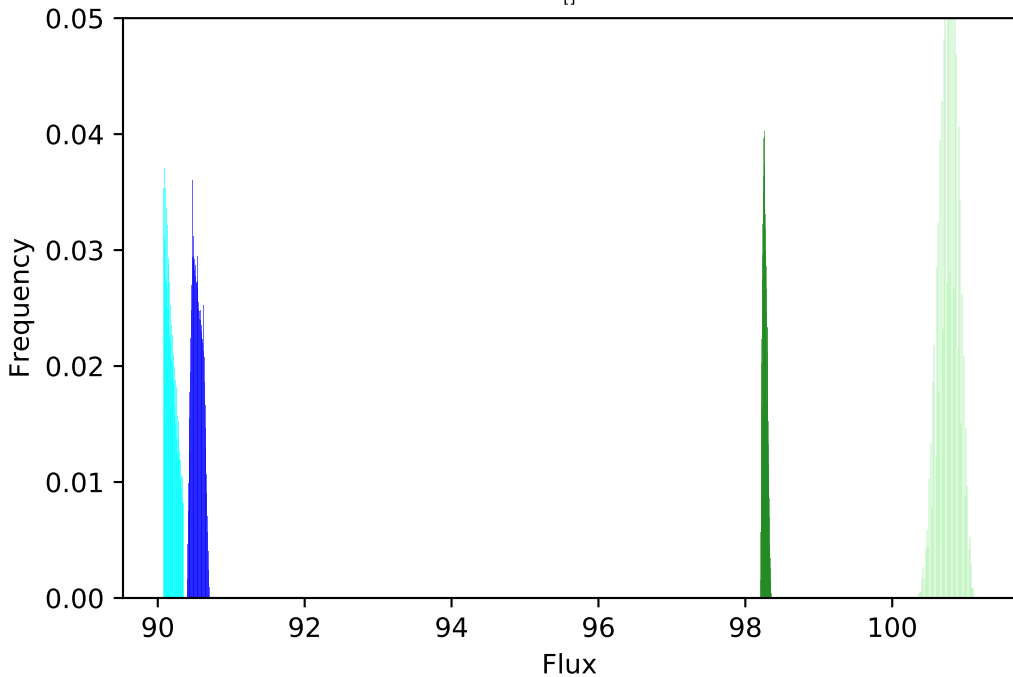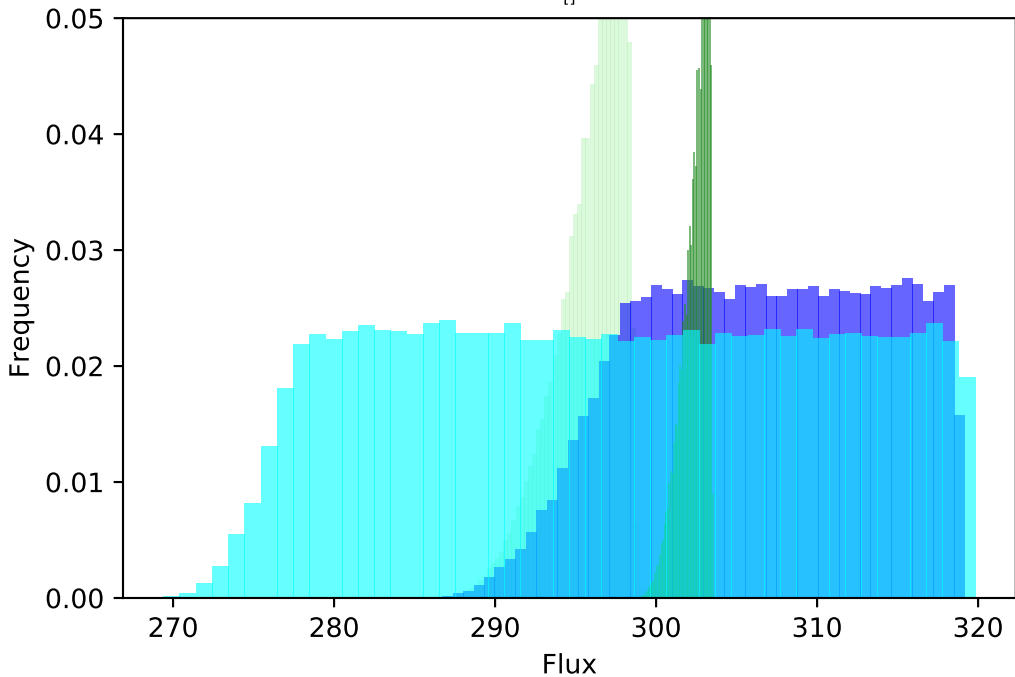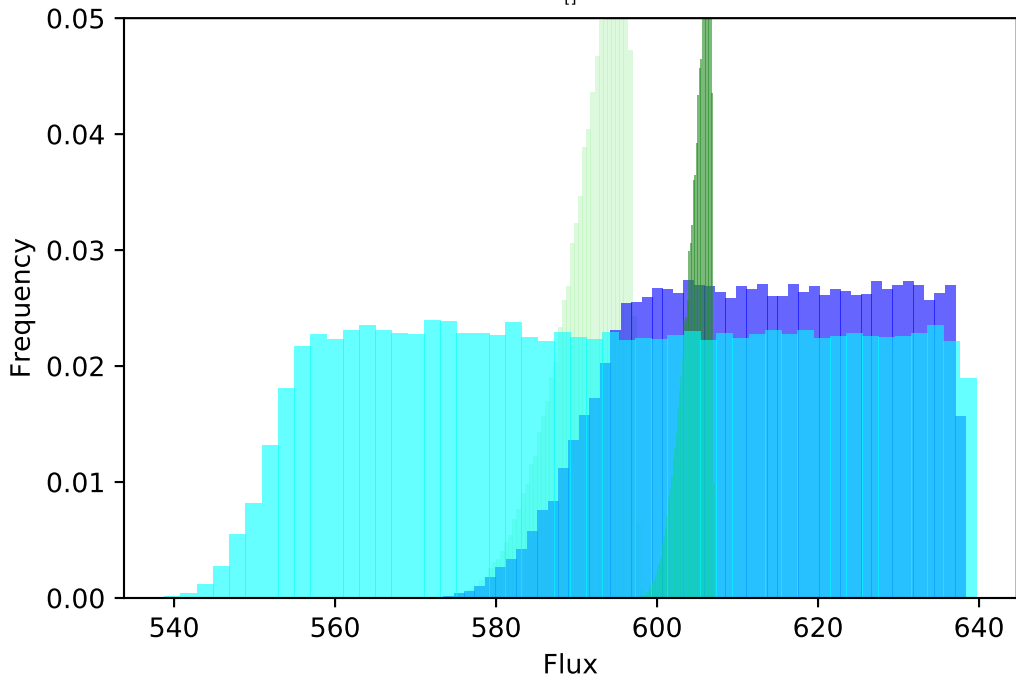0 : 2.0 H2O_h + 4.0 H_h + 2.0 PQ_h + 4.0 hnu_h --> 4.0 H_l + O2_h + 2.0 PQH2_h
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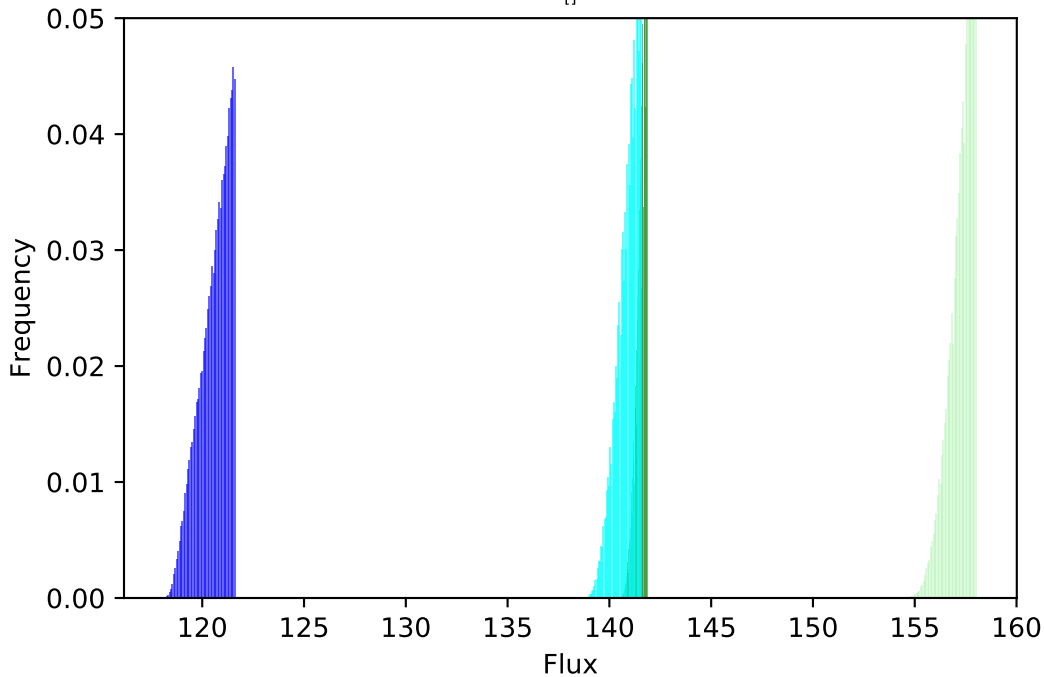
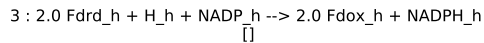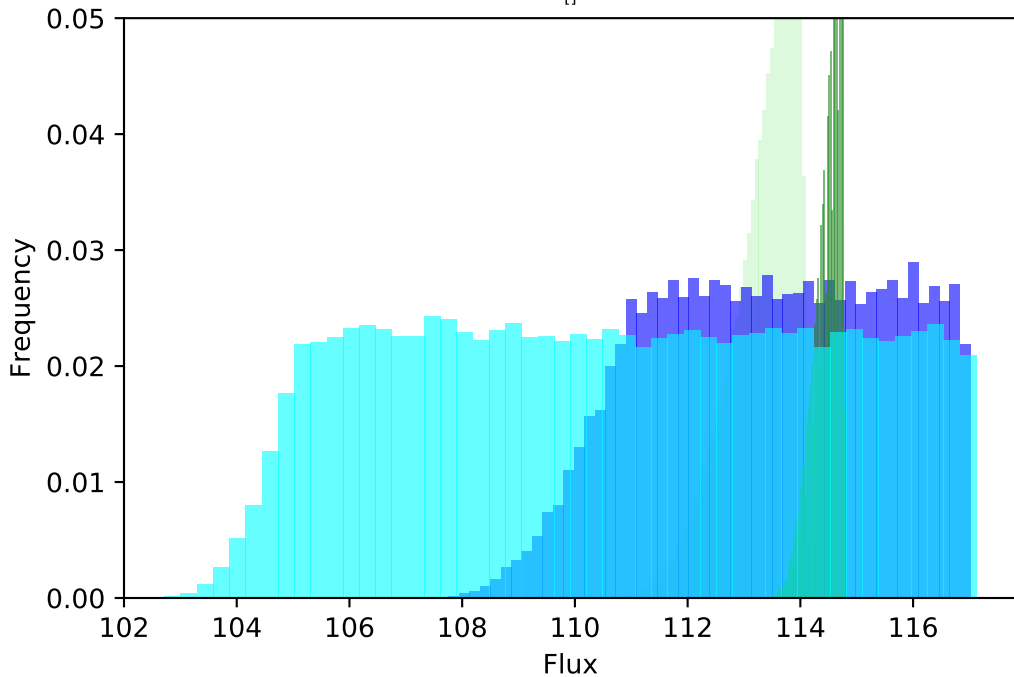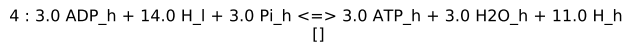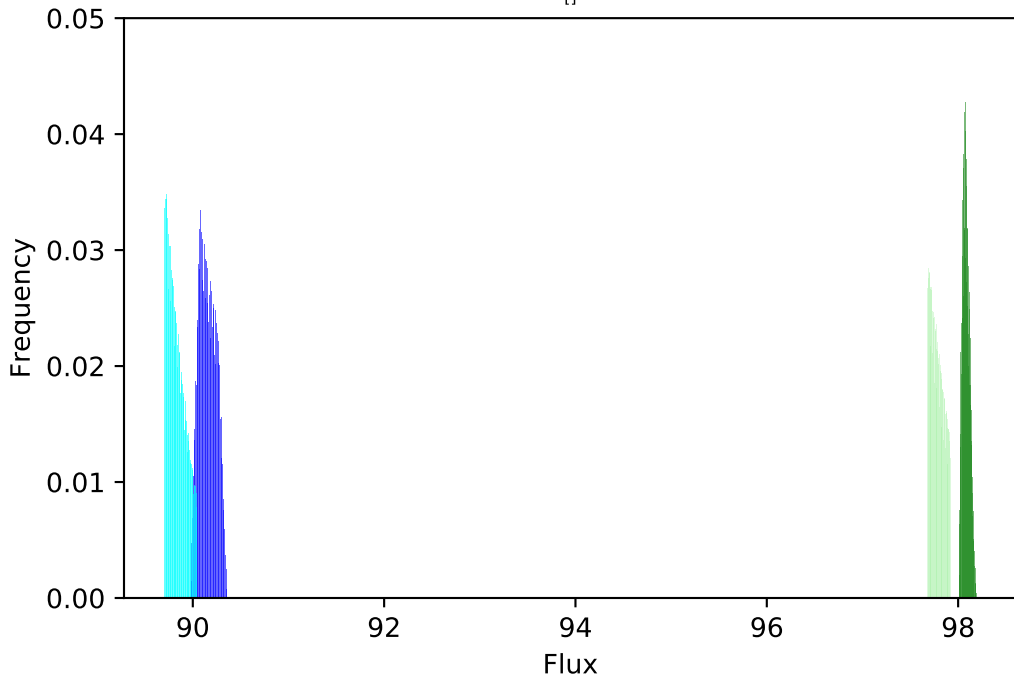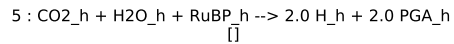1 : 2.0 H_h + 2.0 PCox_h + PQH2_h --> 4.0 H_l + 2.0 PCrd_h + PQ_h
[]

2 : Fdox_h + PCrd_h + hnu_h --> Fdrd_h + PCox_h
[]

3 : 2.0 Fdrd_h + H_h + NADP_h --> 2.0 Fdox_h + NADPH_h
[]

4 : 3.0 ADP_h + 14.0 H_l + 3.0 Pi_h <=> 3.0 ATP_h + 3.0 H2O_h + 11.0 H_h
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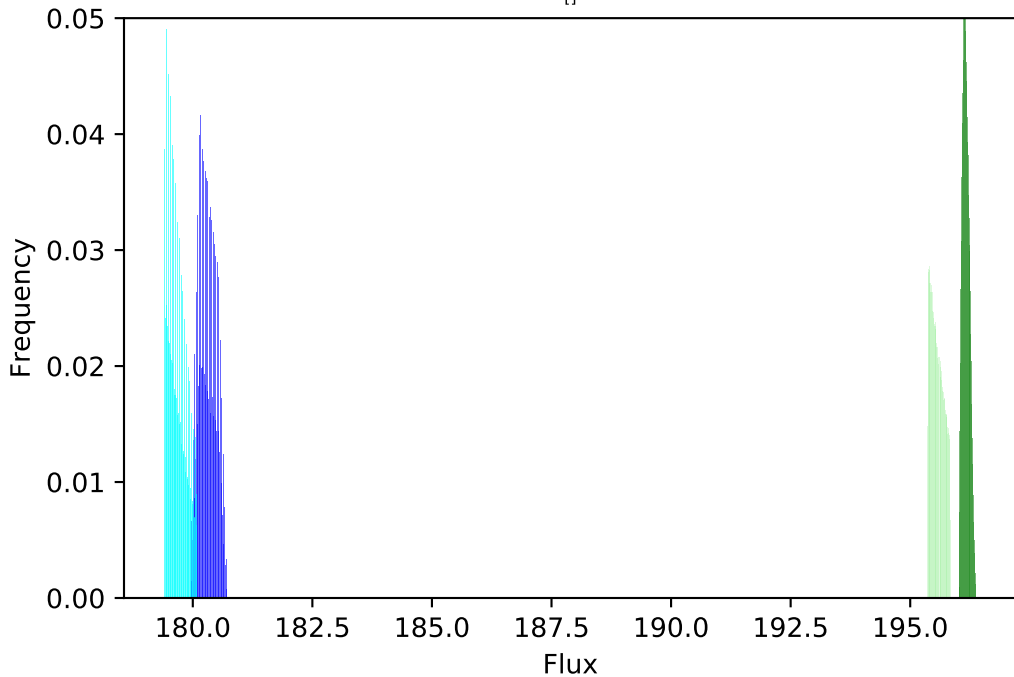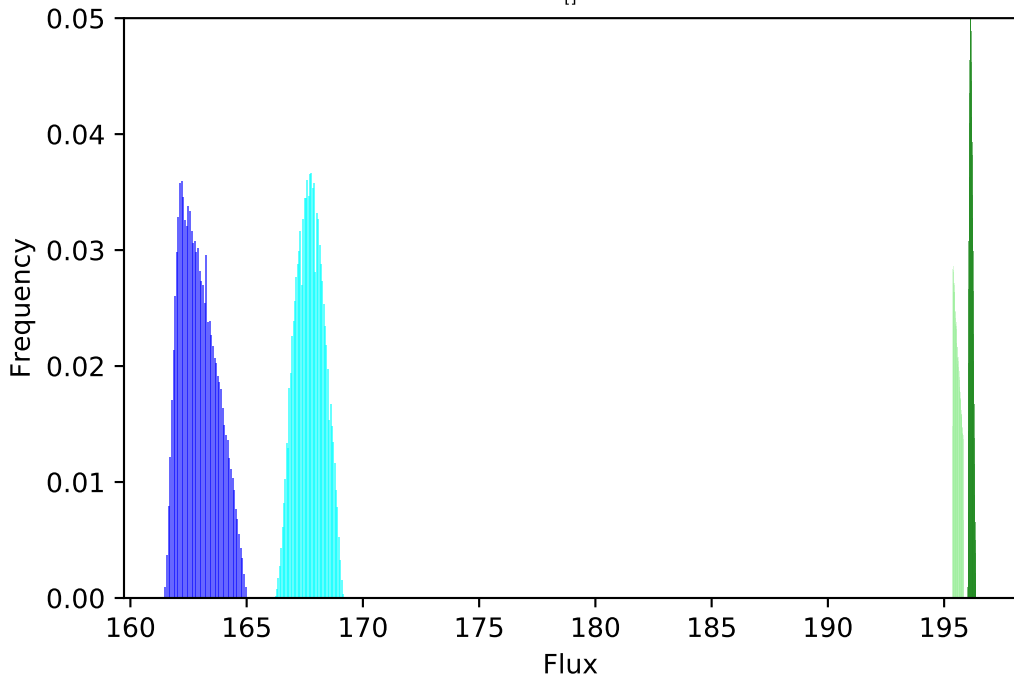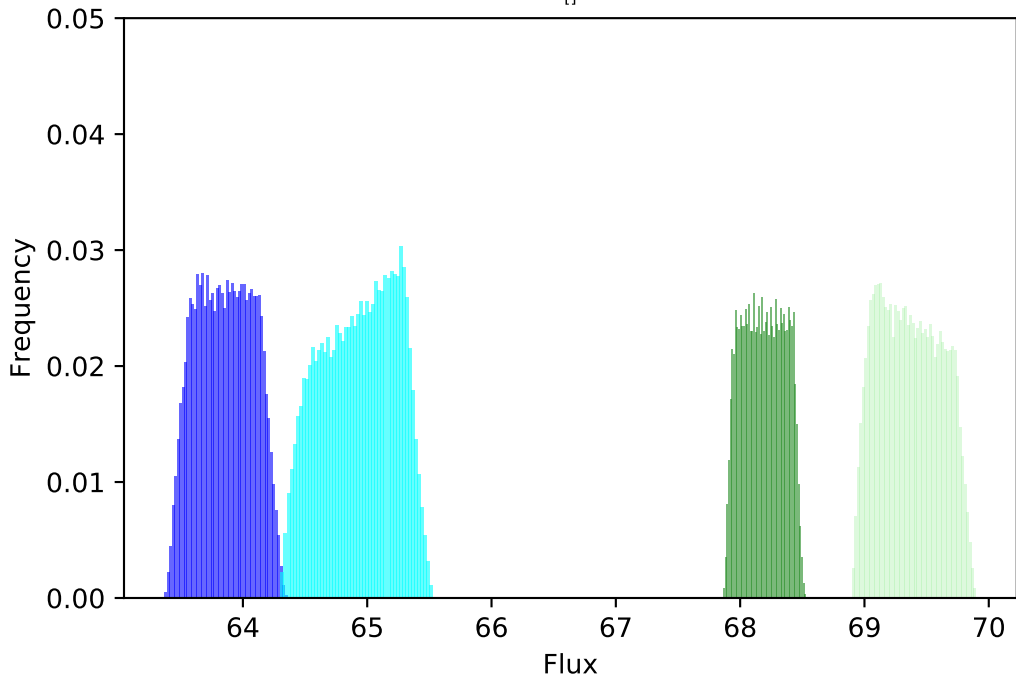5 : CO2_h + H2O_h + RuBP_h --> 2.0 H_h + 2.0 PGA_h
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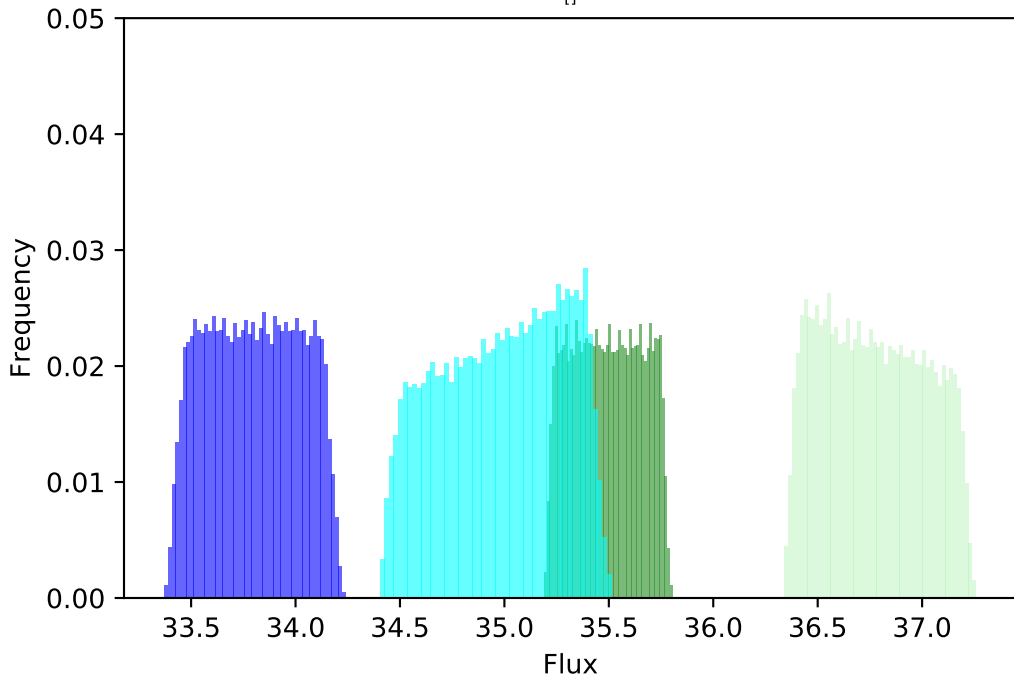6 : ATP_h + PGA_h <=> ADP_h + DPGA_h
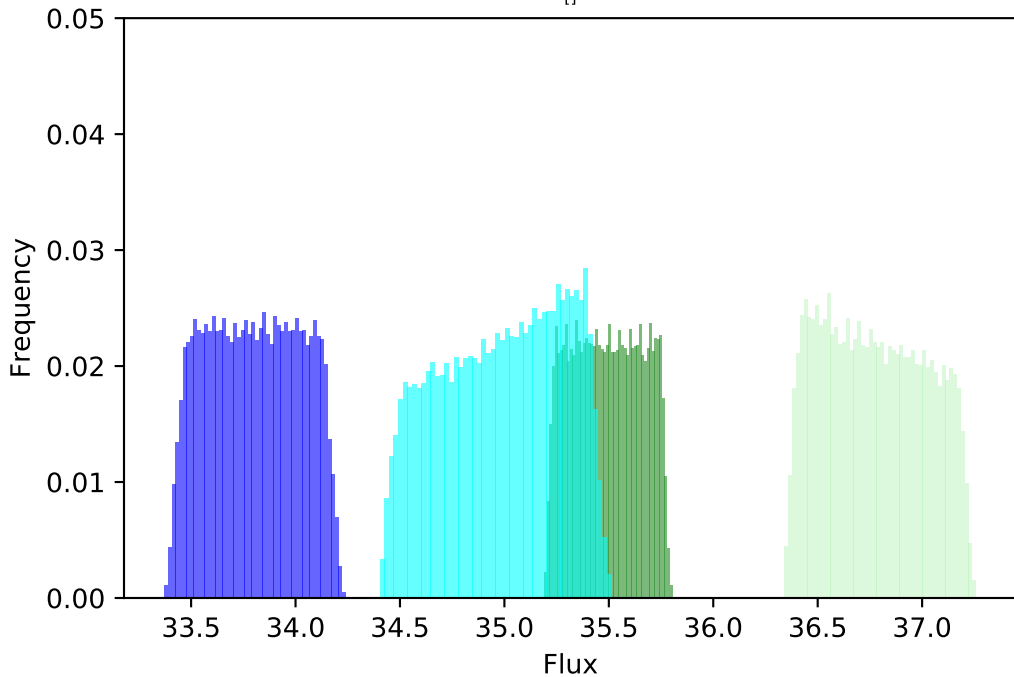[]

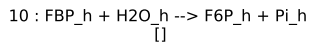7 : DPGA_h + H_h + NADPH_h --> GAP_h + NADP_h + Pi_h
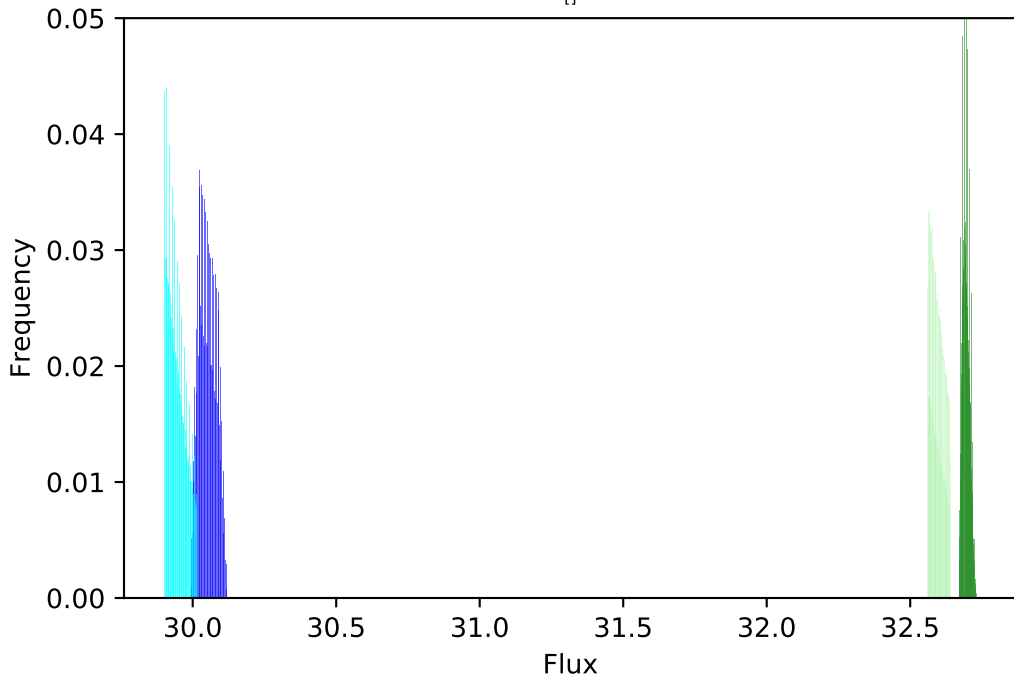[]

8 : GAP_h <=> DHAP_h
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9 : DHAP_h + GAP_h <=> FBP_h
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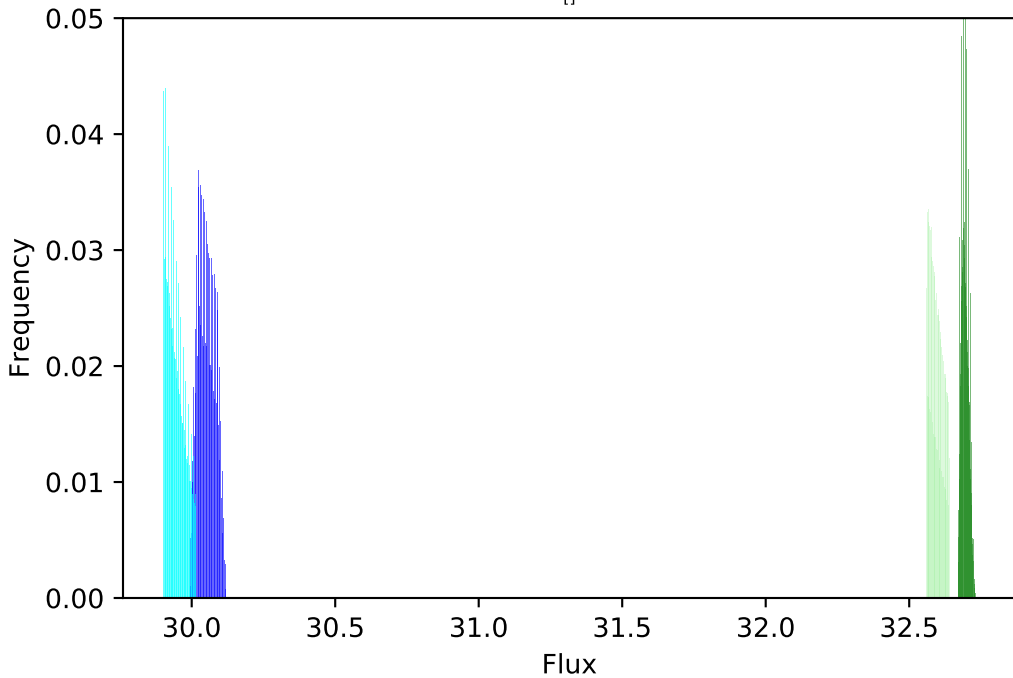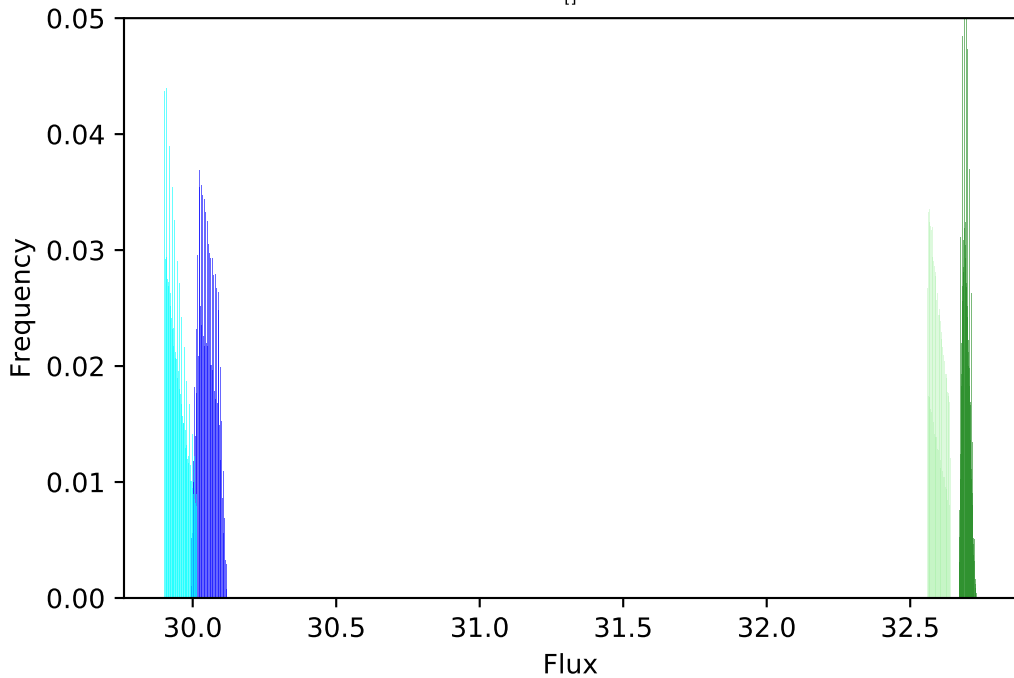10 : FBP_h + H2O_h --> F6P_h + Pi_h
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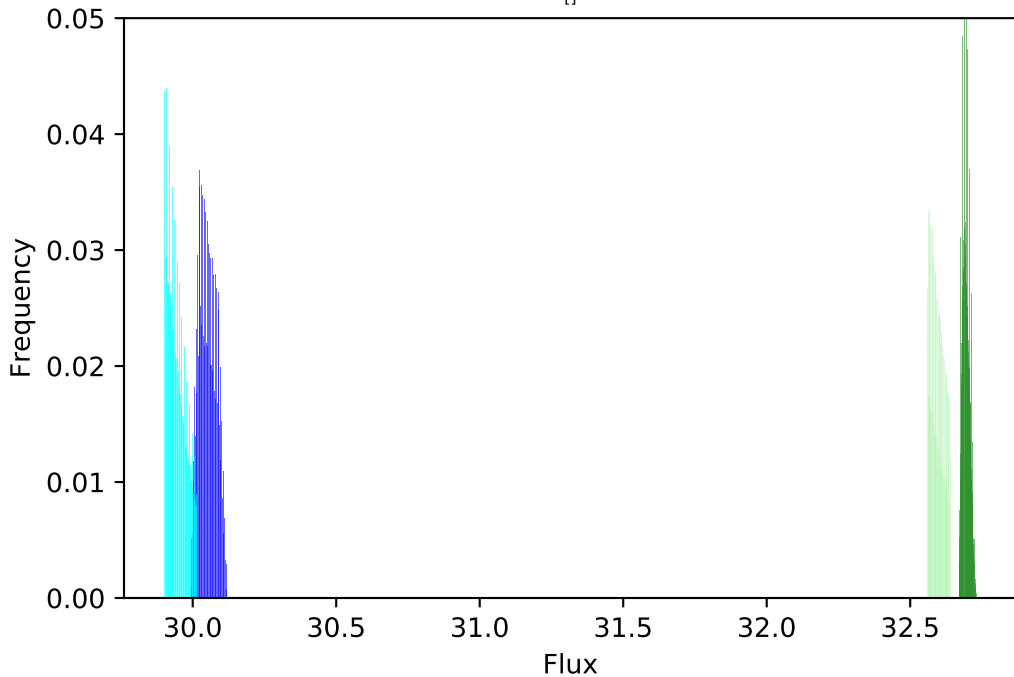11 : F6P_h + GAP_h <=> E4P_h + X5P_h
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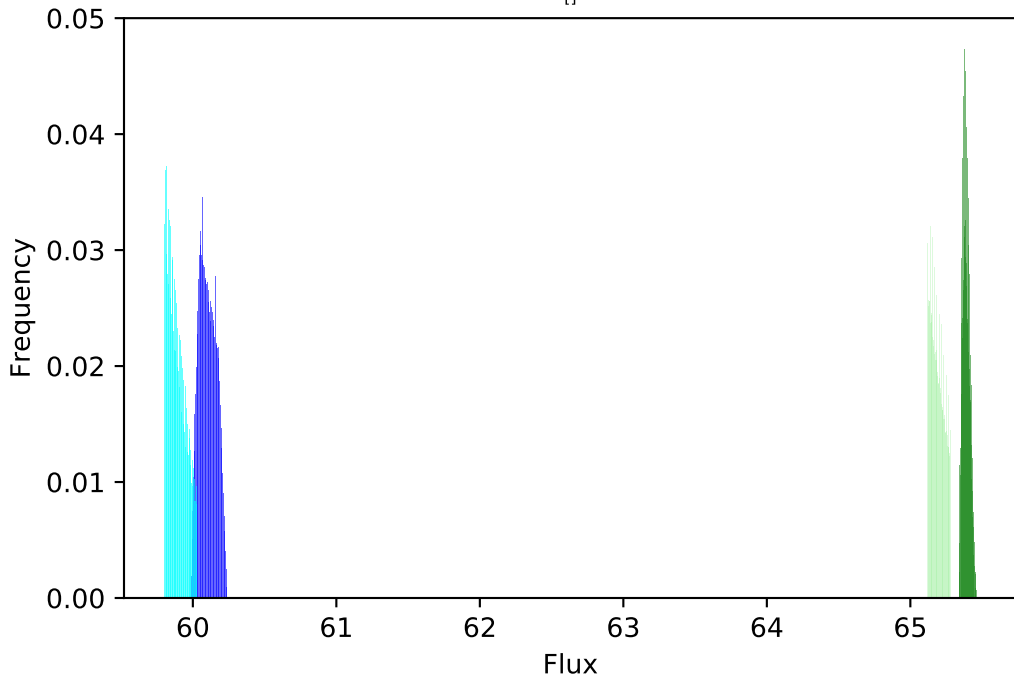12 : DHAP_h + E4P_h --> SBP_h
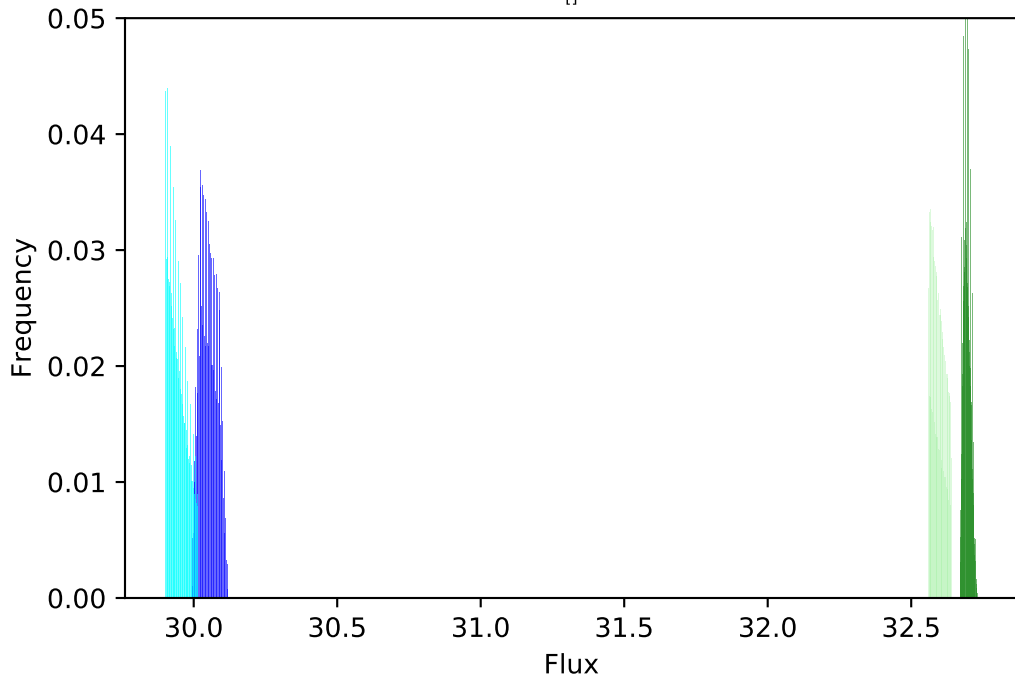[]

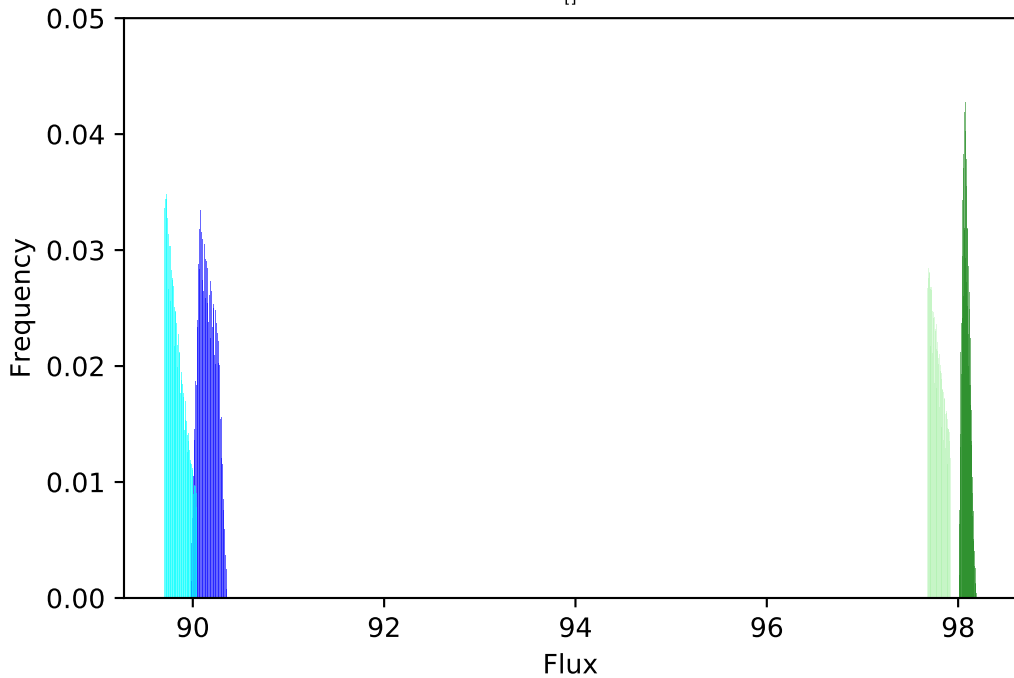13 : H2O_h + SBP_h --> Pi_h + S7P_h
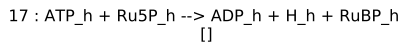[]

14 : GAP_h + S7P_h <=> R5P_h + X5P_h
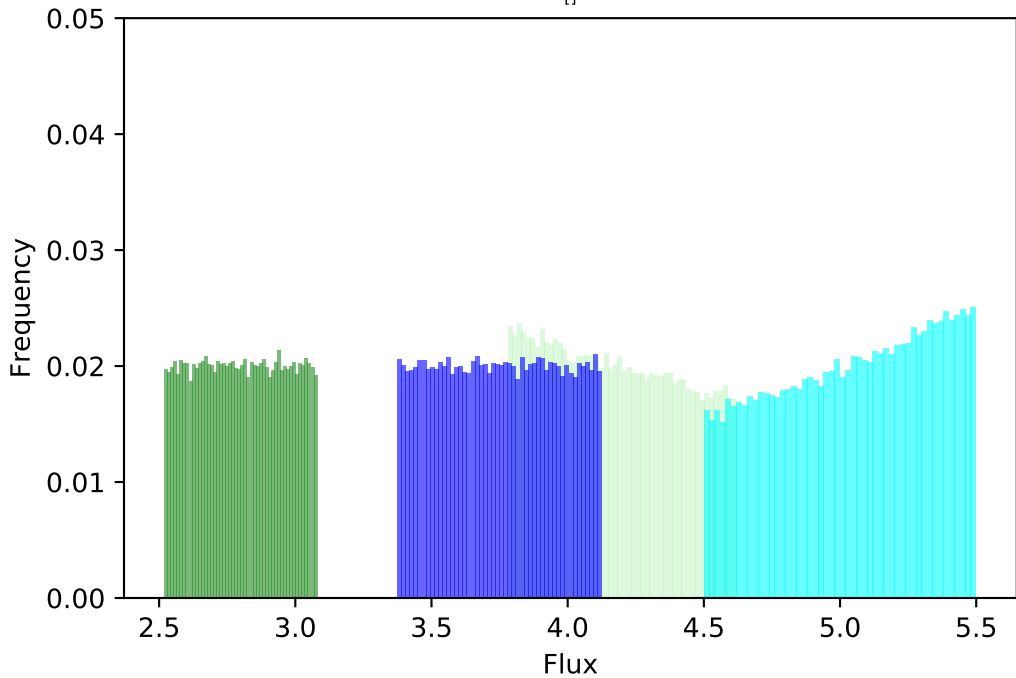[]

15 : X5P_h <=> Ru5P_h
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16 : R5P_h <=> Ru5P_h
[]

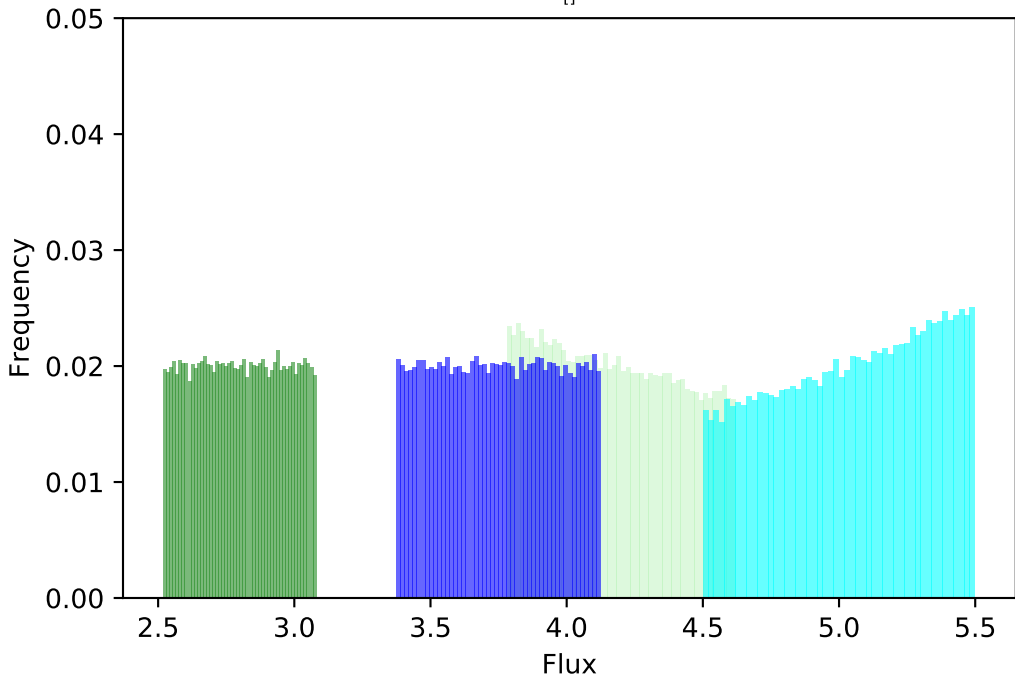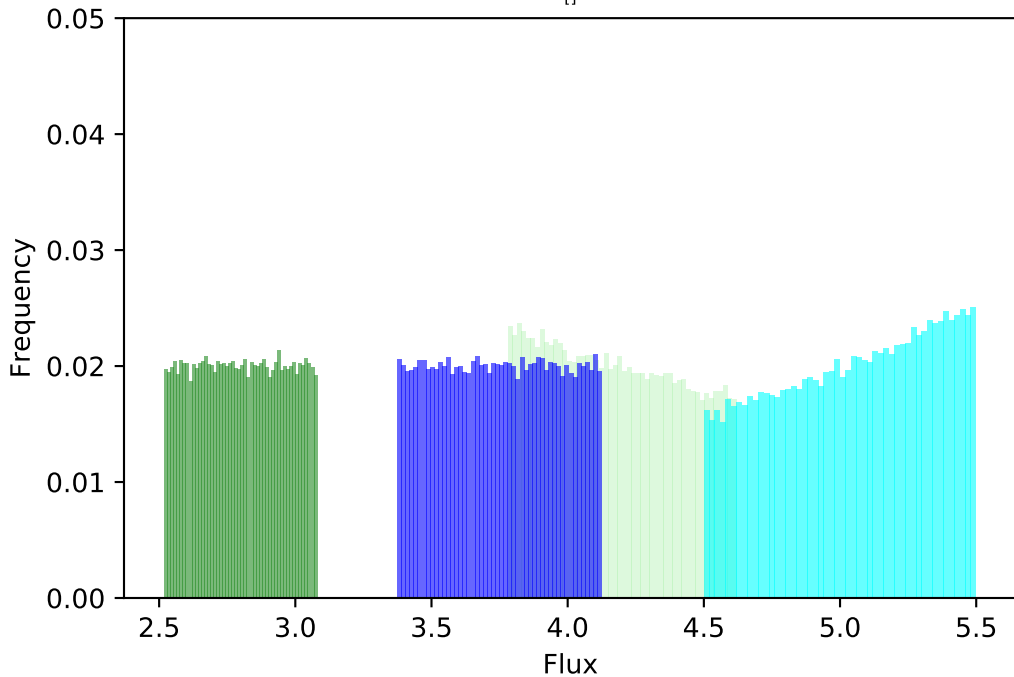17 : ATP_h + Ru5P_h --> ADP_h + H_h + RuBP_h
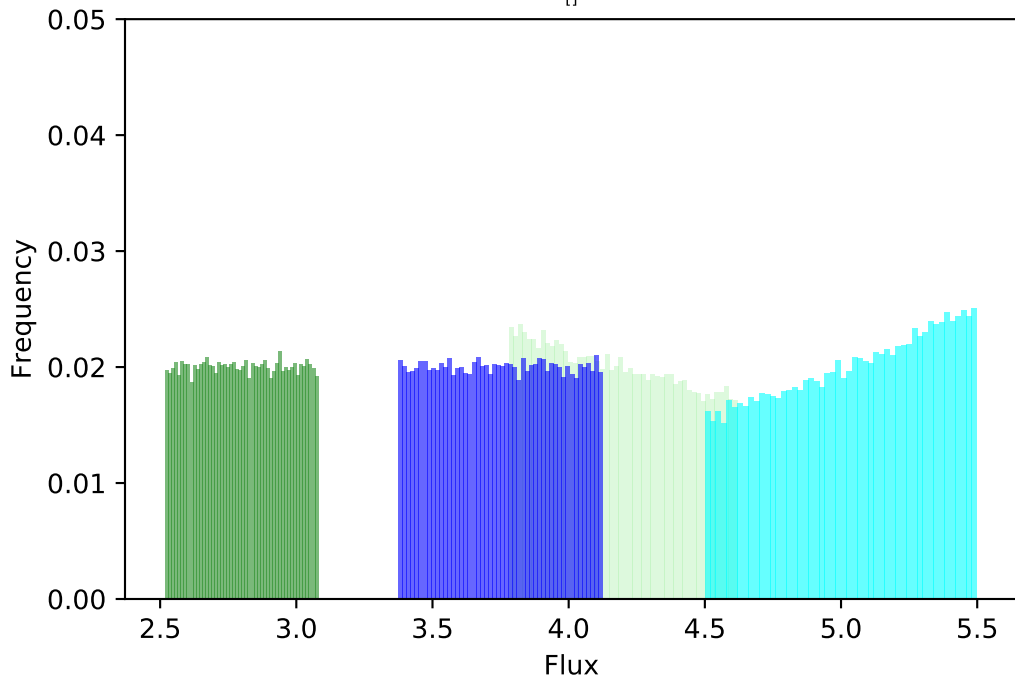[]

18 : F6P_h <=> G6P_h
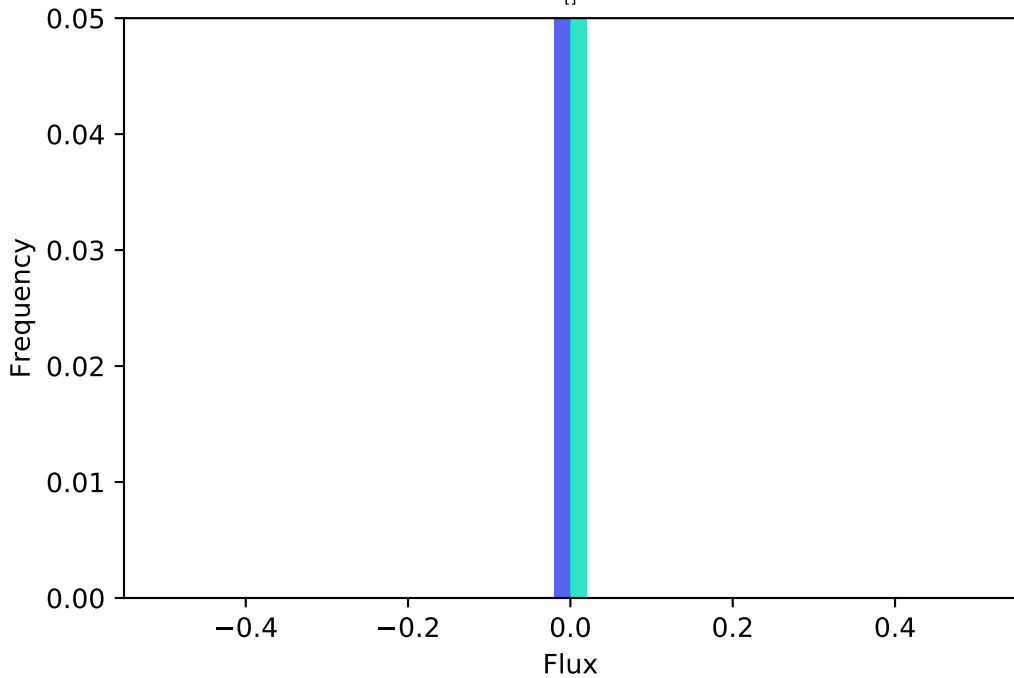[]

19 : G6P_h <=> G1P_h
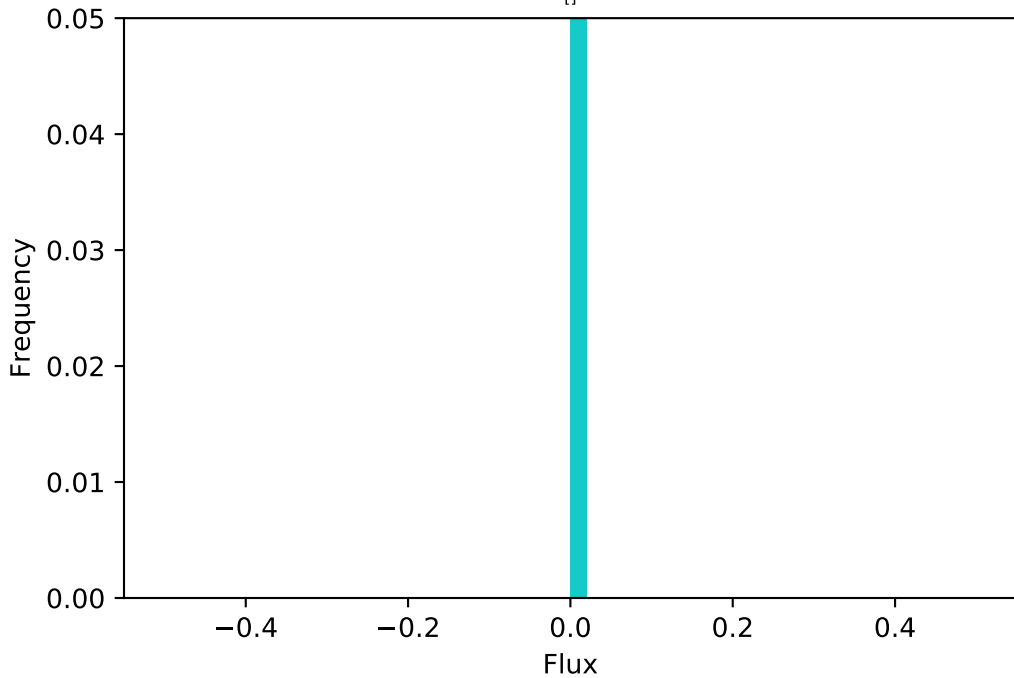[]

20 : ATP_h + G1P_h --> ADPG_h + PPi_h
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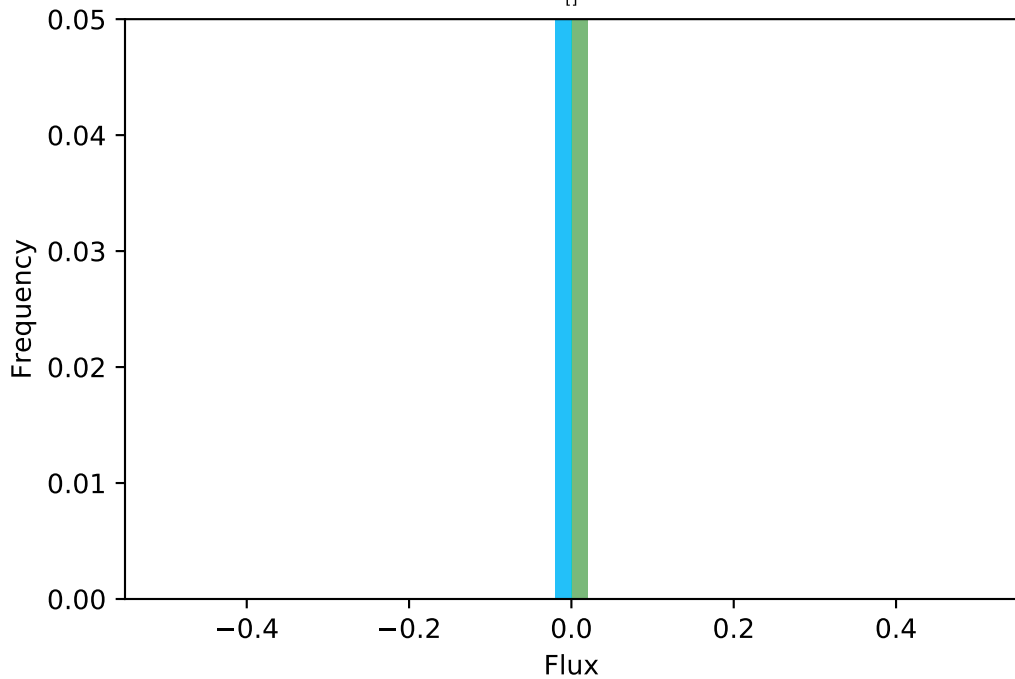21 : ADPG_h + H2O_h --> ADP_h + H_h + starch1_h
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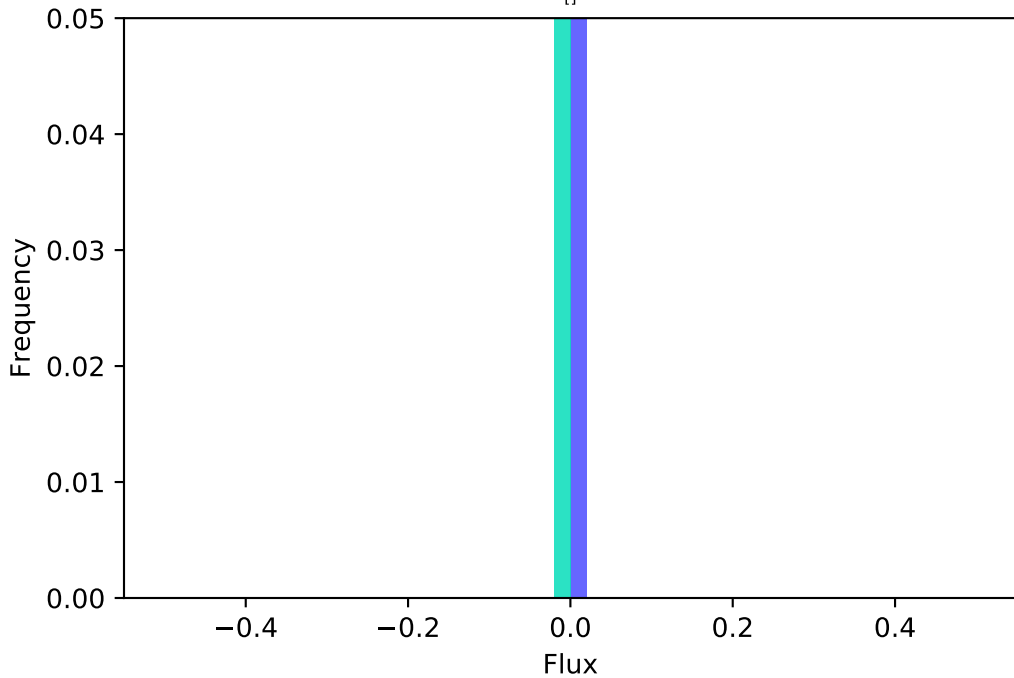22 : ADPG_h + starch1_h --> ADP_h + H_h + starch2_h
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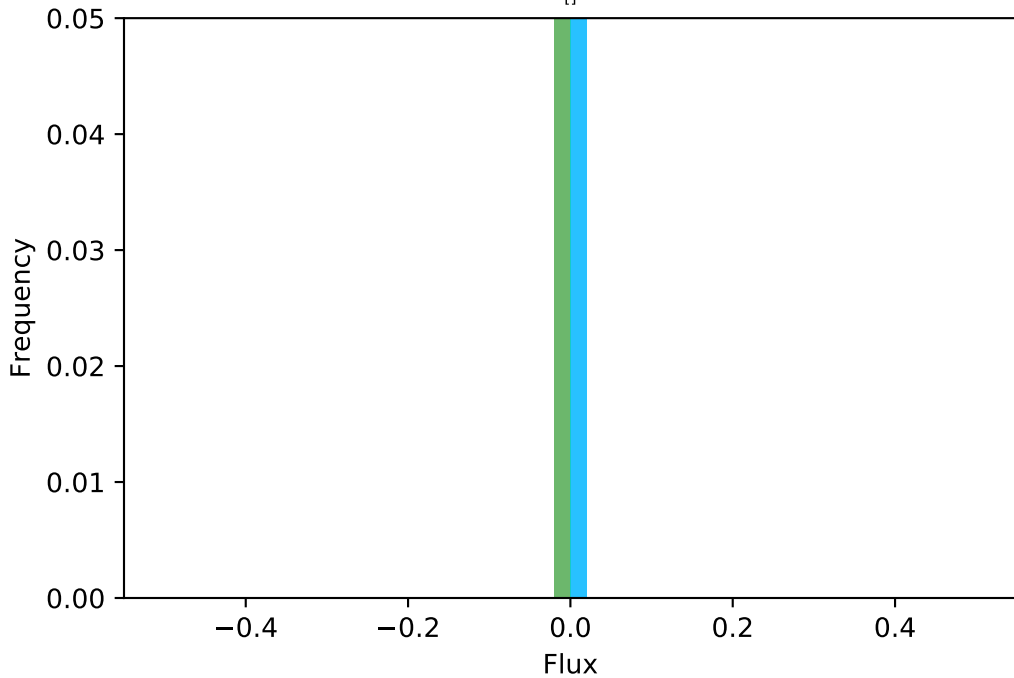23 : ADPG_h + starch2_h --> ADP_h + H_h + starch3_h
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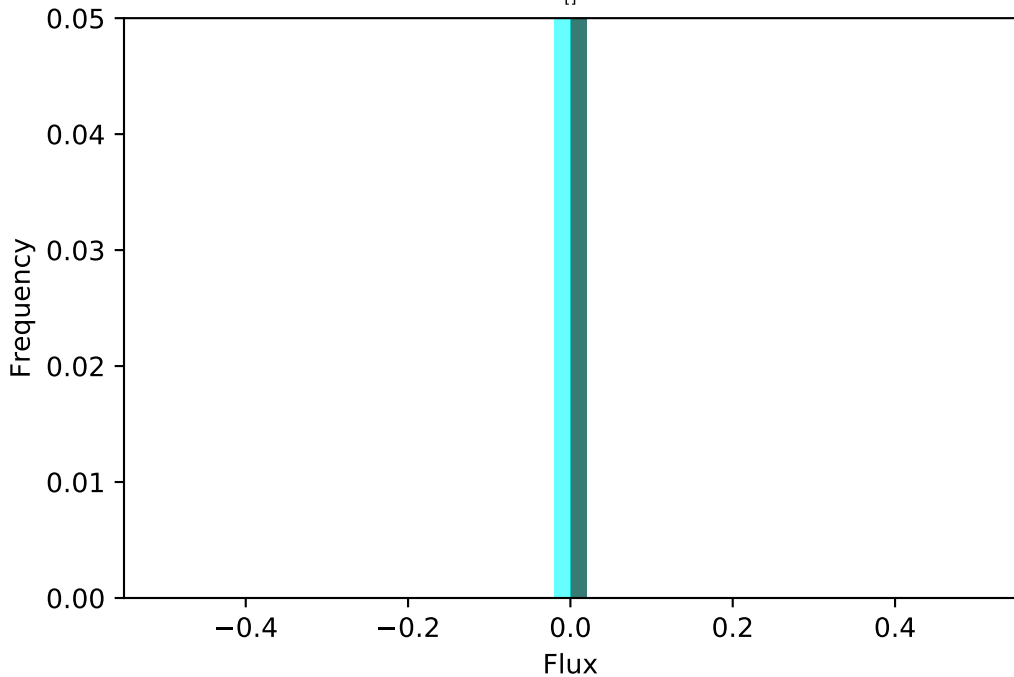
24 : H2O_h + starch5_h --> Mas_h + starch3_h
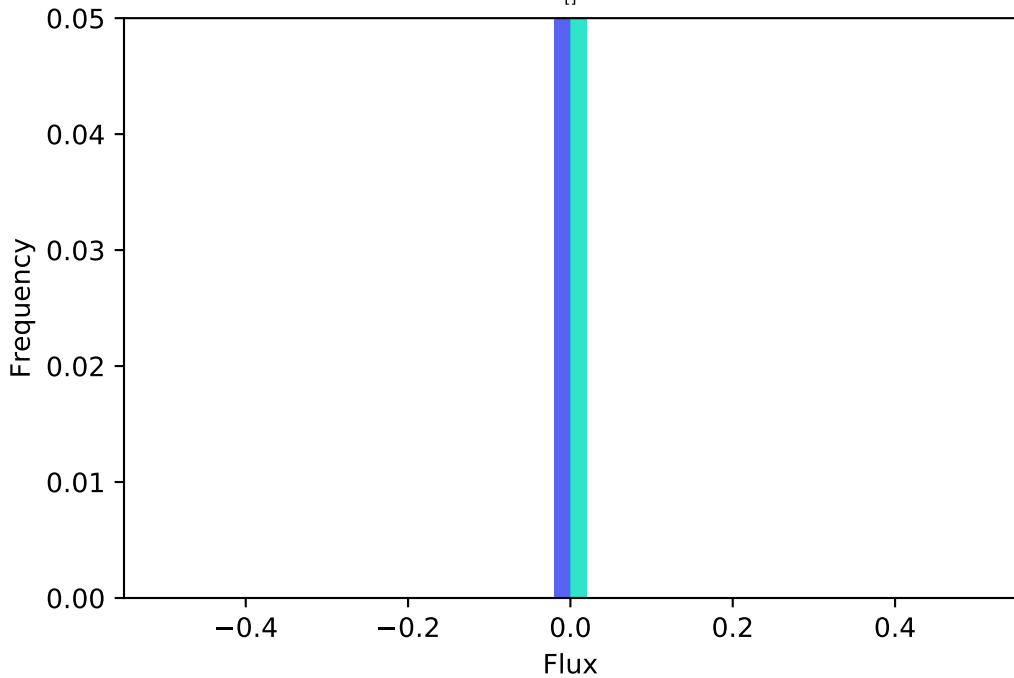[]

25 : H2O_h + starch3_h --> Mas_h + starch1_h
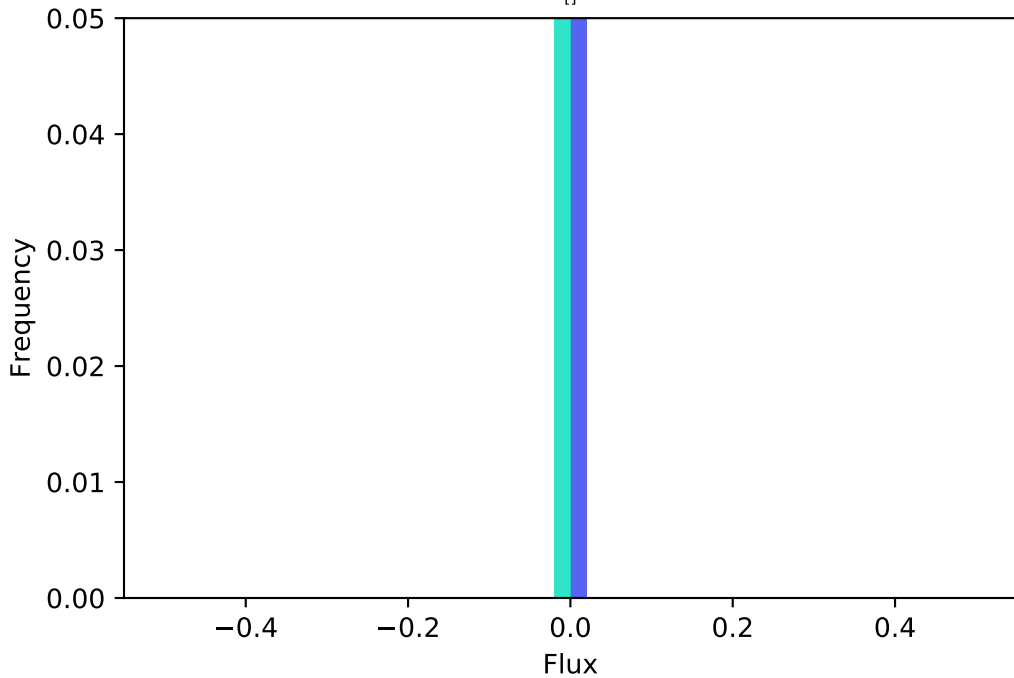[]

26 : 2.0 starch3_h --> Glc_h + starch5_h
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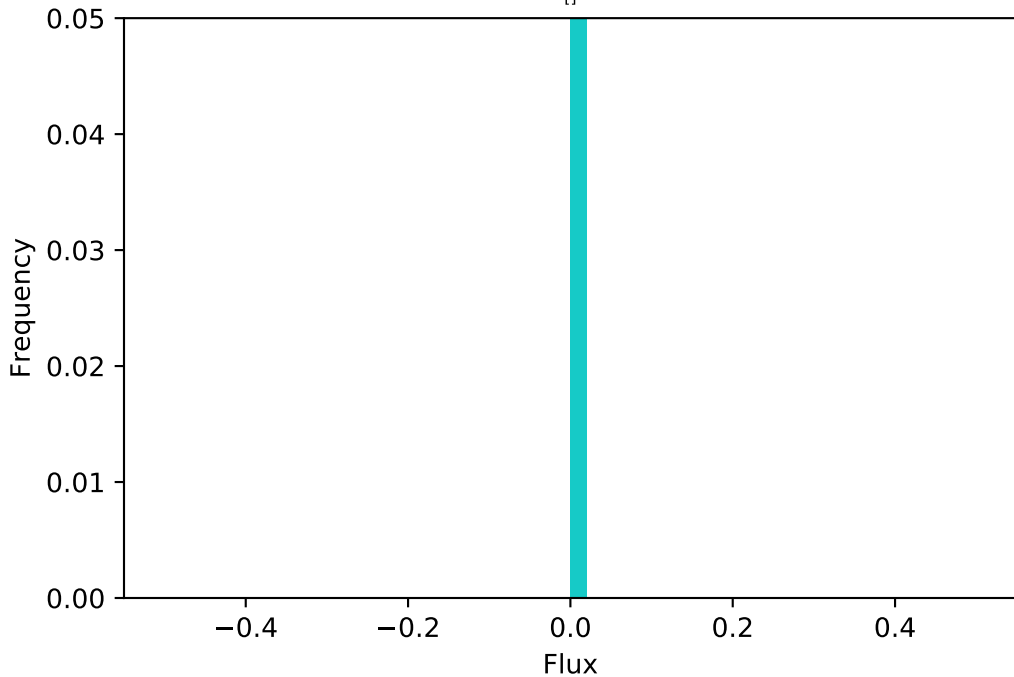
27 : Mas_h + starch1_h --> Glc_h + starch2_h
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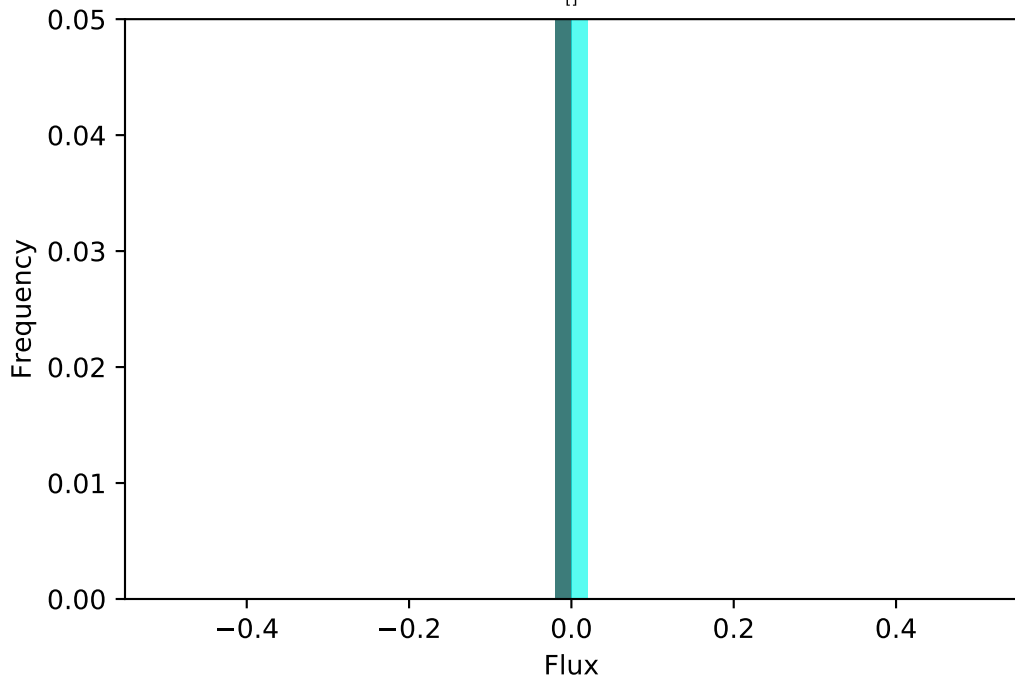
28 : Mas_h + starch2_h --> Glc_h + starch3_h
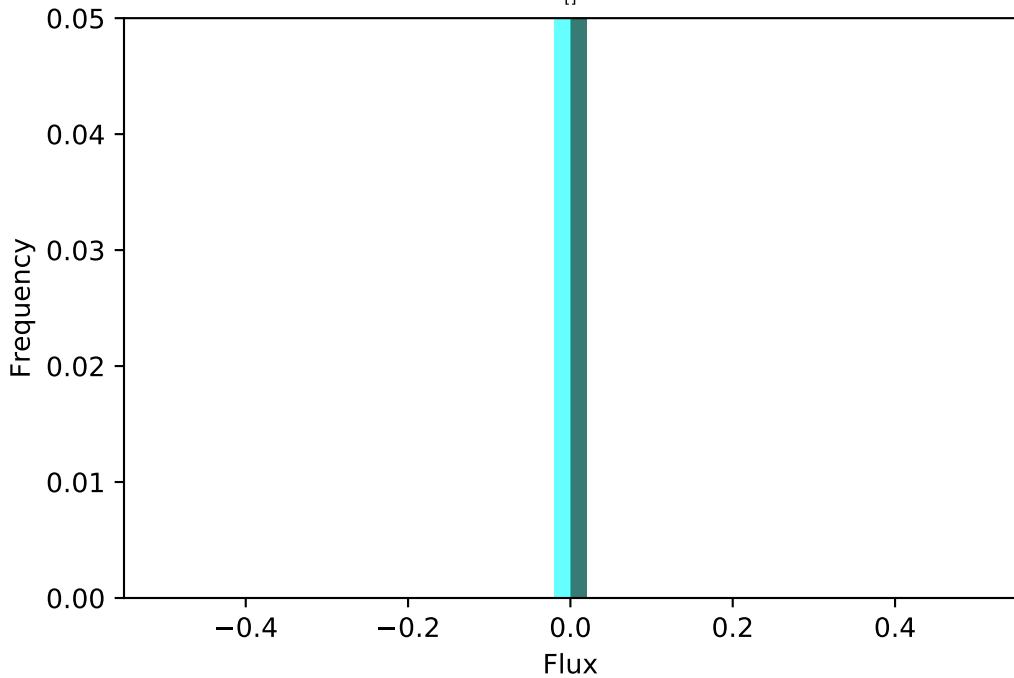[]

29 : Mas_c + starch1_c --> Glc_c + starch2_c
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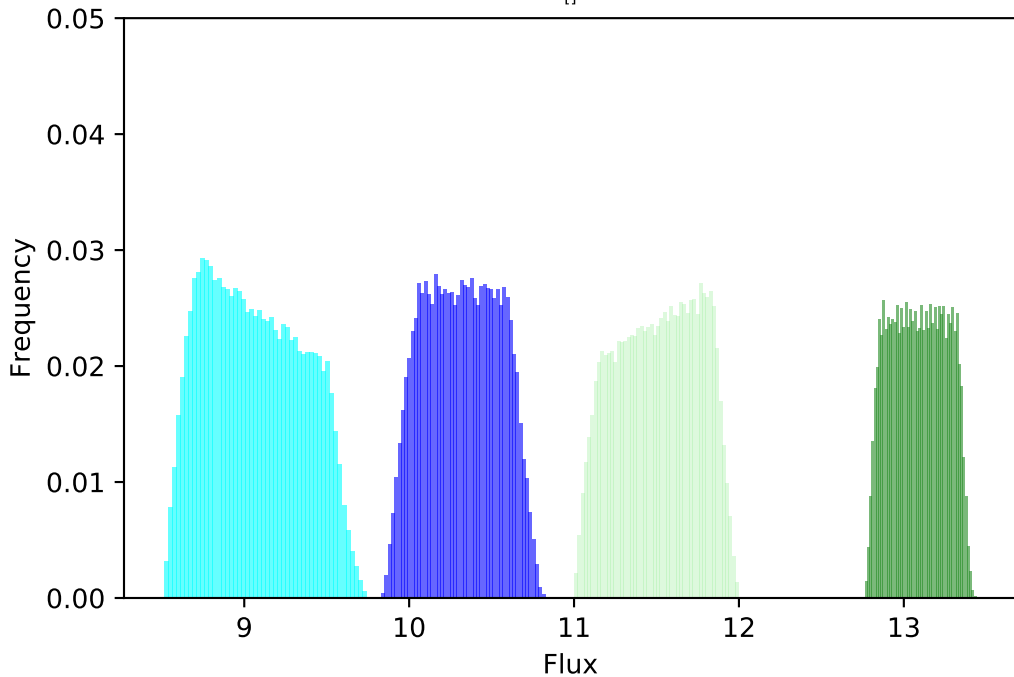30 : ATP_c + Glc_c --> ADP_c + G6P_c + H_c
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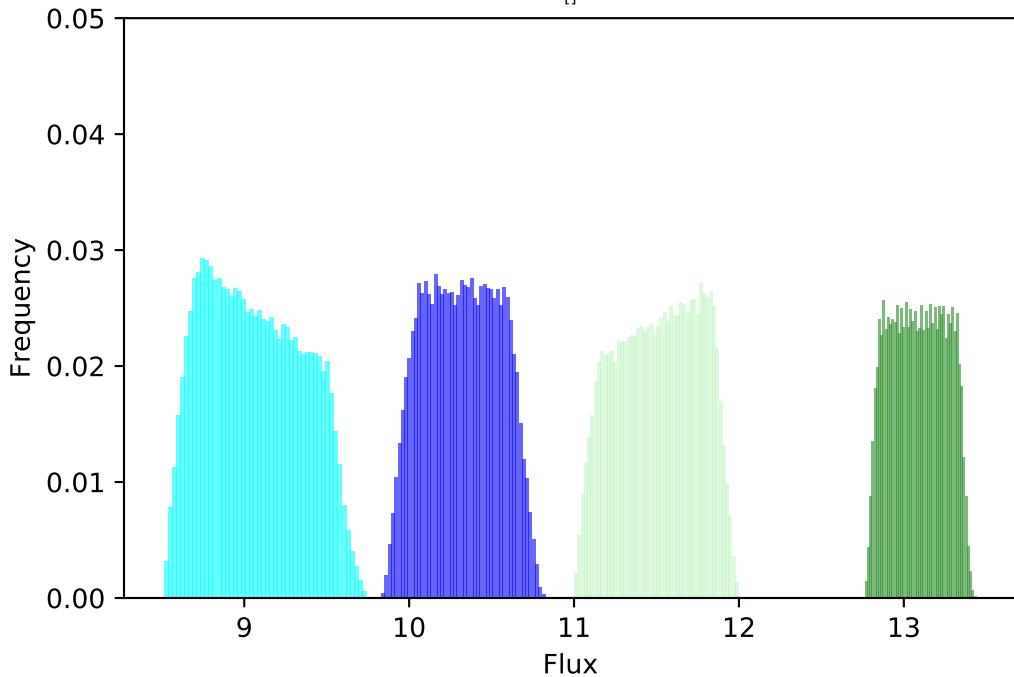31 : Pi_h + starch2_h --> G1P_h + starch1_h
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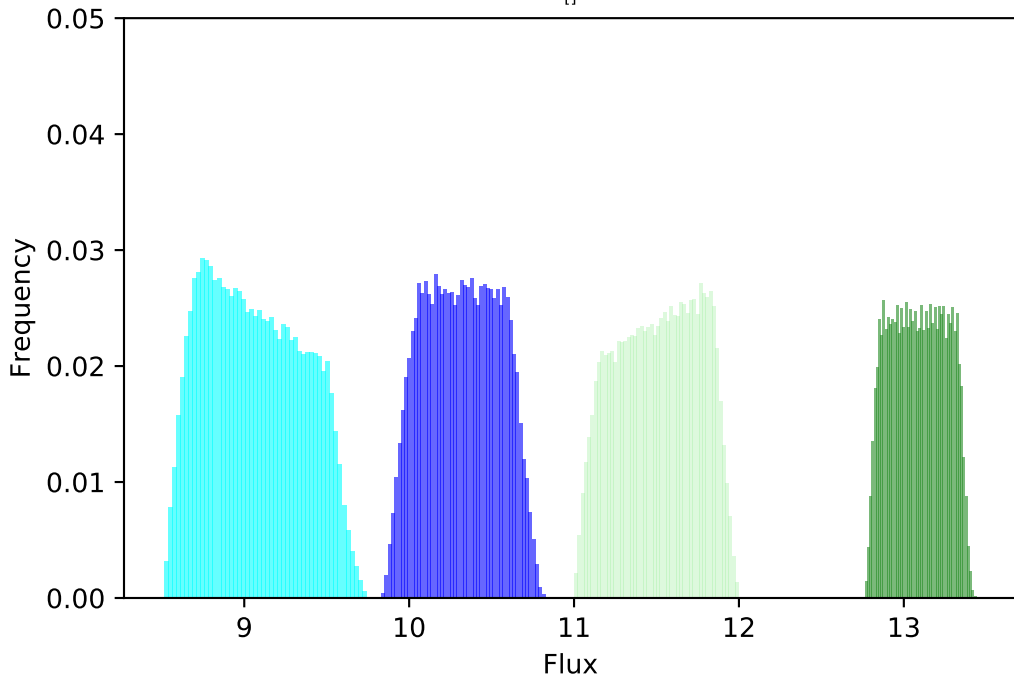32 : Pi_c + starch2_c --> G1P_c + starch1_c
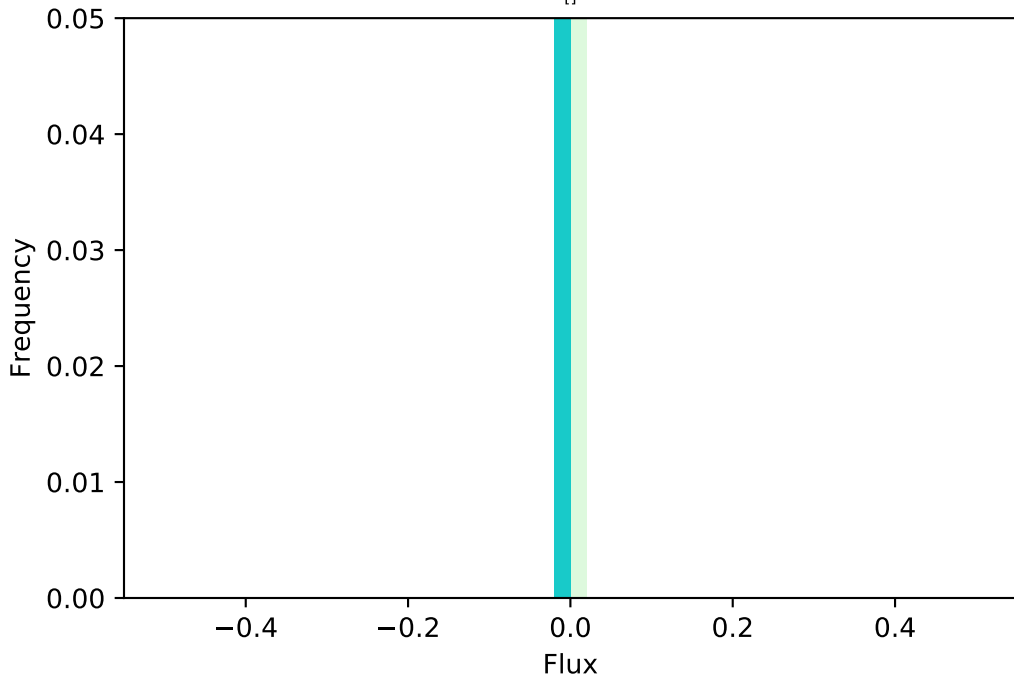[]

33 : GAP_c --> DHAP_c
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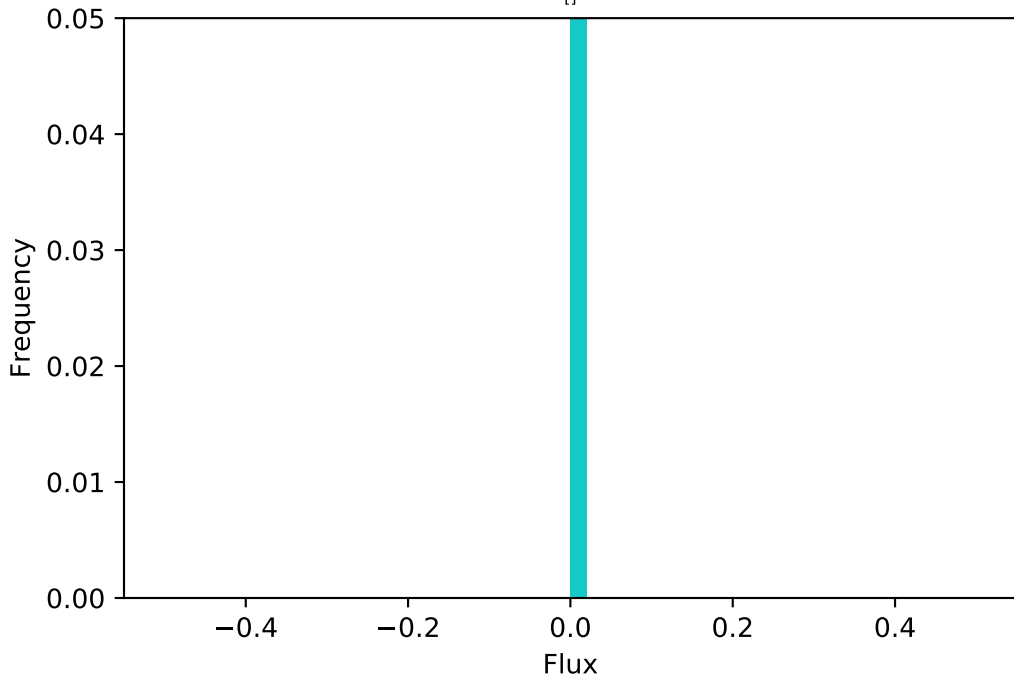34 : DHAP_c + GAP_c --> FBP_c
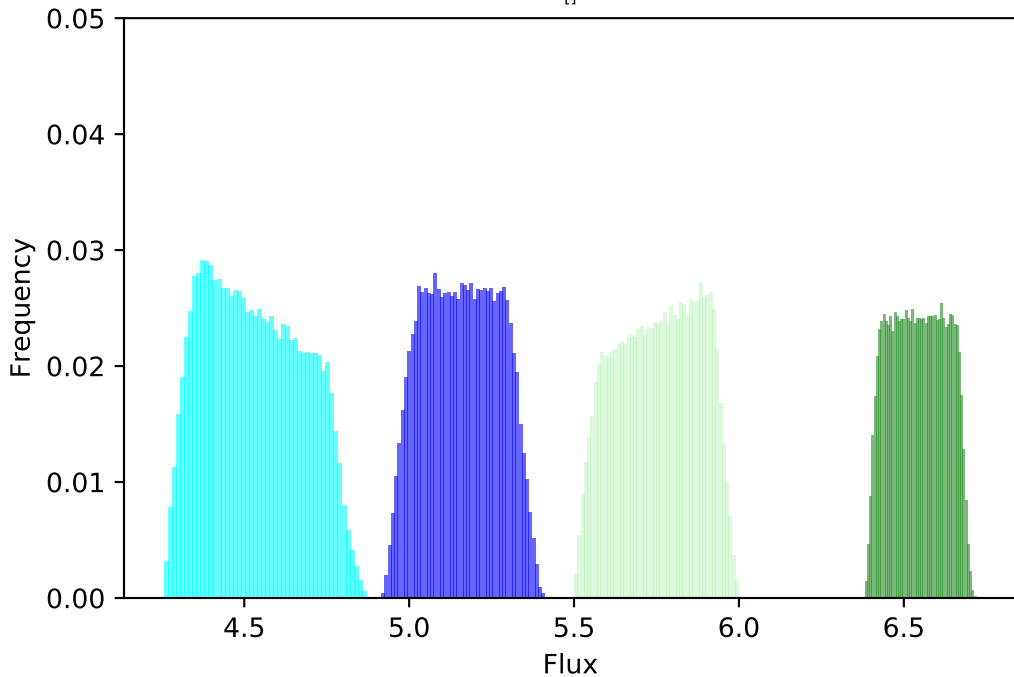[]

35 : FBP_c + H2O_c --> F6P_c + Pi_c
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36 : ATP_c + F6P_c --> ADP_c + F26BP_c + H_c
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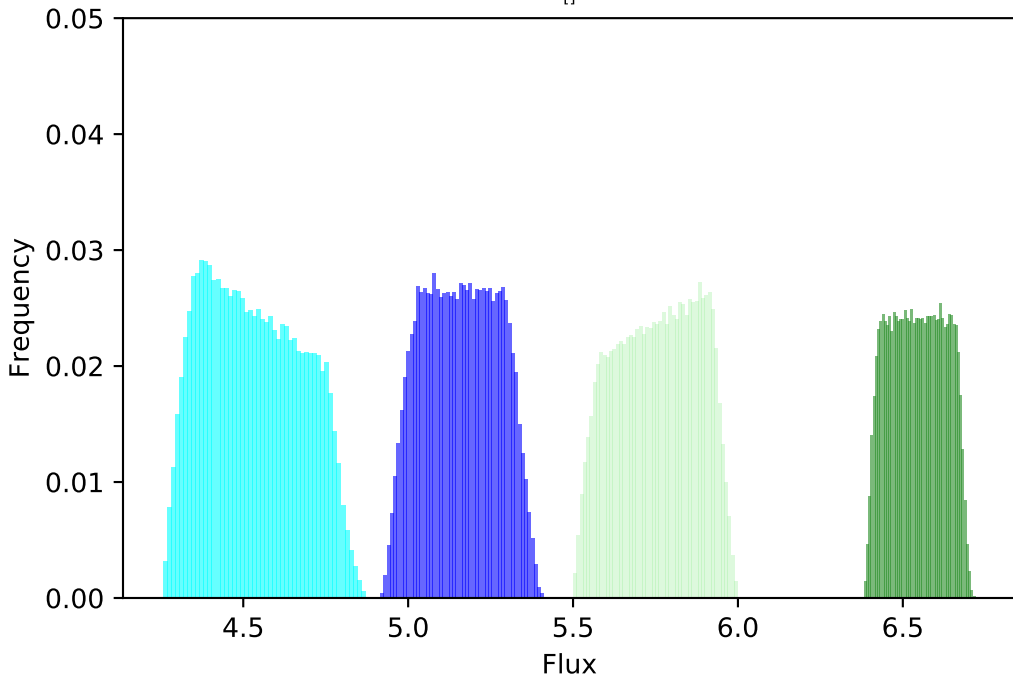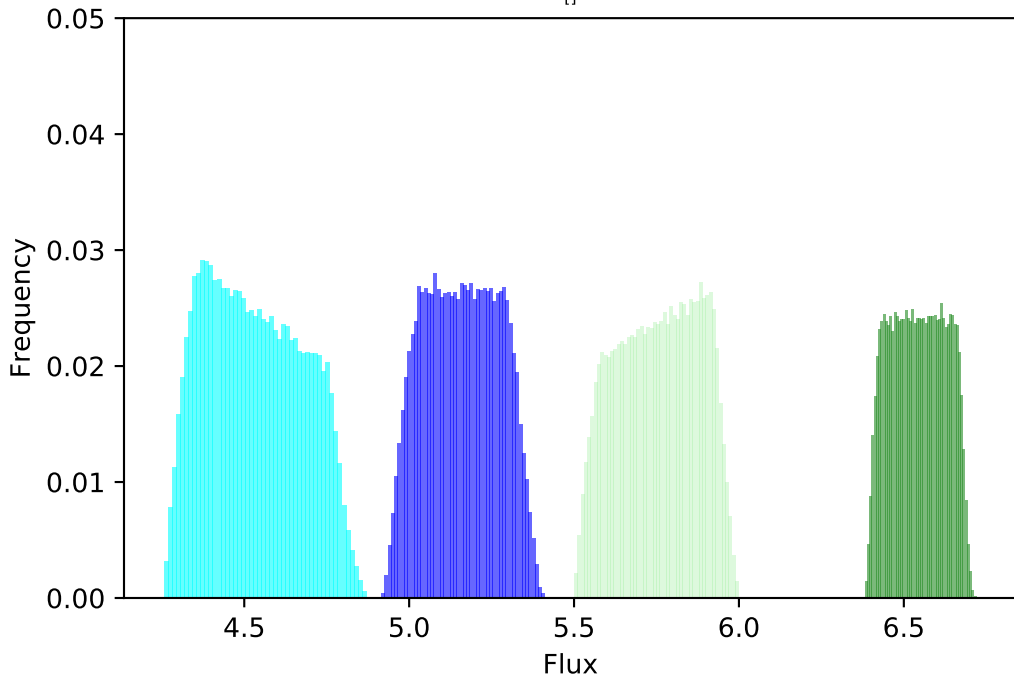
37 : F26BP_c + H2O_c --> F6P_c + Pi_c
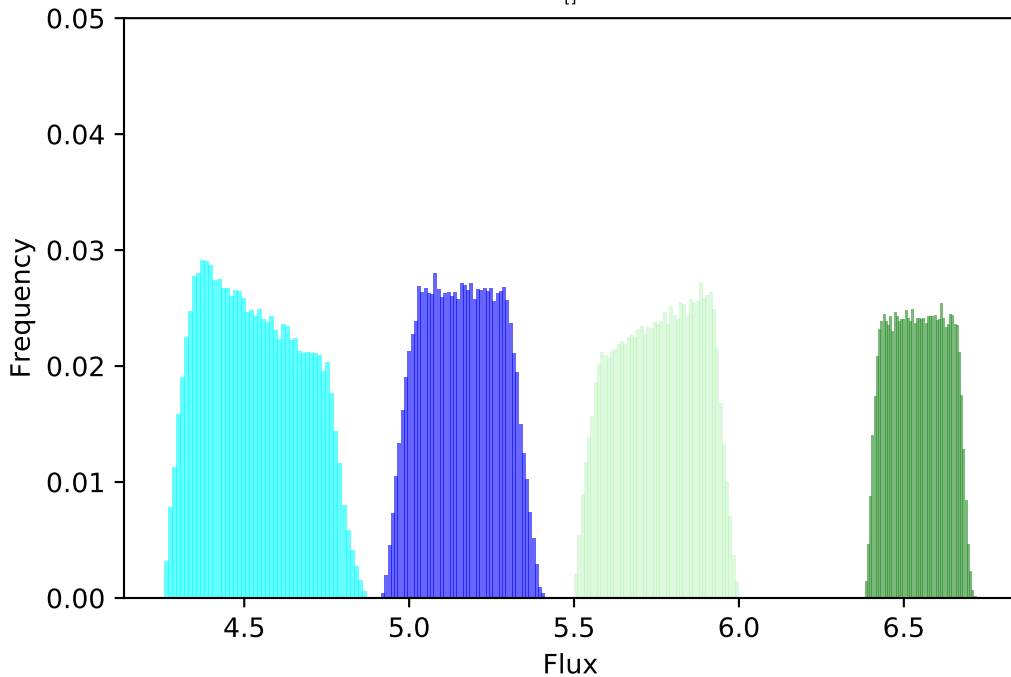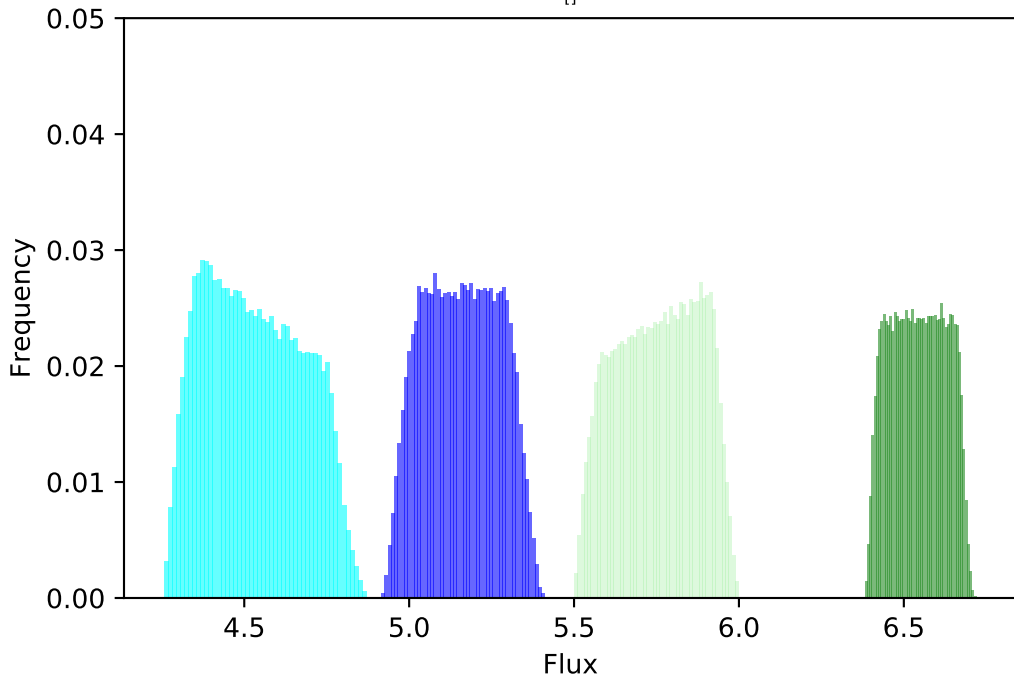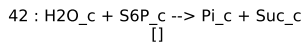[]

