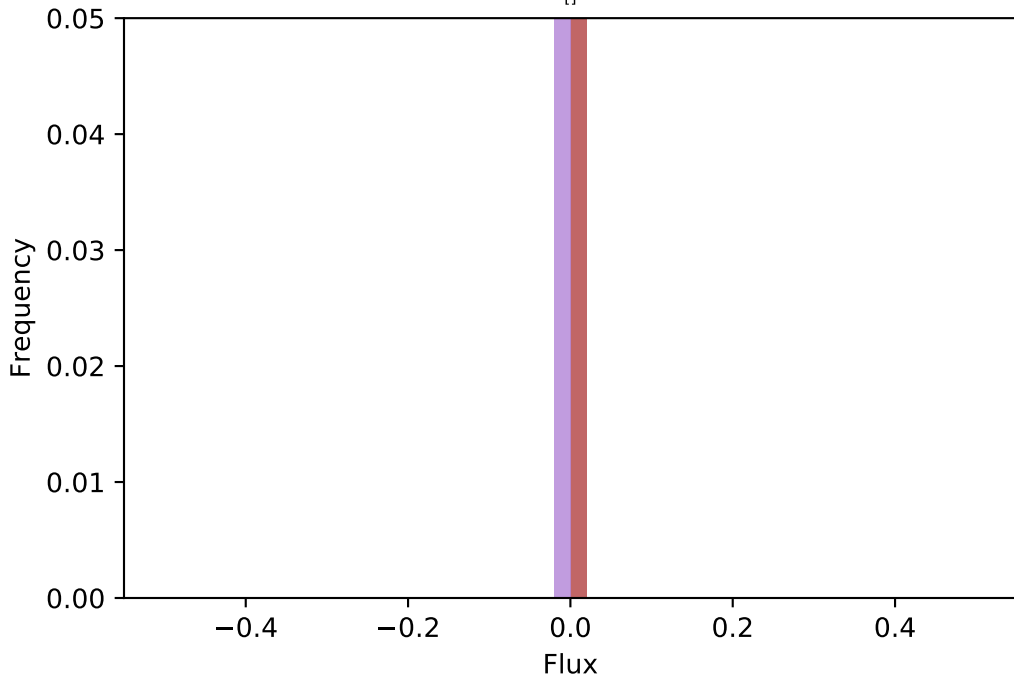
542 : ATP\_c + H2O\_c --> ADP\_c + H\_c + Pi\_c  
[ ]