38 : F6P_c <=> G6P_c
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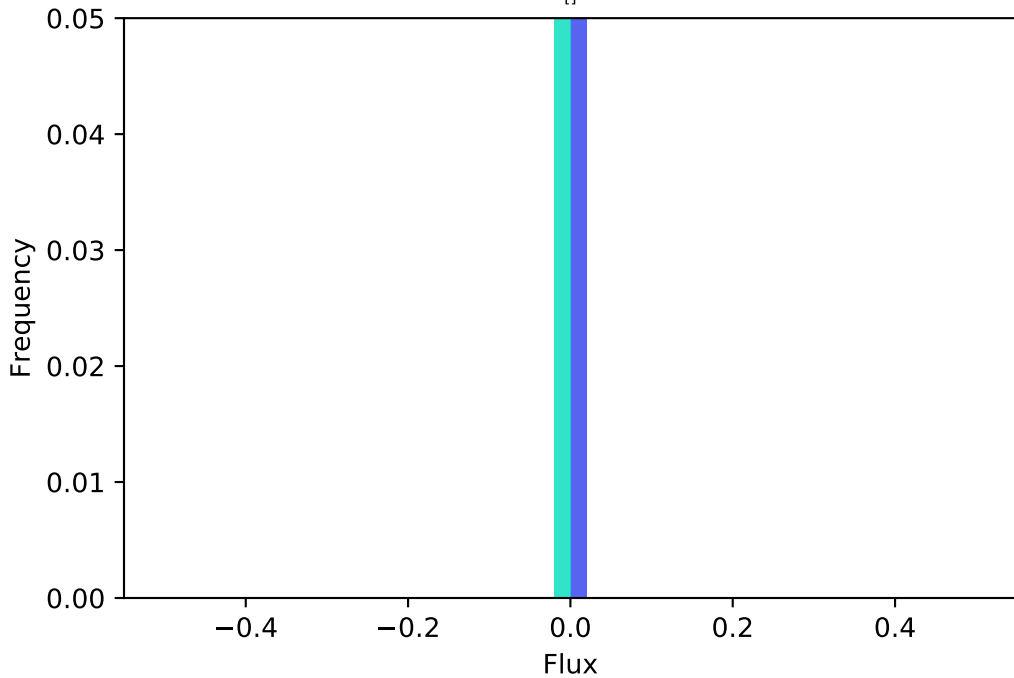39 : G6P_c <=> G1P_c
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40 : G1P_c + H_c + UTP_c <=> PPi_c + UDPG_c
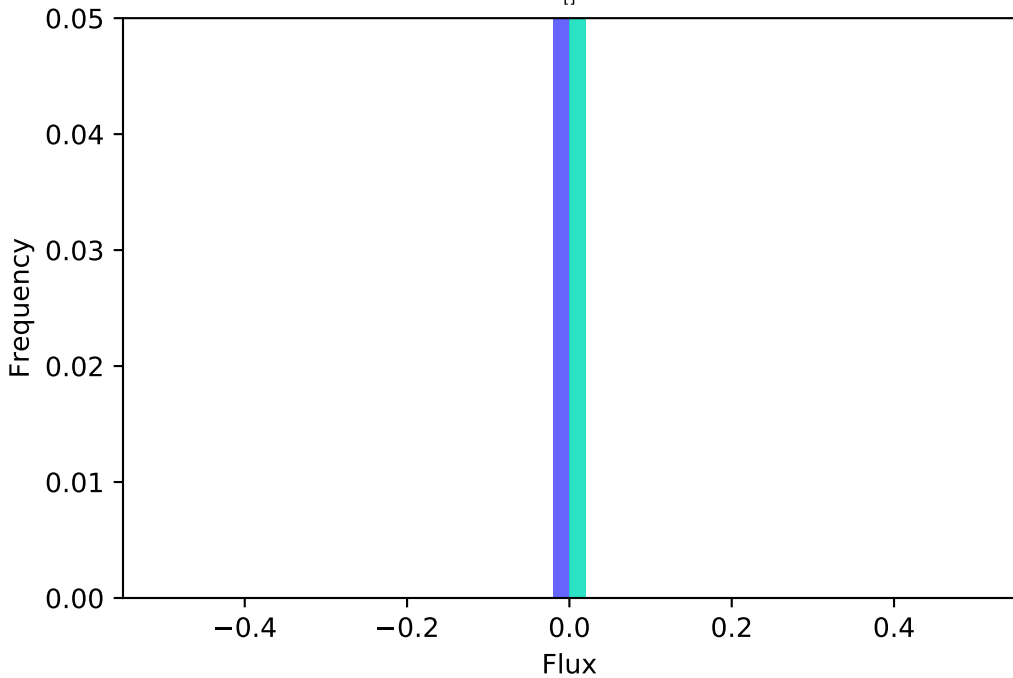[]

41 : F6P_c + UDPG_c --> S6P_c + UDP_c
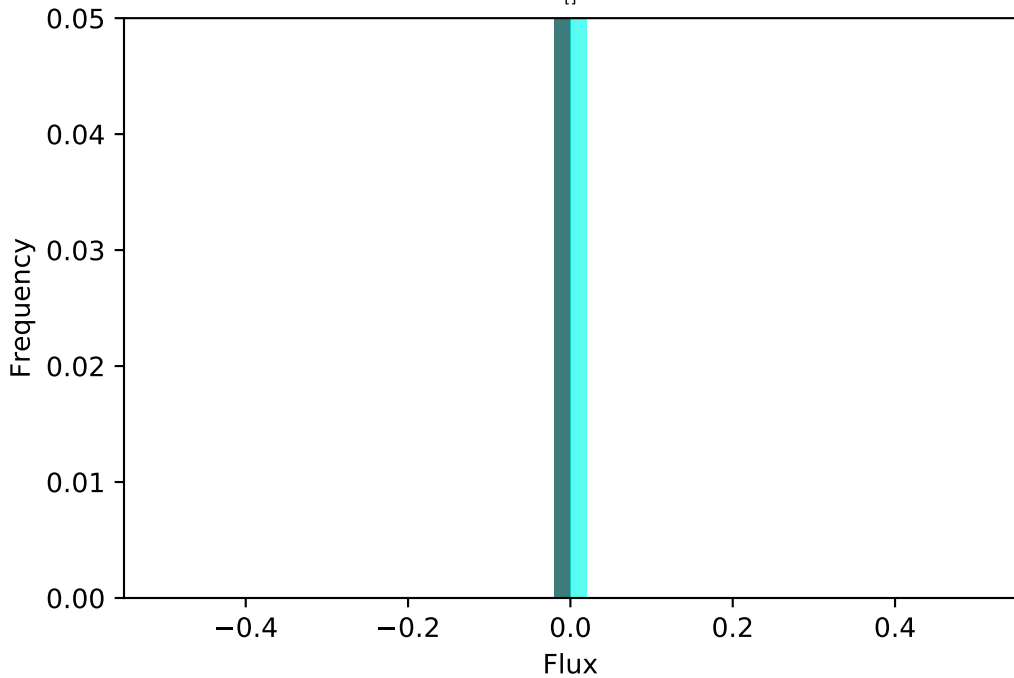[]

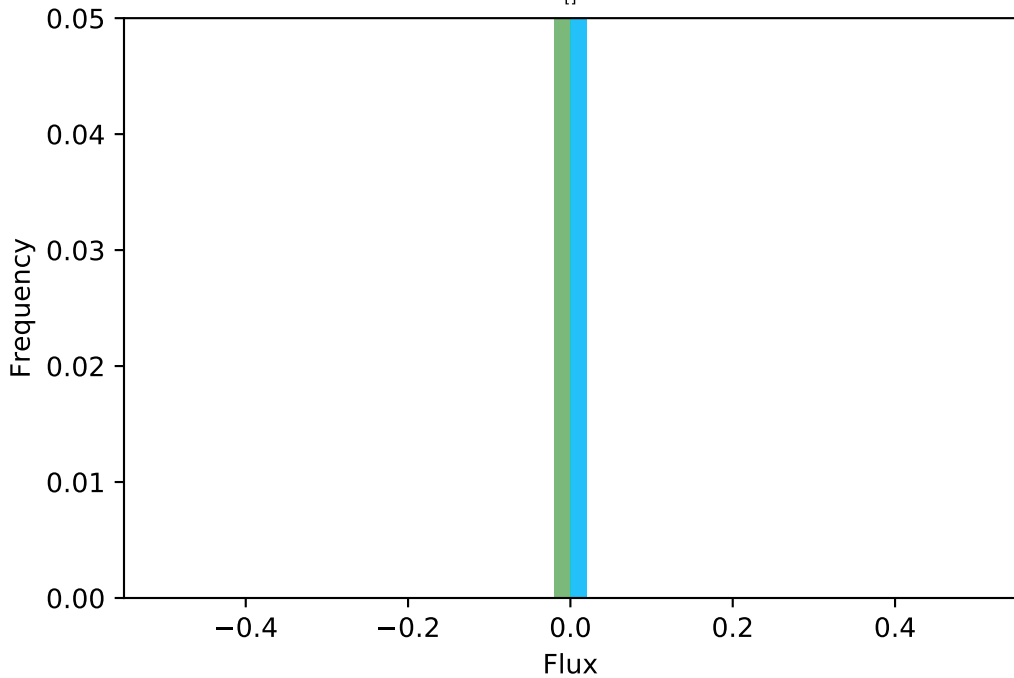42 : H2O_c + S6P_c --> Pi_c + Suc_c
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43 : Suc_c + UDP_c <=> Frc_c + UDPG_c
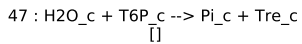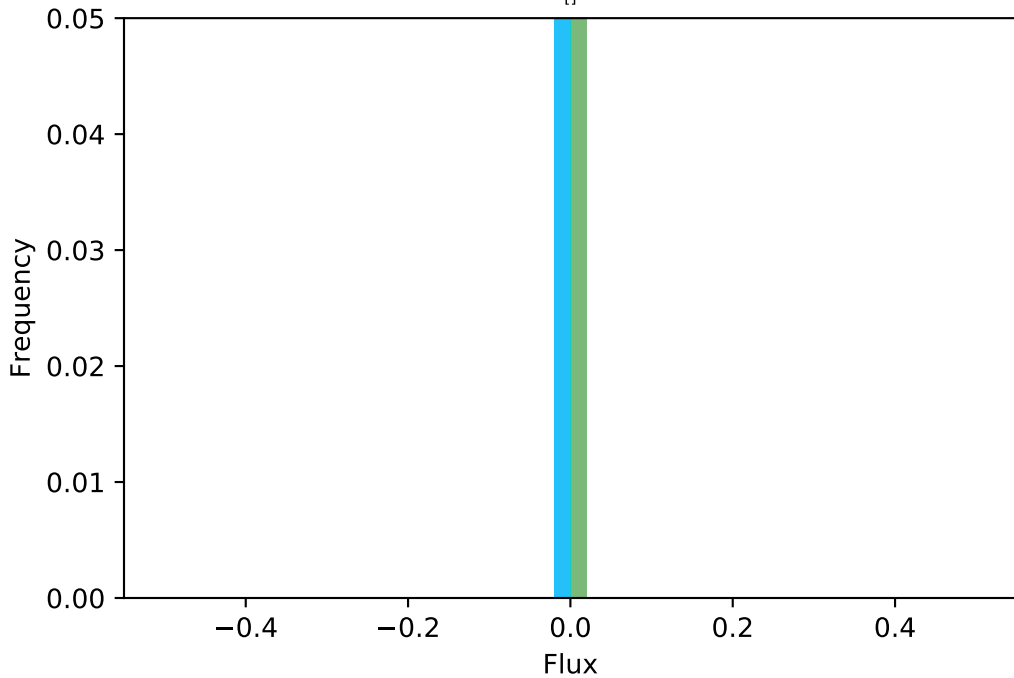[]

44 : H2O_c + Suc_c --> Frc_c + Glc_c
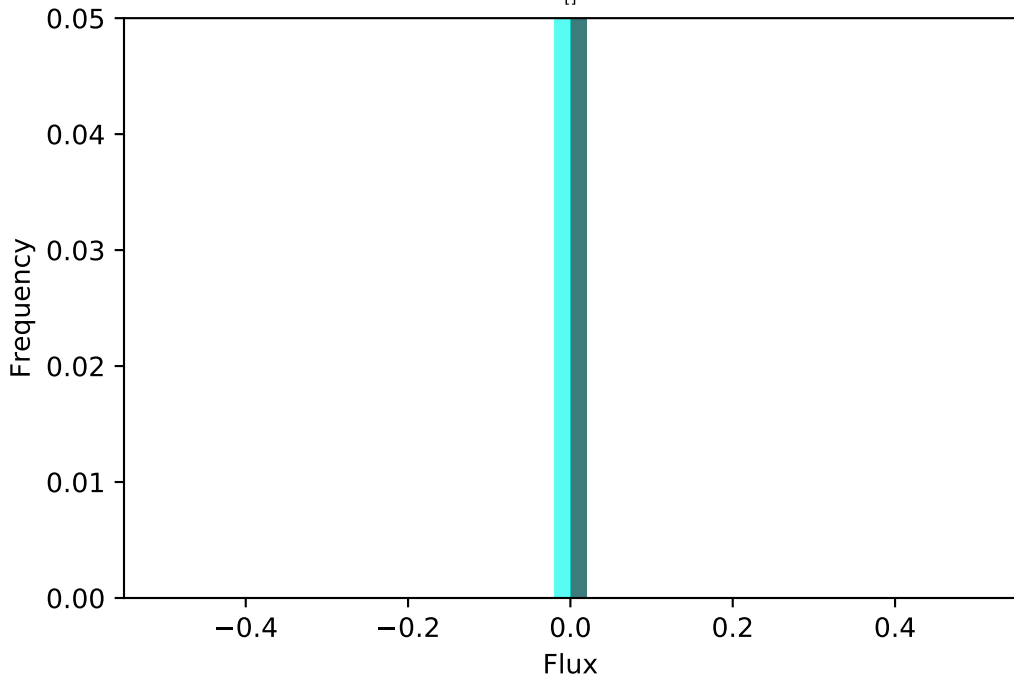[]

45 : ATP_c + Frc_c --> ADP_c + F6P_c + H_c
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46 : G6P_c + UDPG_c --> T6P_c + UDP_c
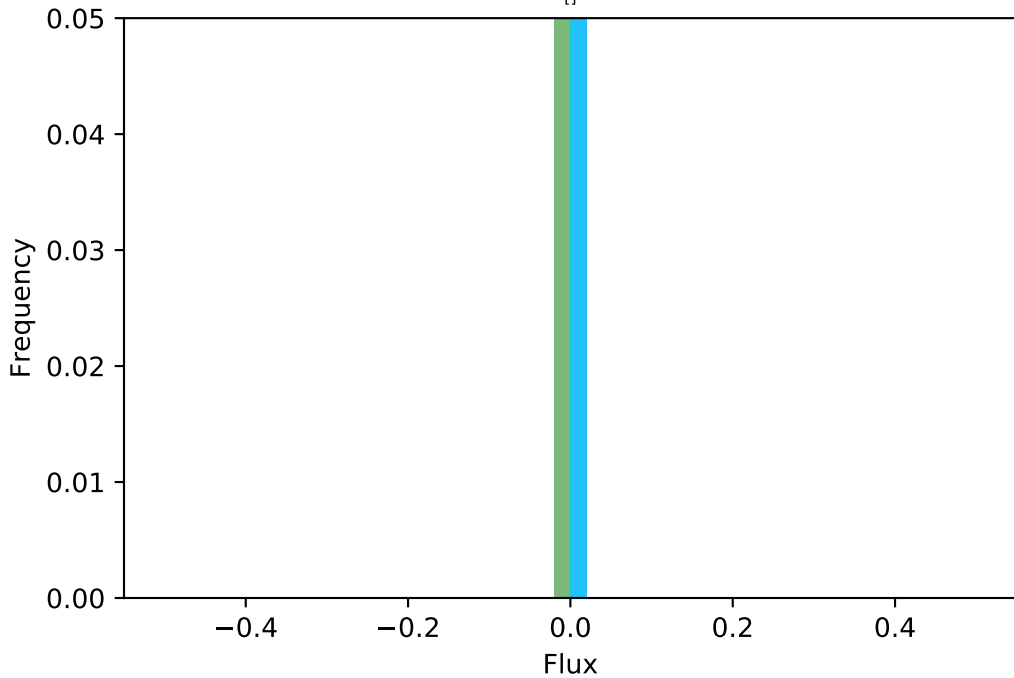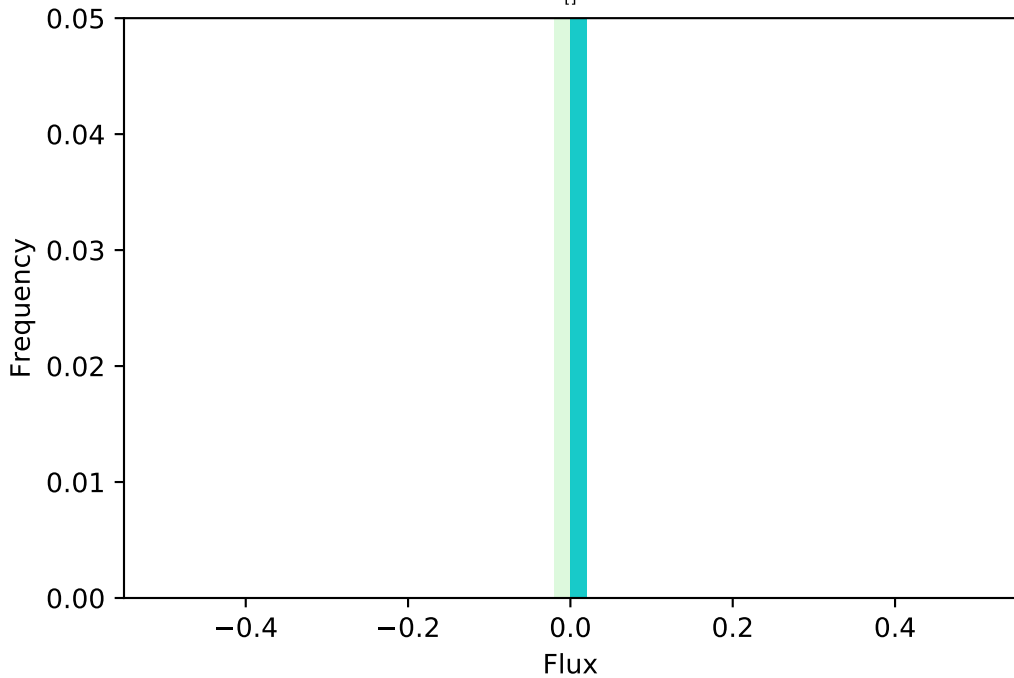[]

47 : H2O_c + T6P_c --> Pi_c + Tre_c
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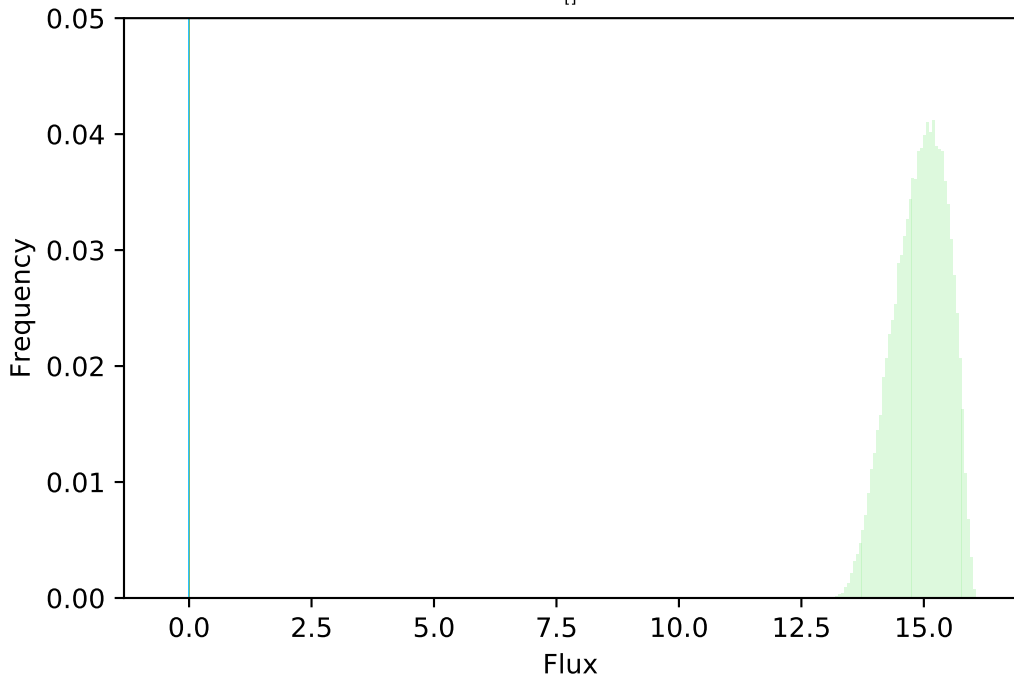48 : H2O_c + UDPG_c --> UDP_c + cellulose1_c
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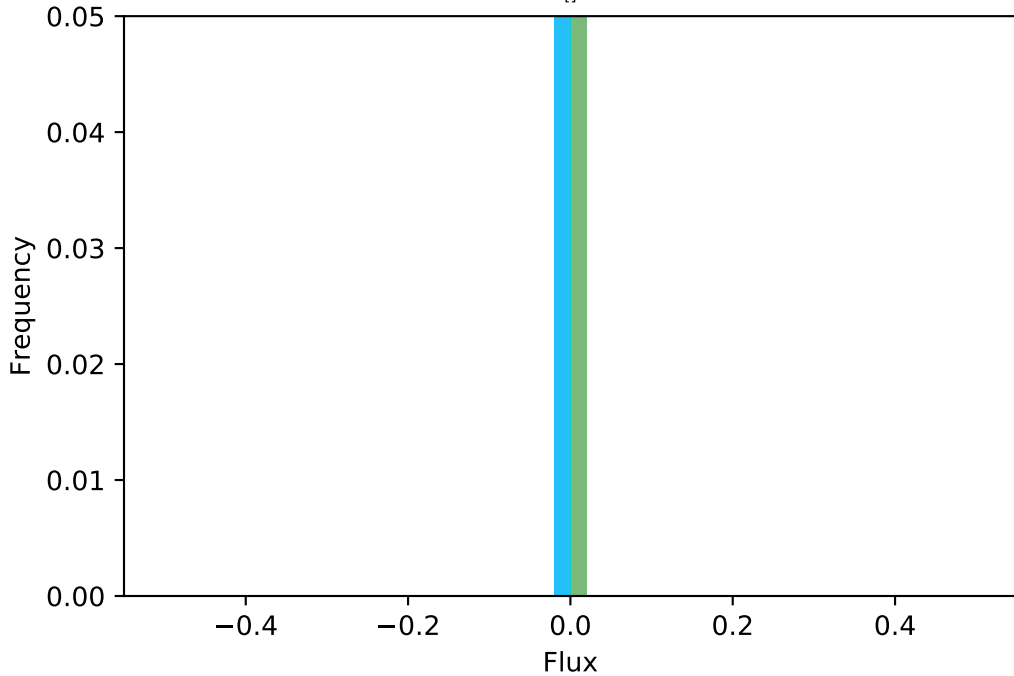49 : UDPG_c + cellulose1_c --> UDP_c + cellulose2_c
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50 : UDPG_c + cellulose2_c --> UDP_c + cellulose3_c
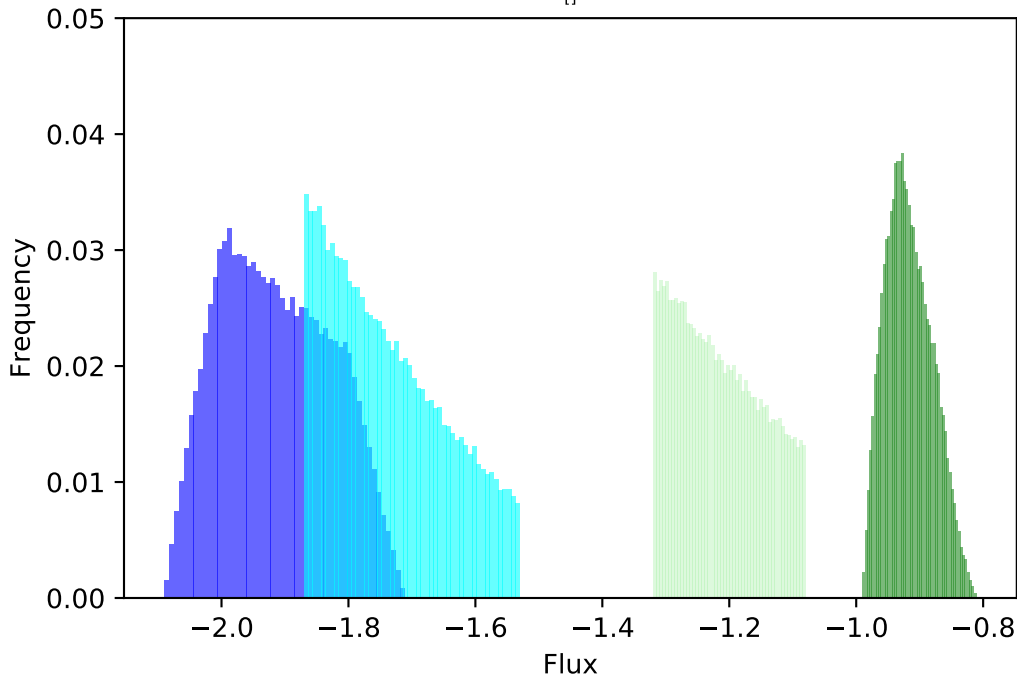[]

51 : Mal_c + NAD_c --> NADH_c + OAA_c
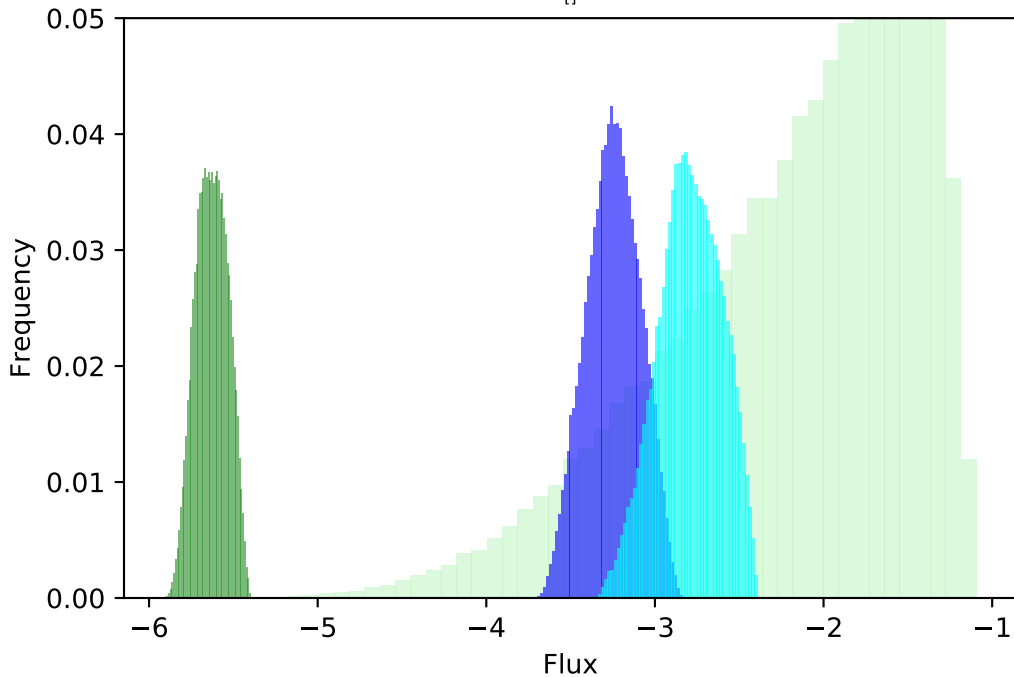[]

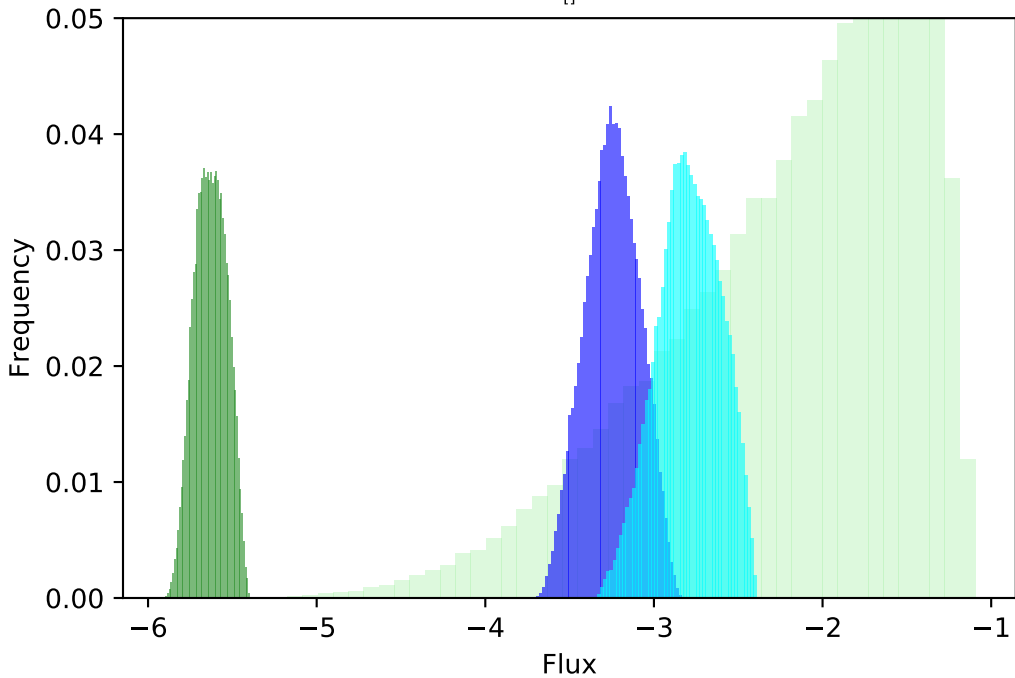52 : ATP_c + OAA_c --> ADP_c + CO2_c + PEP_c
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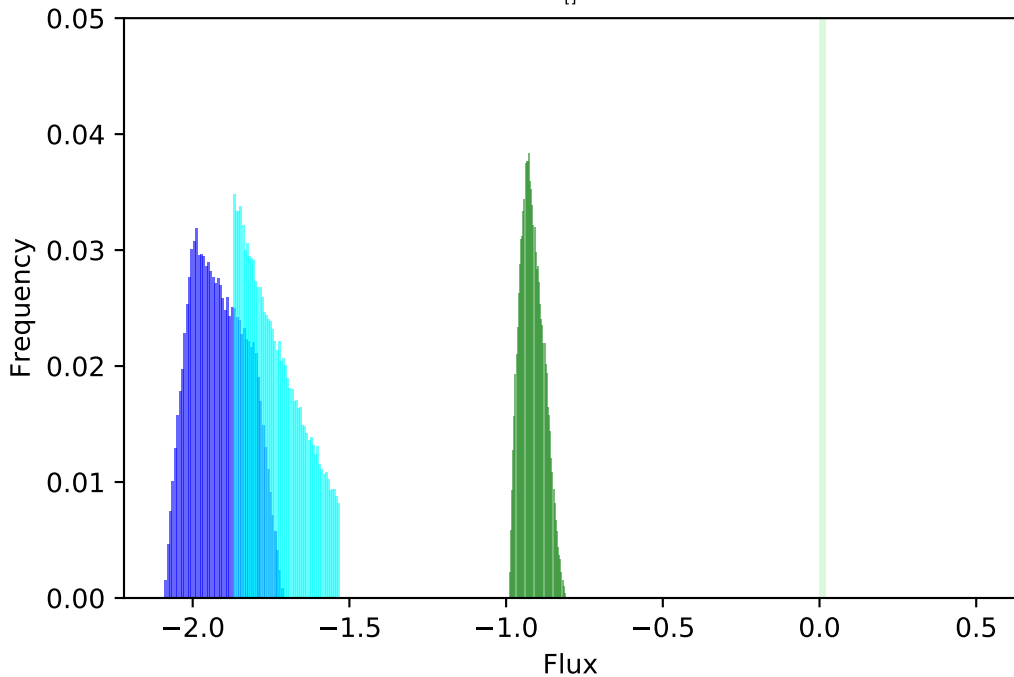53 : OAA_c + Pi_c <=> HCO3_c + PEP_c
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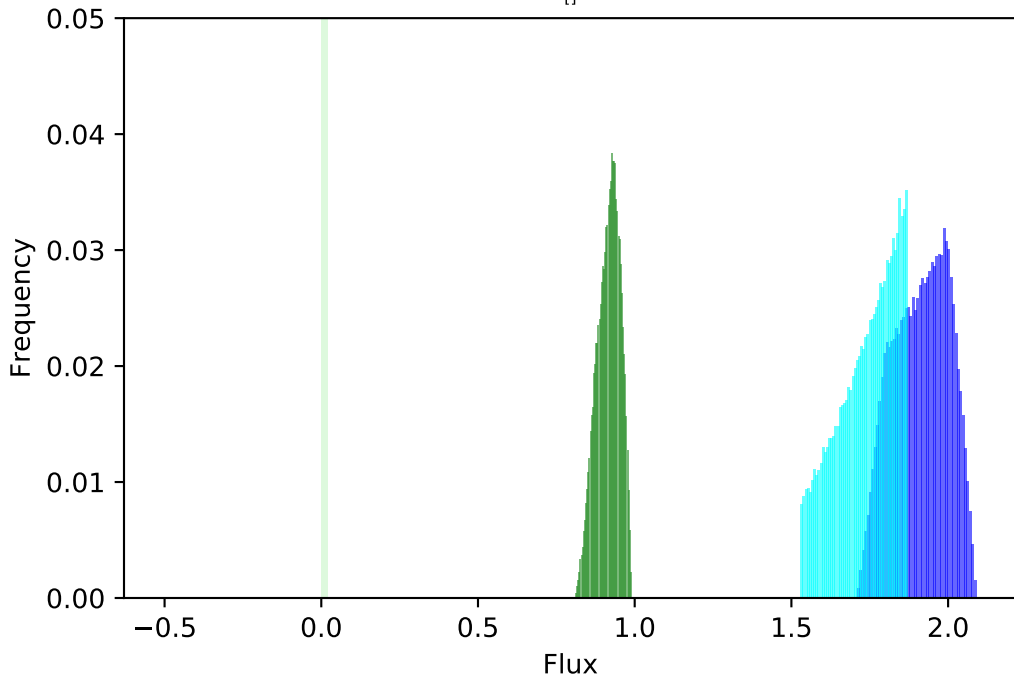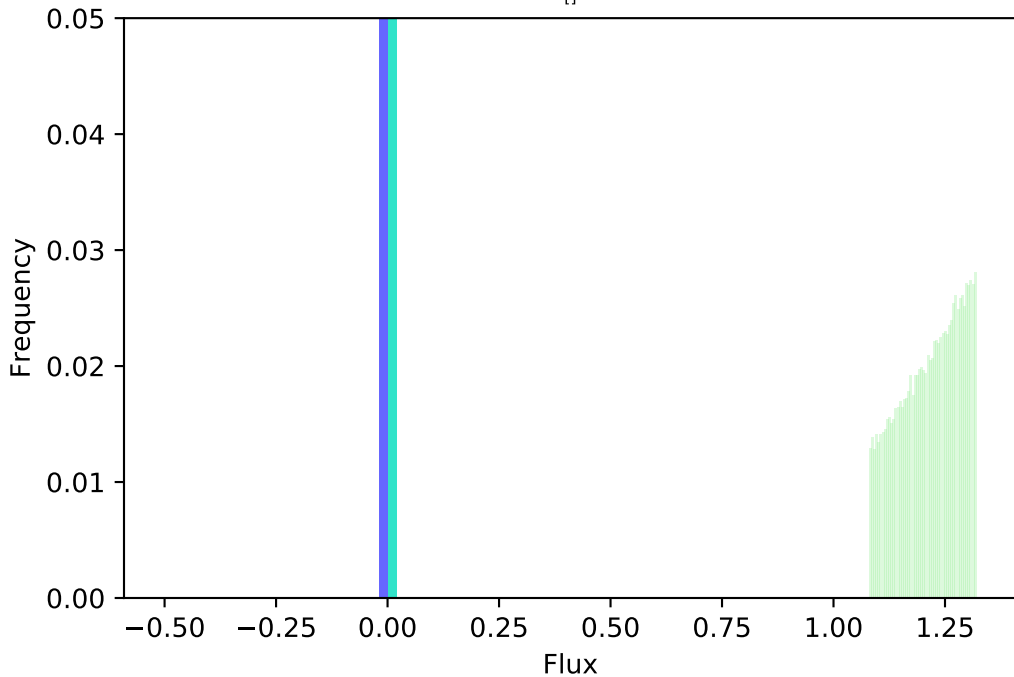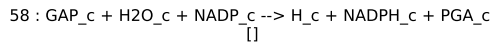54 : H2O_c + PEP_c <=> 2PGA_c
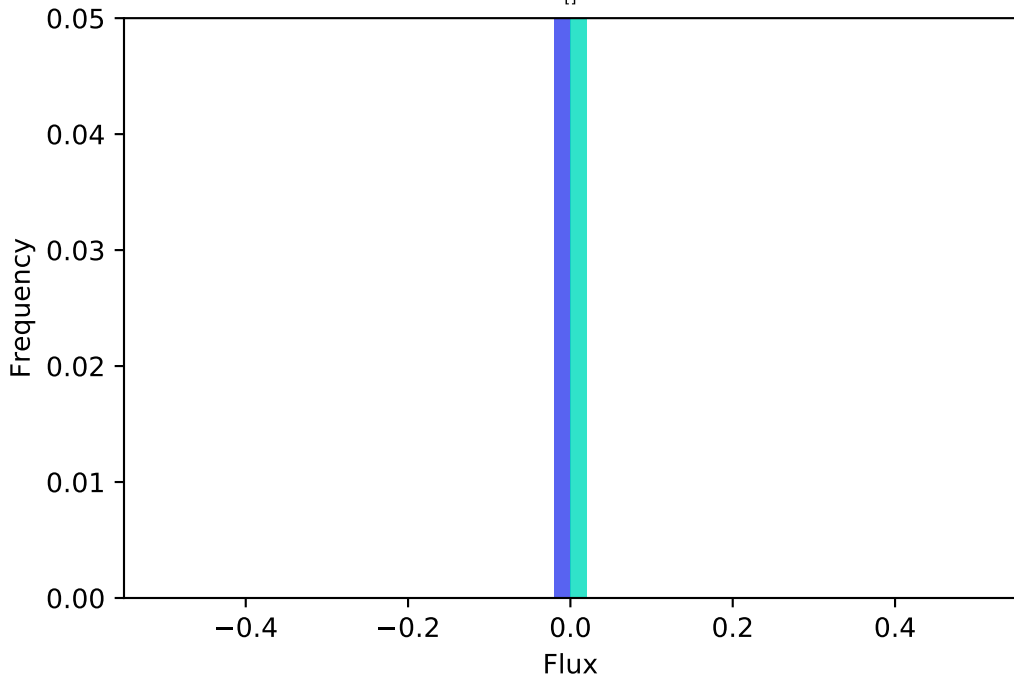[]

55 : 2PGA_c <=> PGA_c
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56 : ATP_c + PGA_c <=> ADP_c + DPGA_c
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57 : GAP_c + NAD_c + Pi_c <=> DPGA_c + NADH_c
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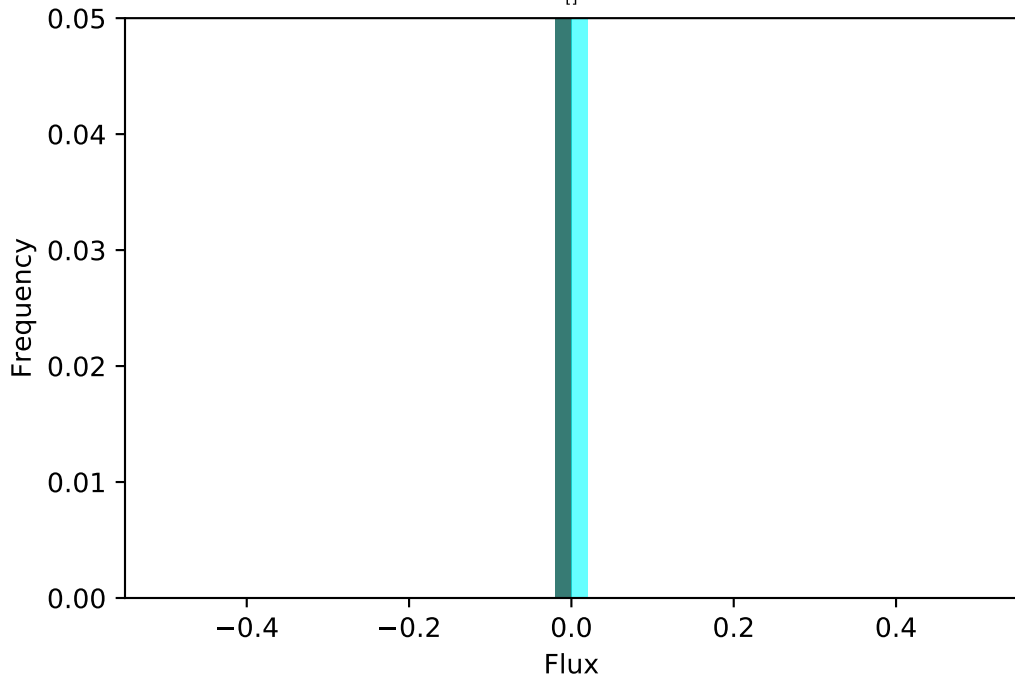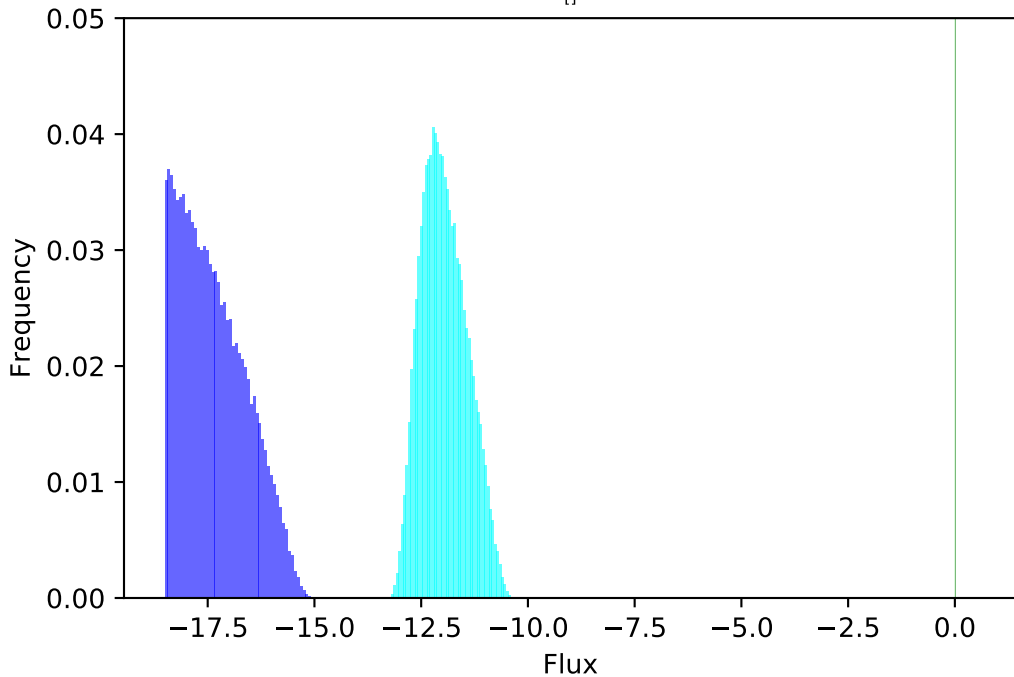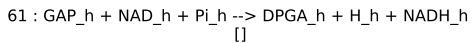58 : GAP_c + H2O_c + NADP_c --> H_c + NADPH_c + PGA_c
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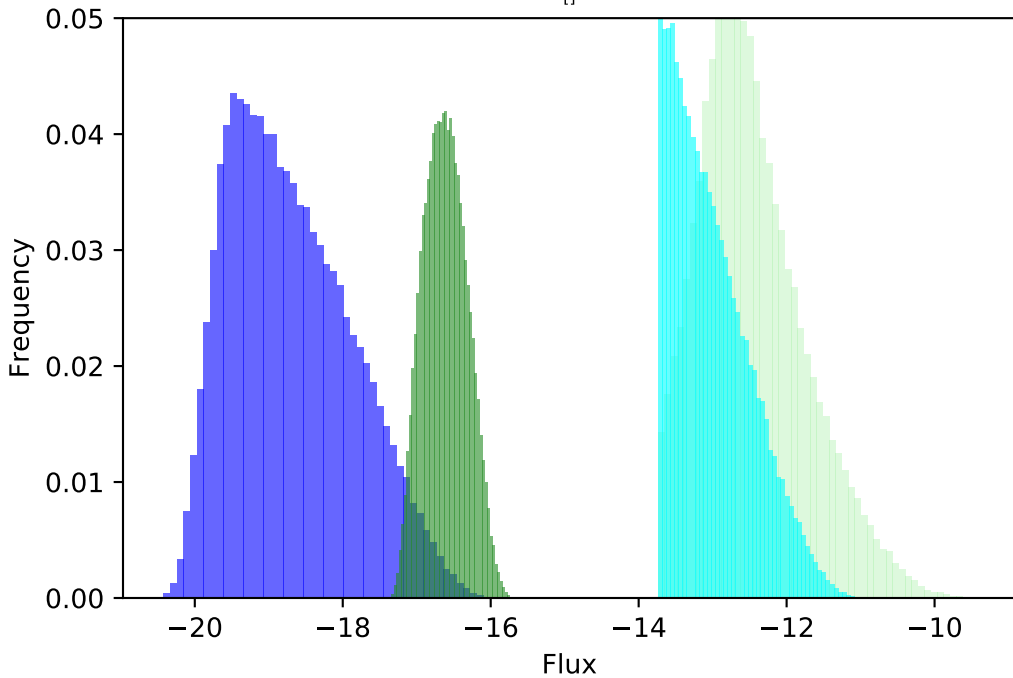59 : ATP_c + F6P_c --> ADP_c + FBP_c + H_c
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60 : ATP_h + F6P_h --> ADP_h + FBP_h + H_h
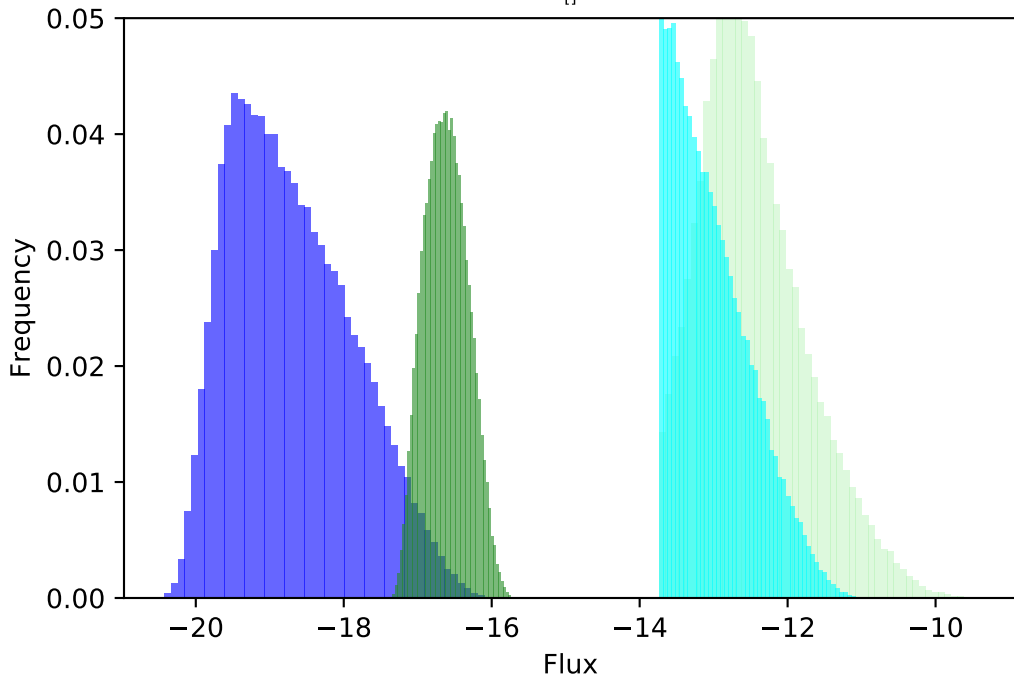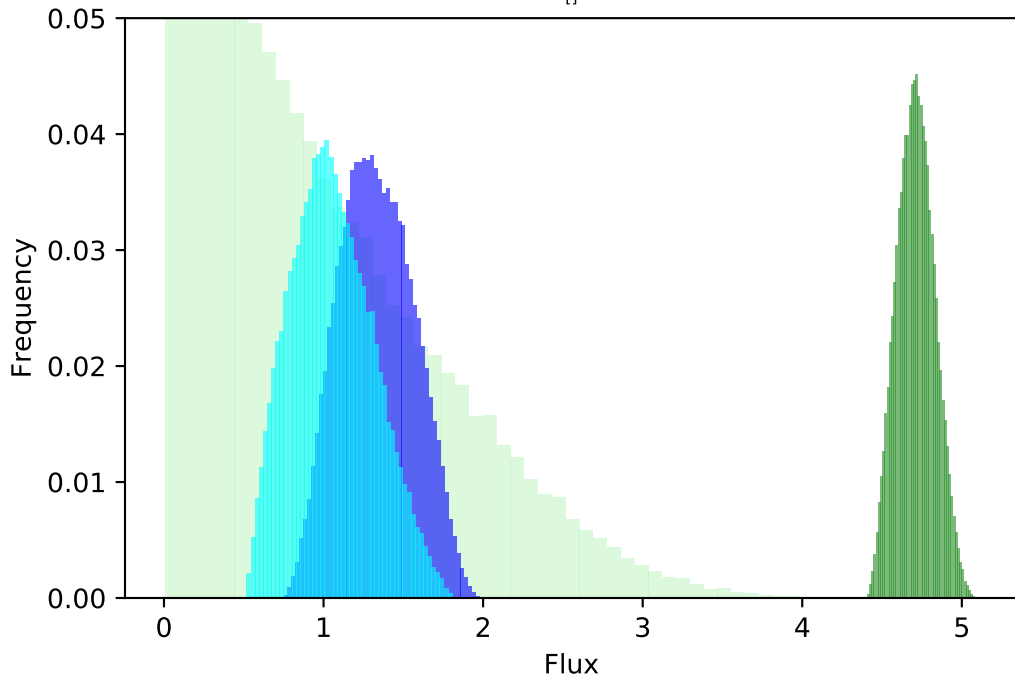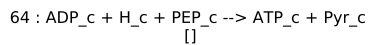[]

61 : GAP_h + NAD_h + Pi_h --> DPGA_h + H_h + NADH_h
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62 : PGA_h --> 2PGA_h
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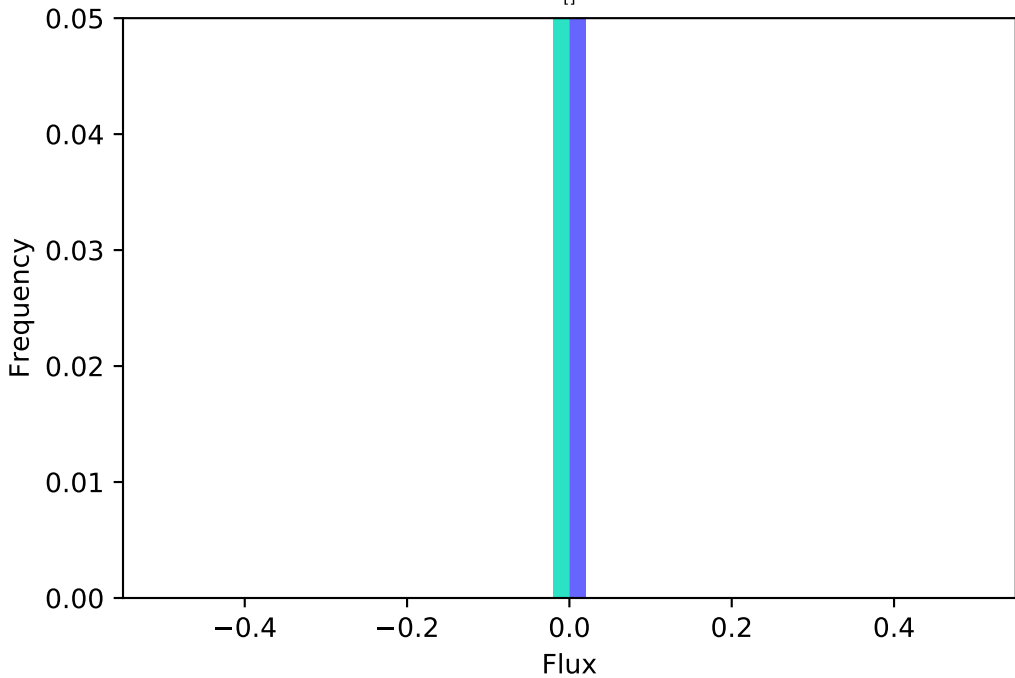
63 : 2PGA_h <=> H2O_h + PEP_h
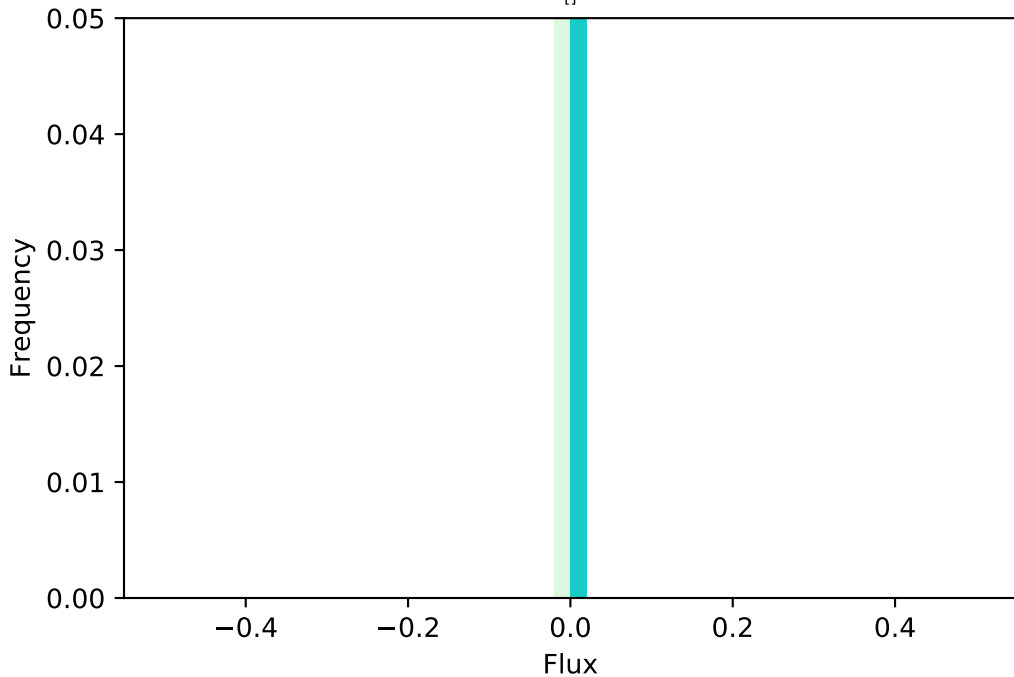[]

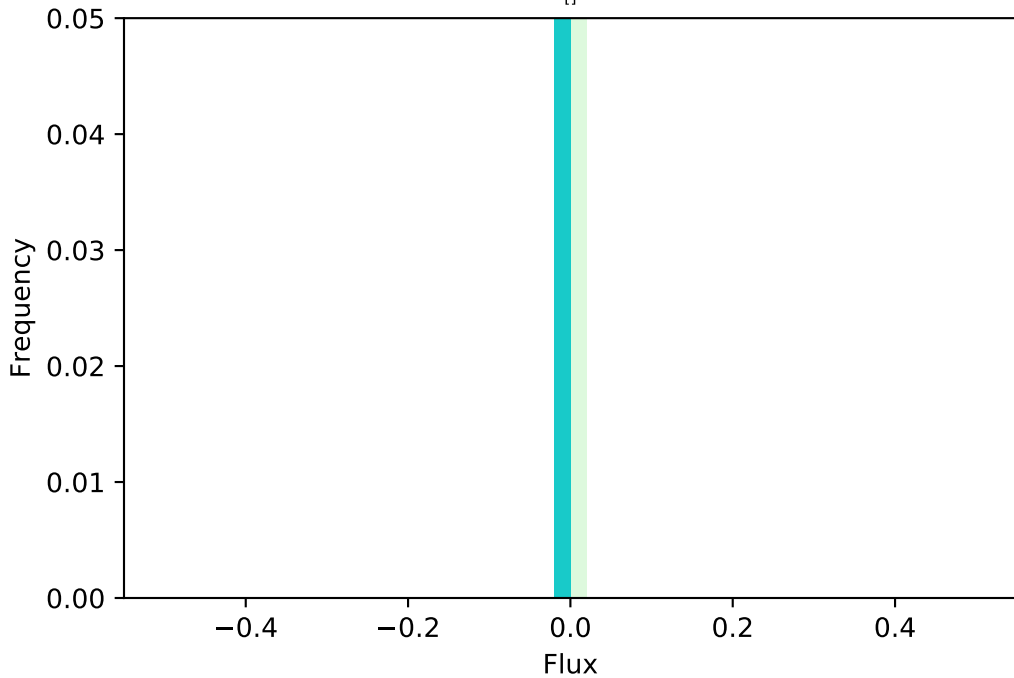64 : ADP_c + H_c + PEP_c --> ATP_c + Pyr_c
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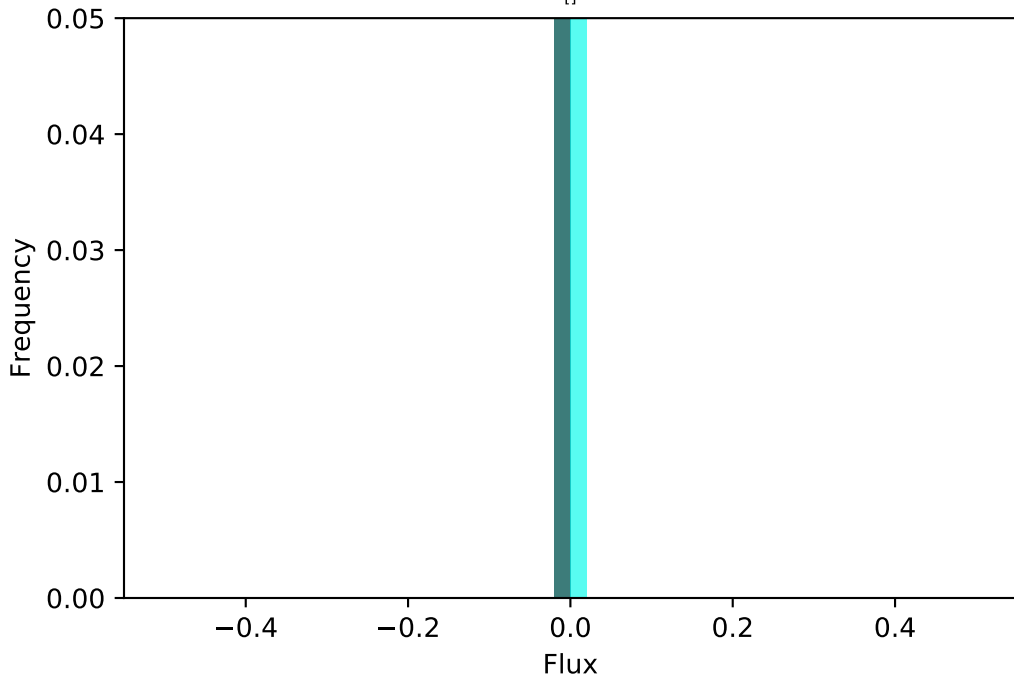65 : ADP_h + H_h + PEP_h --> ATP_h + Pyr_h
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66 : H_m + Pyr_m + ThPP_m --> CO2_m + H_DASH_Eth_DASH_ThPP_m
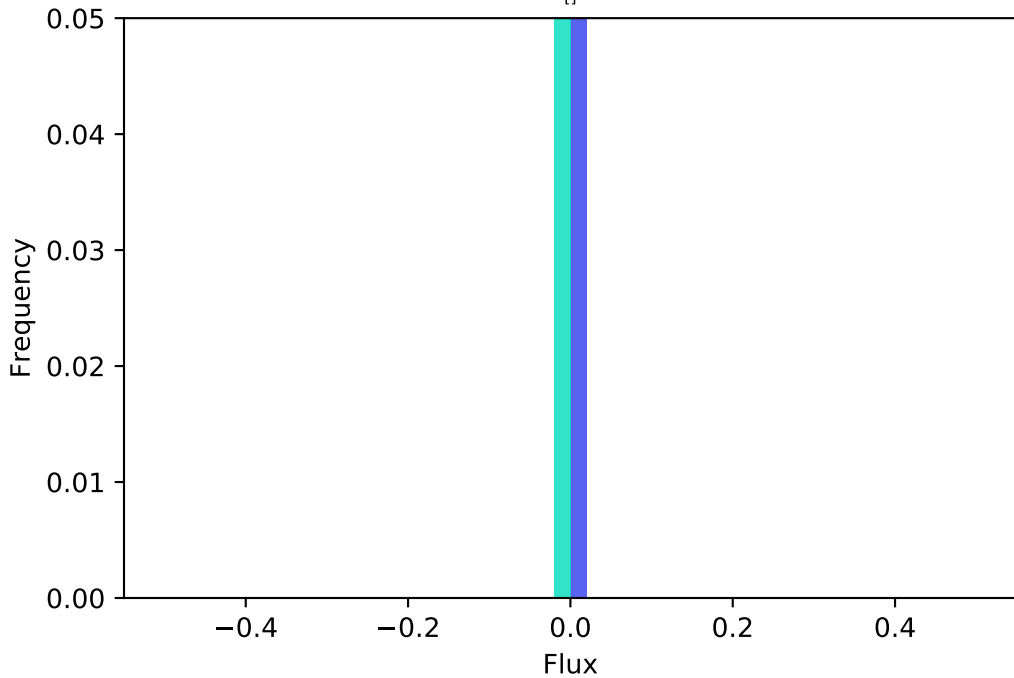[]

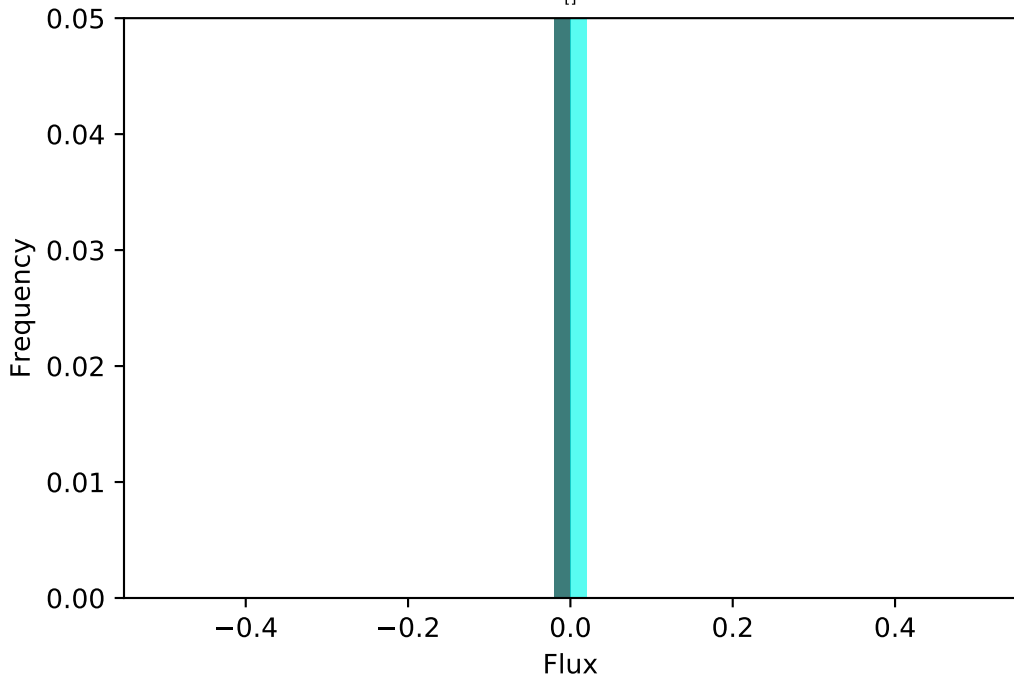67 : H_DASH_Eth_DASH_ThPP_m + LPA_m --> A_DASH_DHL_m + ThPP_m
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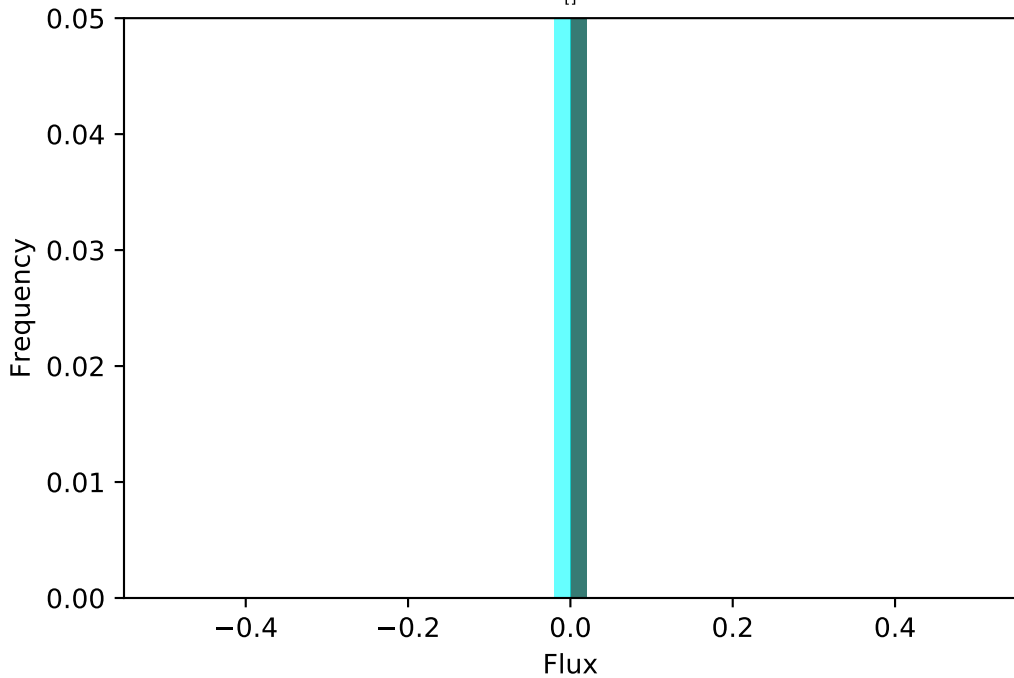68 : A_DASH_DHL_m + CoA_m --> A_DASH_CoA_m + DHL_m
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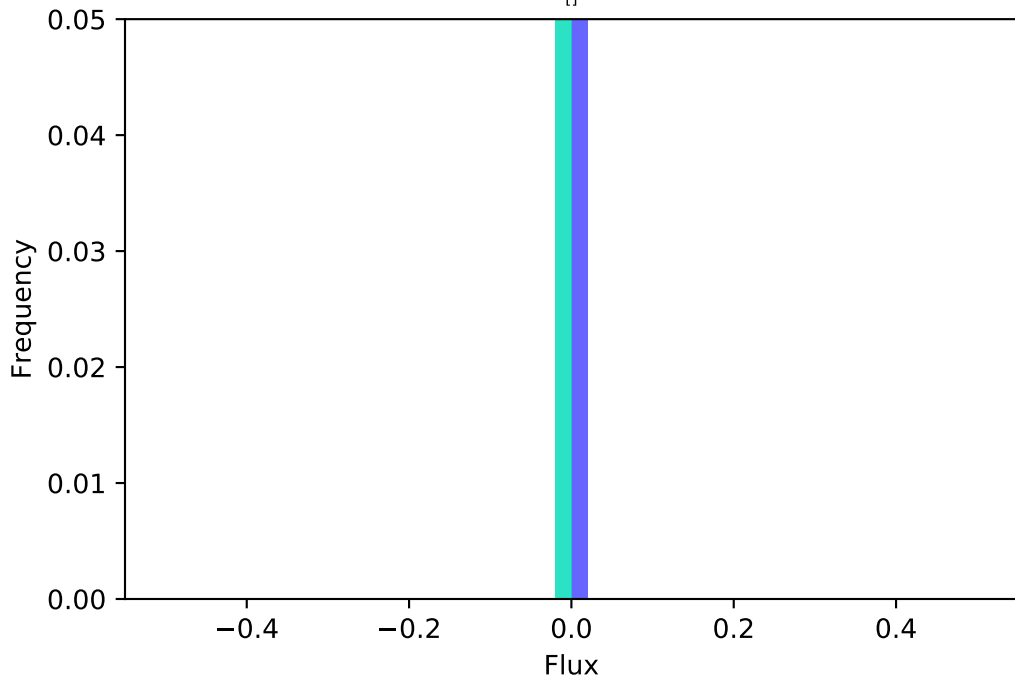69 : DHL_m + NAD_m --> H_m + LPA_m + NADH_m
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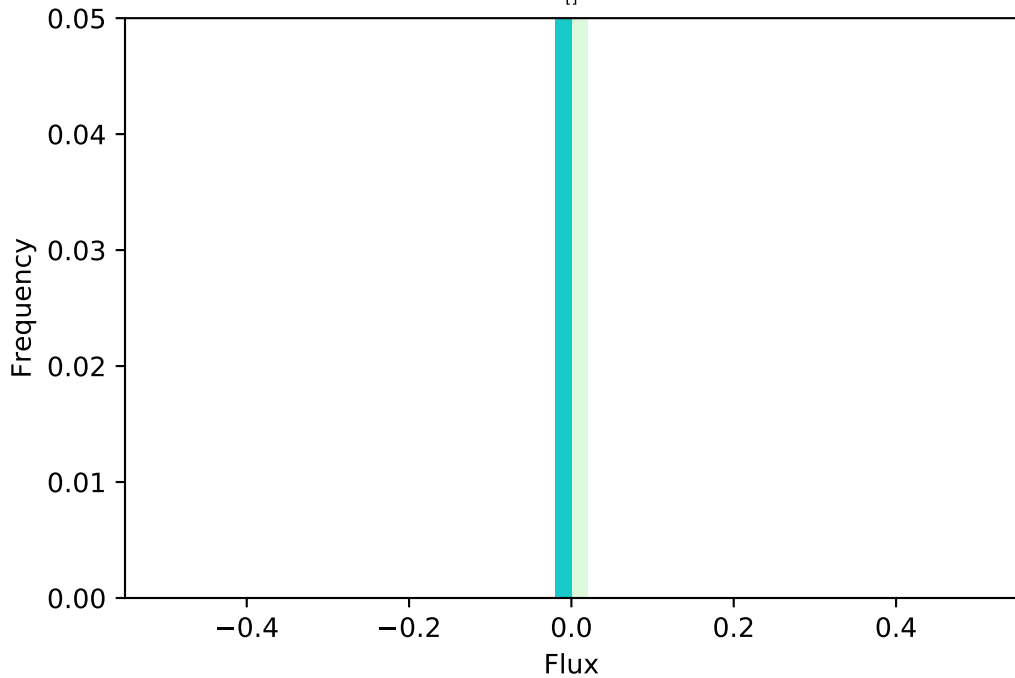70 : A_DASH_CoA_m + H2O_m + OAA_m --> Cit_m + CoA_m + H_m
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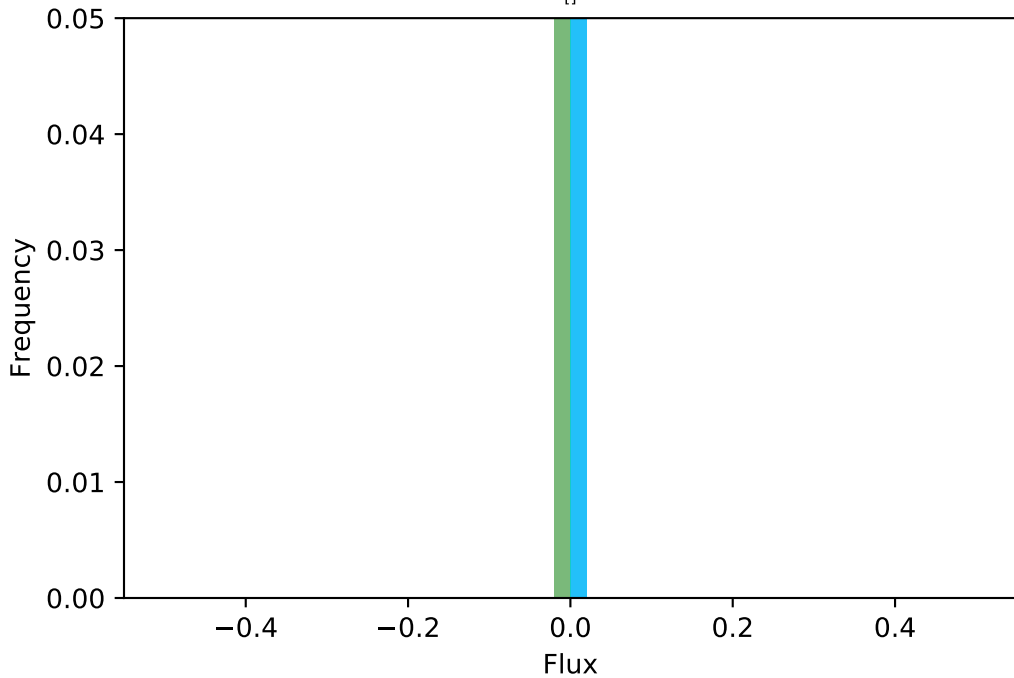71 : Cit_m --> H2O_m + cACN_m
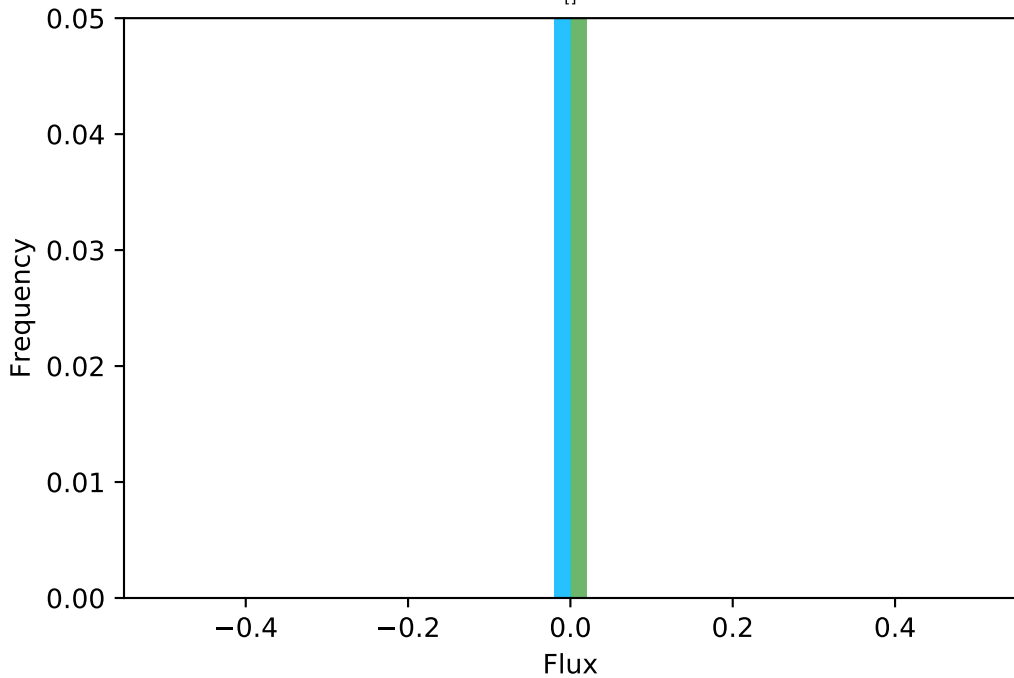[]

72 : H2O_m + cACN_m --> iCit_m
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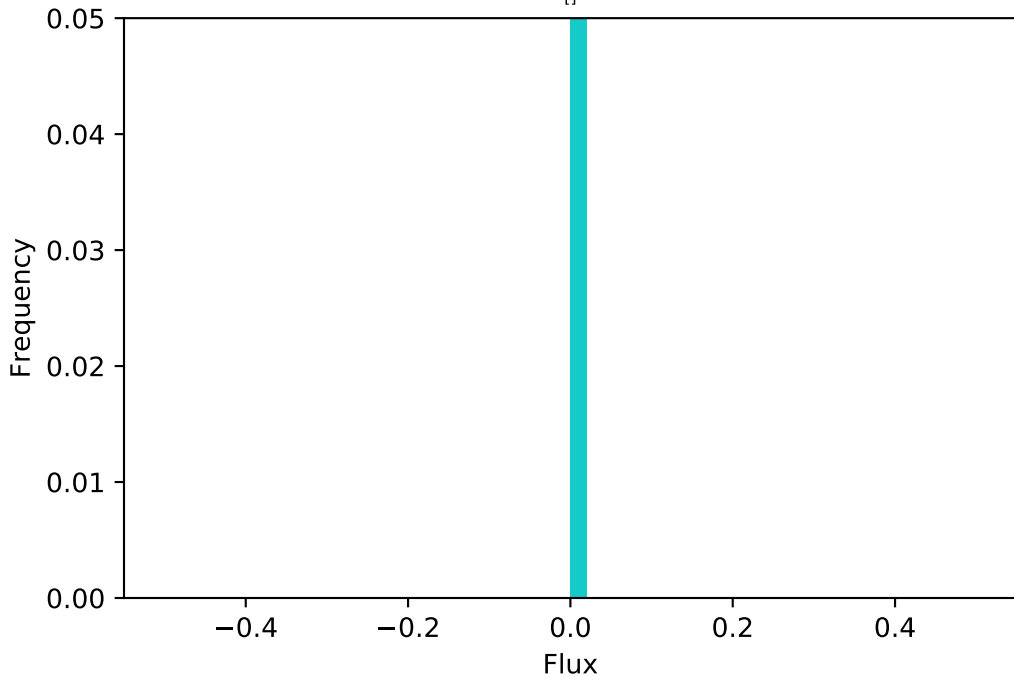73 : NAD_m + iCit_m --> CO2_m + KG_m + NADH_m
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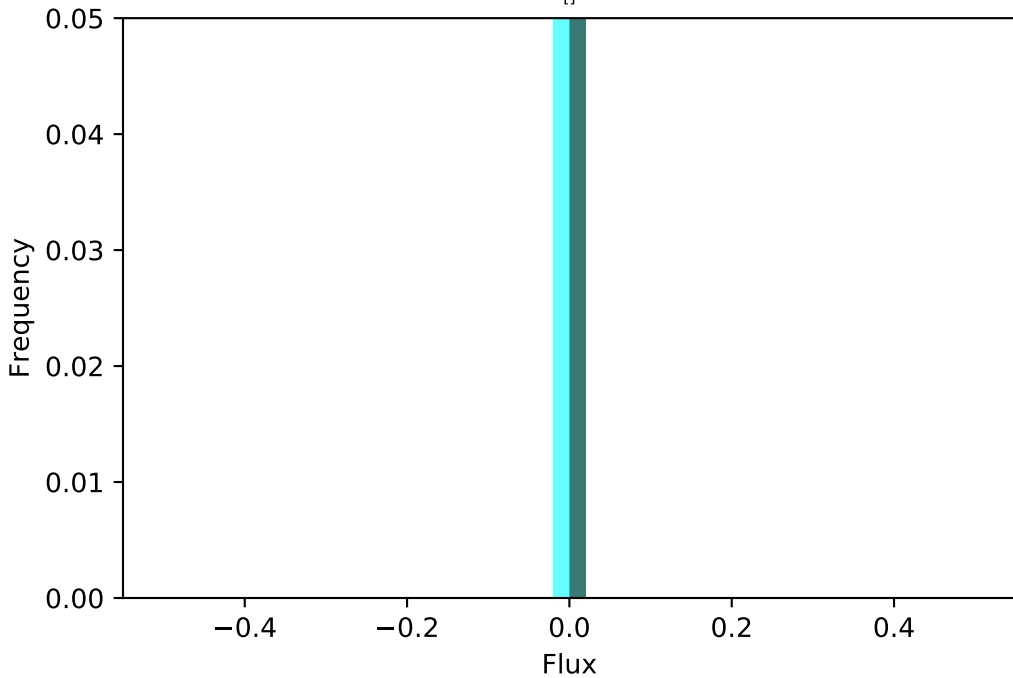74 : H_m + KG_m + LPA_m --> CO2_m + S_DASH_DHL_m
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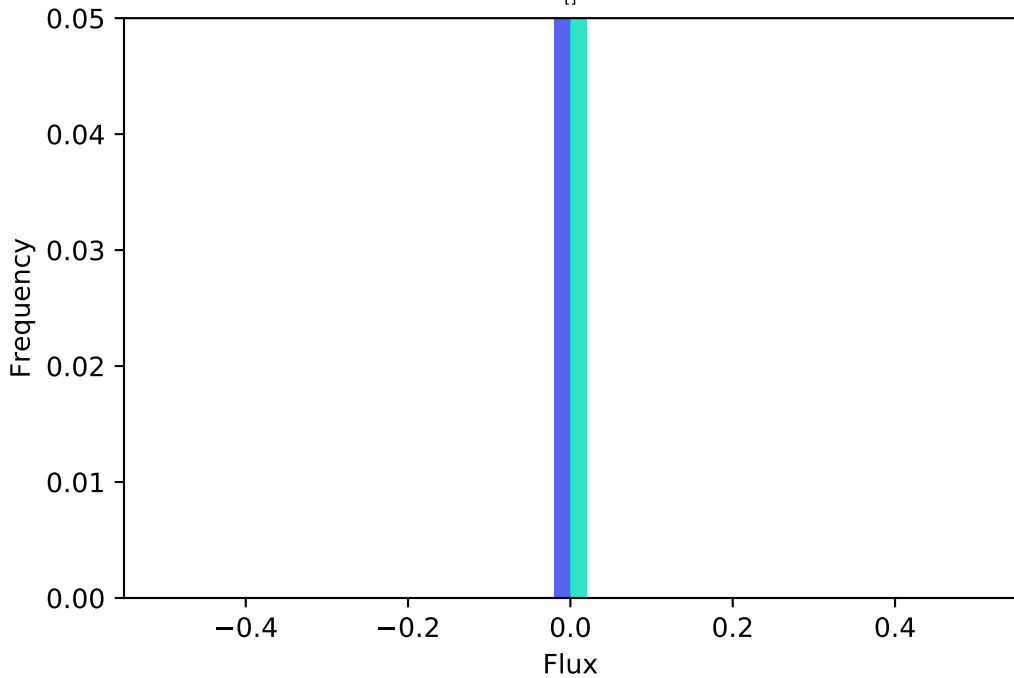75 : CoA_m + S_DASH_DHL_m --> DHL_m + S_DASH_CoA_m
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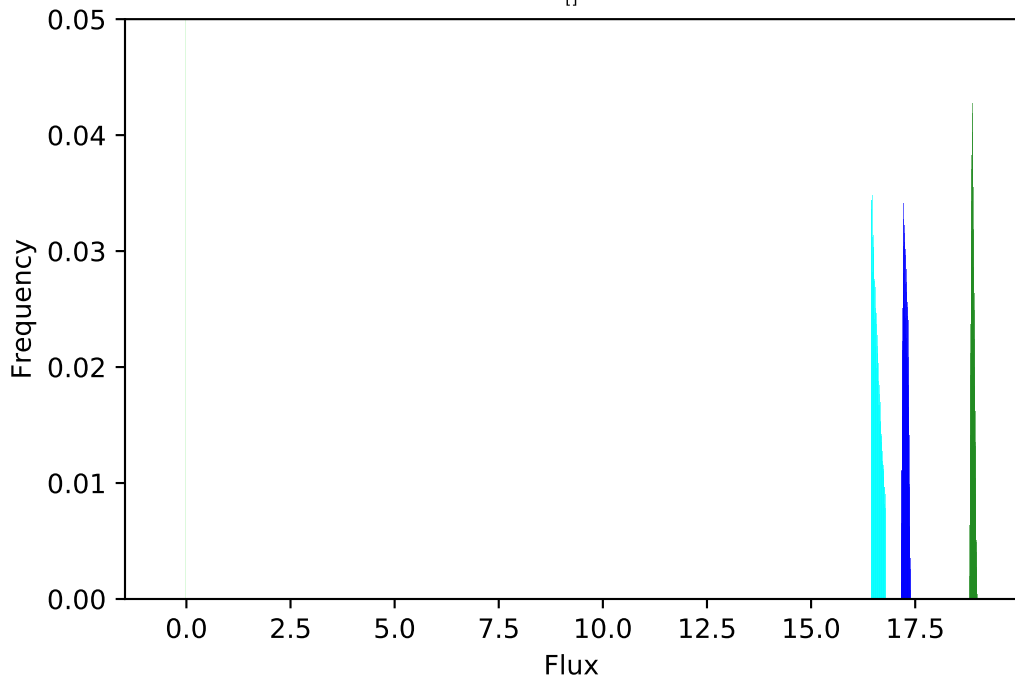76 : ADP_m + Pi_m + S_DASH_CoA_m --> ATP_m + CoA_m + SCA_m
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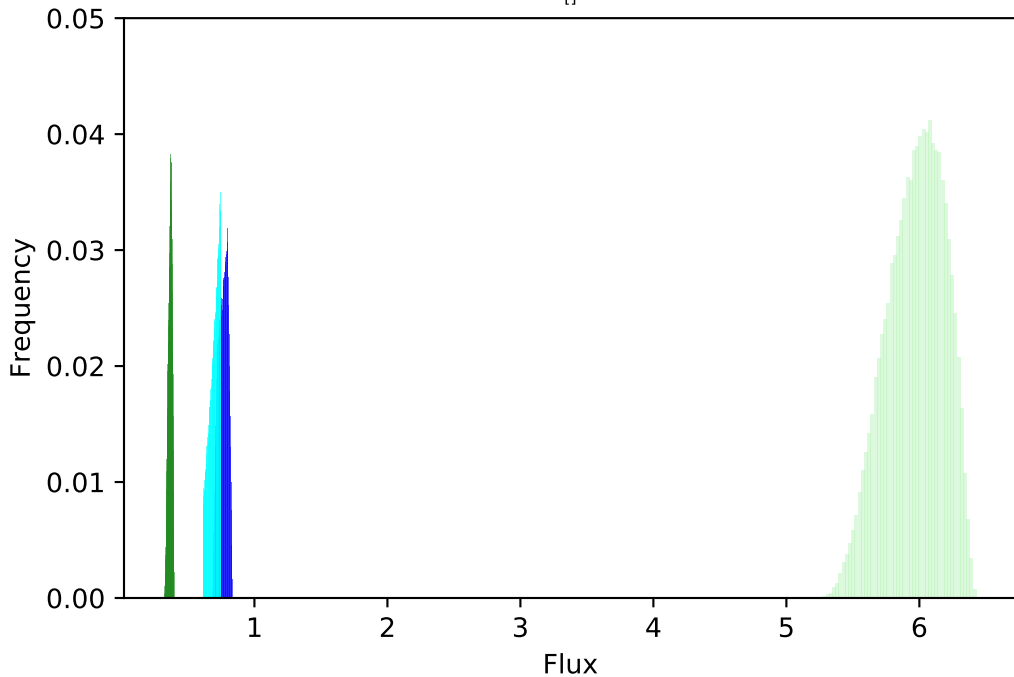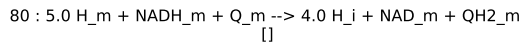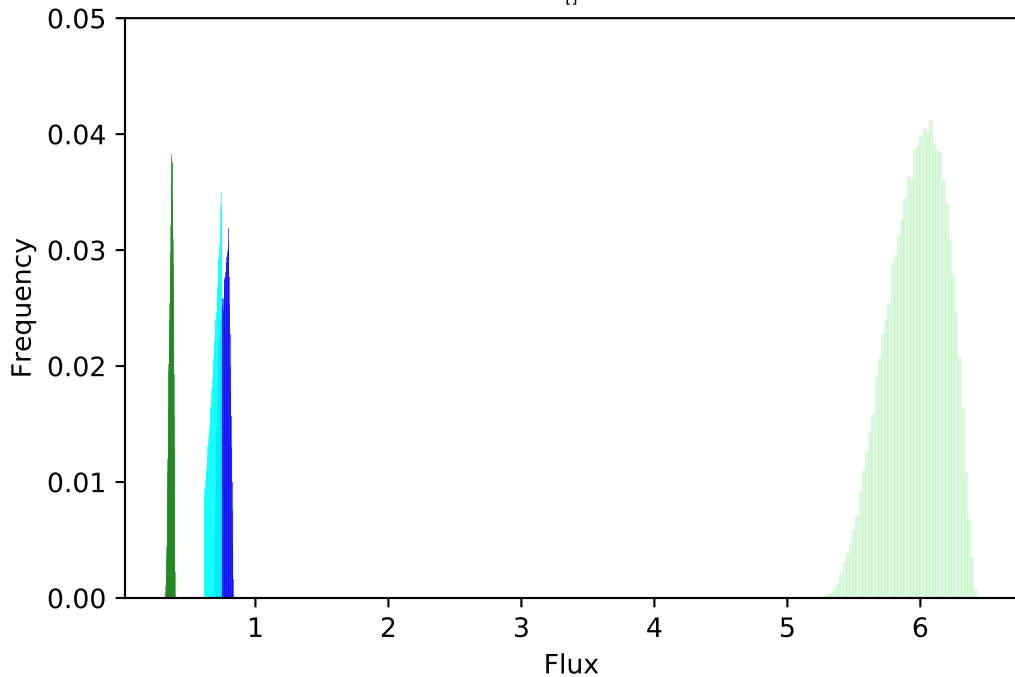77 : Q_m + SCA_m --> Fum_m + QH2_m
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78 : Fum_m + H2O_m --> Mal_m
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79 : Mal_m + NAD_m <=> H_m + NADH_m + OAA_m
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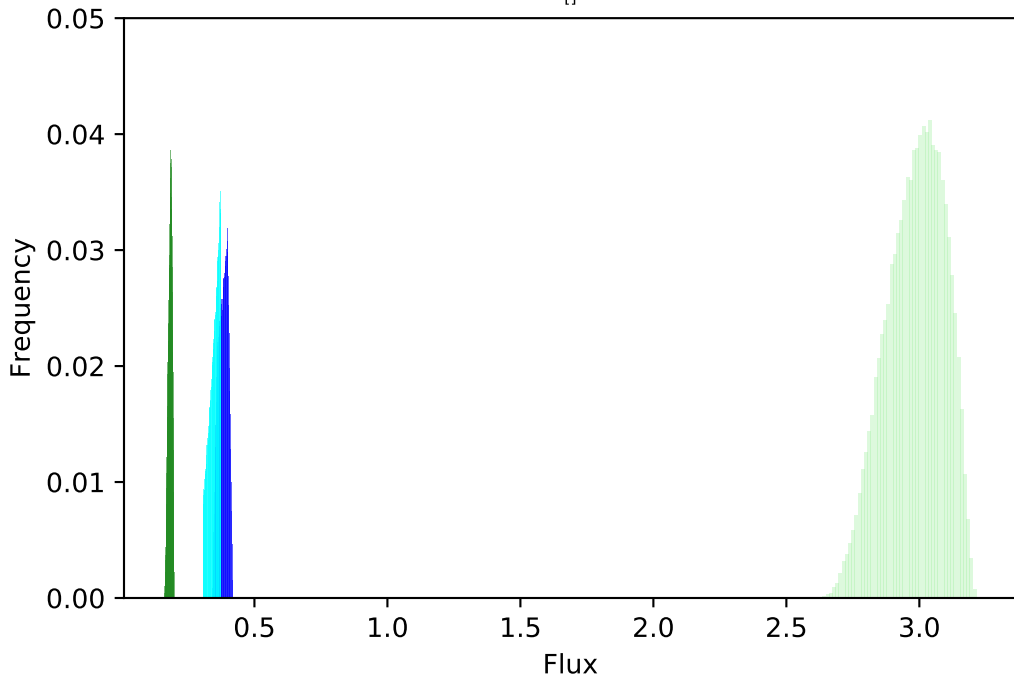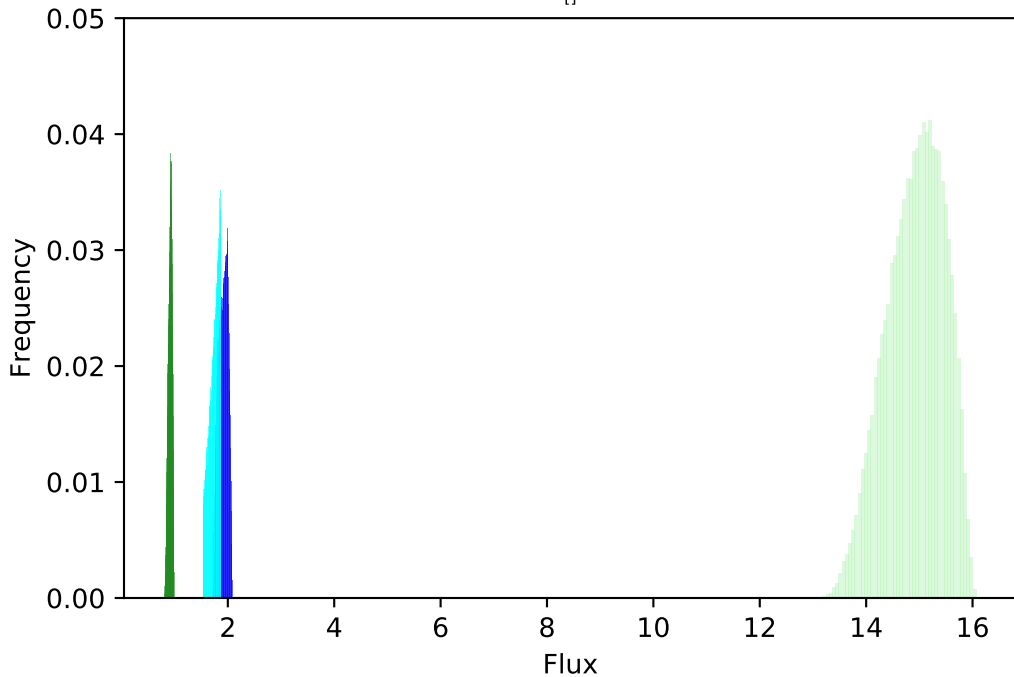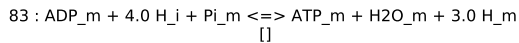80 : 5.0 H_m + NADH_m + Q_m --> 4.0 H_i + NAD_m + QH2_m
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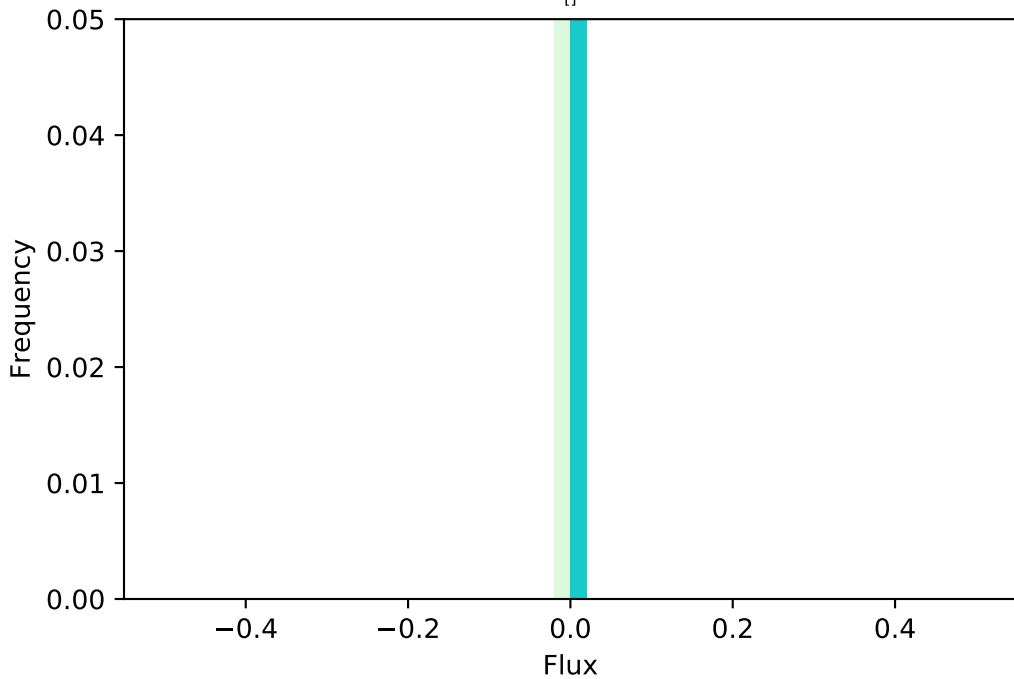81 : 2.0 Cytcox_m + 2.0 H_m + QH2_m --> 2.0 Cytcrd_m + 4.0 H_i + Q_m
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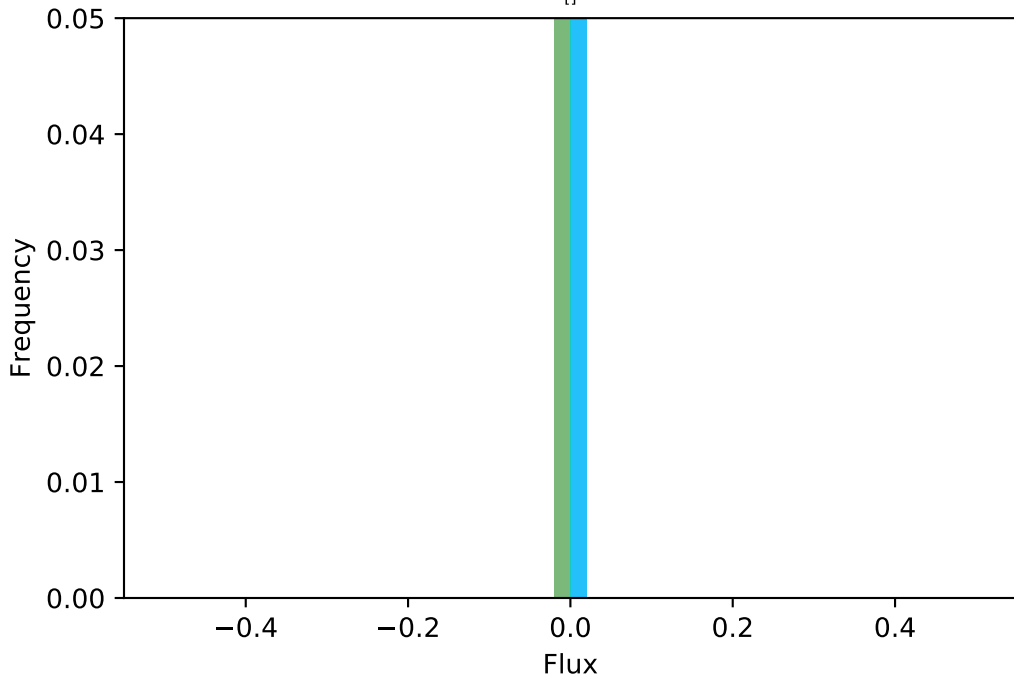82 : 4.0 Cytcrd_m + 8.0 H_m + O2_m --> 4.0 Cytcox_m + 2.0 H2O_m + 4.0 H_i
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83 : ADP_m + 4.0 H_i + Pi_m <=> ATP_m + H2O_m + 3.0 H_m
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84 : O2_h + RuBP_h --> 2.0 H_h + PGA_h + PGCA_h
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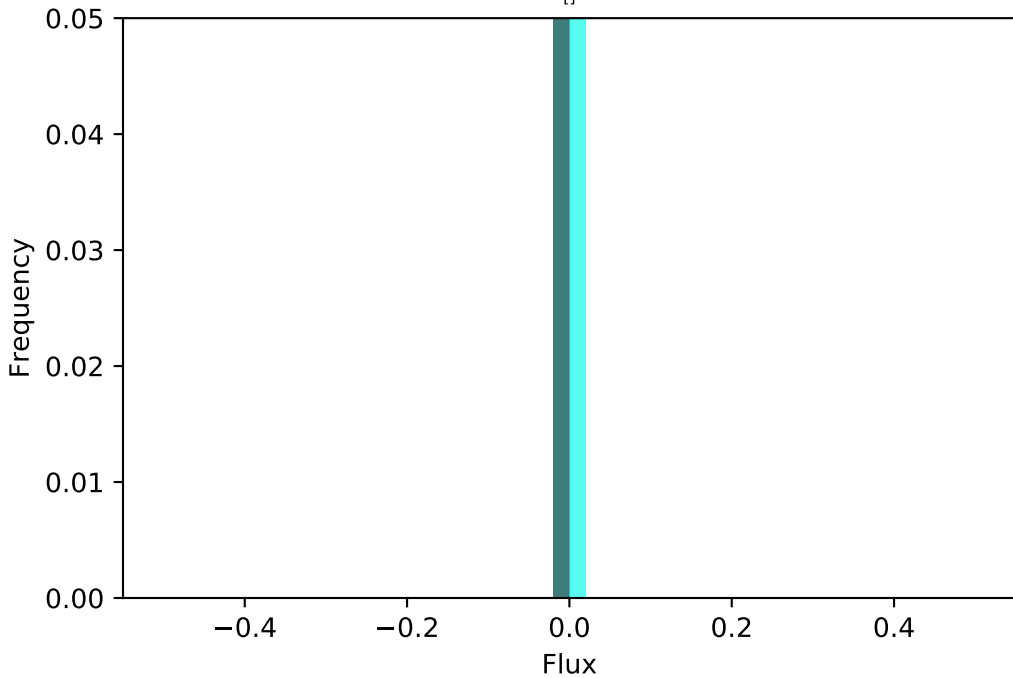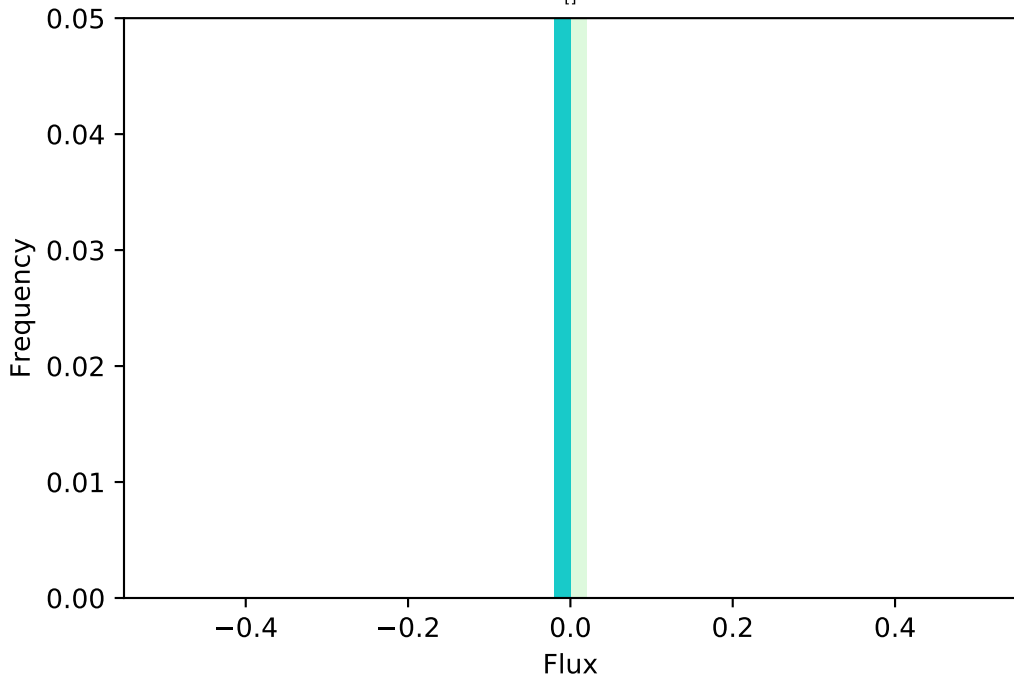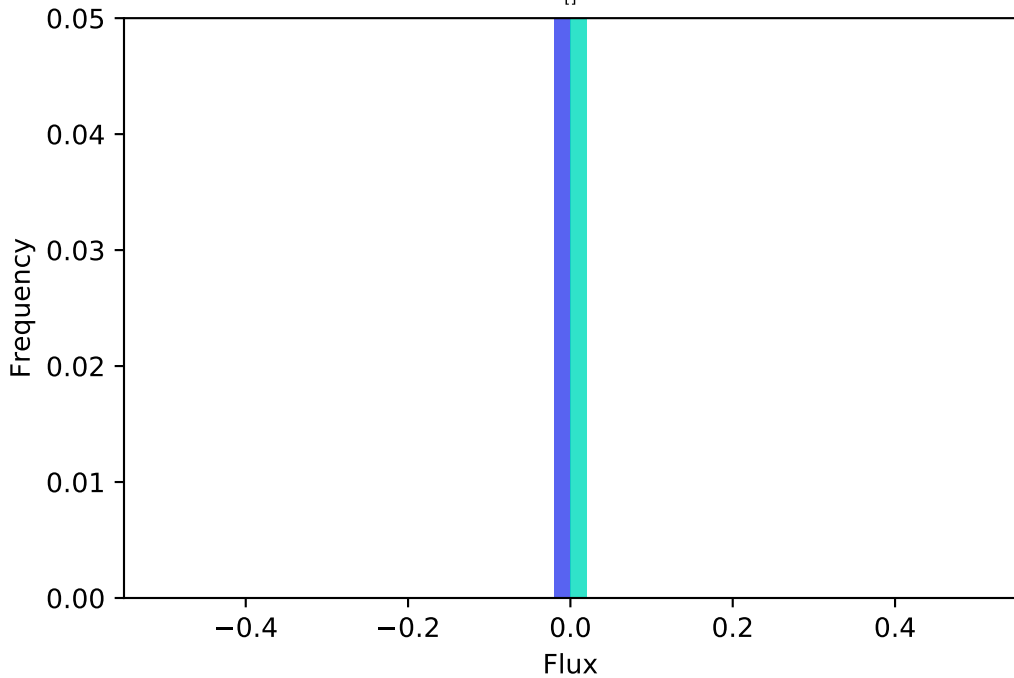
85 : H2O_h + PGCA_h --> GCA_h + Pi_h
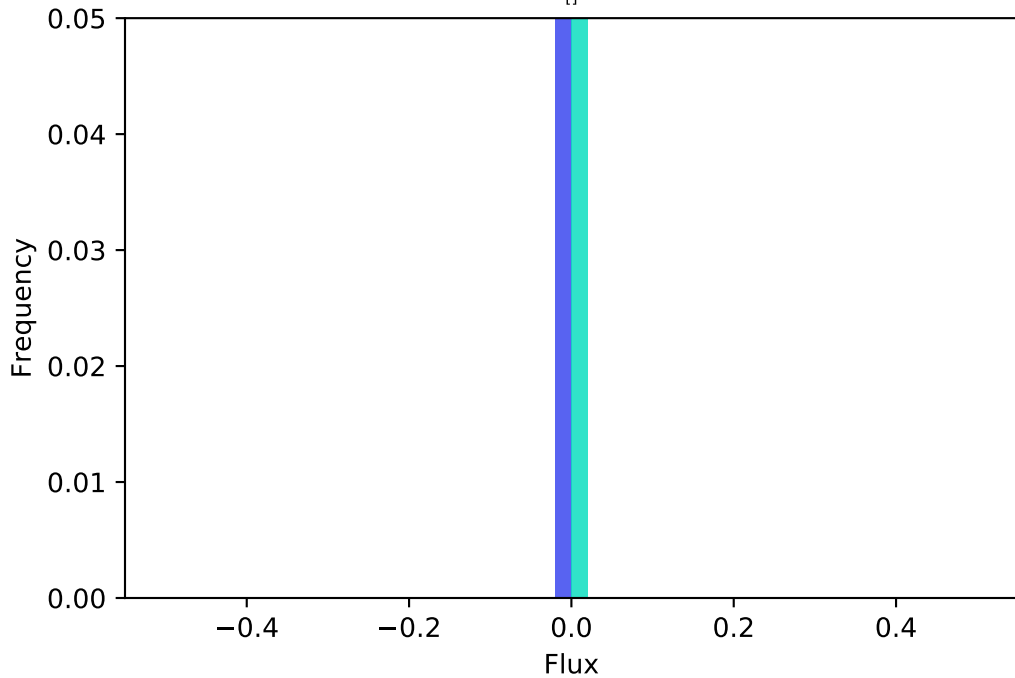[]

86 : GCA_p + O2_p --> GLX_p + H2O2_p
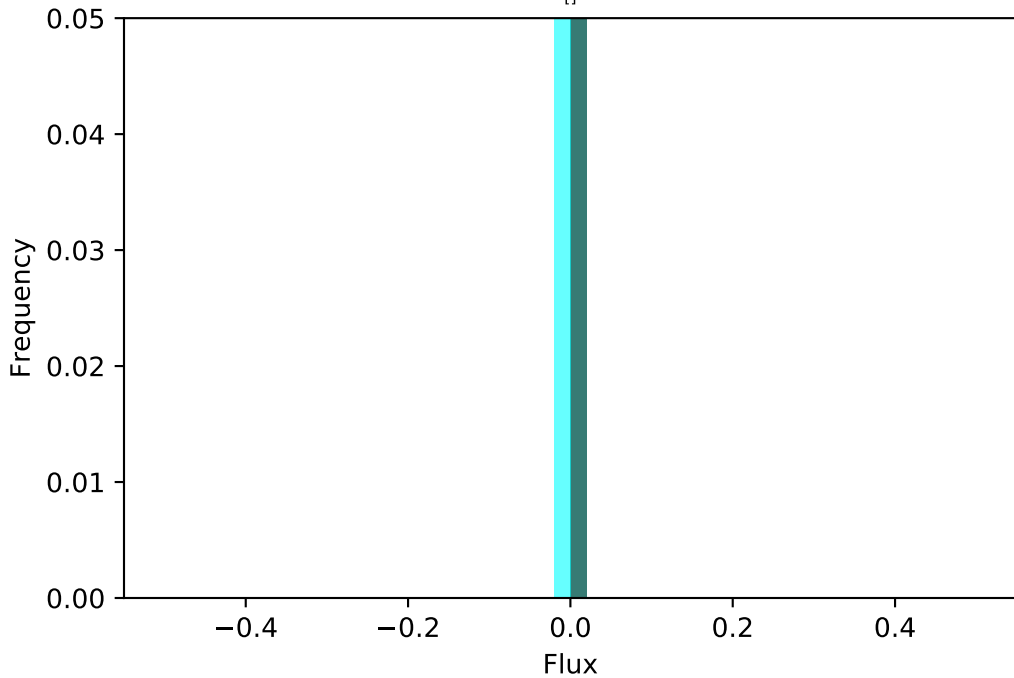[]

87 : 2.0 H2O2_p --> 2.0 H2O_p + O2_p
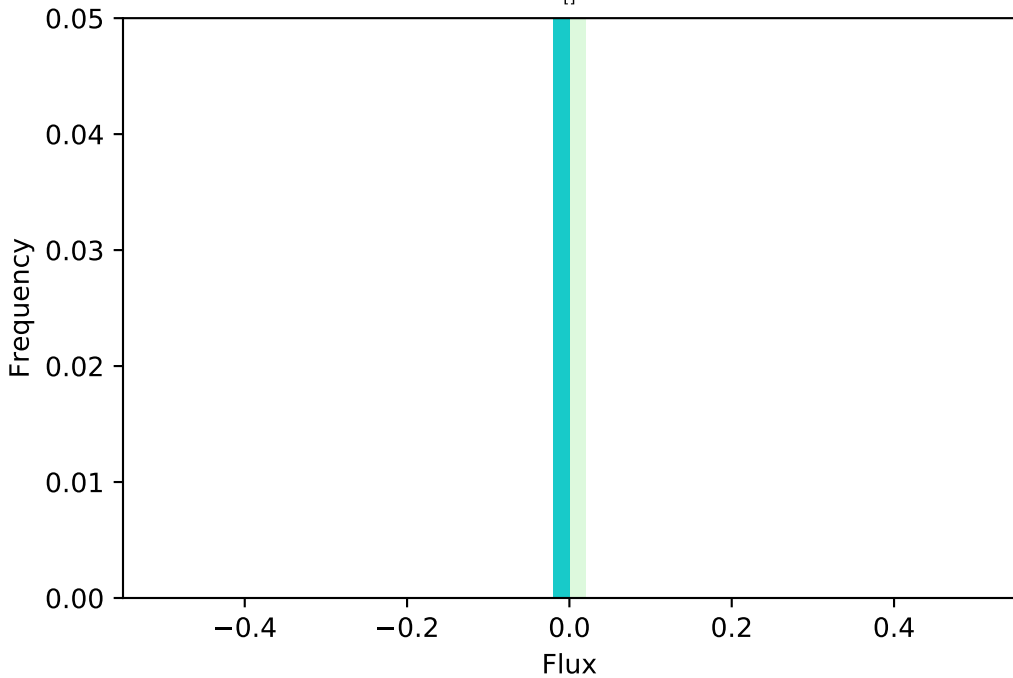[]

88 : GLX_p + Glu_p --> Gly_p + KG_p
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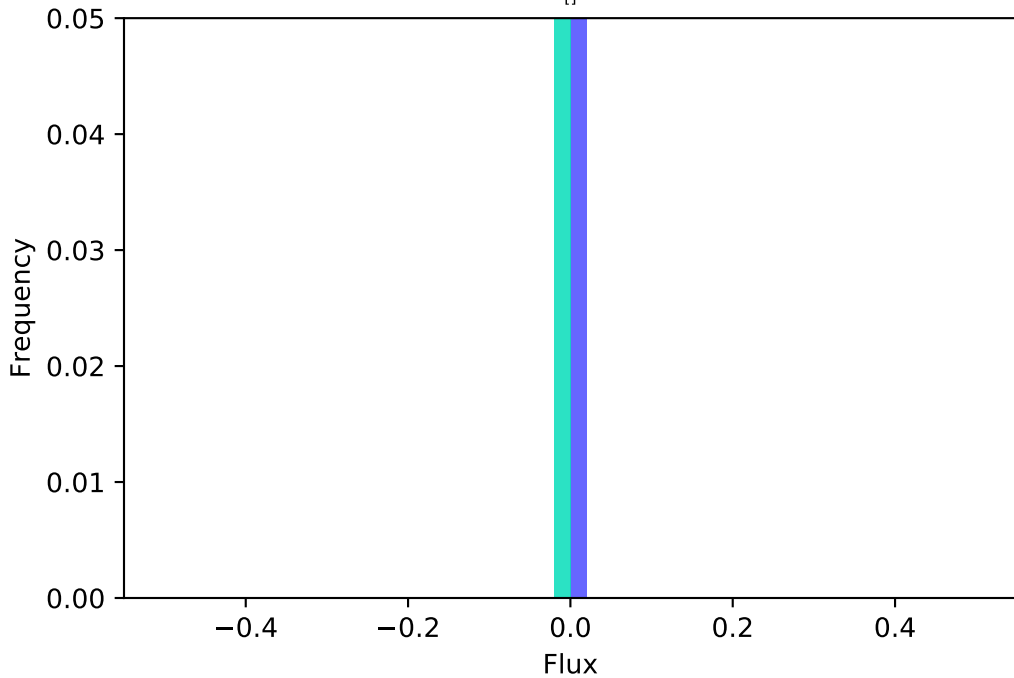89 : Gly_m + H_m + LPL_m --> CO2_m + amDHP_m
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90 : THF_m + amDHP_m --> DHP_m + M_DASH_THF_m + NH4_m
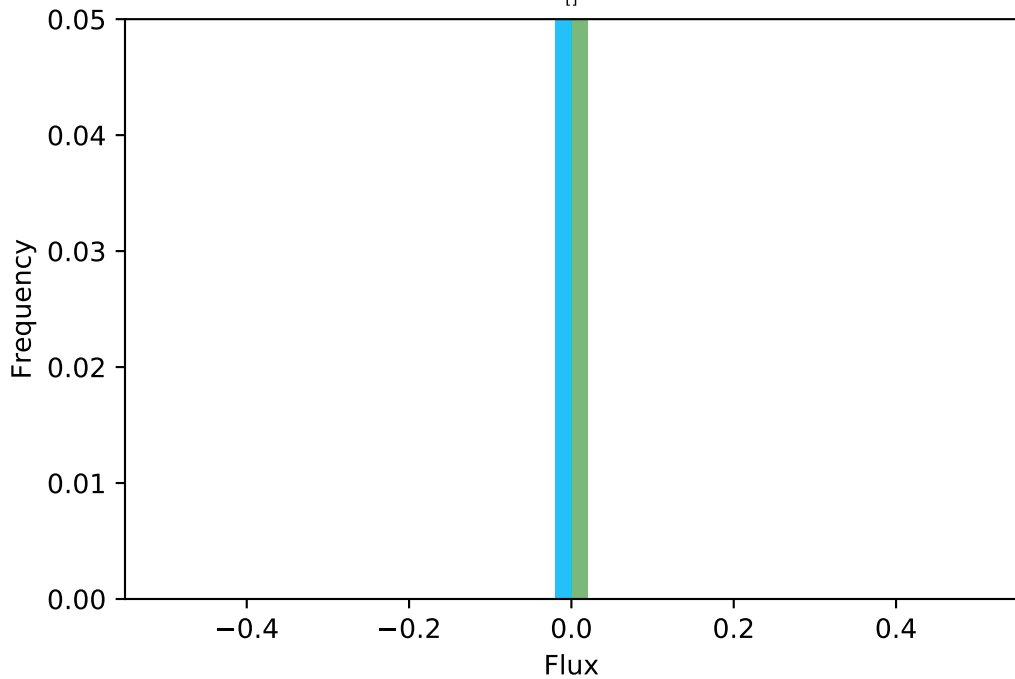[ ]

91 : DHP_m + NAD_m --> H_m + LPL_m + NADH_m
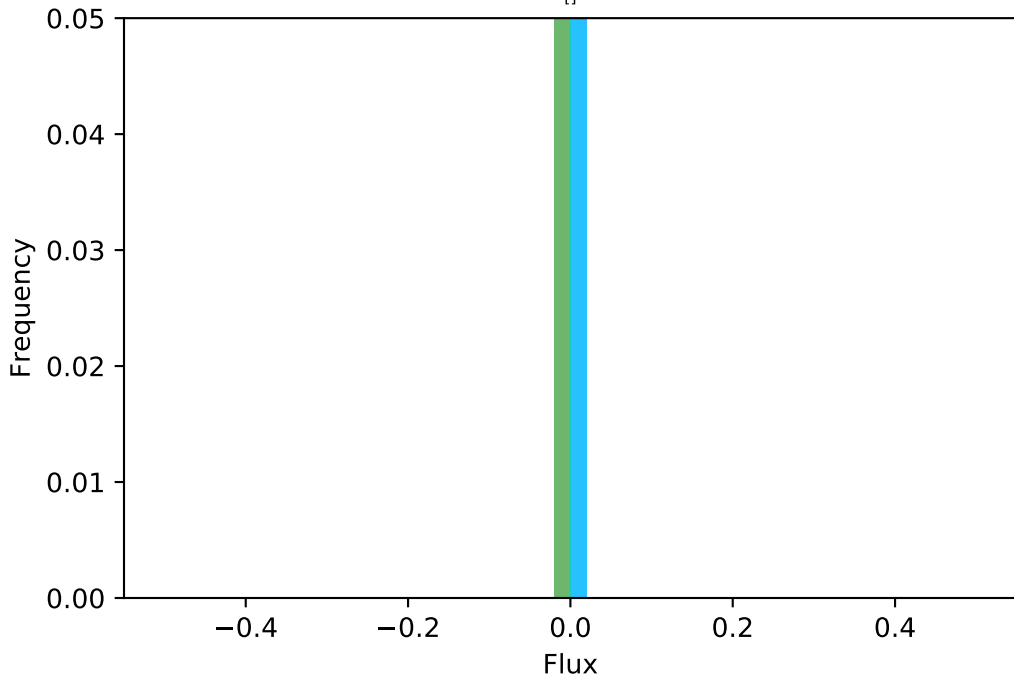[]

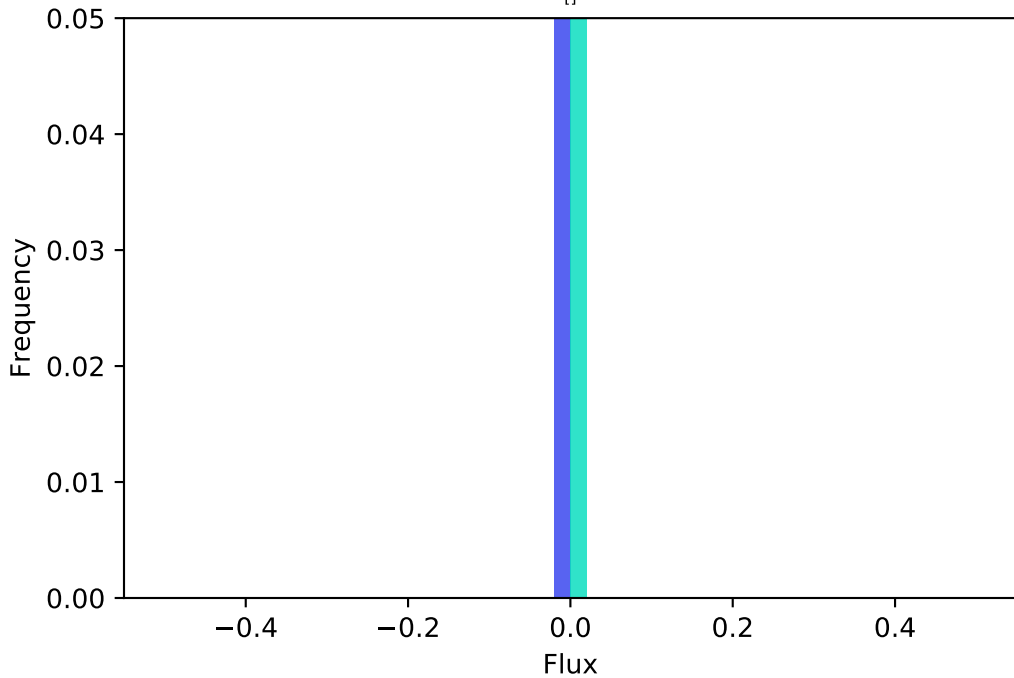92 : Gly_m + H2O_m + M_DASH_THF_m <=> Ser_m + THF_m
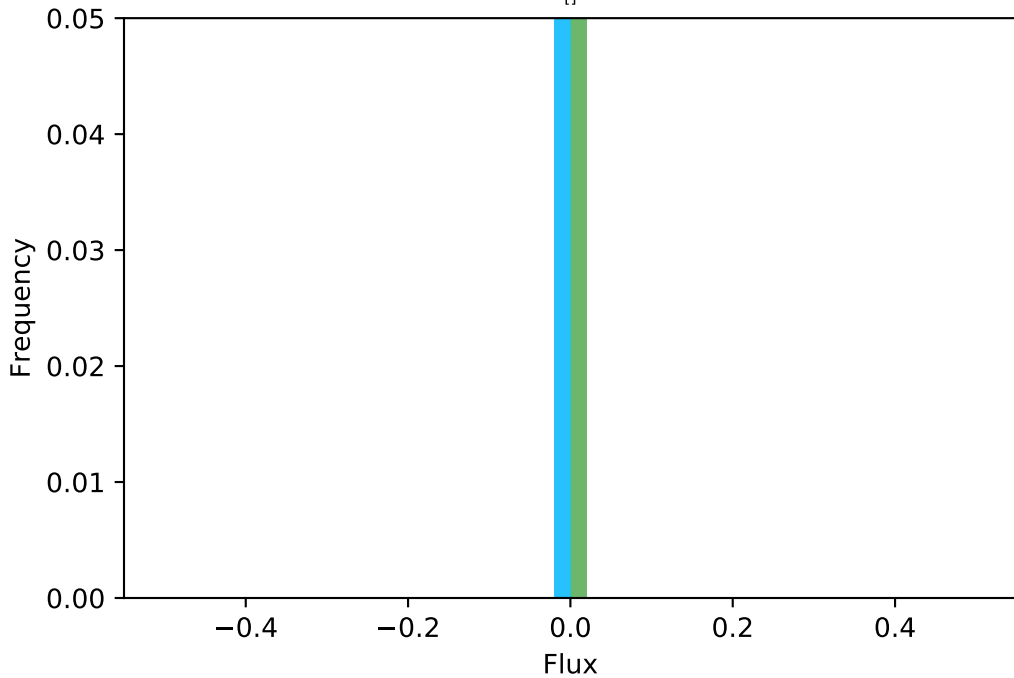[]

93 : GLX_p + Ser_p --> Gly_p + HPR_p
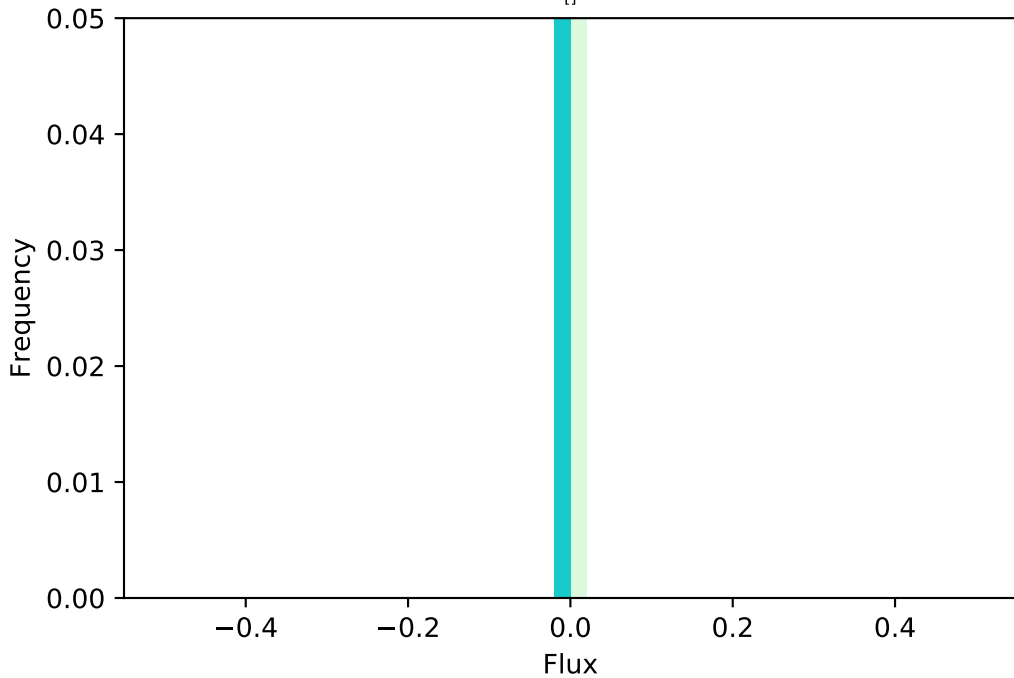[]

94 : HPR_p + H_p + NADH_p --> GCEA_p + NAD_p
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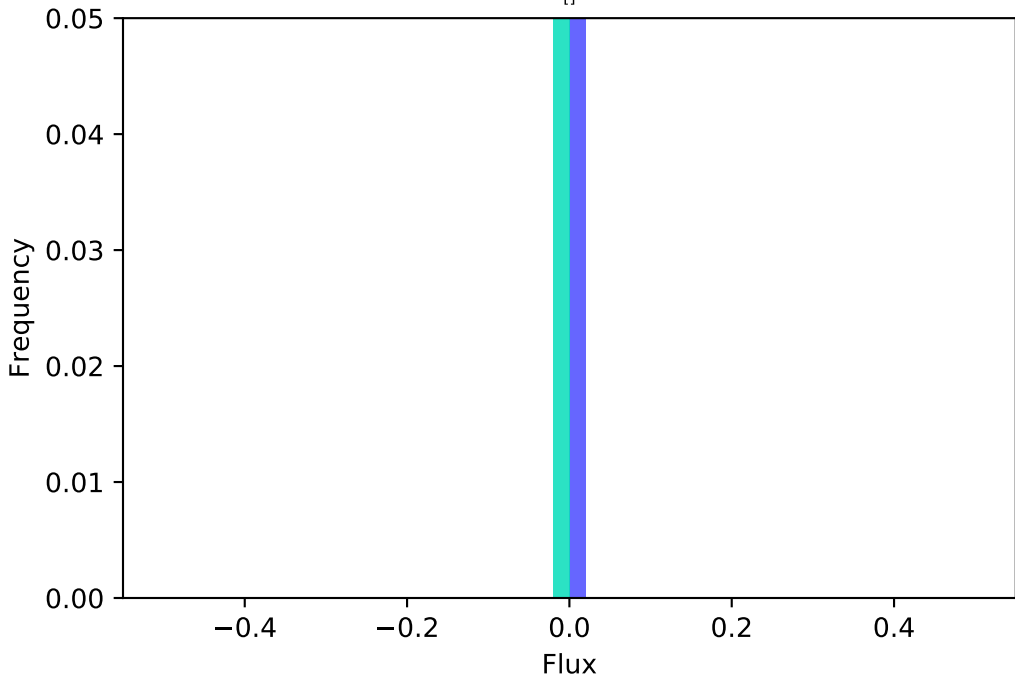95 : Mal_p + NAD_p <=> H_p + NADH_p + OAA_p
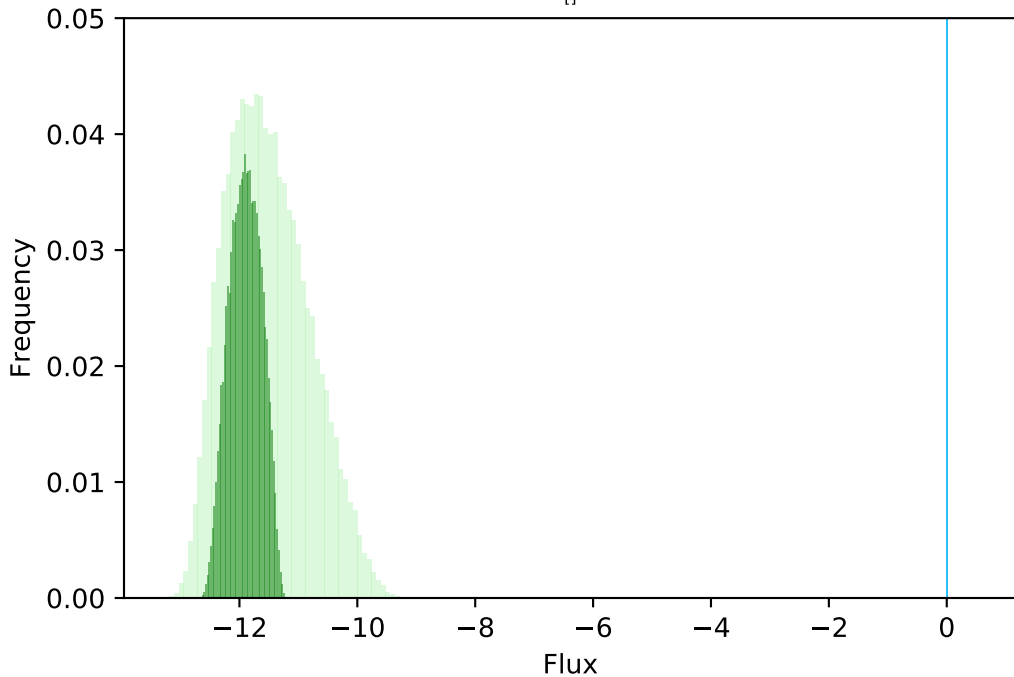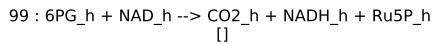[]

96 : ATP_h + GCEA_h --> ADP_h + H_h + PGA_h
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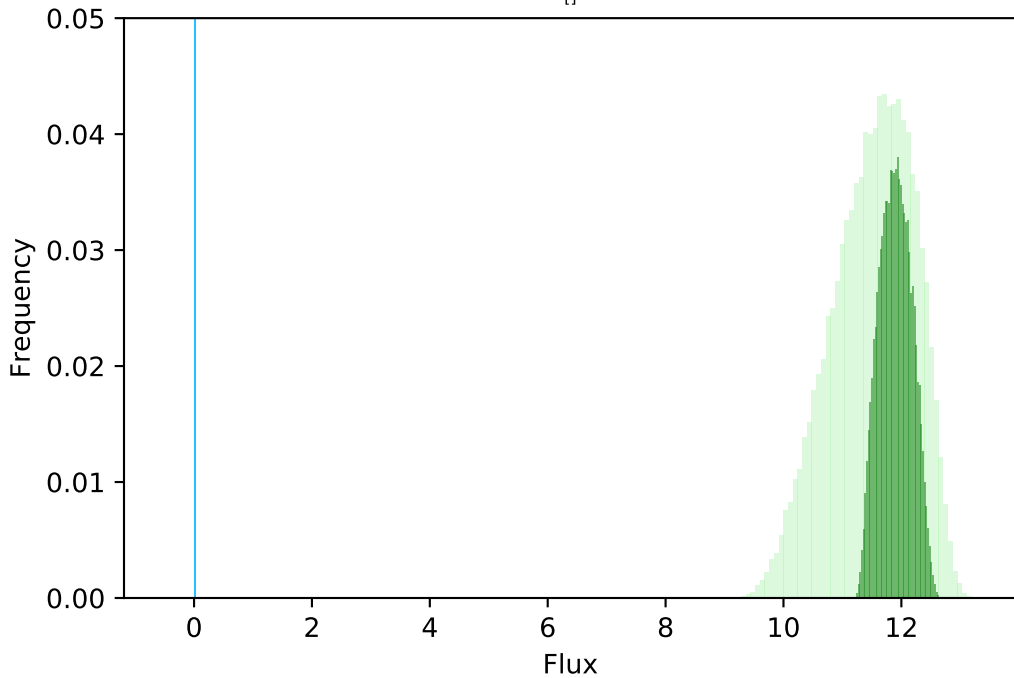97 : G6P_h + NADP_h --> GLP_h + H_h + NADPH_h
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98 : GLP_h + H2O_h --> 6PG_h + H_h
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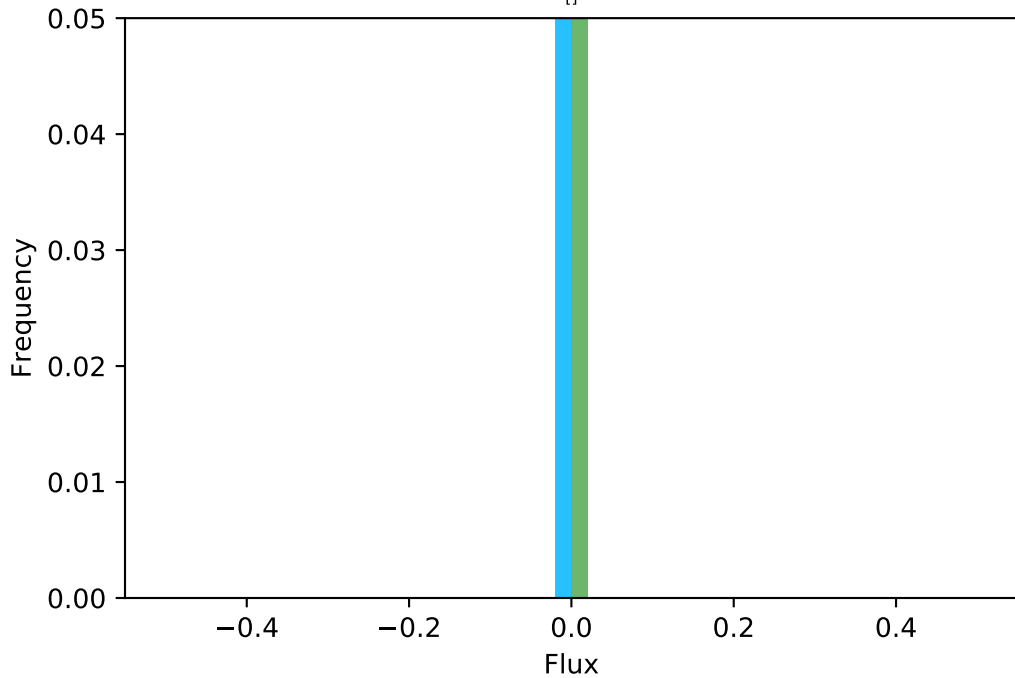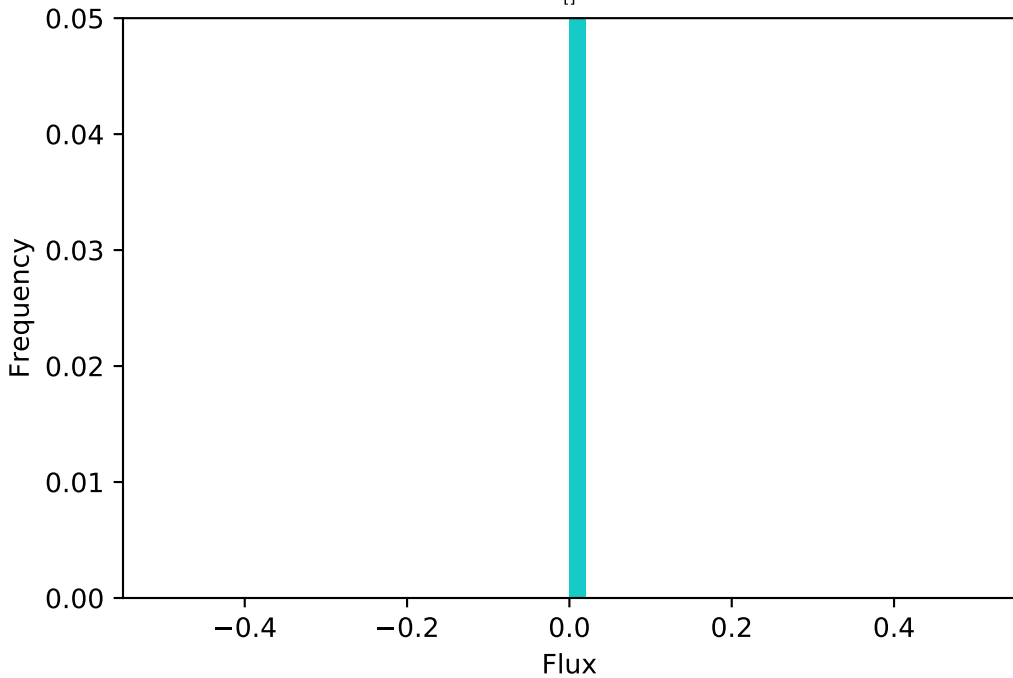99 : 6PG_h + NAD_h --> CO2_h + NADH_h + Ru5P_h
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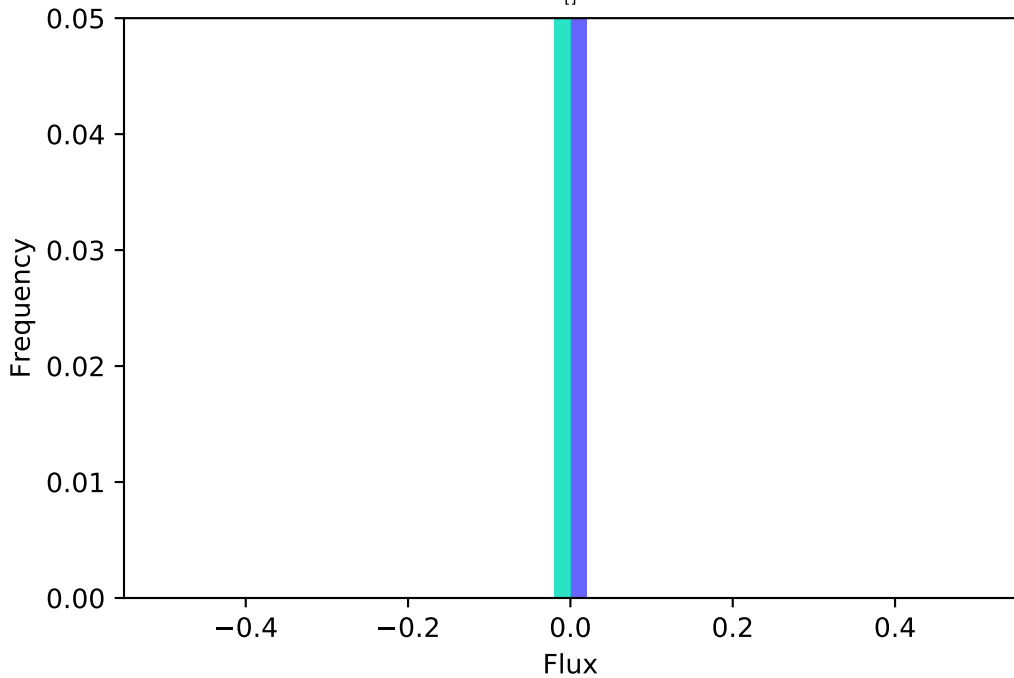100 : 6PG_h + NADP_h --> CO2_h + NADPH_h + Ru5P_h
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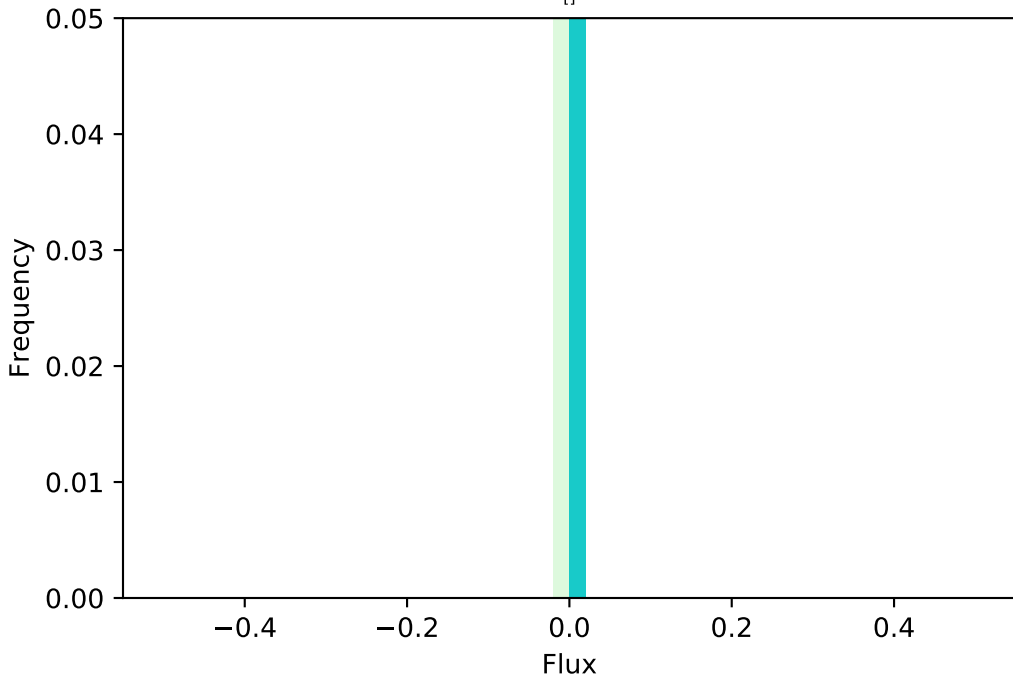101 : GAP_h + S7P_h --> E4P_h + F6P_h
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102 : E4P_h + H2O_h + PEP_h --> DAHP_h + Pi_h
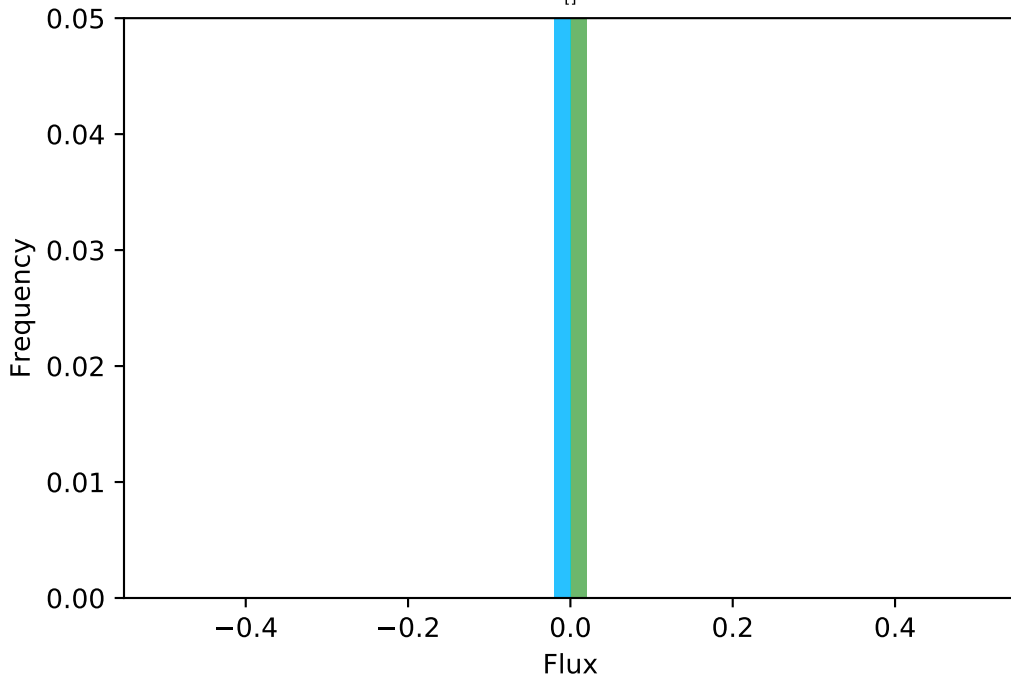[]

103 : DAHP_h --> DHQ_h + Pi_h
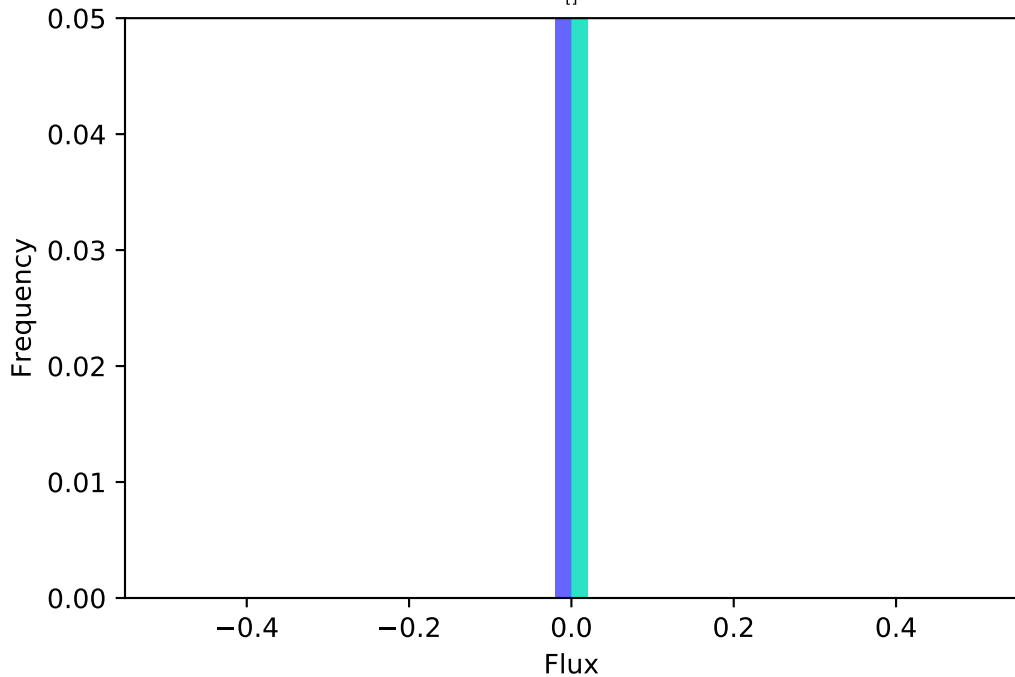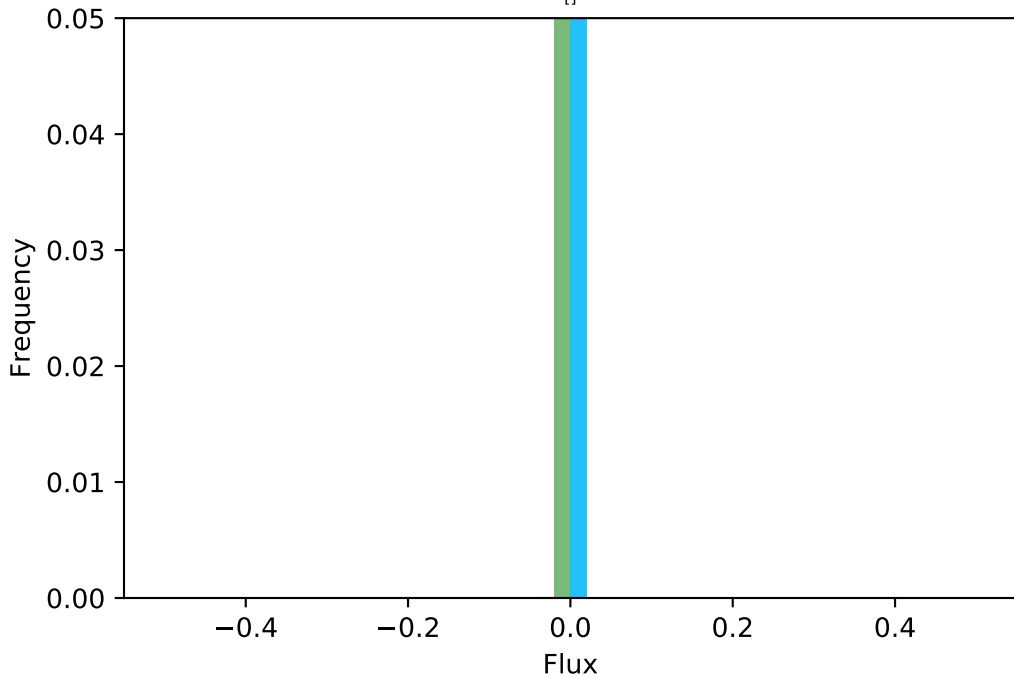[]

104 : DHQ_h --> DHS_h + H2O_h
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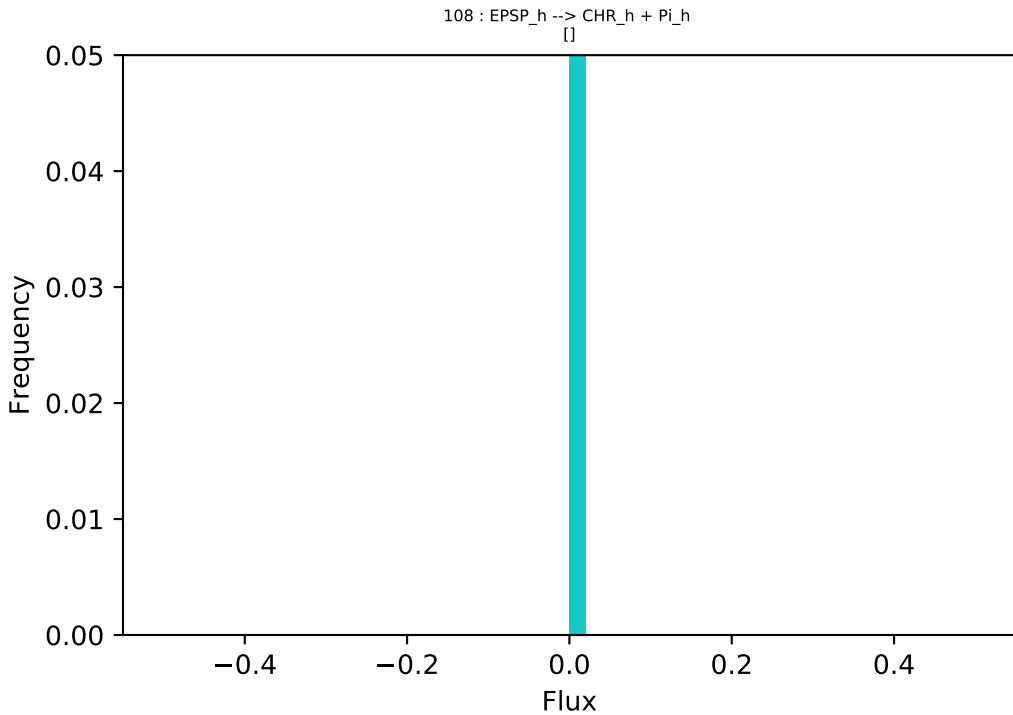105 : DHS_h + H_h + NADPH_h --> NADP_h + SA_h
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106 : ATP_h + SA_h --> ADP_h + H_h + S3P_h
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107 : PEP_h + S3P_h --> EPSP_h + Pi_h
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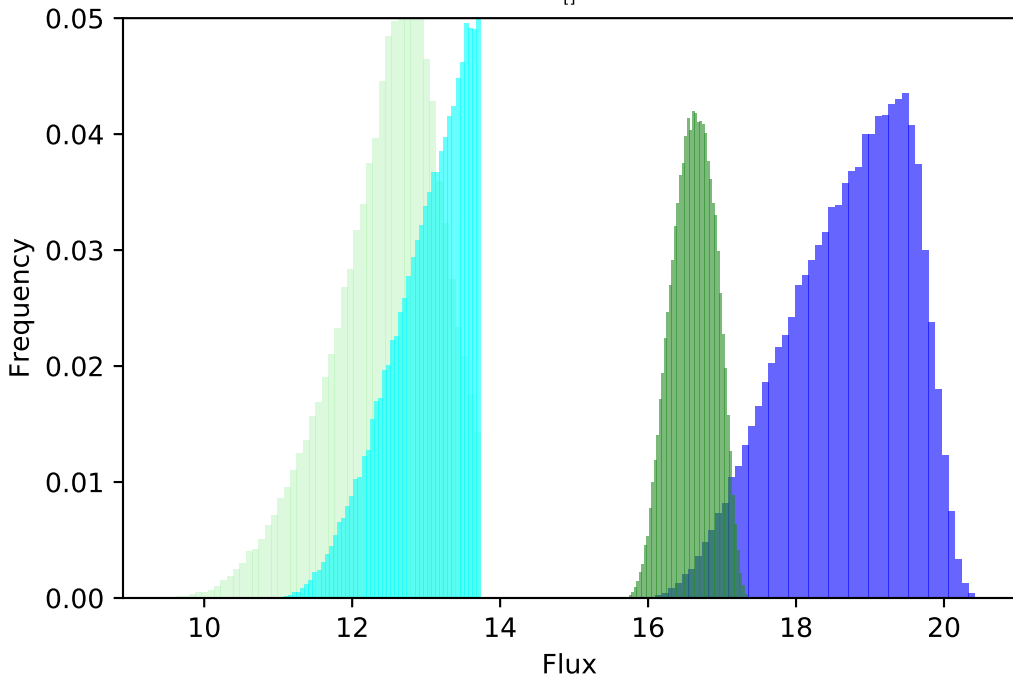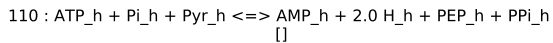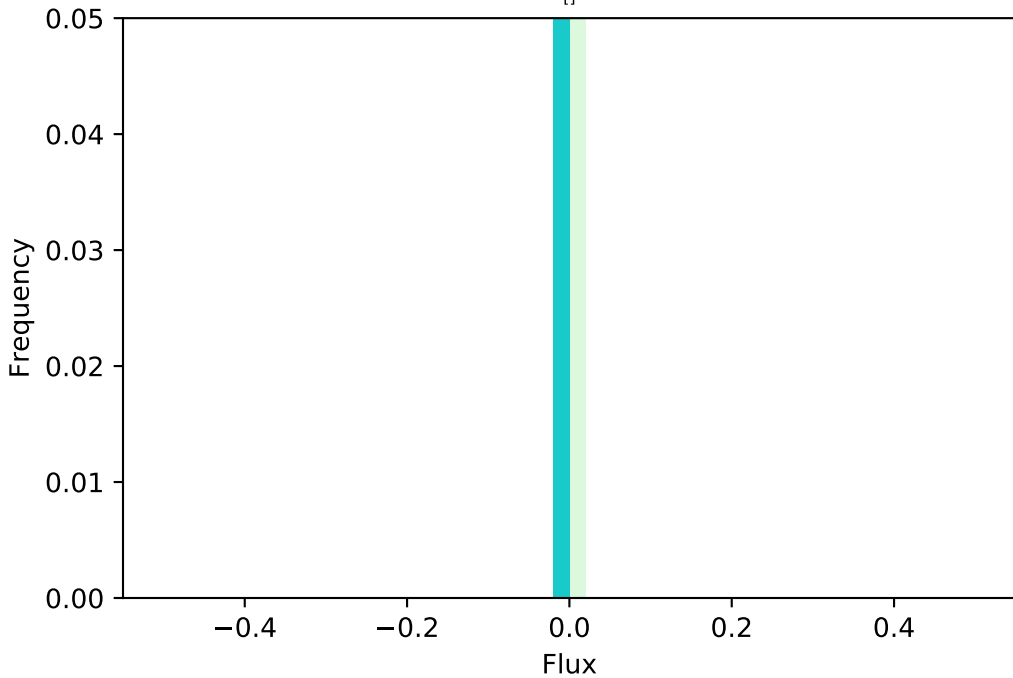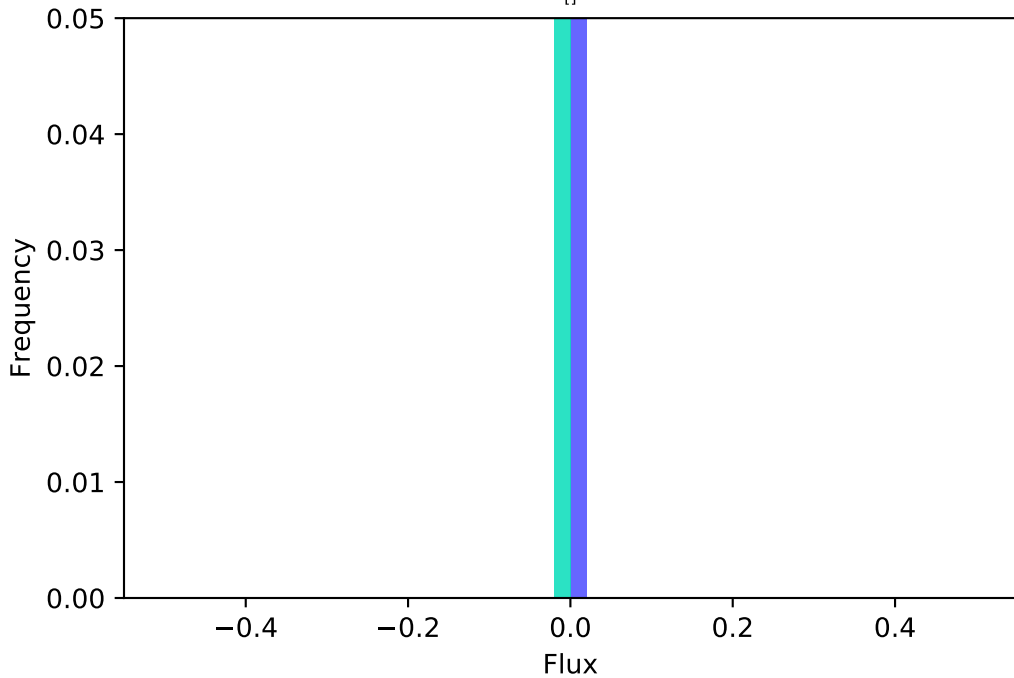
108 : EPSP_h --> CHR_h + Pi_h
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109 : ATP_h + R5P_h --> AMP_h + H_h + PRPP_h
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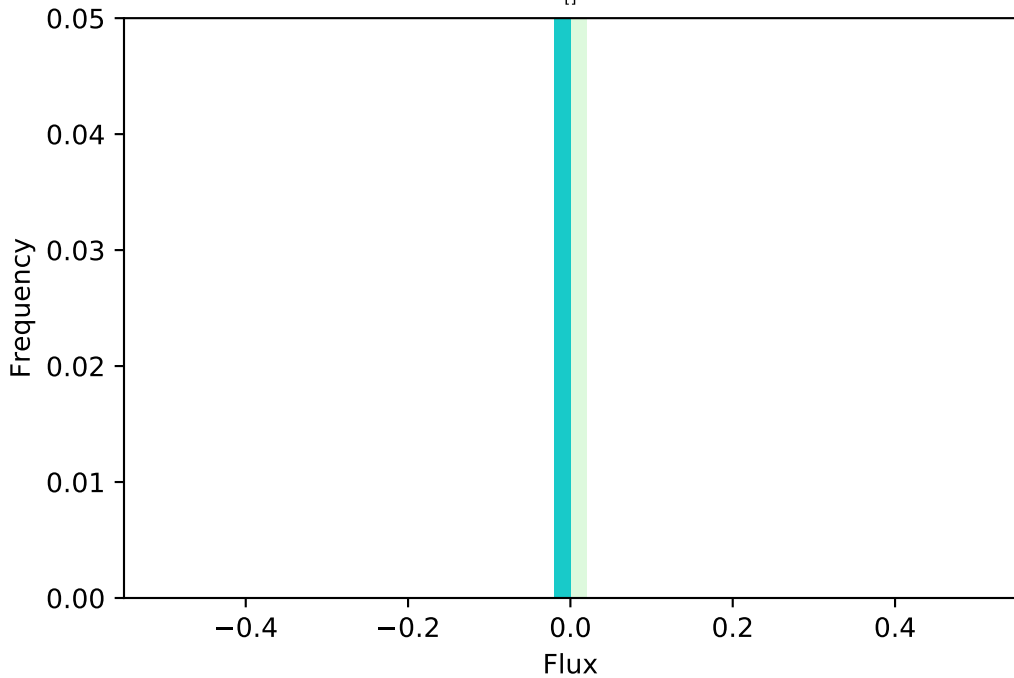110 : ATP_h + Pi_h + Pyr_h <=> AMP_h + 2.0 H_h + PEP_h + PPi_h
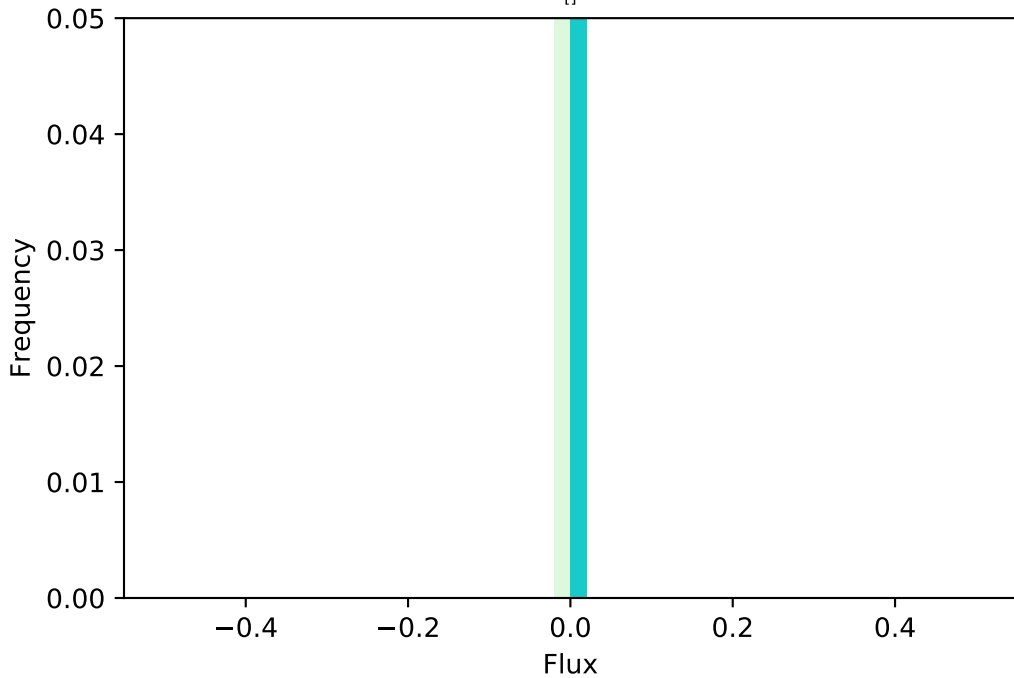[]

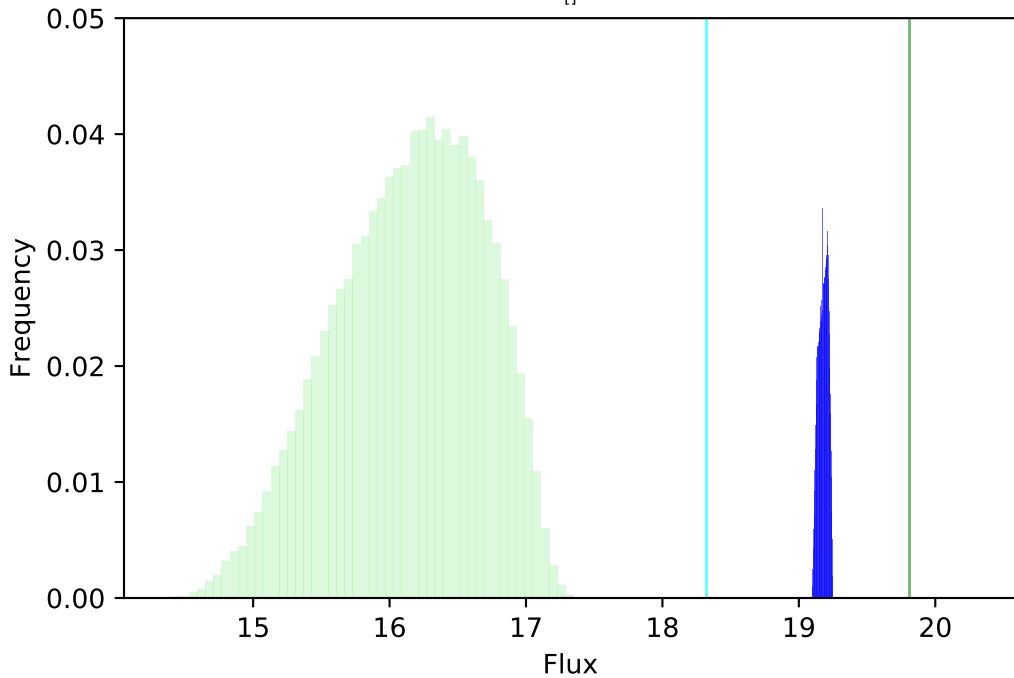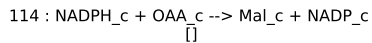111 : H_c + Mal_c + NADP_c --> CO2_c + NADPH_c + Pyr_c
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112 : Mal_h + NADP_h --> CO2_h + NADPH_h + Pyr_h
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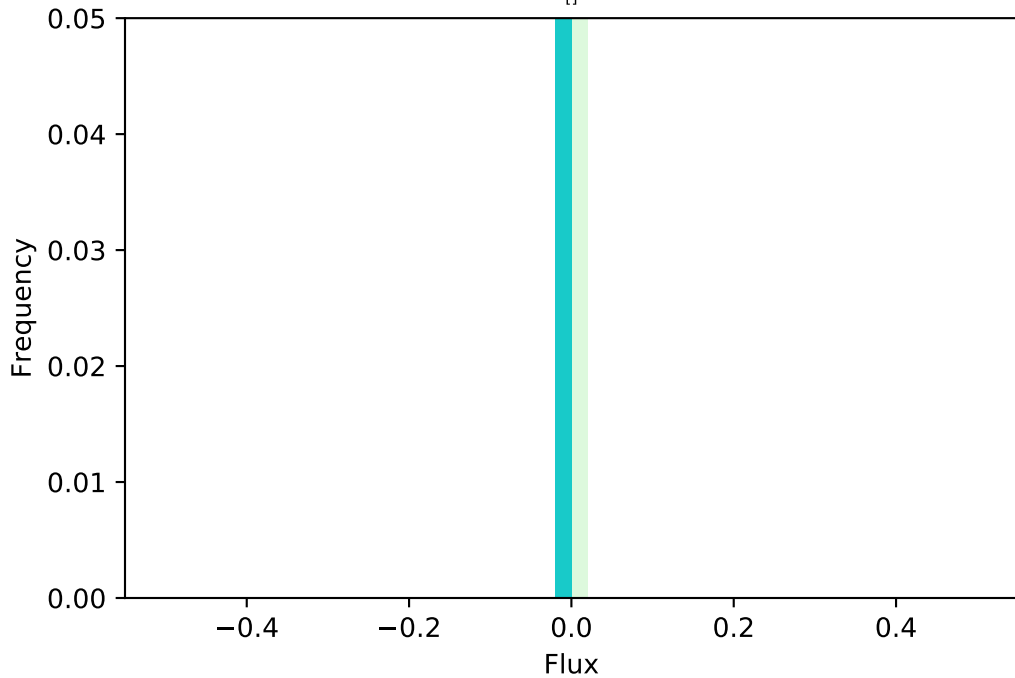
113 : Mal_h + NAD_h --> H_h + NADH_h + OAA_h
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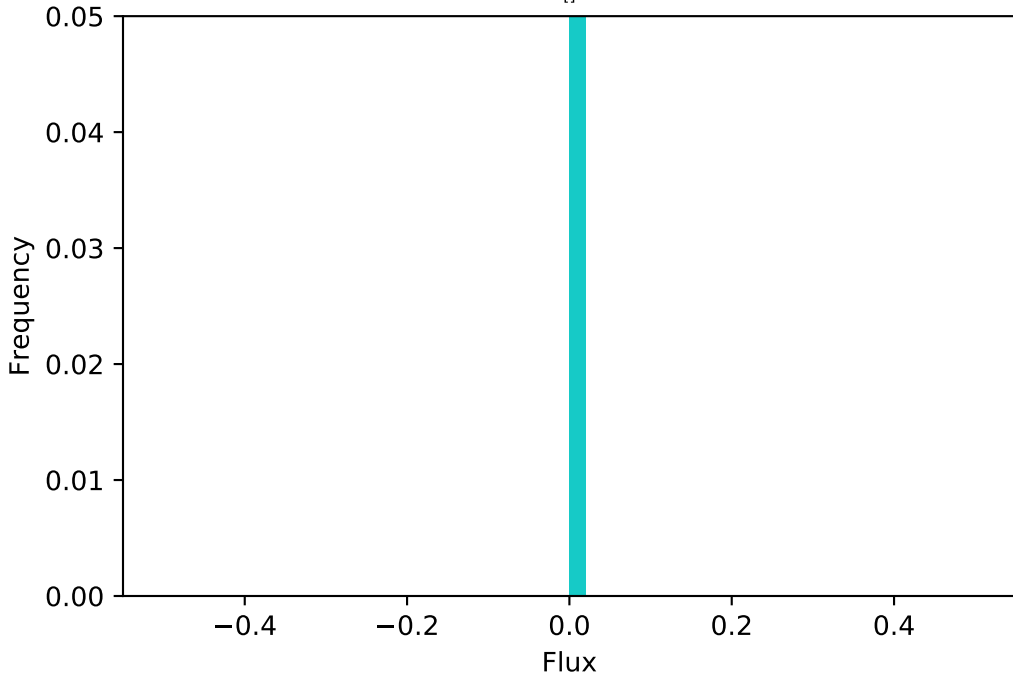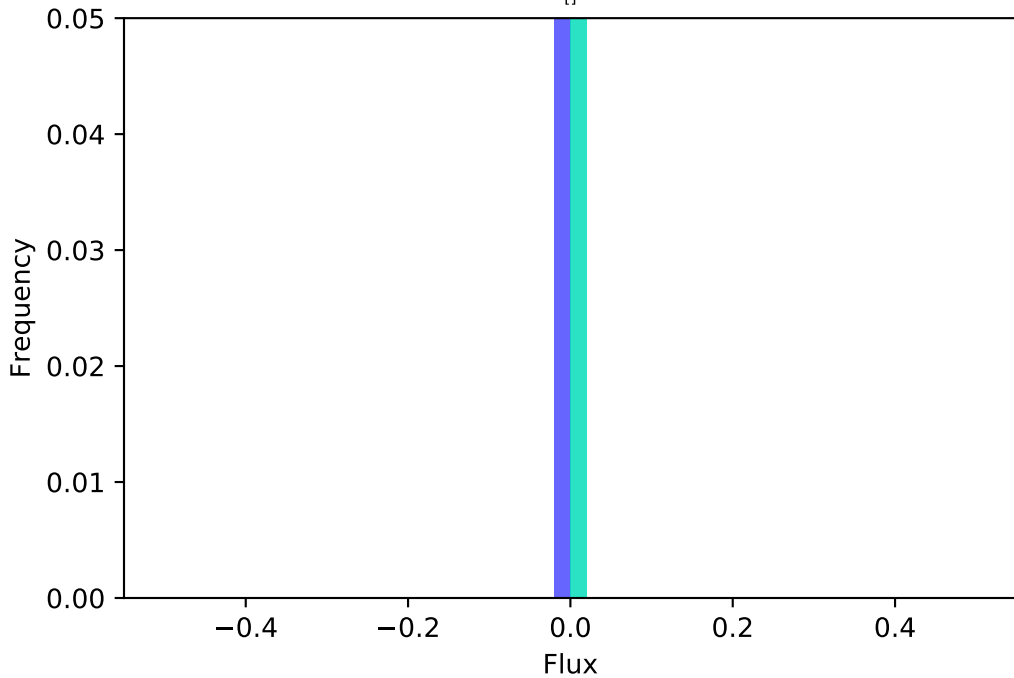114 : NADPH_c + OAA_c --> Mal_c + NADP_c
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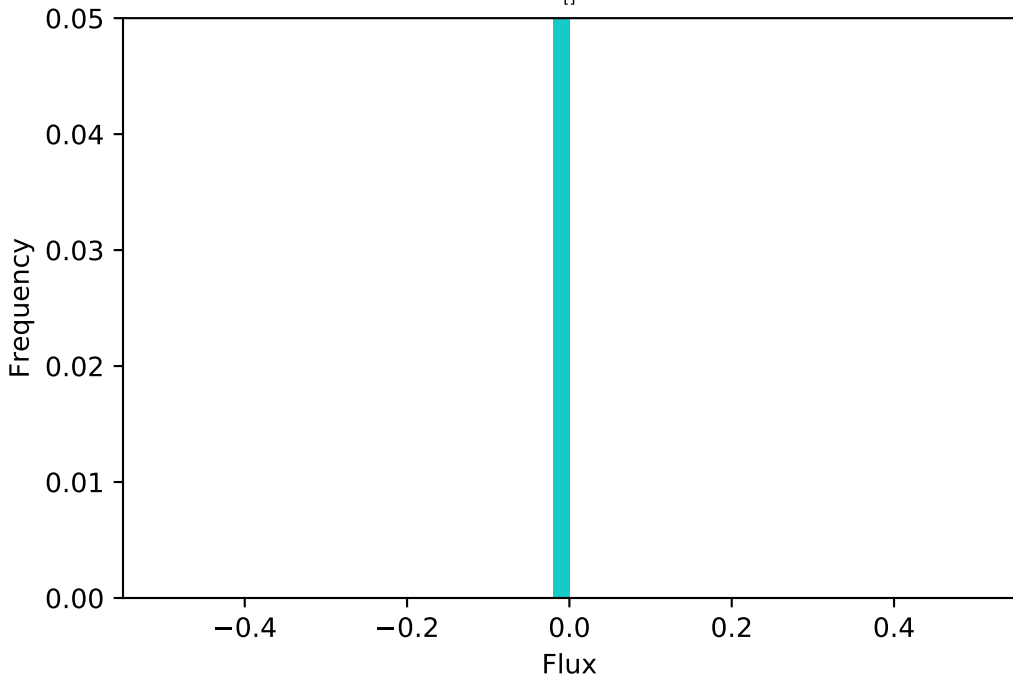115 : H_h + NADPH_h + OAA_h --> Mal_h + NADP_h
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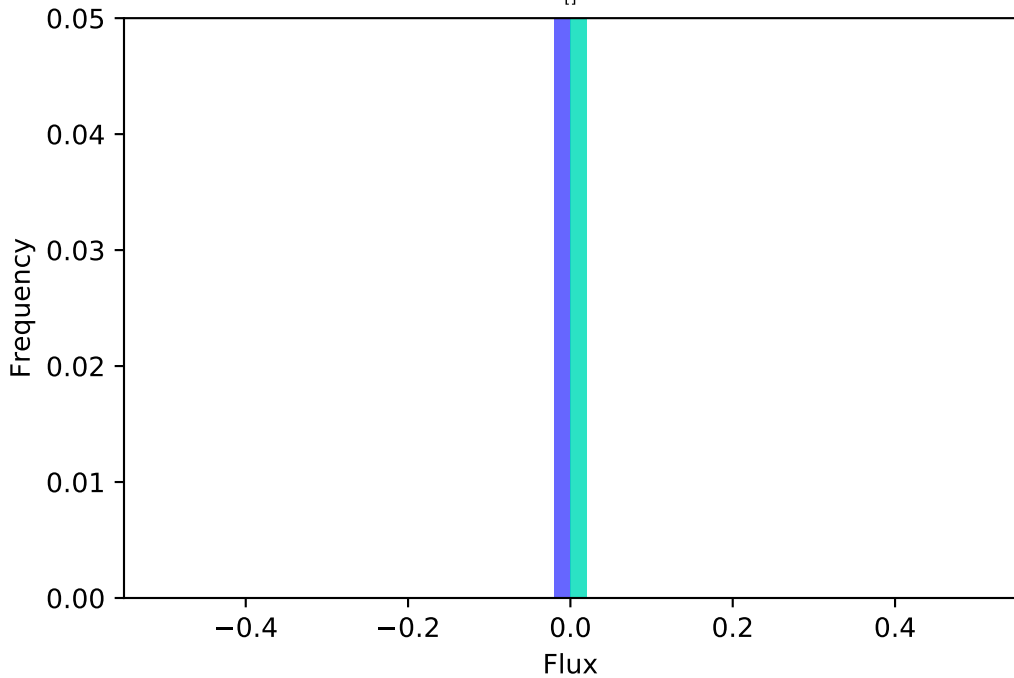116 : H_m + NADPH_m + OAA_m --> Mal_m + NADP_m
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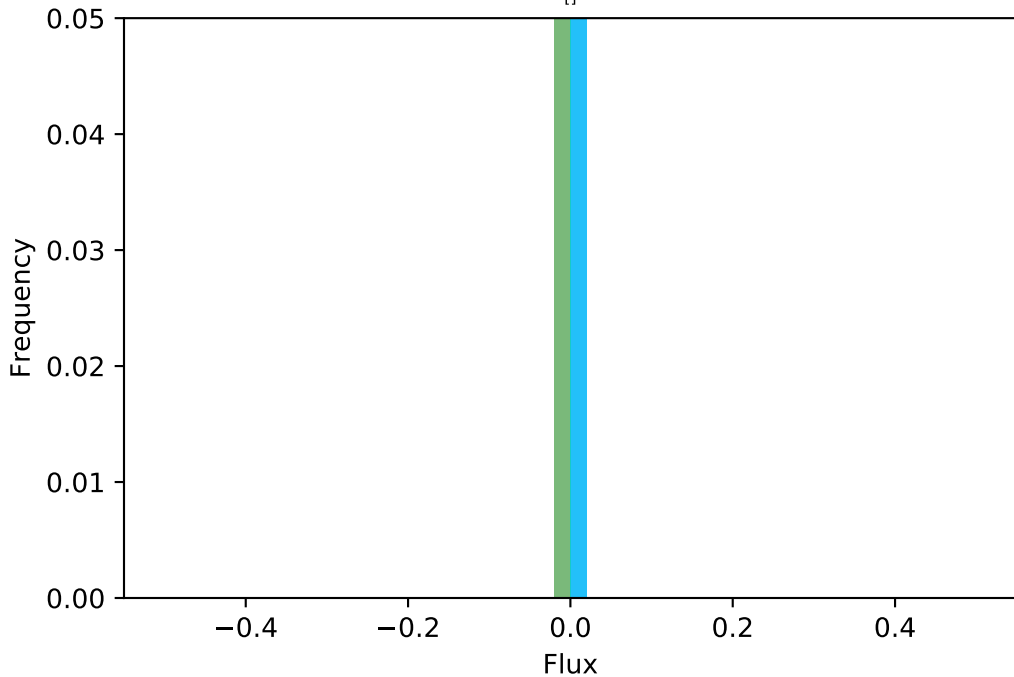117 : A_DASH_CoA_c + H2O_c + OAA_c --> Cit_c + CoA_c + H_c
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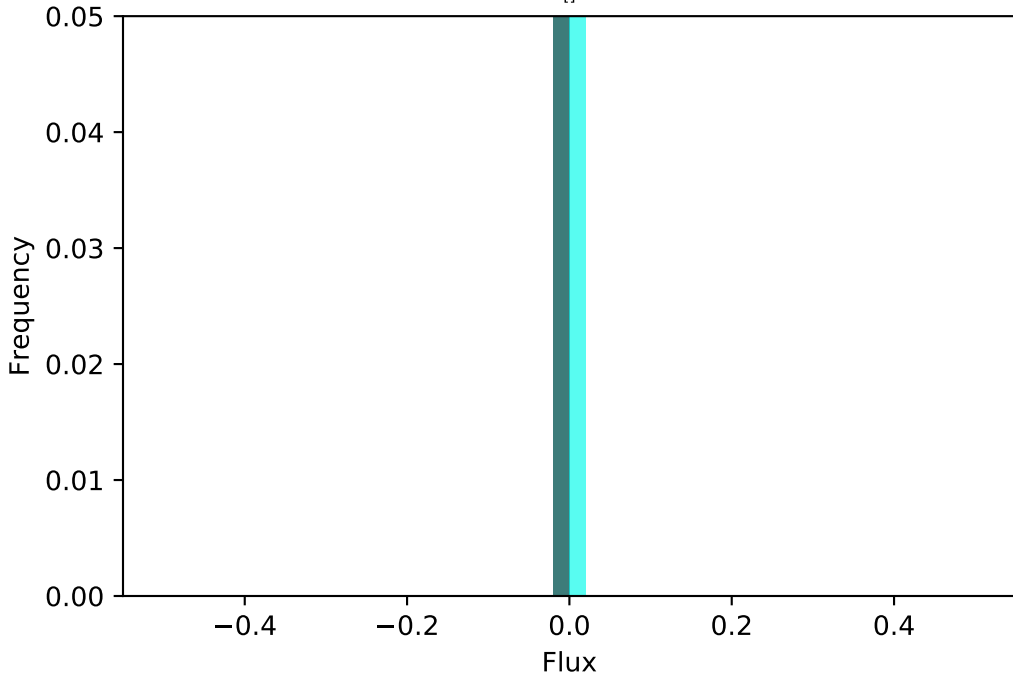118 : A_DASH_CoA_h + H2O_h + OAA_h --> Cit_h + CoA_h + H_h
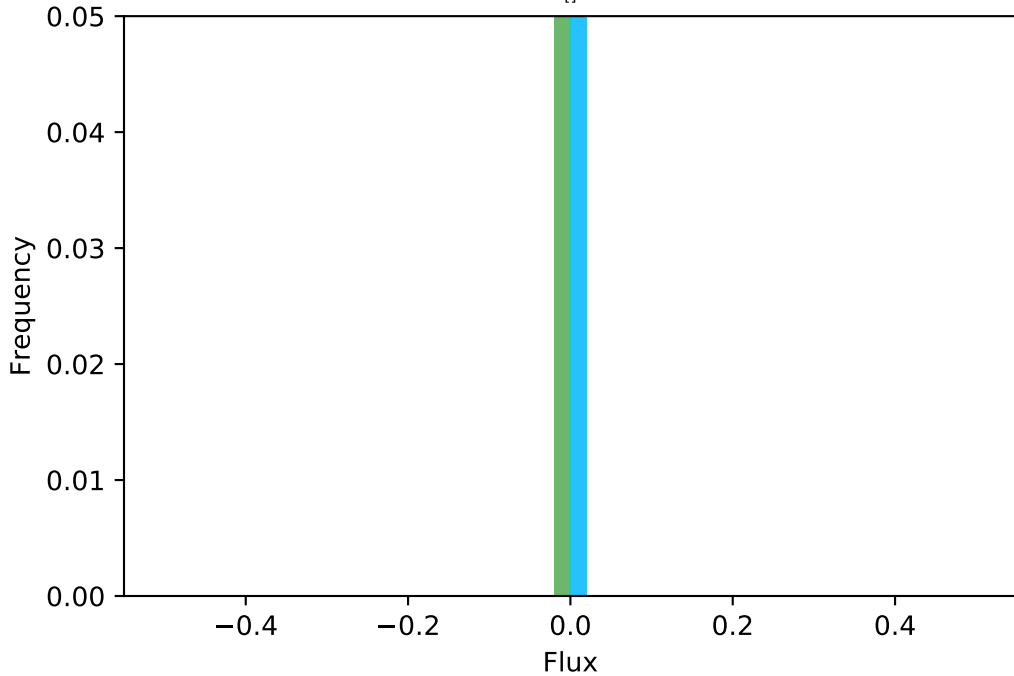[]

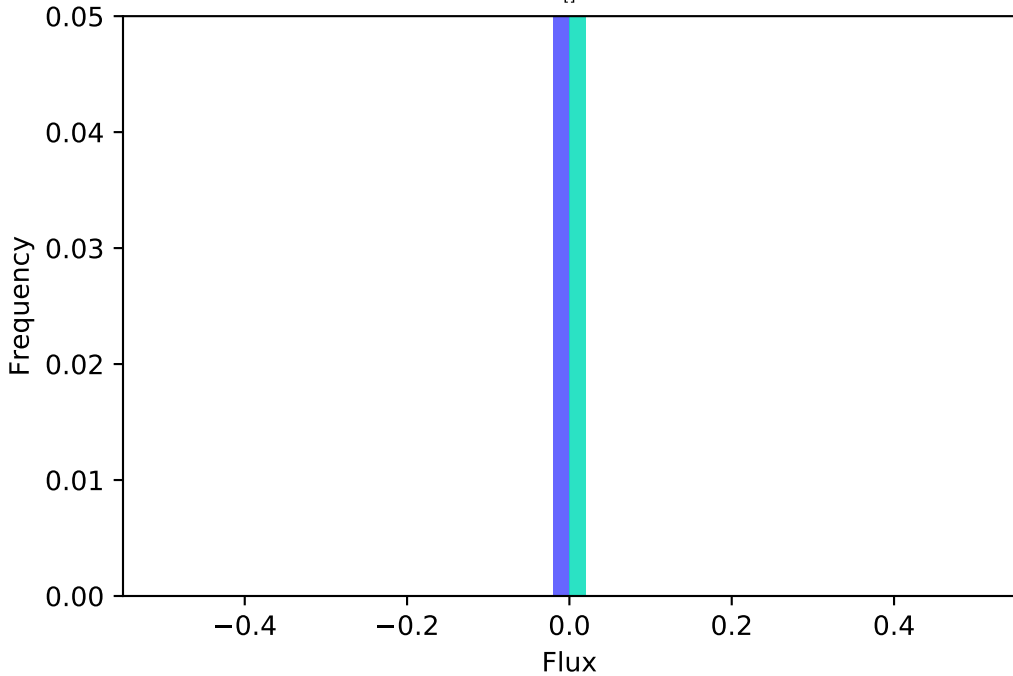119 : Cit_c --> H2O_c + cACN_c
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120 : Cit_h --> H2O_h + cACN_h
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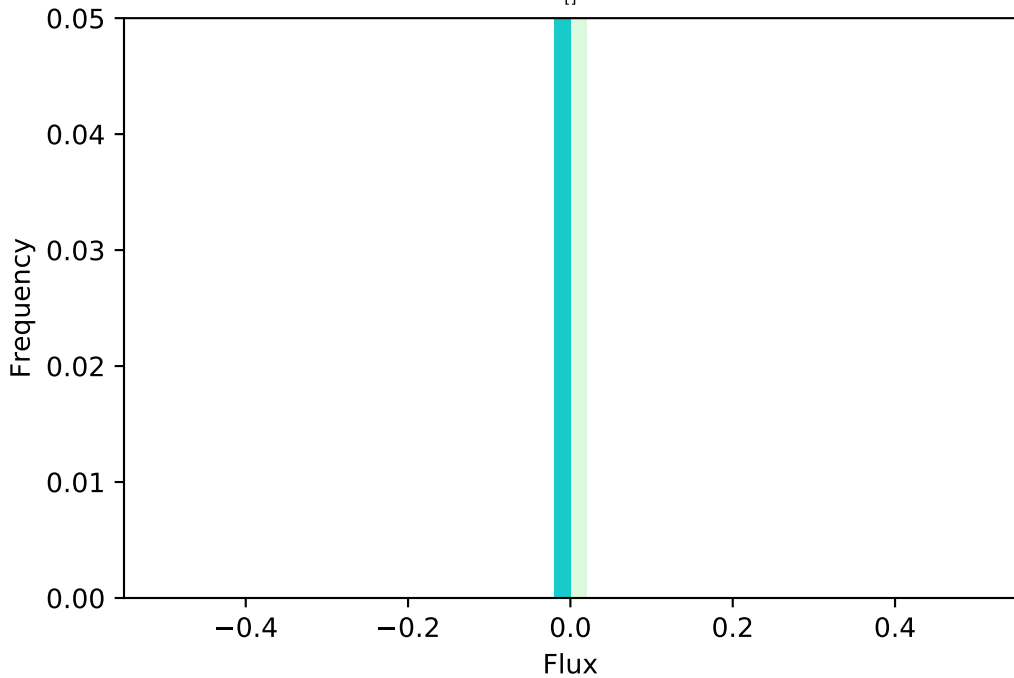121 : H2O_c + cACN_c --> iCit_c
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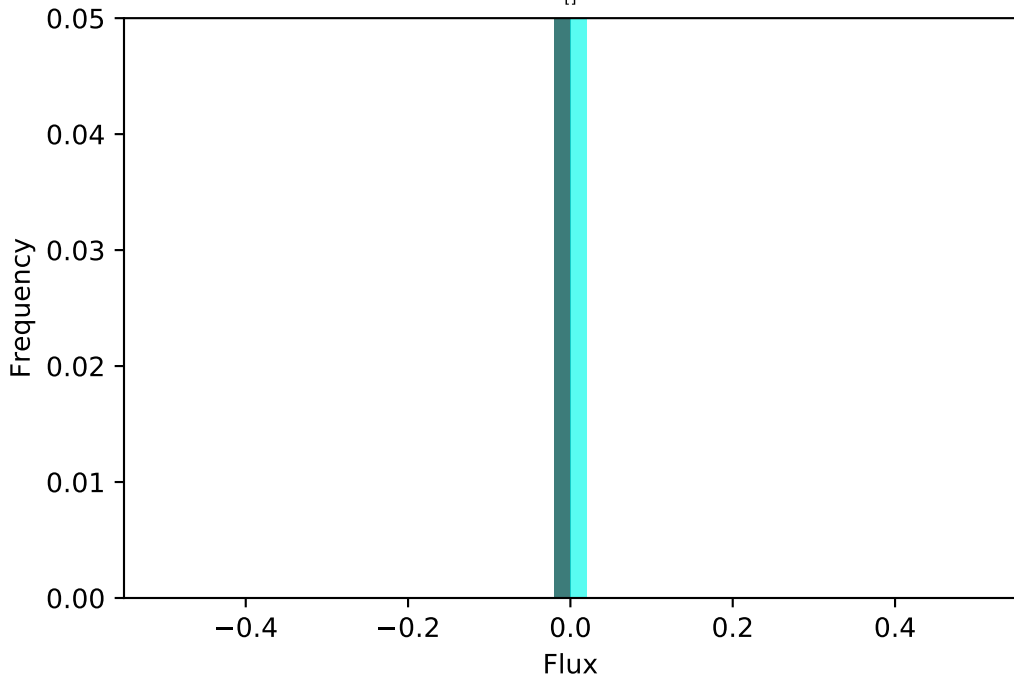122 : H2O_h + cACN_h --> iCit_h
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123 : H_c + NAD_c + iCit_c --> CO2_c + KG_c + NADH_c
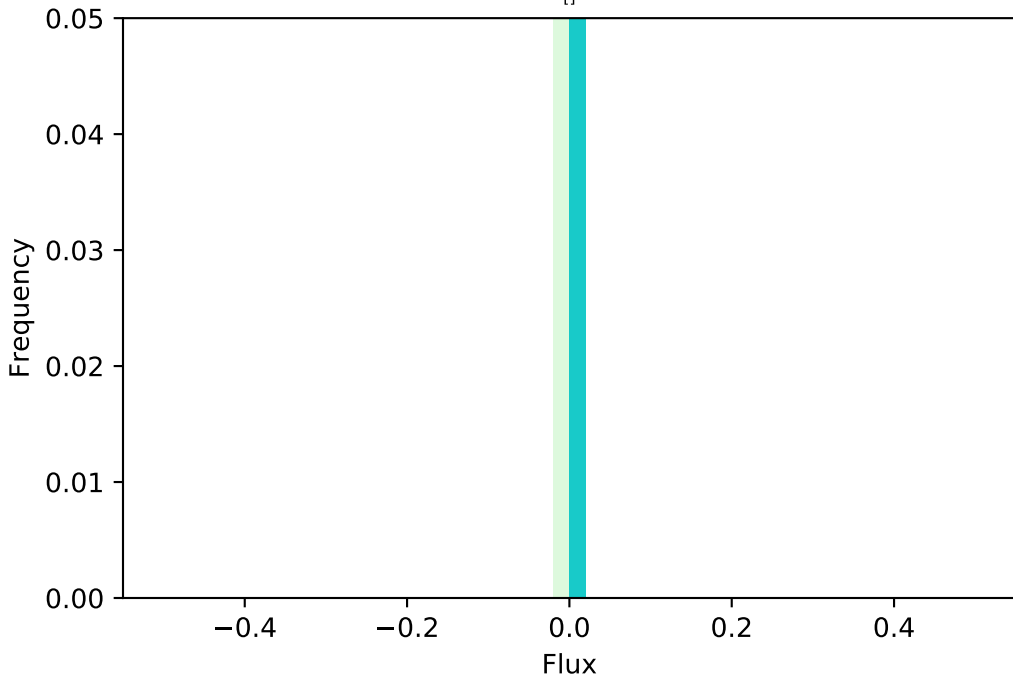[]

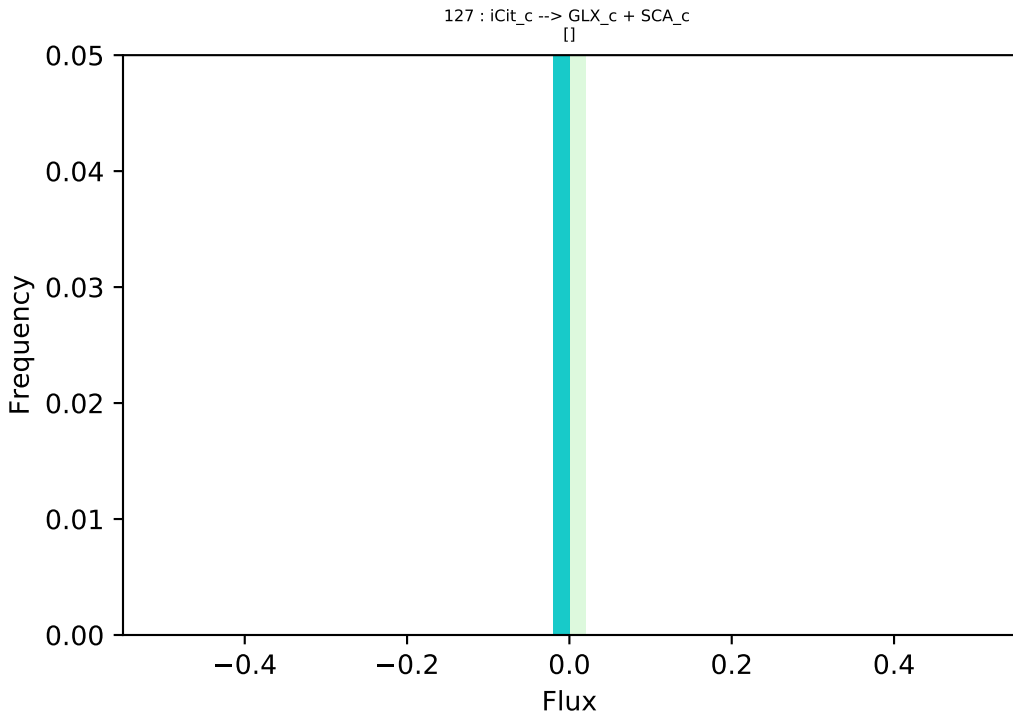124 : H_c + NADP_c + iCit_c --> CO2_c + KG_c + NADPH_c
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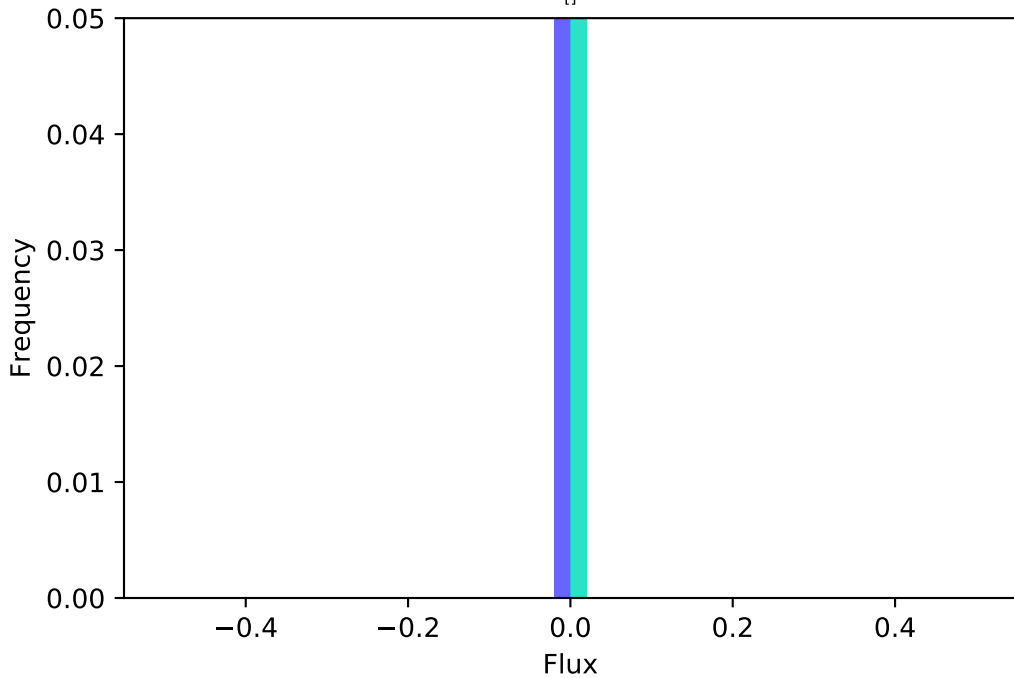125 : NADP_h + iCit_h --> CO2_h + KG_h + NADPH_h
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126 : NADP_m + iCit_m --> CO2_m + KG_m + NADPH_m
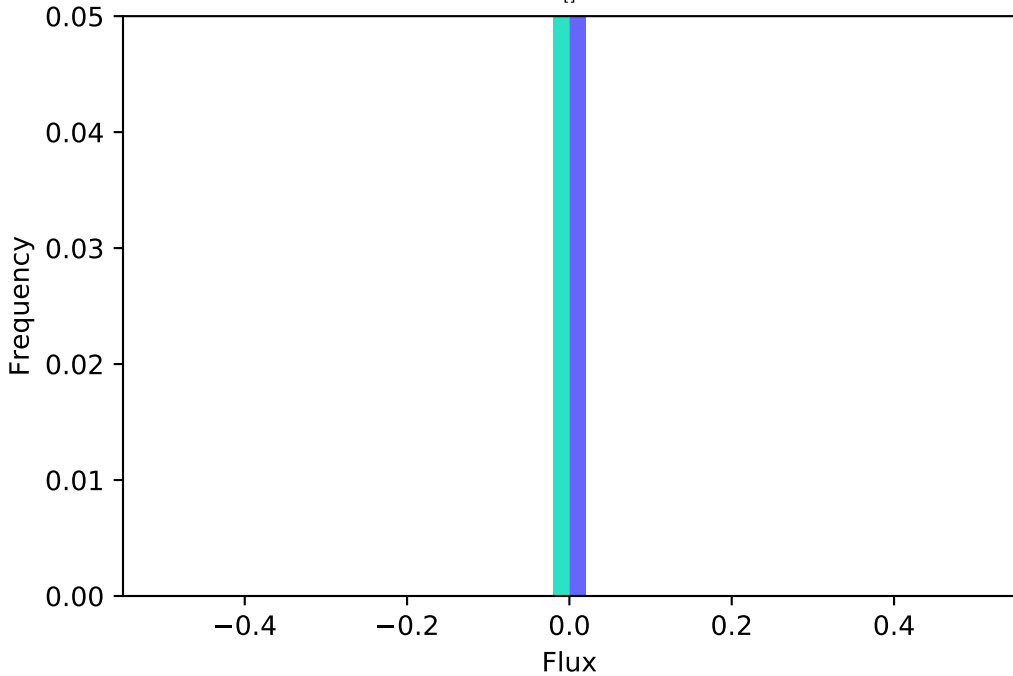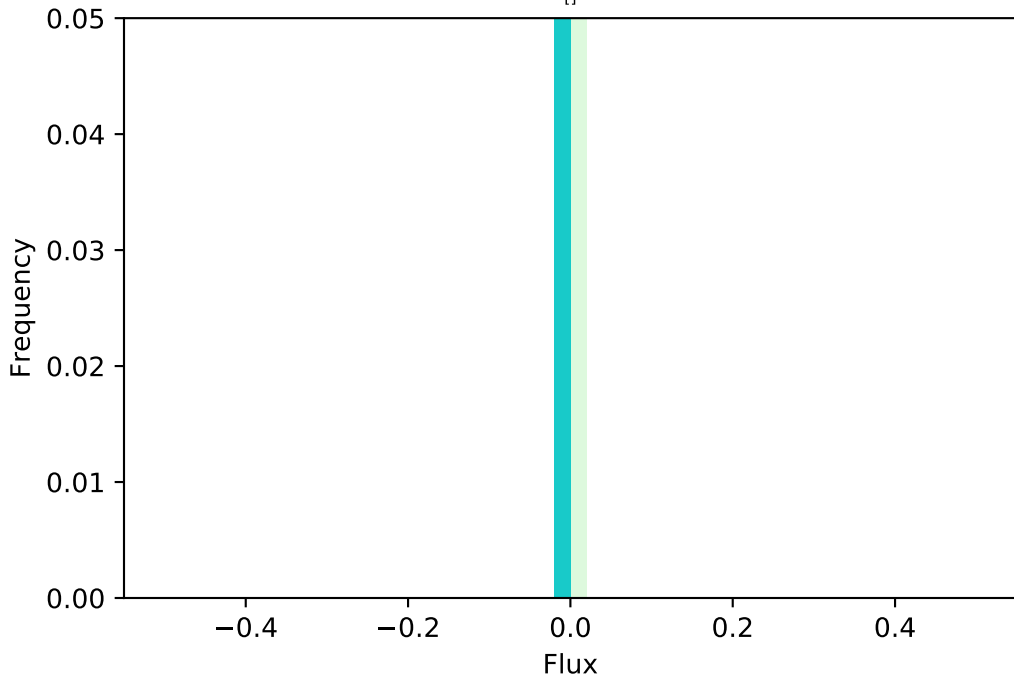[]