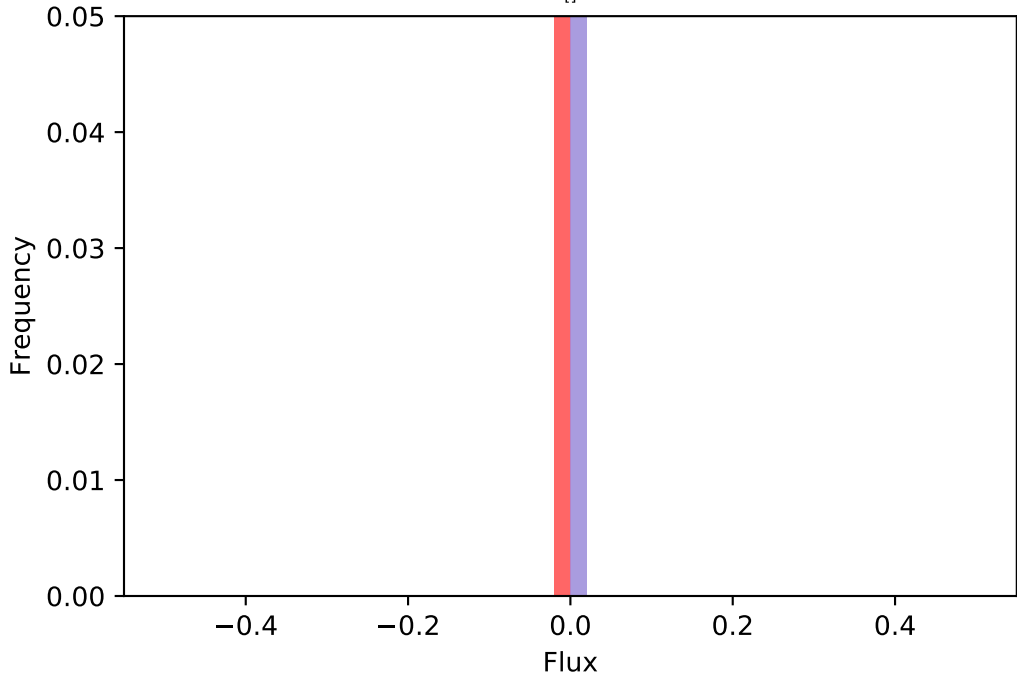


544 : ATP\_m + H2O\_m --> ADP\_m + H\_m + Pi\_m  
[ ]

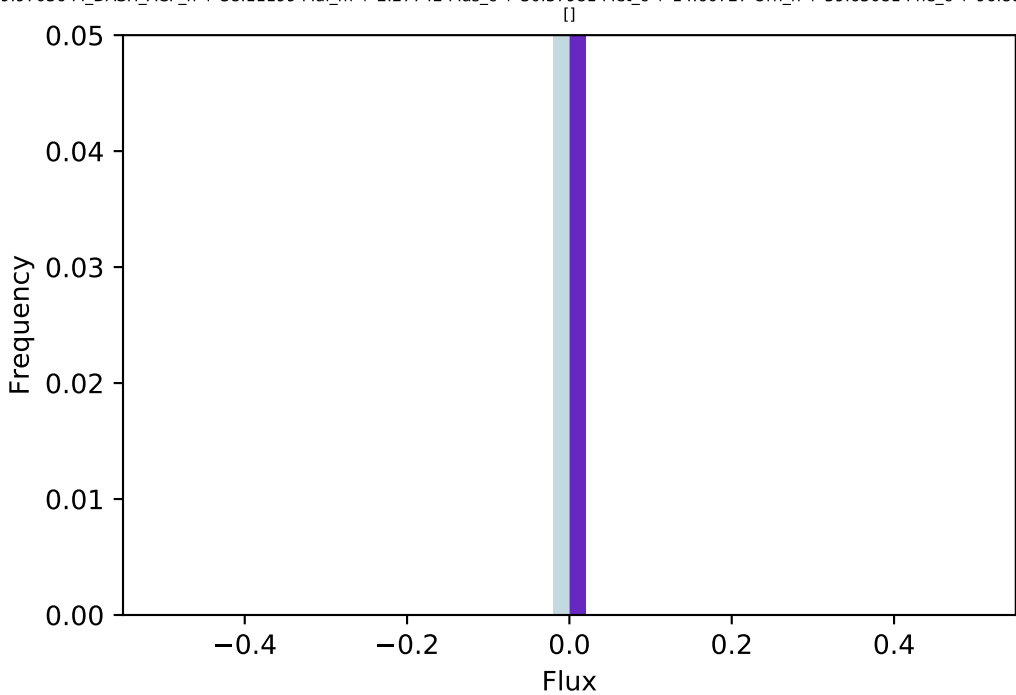


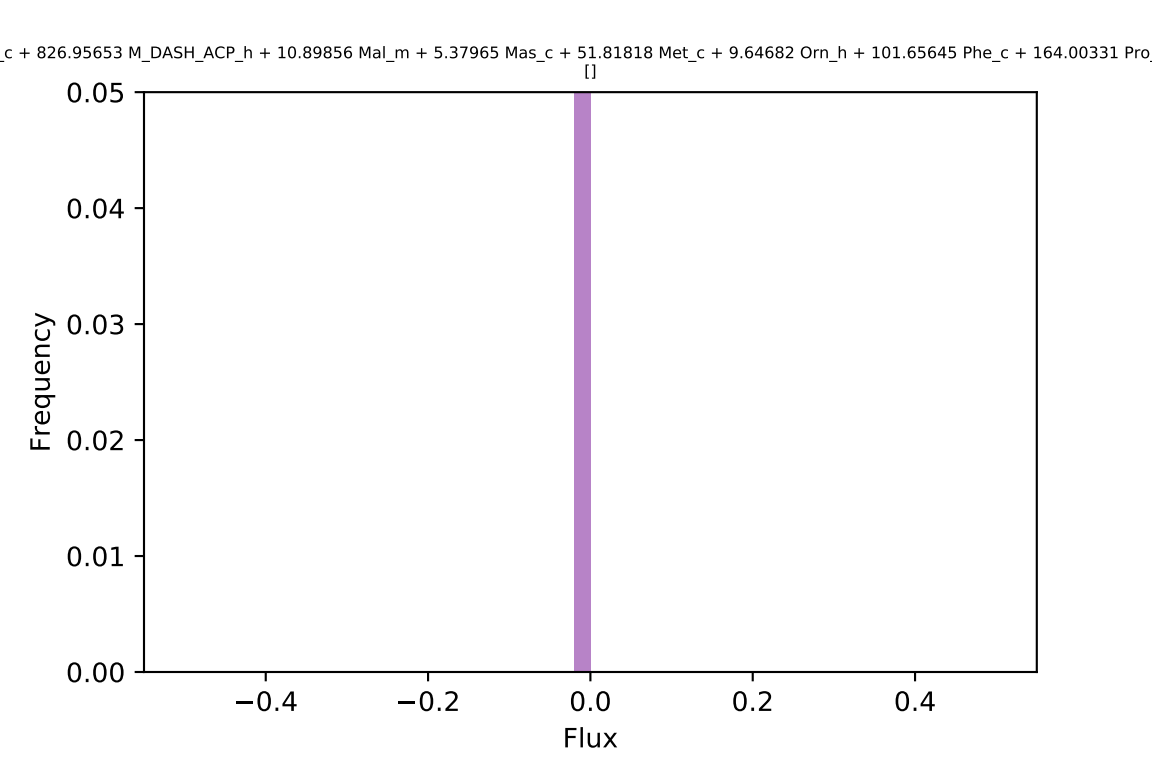
Arg\_c + Asn\_c + Asp\_c + Cys\_c + Gln\_c + Glu\_c + Gly\_c + His\_c + Ile\_c + Leu\_c + Lys\_c + Met\_c + Phe\_c + Pro\_c + Ser\_c + Thr\_c + Trp\_c + T

[ ]