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
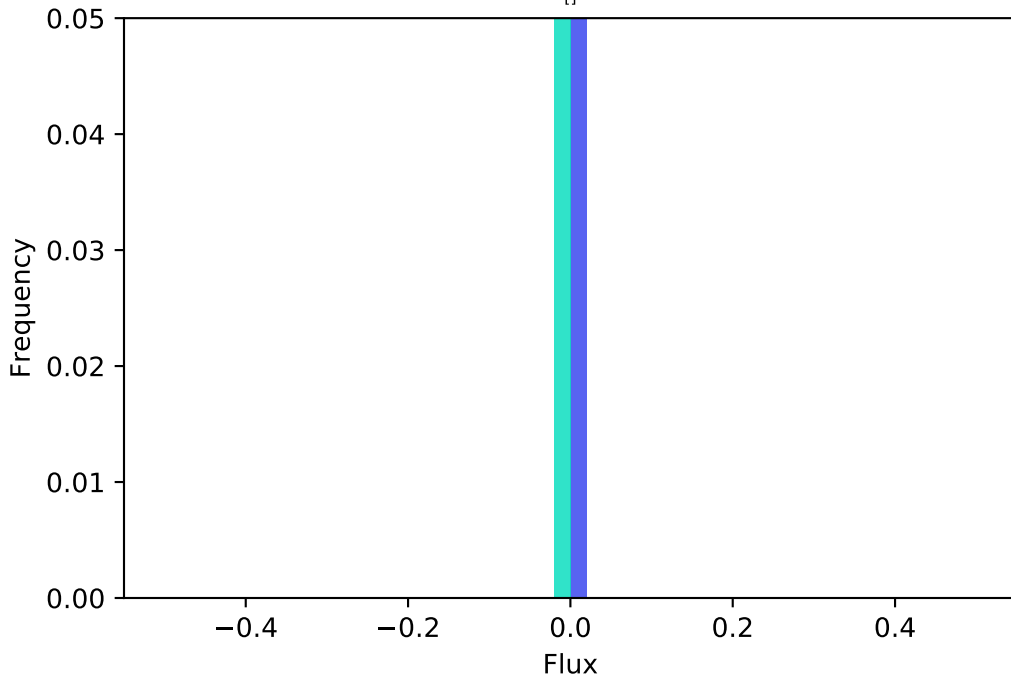[]

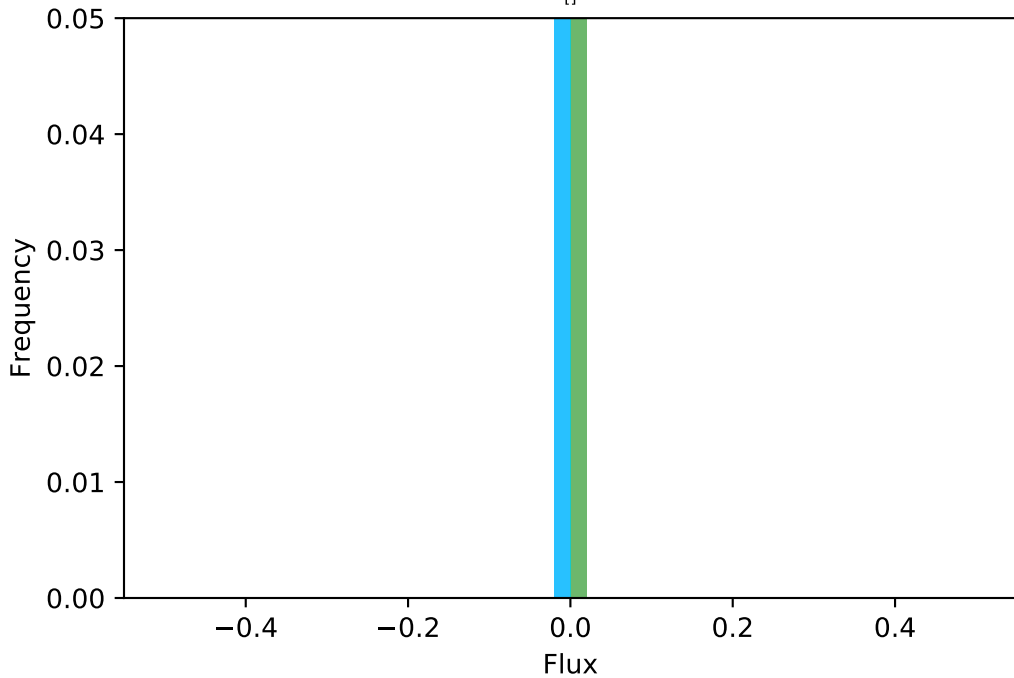129 : ATP_c + Cit_c + CoA_c --> ADP_c + A_DASH_CoA_c + OAA_c + Pi_c
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130 : AC_h + ATP_h + CoA_h --> AMP_h + A_DASH_CoA_h + H_h + PPi_h
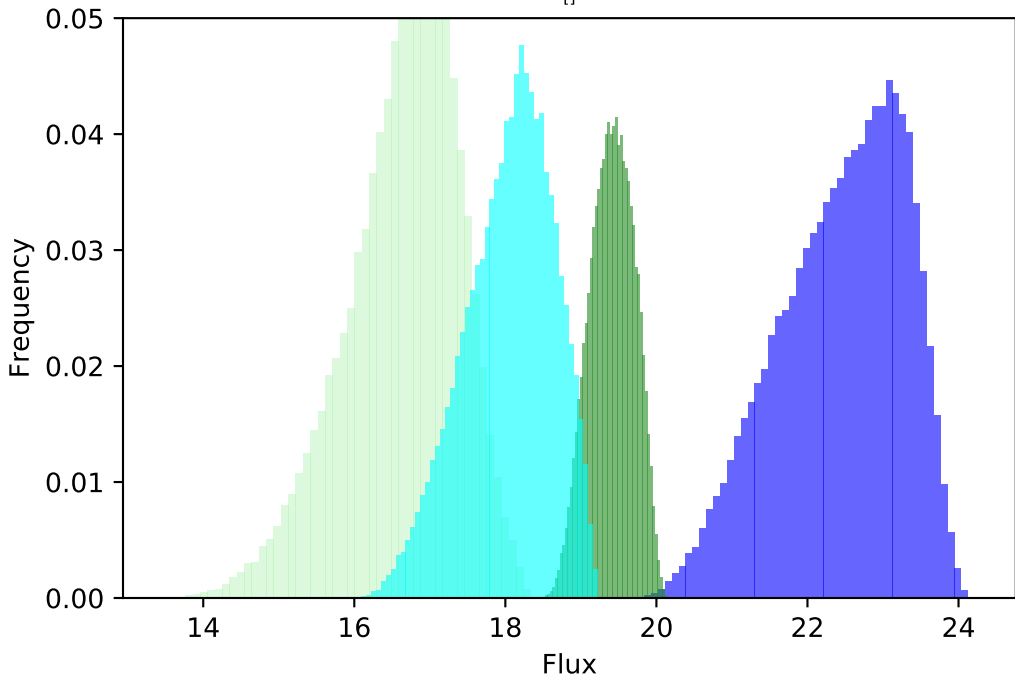[]

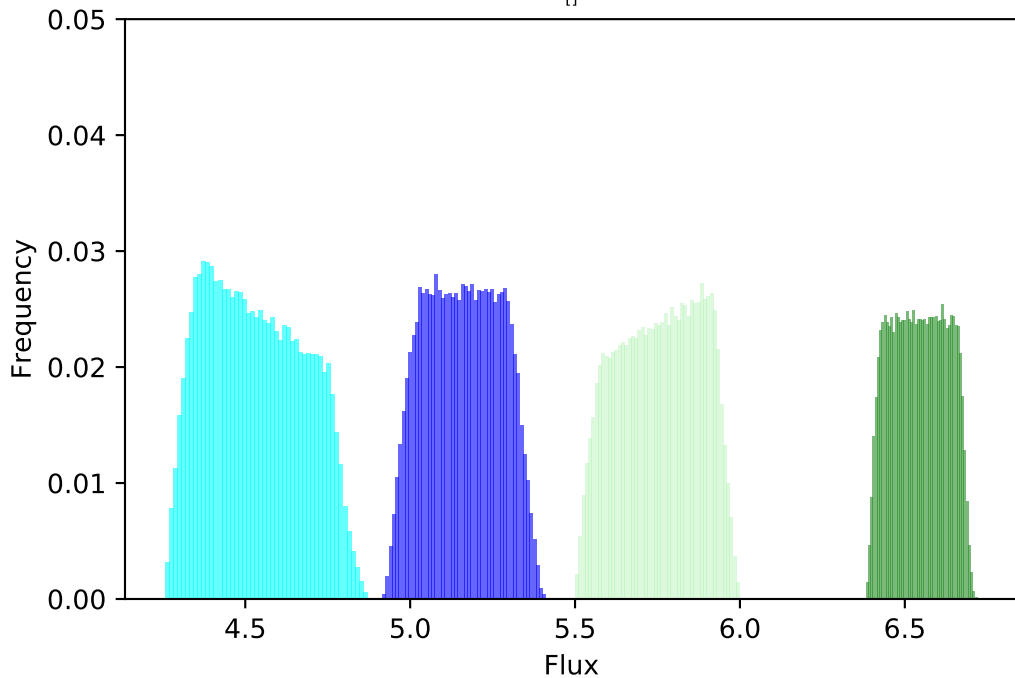131 : ATP_h + A_DASH_CoA_h + HCO3_h --> ADP_h + H_h + M_DASH_CoA_h + Pi_h
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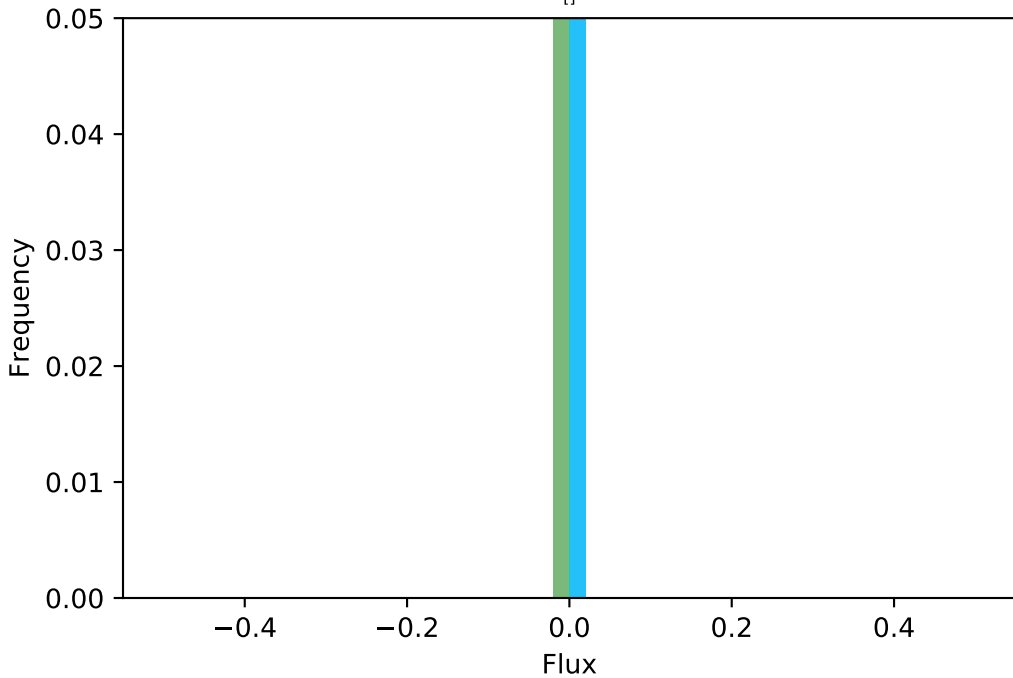132 : ACP_h + M_DASH_CoA_h --> CoA_h + M_DASH_ACP_h
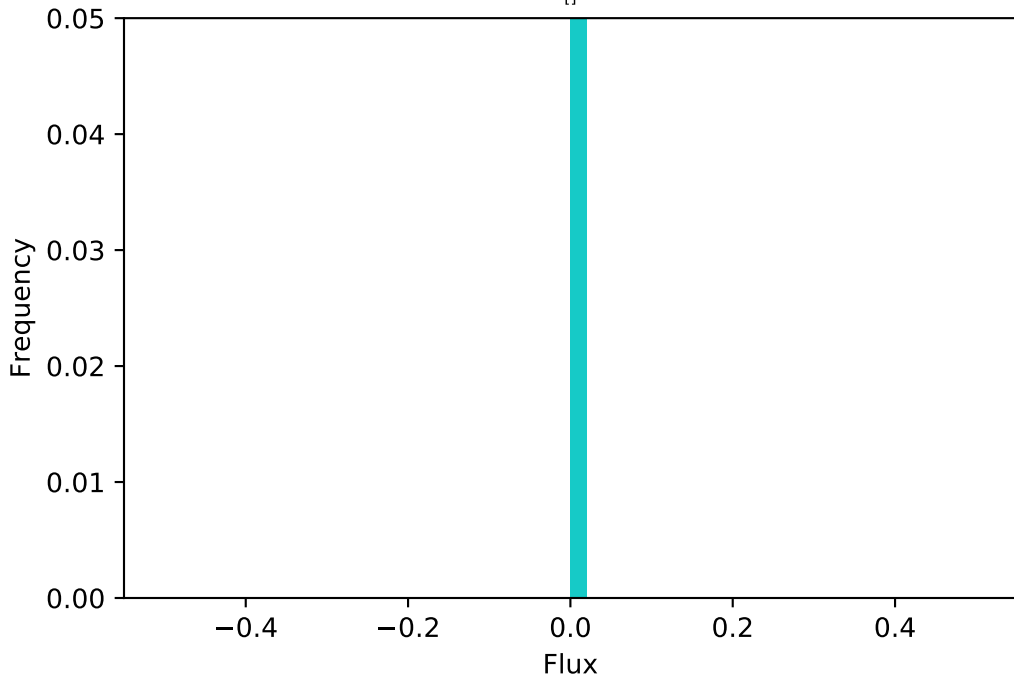[]

133 : H2O_h + PPi_h --> 2.0 Pi_h
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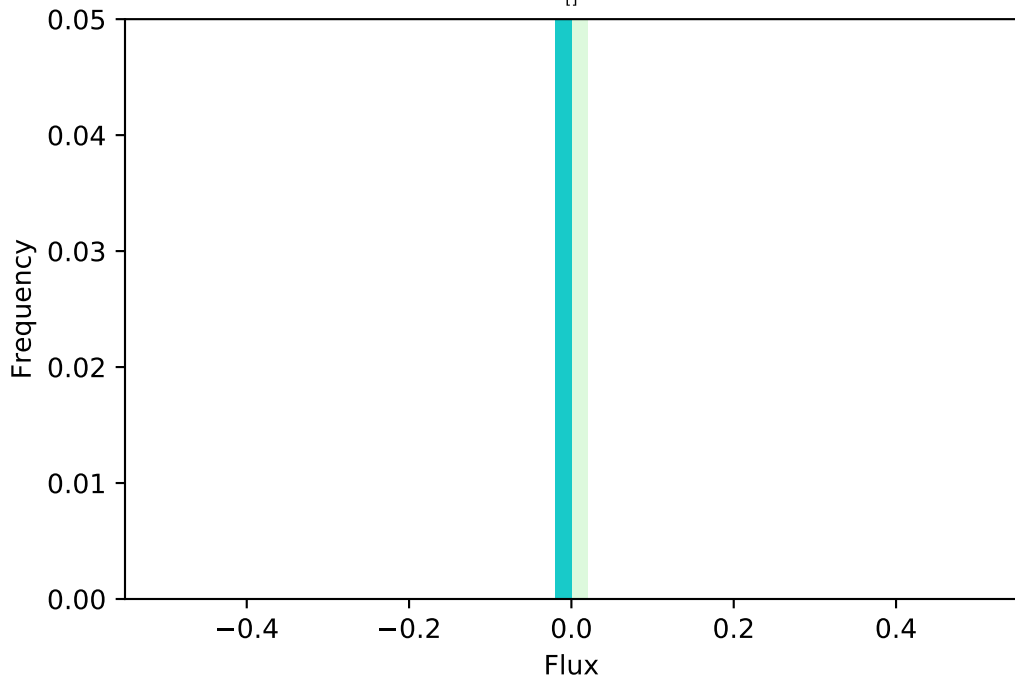134 : H2O_c + PPi_c --> H_c + 2.0 Pi_c
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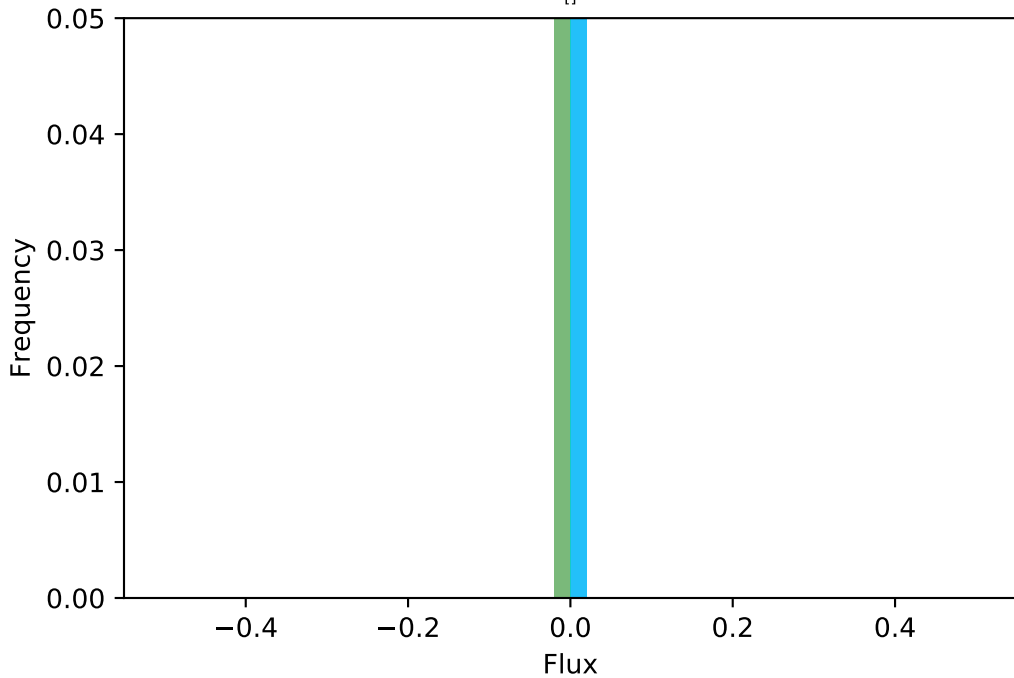135 : F6P_c + PPi_c --> FBP_c + H_c + Pi_c
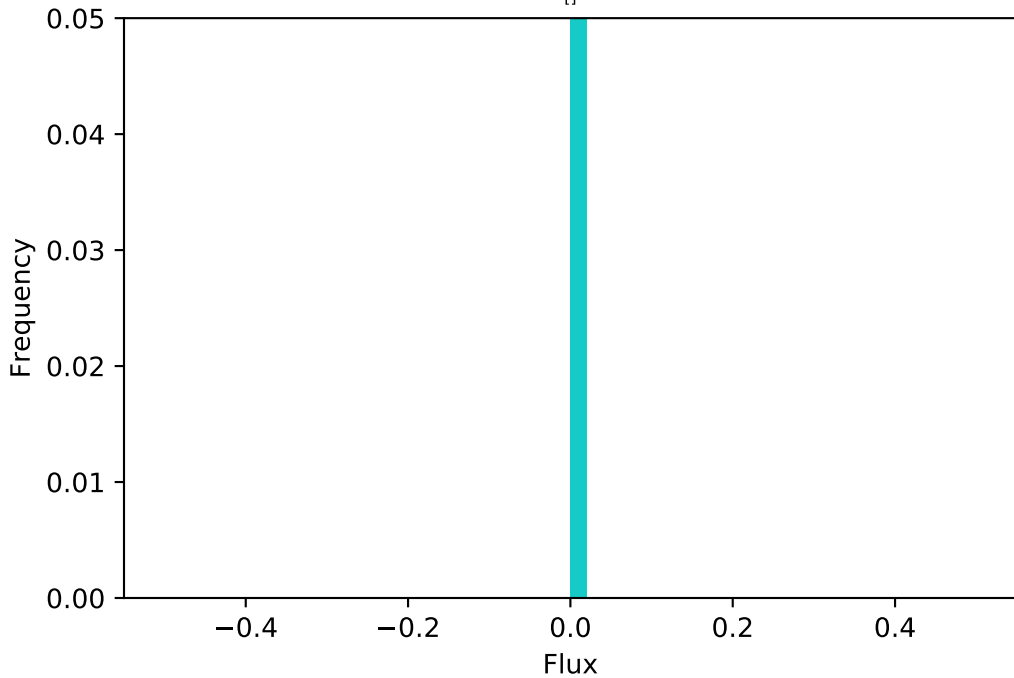[]

136 : CO2_h + NADH_h --> For_h + NAD_h
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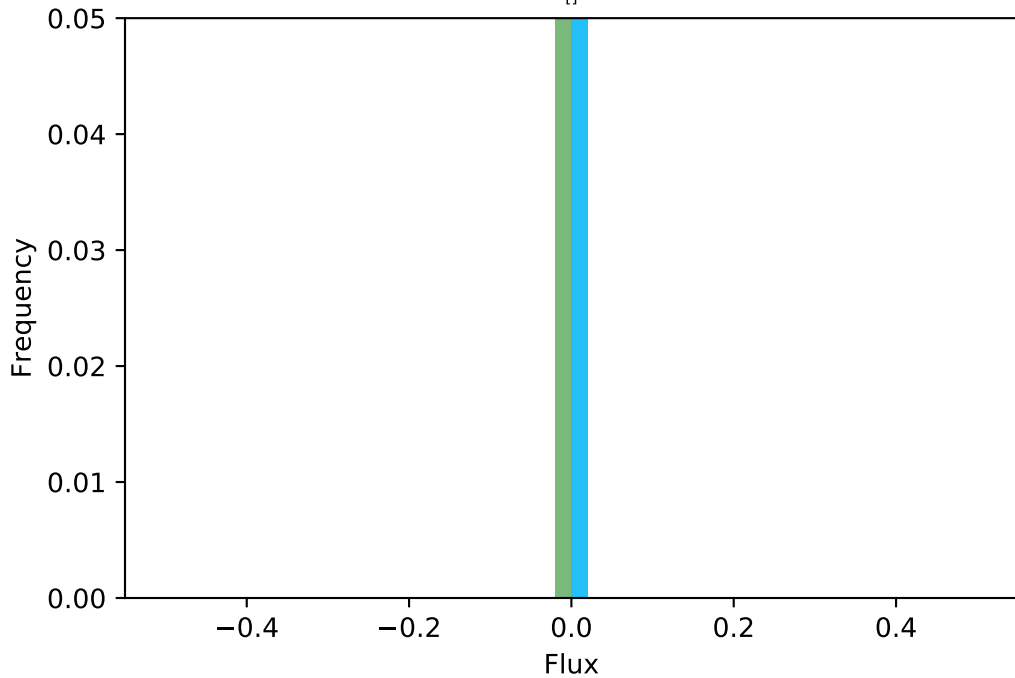137 : ATP_h + For_h + H_h + THF_h --> ADP_h + F_DASH_THF_h + Pi_h
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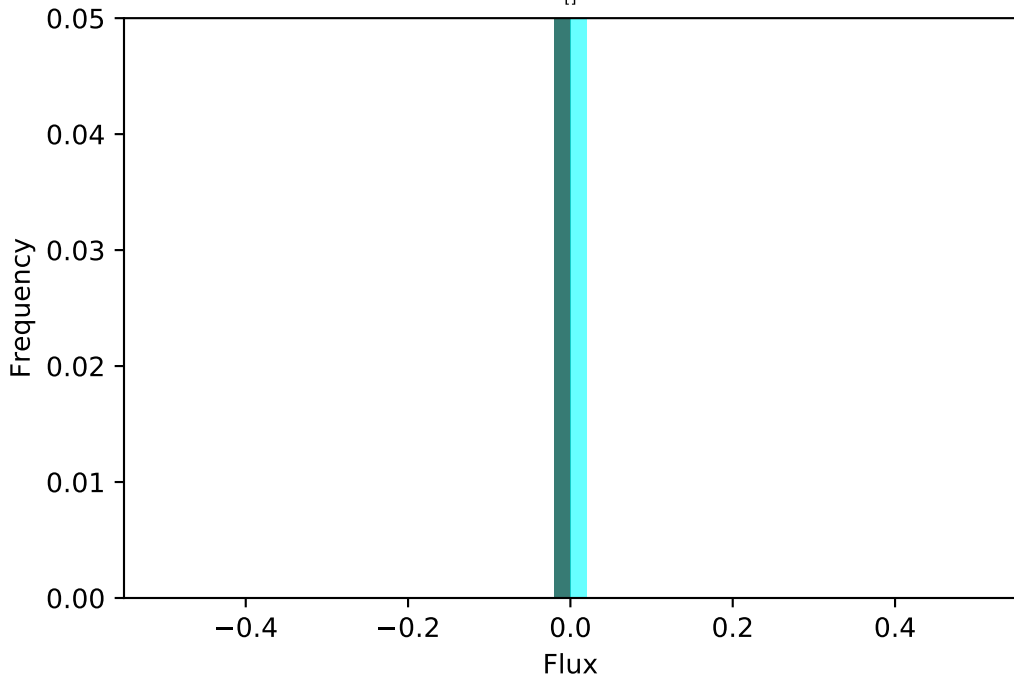138 : DHF_c + NADPH_c --> NADP_c + THF_c
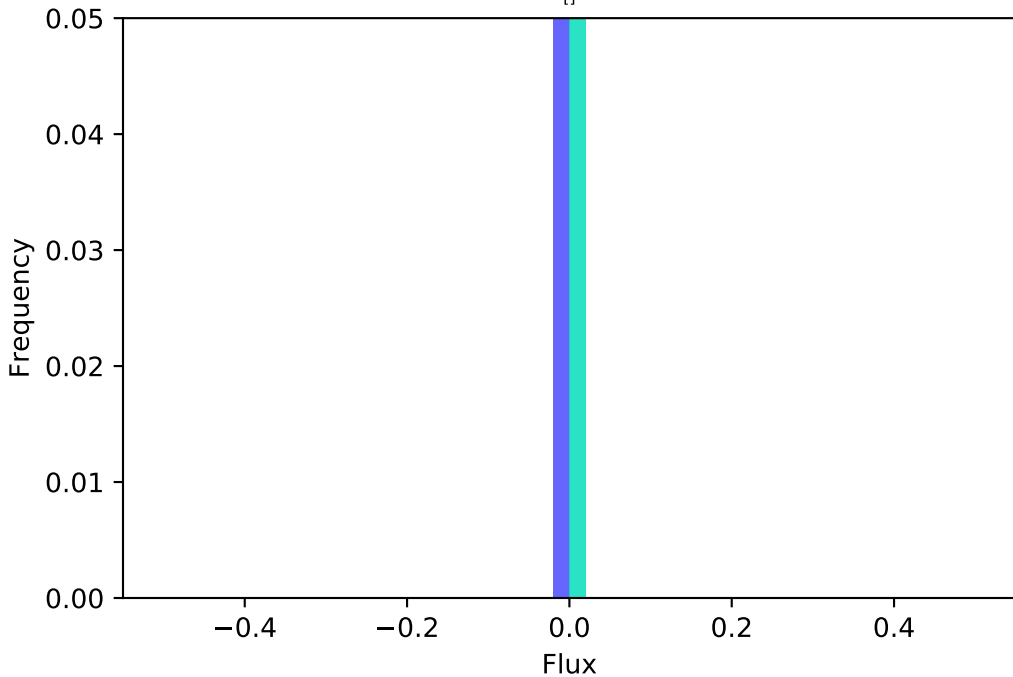[]

139 : NADPH_c + TRXox_c --> NADP_c + TRXrd_c
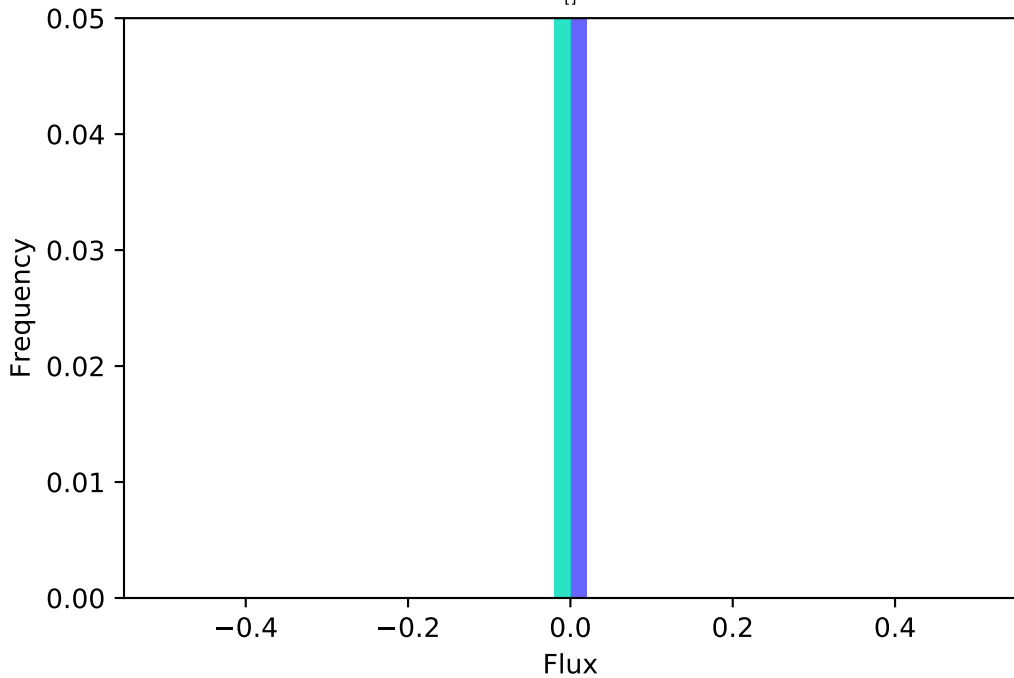[]

140 : ADN_c + ATP_c --> ADP_c + AMP_c + H_c
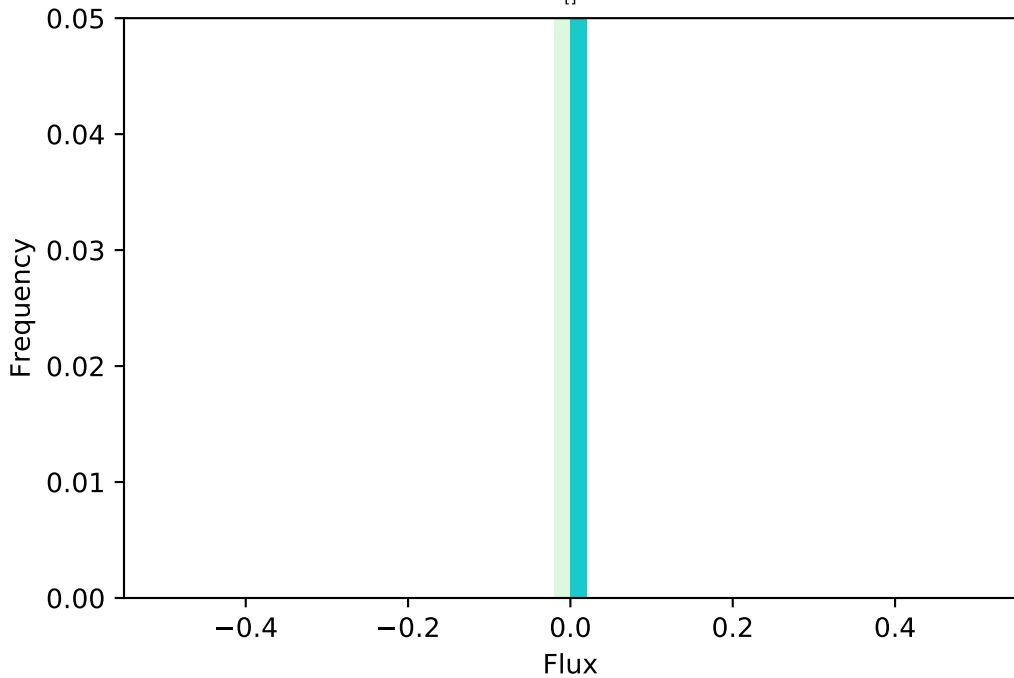[]

141 : ADN_c + H2O_c --> AD_c + H_c + Rib_c
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142 : AD_c + PRPP_c --> AMP_c + PPi_c
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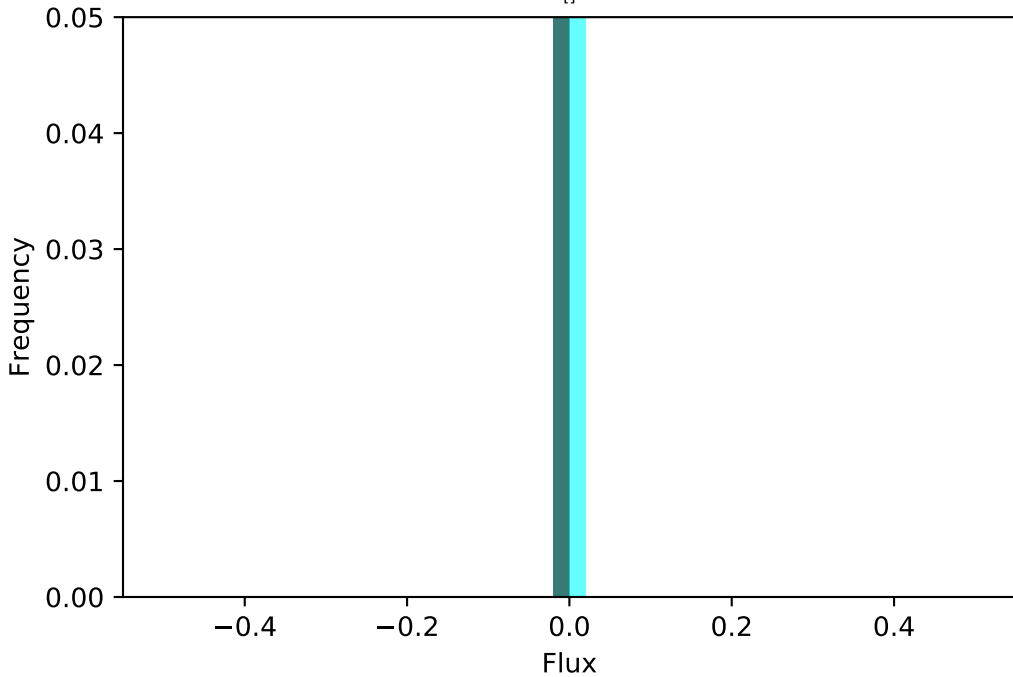143 : ATP_h + Rib_h --> ADP_h + H_h + R5P_h
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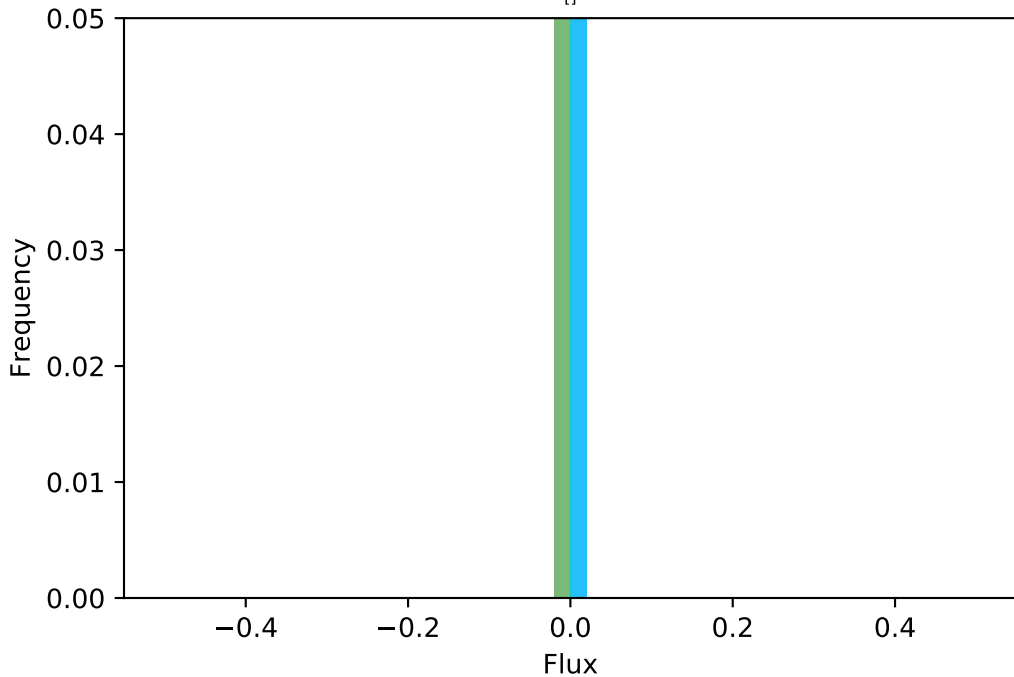144 : NADH_c + NO3_c --> H2O_c + NAD_c + NO2_c
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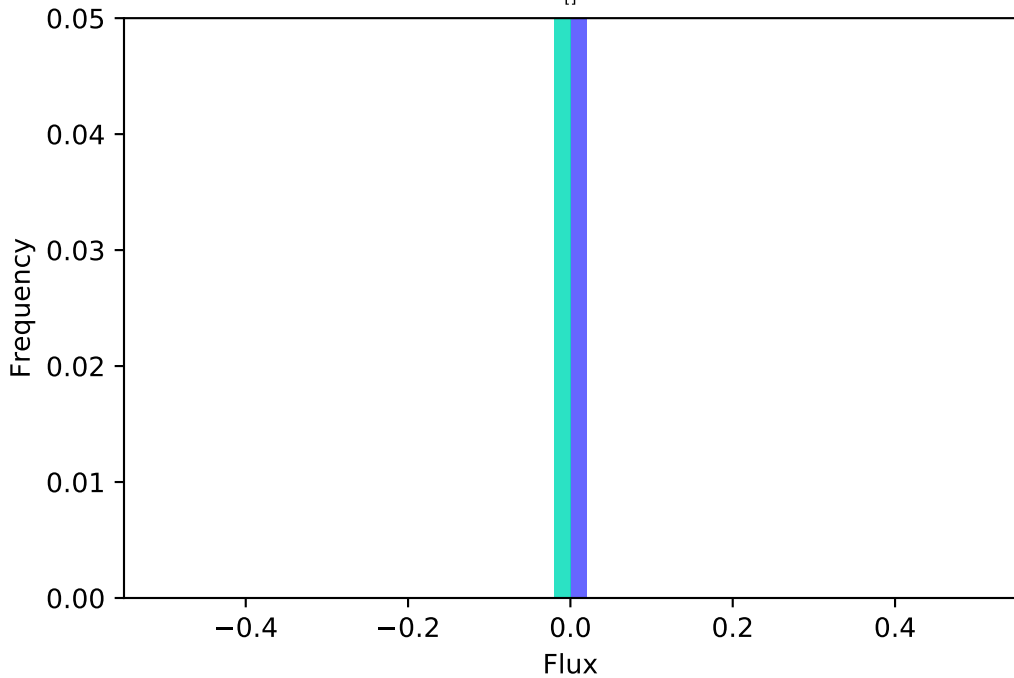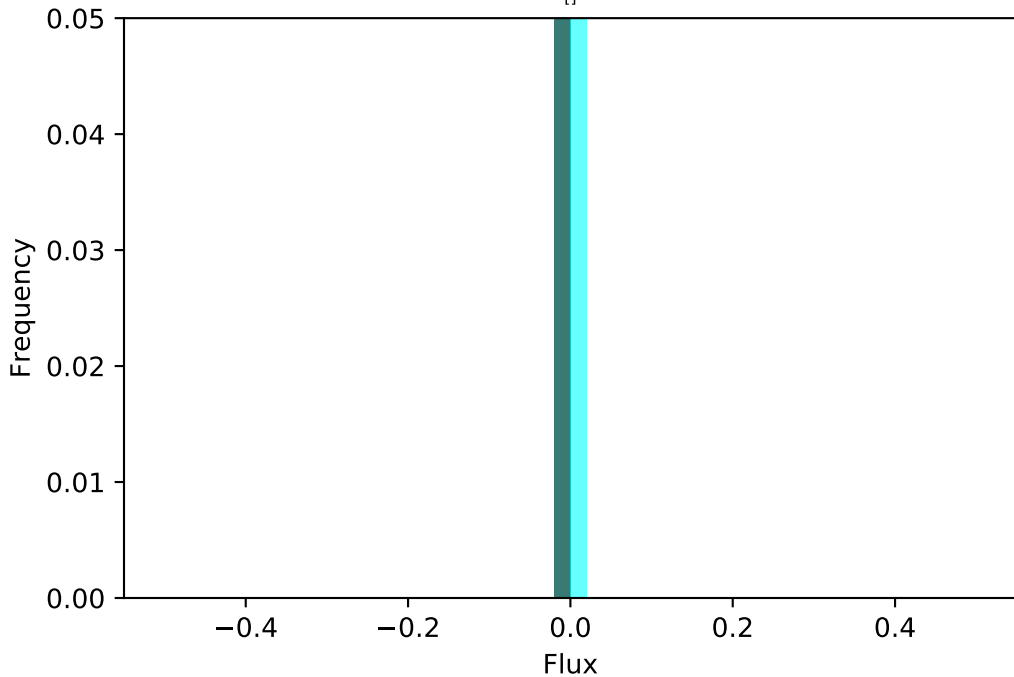145 : NADPH_c + NO3_c <=> H2O_c + NADP_c + NO2_c
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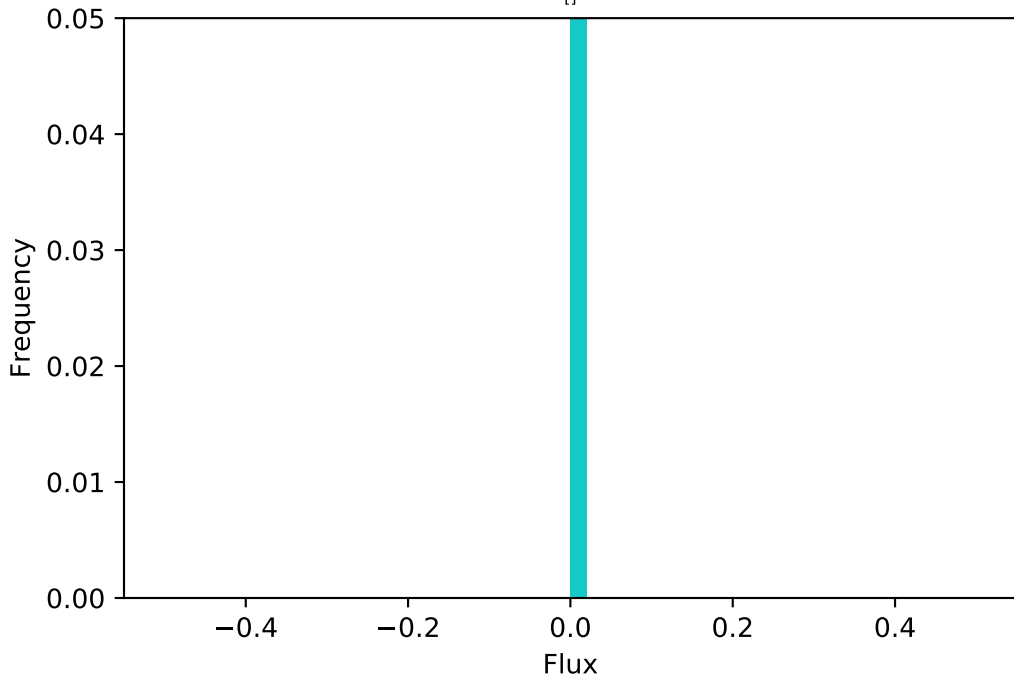146 : 6.0 Fdrd_h + 8.0 H_h + NO2_h --> 6.0 Fdox_h + 2.0 H2O_h + NH4_h
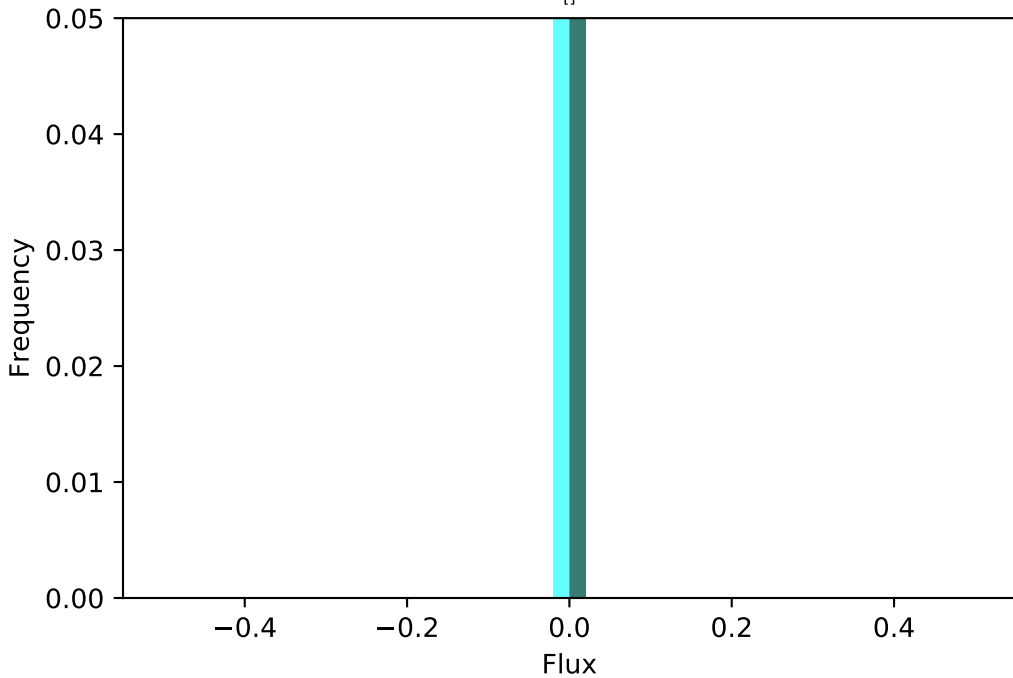[]

147 : ATP_h + SO4_h --> APS_h + PPi_h
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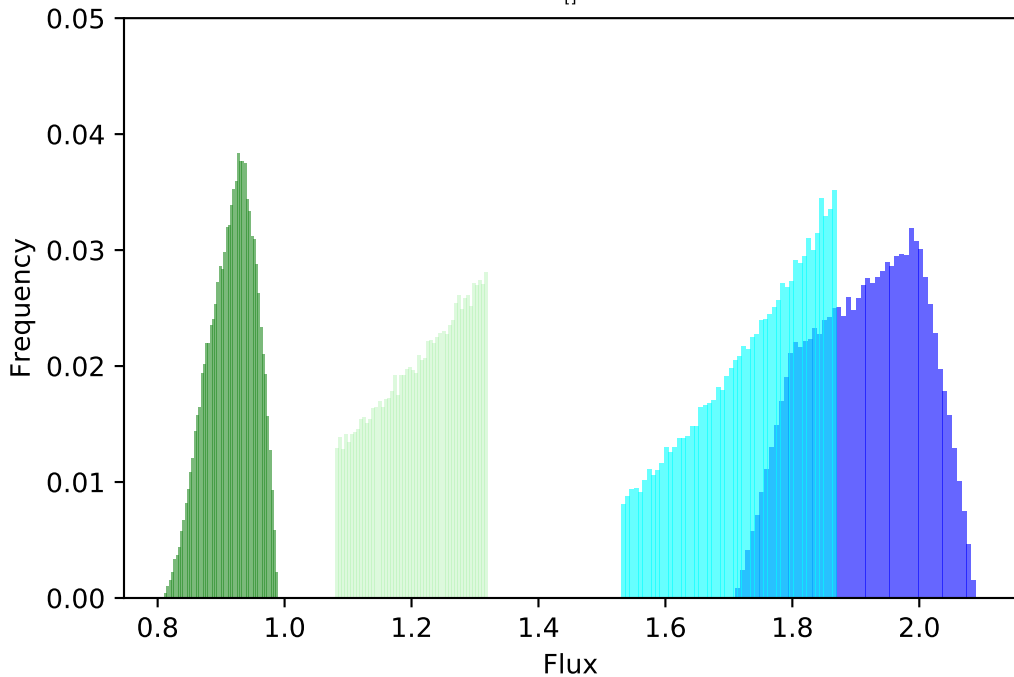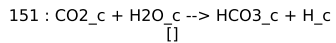148 : APS_h + 2.0 GSH_h --> AMP_h + GSSG_h + H_h + SO3_h
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149 : GSSG_h + H_h + NADPH_h --> 2.0 GSH_h + NADP_h
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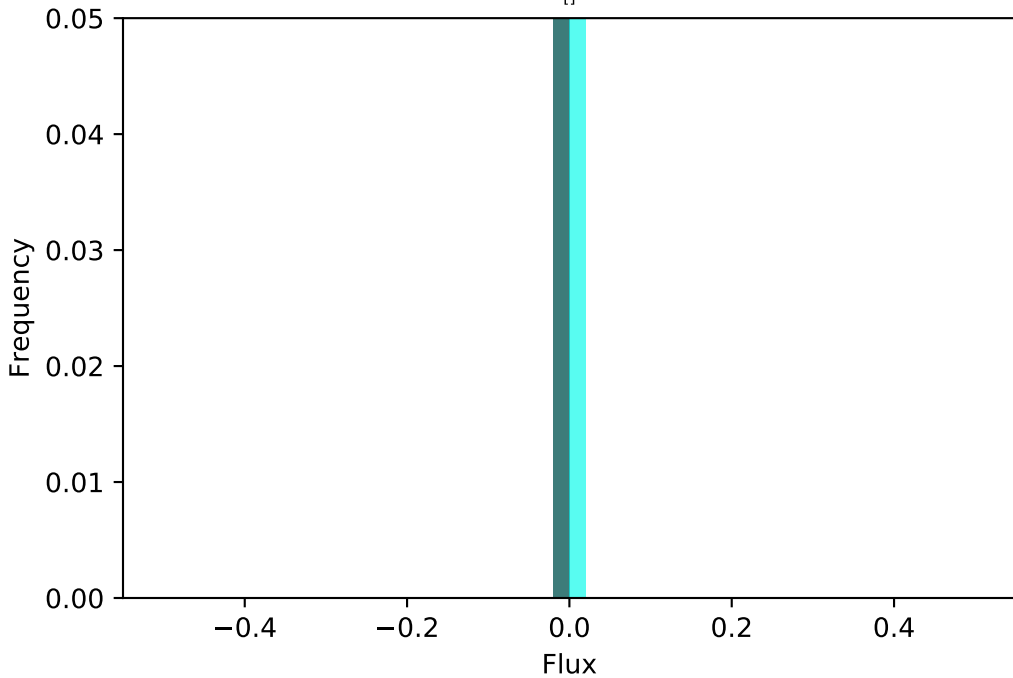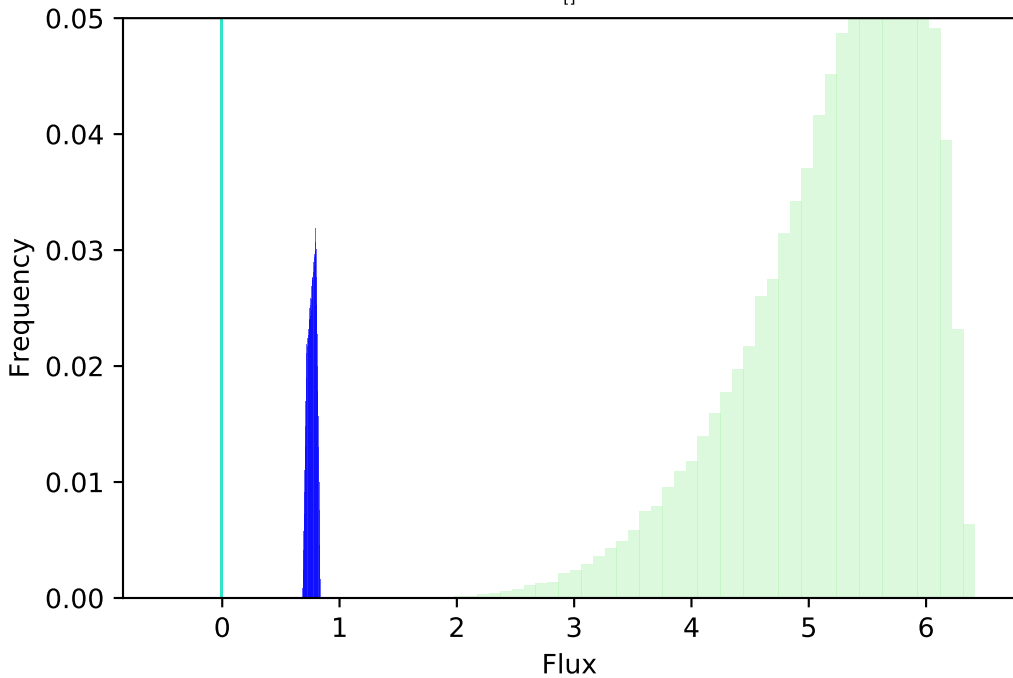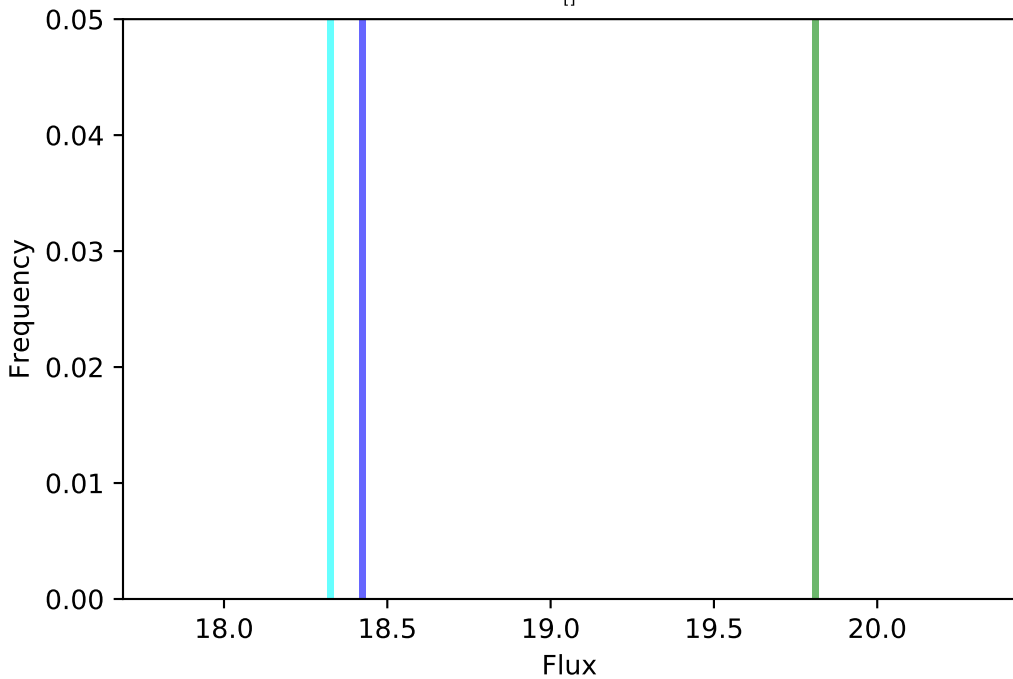150 : 3.0 Fdrd_h + 7.0 H_h + SO3_h --> 3.0 Fdox_h + 3.0 H2O_h + H2S_h
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151 : CO2_c + H2O_c --> HCO3_c + H_c
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152 : CO2_h + H2O_h --> HCO3_h + H_h
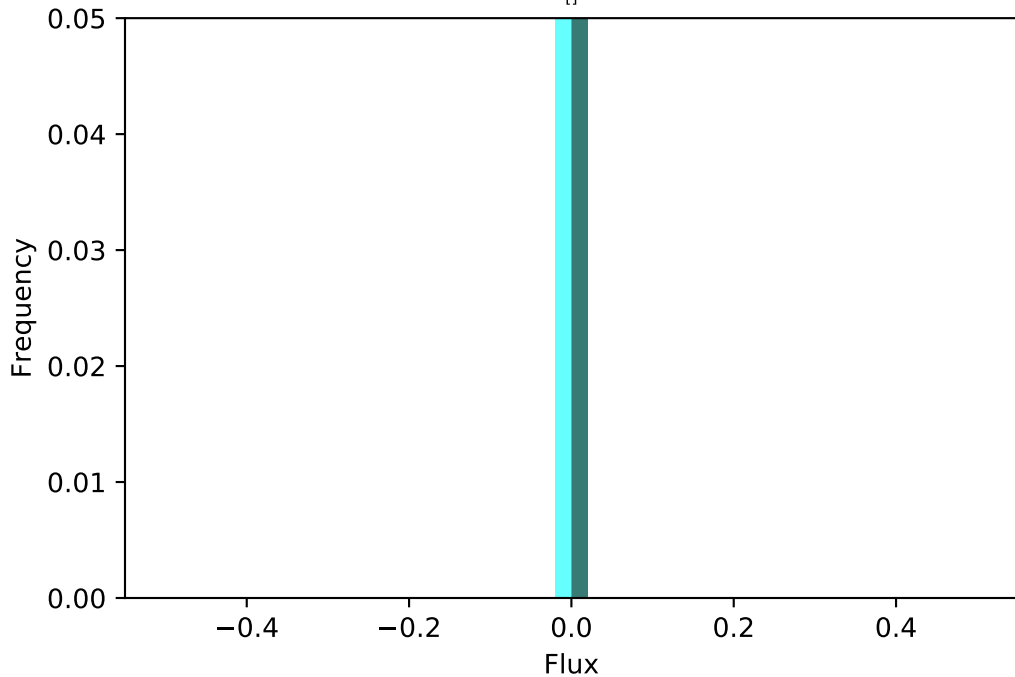[]

153 : Glu_h + Pyr_h <=> Ala_h + KG_h
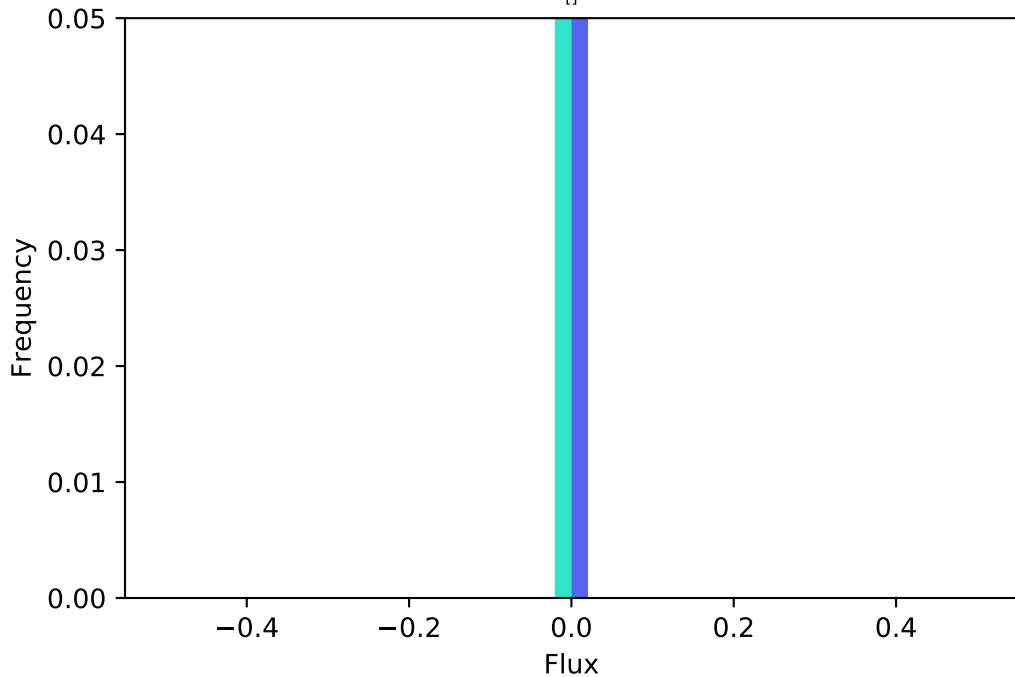[]

154 : Glu_m + Pyr_m <=> Ala_m + KG_m
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155 : Glu_p + Pyr_p <=> Ala_p + KG_p
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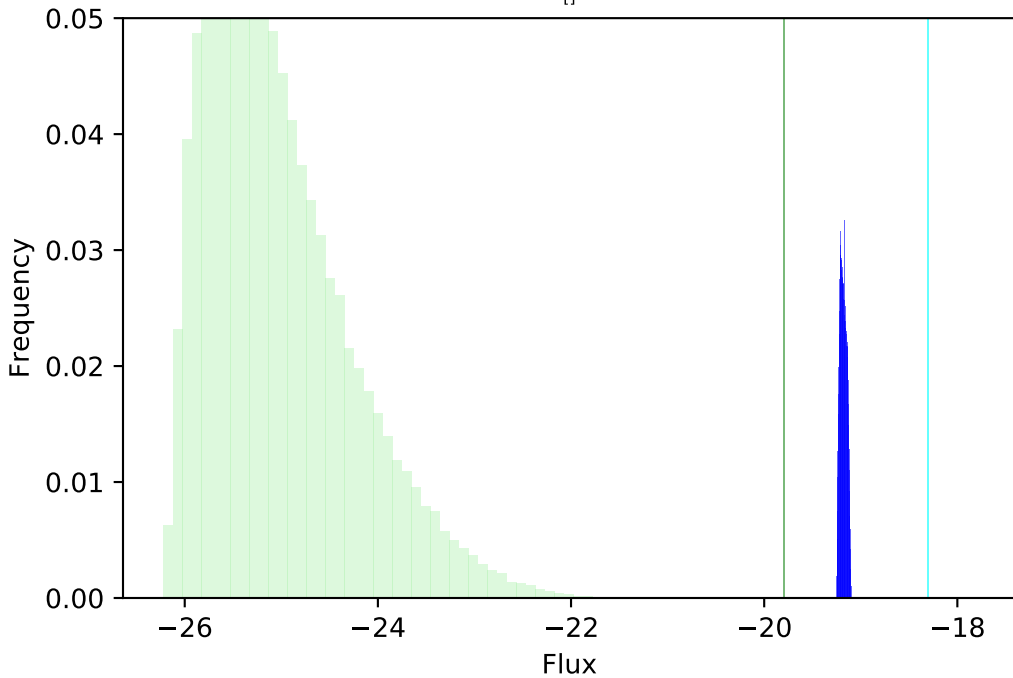
156 : ATP_h + A_DASH_Glu_h --> ADP_h + A_DASH_GluP_h
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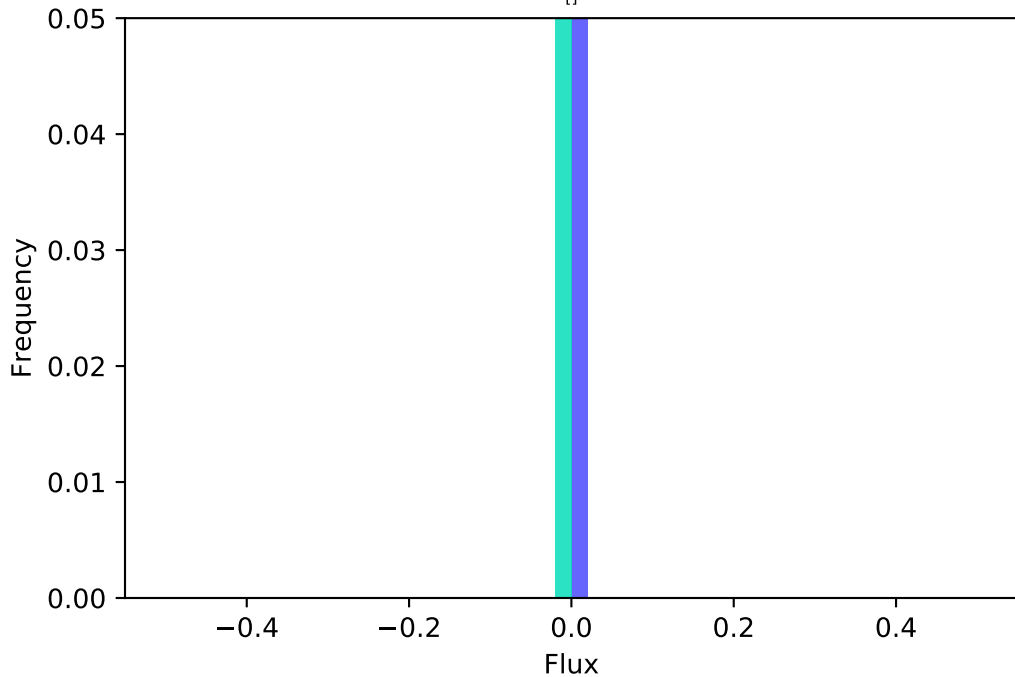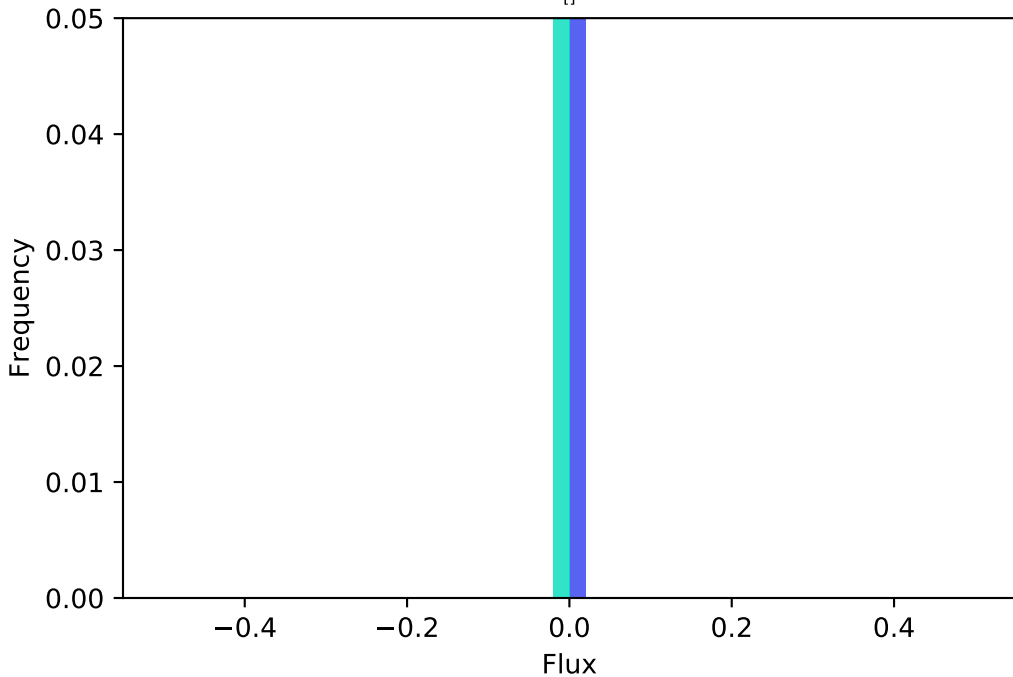157 : A_DASH_GluP_h + H_h + NADPH_h --> A_DASH_Glu_DASH_SeA_h + NADP_h + Pi_h
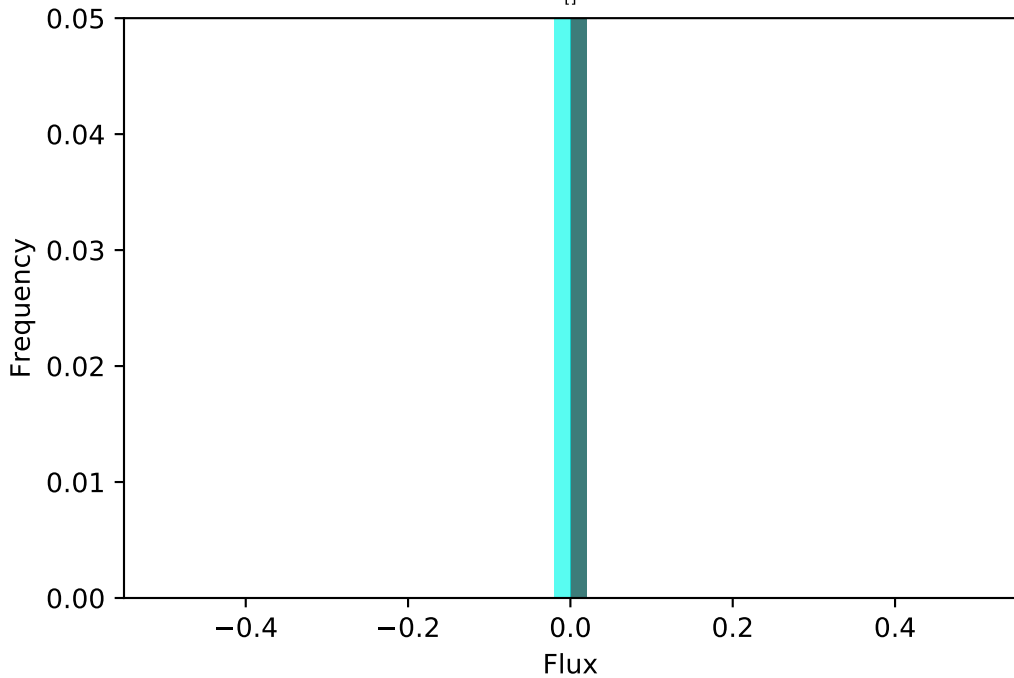[]

158 : A_DASH_Glu_DASH_SeA_h + Glu_h --> A_DASH_Orn_h + KG_h
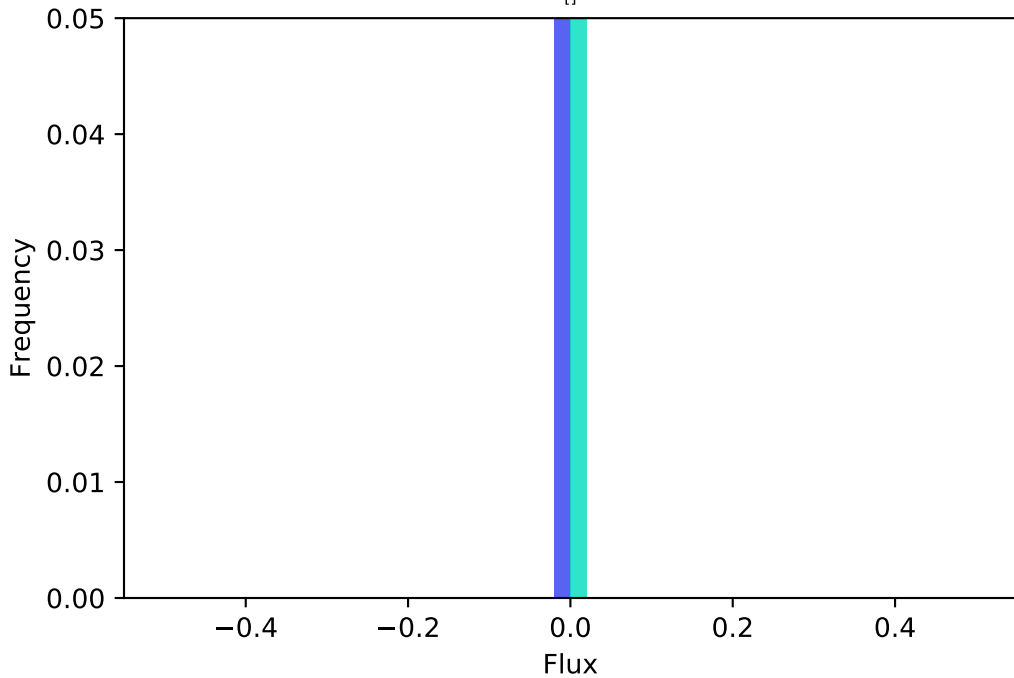[]
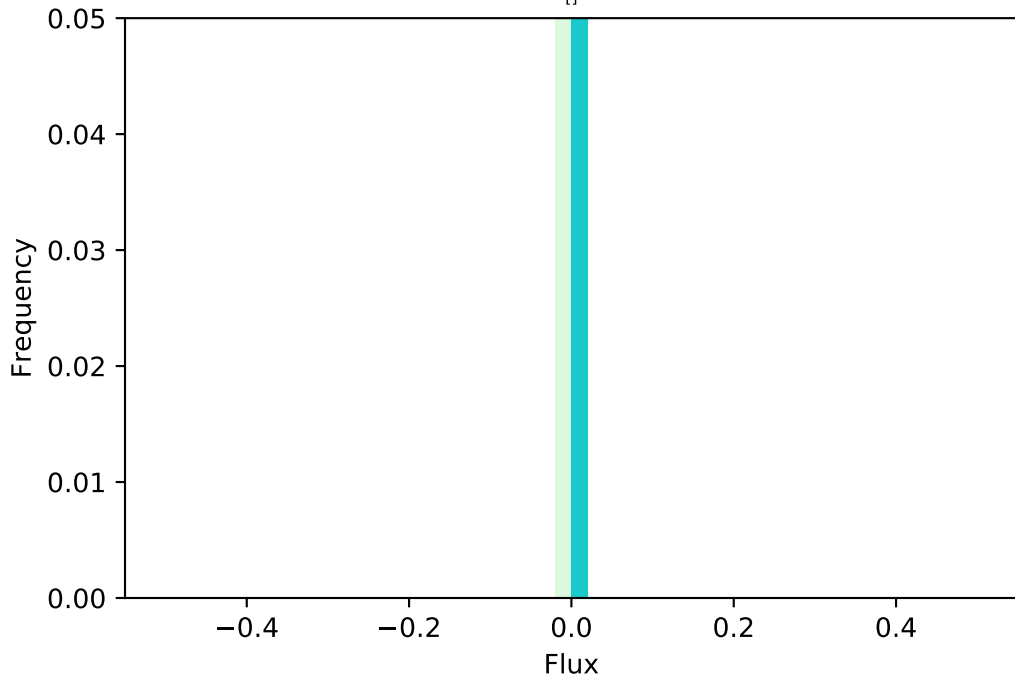
159 : A_DASH_Orn_h + Glu_h --> A_DASH_Glu_h + Orn_h
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160 : 2.0 ATP_h + Gln_h + H2O_h + HCO3_h --> 2.0 ADP_h + CBP_h + Glu_h + 3.0 H_h + Pi_h
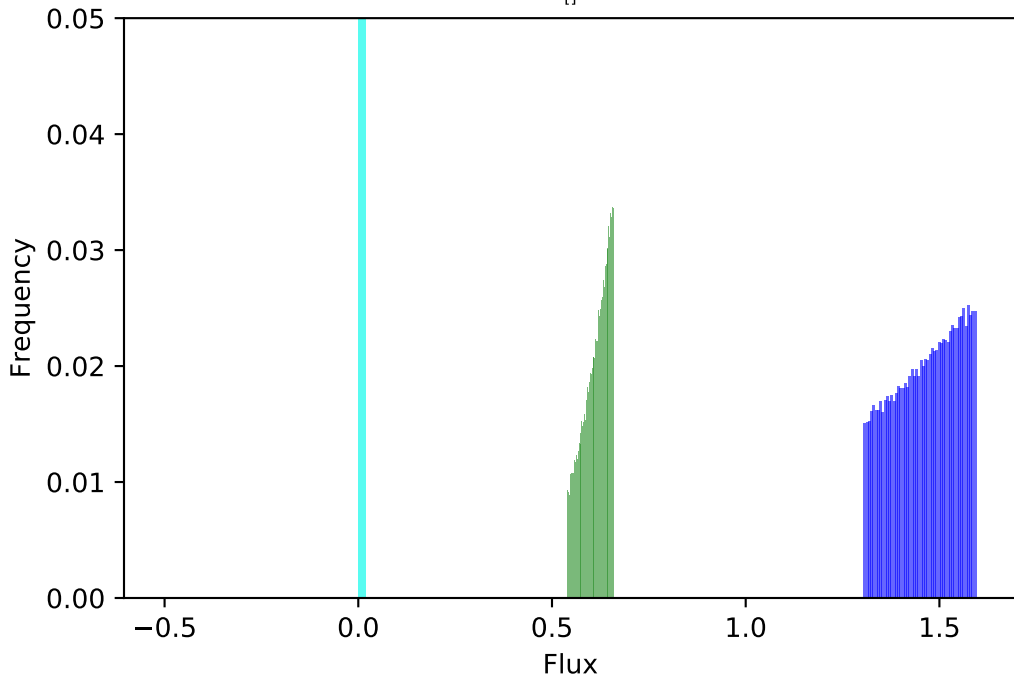[]

161 : CBP_h + H_h + Orn_h <=> CTL_h + Pi_h
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162 : ATP_h + Asp_h + CTL_h --> AMP_h + Arg_DASH_SCA_h + 3.0 H_h + PPi_h
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163 : Arg_DASH_SCA_h --> Arg_h + Fum_h
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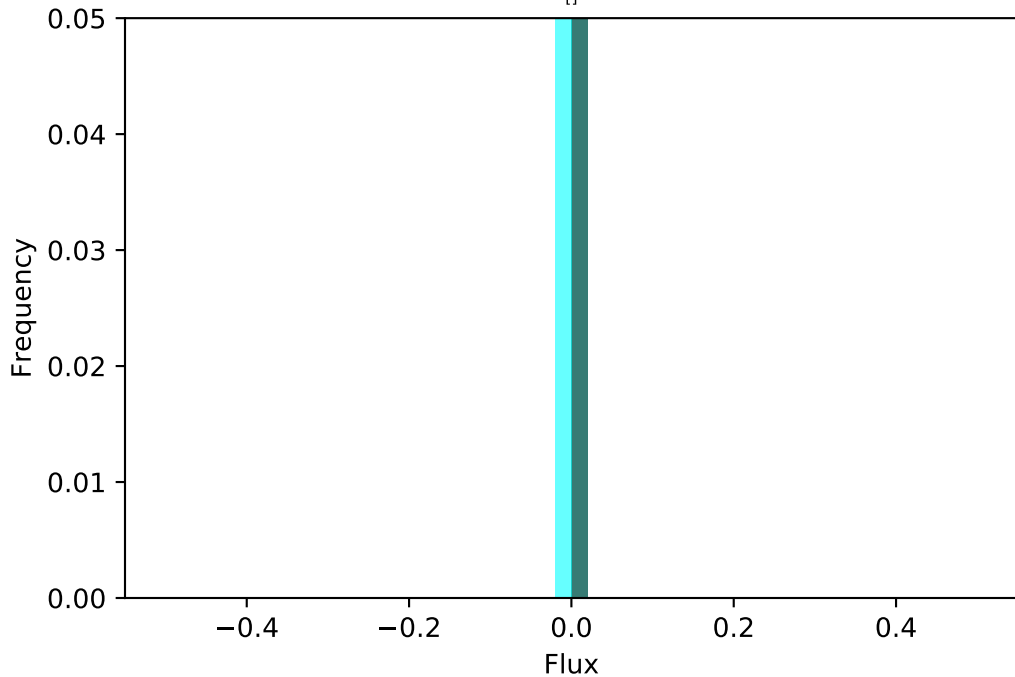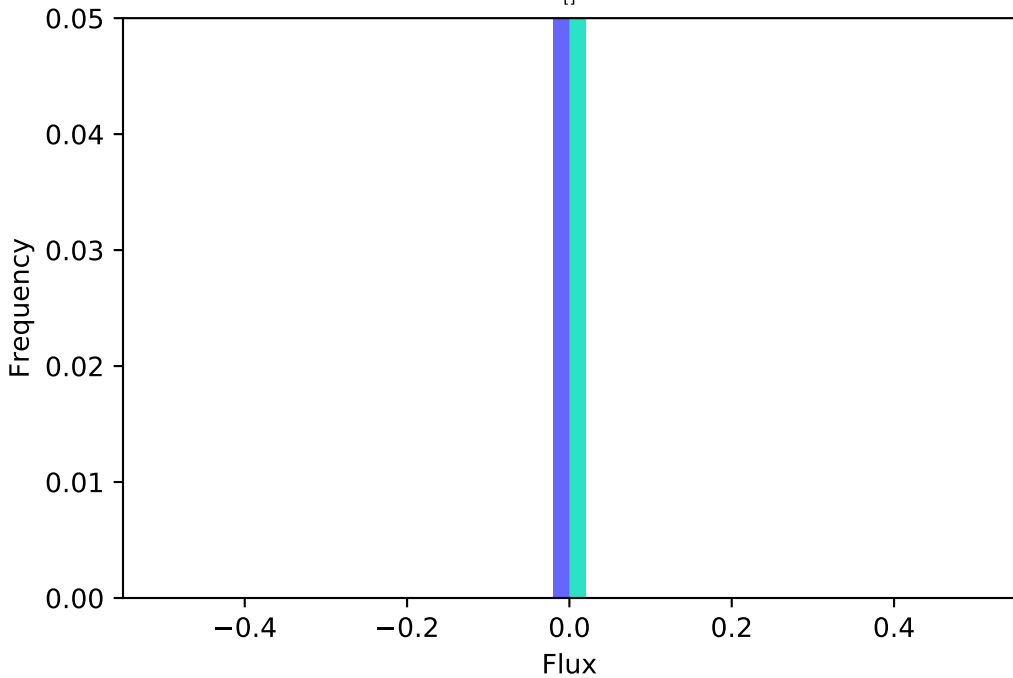
164 : Mal_c --> Fum_c + H2O_c
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165 : ATP_c + Asp_c + Gln_c + H2O_c --> AMP_c + Asn_c + Glu_c + H_c + PPi_c
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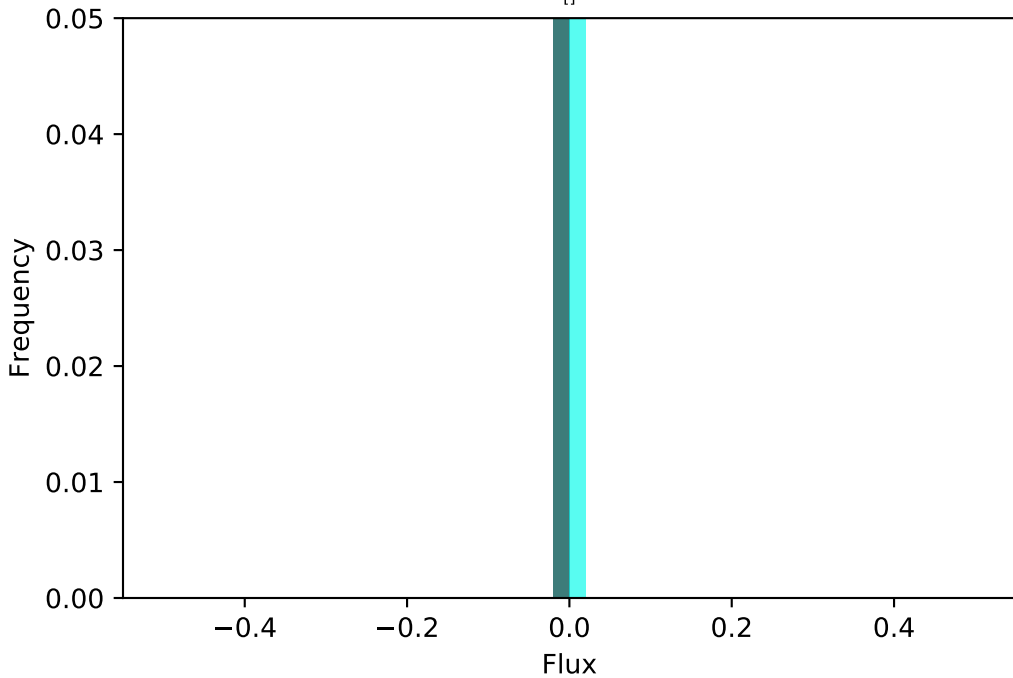
166 : Glu_c + OAA_c --> Asp_c + KG_c
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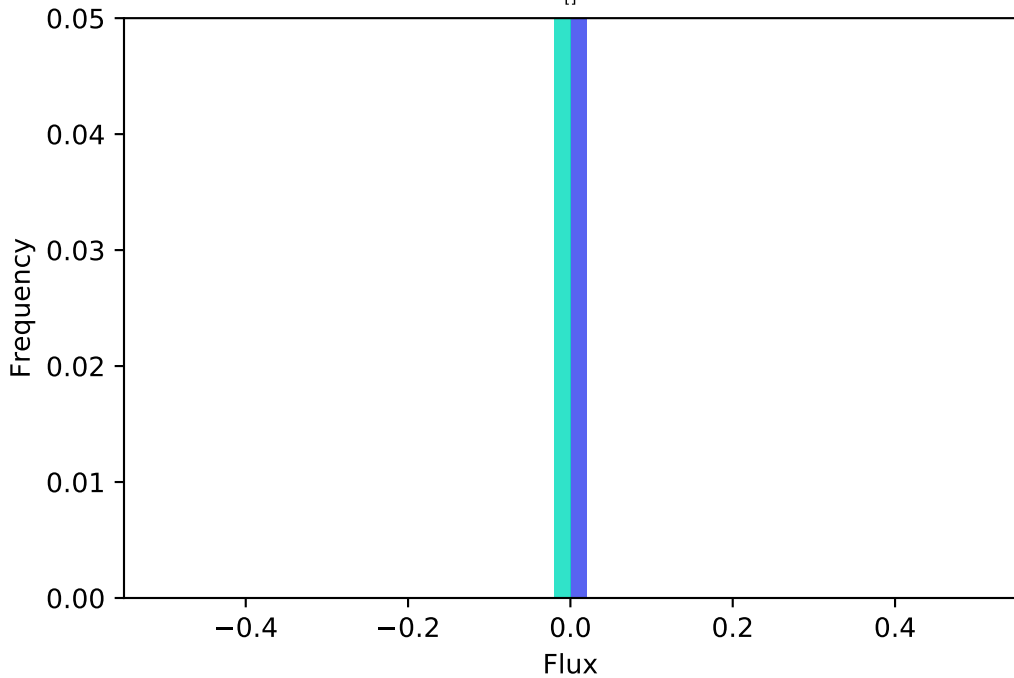
167 : Glu_h + OAA_h <=> Asp_h + KG_h
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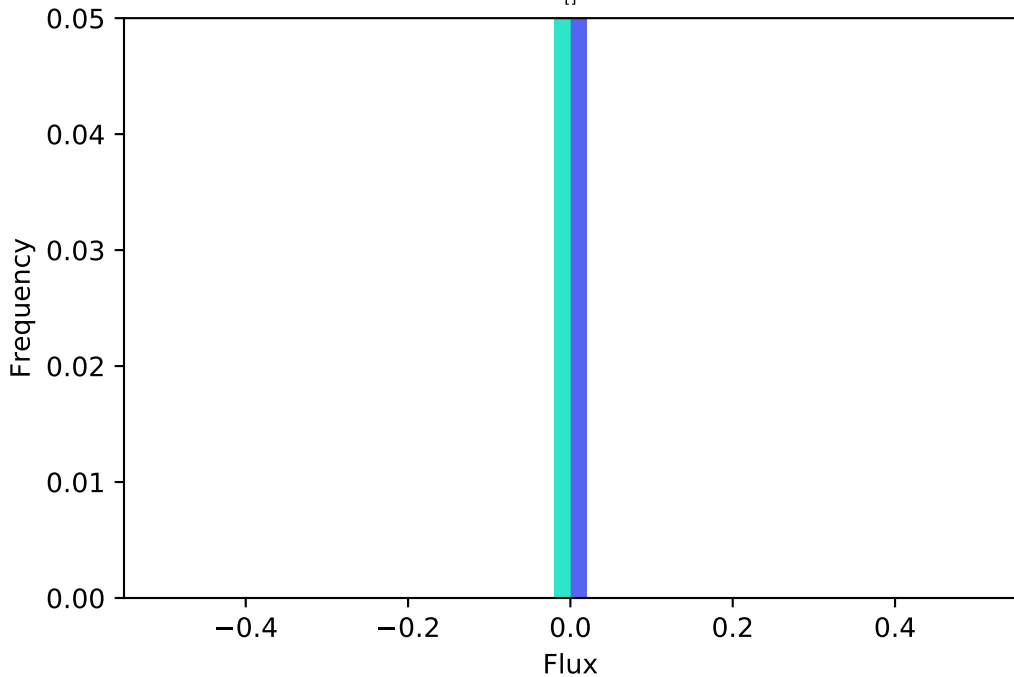
168 : Glu_m + OAA_m <=> Asp_m + KG_m
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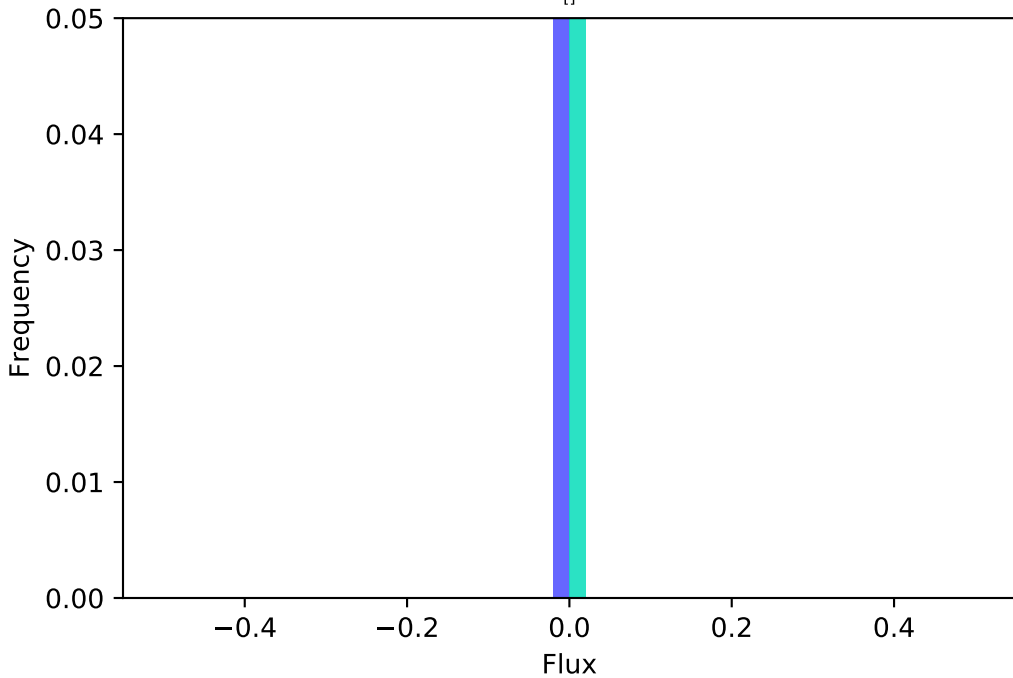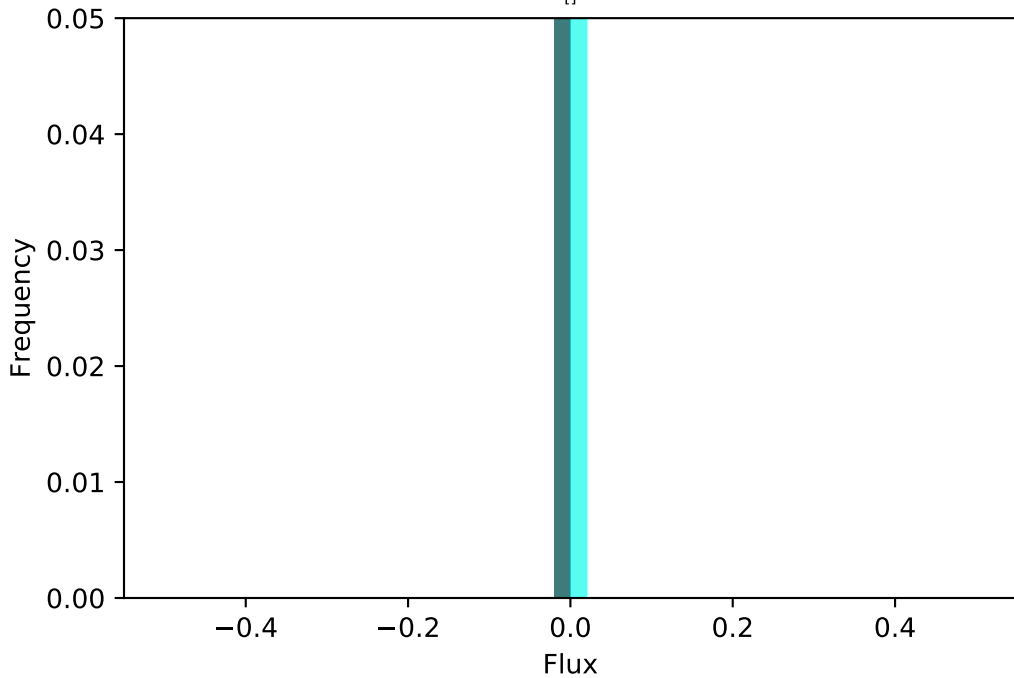
169 : Glu_p + OAA_p <=> Asp_p + KG_p
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170 : Asn_c + H2O_c --> Asp_c + NH4_c
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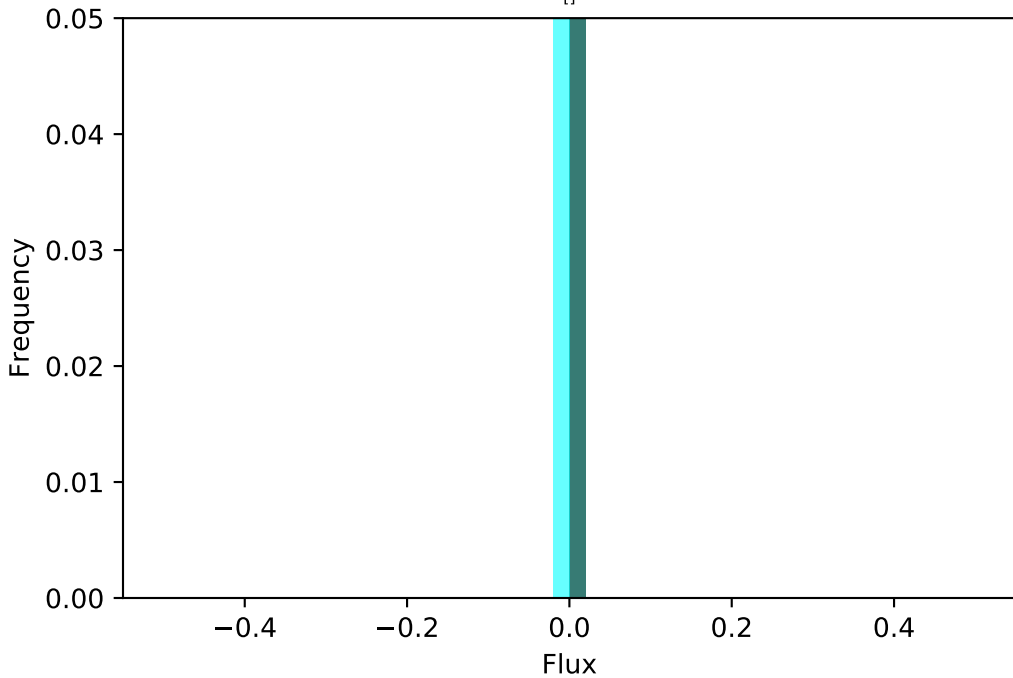
171 : A_DASH_CoA_c + Ser_c --> A_DASH_Ser_c + CoA_c
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172 : A_DASH_CoA_h + Ser_h --> A_DASH_Ser_h + CoA_h
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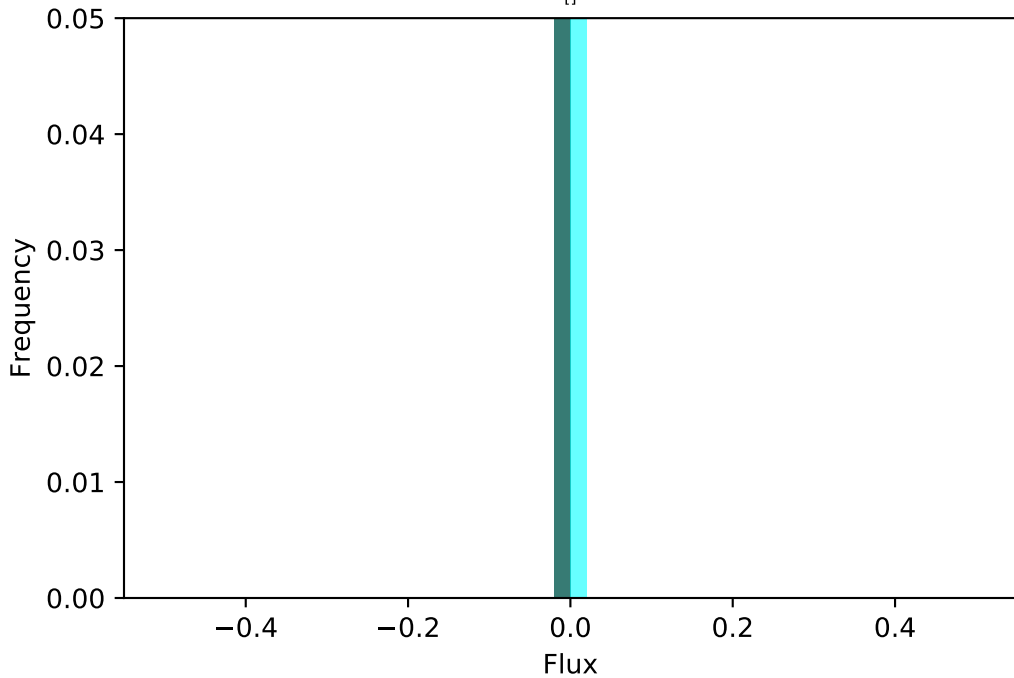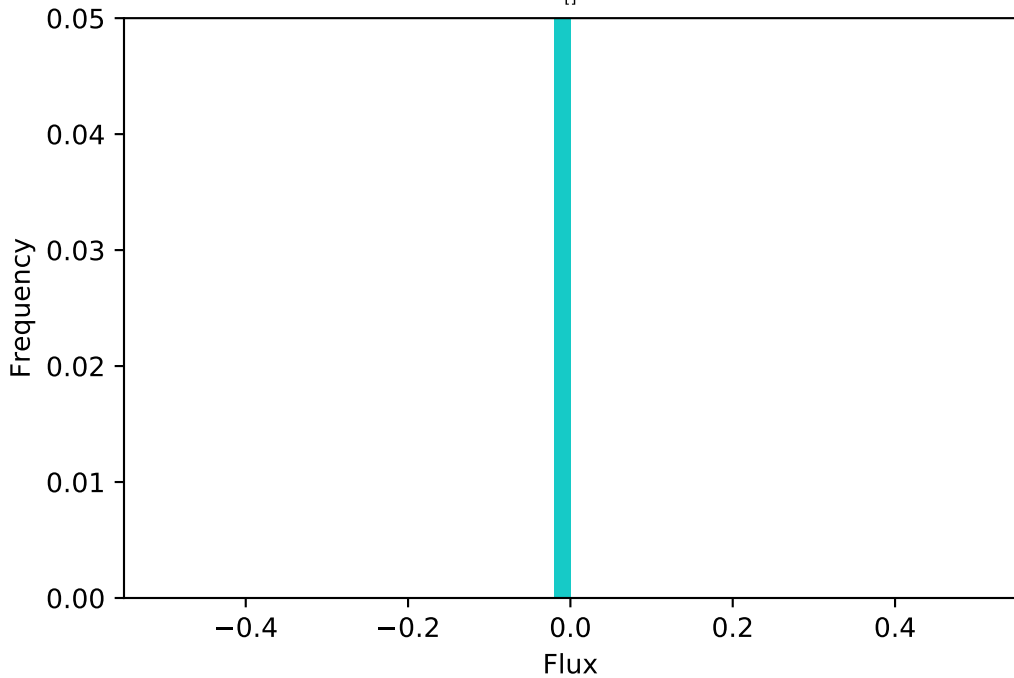
173 : A_DASH_CoA_m + Ser_m --> A_DASH_Ser_m + CoA_m
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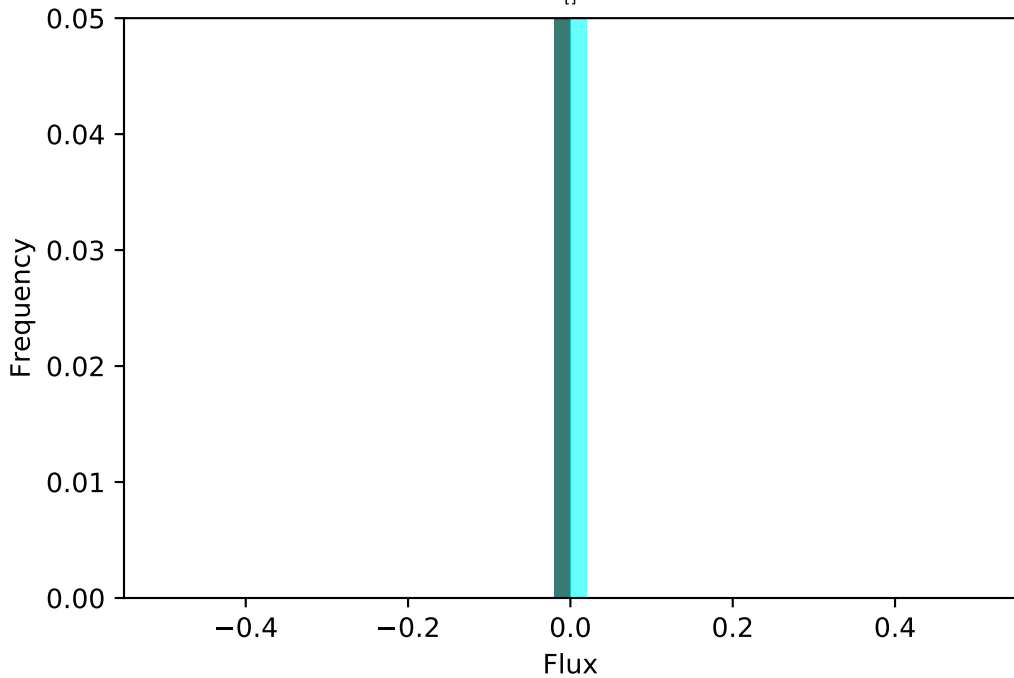
174 : A_DASH_Ser_c + H2S_c --> AC_c + Cys_c + H_c
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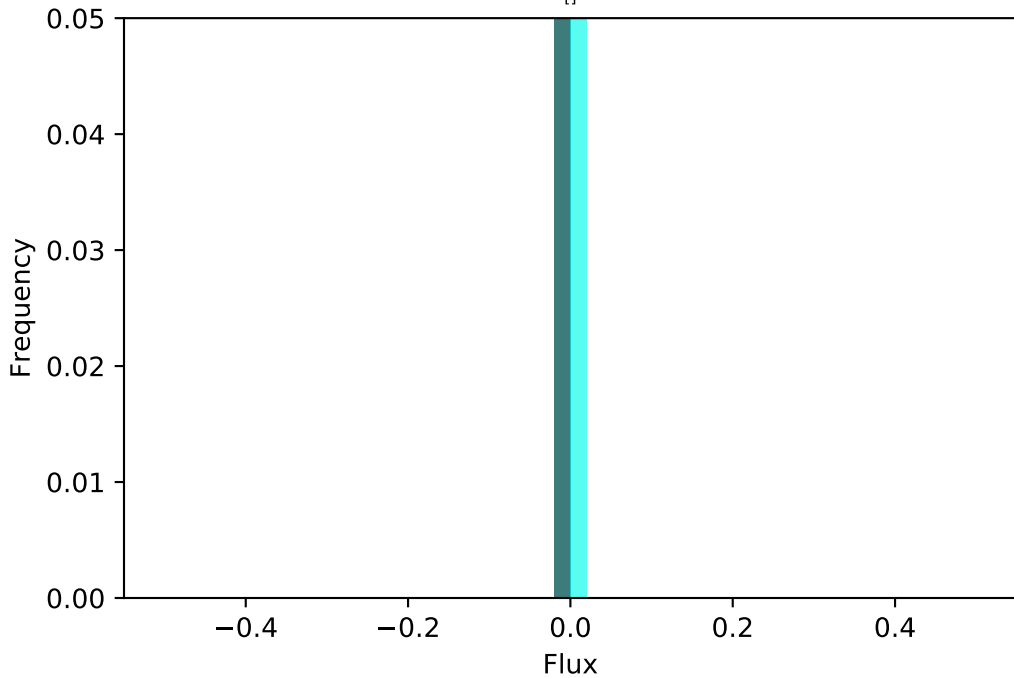
175 : A_DASH_Ser_h + H2S_h --> AC_h + Cys_h + H_h
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176 : A_DASH_Ser_m + H2S_m --> AC_m + Cys_m + H_m
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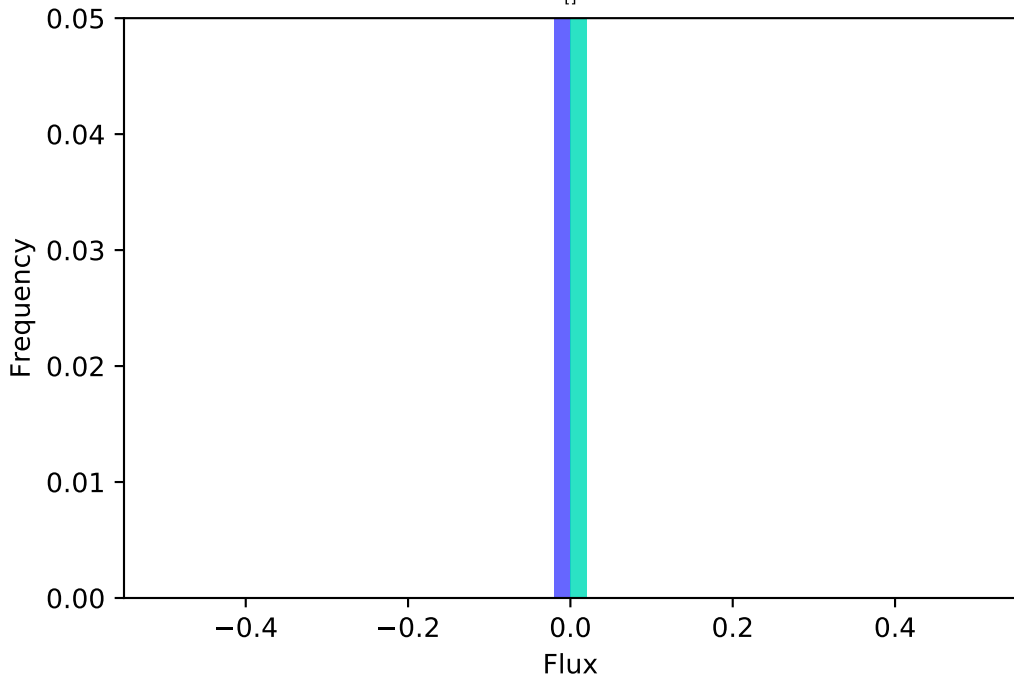
177 : Gln_h + H_h + KG_h + NADPH_h --> 2.0 Glu_h + NADP_h
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178 : Glu_c + H2O_c + NADP_c --> KG_c + NADPH_c + NH4_c
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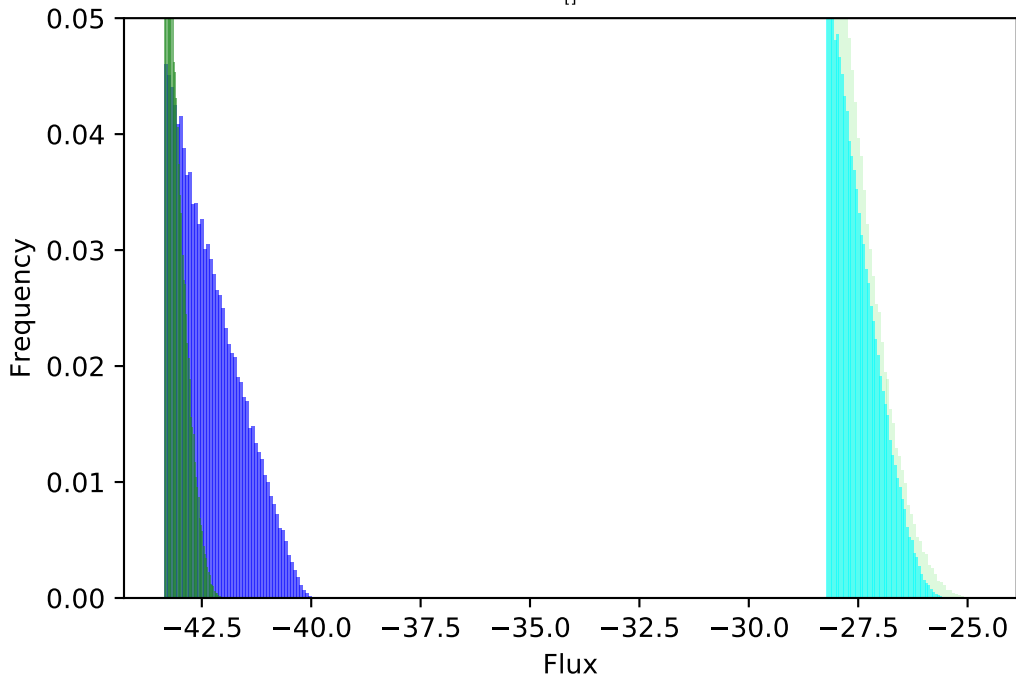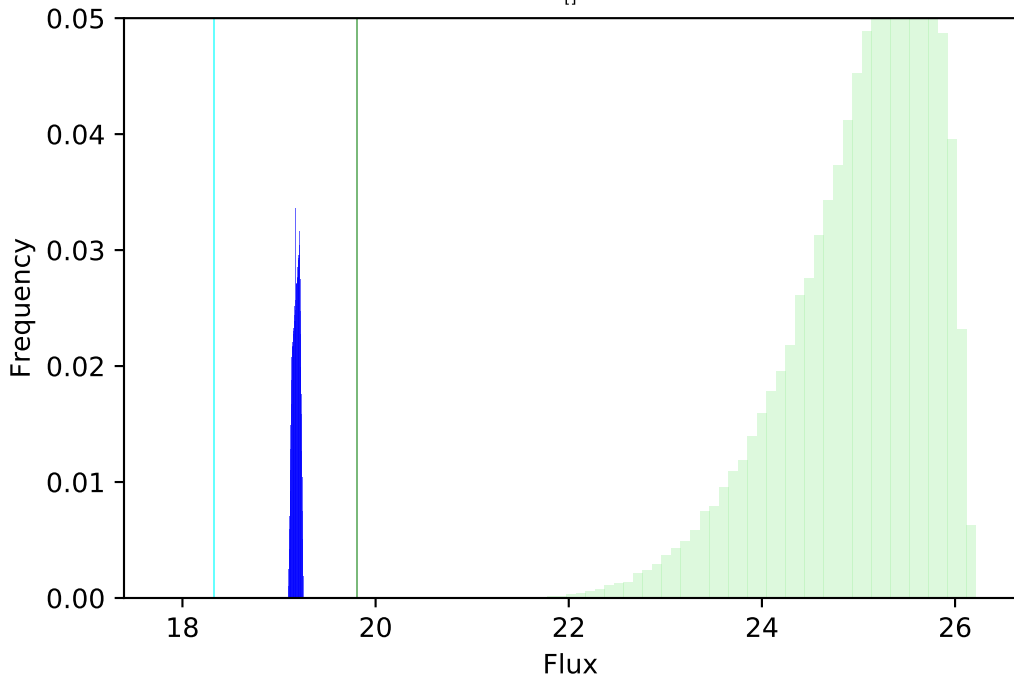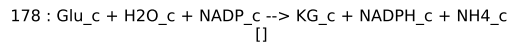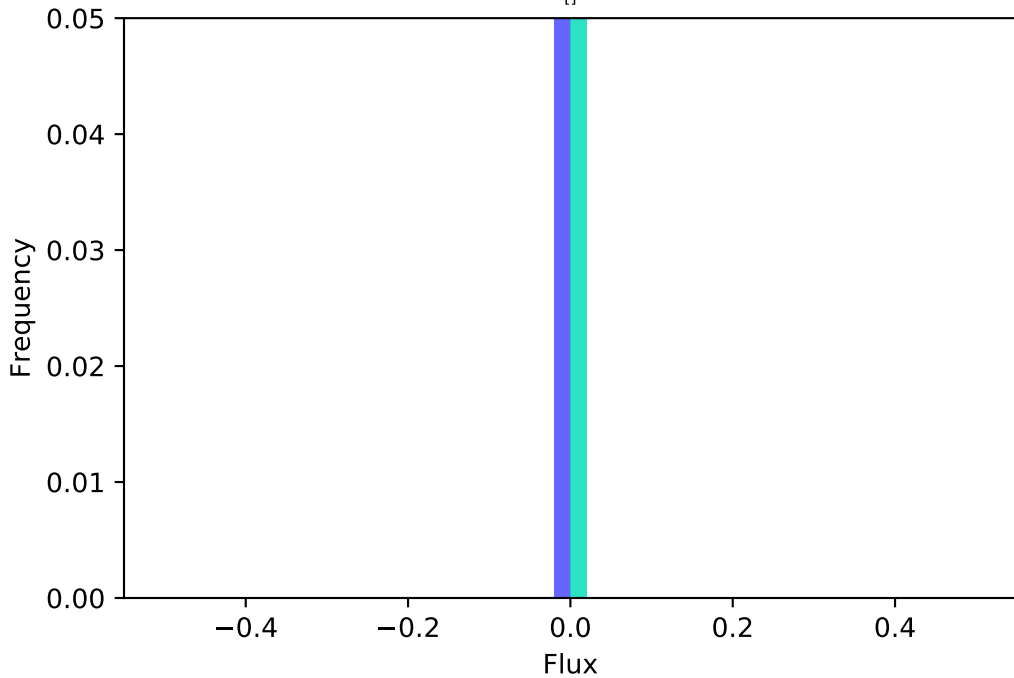
179 : Gln_c + H2O_c --> Glu_c + NH4_c
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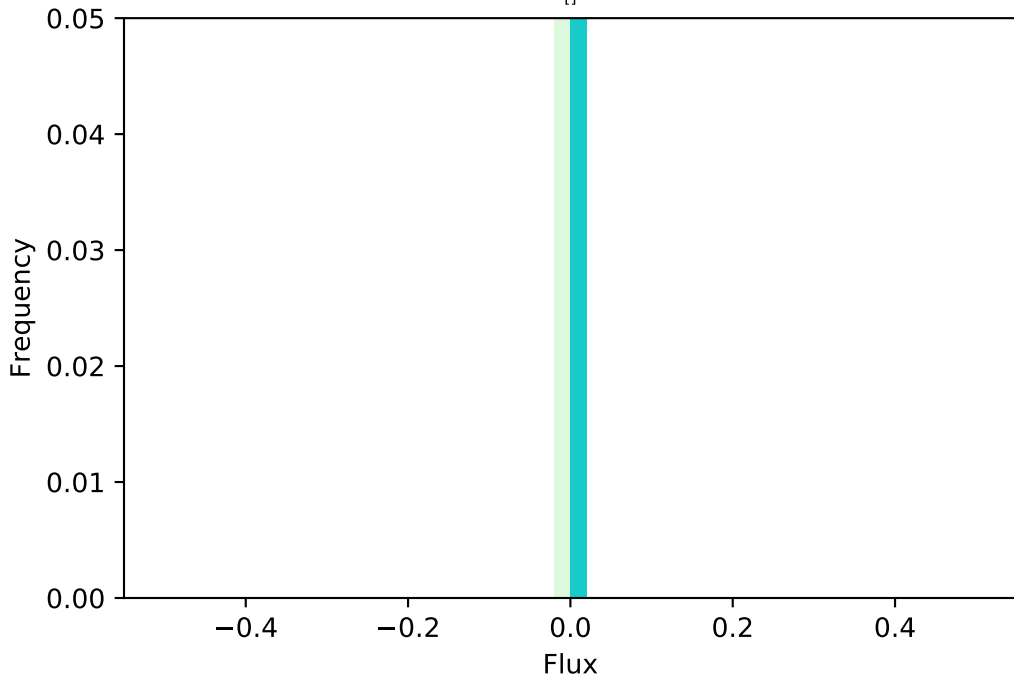
180 : Gln_h + H_h + KG_h + NADH_h --> 2.0 Glu_h + NAD_h
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181 : 2.0 Fdrd_h + Gln_h + 2.0 H_h + KG_h --> 2.0 Fdox_h + 2.0 Glu_h
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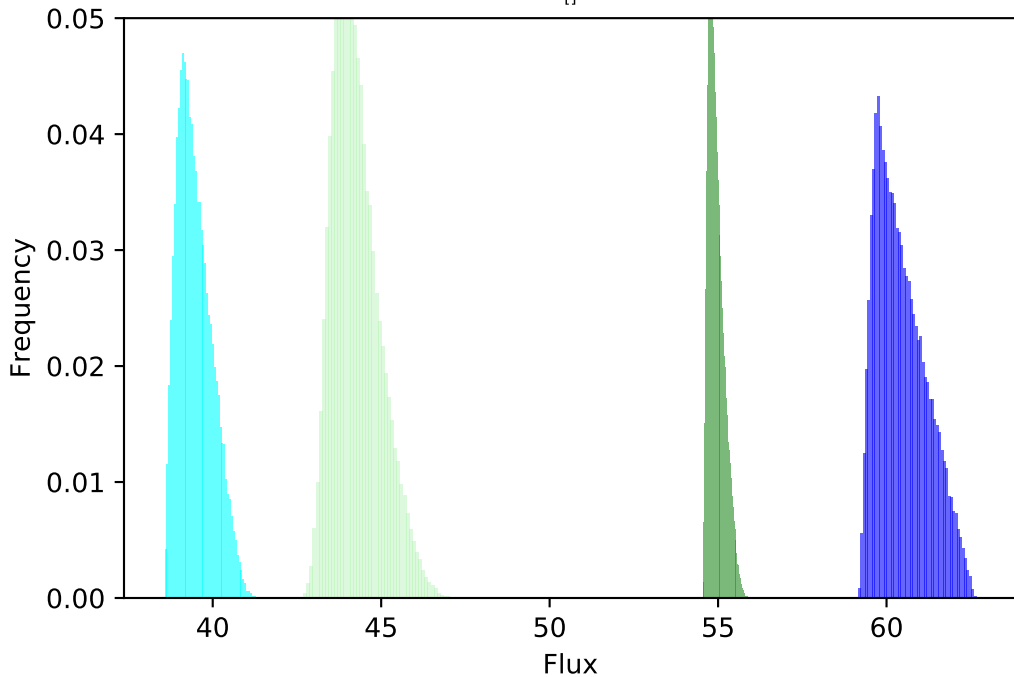
182 : H_m + KG_m + NADH_m + NH4_m --> Glu_m + H2O_m + NAD_m
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183 : H_m + KG_m + NADPH_m + NH4_m <=> Glu_m + H2O_m + NADP_m
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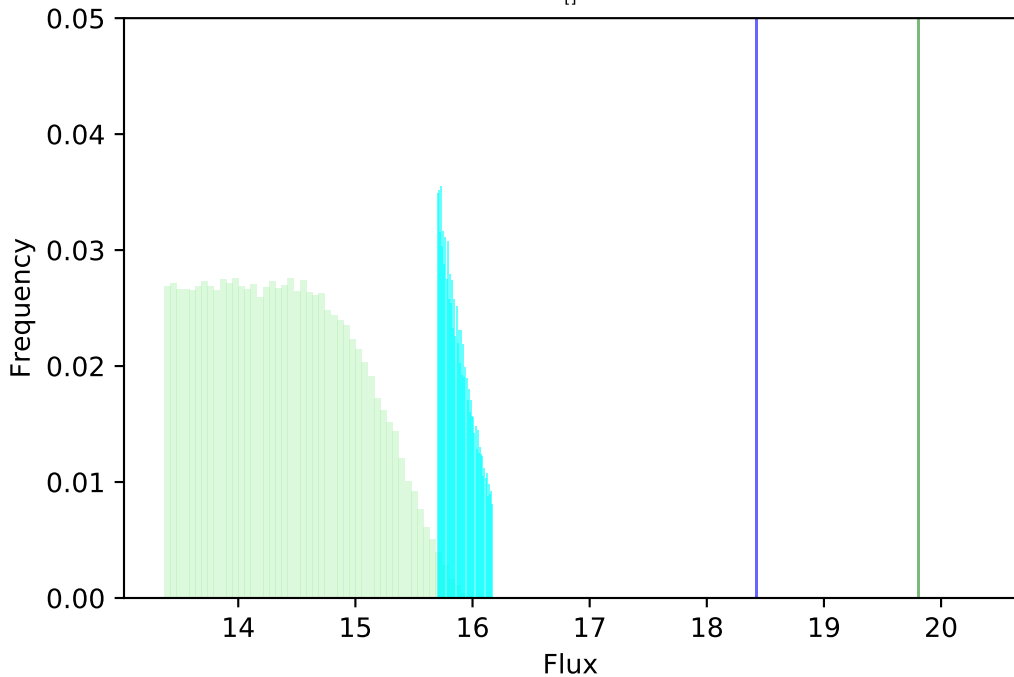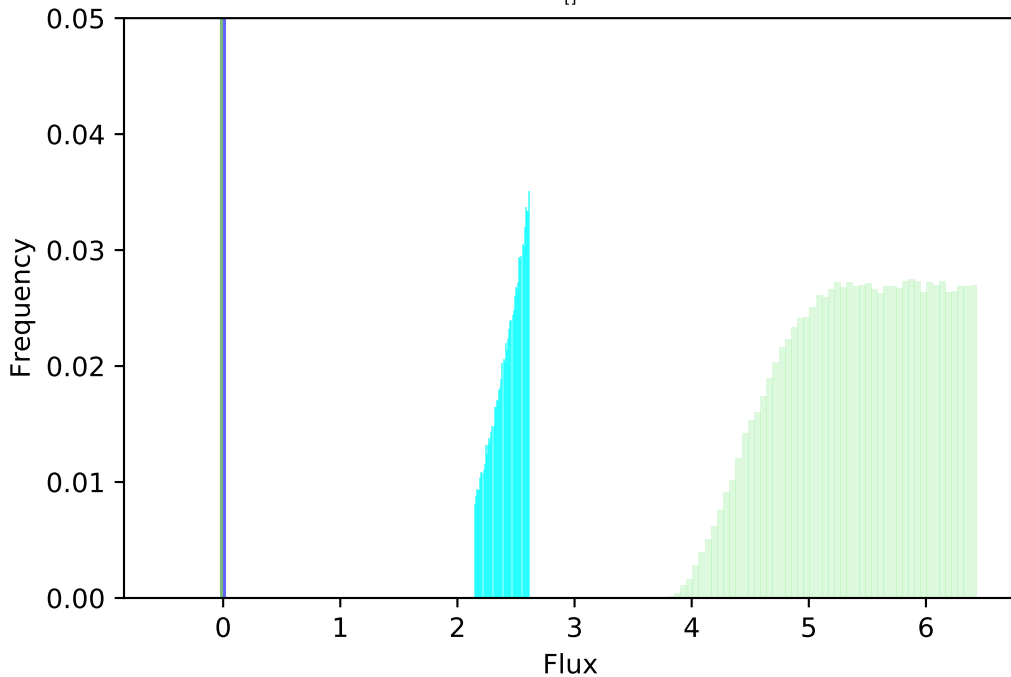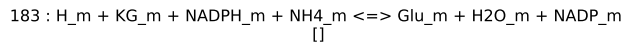
184 : Glu_m + H2O_m + NAD_m --> H_m + KG_m + NADH_m + NH4_m
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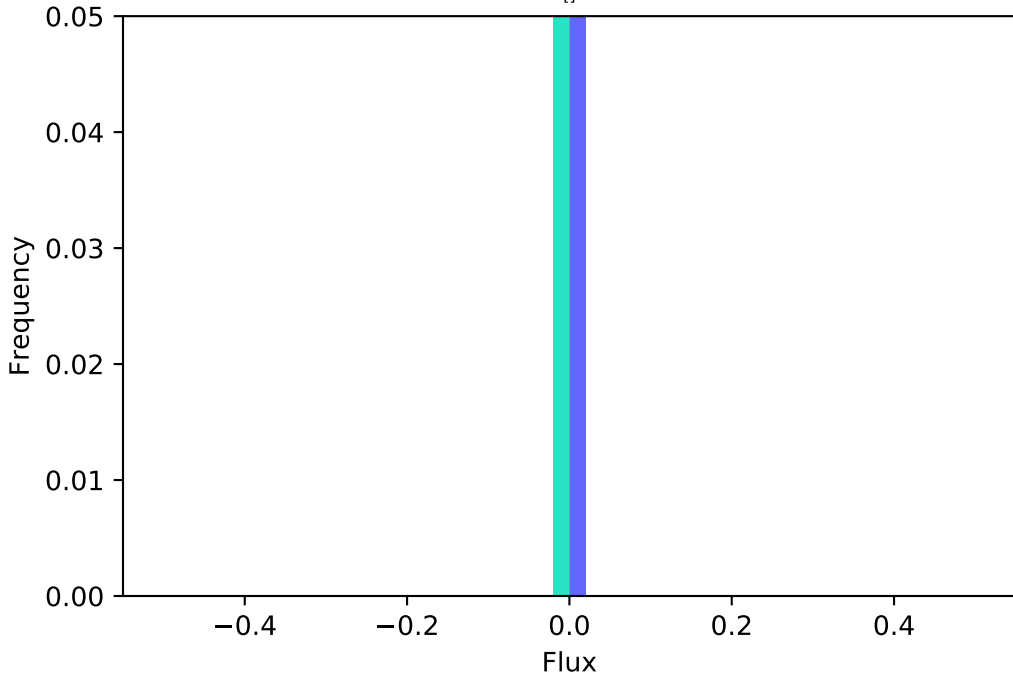
185 : Glu_c + H_c --> CO2_c + GABA_c
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186 : GABA_m + Pyr_m <=> Ala_m + SCA_DASH_SeA_m
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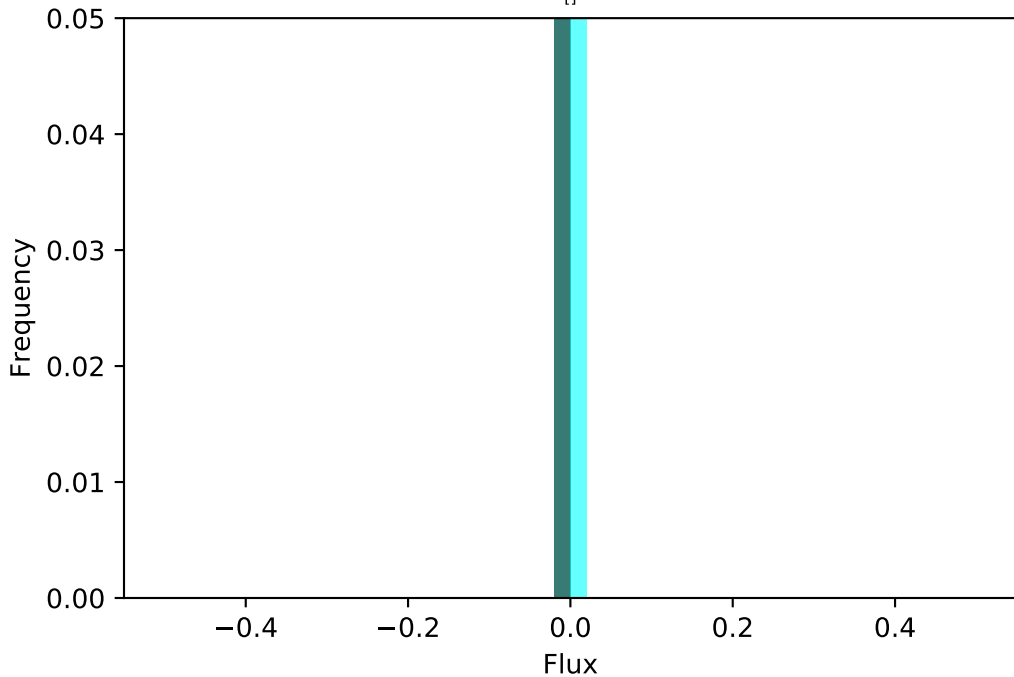
187 : GABA_m + KG_m --> Glu_m + SCA_DASH_SeA_m
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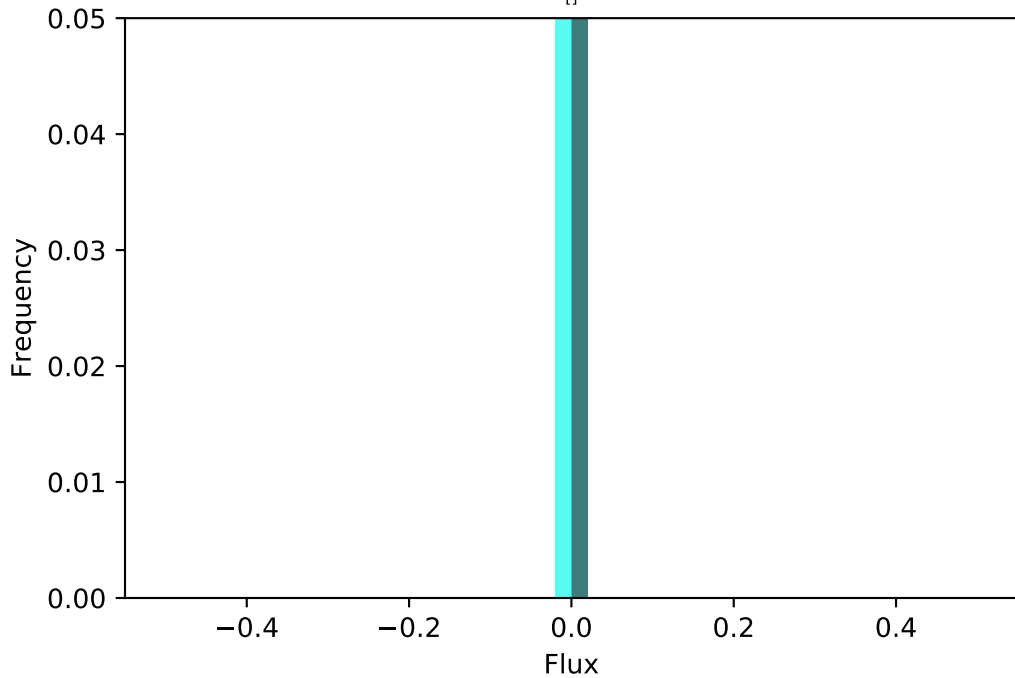
188 : H2O_m + NAD_m + SCA_DASH_SeA_m --> 2.0 H_m + NADH_m + SCA_m
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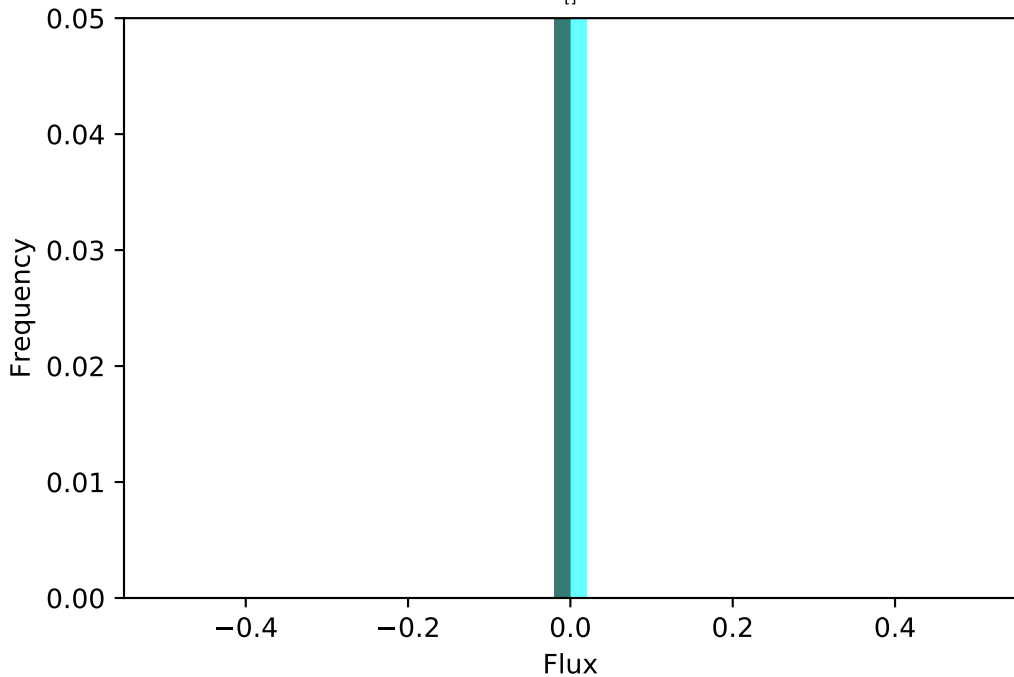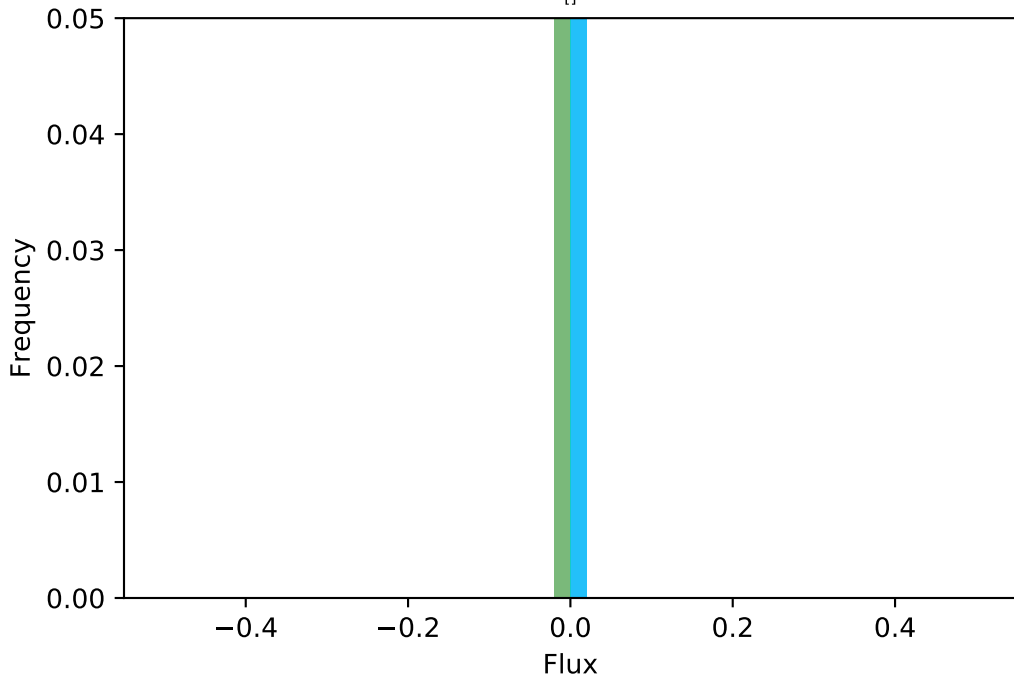
189 : ATP_c + Glu_c + NH4_c --> ADP_c + Gln_c + H_c + Pi_c
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190 : ATP_h + Glu_h + NH4_h --> ADP_h + Gln_h + H_h + Pi_h
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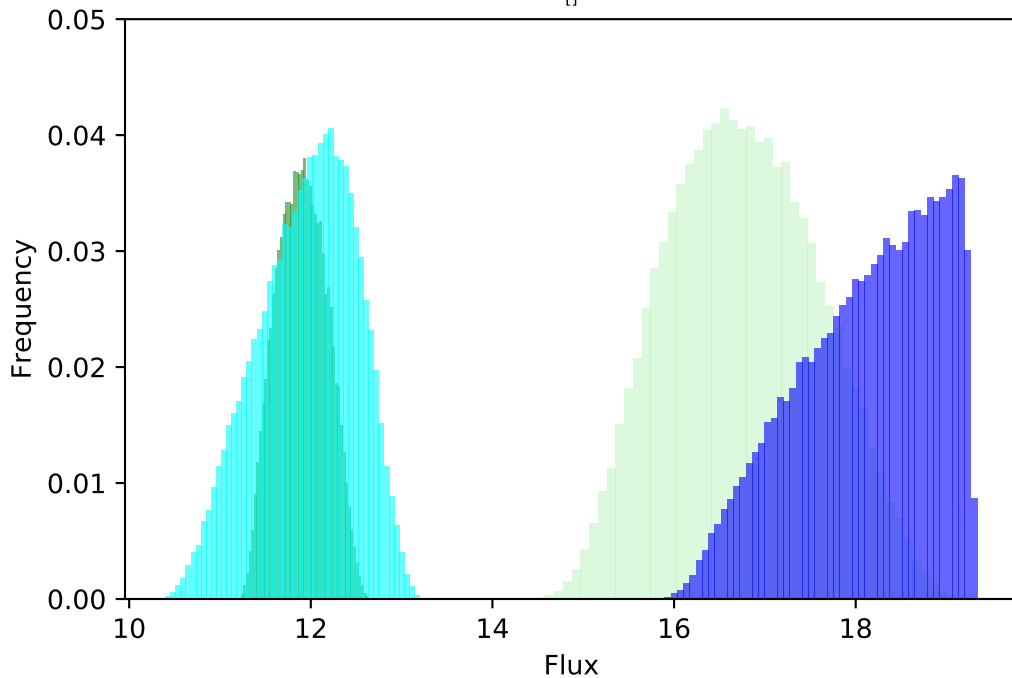
191 : ATP_m + Glu_m + NH4_m --> ADP_m + Gln_m + H_m + Pi_m
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192 : Thr_c --> ACD_c + Gly_c
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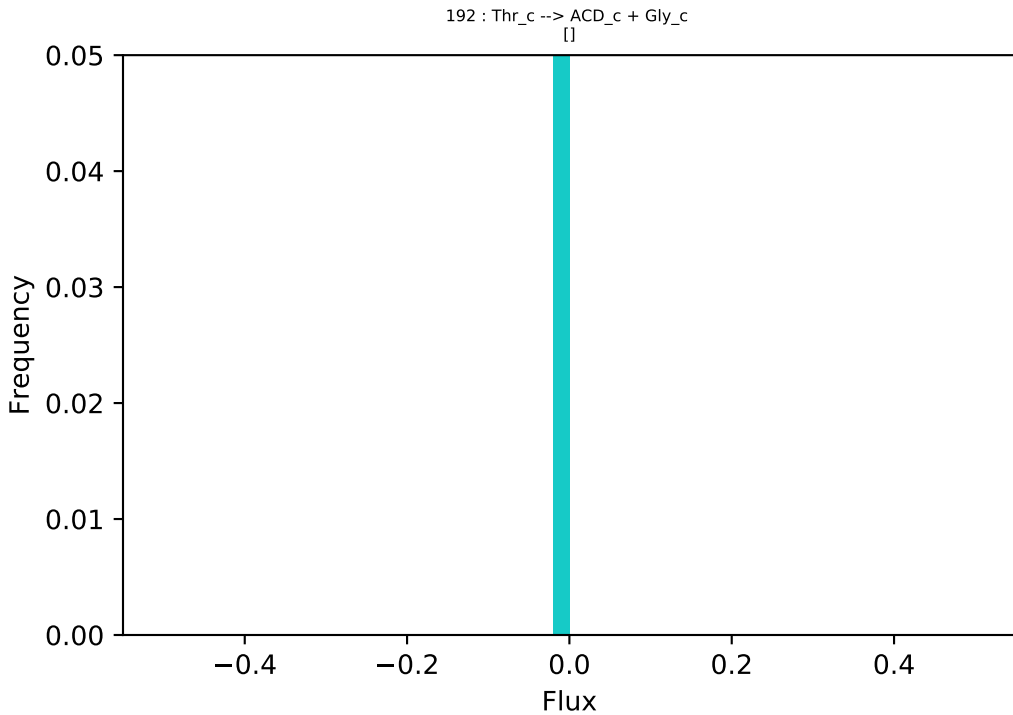
193 : ACD_c + H2O_c + NAD_c --> AC_c + H_c + NADH_c
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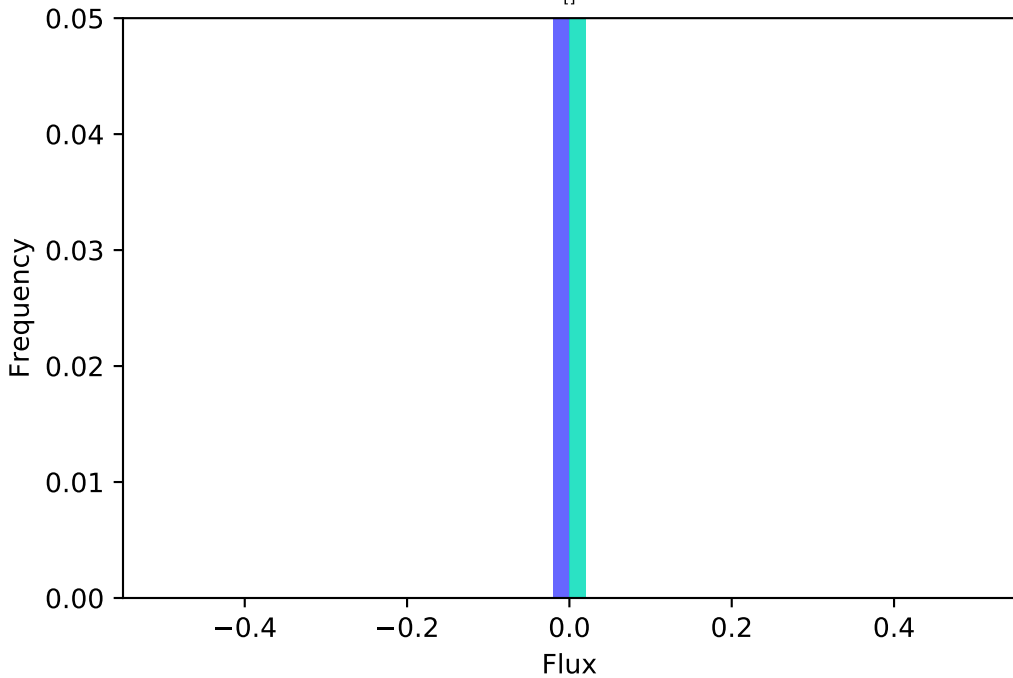
194 : GCA_h + O2_h --> GLX_h + H2O2_h
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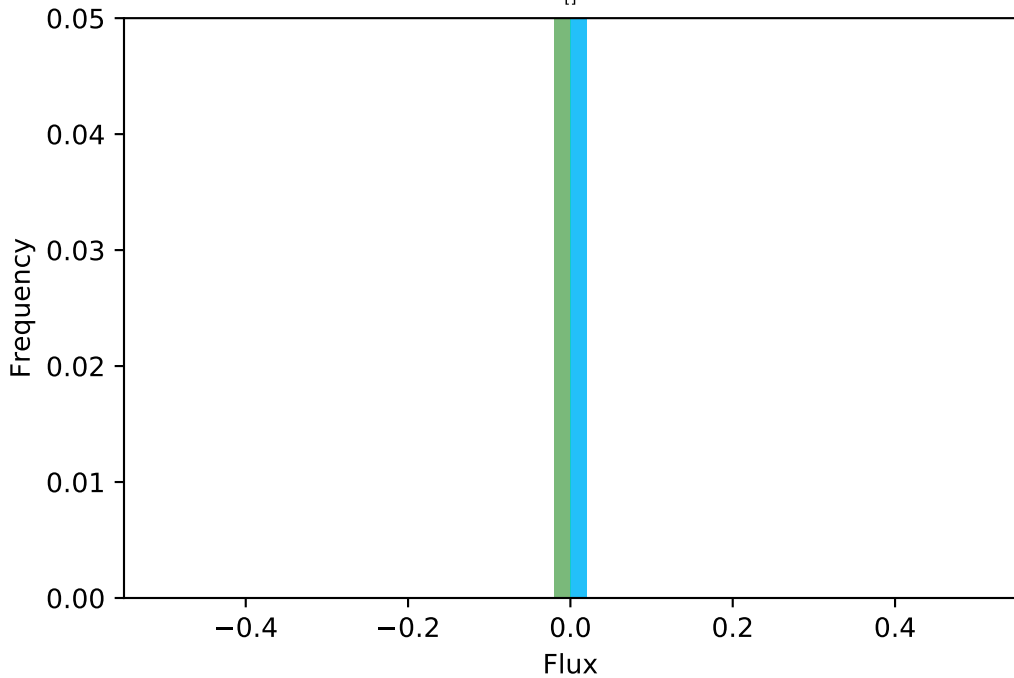
195 : 2.0 H2O2_h --> 2.0 H2O_h + O2_h
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196 : GLX_h + Ser_h --> Gly_h + HPR_h
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197 : HPR_h + H_h + NADH_h --> GCEA_h + NAD_h
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198 : GLX_h + Glu_h --> Gly_h + KG_h
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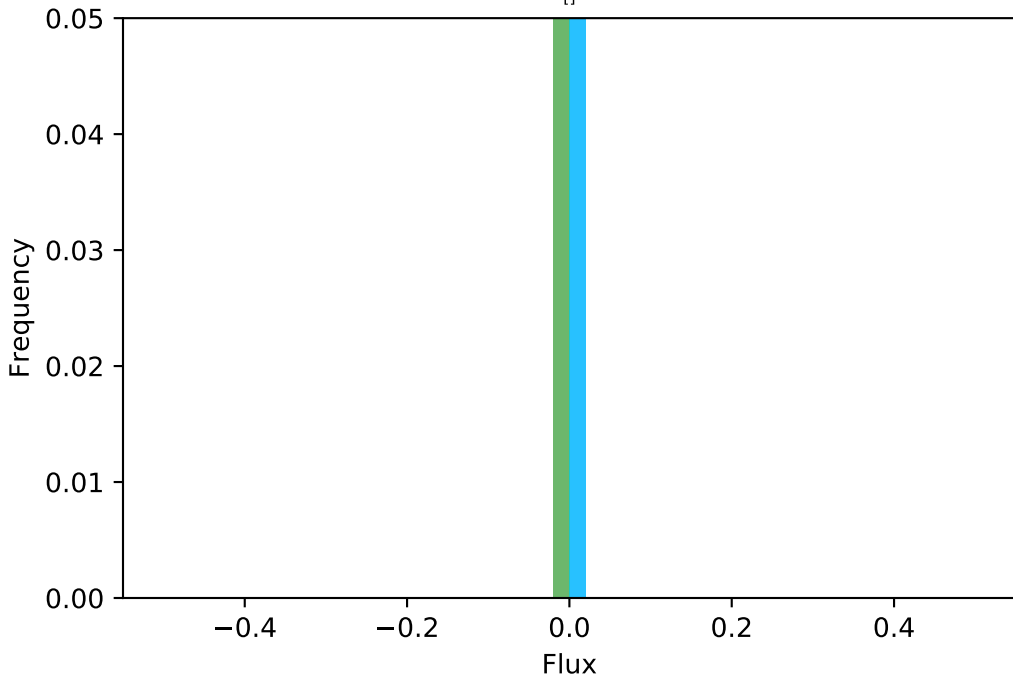
199 : ATP_h + PRPP_h --> H_h + PPi_h + PR_DASH_ATP_h
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200 : H2O_h + PR_DASH_ATP_h --> 2.0 H_h + PPi_h + PR_DASH_AMP_h
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201 : H2O_h + PR_DASH_AMP_h --> P_DASH_AICAR_DASH_P_h
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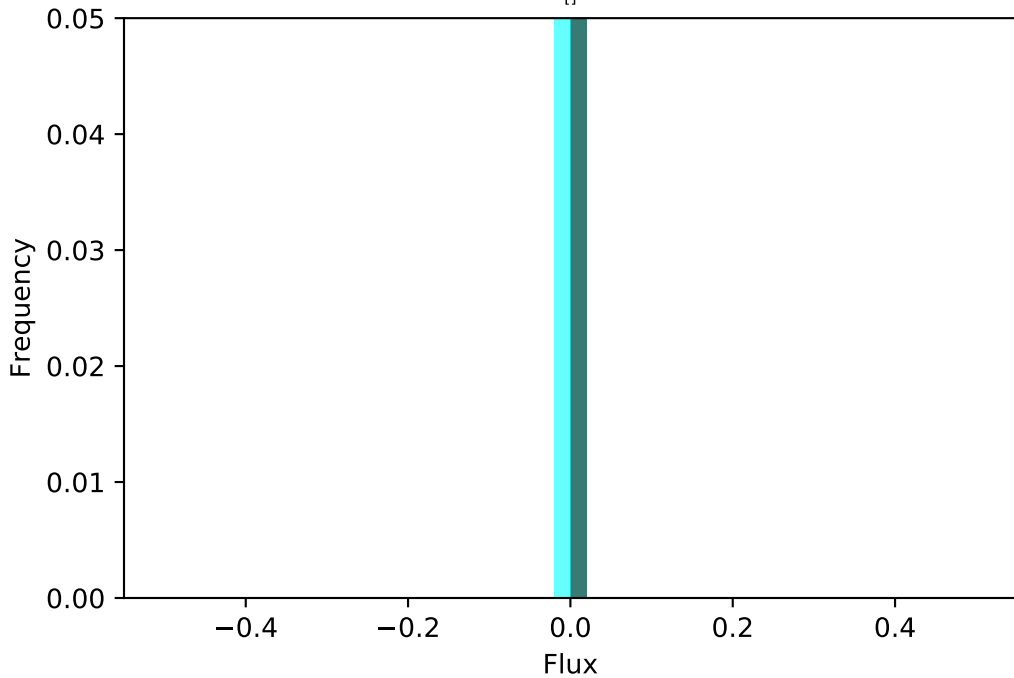
202 : P_DASH_AICAR_DASH_P_h --> Pu_DASH_AICAR_DASH_P_h
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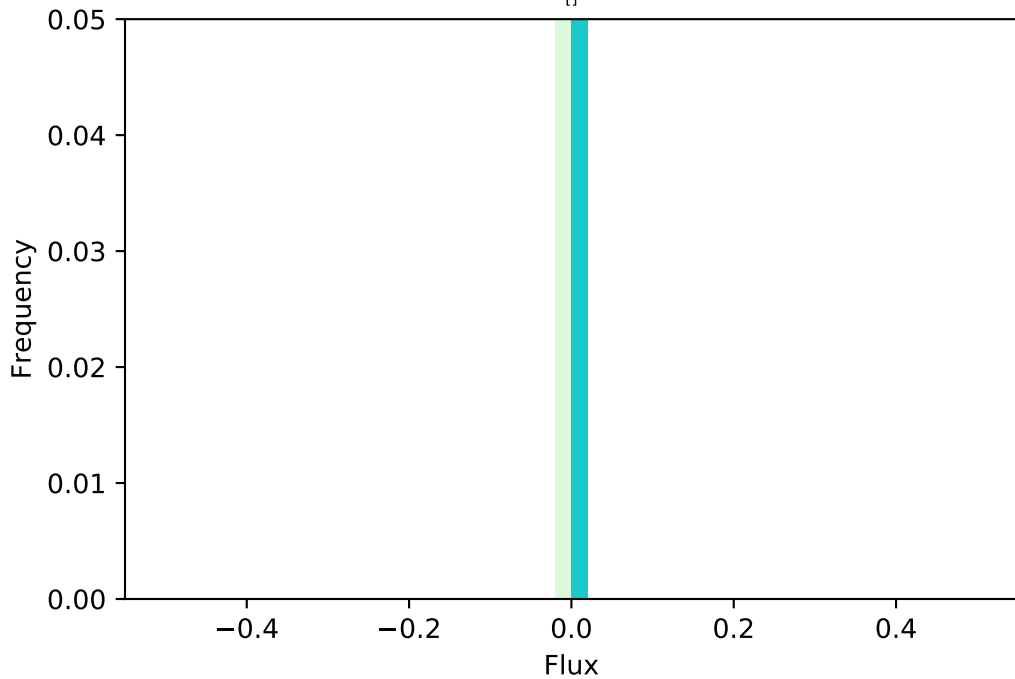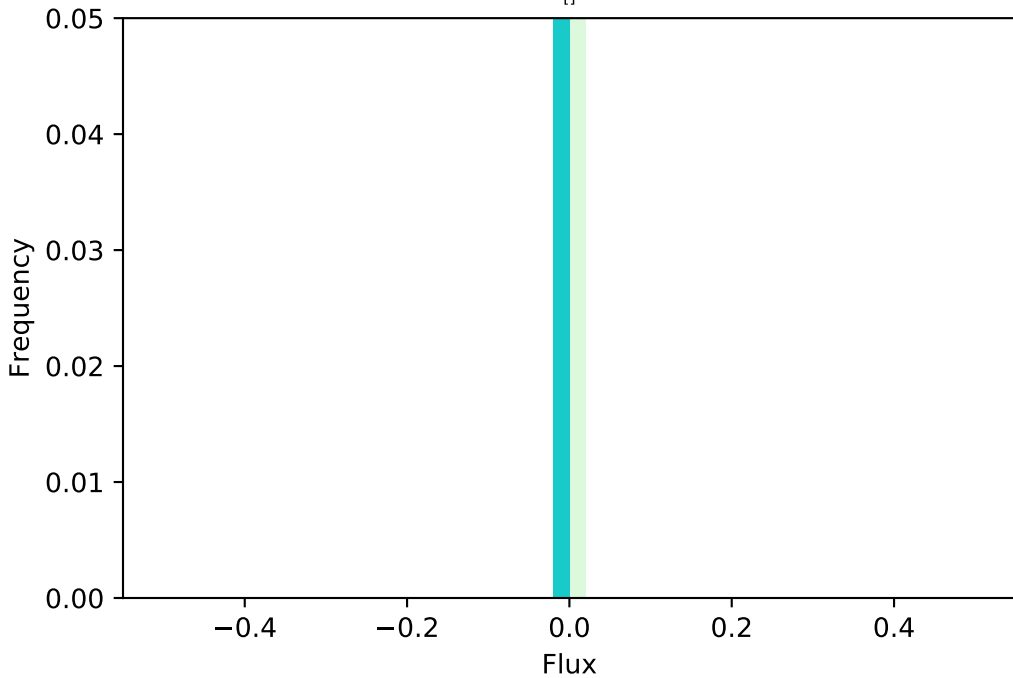
203 : Gln_h + Pu_DASH_AICAR_DASH_P_h --> AICAR_h + EIGP_h + Glu_h
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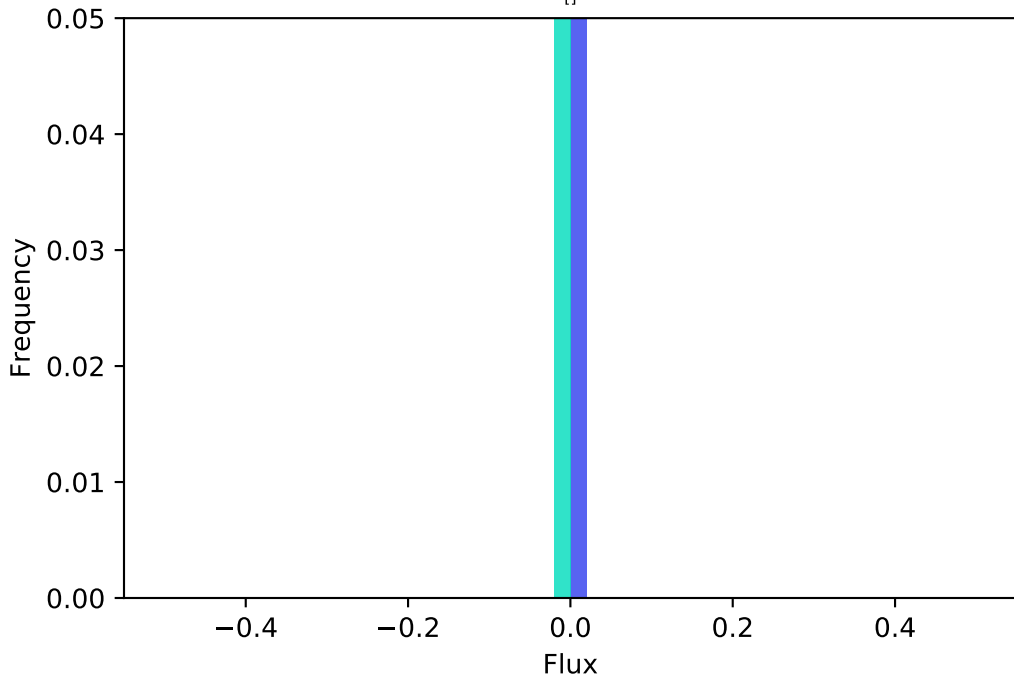
204 : EIGP_h --> H2O_h + IA_DASH_P_h
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205 : Glu_h + IA_DASH_P_h --> Hisol_DASH_P_h + KG_h
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206 : H2O_h + Hisol_DASH_P_h --> Hisol_h + Pi_h
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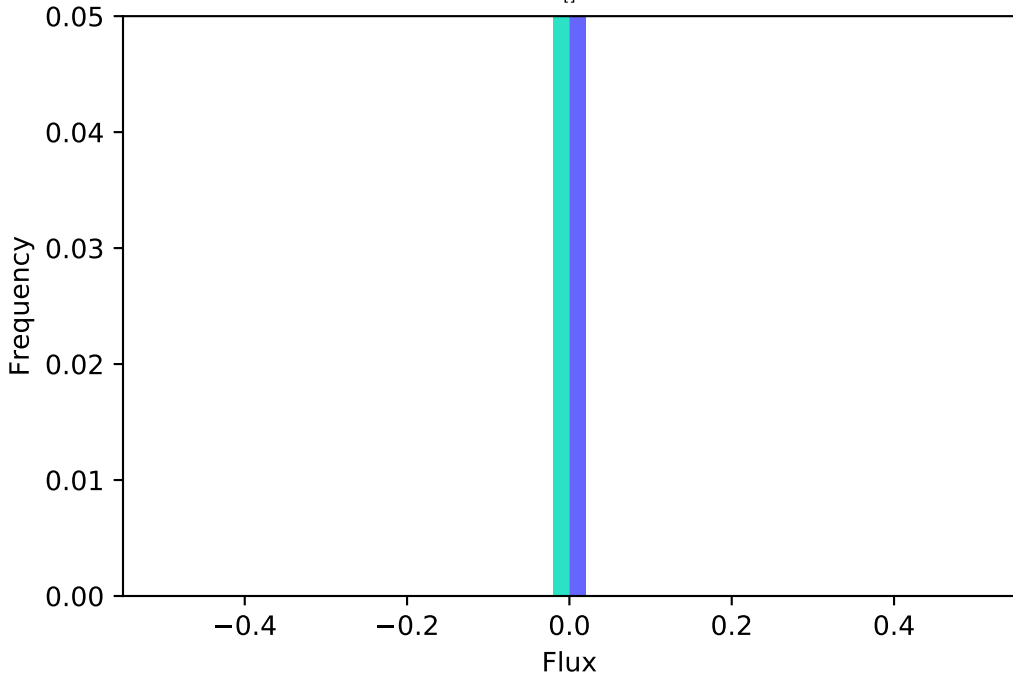
207 : Hisol_h + NAD_h --> 2.0 H_h + Hisal_h + NADH_h
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208 : H2O_h + Hisal_h + NAD_h --> H_h + His_h + NADH_h
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209 : Thr_h --> NH4_h + OB_h
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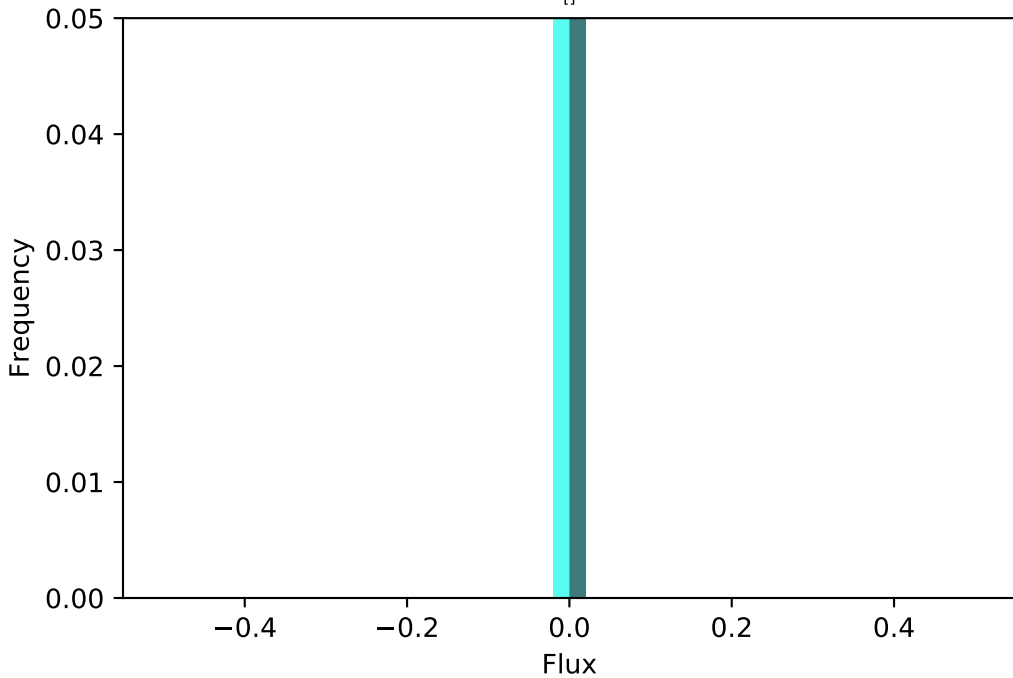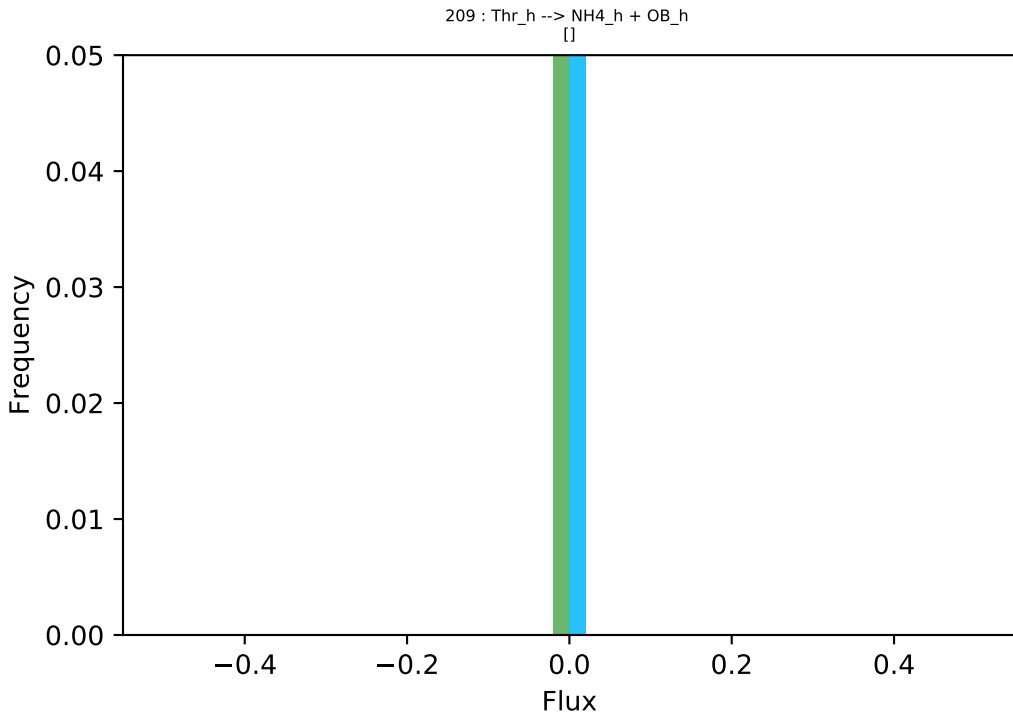
210 : H_h + Pyr_h + ThPP_h --> CO2_h + H_DASH_Eth_DASH_ThPP_h
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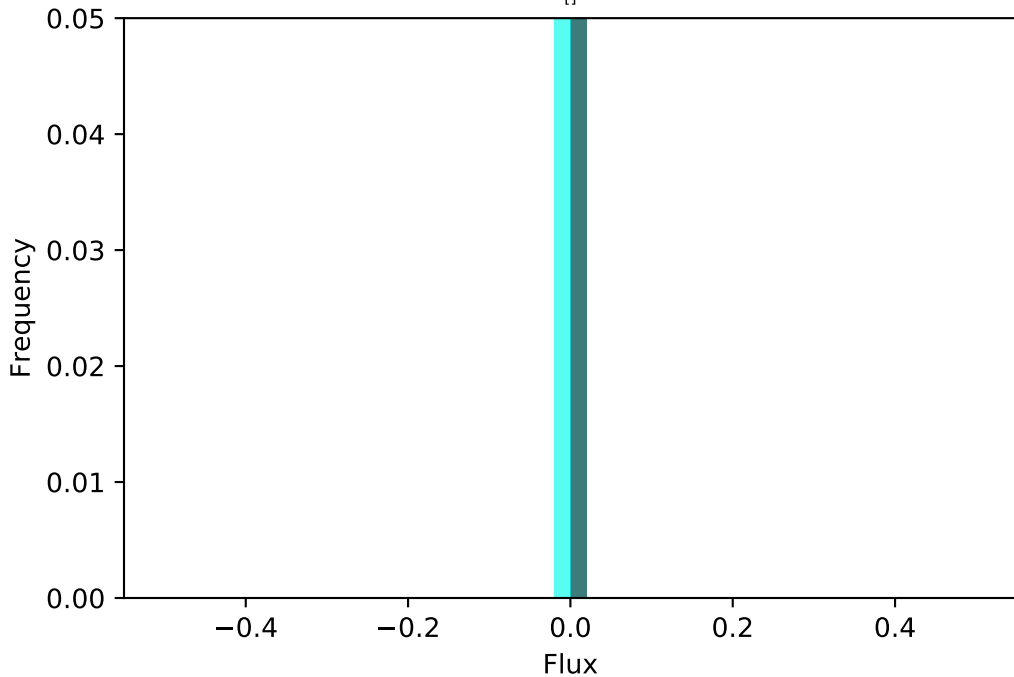
211 : H_DASH_Eth_DASH_ThPP_h + OB_h --> AHB_h + ThPP_h
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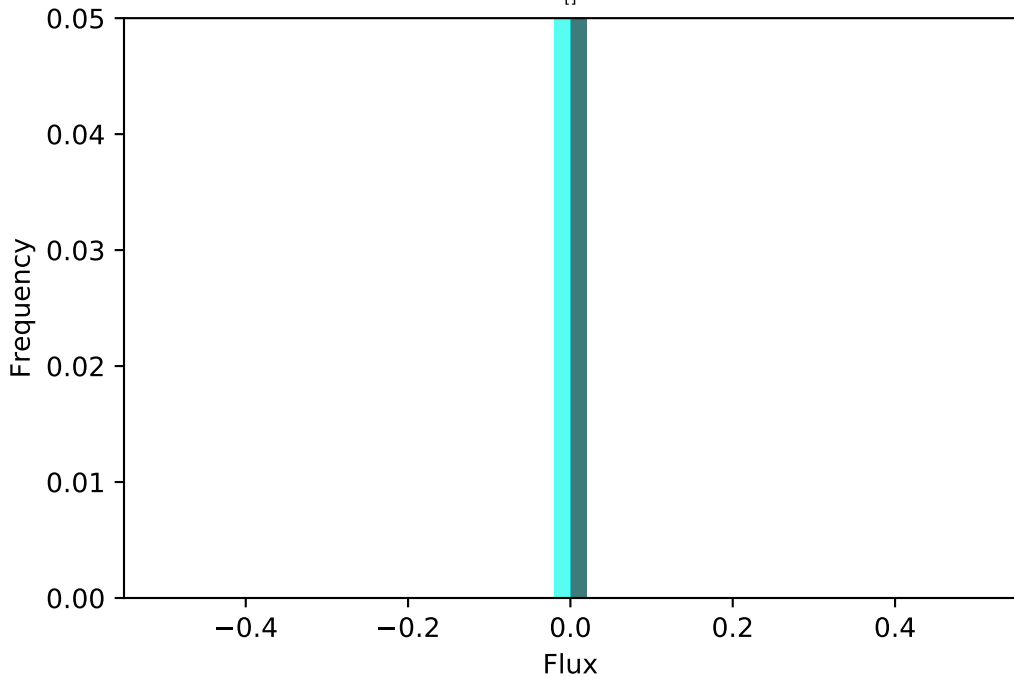
212 : AHB_h --> HMOP_h
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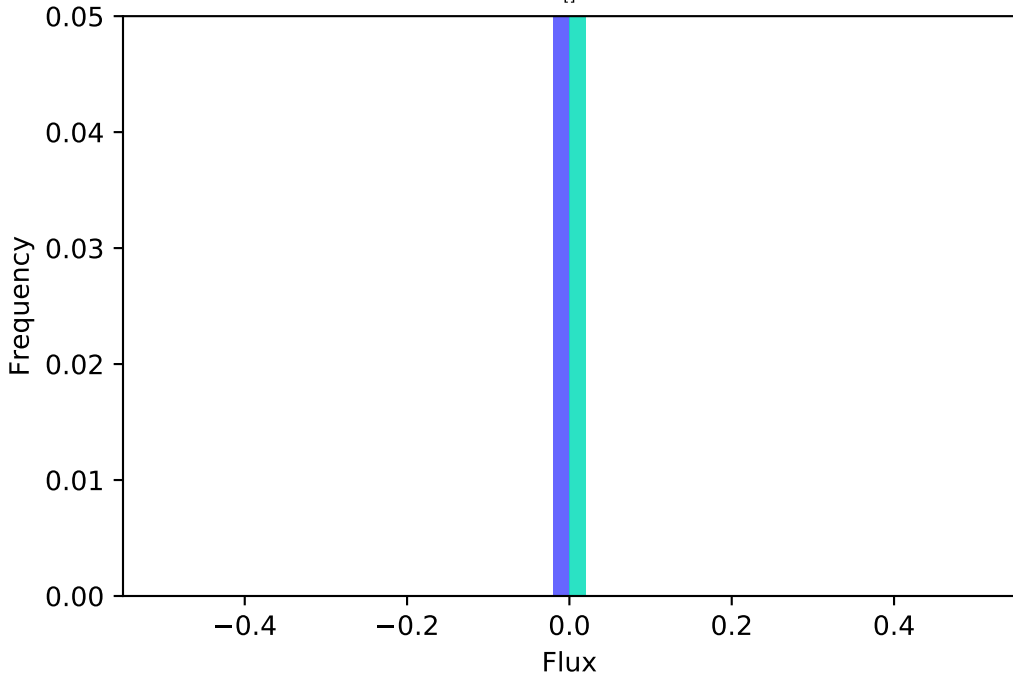
213 : HMOP_h + H_h + NADPH_h --> DHMP_h + NADP_h
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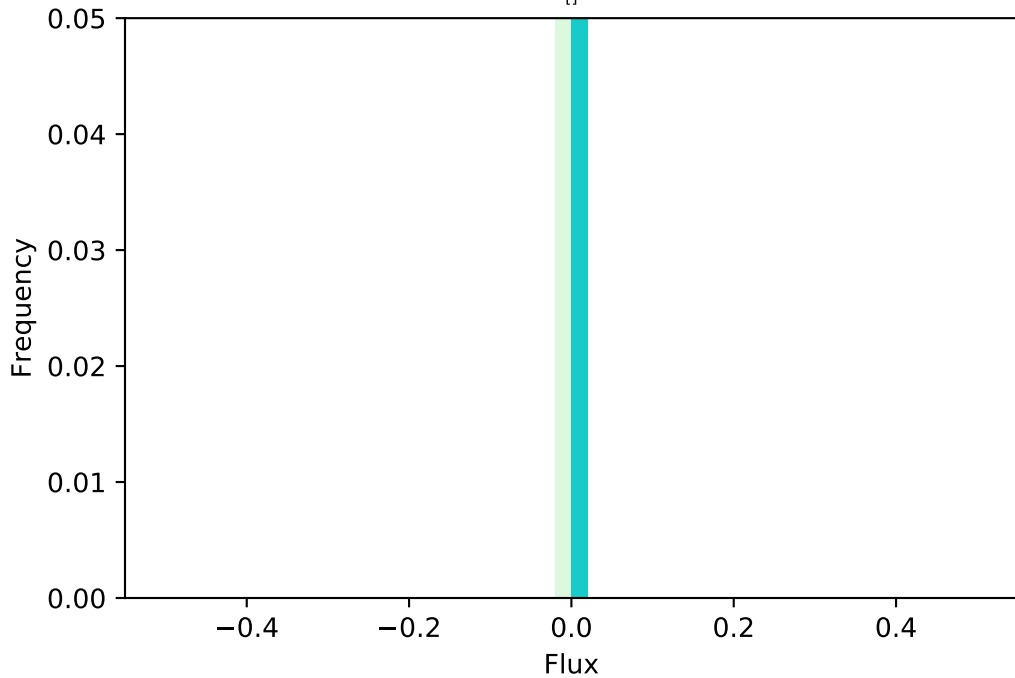
214 : DHMP_h --> H2O_h + MOP_h
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215 : Glu_h + MOP_h --> Ile_h + KG_h
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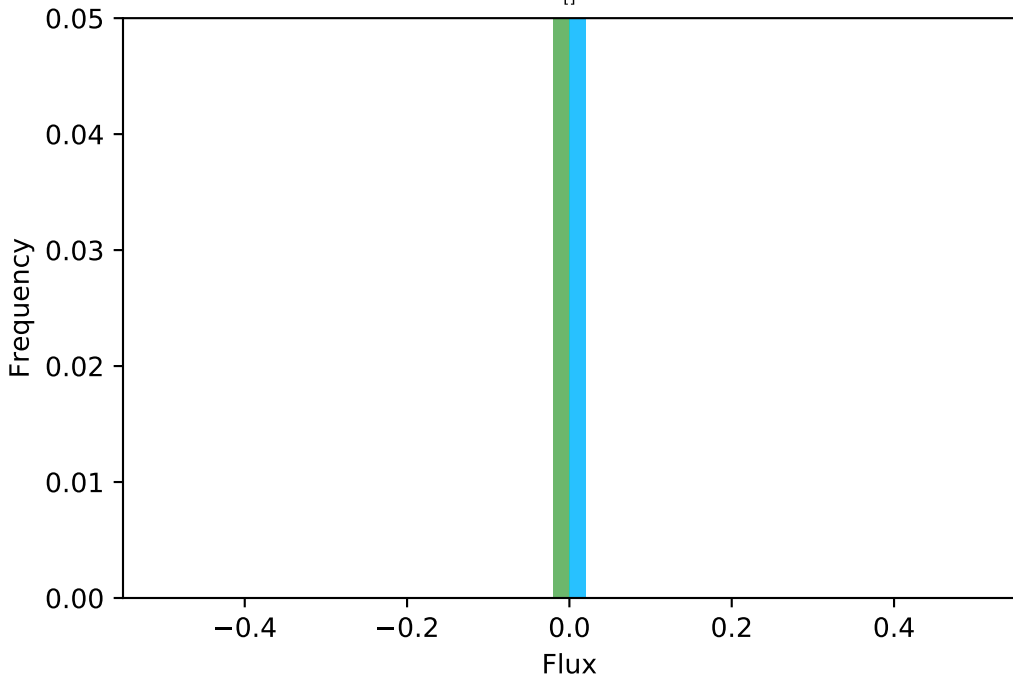
216 : H_DASH_Eth_DASH_ThPP_h + Pyr_h --> AL_h + ThPP_h
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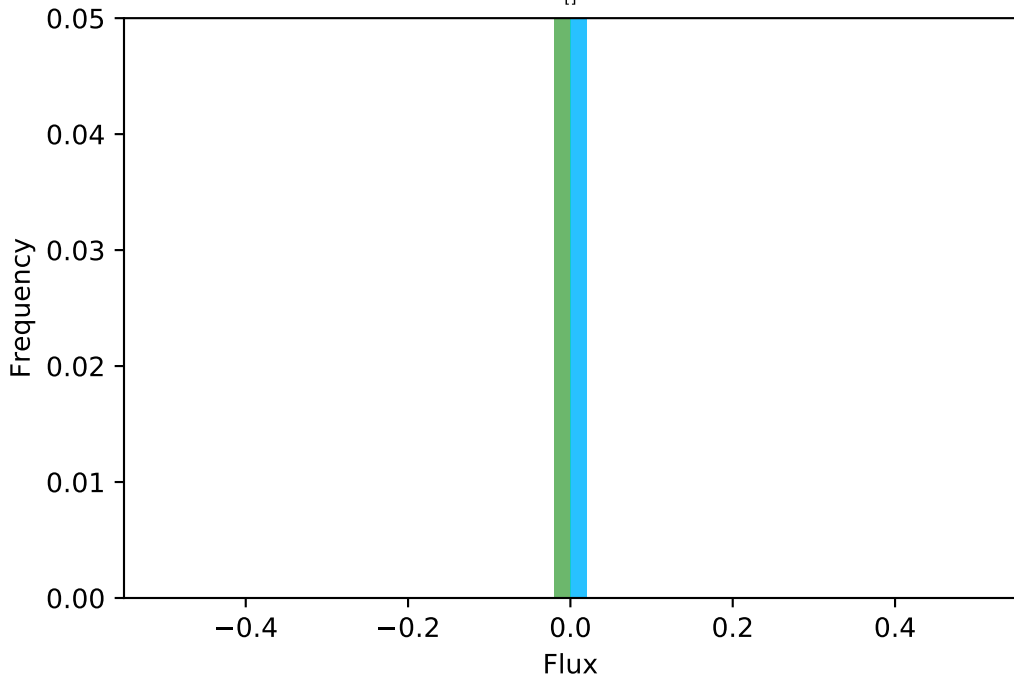
217 : AL_h --> HMOB_h
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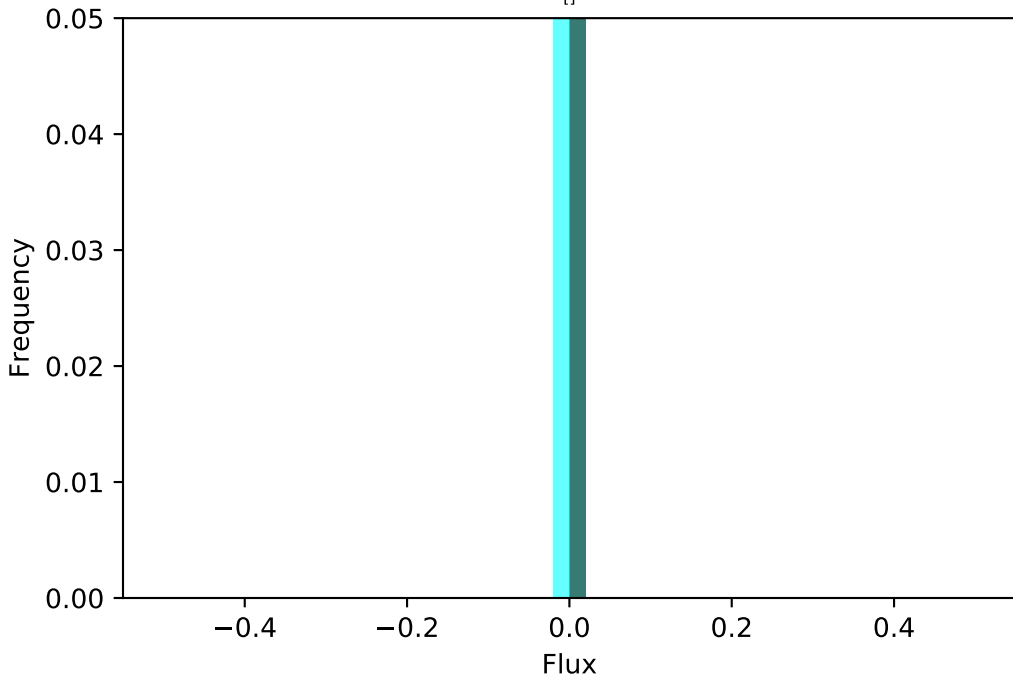
218 : HMOB_h + H_h + NADPH_h --> DHMB_h + NADP_h
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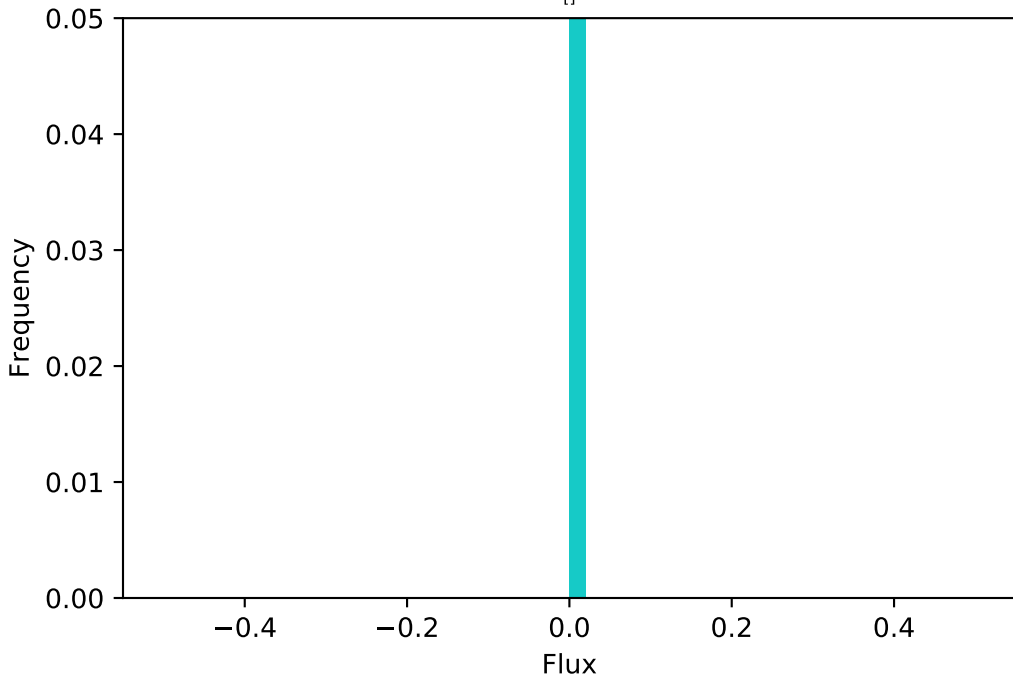
219 : DHMB_h --> H2O_h + MOB_h
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220 : A_DASH_CoA_h + H2O_h + MOB_h --> 2IPM_h + CoA_h + H_h
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221 : 2IPM_h --> H2O_h + IPM_h
[]

222 : H2O_h + IPM_h --> 3IPM_h
[]