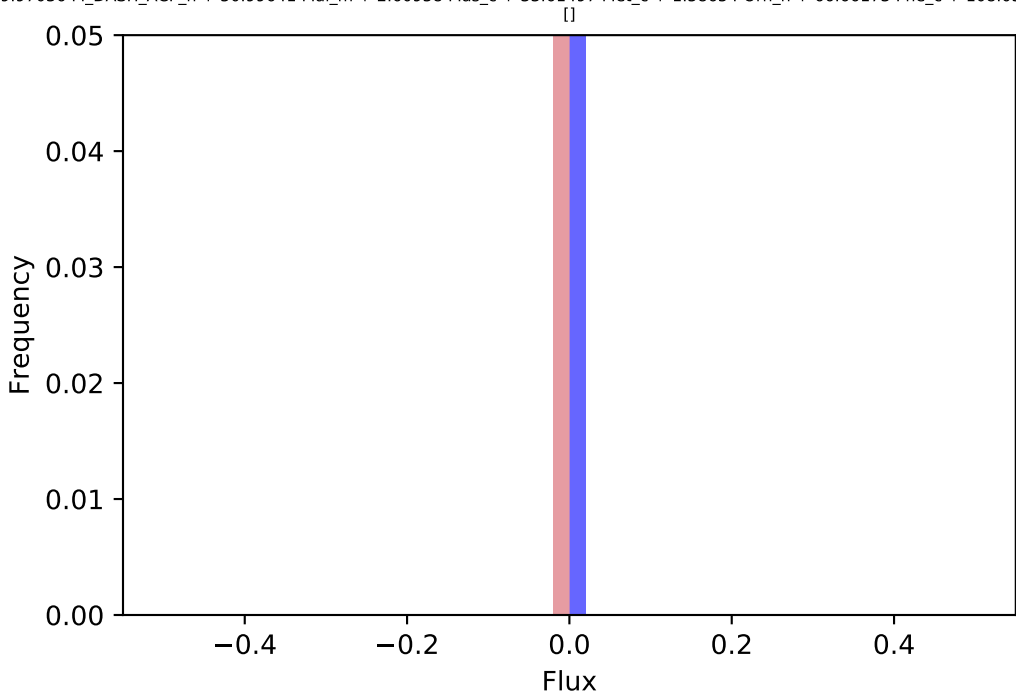


779.97036 M\_DASH\_ACP\_h + 38.11199 Mal\_m + 2.27742 Mas\_c + 30.37981 Met\_c + 14.60727 Orn\_h + 59.65081 Phe\_c + 96.88322 Pro\_c + 0

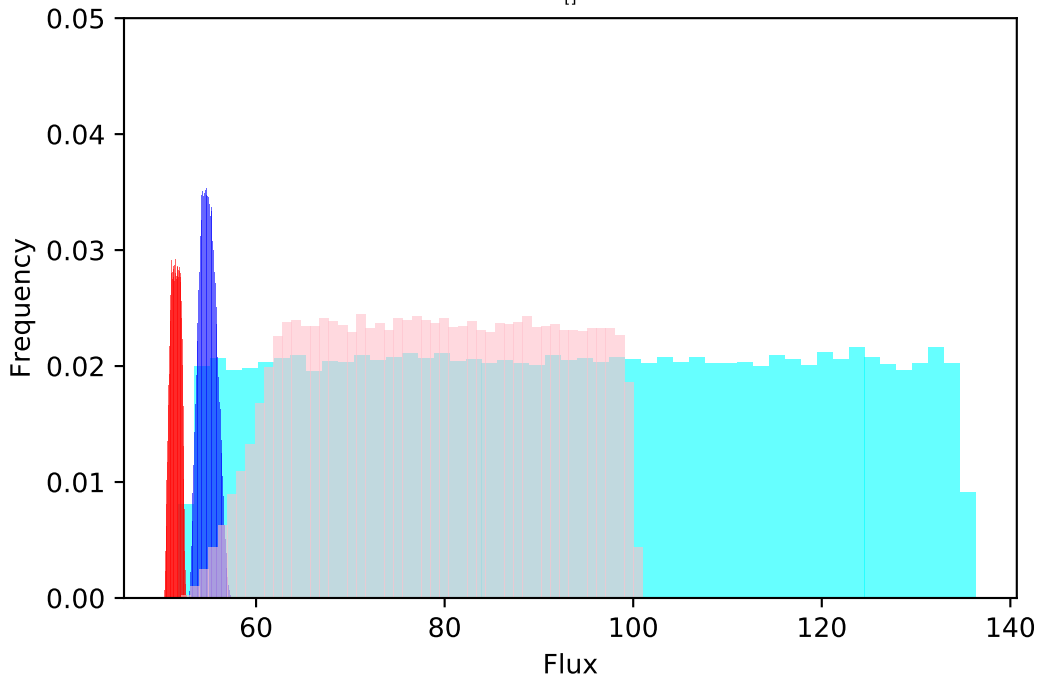




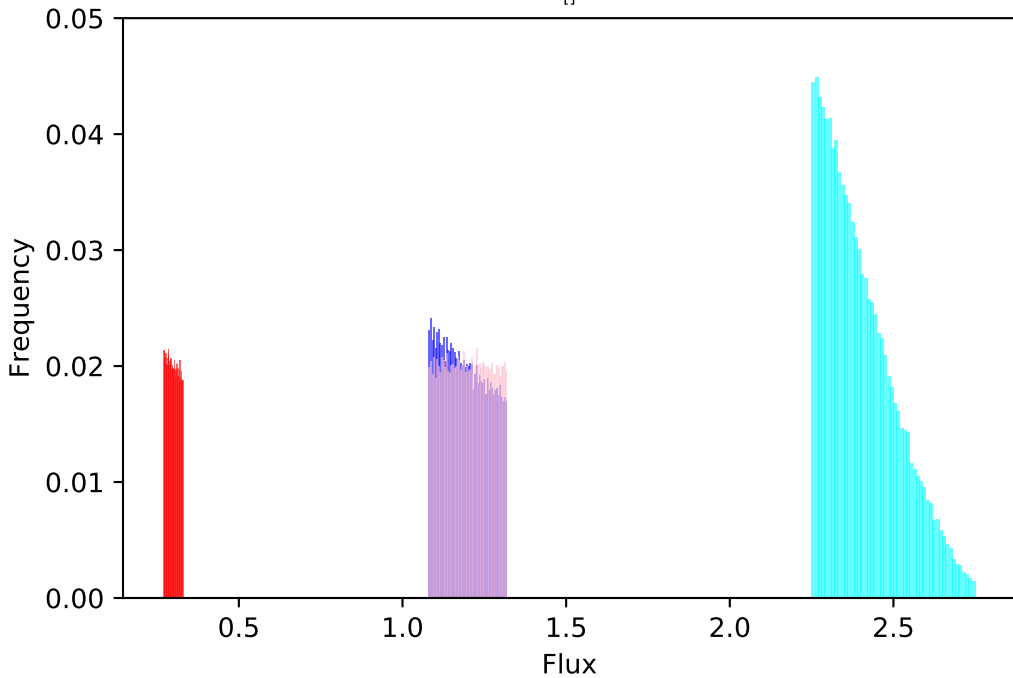
779.97036 M\_DASH\_ACP\_h + 50.99641 Mal\_m + 2.60958 Mas\_c + 33.61497 Met\_c + 1.58654 Orn\_h + 66.66173 Phe\_c + 108.03688 Pro\_c + 0



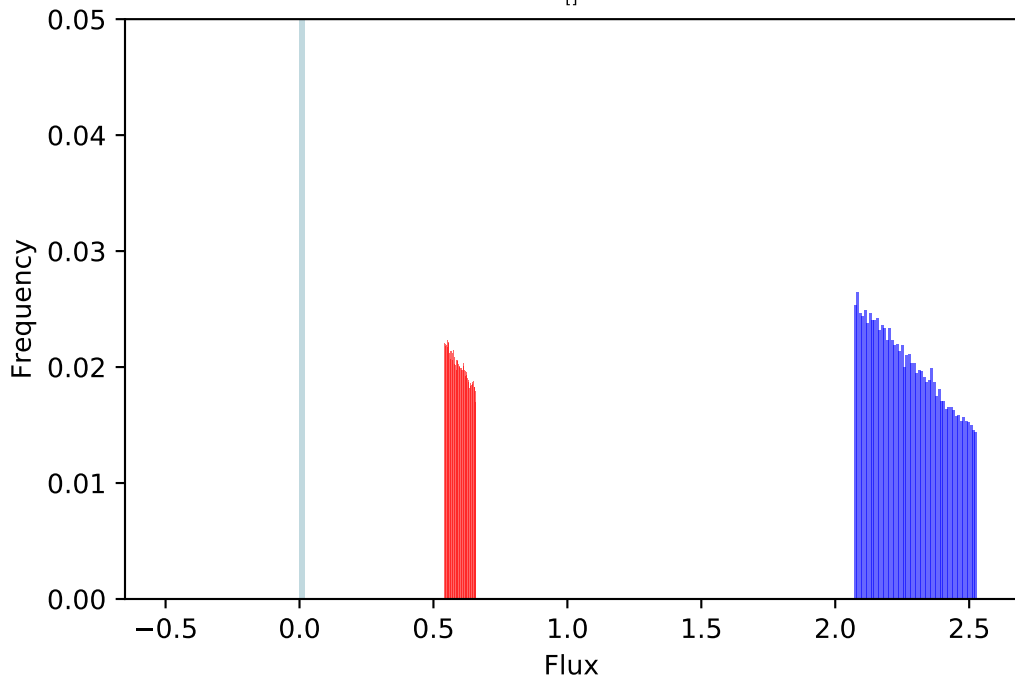
549 : 2.0 Fdrd\_h + 2.0 H\_h + PQ\_h --> 2.0 Fdox\_h + PQH2\_h  
[]



550 : Mal\_c -->  
[]



551 : Fum\_c -->  
[]





552 : starch1\_h -->  
[]