223 : 3IPM_h + NAD_h --> H_h + IPO_h + NADH_h
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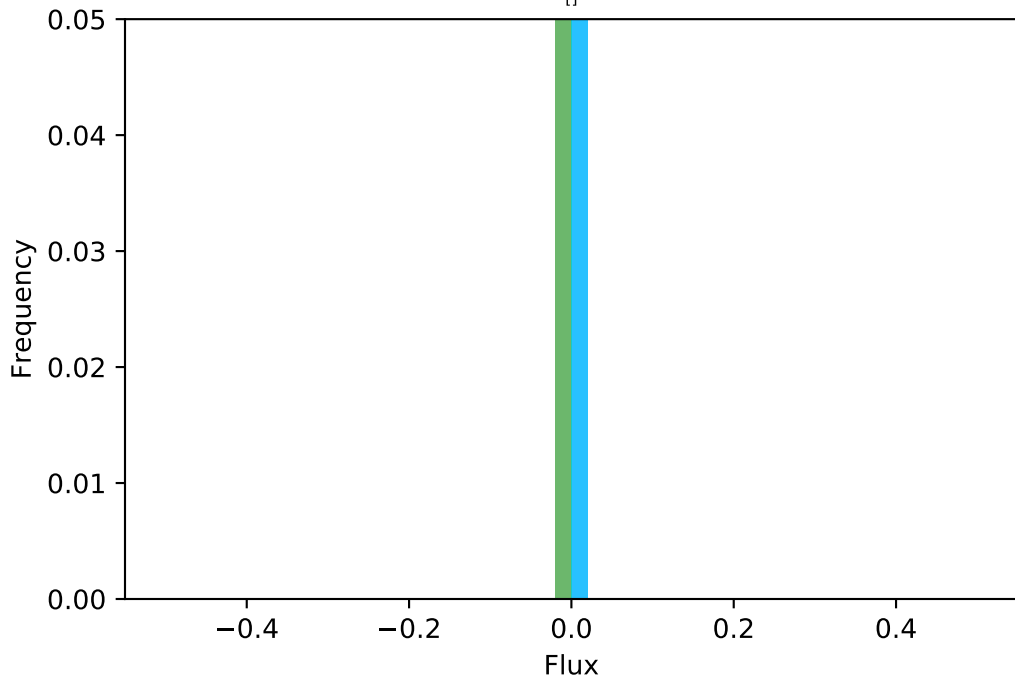
224 : H_h + IPO_h --> 4MOP_h + CO2_h
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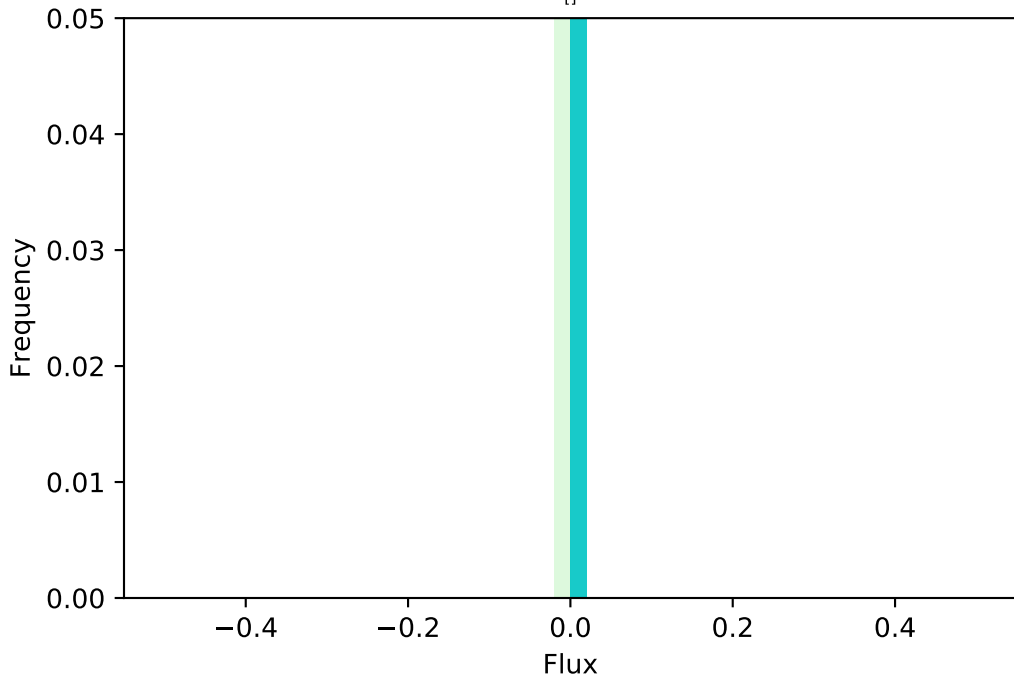
225 : 4MOP_h + Glu_h --> KG_h + Leu_h
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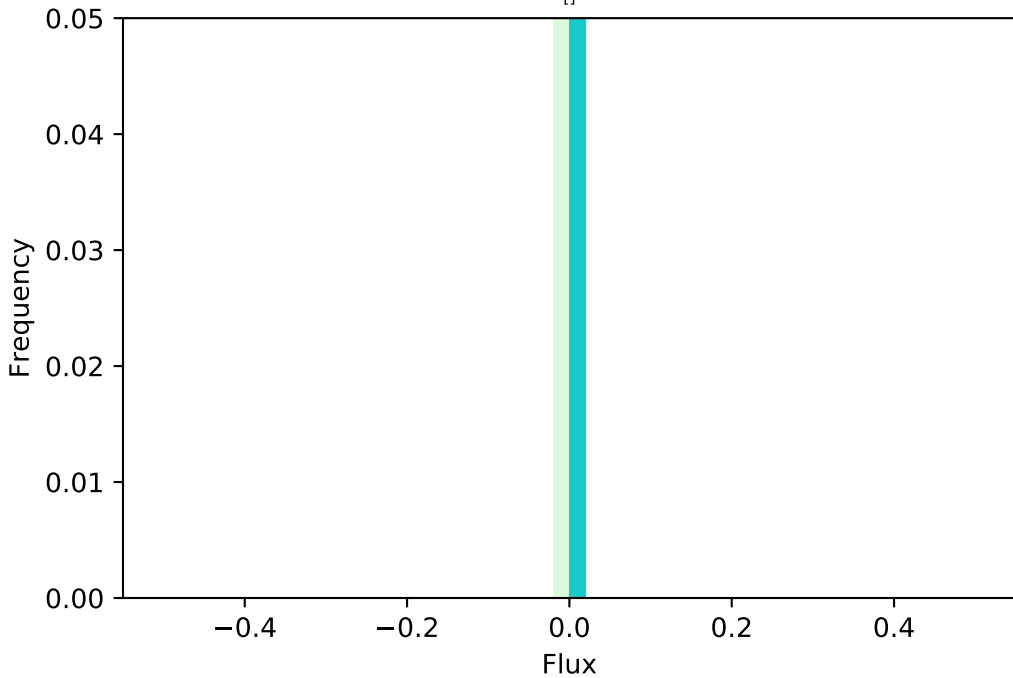
226 : ATP_h + Asp_h --> ADP_h + AspP_h
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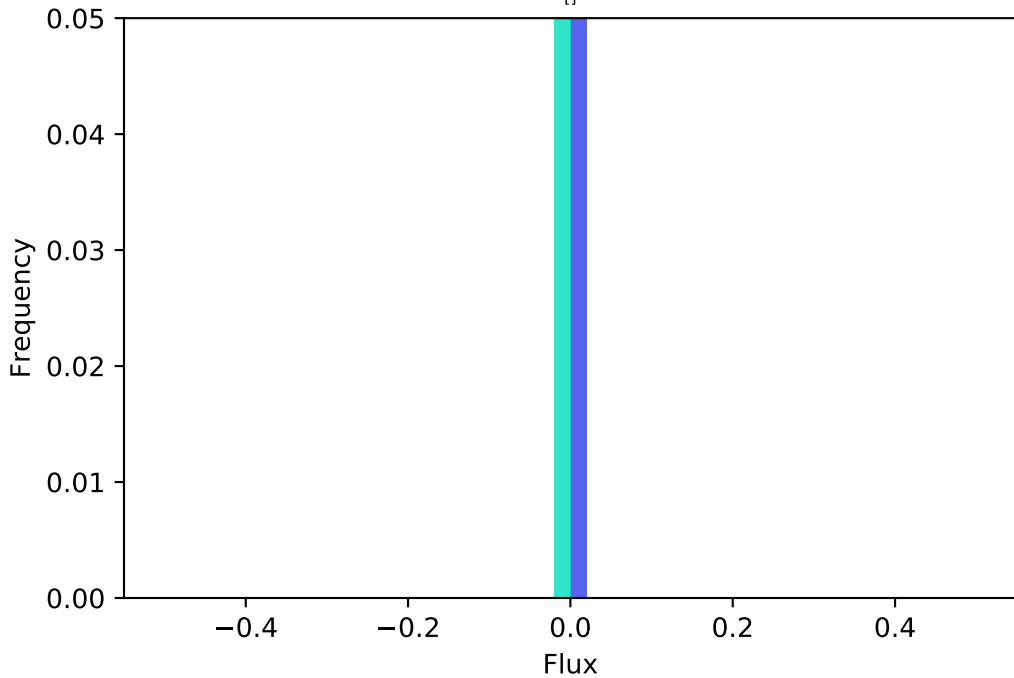
227 : AspP_h + H_h + NADPH_h --> Asp_DASH_SeA_h + NADP_h + Pi_h
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228 : Asp_DASH_SeA_h + Pyr_h --> DHD_h + 2.0 H2O_h + H_h
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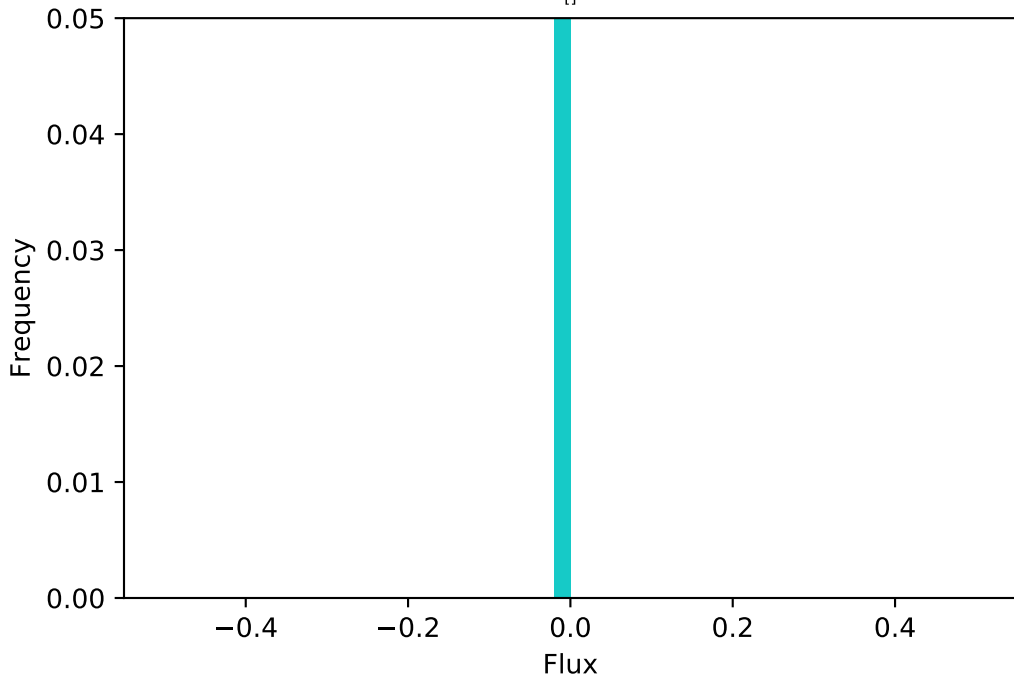
229 : DHD_h + H_h + NADH_h --> NAD_h + THD_h
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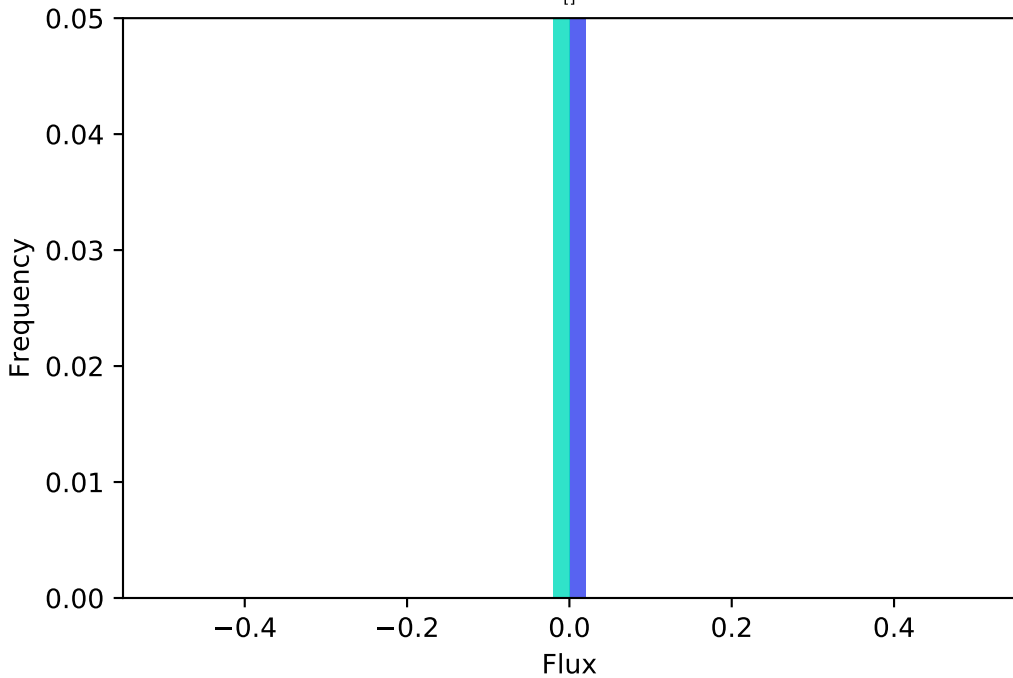
230 : DHD_h + H_h + NADPH_h --> NADP_h + THD_h
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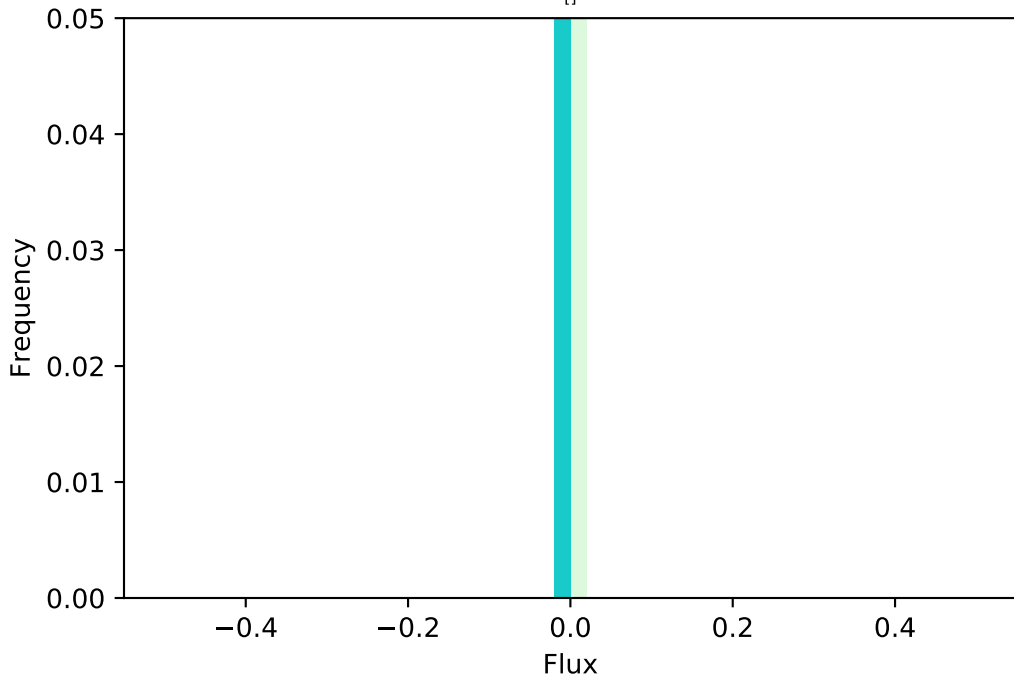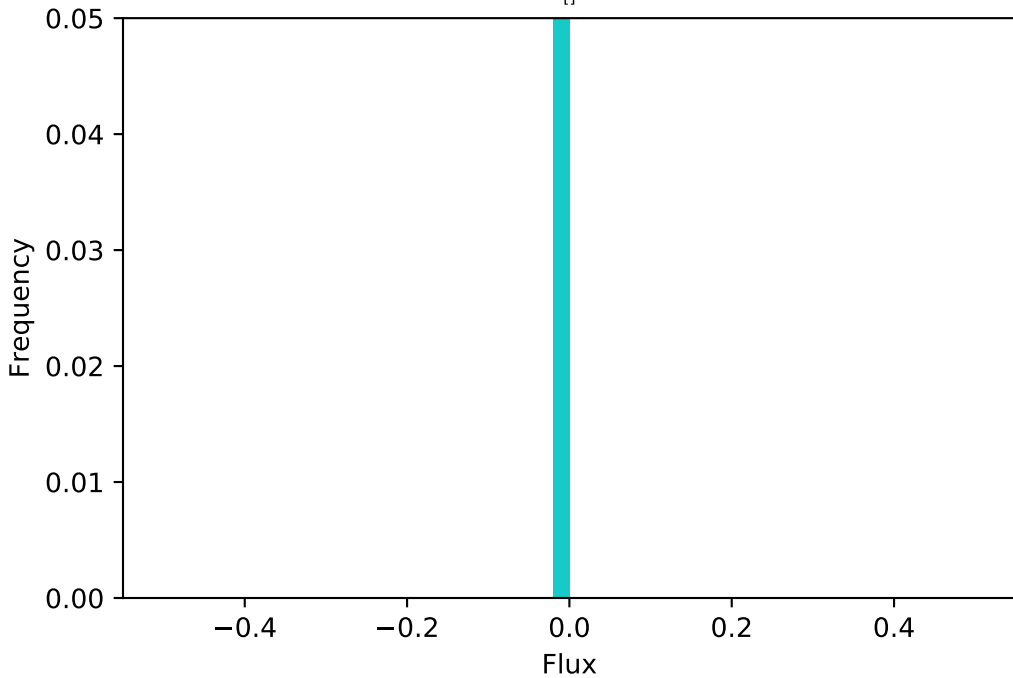
231 : Glu_h + H2O_h + H_h + THD_h --> DAP_h + KG_h
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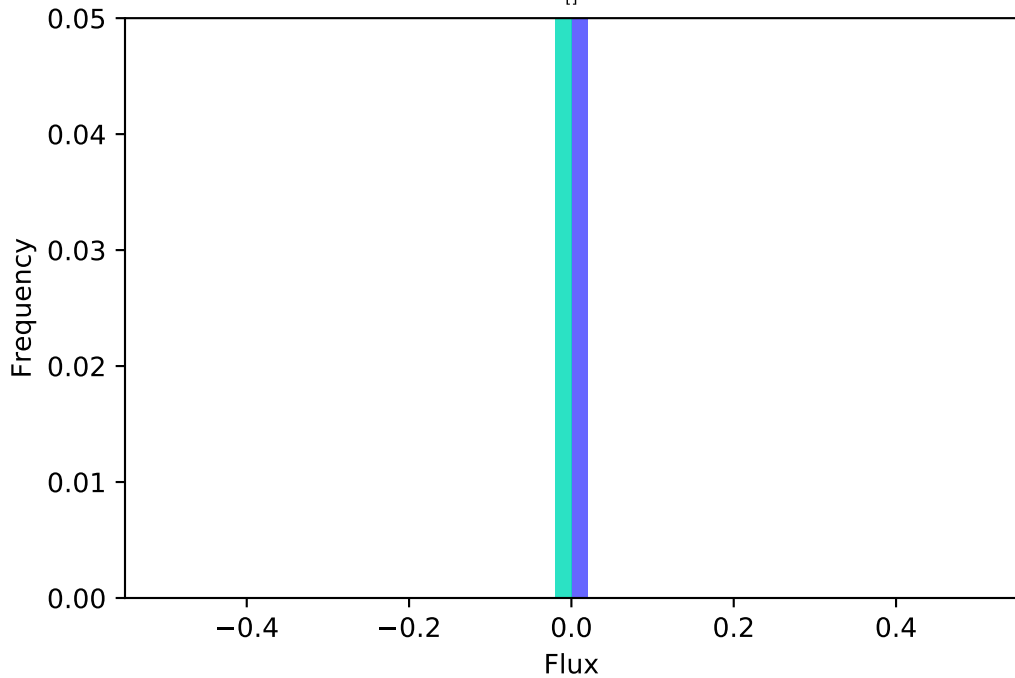
232 : DAP_h --> mDAP_h
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233 : H_h + mDAP_h --> CO2_h + Lys_h
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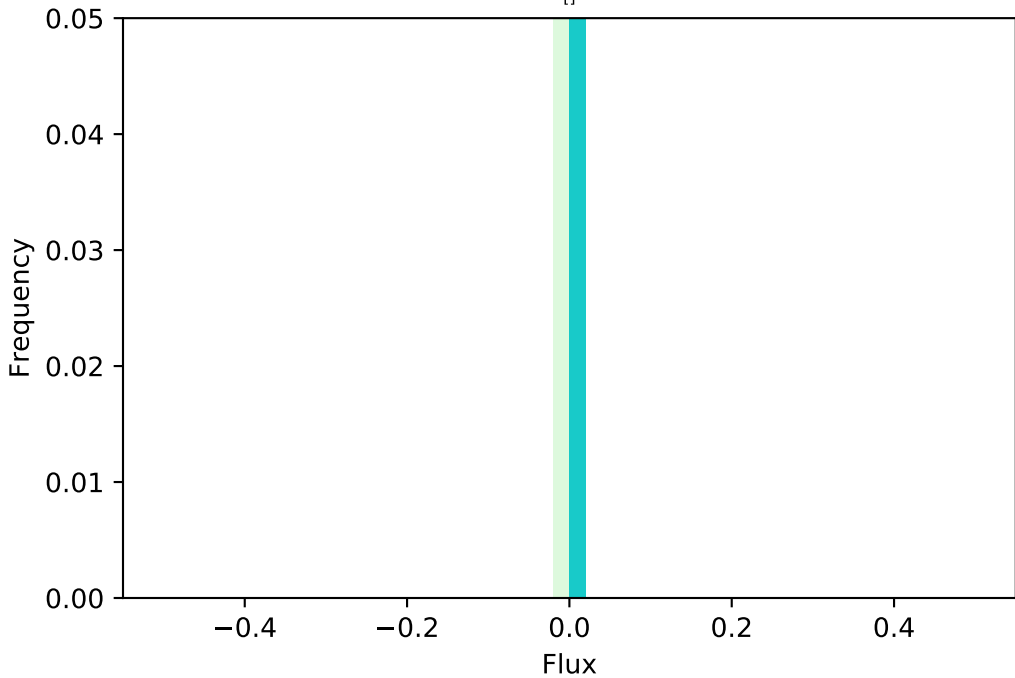
234 : Asp_DASH_SeA_h + H_h + NADPH_h --> H_DASH_Ser_h + NADP_h
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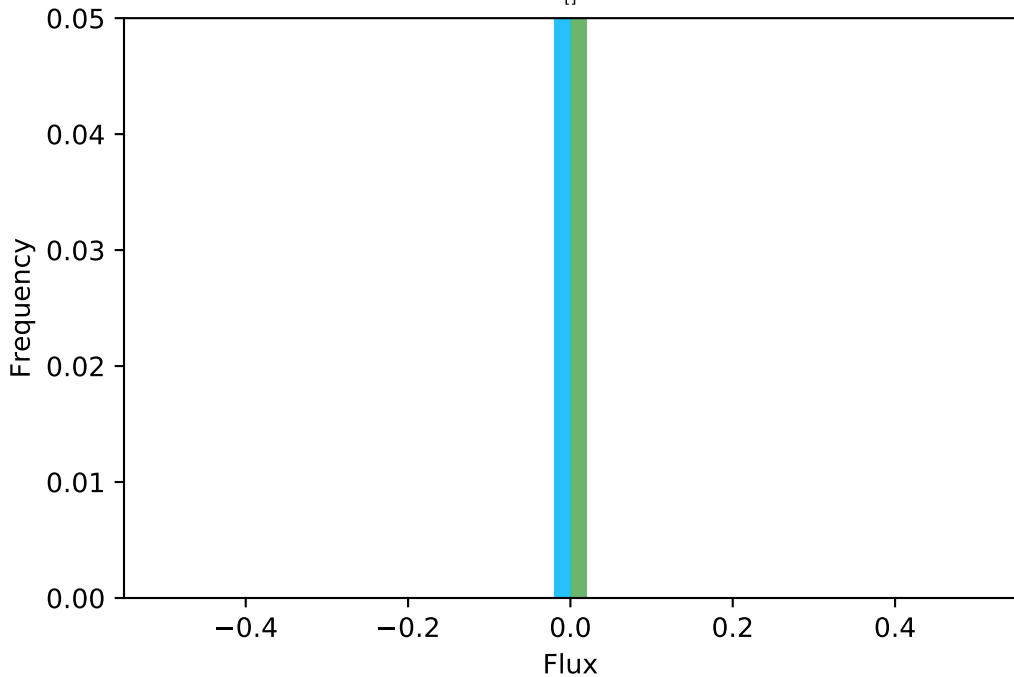
235 : Asp_DASH_SeA_h + H_h + NADH_h --> H_DASH_Ser_h + NAD_h
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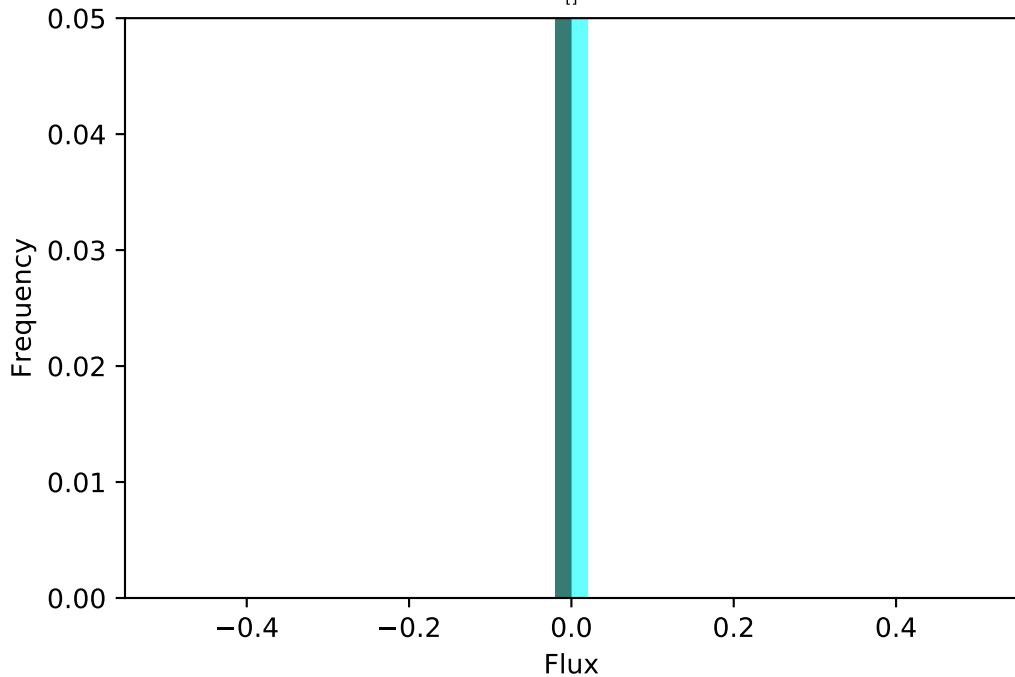
236 : ATP_h + H_DASH_Ser_h --> ADP_h + H_h + PH_DASH_Ser_h
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237 : Cys_h + PH_DASH_Ser_h --> CTH_h + Pi_h
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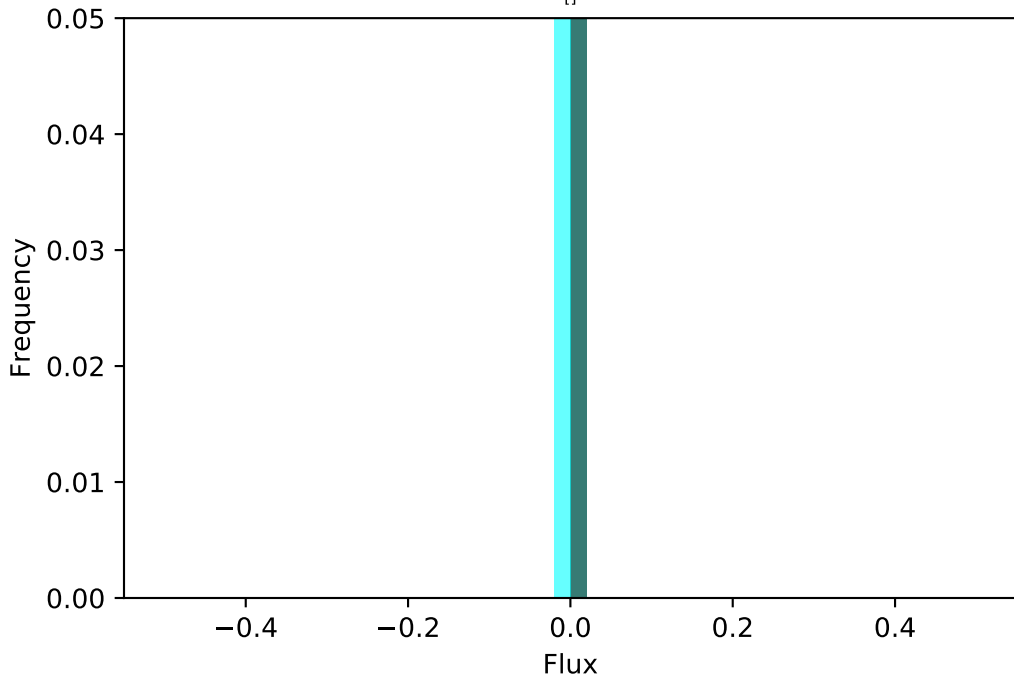
238 : CTH_h + H2O_h --> H_DASH_Cys_h + NH4_h + Pyr_h
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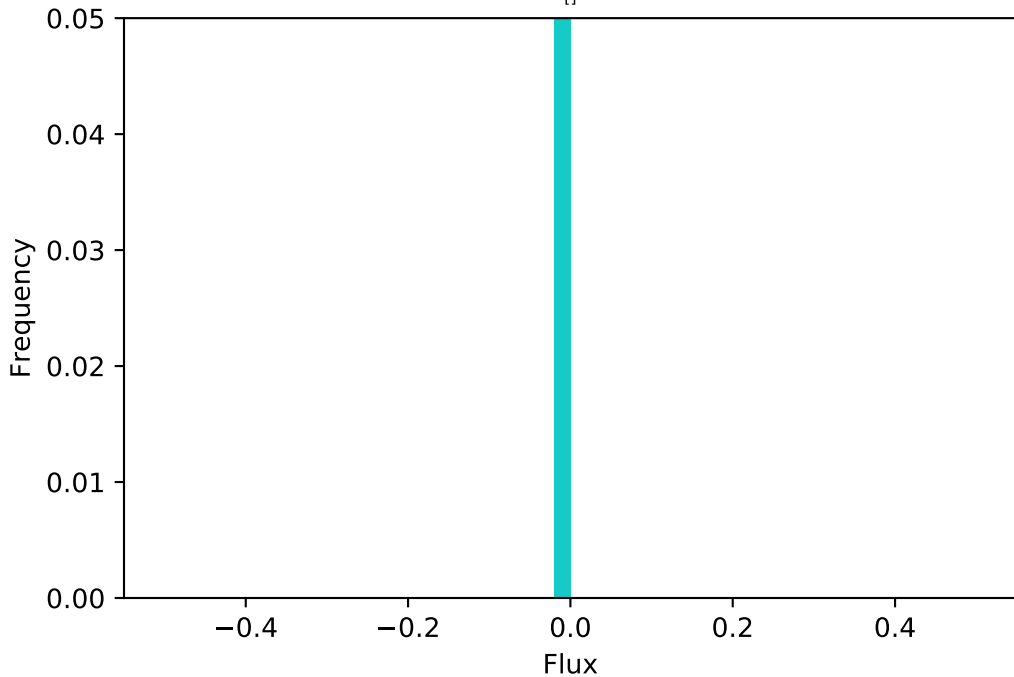
239 : M_DASH_THF_c + NADH_c --> 5M_DASH_THF_c + NAD_c
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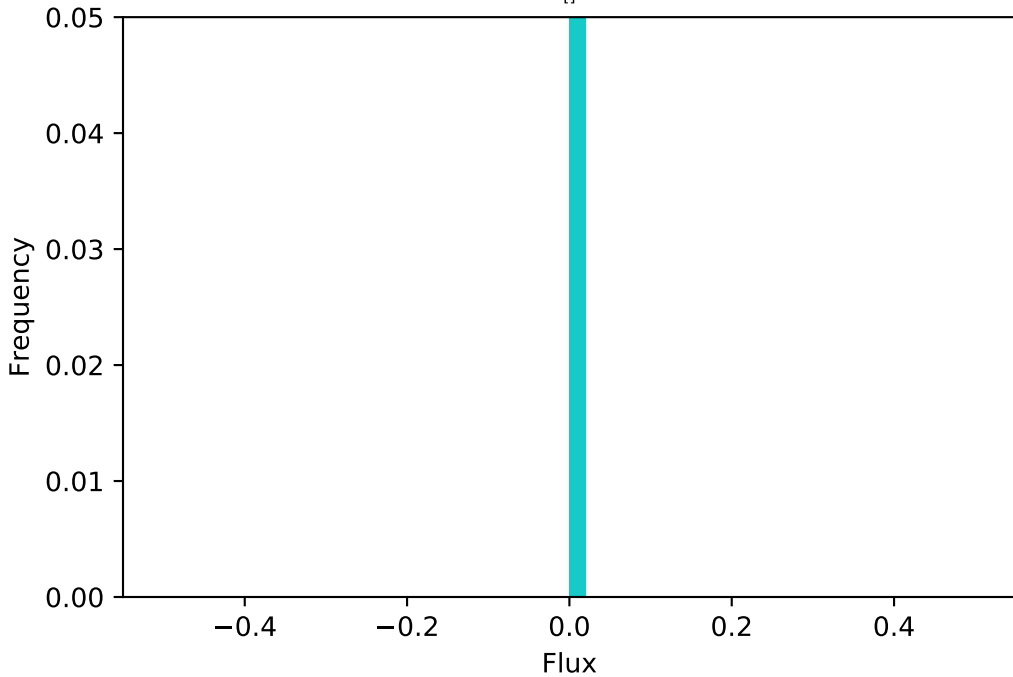
240 : 5M_DASH_THF_c + H_DASH_Cys_c --> Met_c + THF_c
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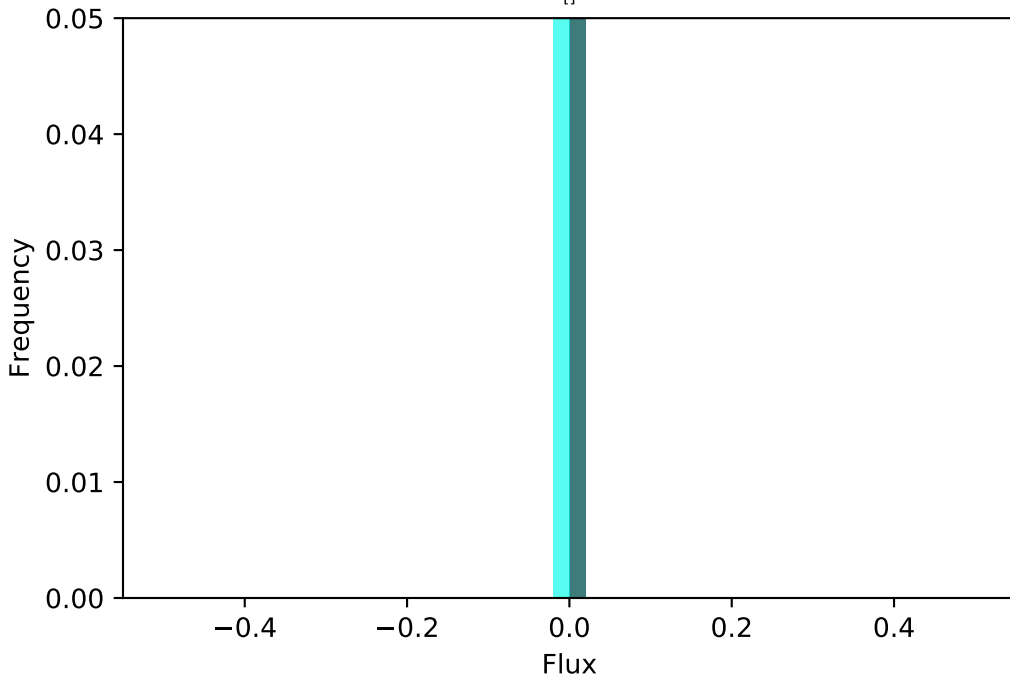
241 : Gly_c + H2O_c + M_DASH_THF_c <=> Ser_c + THF_c
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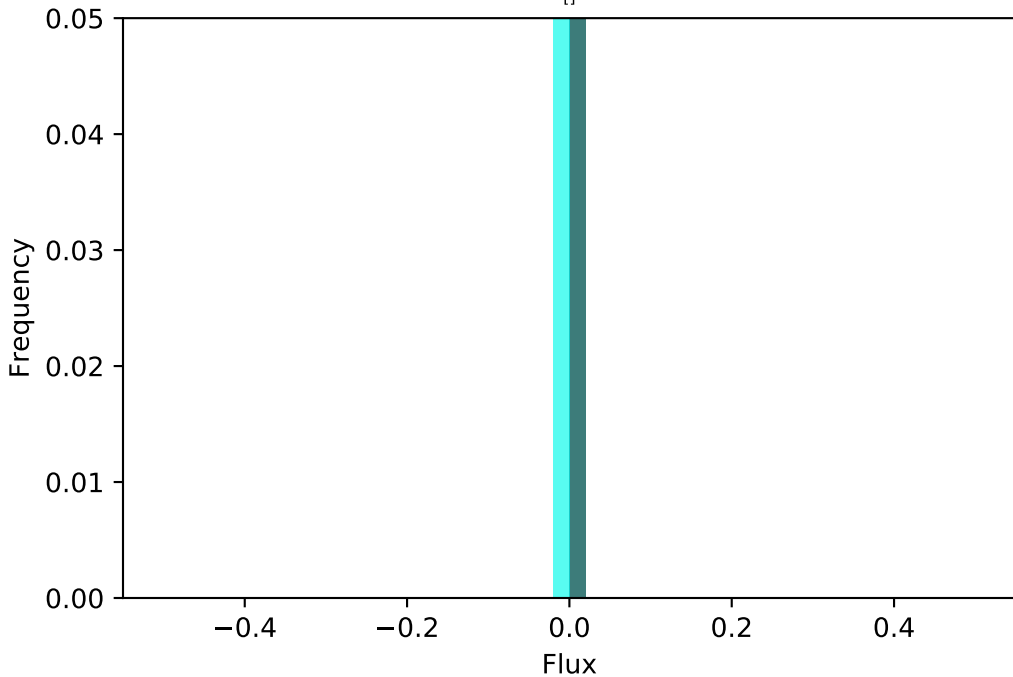
242 : ATP_c + H2O_c + Met_c --> H_c + PPi_c + Pi_c + aMet_c
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243 : H_DASH_Cys_c + aMet_c --> Met_c + aH_DASH_Cys_c
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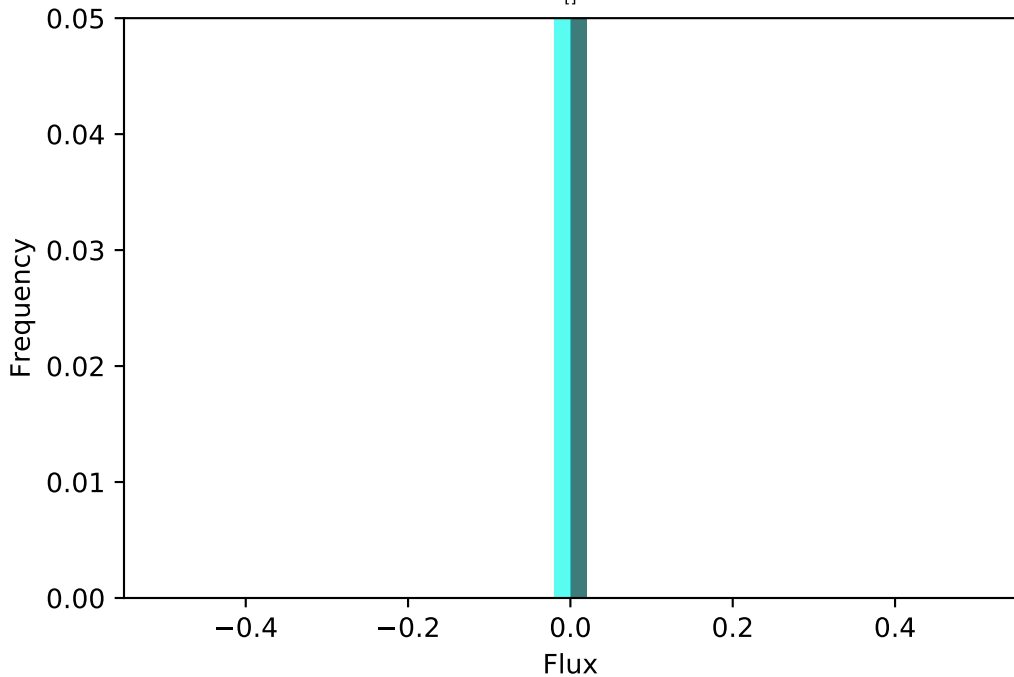
244 : H2O_c + aH_DASH_Cys_c <=> ADN_c + H_DASH_Cys_c
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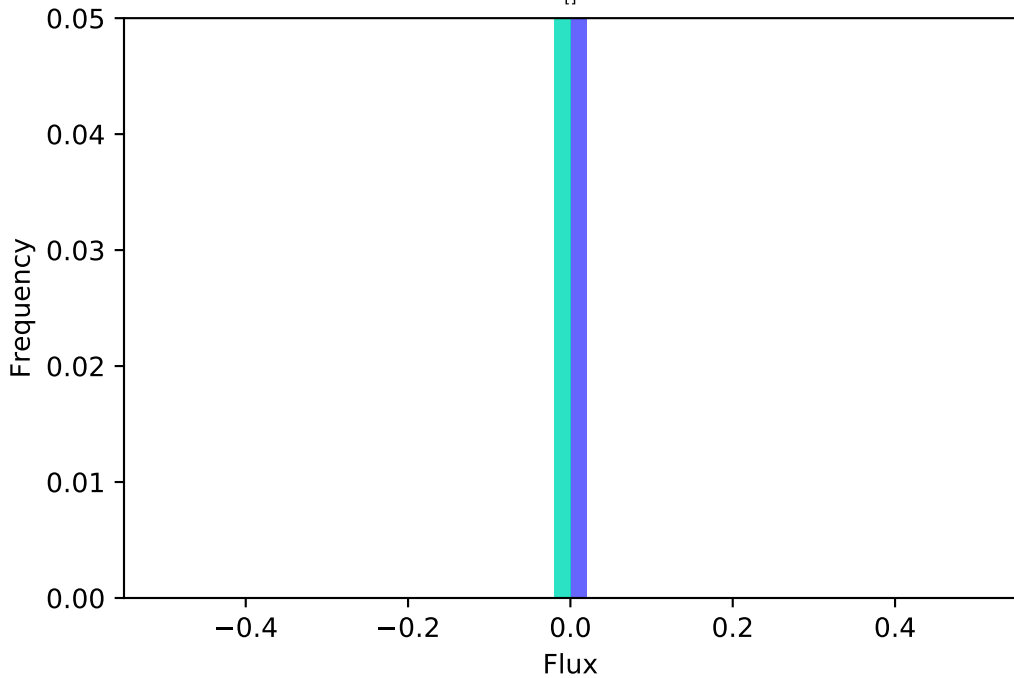
245 : CHR_h --> PRE_h
[]

246 : Glu_h + PRE_h <=> AGN_h + KG_h
[]

247 : AGN_h + H_h --> CO2_h + H2O_h + Phe_h
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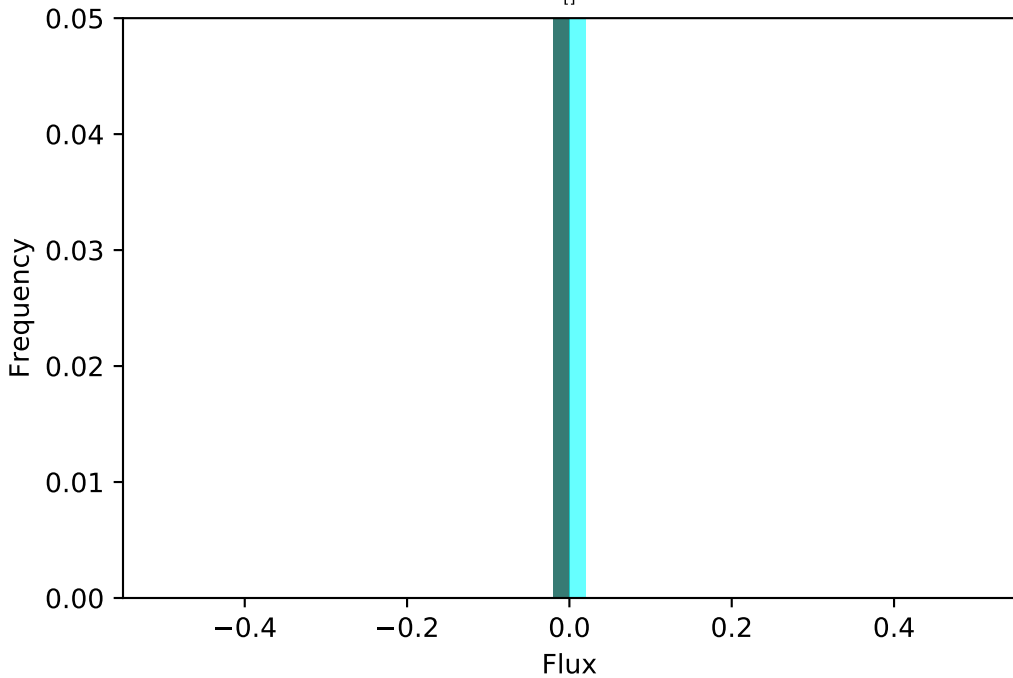
248 : Arg_m + H2O_m + H_m --> Orn_m + urea_m
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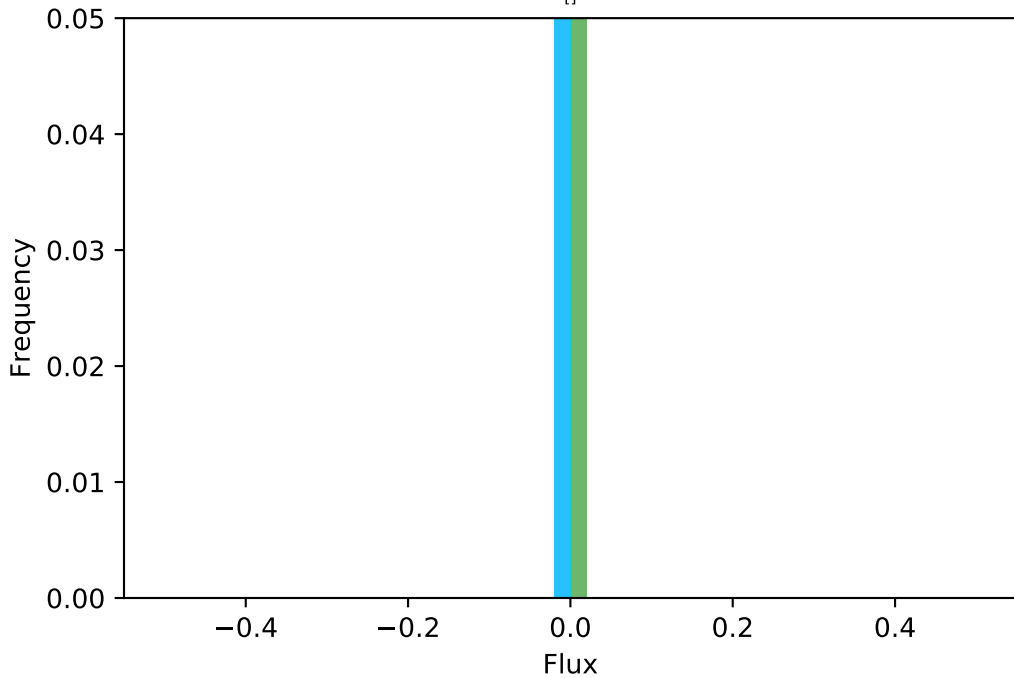
249 : H2O_m + H_m + urea_m --> CO2_m + 2.0 NH4_m
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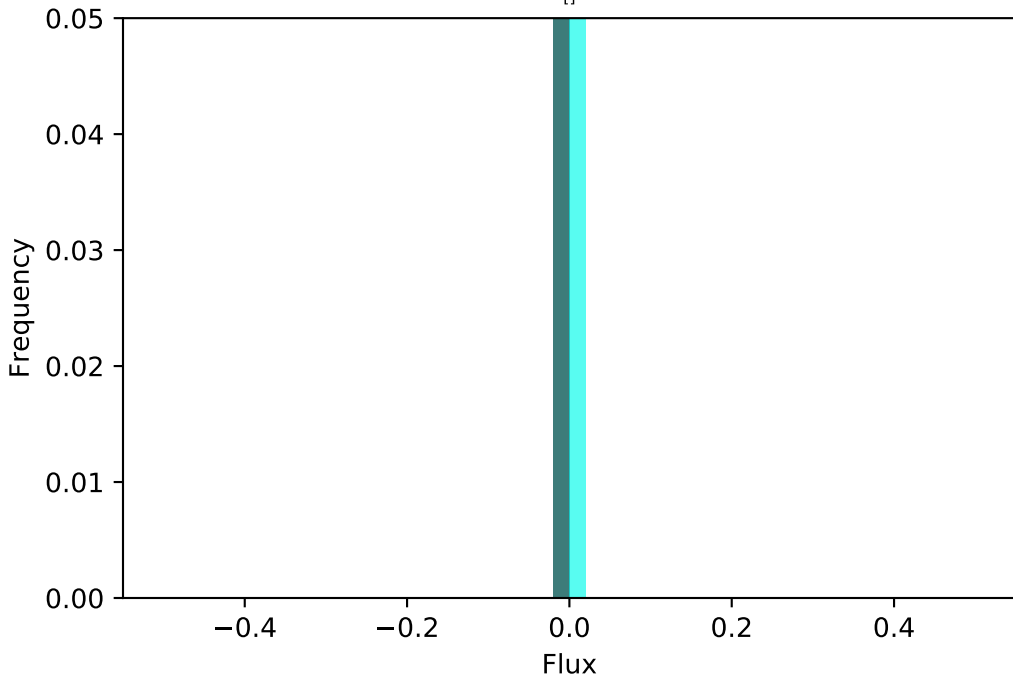
250 : KG_m + Orn_m <=> Glu_DASH_SeA_m + Glu_m
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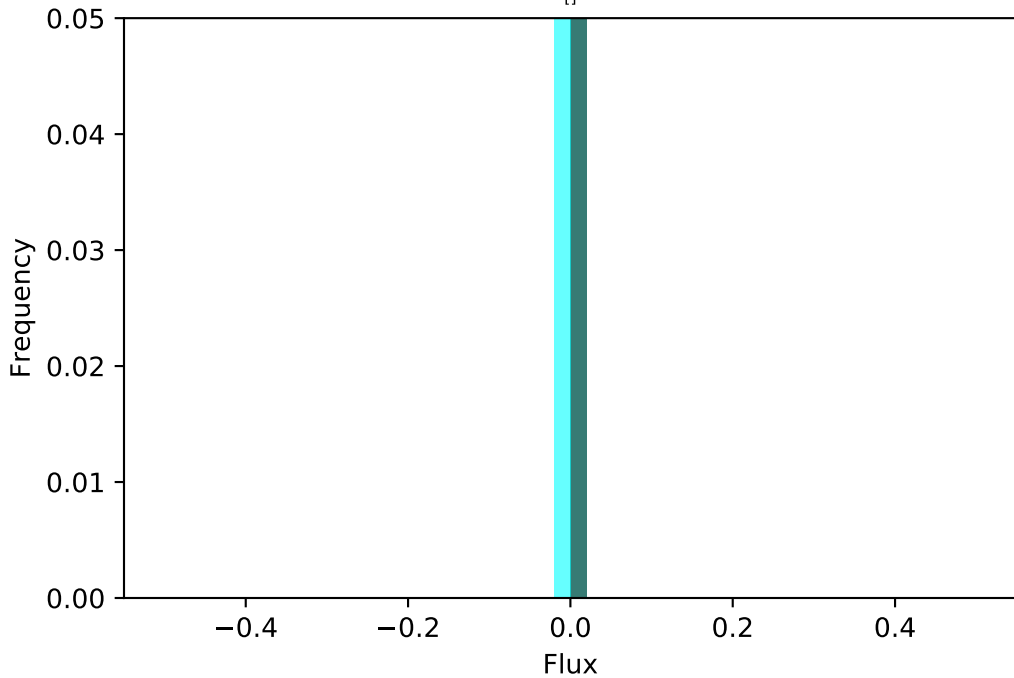
251 : ATP_c + Glu_c --> ADP_c + GluP_c
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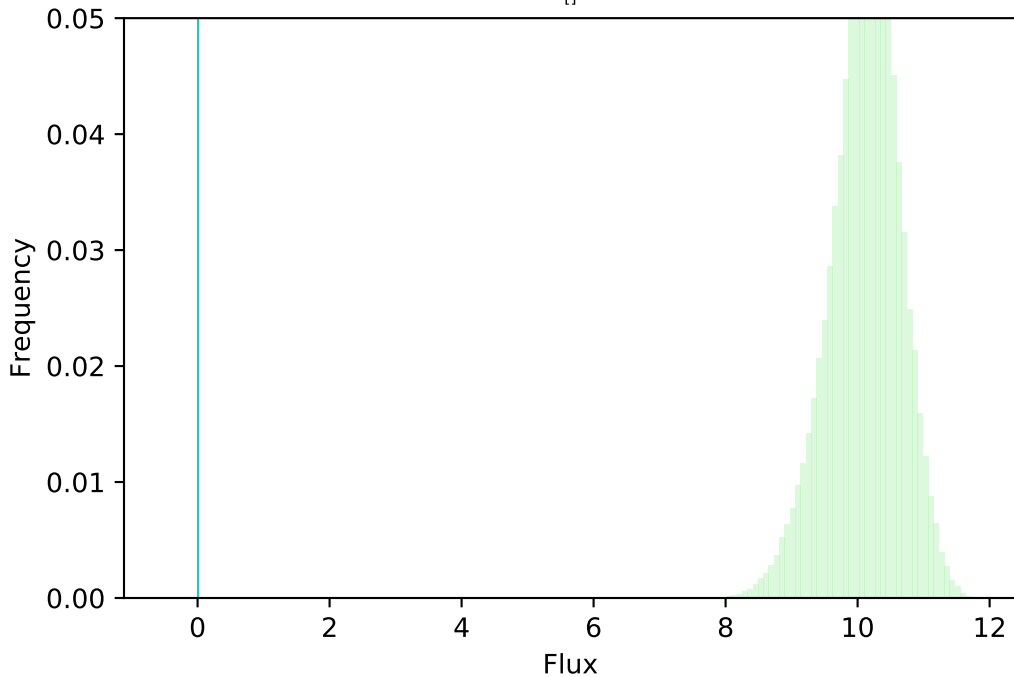
252 : ATP_h + Glu_h --> ADP_h + GluP_h
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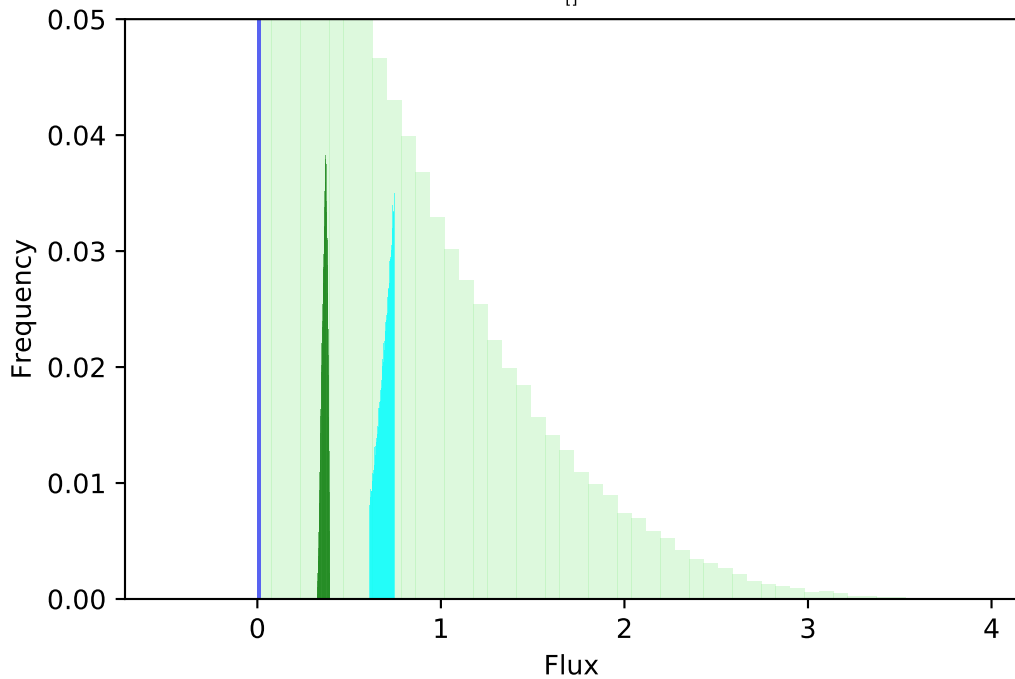
253 : ATP_m + Glu_m --> ADP_m + GluP_m
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254 : GluP_c + NADPH_c --> Glu_DASH_SeA_c + NADP_c + Pi_c
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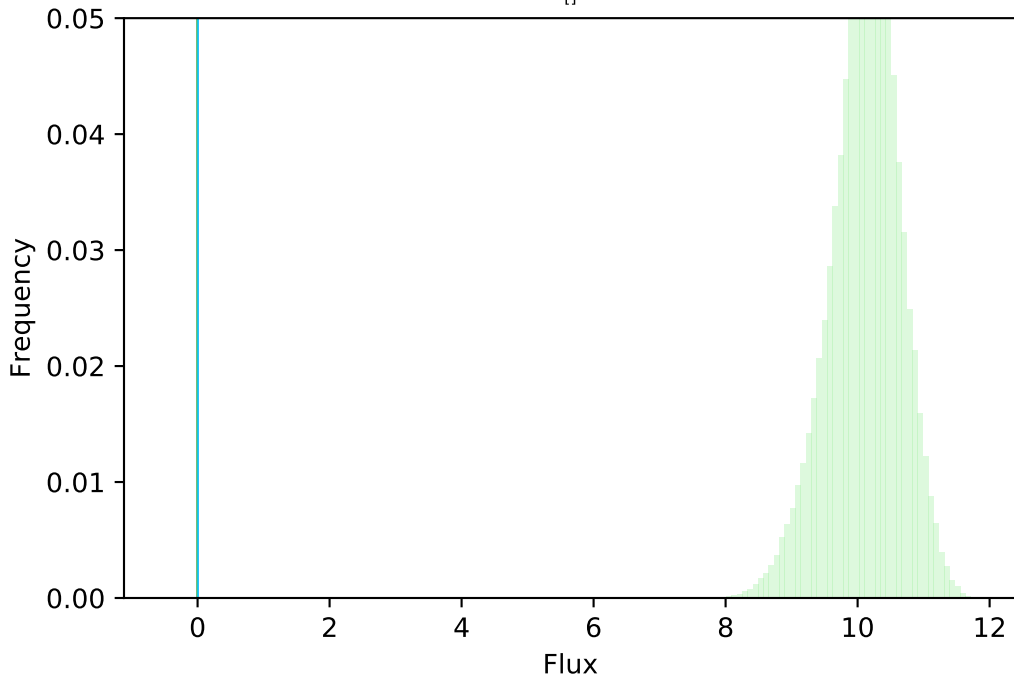
255 : GluP_h + H_h + NADPH_h --> Glu_DASH_SeA_h + NADP_h + Pi_h
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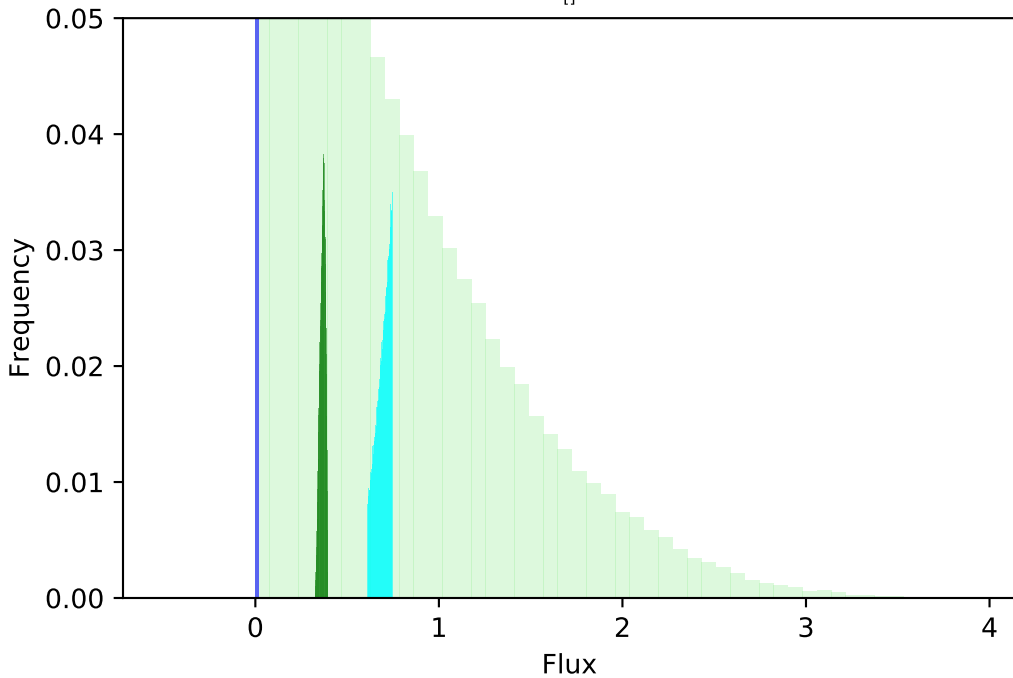
256 : GluP_m + H_m + NADPH_m --> Glu_DASH_SeA_m + NADP_m + Pi_m
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257 : Glu_DASH_SeA_c --> H2O_c + H_c + P5C_c
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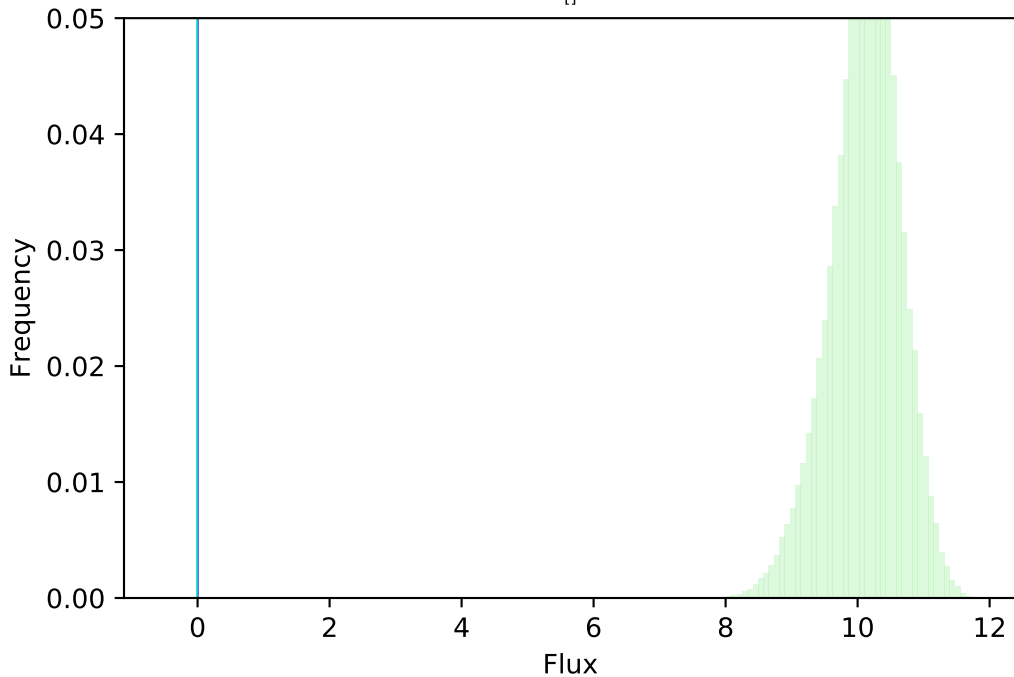
258 : Glu_DASH_SeA_h --> H2O_h + H_h + P5C_h
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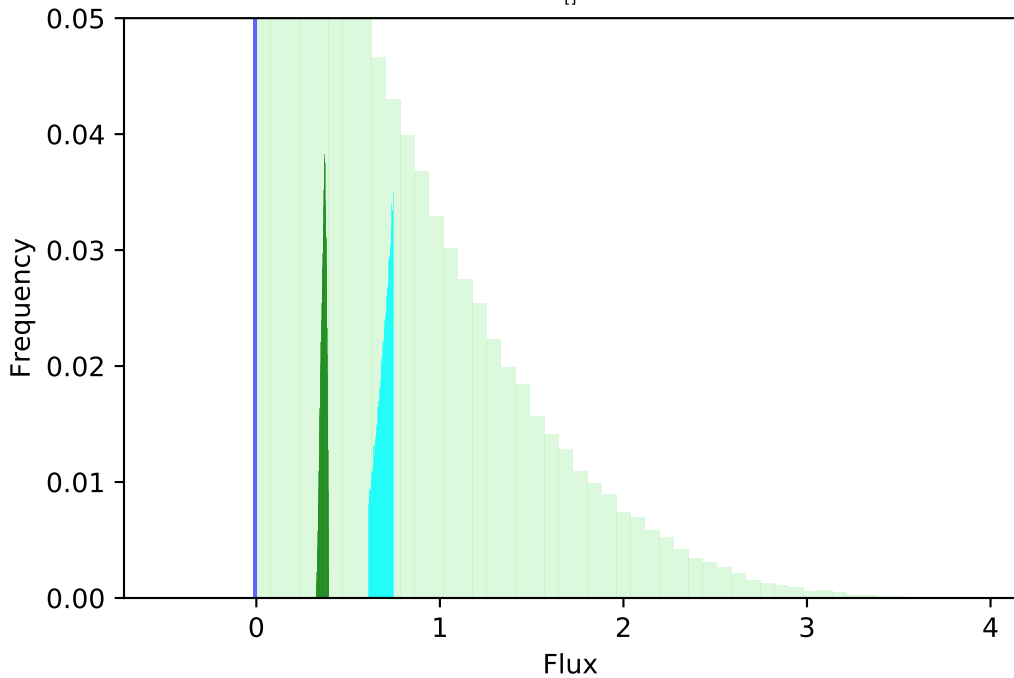
259 : Glu_DASH_SeA_m --> H2O_m + H_m + P5C_m
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260 : H_c + NADH_c + P5C_c --> NAD_c + Pro_c
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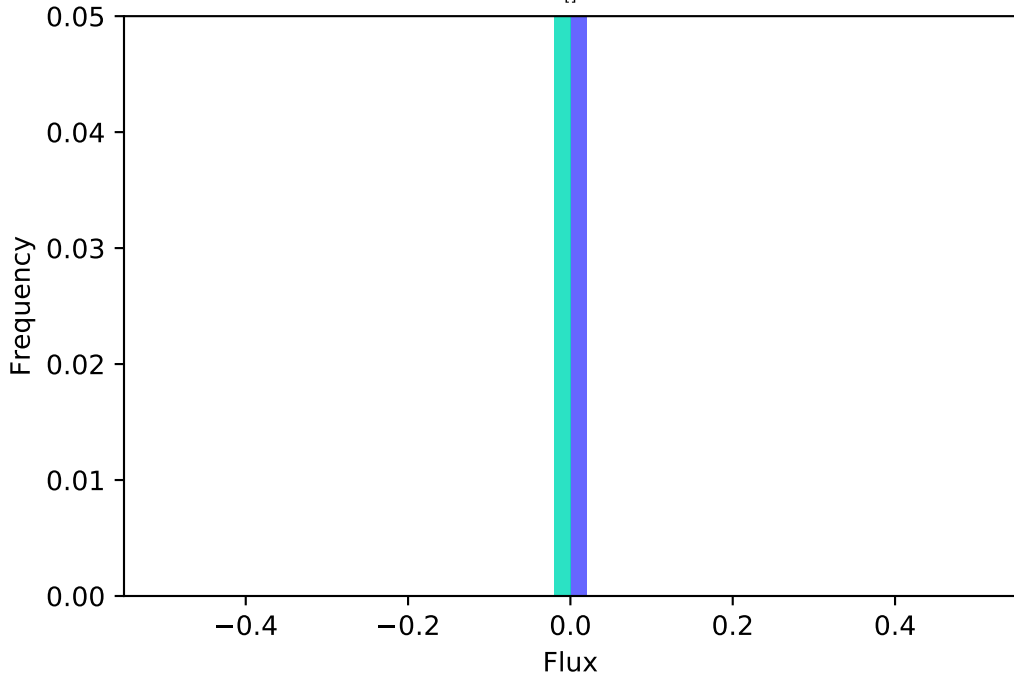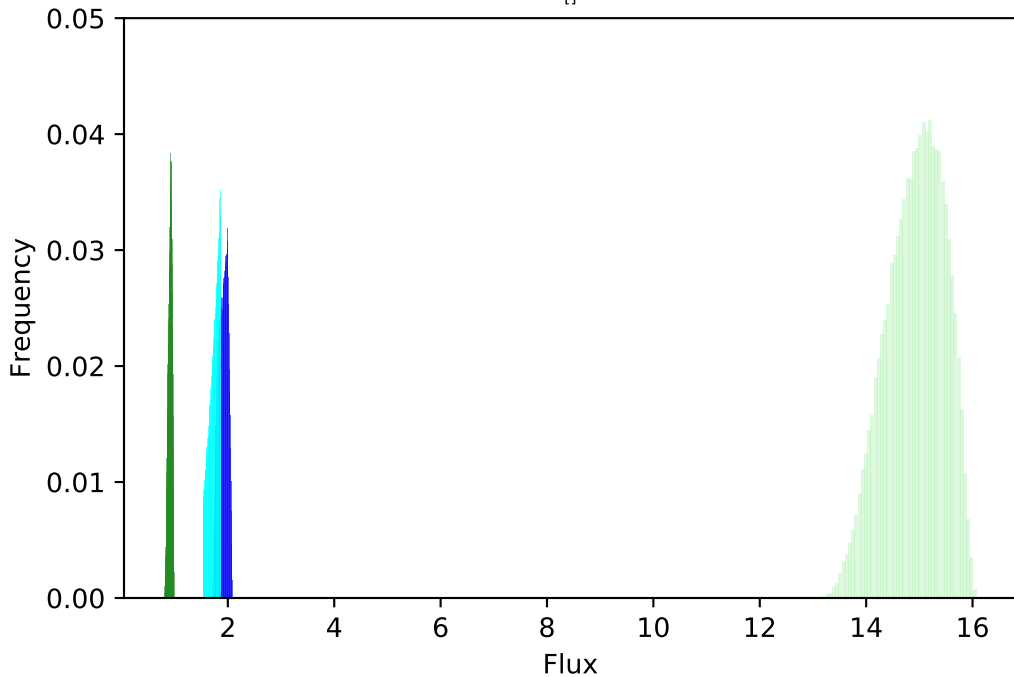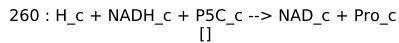
261 : NAD_m + Pro_m --> 2.0 H_m + NADH_m + P5C_m
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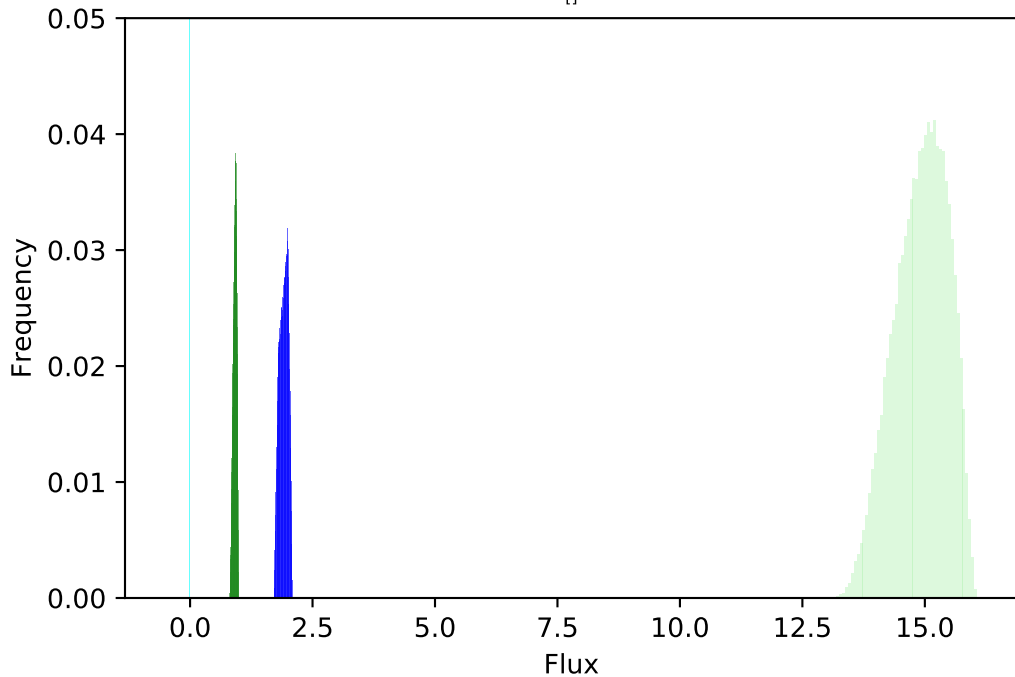
262 : NADP_m + Pro_m --> 2.0 H_m + NADPH_m + P5C_m
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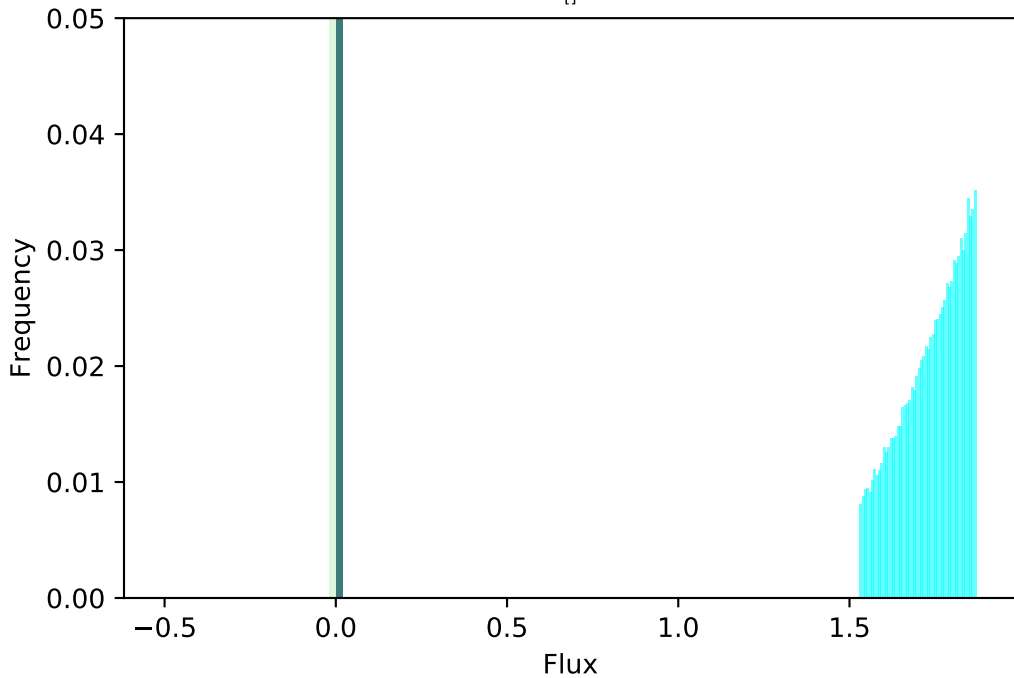
263 : 2.0 H2O_h + NAD_h + P5C_h --> Glu_h + H_h + NADH_h
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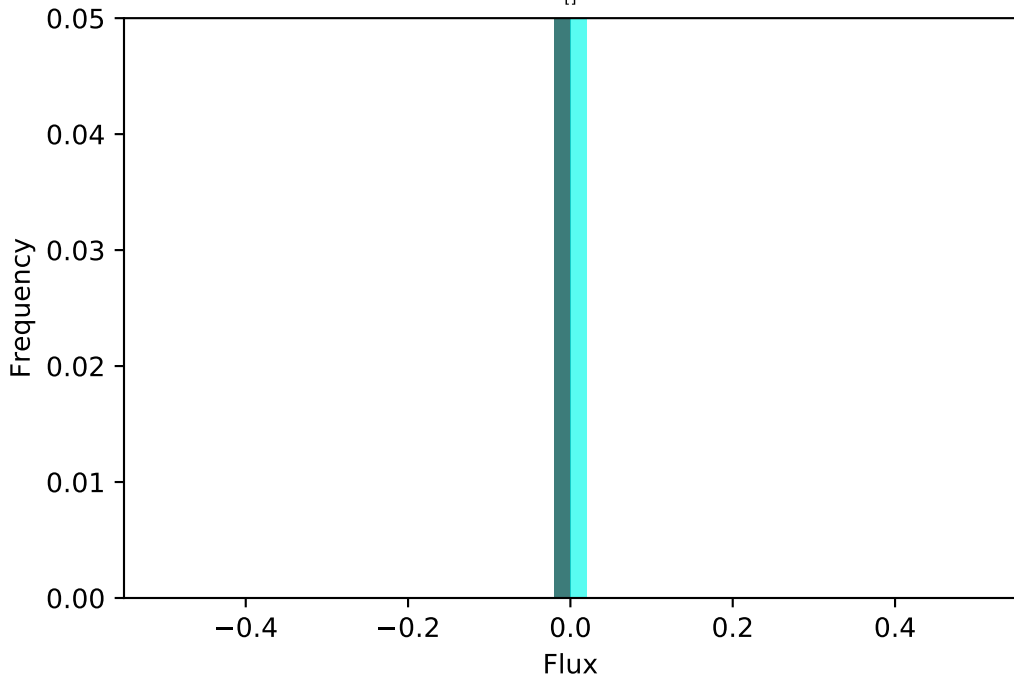
264 : 2.0 H2O_m + NAD_m + P5C_m --> Glu_m + H_m + NADH_m
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265 : 2.0 H2O_m + NADP_m + P5C_m --> Glu_m + H_m + NADPH_m
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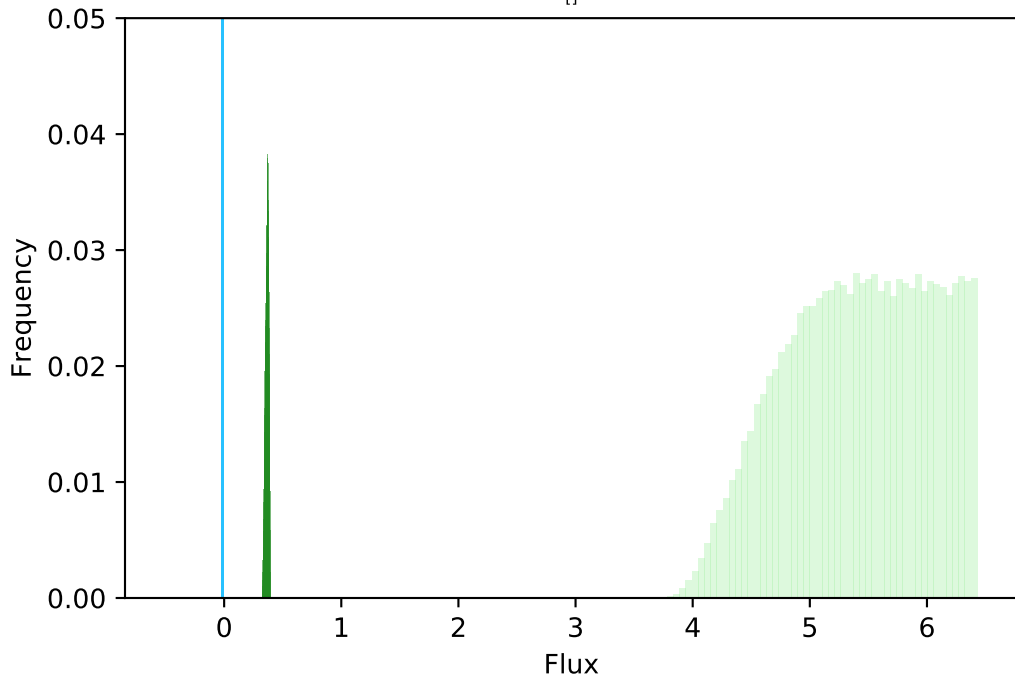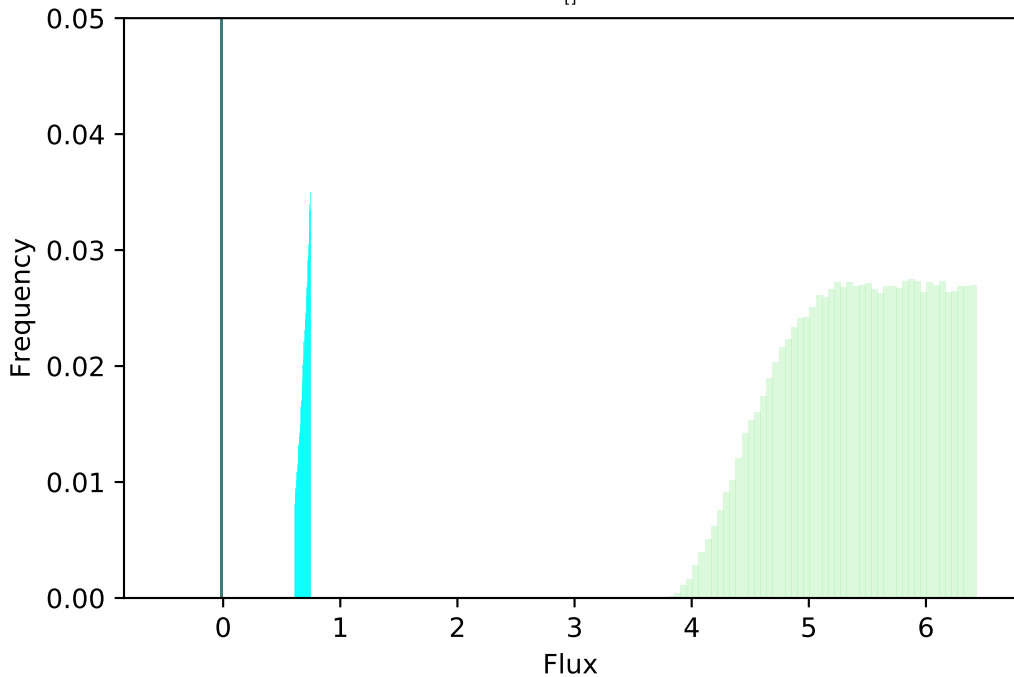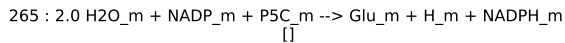
266 : NAD_h + PGA_h <=> H_h + NADH_h + P_DASH_HPR_h
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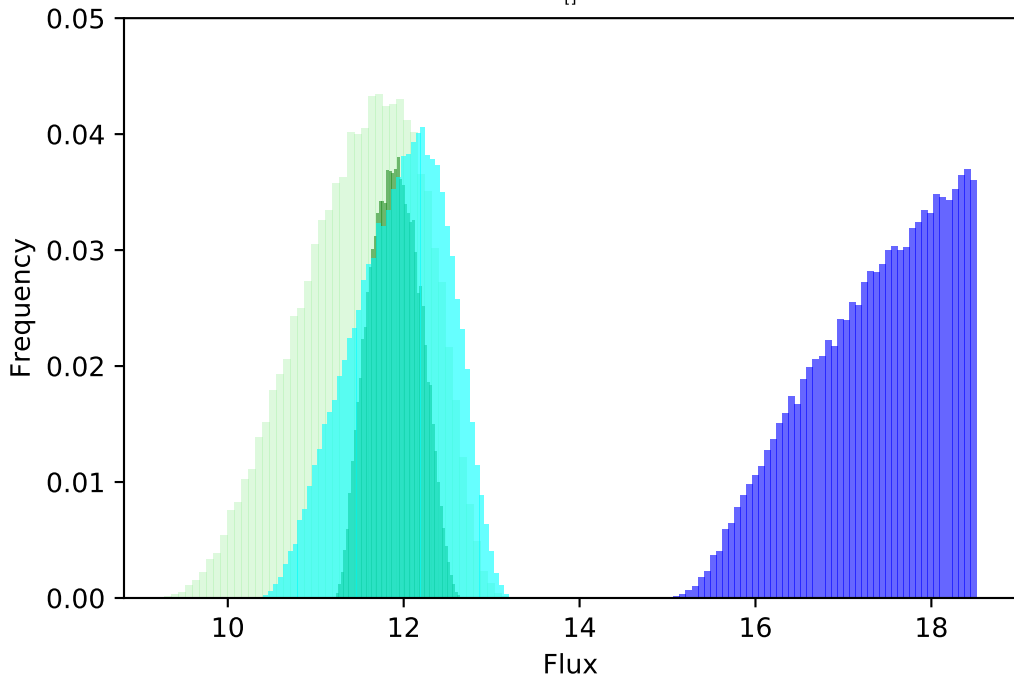
267 : Glu_h + P_DASH_HPR_h --> KG_h + PSer_h
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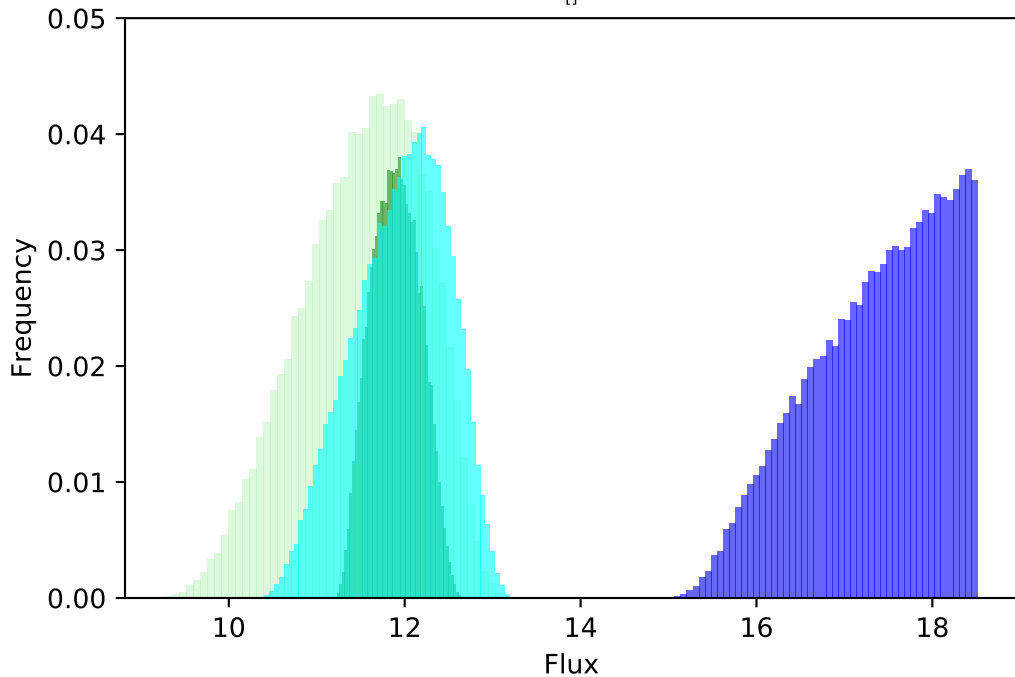
268 : H2O_h + PSer_h --> Pi_h + Ser_h
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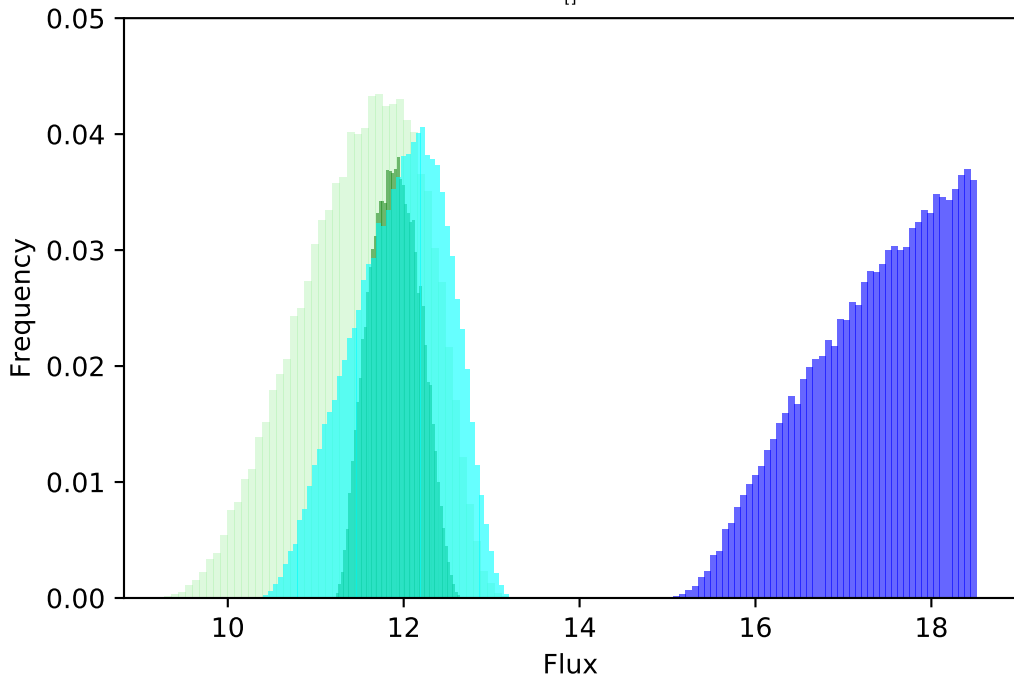
269 : Ser_c --> NH4_c + Pyr_c
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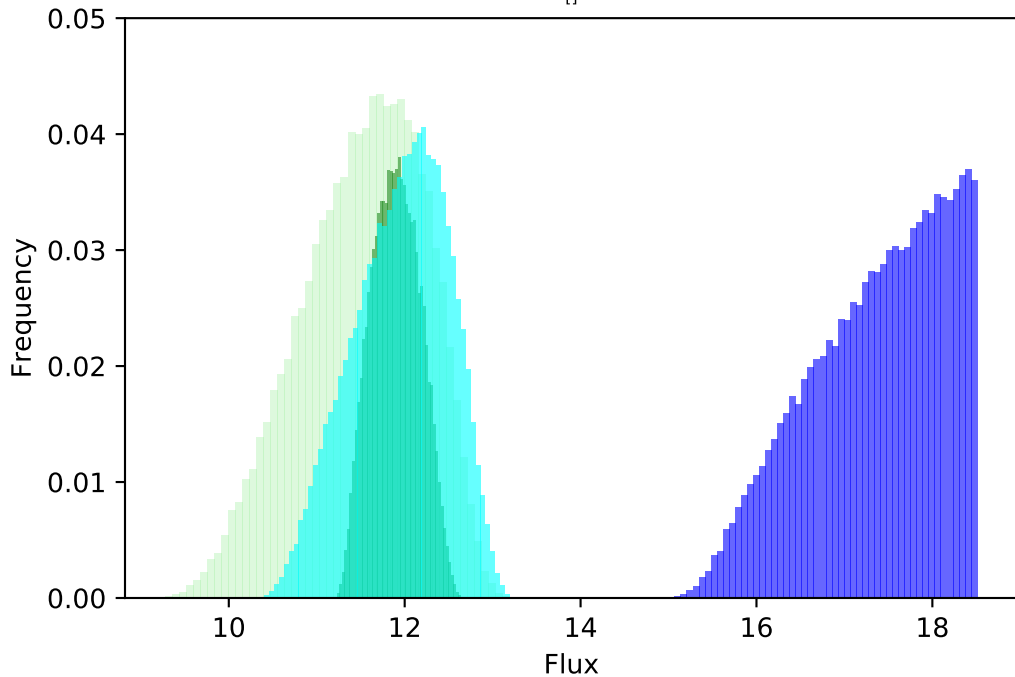
270 : H2O_h + PH_DASH_Ser_h --> Pi_h + Thr_h
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271 : CHR_h + Gln_h --> ANT_h + Glu_h + H_h + Pyr_h
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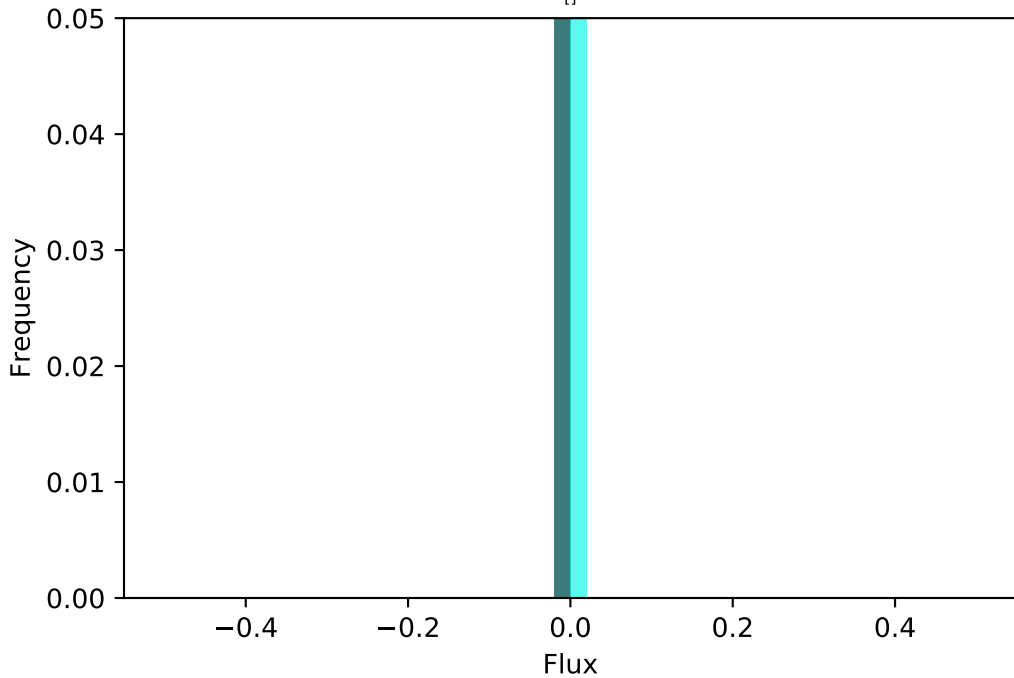
272 : ANT_h + PRPP_h --> H_h + PPi_h + PR_DASH_ANT_h
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273 : PR_DASH_ANT_h --> CPD_DASH_Ru5P_h
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274 : CPD_DASH_Ru5P_h + H_h --> CO2_h + H2O_h + Ind_DASH_GP_h
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275 : Ind_DASH_GP_h --> GAP_h + Ind_h
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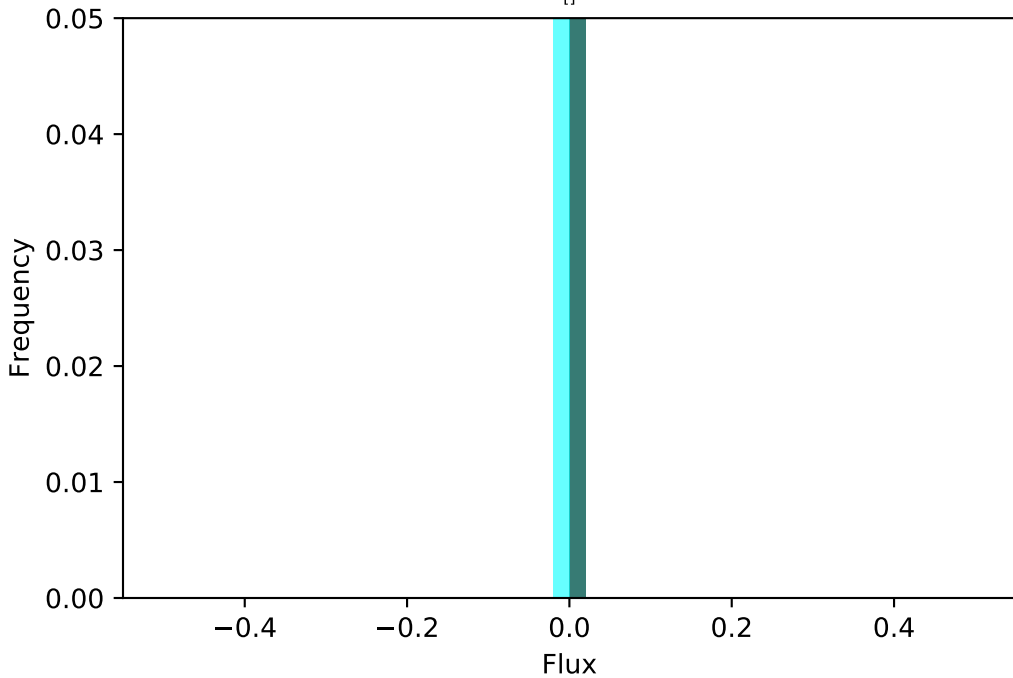
276 : Ind_h + Ser_h --> H2O_h + Trp_h
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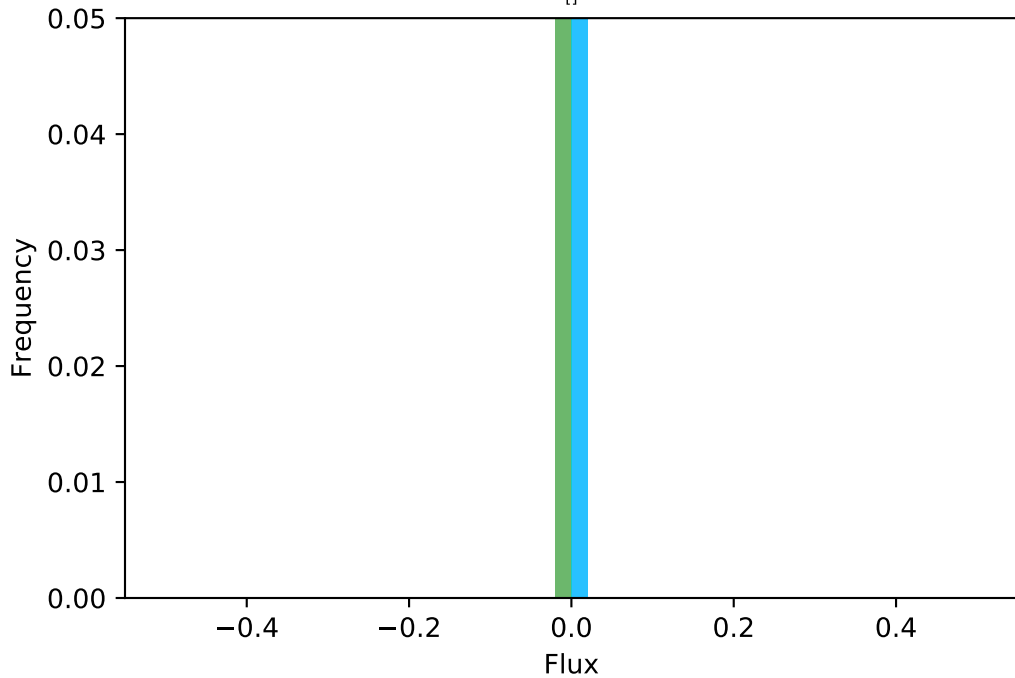
277 : AGN_h + NADP_h --> CO2_h + NADPH_h + Tyr_h
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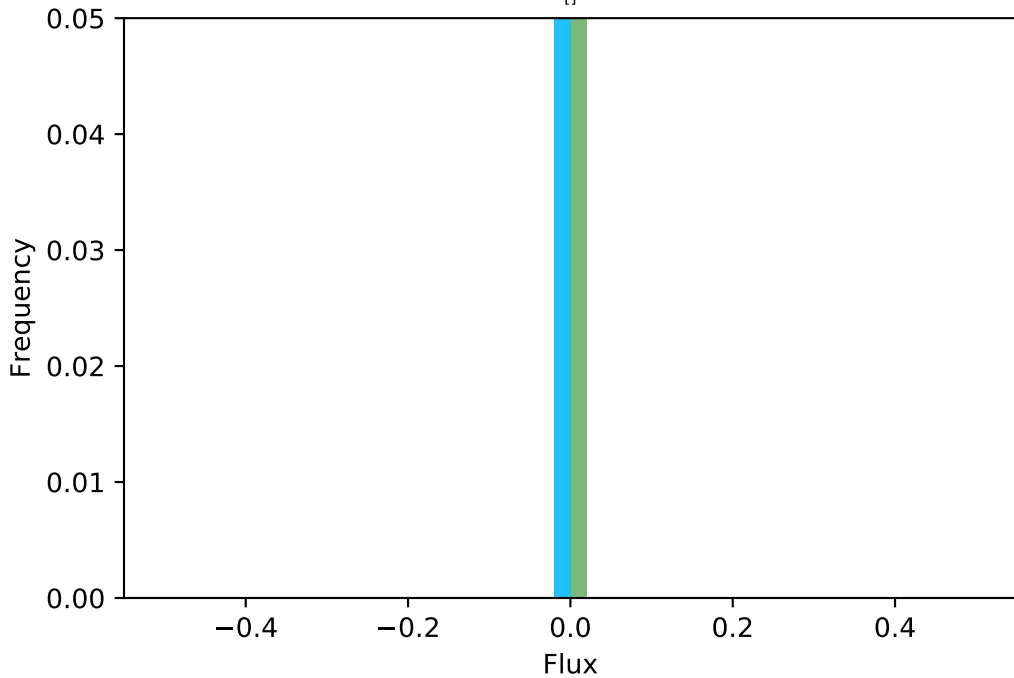
278 : Glu_h + MOB_h --> KG_h + Val_h
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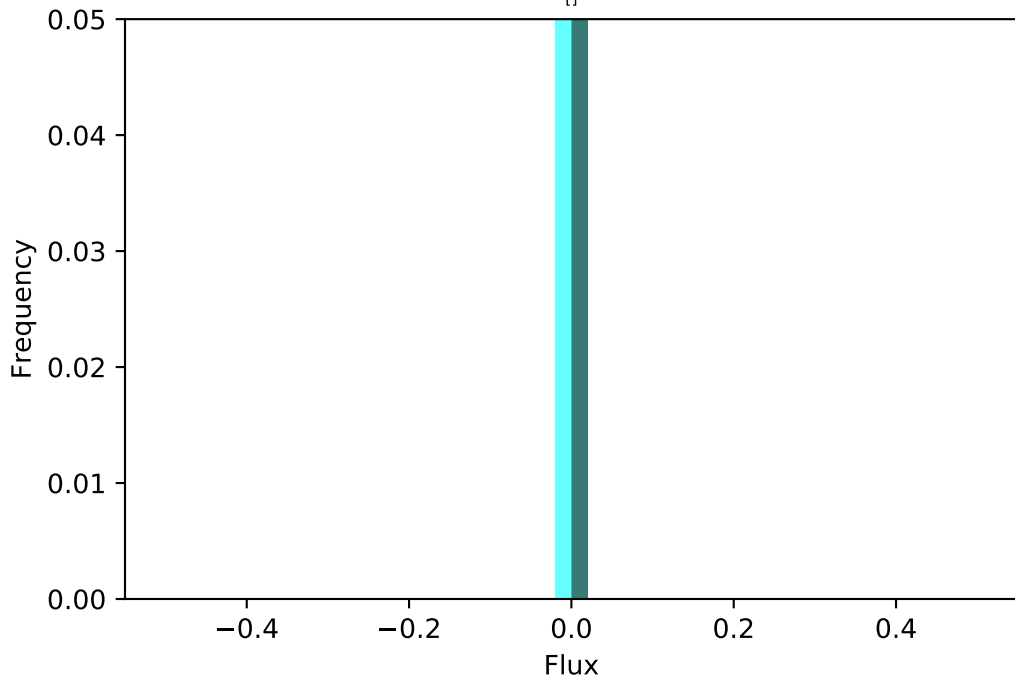
279 : Gln_h + H2O_h + PRPP_h --> Glu_h + H_h + PPi_h + PRA_h
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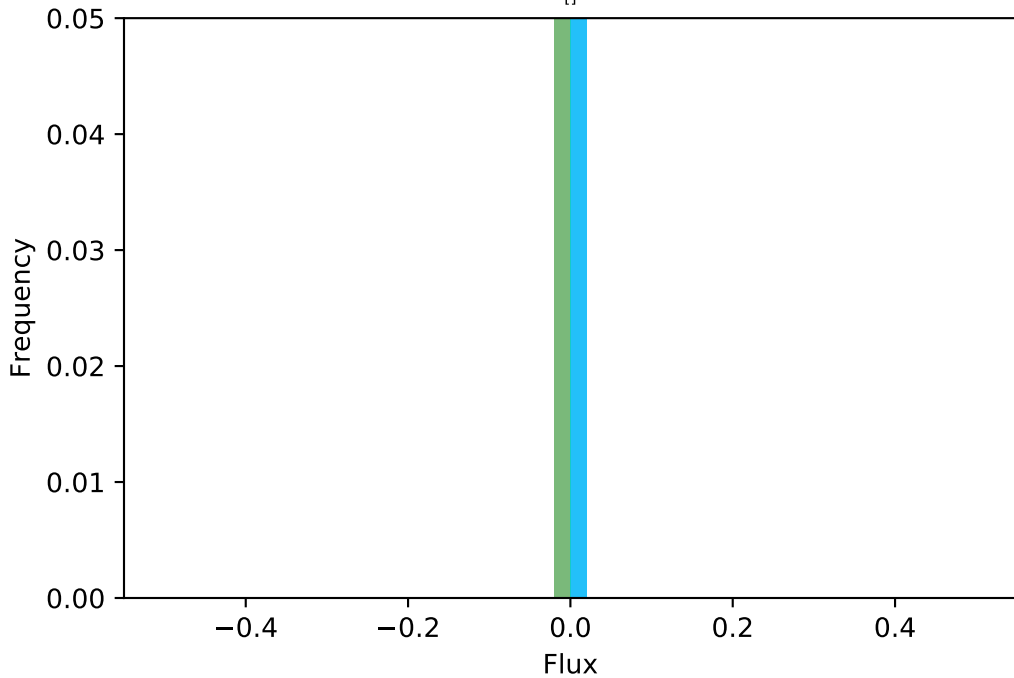
280 : ATP_h + Gly_h + PRA_h --> ADP_h + GAR_h + H_h + Pi_h
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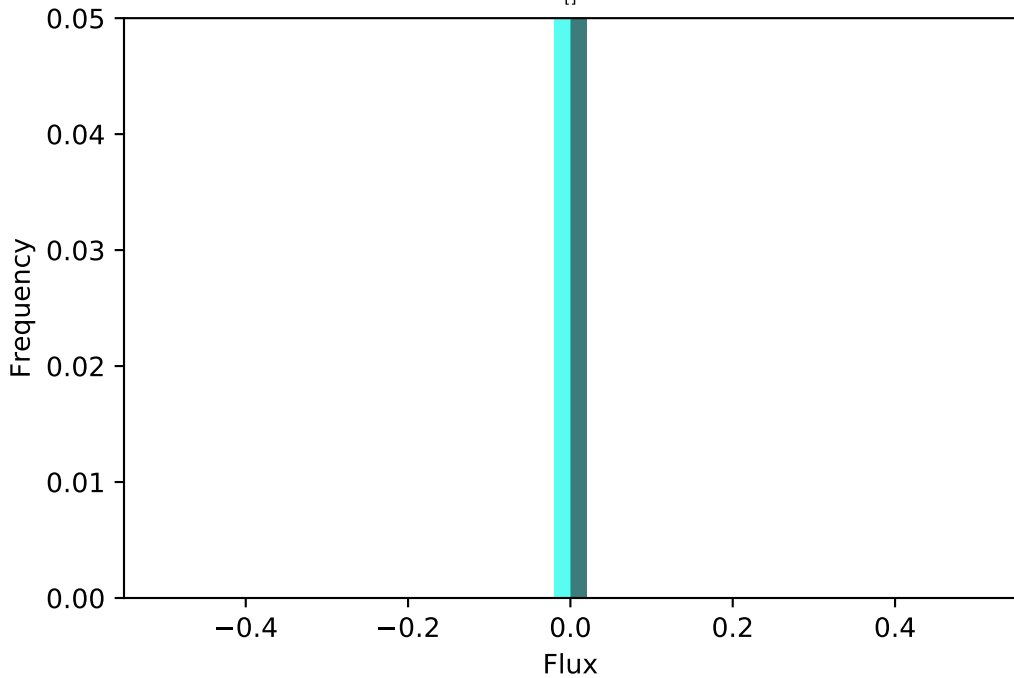
281 : F_DASH_THF_h + GAR_h --> FGAR_h + 2.0 H_h + THF_h
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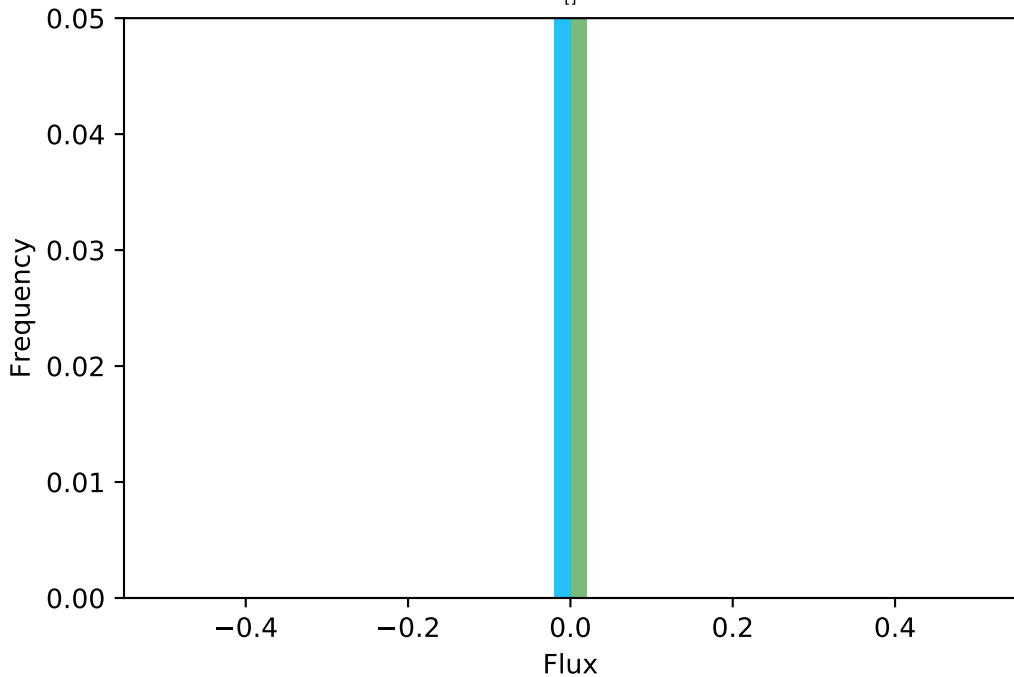
282 : ATP_h + FGAR_h + Gln_h + H2O_h --> ADP_h + FGAM_h + Glu_h + 2.0 H_h + Pi_h
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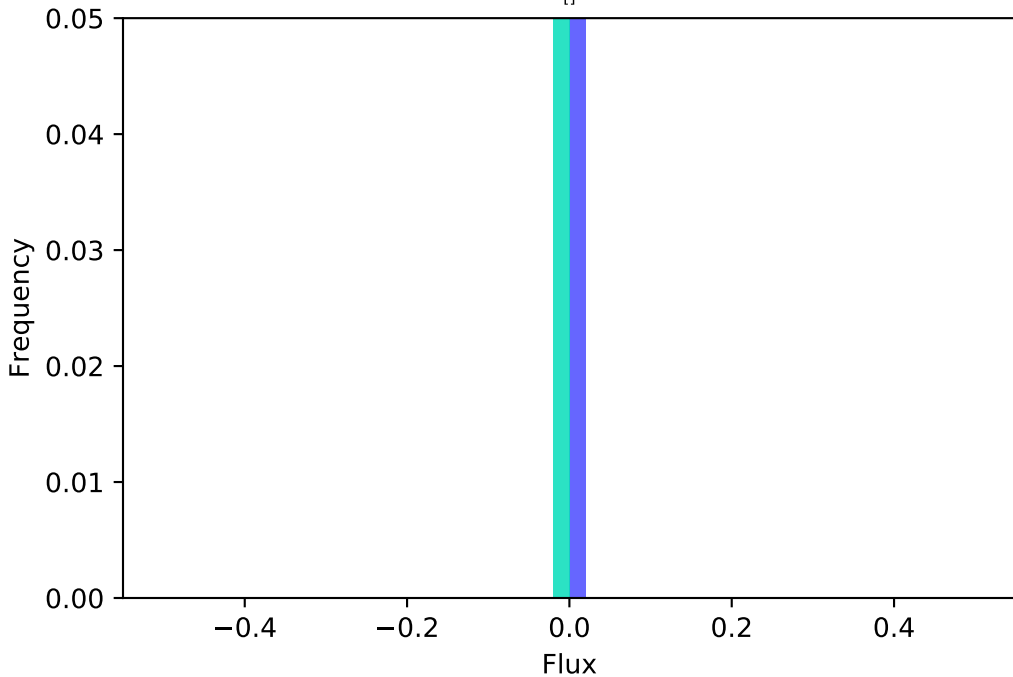
283 : ATP_h + FGAM_h --> ADP_h + AIR_h + H_h + Pi_h
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284 : AIR_h + CO2_h --> CAIR_h + H_h
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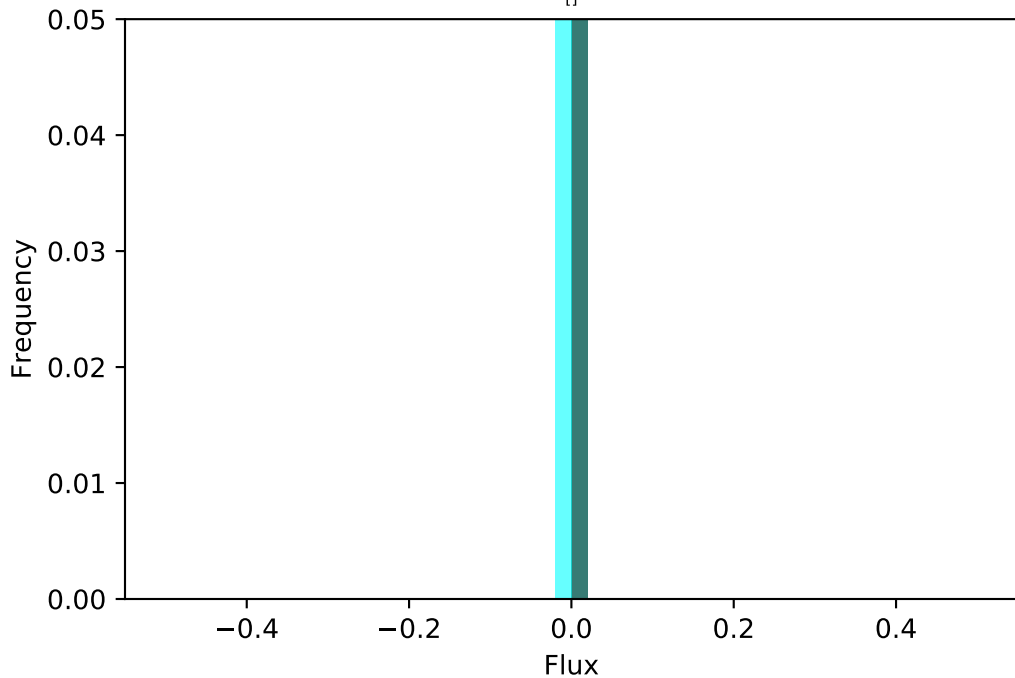
285 : ATP_h + Asp_h + CAIR_h --> ADP_h + H_h + Pi_h + SAICAR_h
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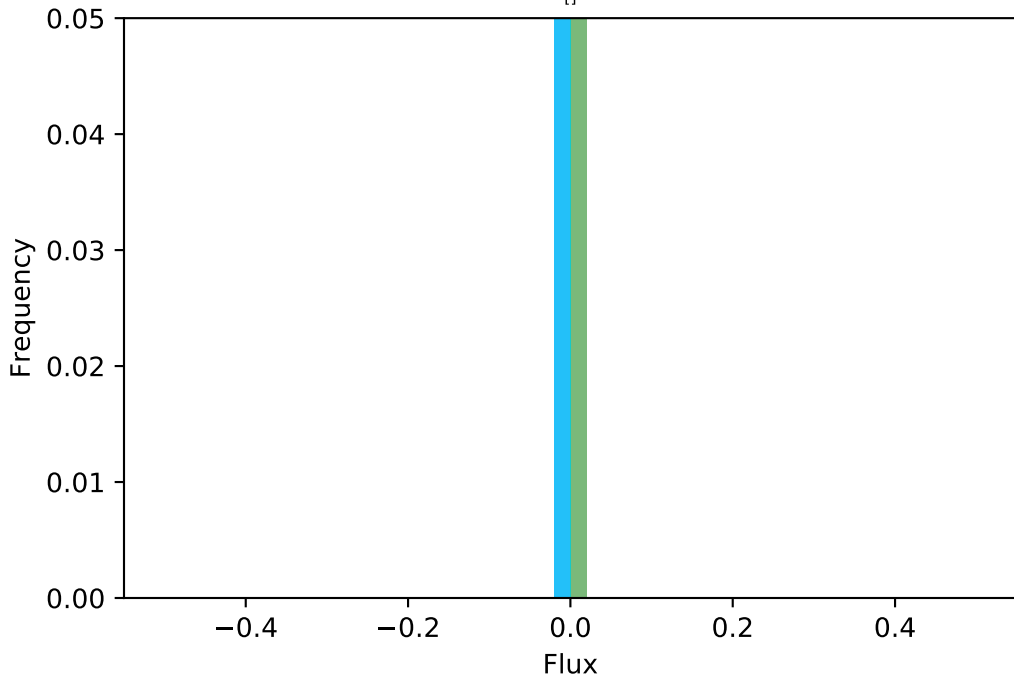
286 : H_h + SAICAR_h --> AICAR_h + Fum_h
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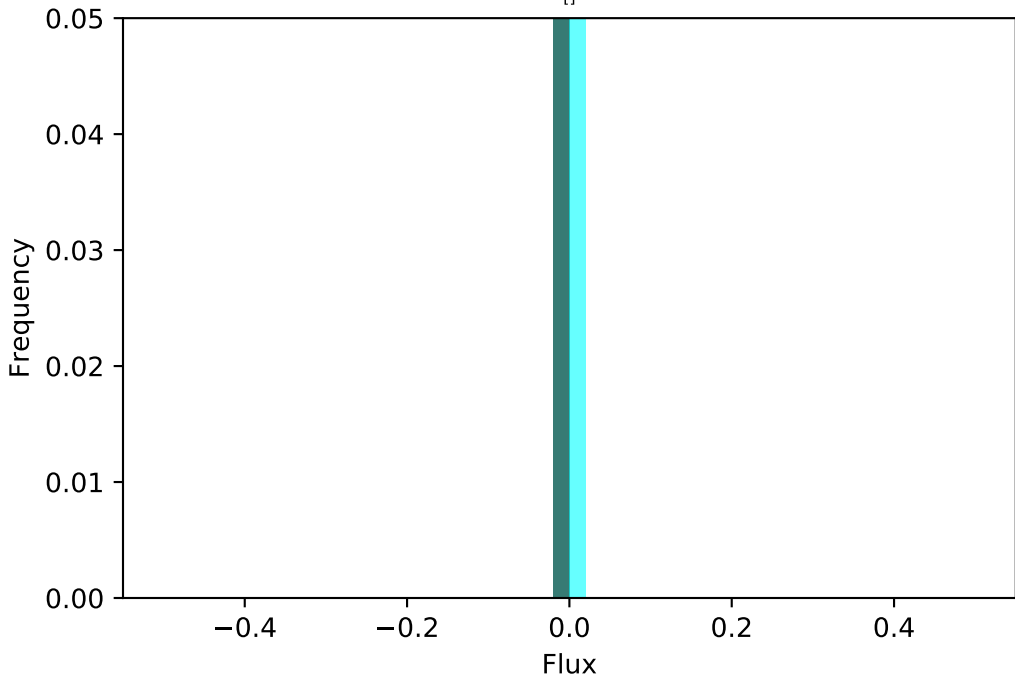
287 : AICAR_h + F_DASH_THF_h --> FAICAR_h + 2.0 H_h + THF_h
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288 : FAICAR_h --> H2O_h + IMP_h
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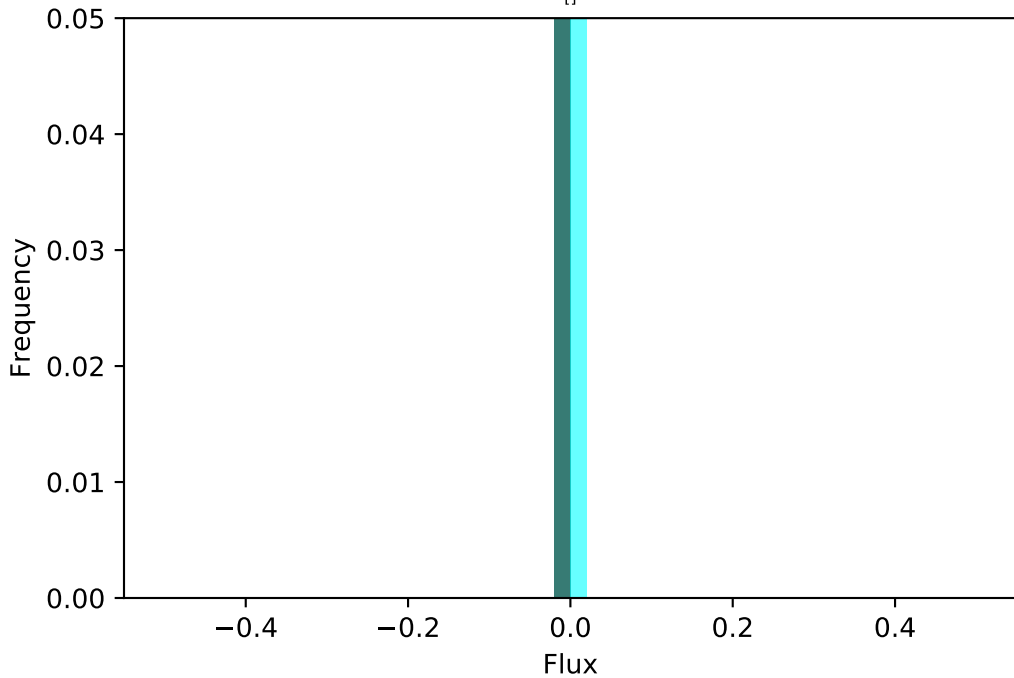
289 : AMP_c + H2O_c + H_c --> IMP_c + NH4_c
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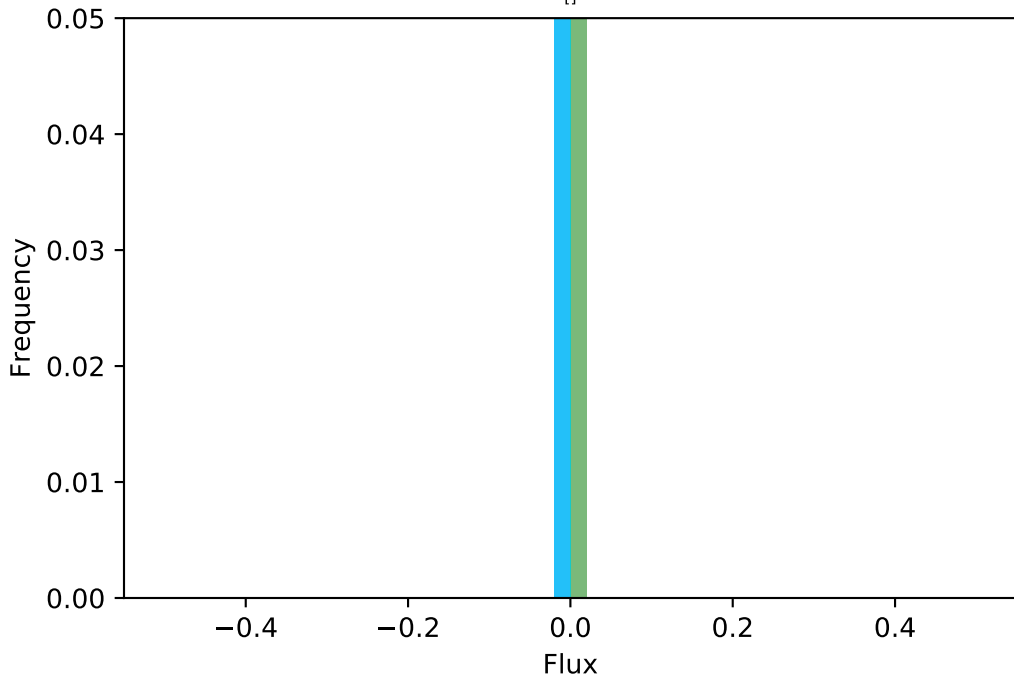
290 : H2O_c + IMP_c + NAD_c --> NADH_c + XMP_c
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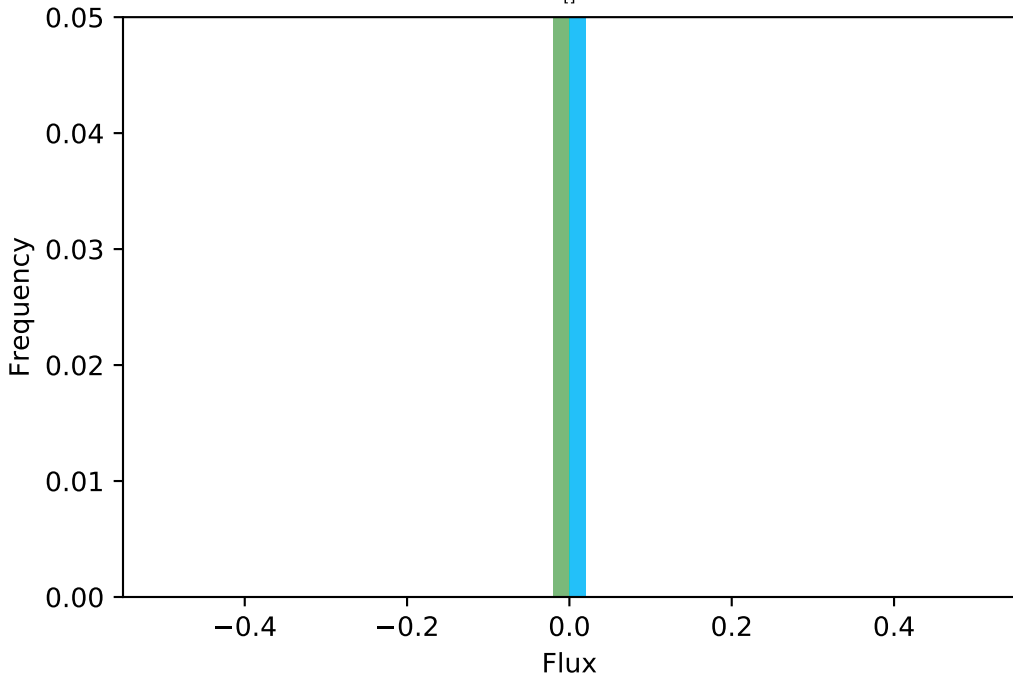
291 : ATP_c + Gln_c + H2O_c + XMP_c --> AMP_c + GMP_c + Glu_c + H_c + PPi_c
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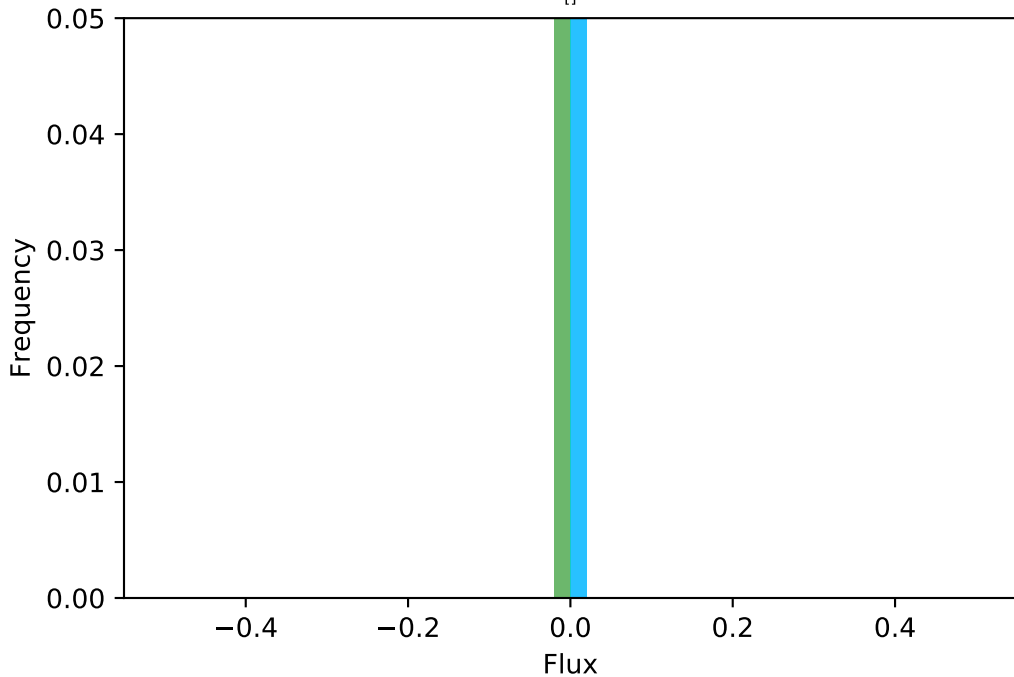
292 : Asp_h + GTP_h + IMP_h --> DC_DASH_AMP_h + GDP_h + H_h + Pi_h
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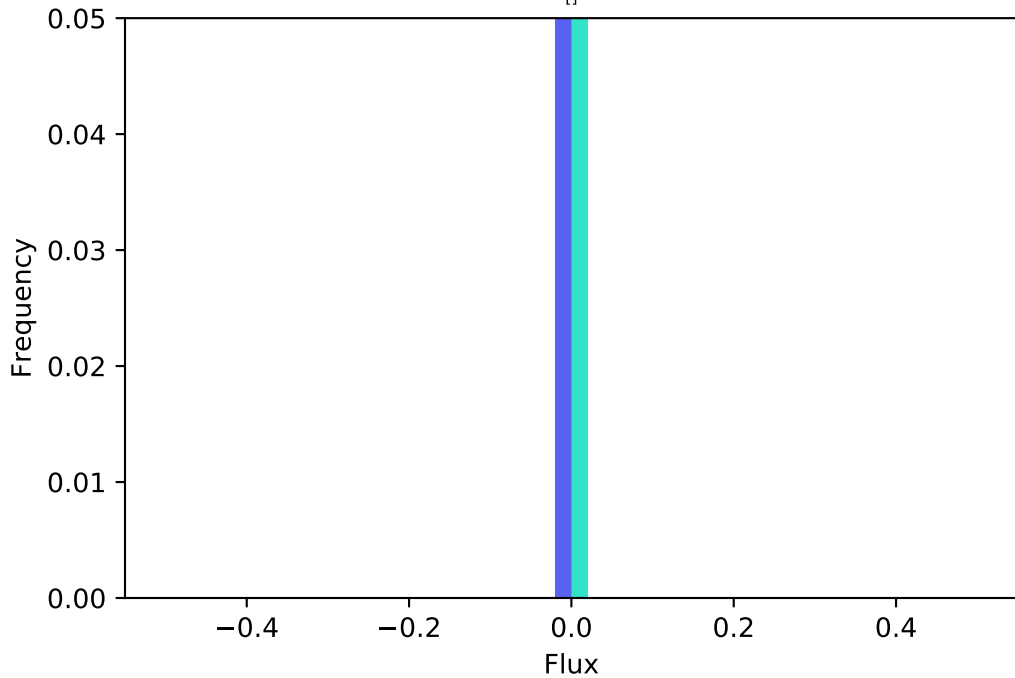
293 : DC_DASH_AMP_h --> AMP_h + Fum_h
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294 : Asp_h + CBP_h --> CB_DASH_Asp_h + Pi_h
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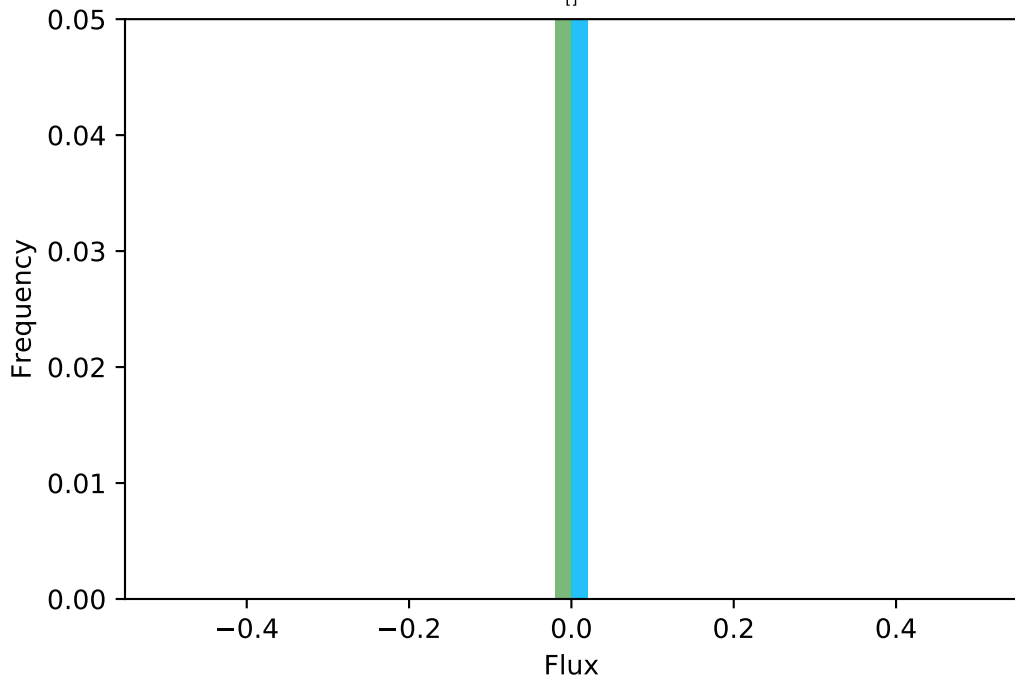
295 : CB_DASH_Asp_h --> DHO_h + H2O_h
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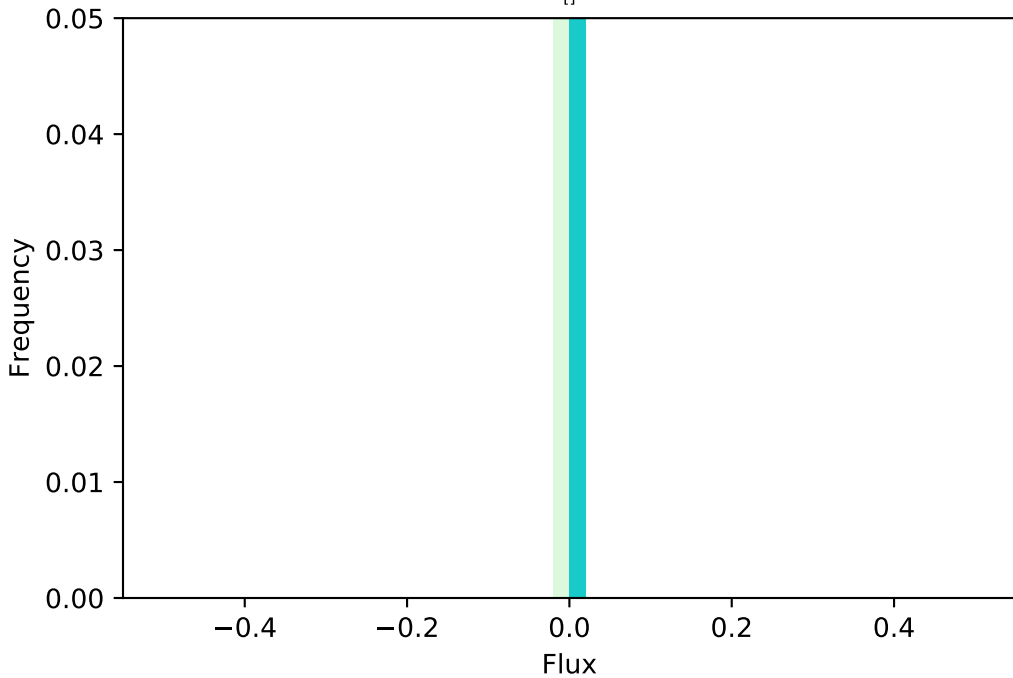
296 : DHO_m + H_m + Q_m --> QH2_m + orO_m
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297 : PRPP_c + orO_c --> H_c + OMP_c + PPi_c
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298 : H_c + OMP_c --> CO2_c + UMP_c
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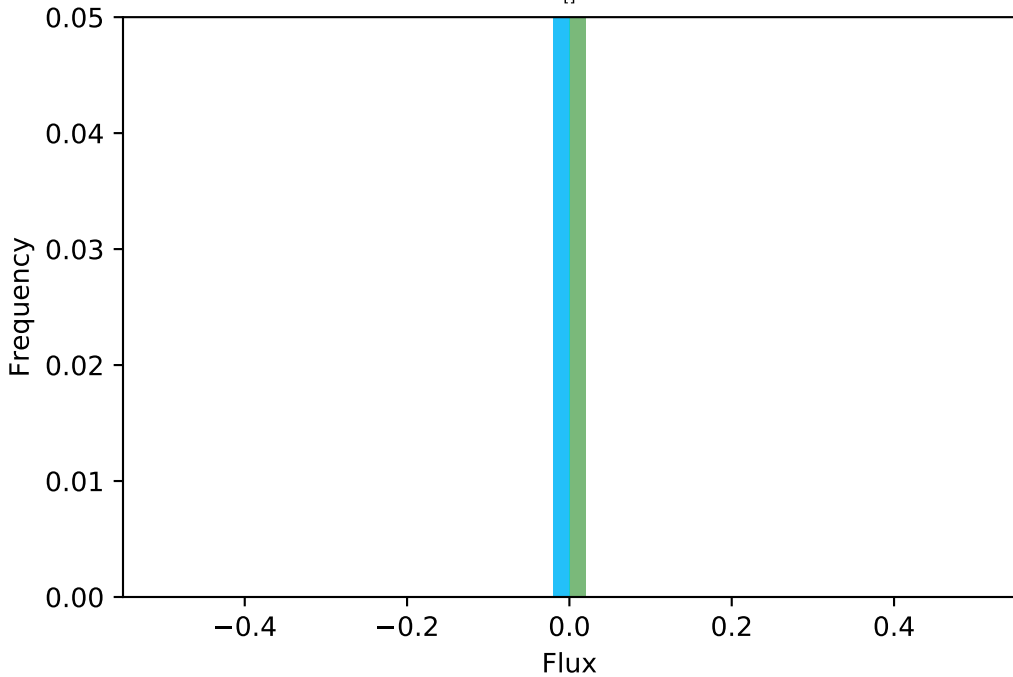
299 : ATP_c + Gln_c + H2O_c + UTP_c --> ADP_c + CTP_c + Glu_c + 2.0 H_c + Pi_c
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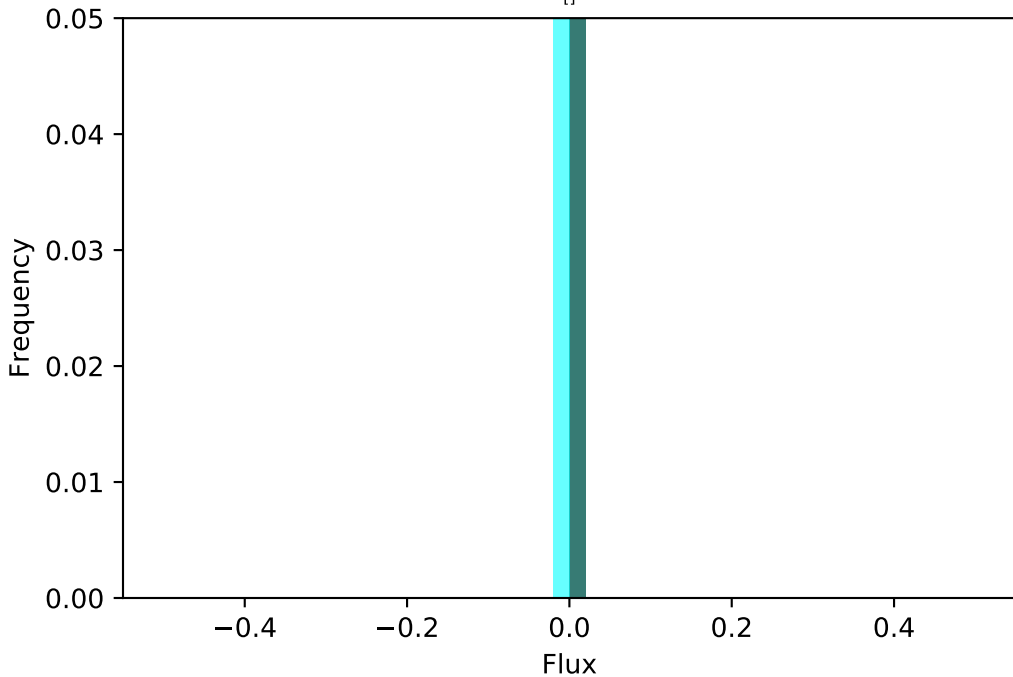
300 : AMP_c + ATP_c --> 2.0 ADP_c
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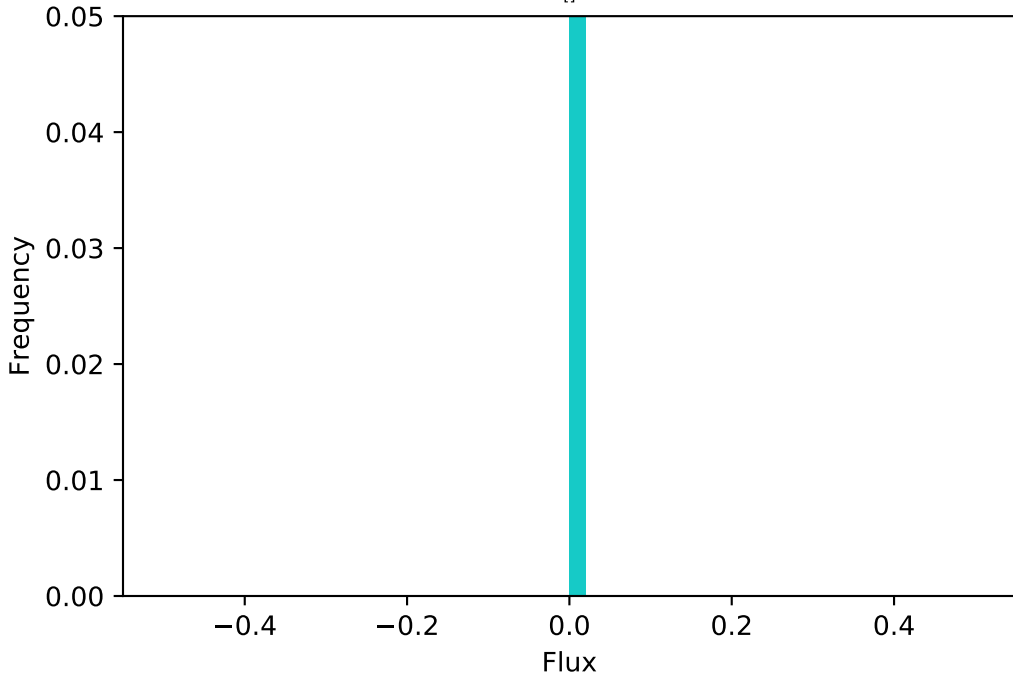
301 : AMP_h + ATP_h --> 2.0 ADP_h
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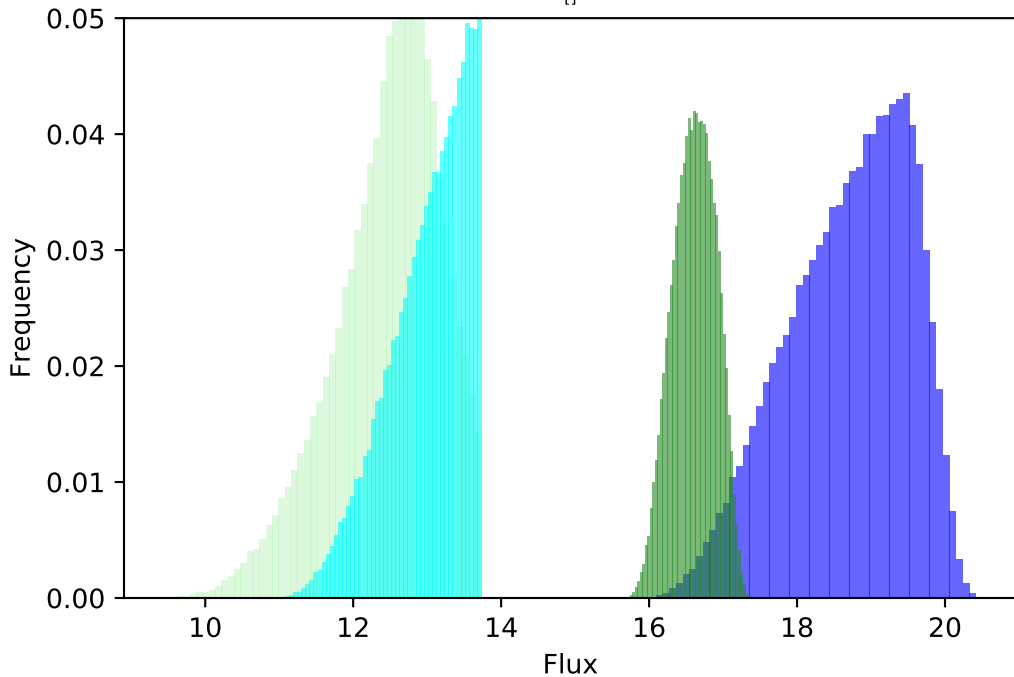
302 : ATP_c + GMP_c + H_c --> ADP_c + GDP_c
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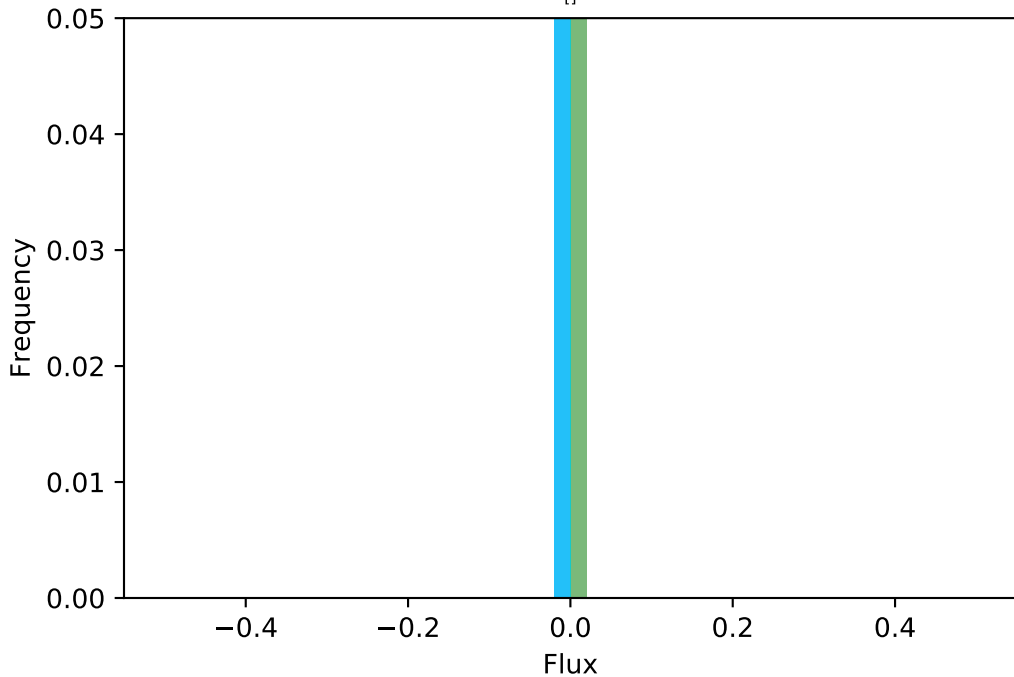
303 : ATP_c + H_c + UMP_c --> ADP_c + UDP_c
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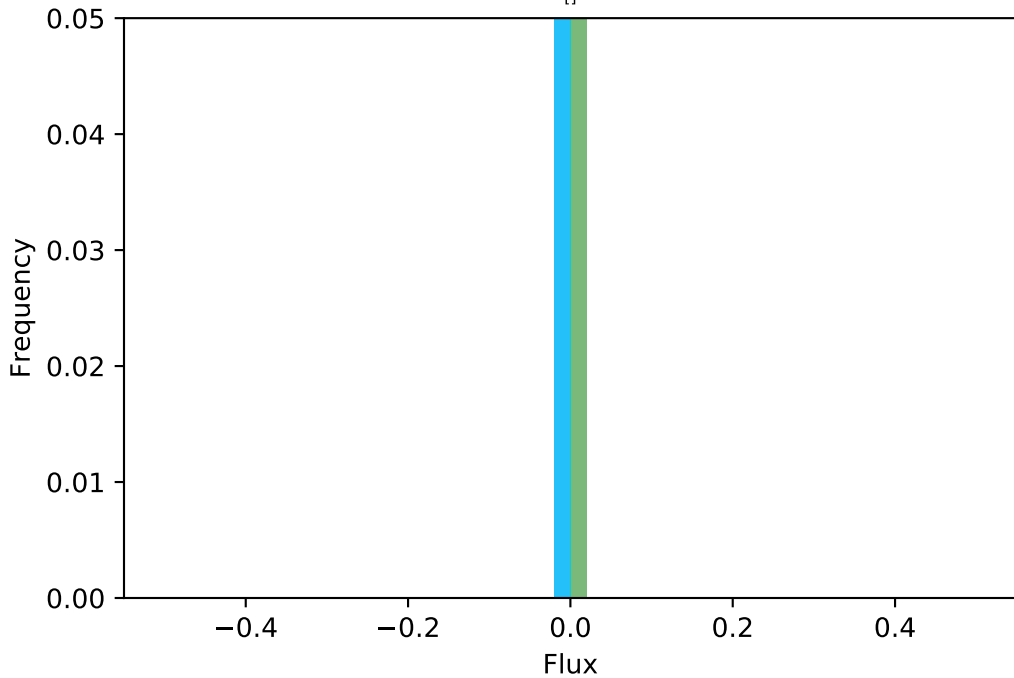
304 : CTP_c + H2O_c --> CDP_c + Pi_c
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305 : ADP_c + H_c + TRXrd_c --> H2O_c + TRXox_c + dADP_c
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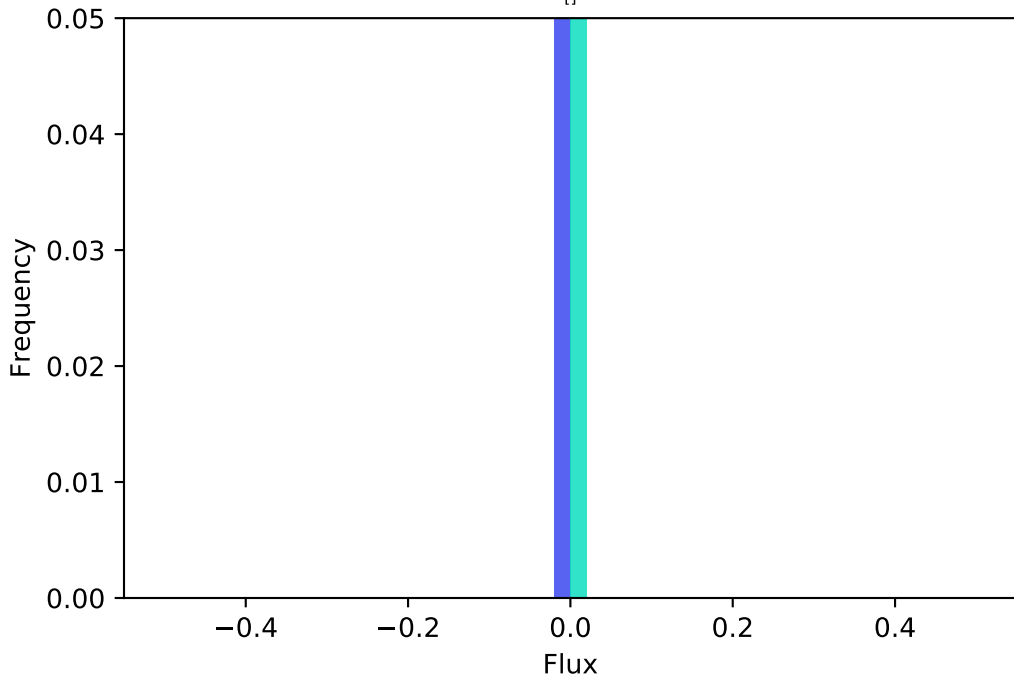
306 : CDP_c + TRXrd_c --> H2O_c + TRXox_c + dCDP_c
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307 : GDP_c + TRXrd_c --> H2O_c + TRXox_c + dGDP_c
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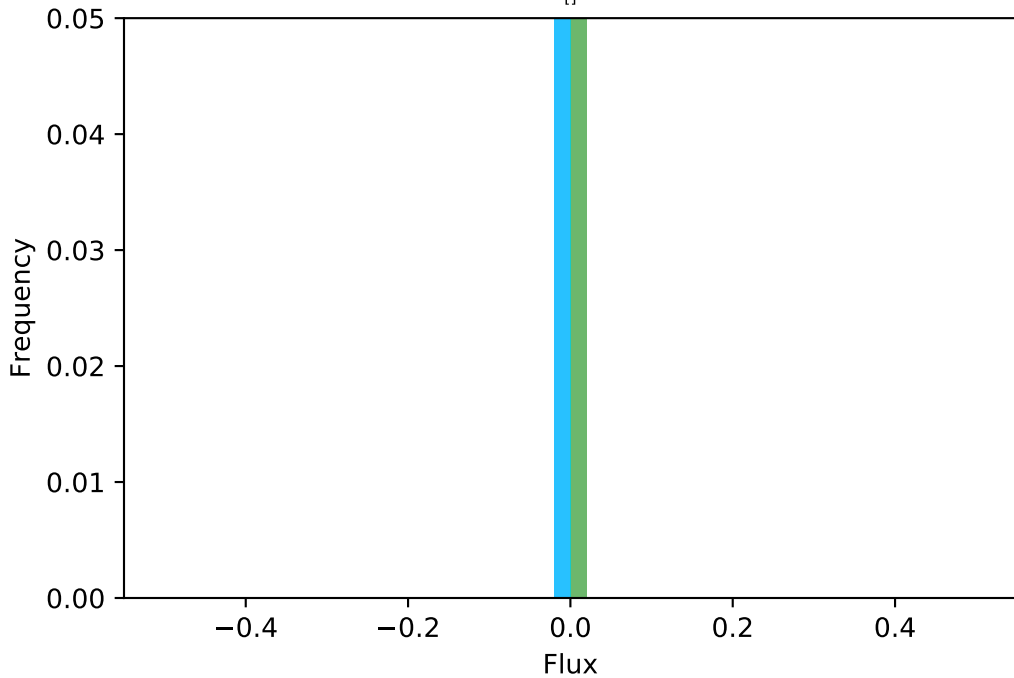
308 : TRXrd_c + UDP_c --> H2O_c + TRXox_c + dUDP_c
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309 : H2O_c + dUTP_c --> 2.0 H_c + PPi_c + dUMP_c
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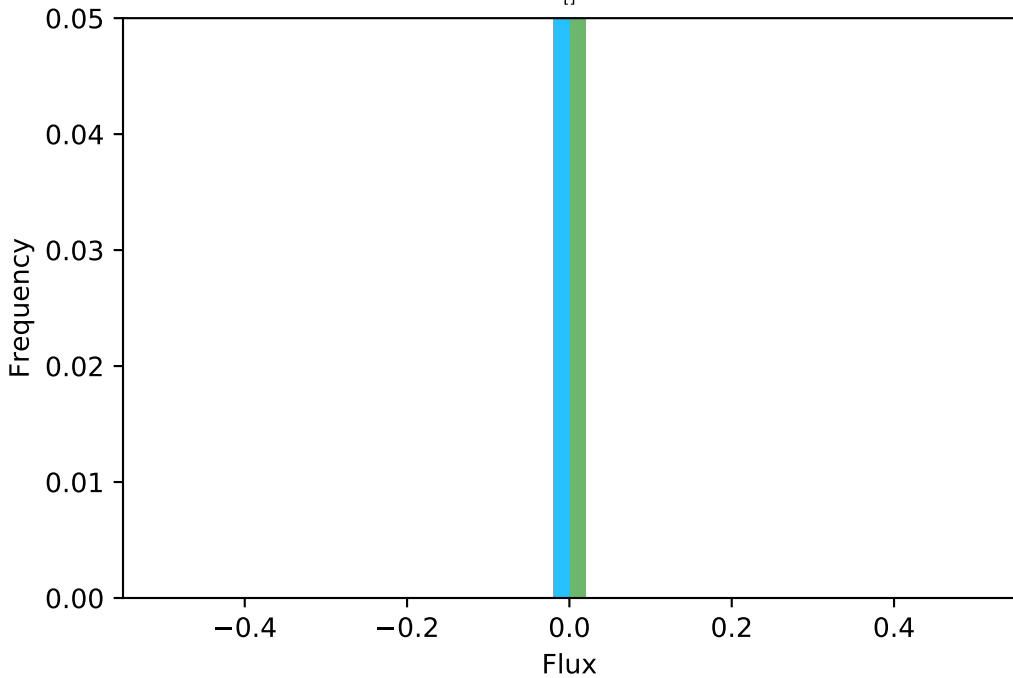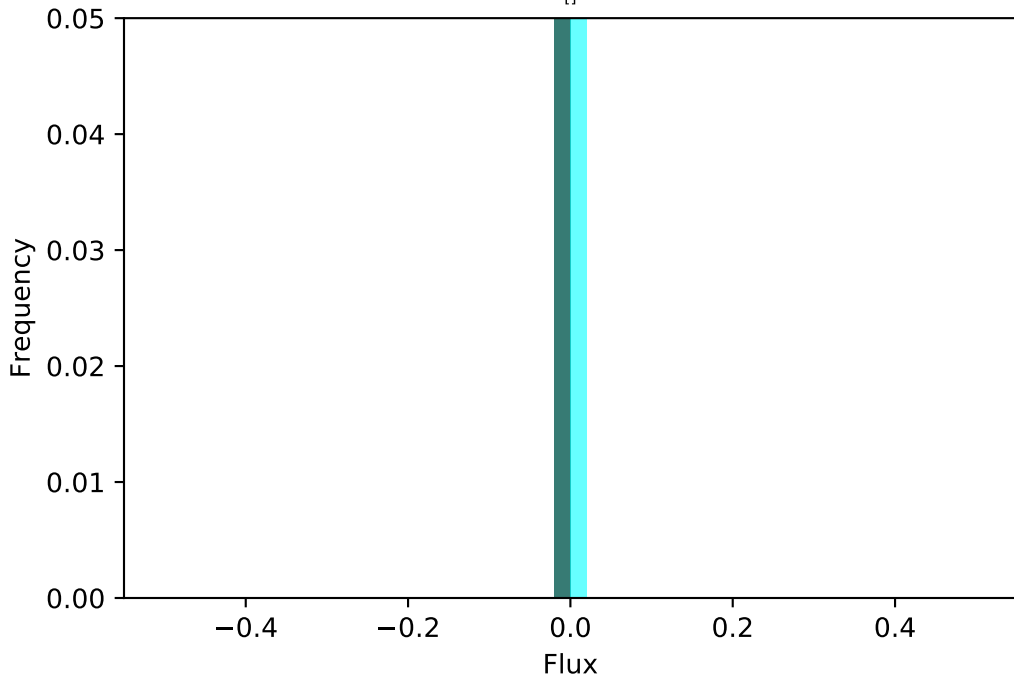
310 : M_DASH_THF_c + dUMP_c --> DHF_c + dTMP_c
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311 : ATP_c + H_c + dTMP_c --> ADP_c + dTDP_c
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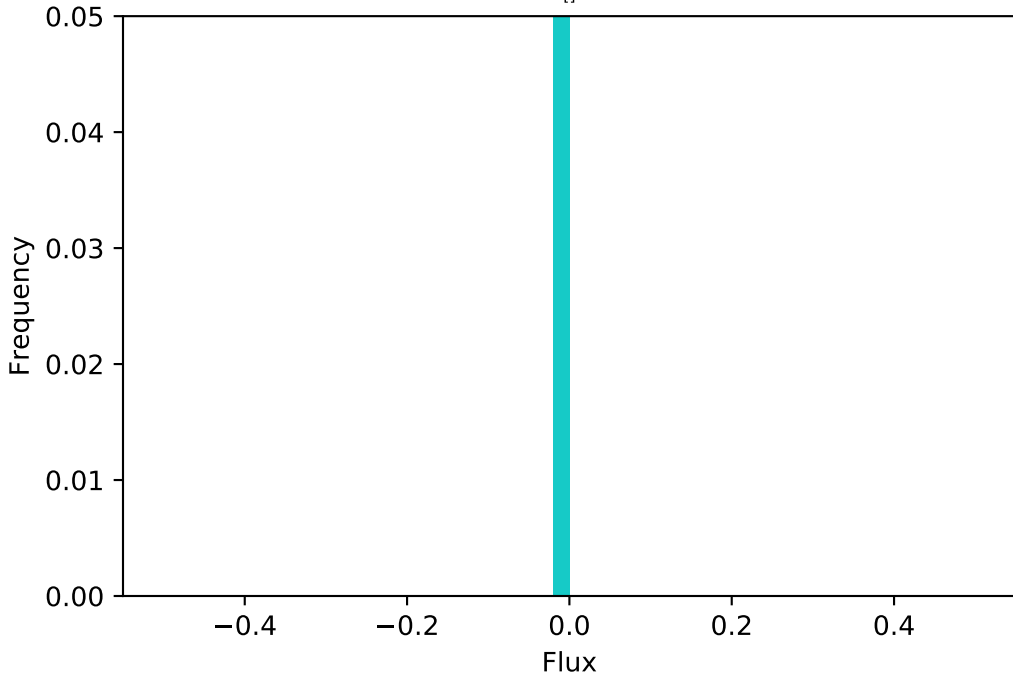
312 : ATP_c + GDP_c --> ADP_c + GTP_c + H_c
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313 : ATP_h + GDP_h --> ADP_h + GTP_h + H_h
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314 : ATP_c + UDP_c --> ADP_c + H_c + UTP_c
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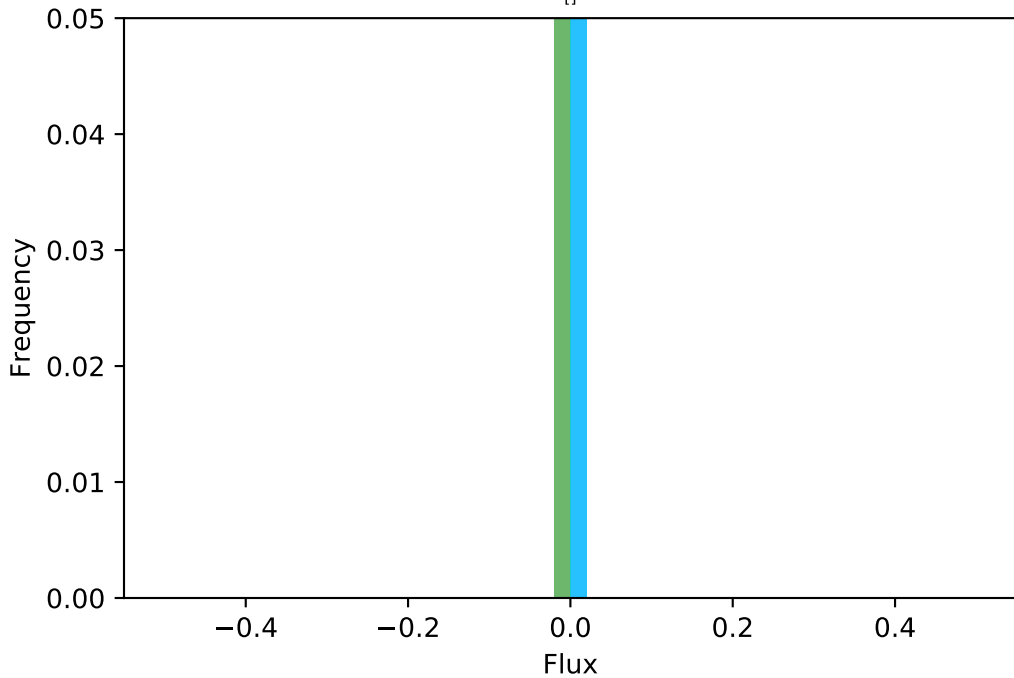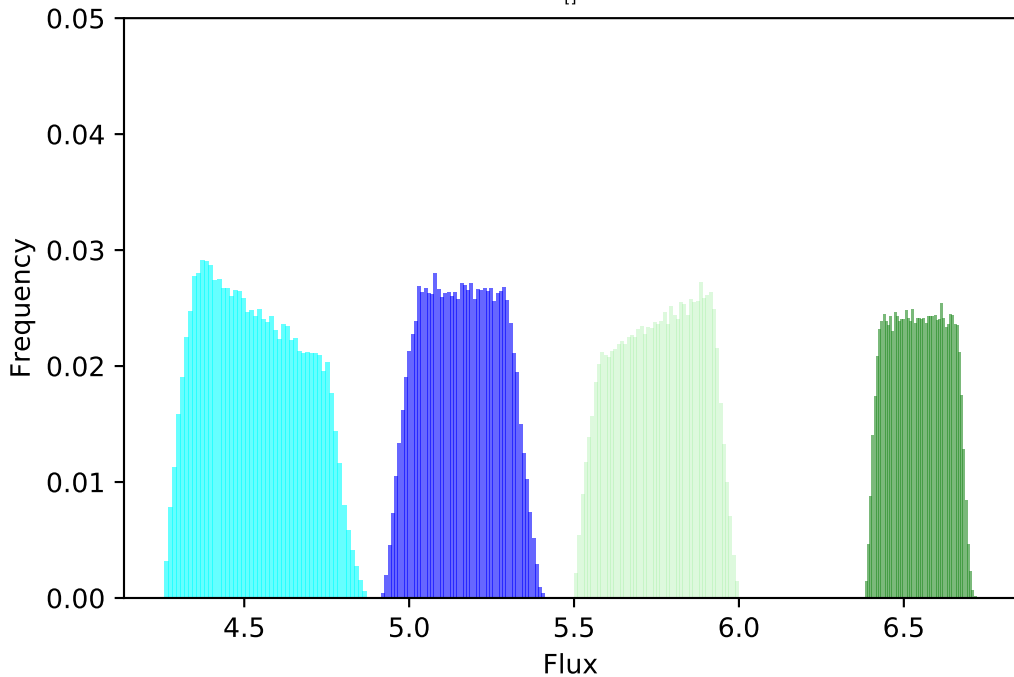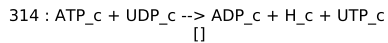
315 : ATP_c + dADP_c --> ADP_c + dATP_c
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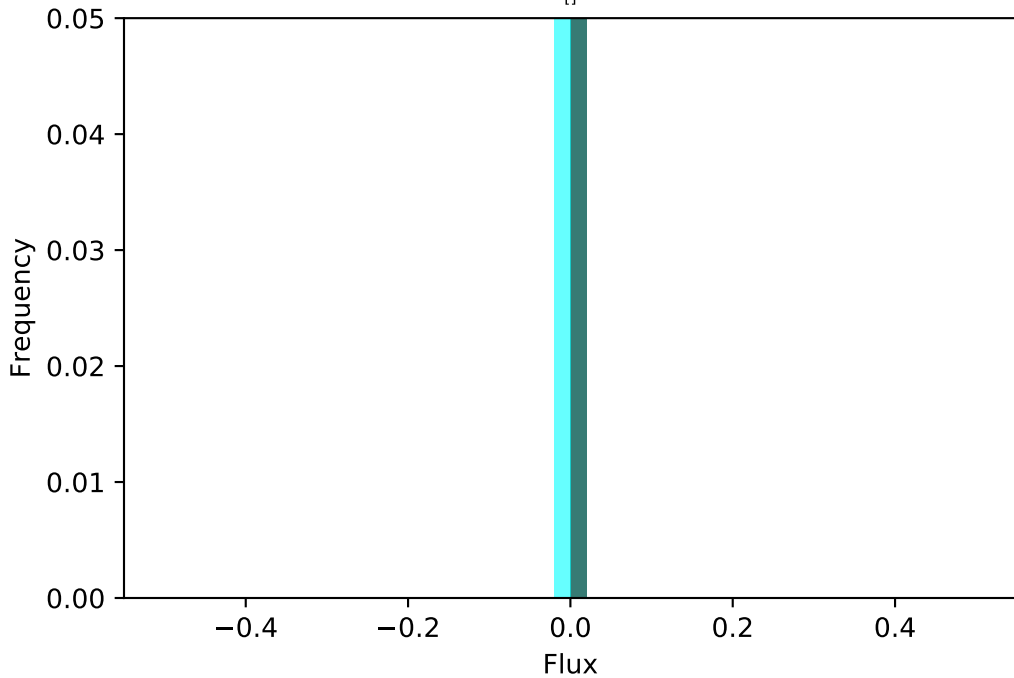
316 : ATP_c + dCDP_c --> ADP_c + dCTP_c
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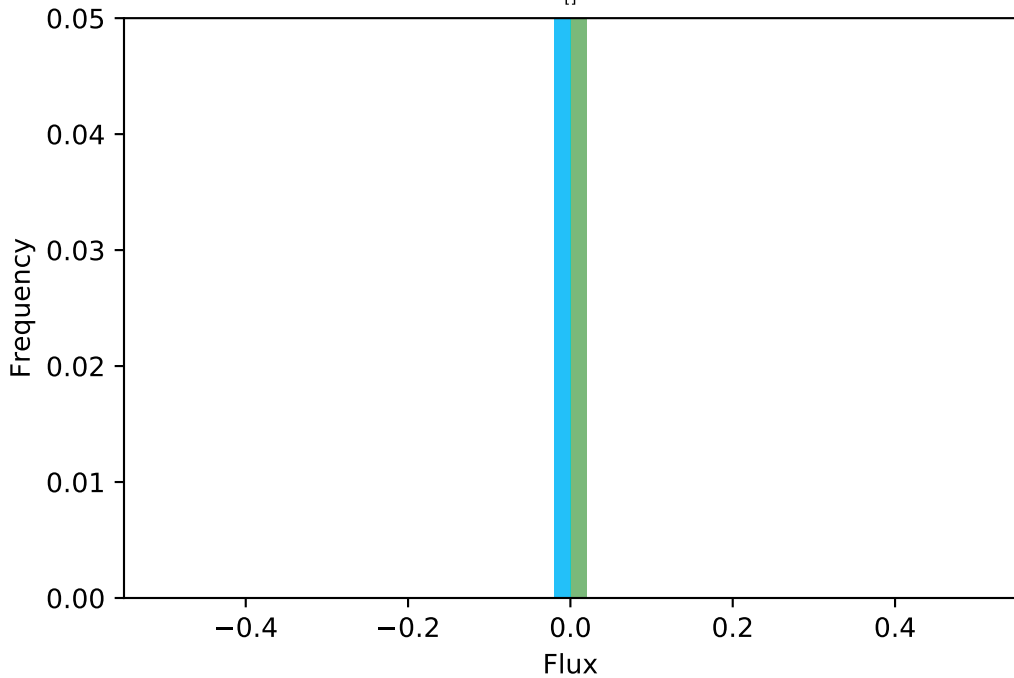
317 : ATP_c + dGDP_c --> ADP_c + dGTP_c
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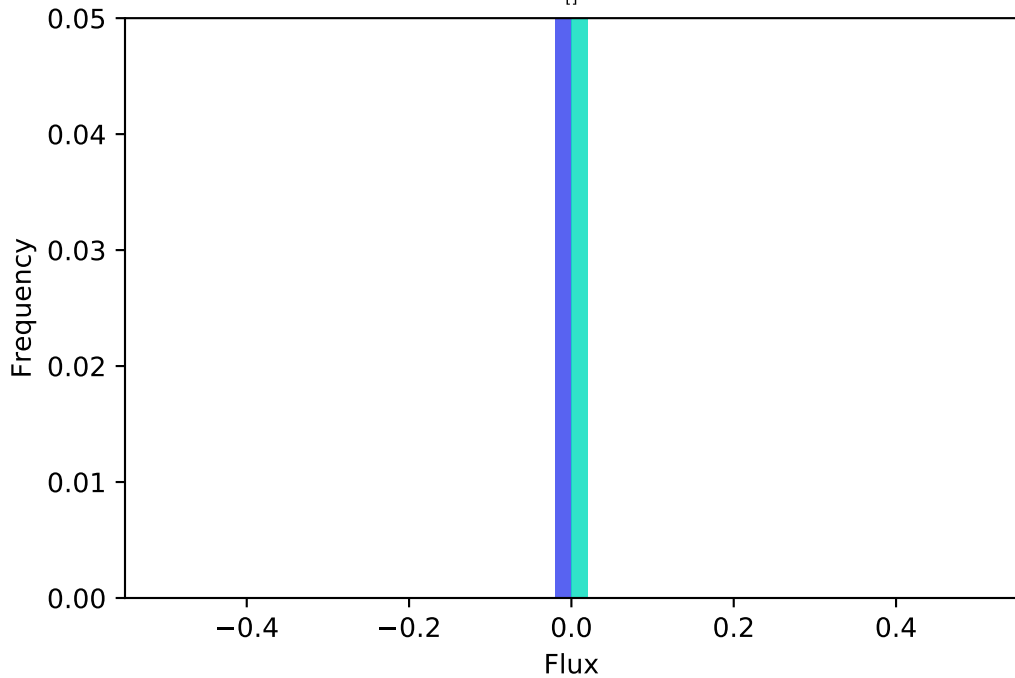
318 : ATP_c + dTDP_c --> ADP_c + dTTP_c
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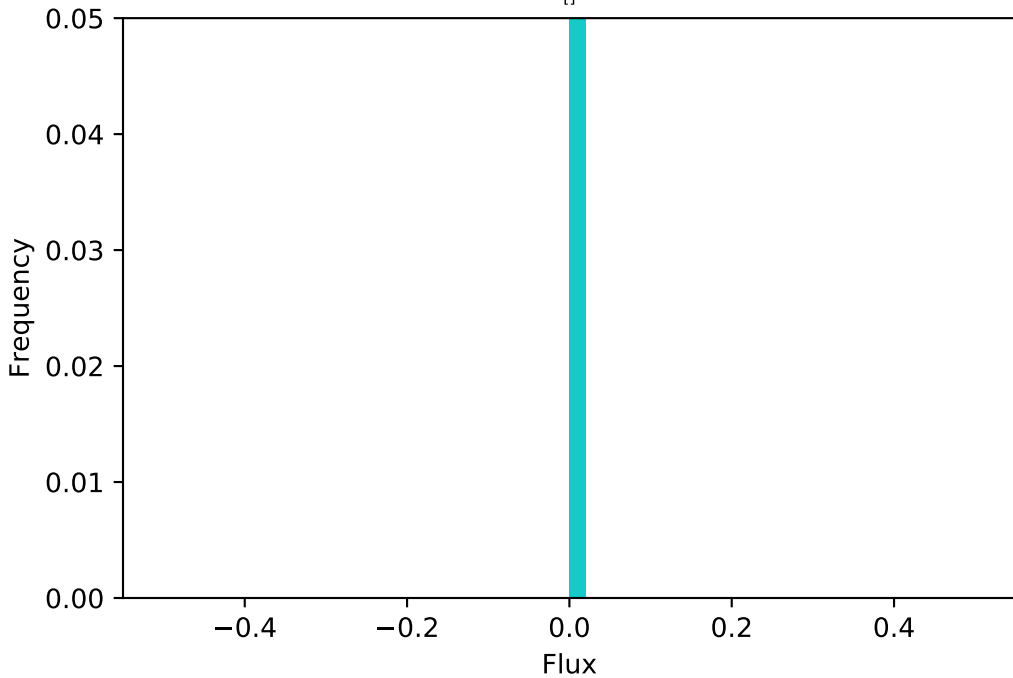
319 : ATP_c + dUDP_c --> ADP_c + dUTP_c
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320 : SO4_c <=> SO4_h
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321 : NO2_c --> NO2_h
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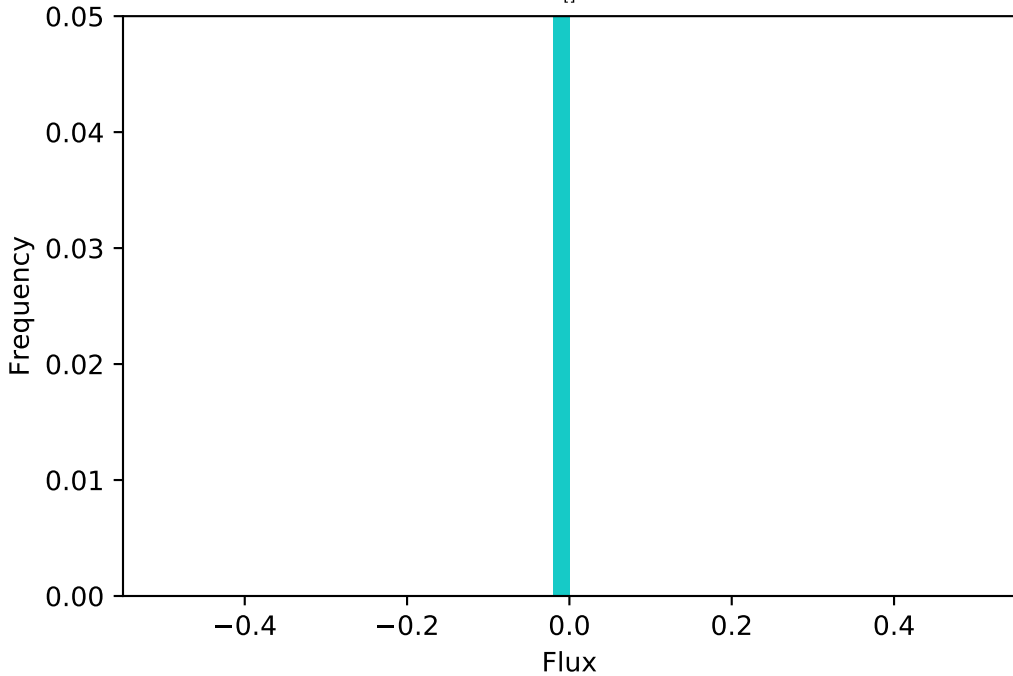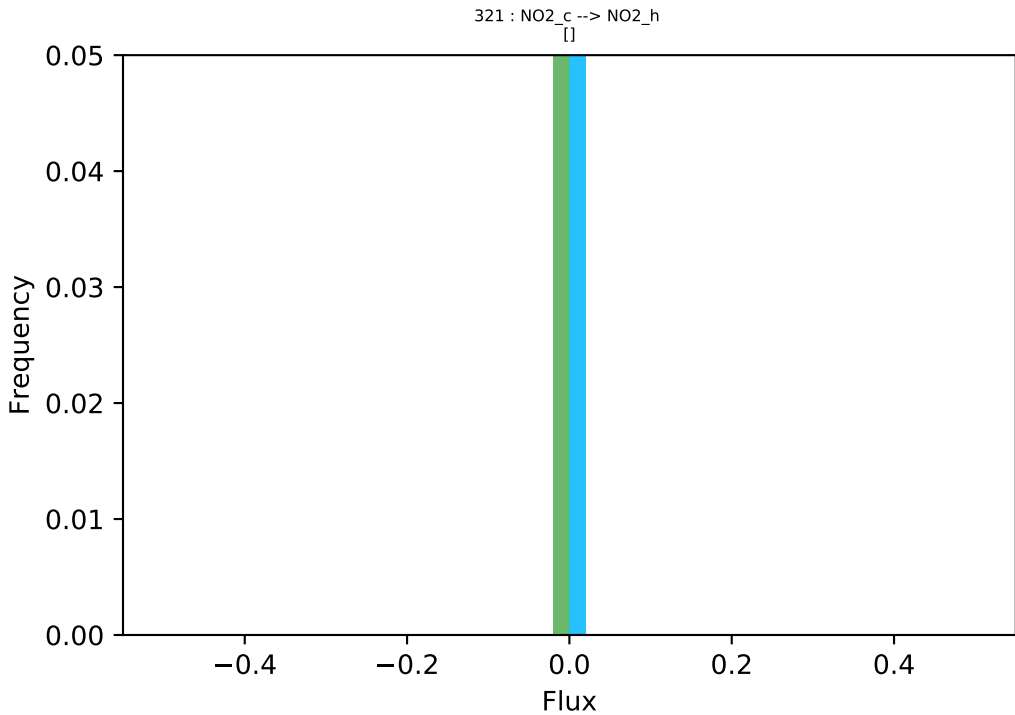
322 : ADP_h + ATP_c + Pi_h --> ADP_c + ATP_h + Pi_c
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323 : ADP_c + ATP_m + Pi_c --> ADP_m + ATP_c + Pi_m

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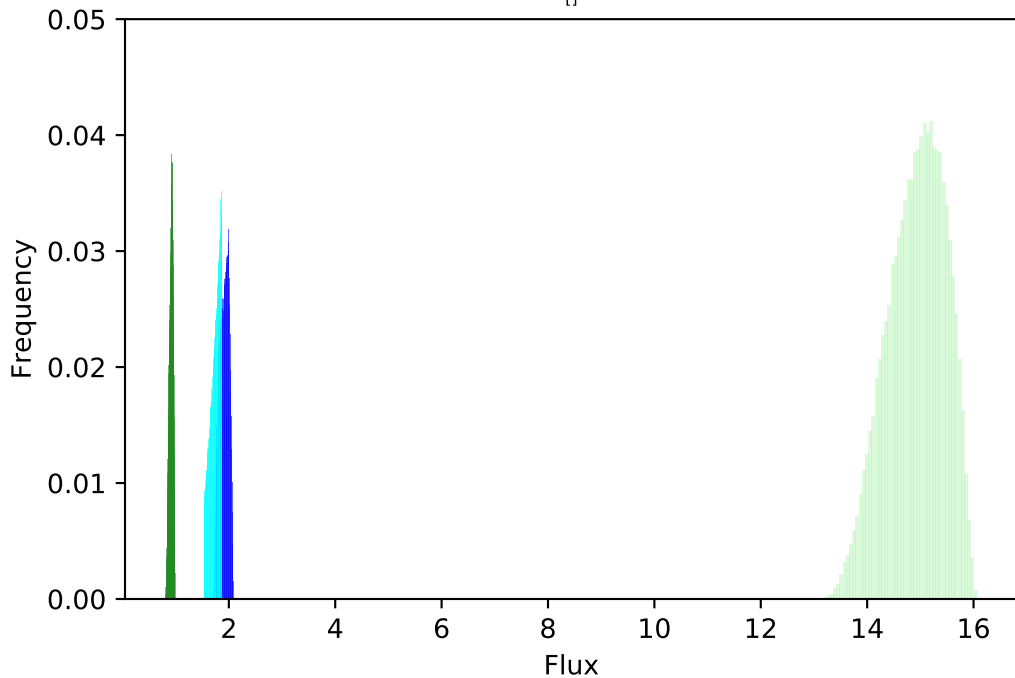
324 : AMP_h --> AMP_c
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325 : ADP_h --> ADP_c
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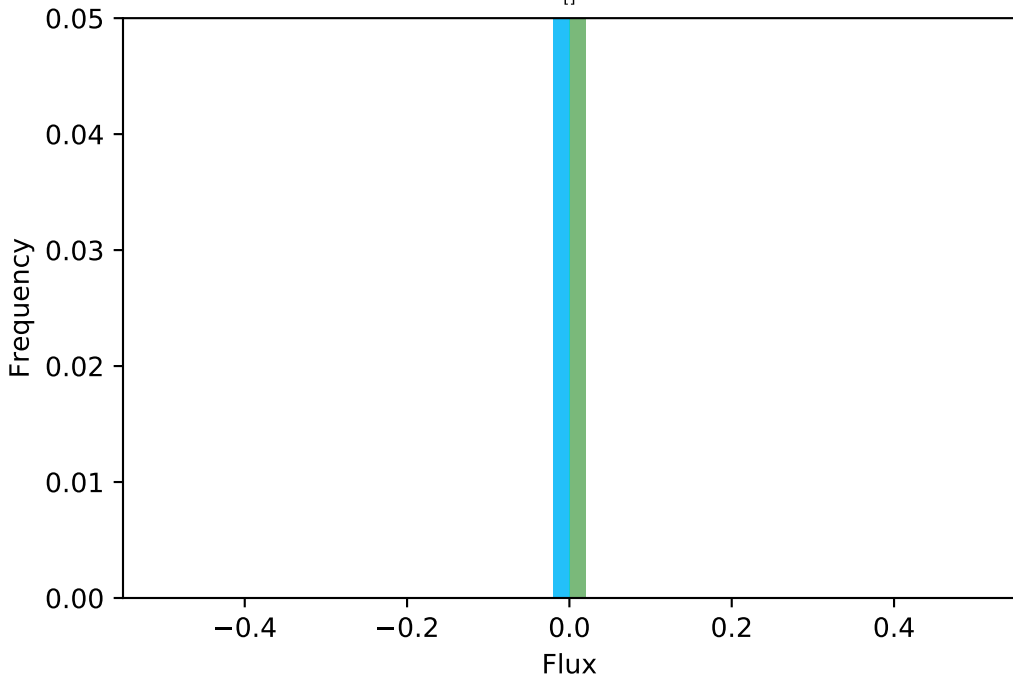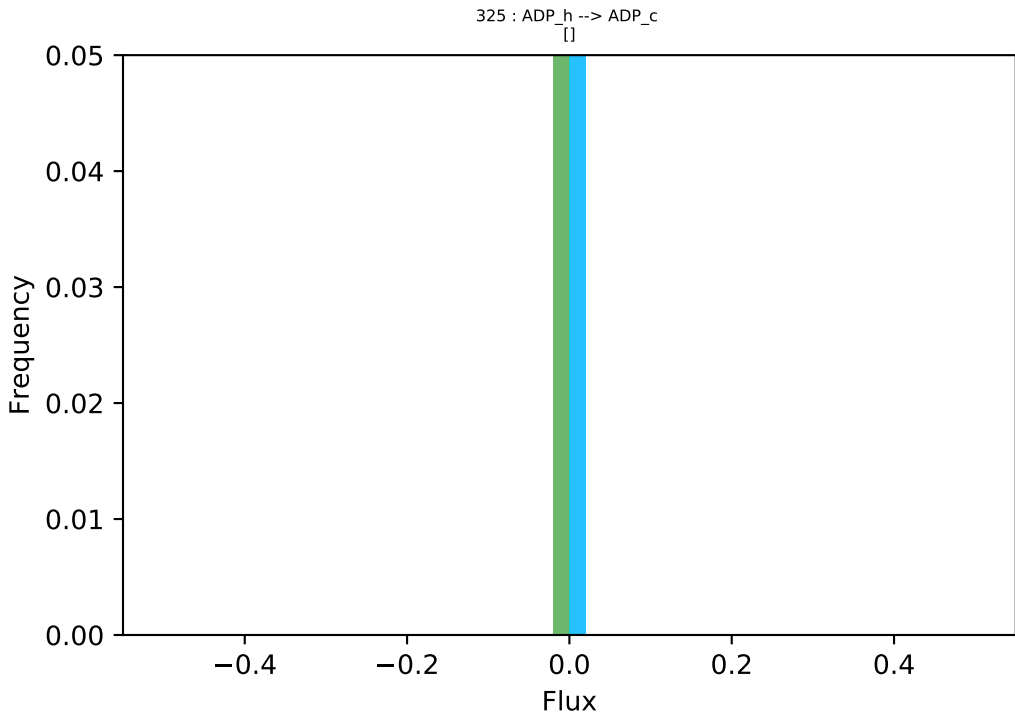
326 : ATP_h --> ATP_c
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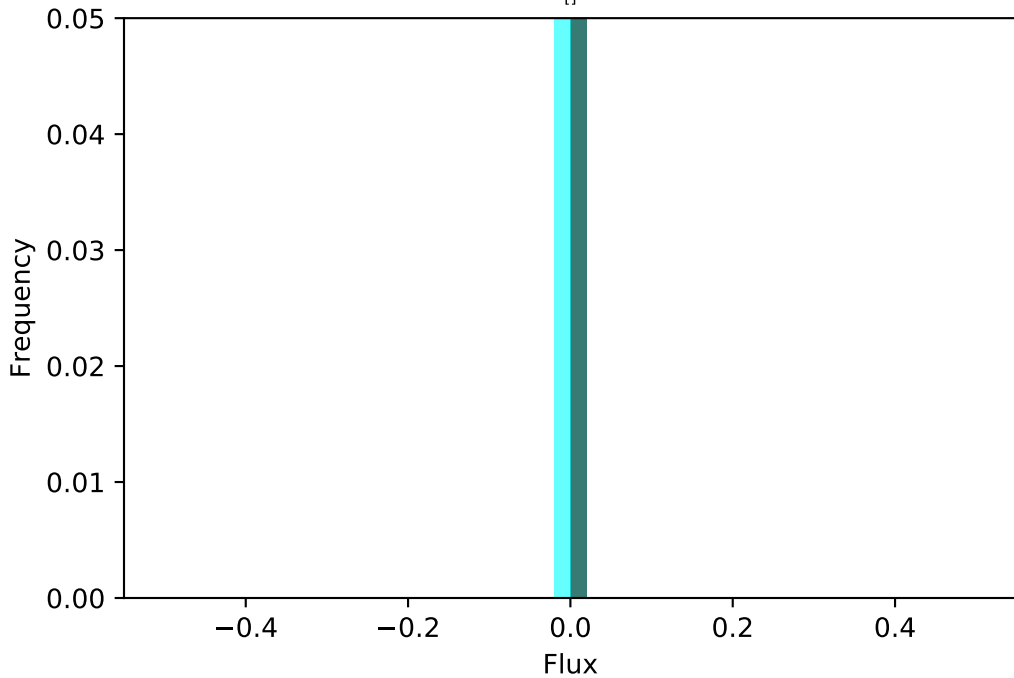
327 : AMP_h + NAD_c --> AMP_c + NAD_h
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328 : ADP_h + NAD_c <=> ADP_c + NAD_h
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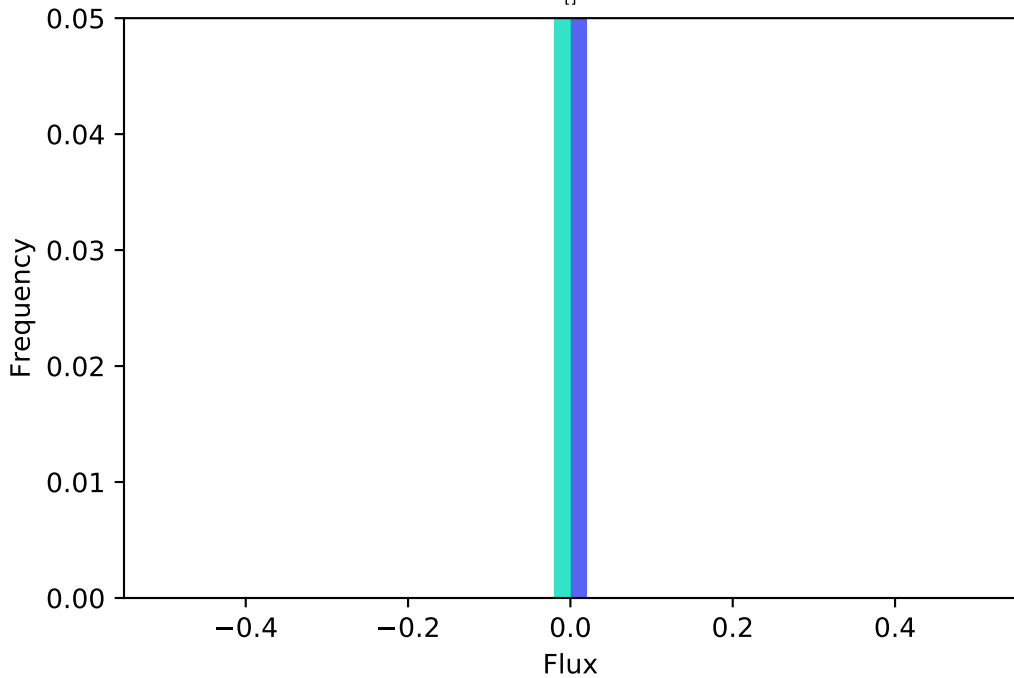
329 : PGA_h + Pi_c --> PGA_c + Pi_h
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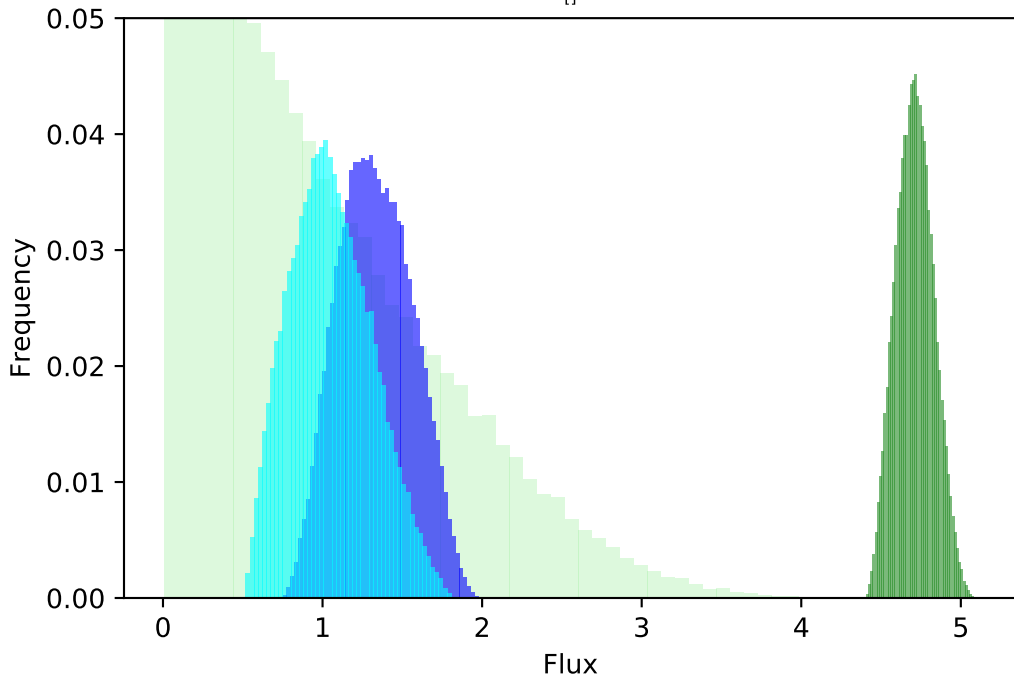
330 : GAP_h + Pi_c --> GAP_c + Pi_h
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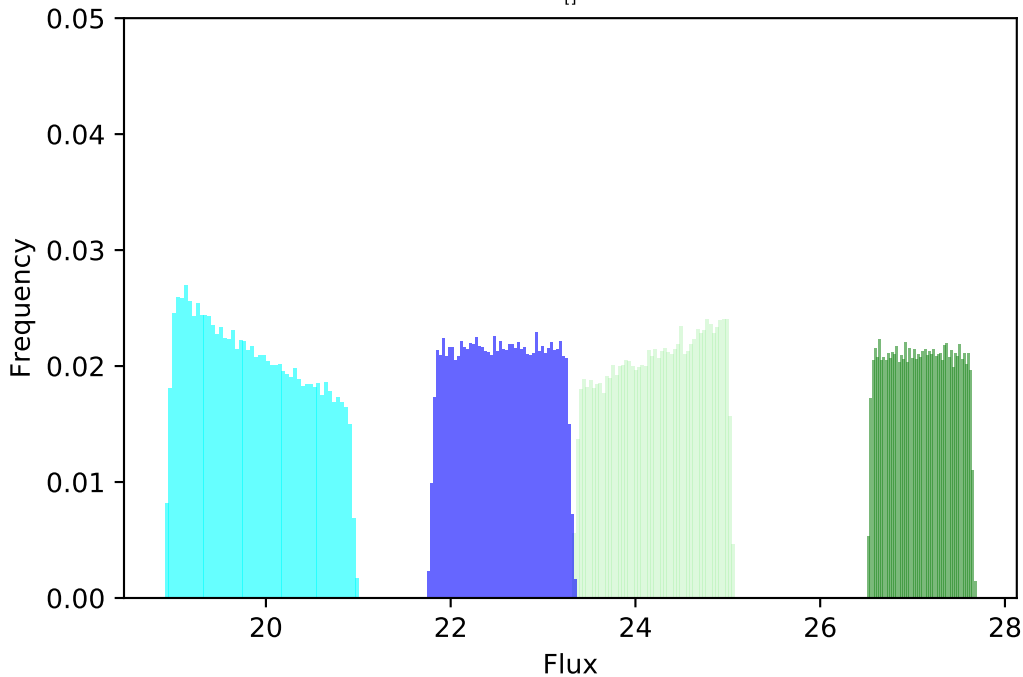
331 : DHAP_h + Pi_c --> DHAP_c + Pi_h
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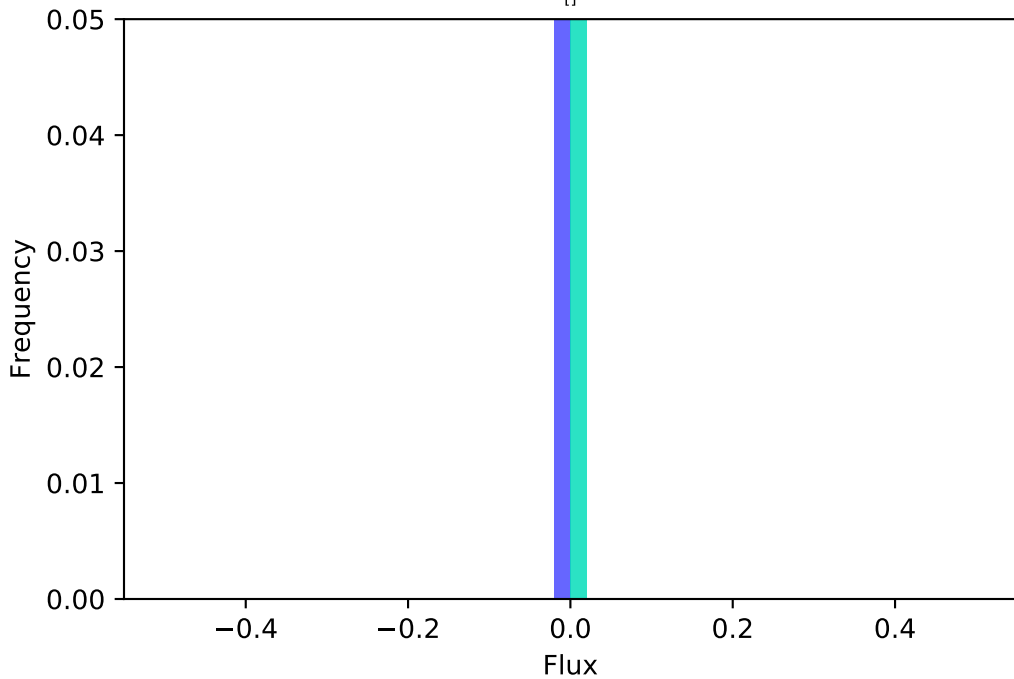
332 : PEP_c + Pi_h --> PEP_h + Pi_c
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333 : GCA_h --> GCA_c
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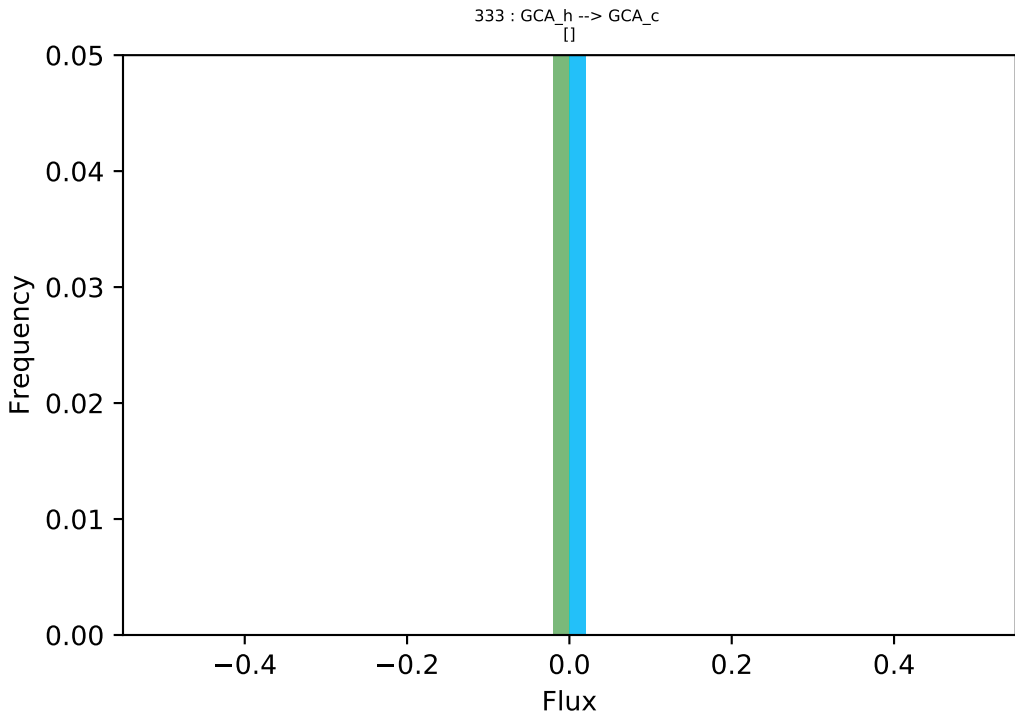
334 : GCEA_c --> GCEA_h
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335 : G6P_c + Pi_h --> G6P_h + Pi_c
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336 : Glc_h --> Glc_c
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337 : Mas_h --> Mas_c
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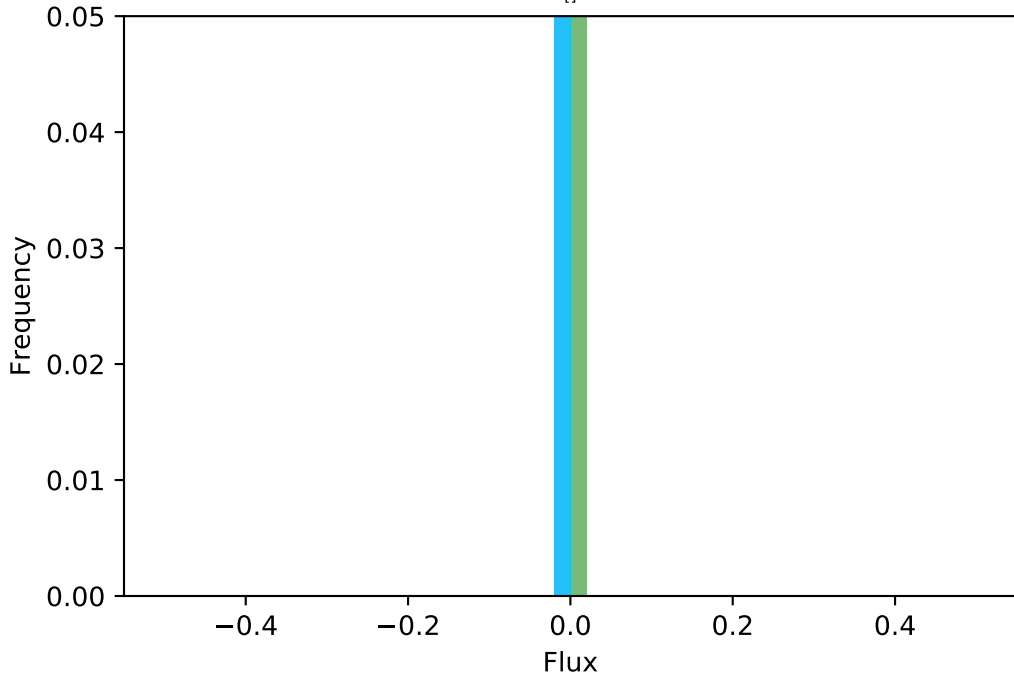
338 : Rib_c --> Rib_h
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339 : Mal_c + Pi_m <=> Mal_m + Pi_c
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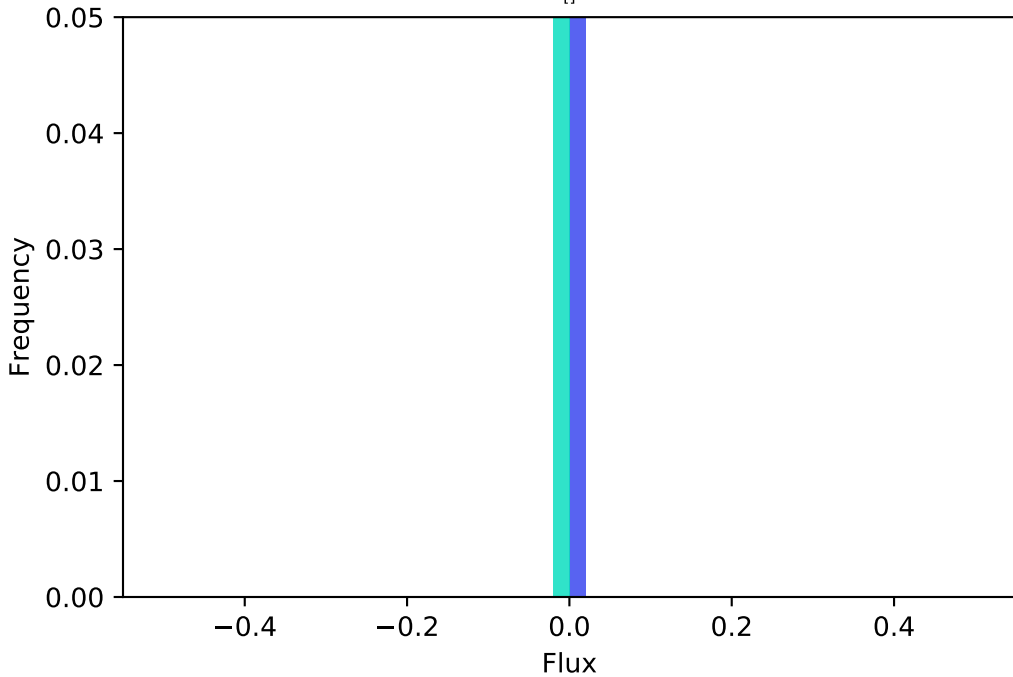
340 : Pi_m + SCA_c <=> Pi_c + SCA_m
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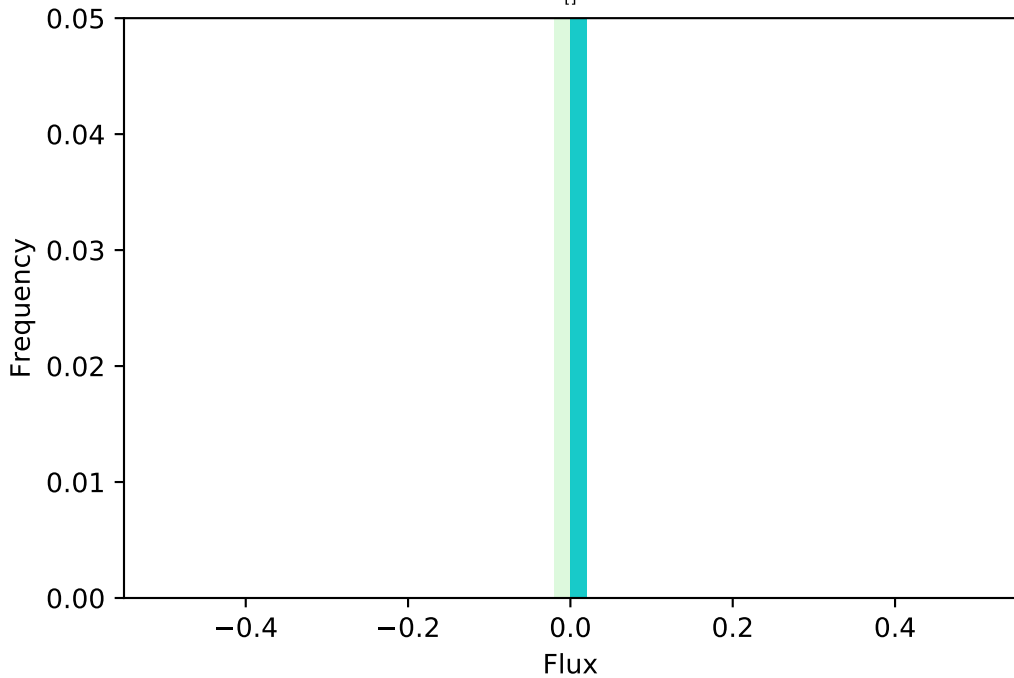
341 : KG_c + Mal_h --> KG_h + Mal_c
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342 : Glu_h + Mal_c --> Glu_c + Mal_h
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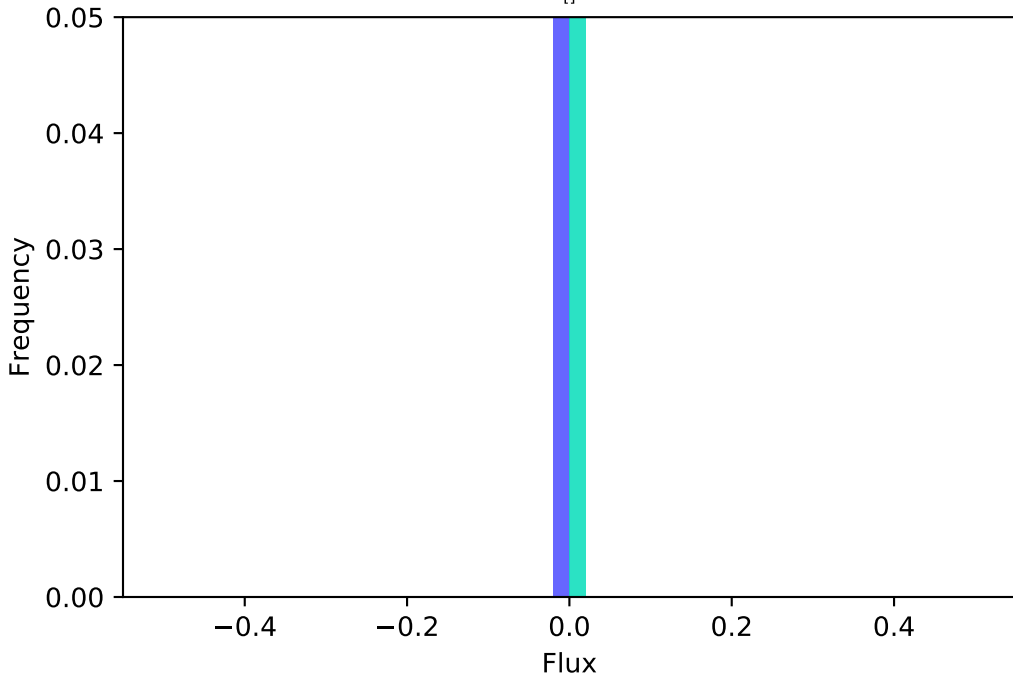
343 : Cit_m + KG_c --> Cit_c + KG_m
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344 : KG_c + iCit_m --> KG_m + iCit_c
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345 : KG_c + cACN_m --> KG_m + cACN_c
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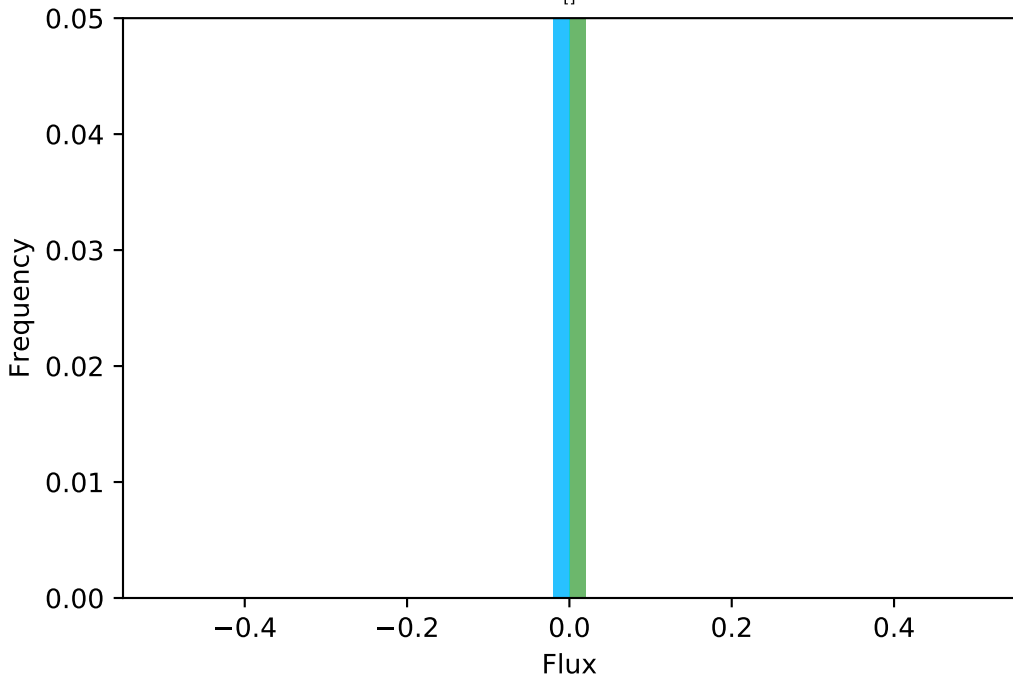
346 : Cit_m + Mal_c --> Cit_c + Mal_m
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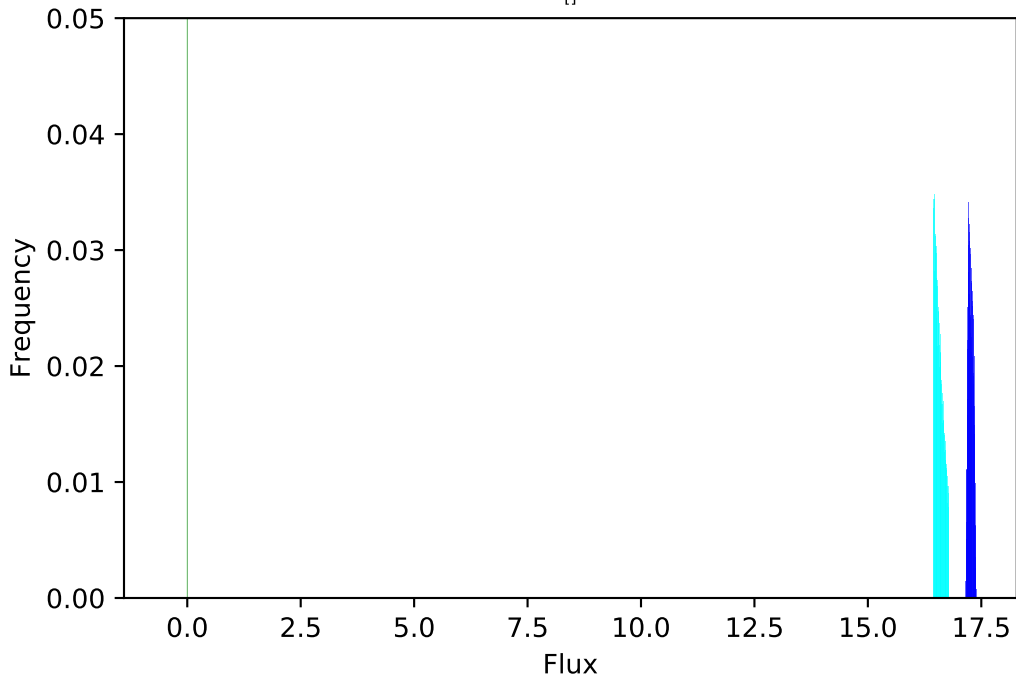
347 : Mal_c + iCit_m <=> Mal_m + iCit_c
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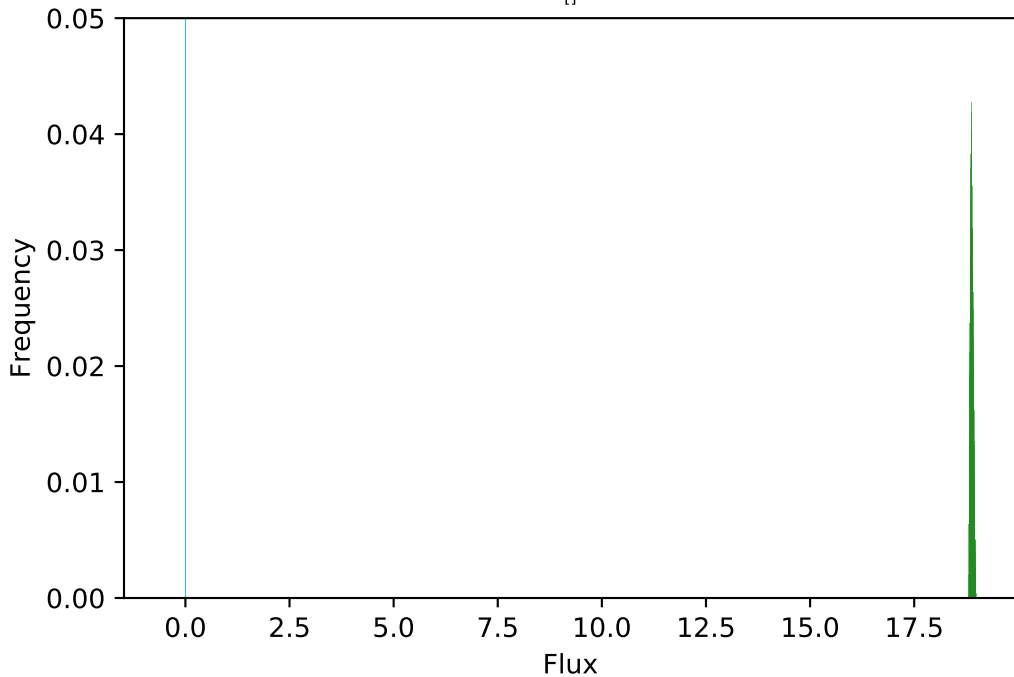
348 : Mal_c + cACN_m <=> Mal_m + cACN_c
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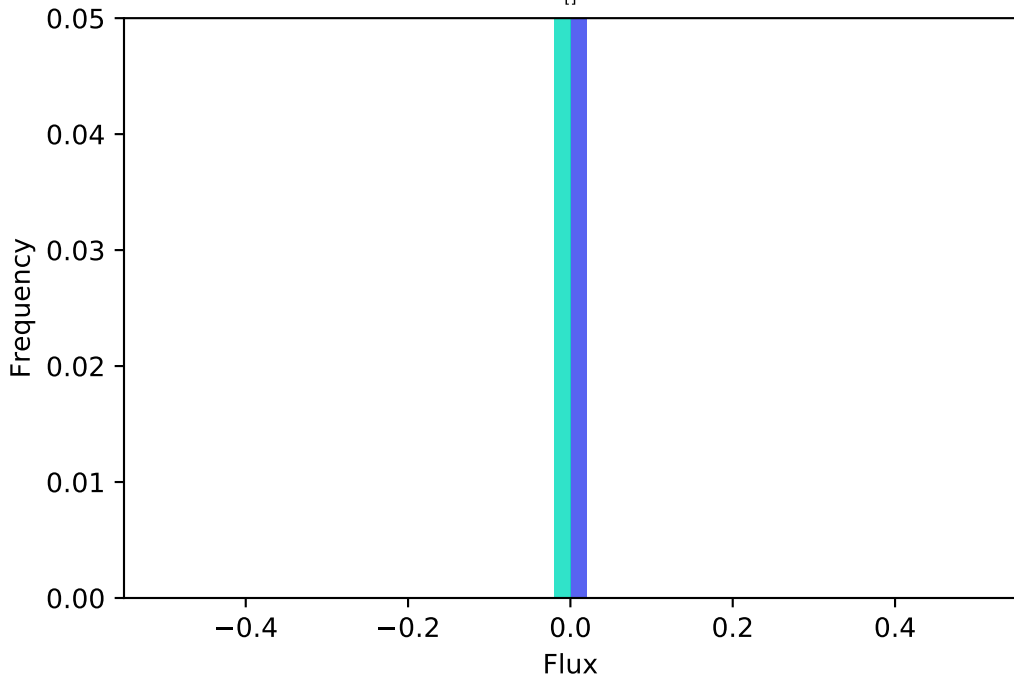
349 : Cit_m + OAA_c <=> Cit_c + OAA_m
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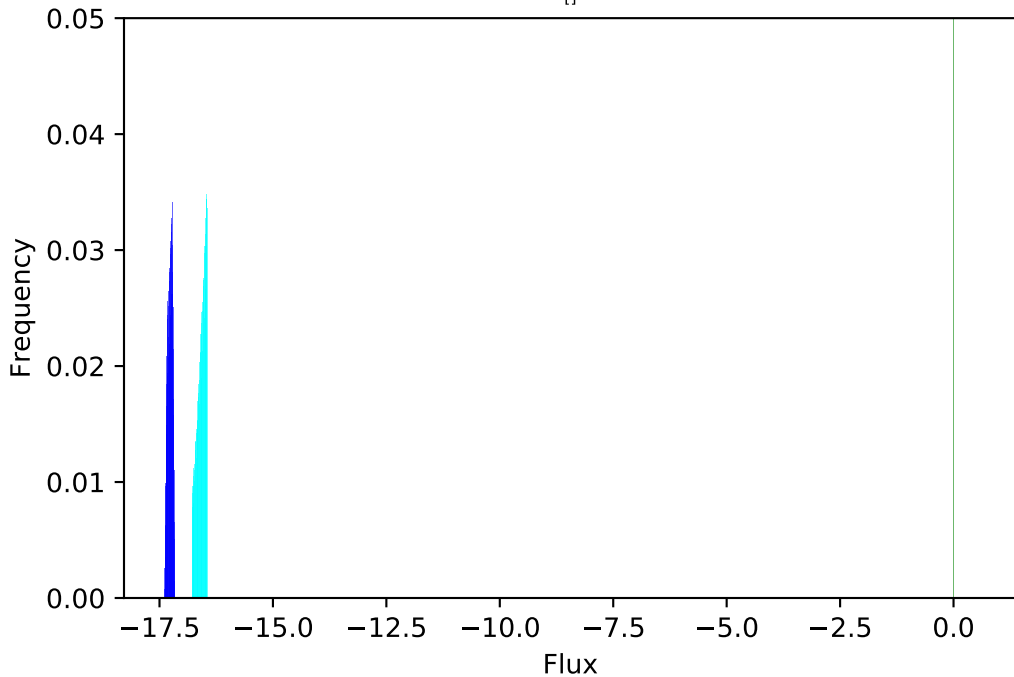
350 : OAA_c + iCit_m --> OAA_m + iCit_c
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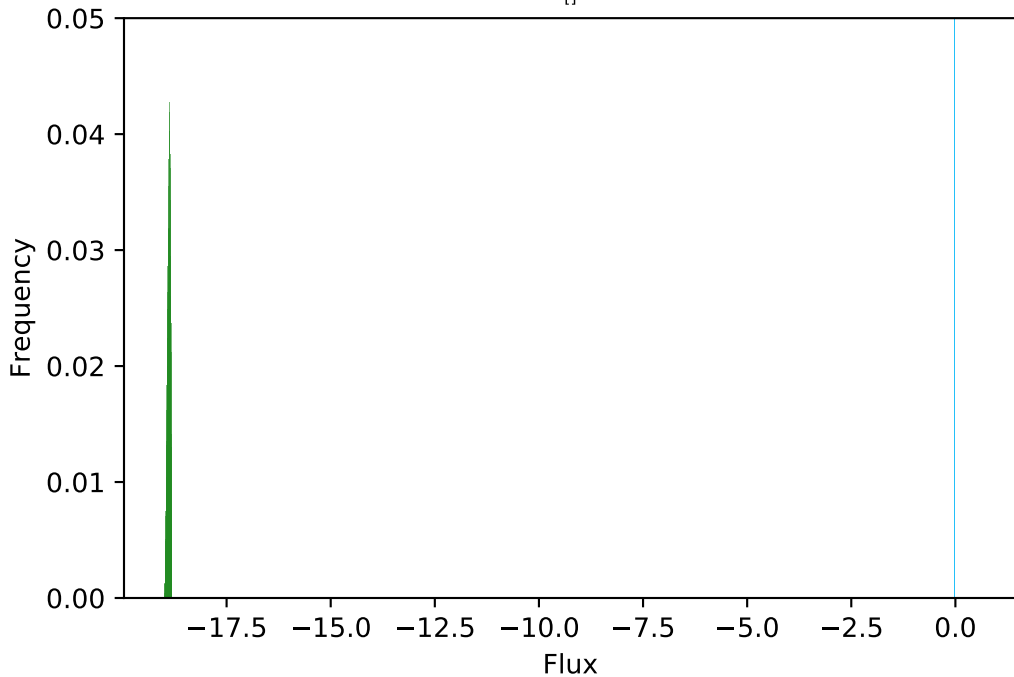
351 : OAA_c + cACN_m <=> OAA_m + cACN_c
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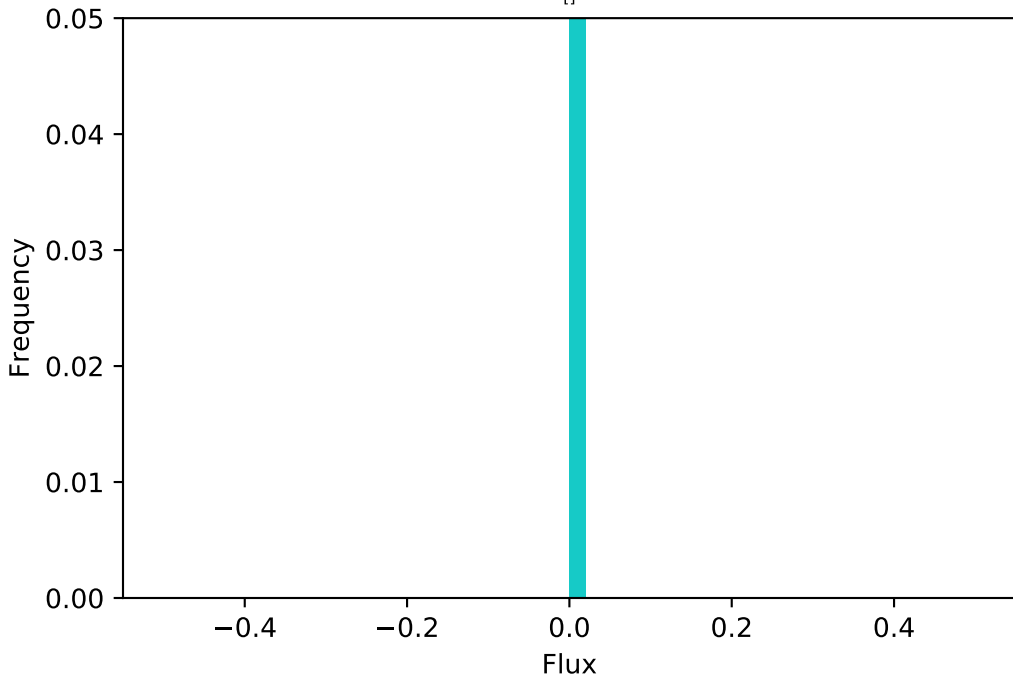
352 : Cit_m + SCA_c --> Cit_c + SCA_m
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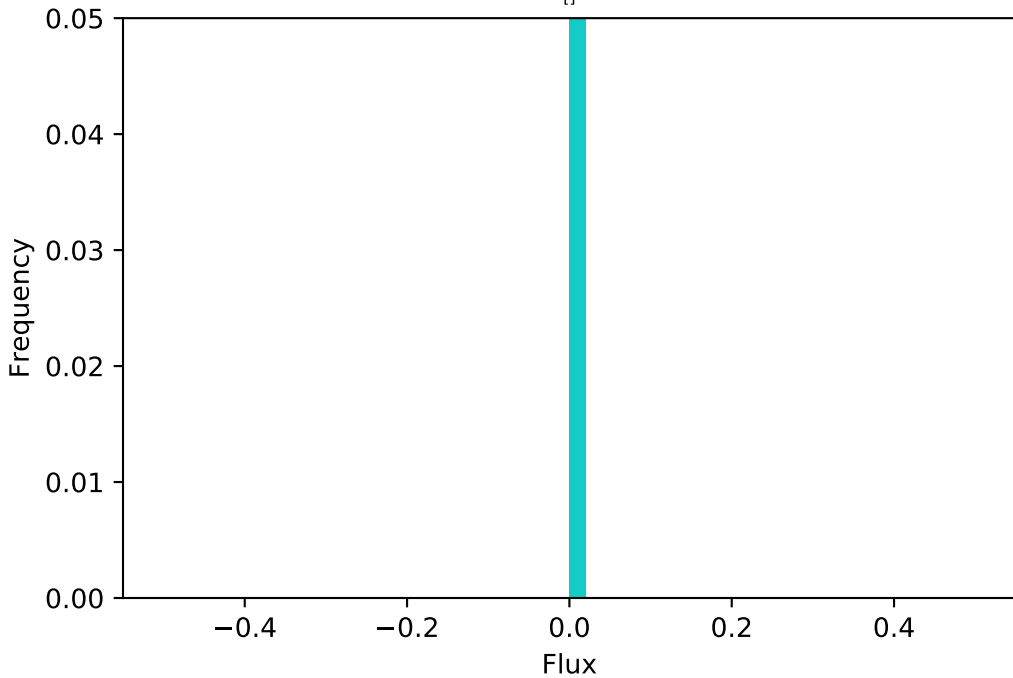
353 : SCA_c + iCit_m --> SCA_m + iCit_c
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354 : SCA_c + cACN_m --> SCA_m + cACN_c
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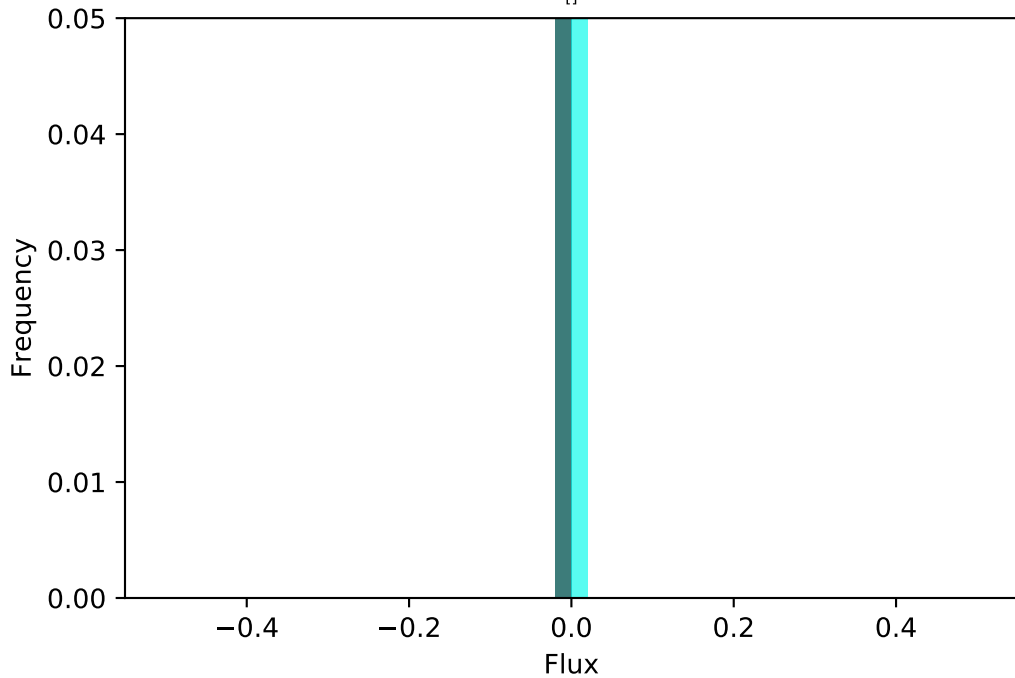
355 : Fum_m + SCA_c --> Fum_c + SCA_m
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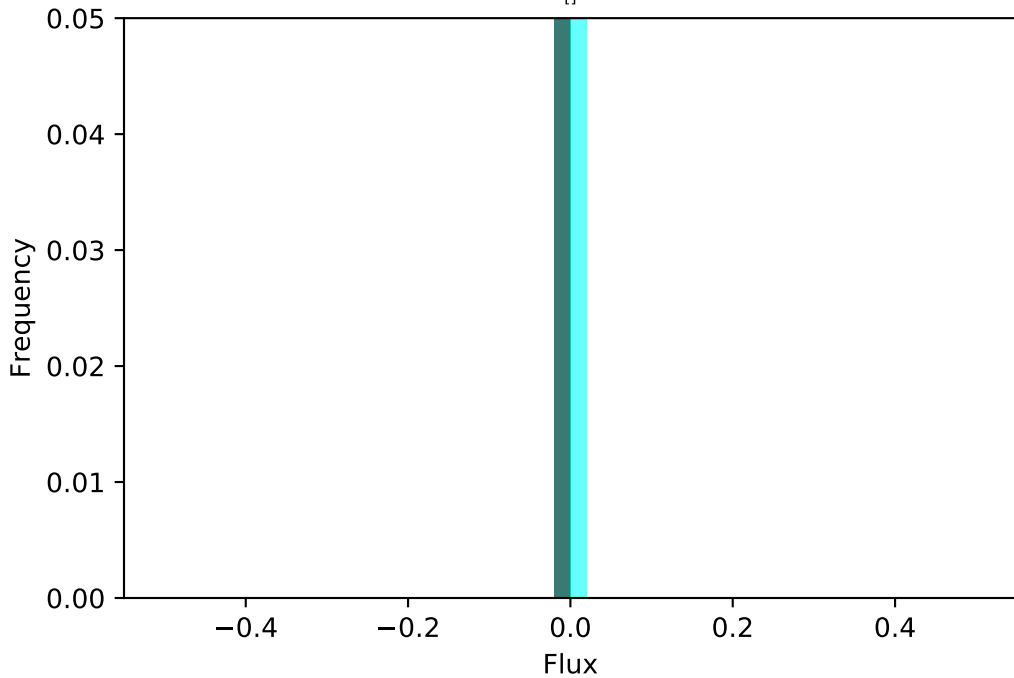
356 : Ala_c <=> Ala_m
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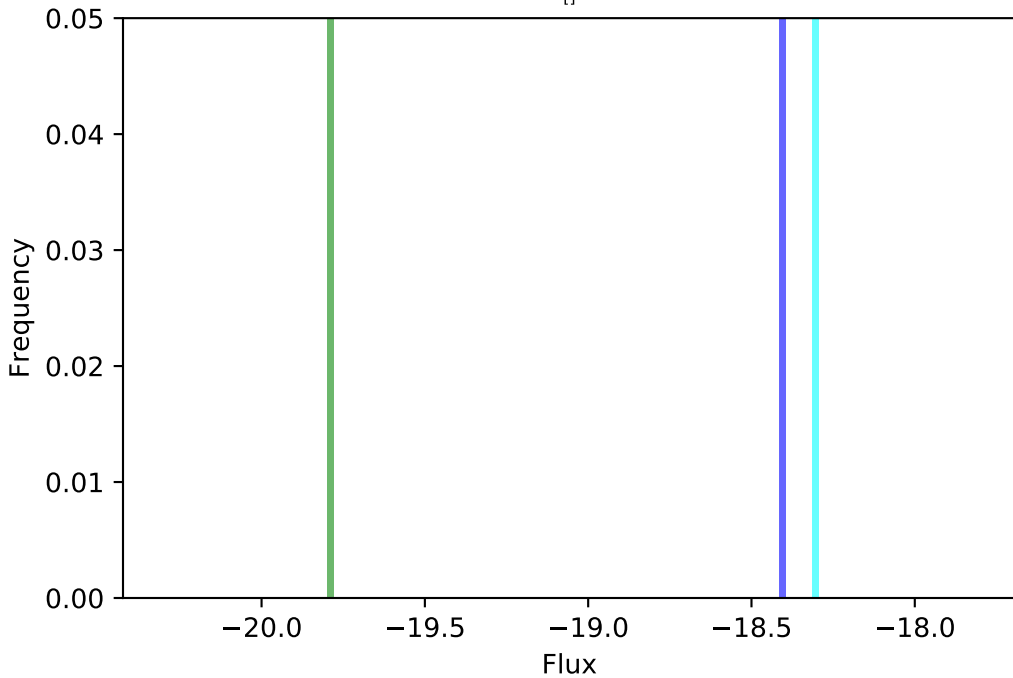
357 : Arg_c <=> Arg_m
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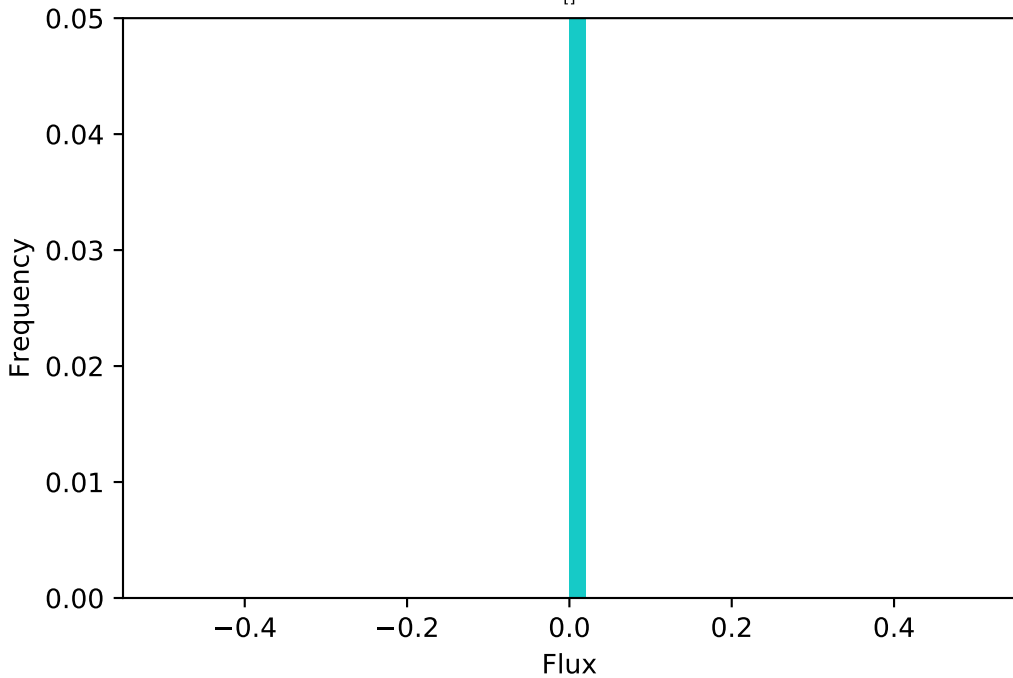
358 : Glu_c <=> Glu_m

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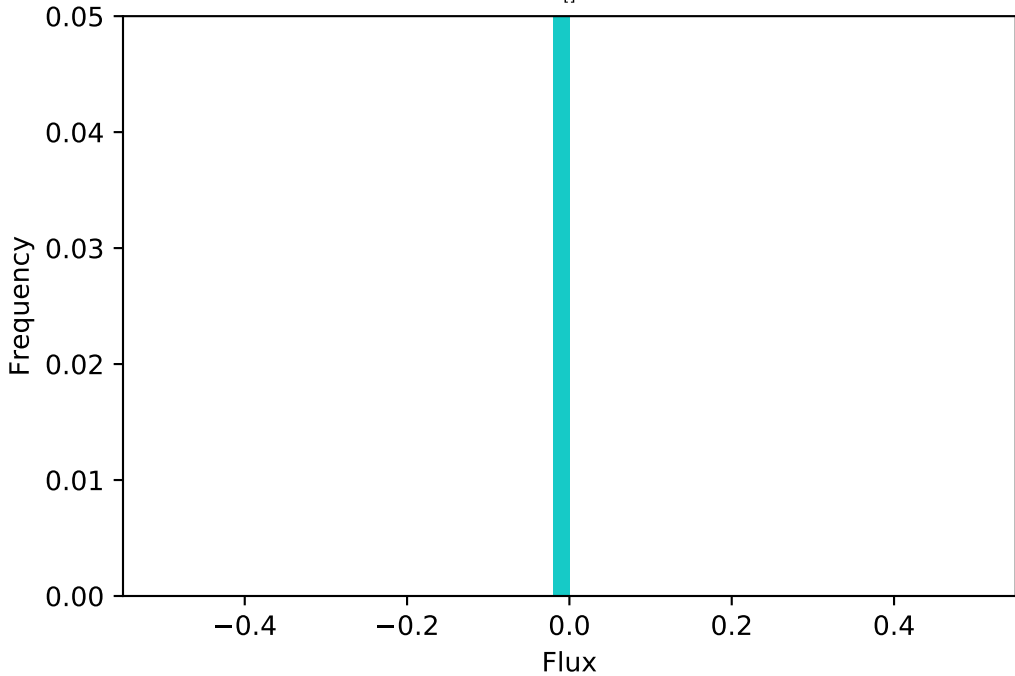
359 : Lys_c --> Lys_m
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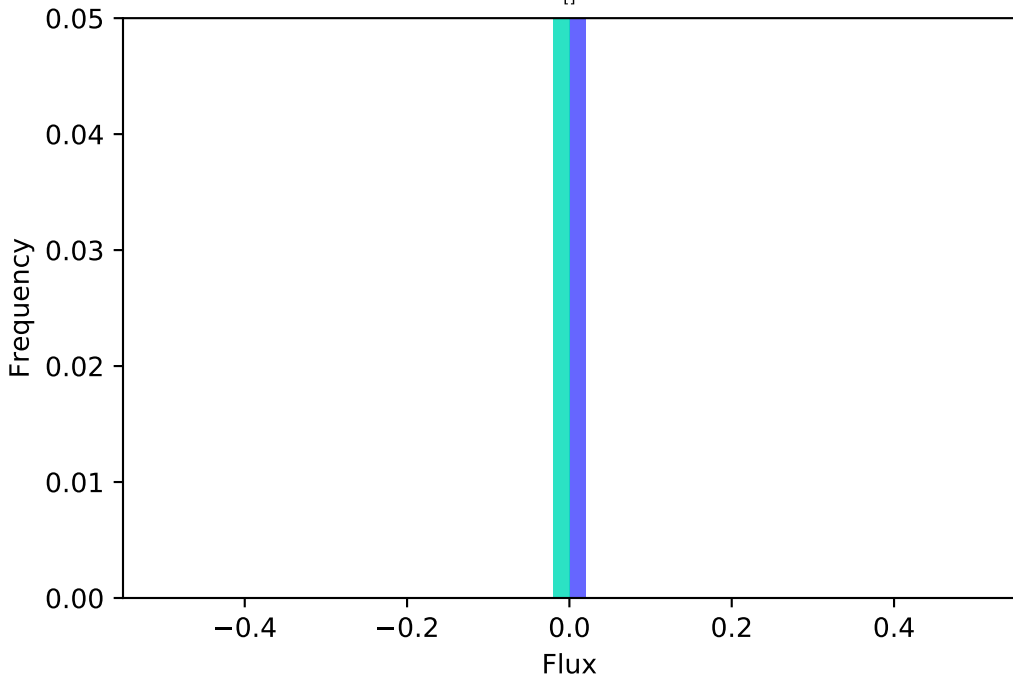
360 : GABA_c <=> GABA_m
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361 : Arg_c + His_m --> Arg_m + His_c
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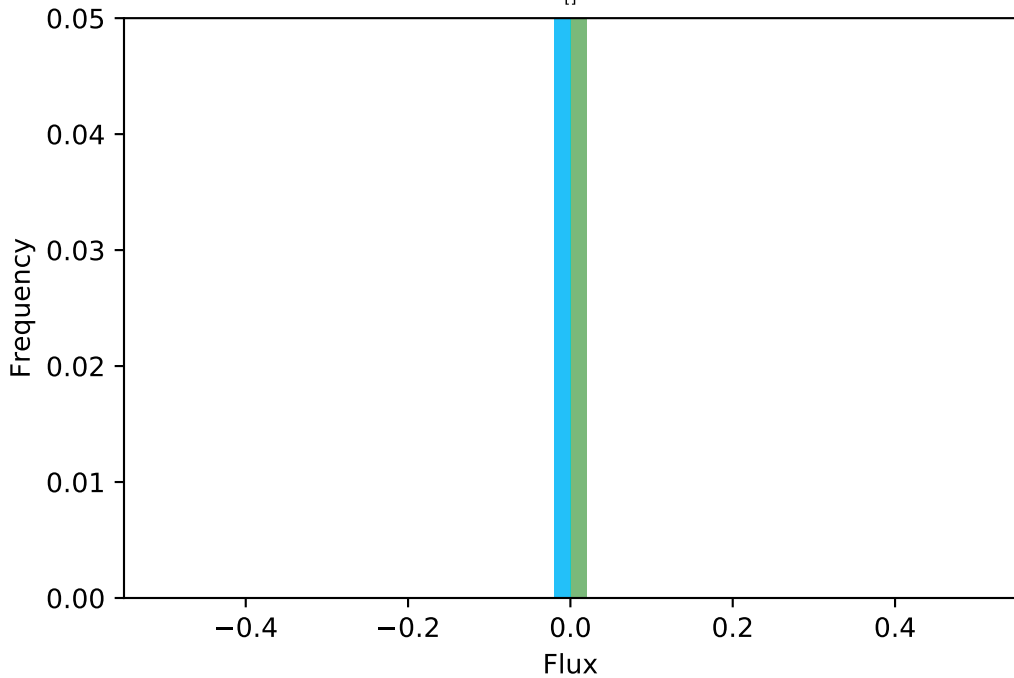
362 : Arg_c + Lys_m --> Arg_m + Lys_c
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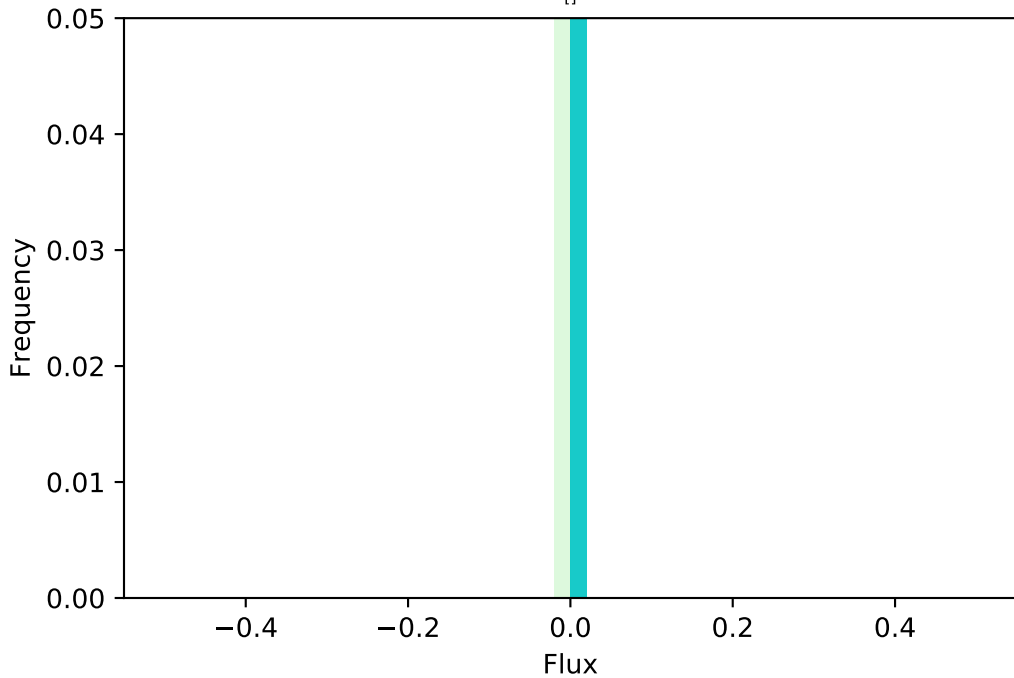
363 : Pro_c --> Pro_m
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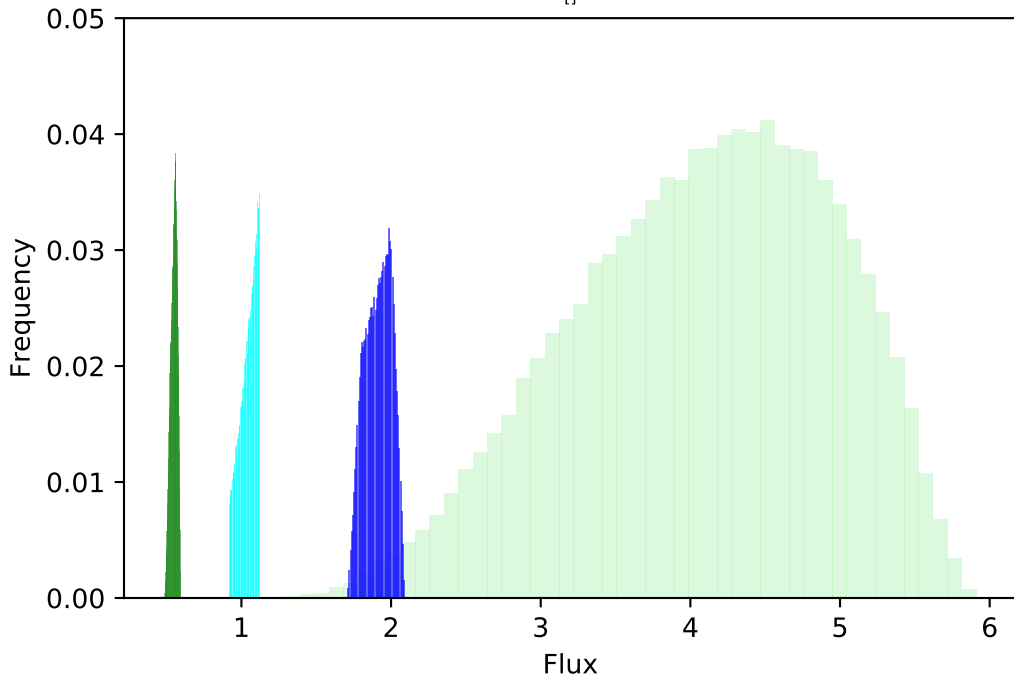
364 : Glu_m + Pro_c --> Glu_c + Pro_m
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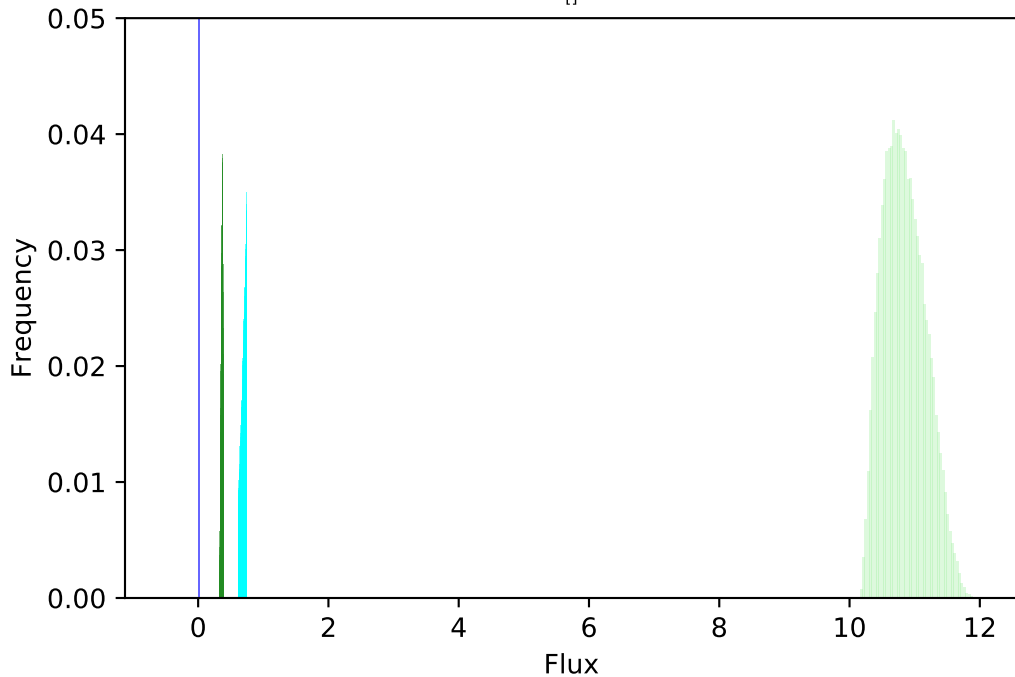
365 : P5C_h --> P5C_c
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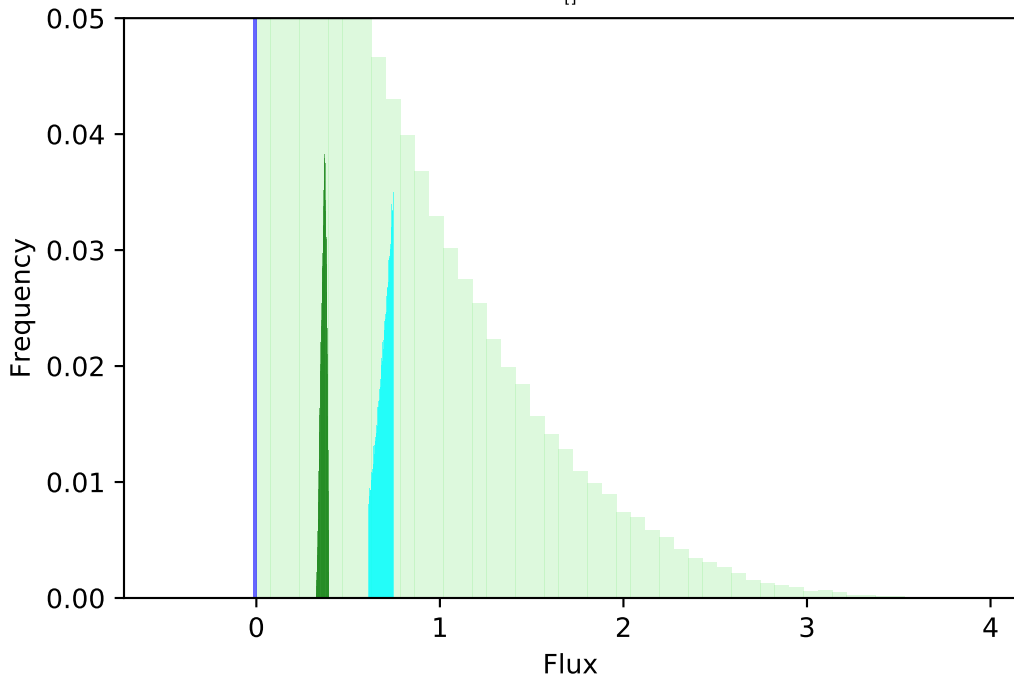
366 : P5C_m --> P5C_c
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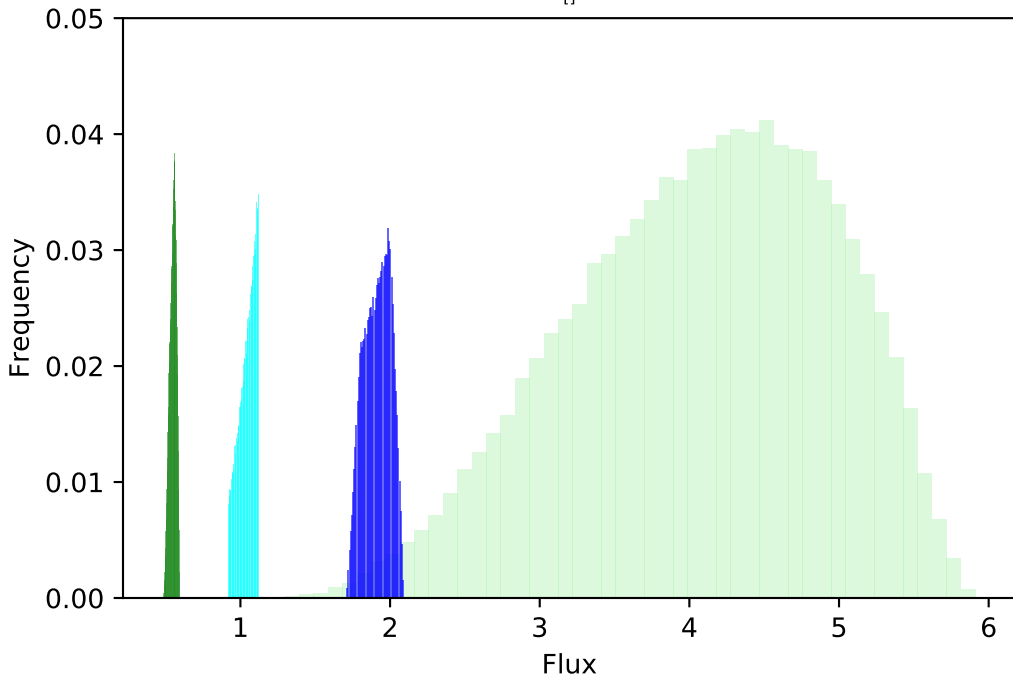
367 : H_h + PRPP_h --> PRPP_c
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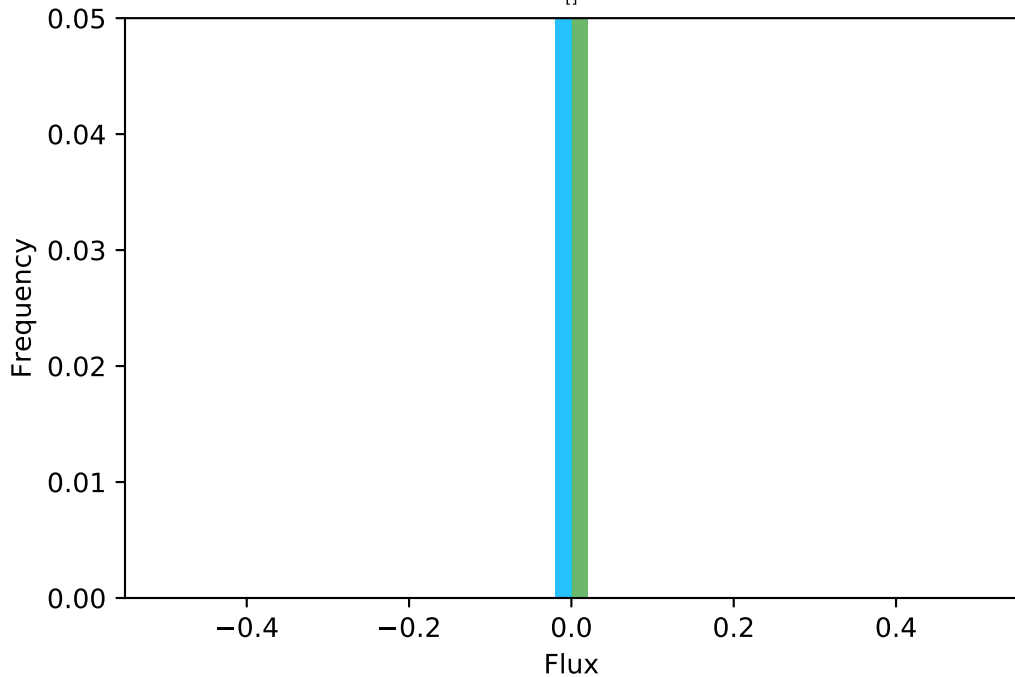
368 : Fum_h --> Fum_c
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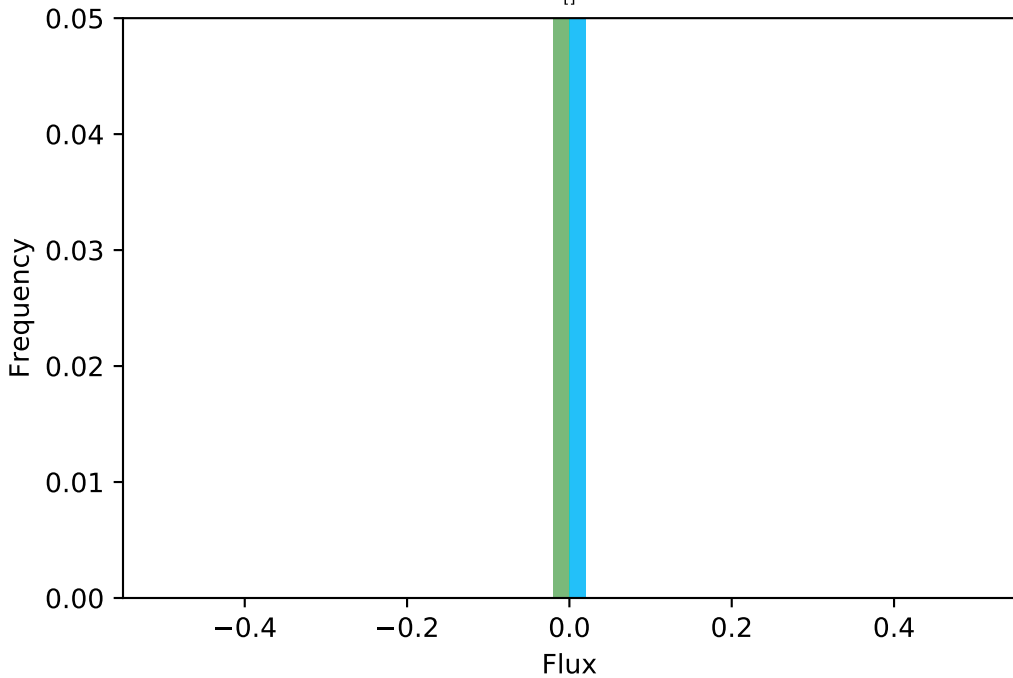
369 : H_DASH_Cys_h --> H_DASH_Cys_c
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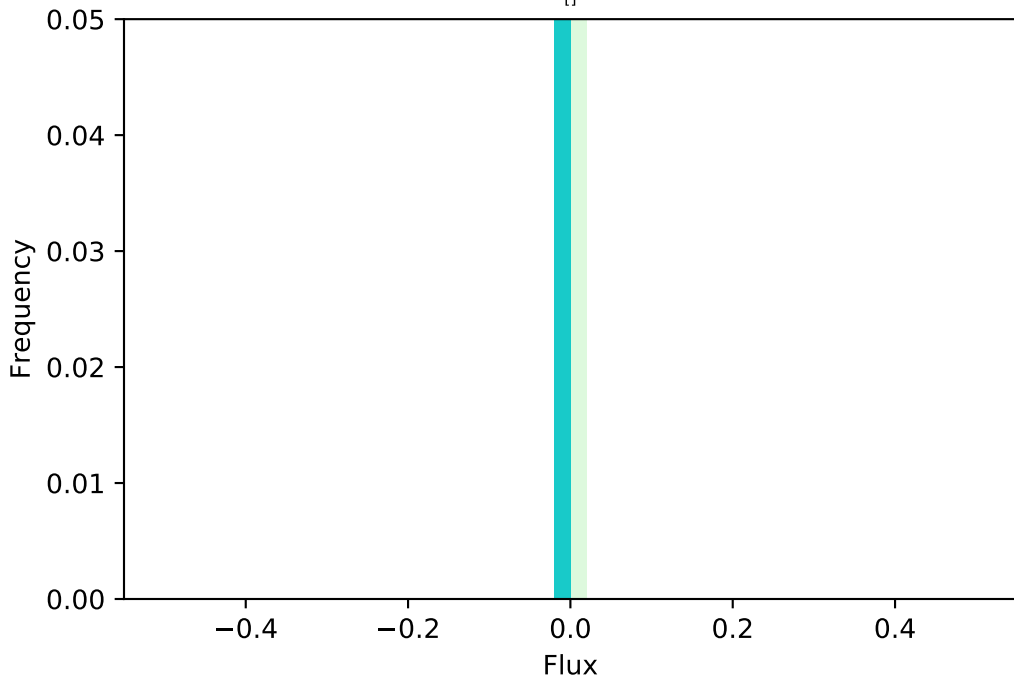
370 : orO_m --> orO_c
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371 : DHO_h --> DHO_c
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372 : DHO_c --> DHO_m
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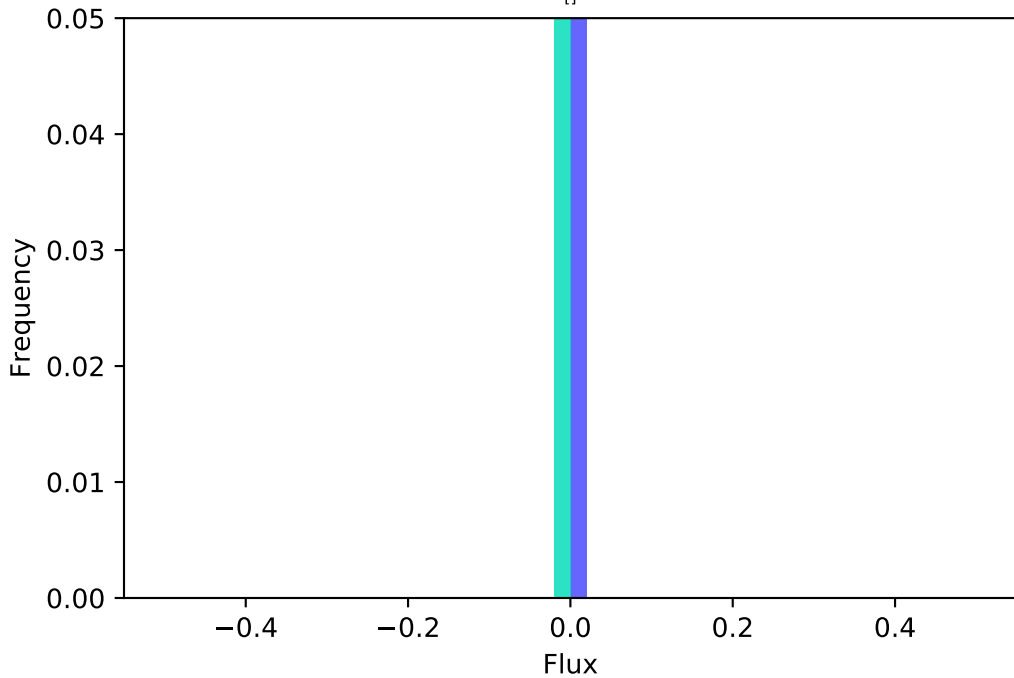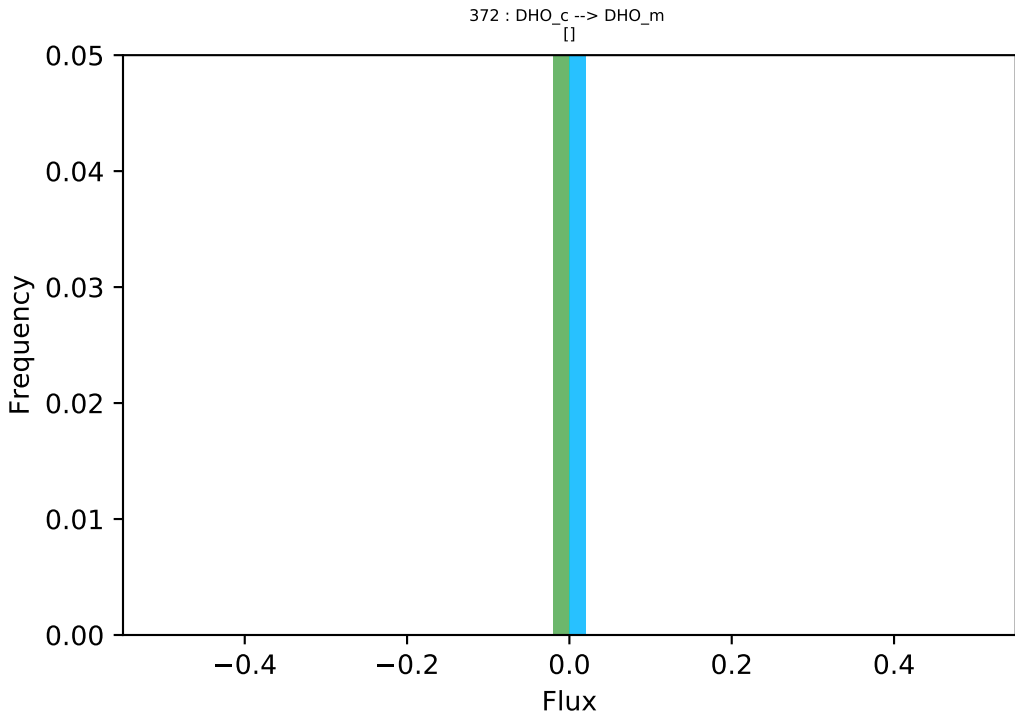
373 : Gly_c + Ser_m --> Gly_m + Ser_c
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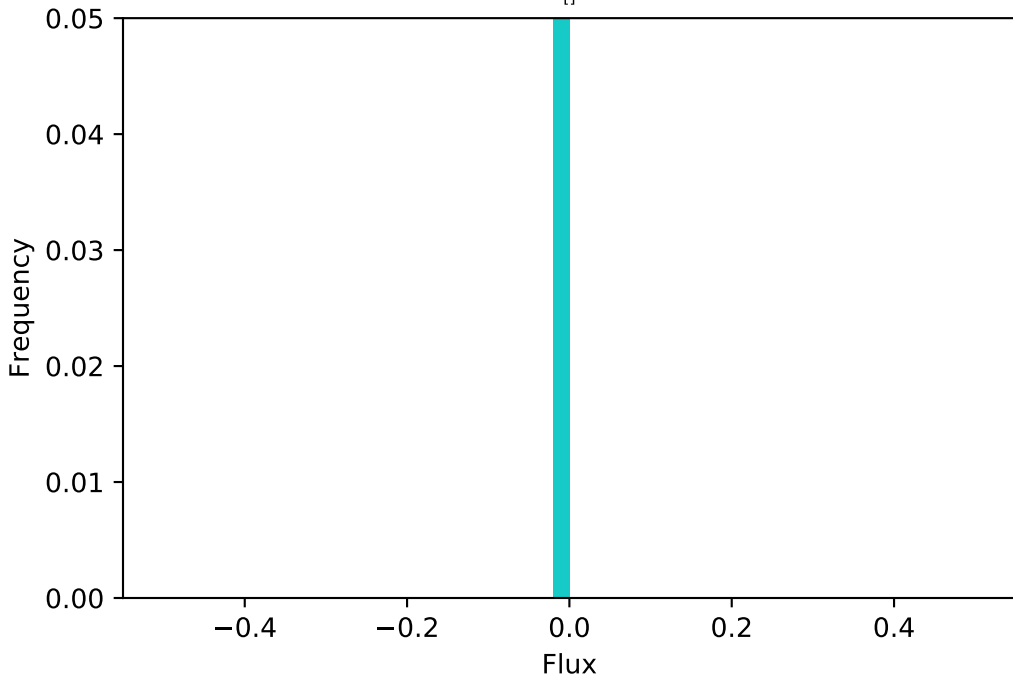
374 : O2_c <=> O2_h
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375 : O2_c <=> O2_m
[]

376 : O2_c --> O2_p
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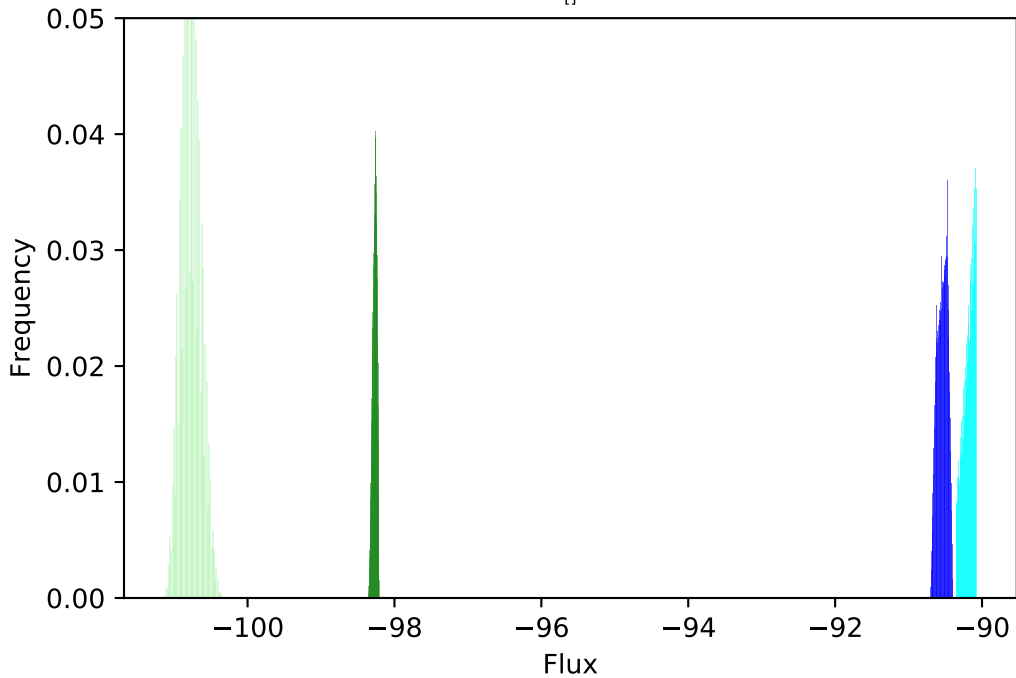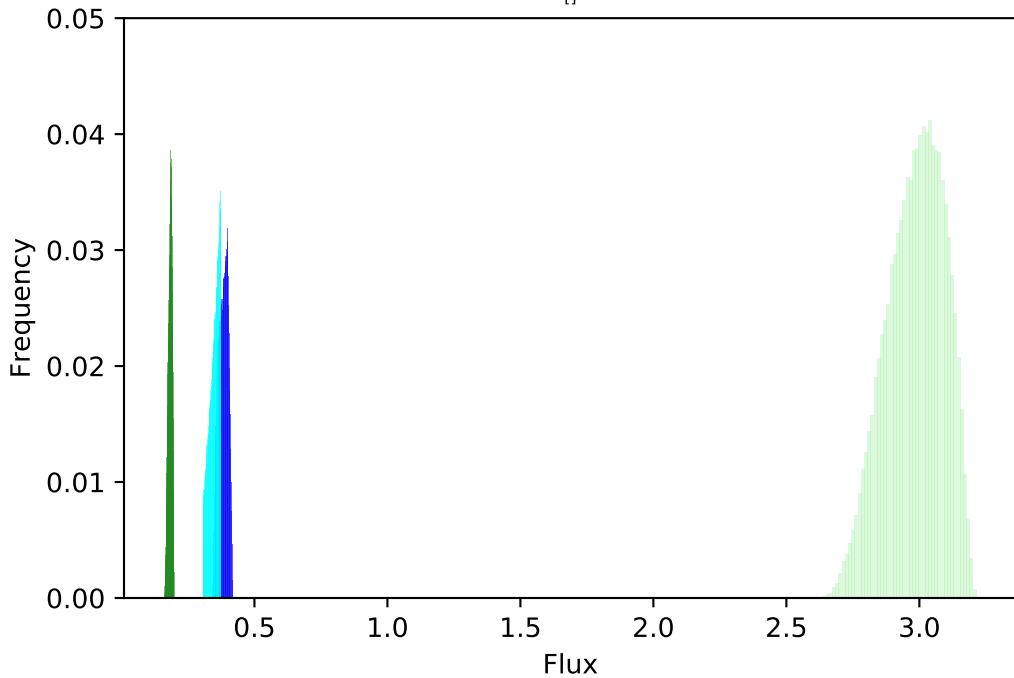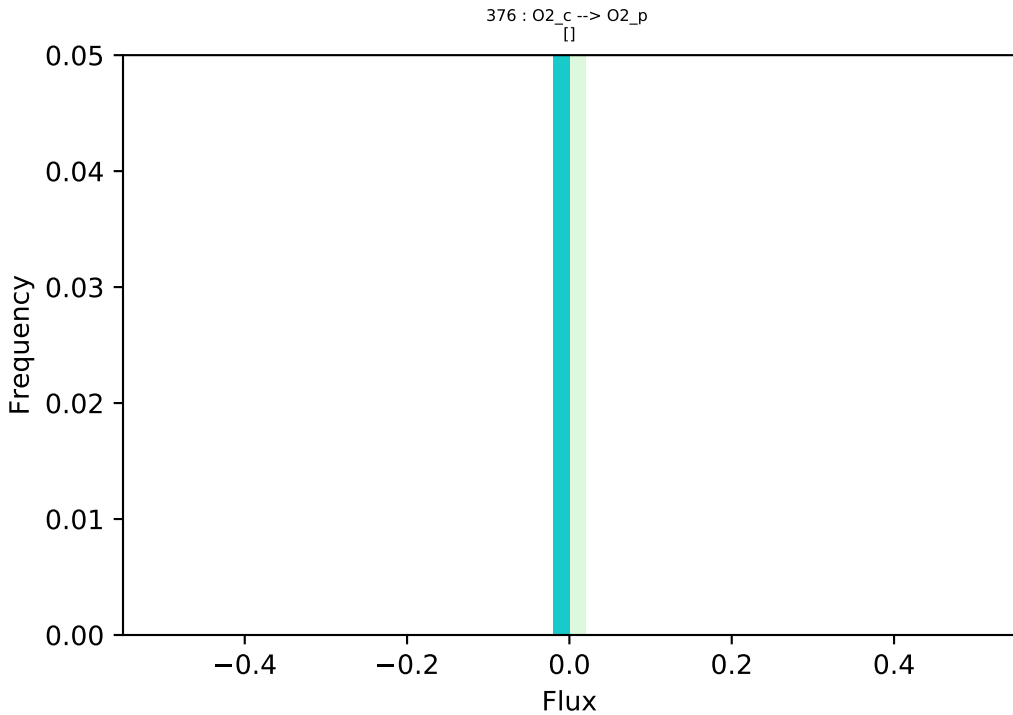
377 : CO2_c <=> CO2_h
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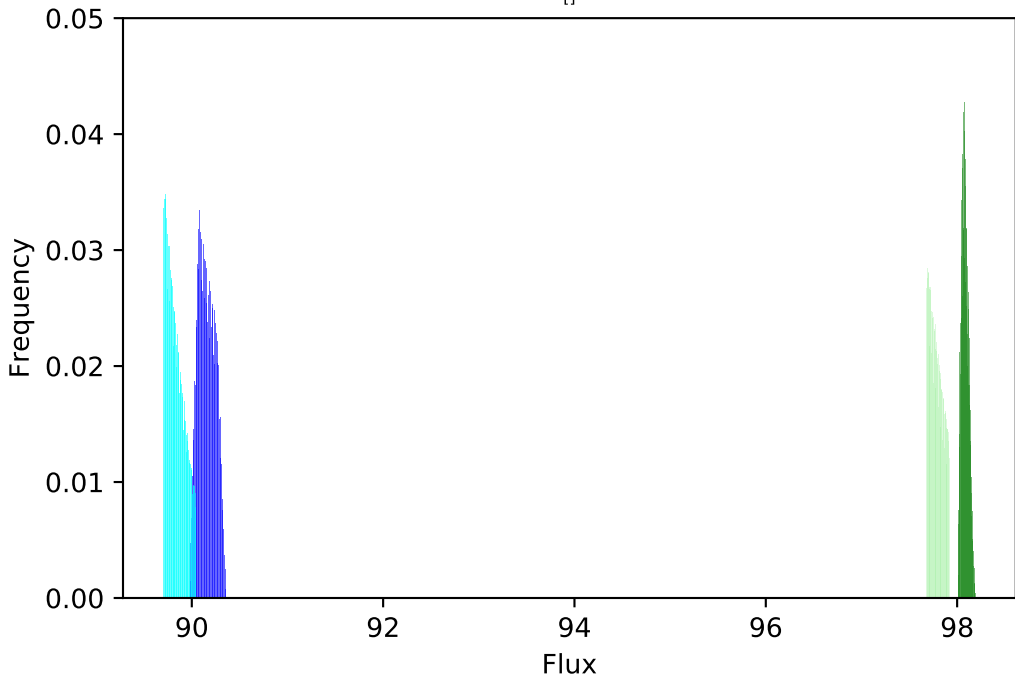
378 : CO2_c <=> CO2_m
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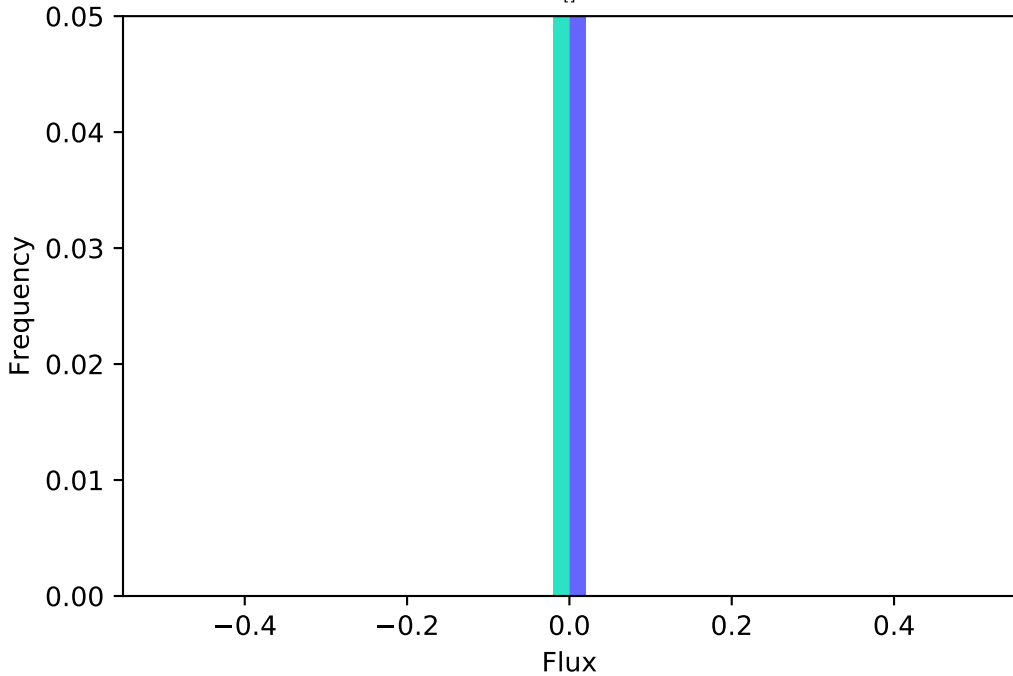
379 : H2O_c <=> H2O_h
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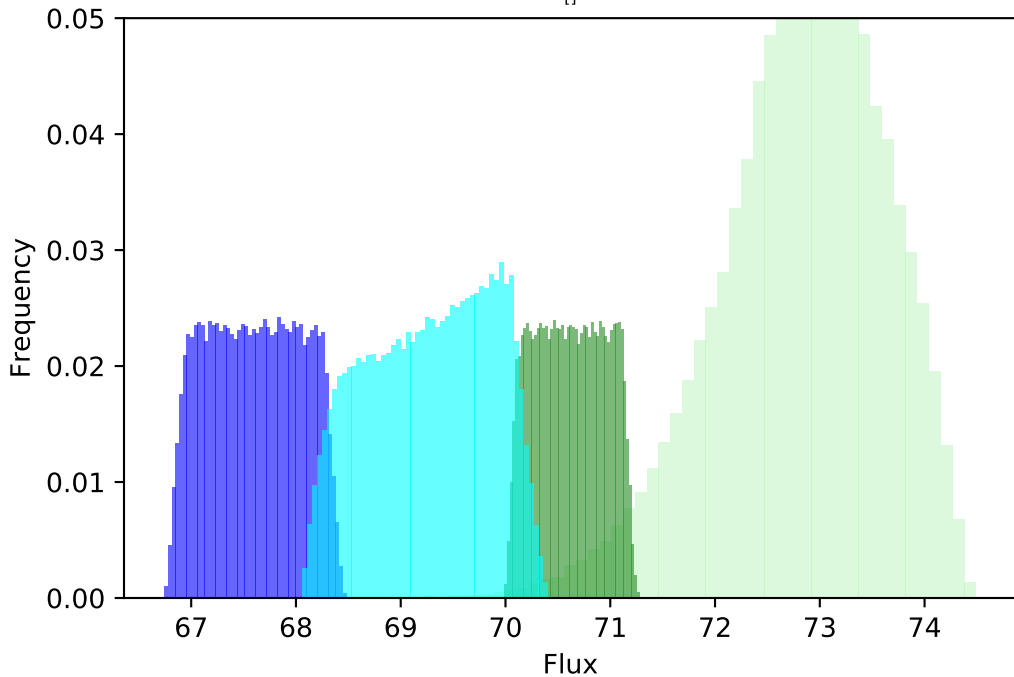
380 : H2O_c <=> H2O_m
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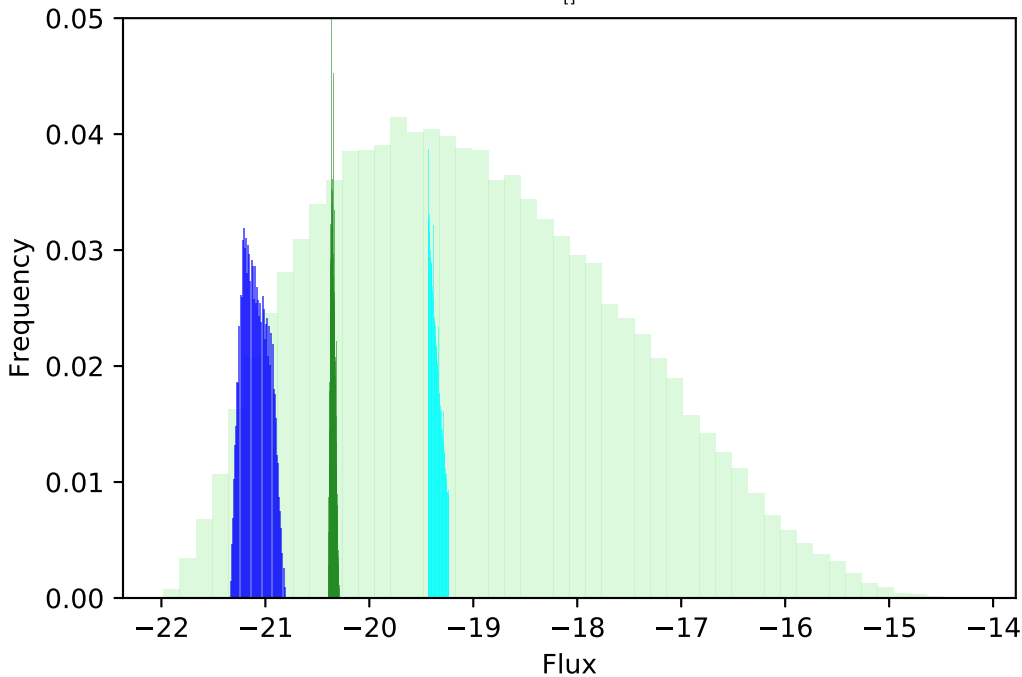
381 : H2O_c --> H2O_p
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382 : H_c --> H_p
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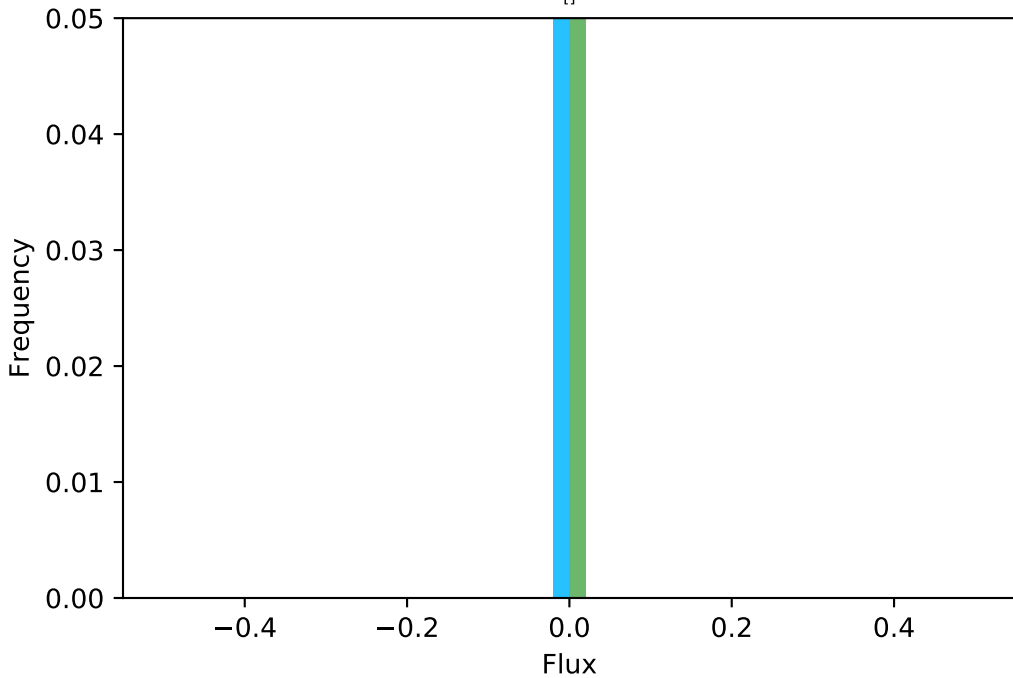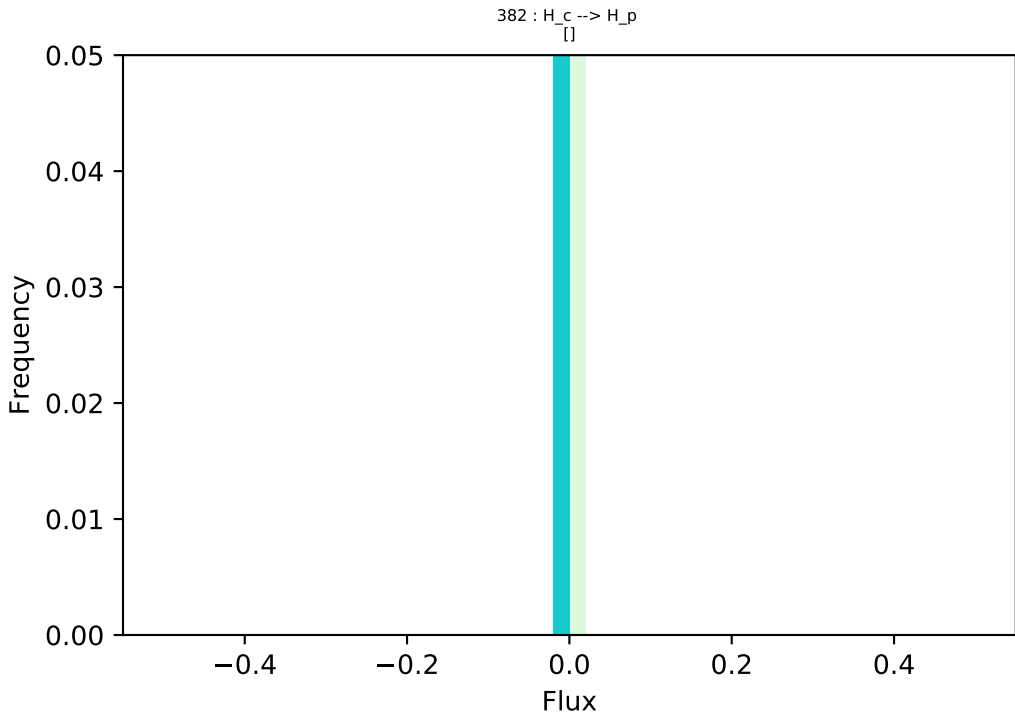
383 : NH4_c <=> NH4_h
[]
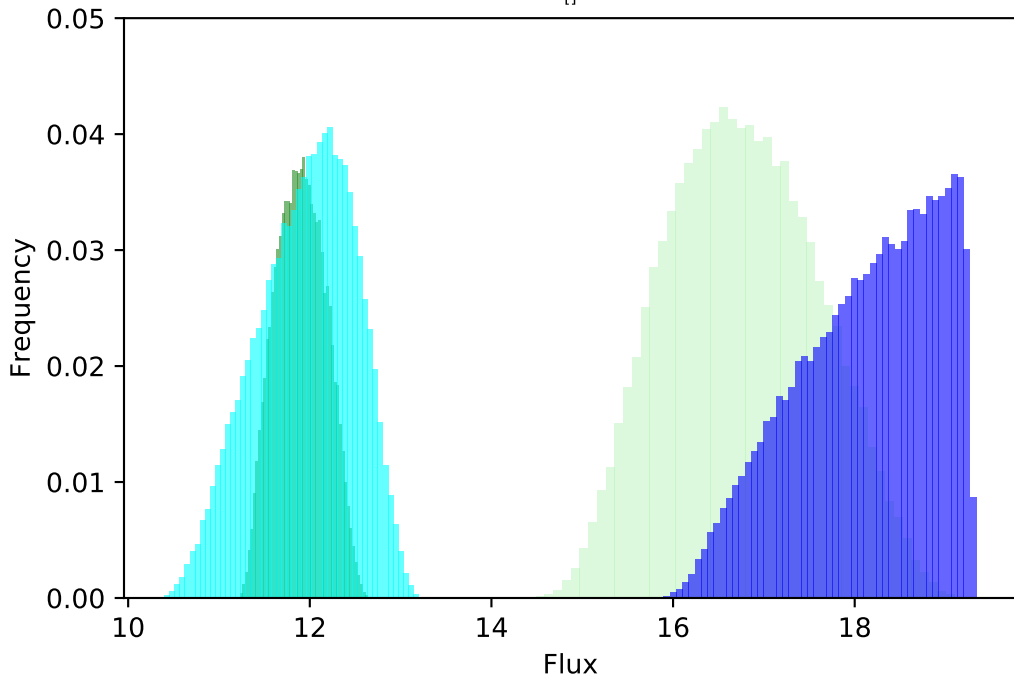
384 : NH4_c <=> NH4_m
[]
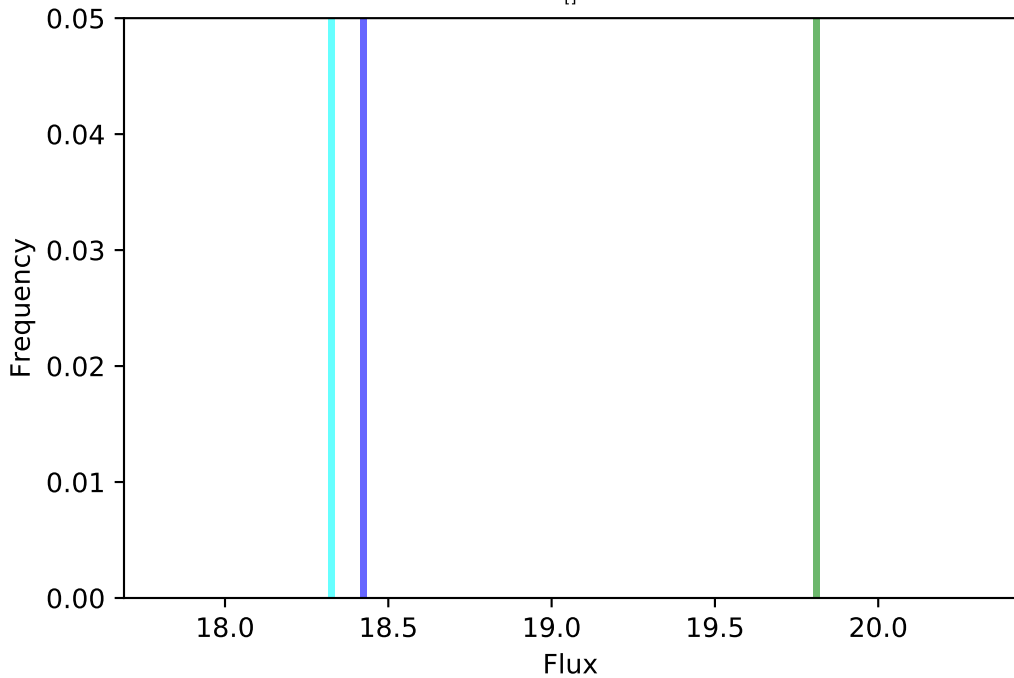
385 : H2S_c <=> H2S_h
[]
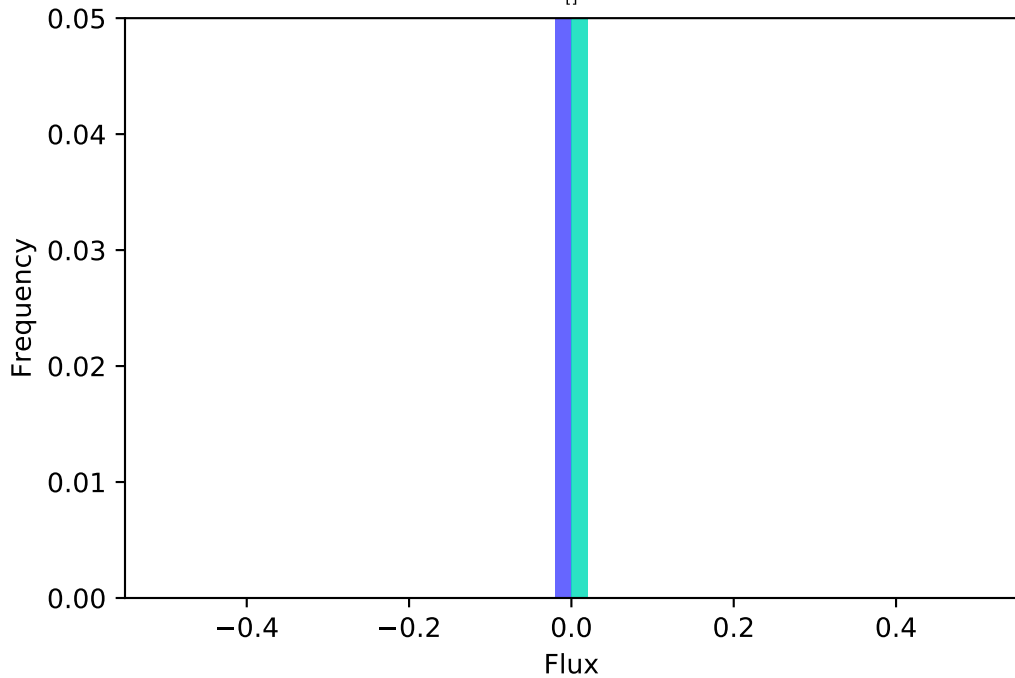
386 : H2S_c --> H2S_m
[]

387 : AC_c <=> AC_h
[]

388 : AC_c --> AC_m
[]
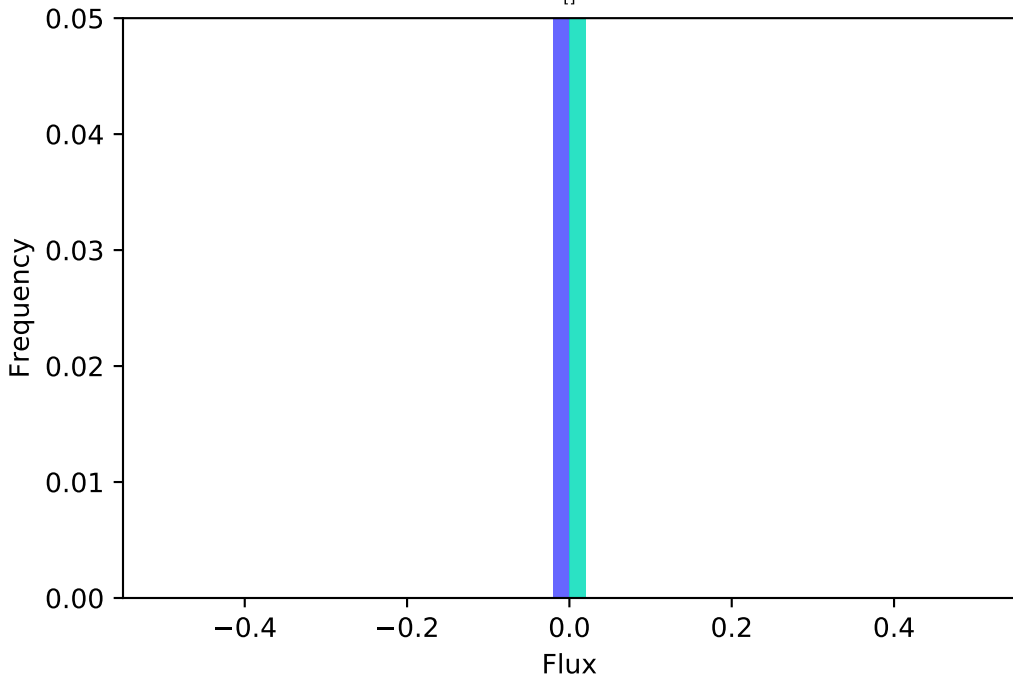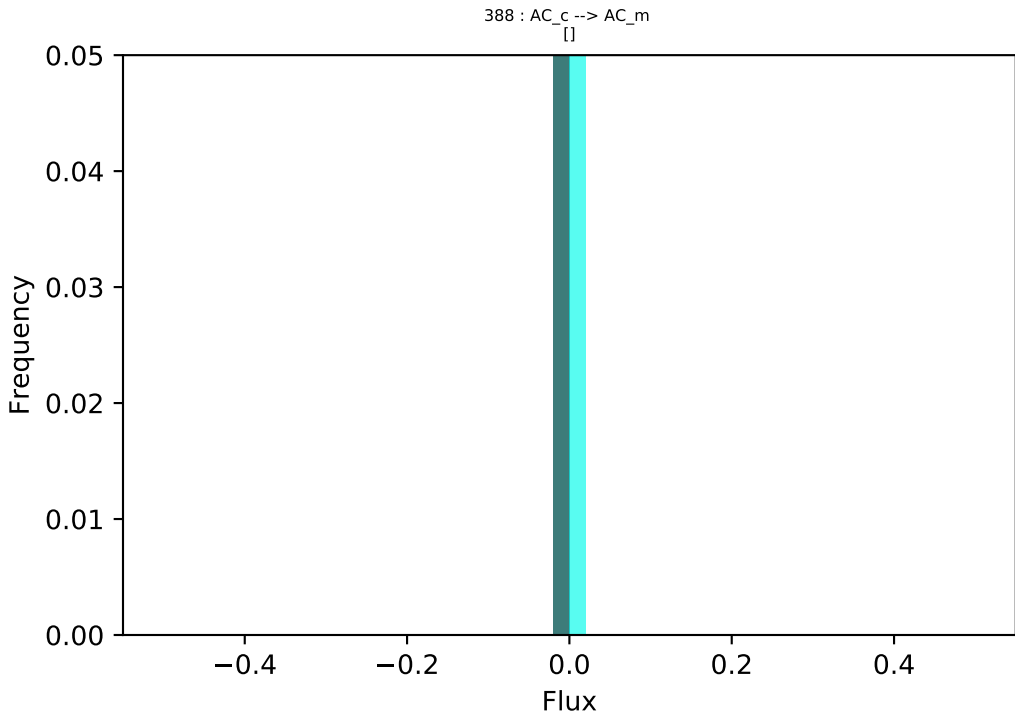
389 : Pyr_c <=> Pyr_h
[]
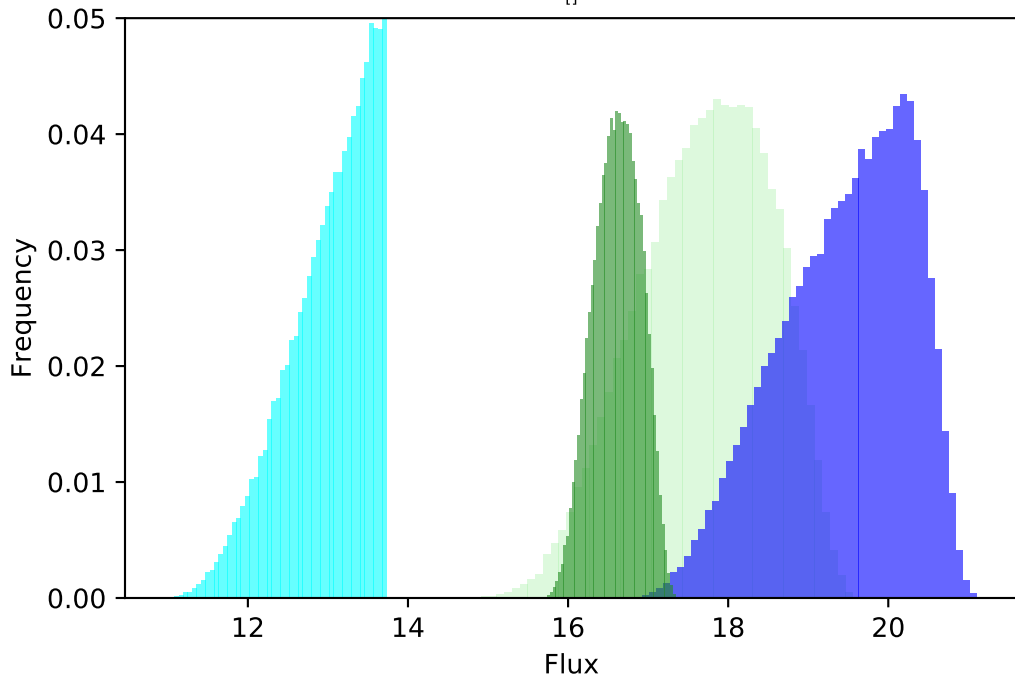
390 : Pyr_c --> Pyr_m
[]
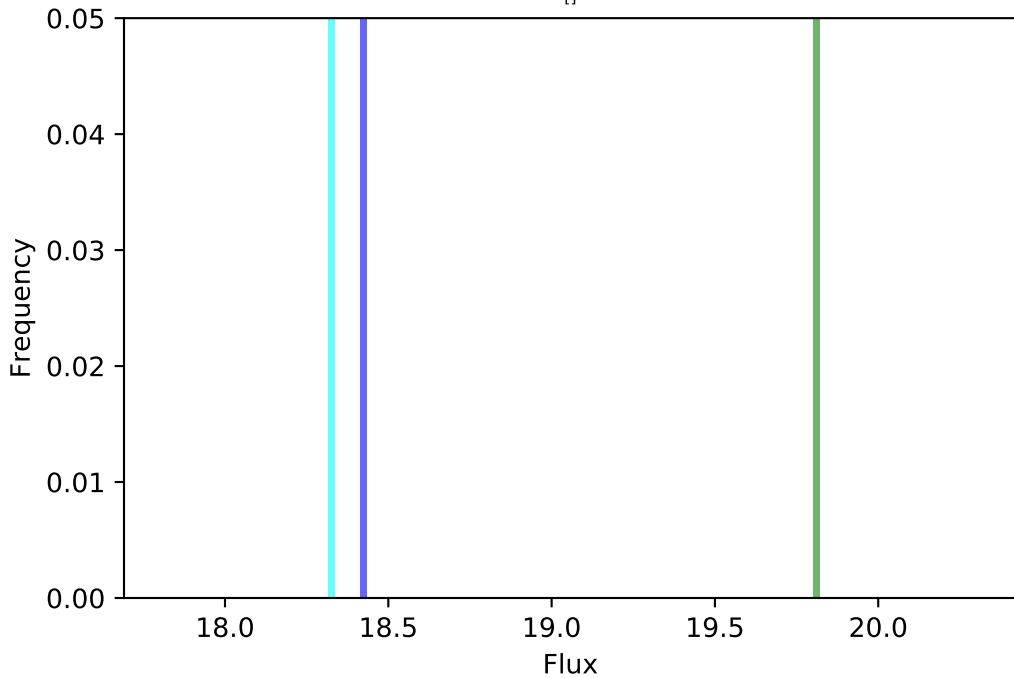
391 : Pyr_c <=> Pyr_p
[]
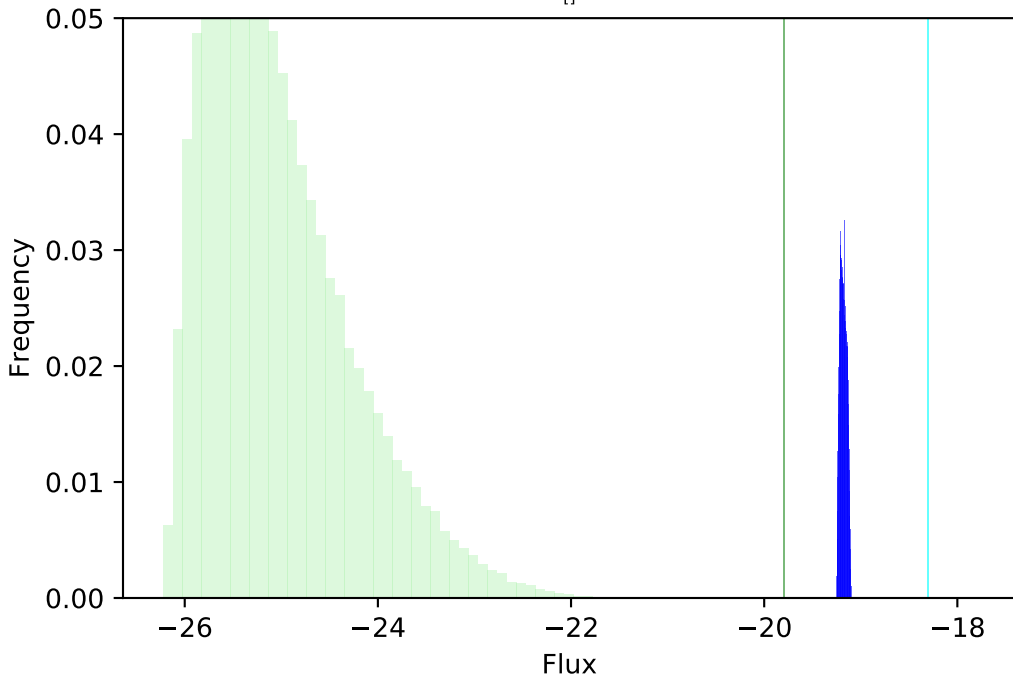
392 : GCA_c <=> GCA_p
[]

393 : GCEA_c <=> GCEA_p
[]
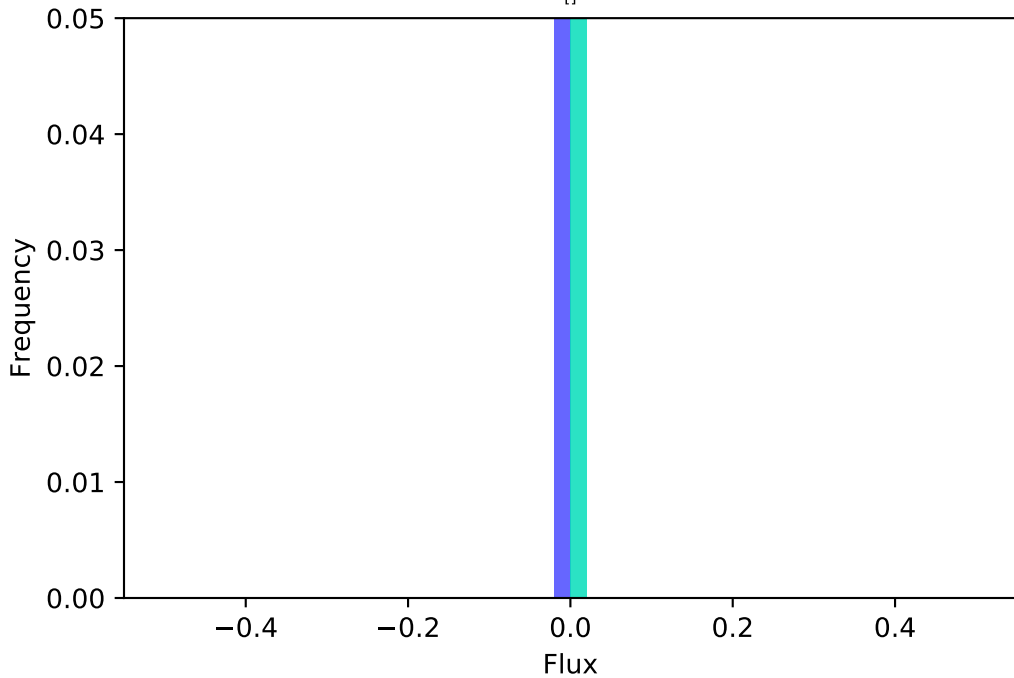
394 : Mal_c <=> Mal_p
[]
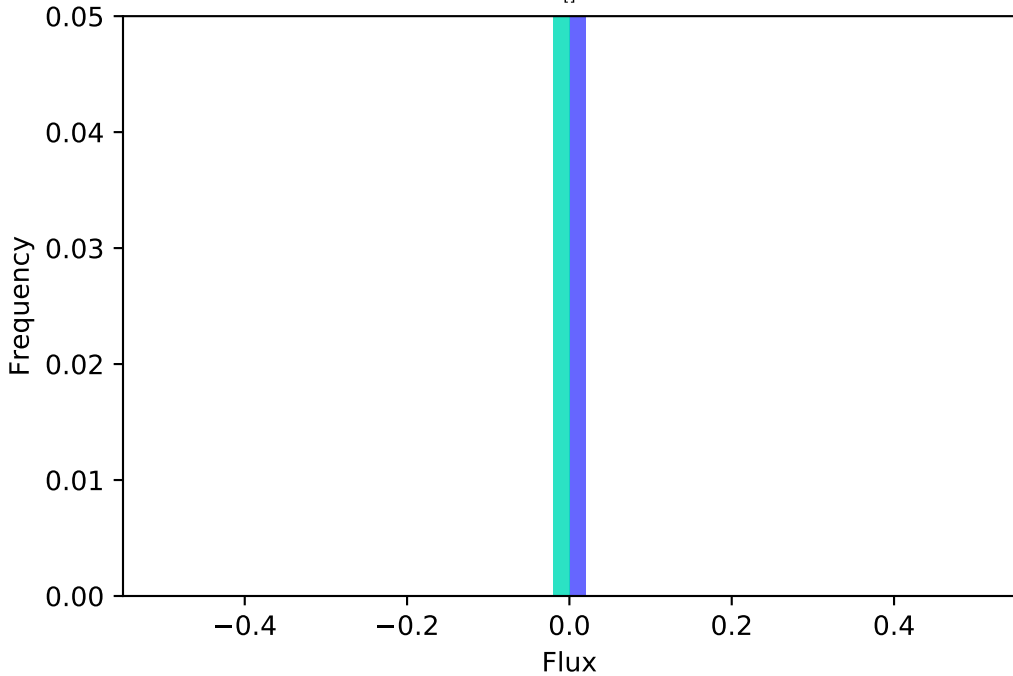
395 : OAA_c <=> OAA_p
[]
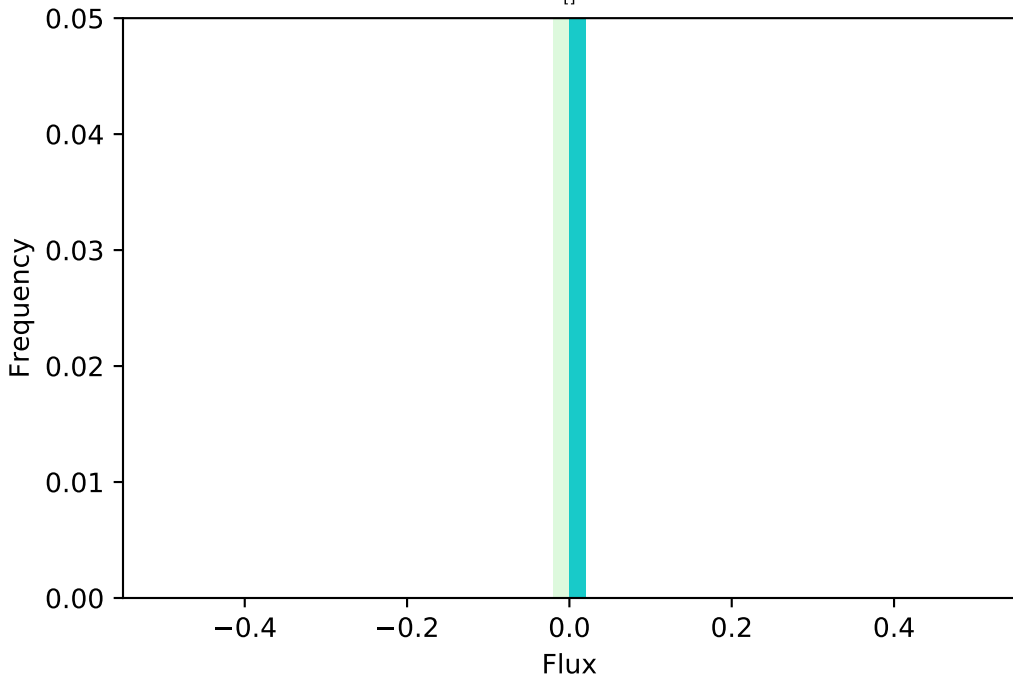
396 : KG_c --> KG_p
[]
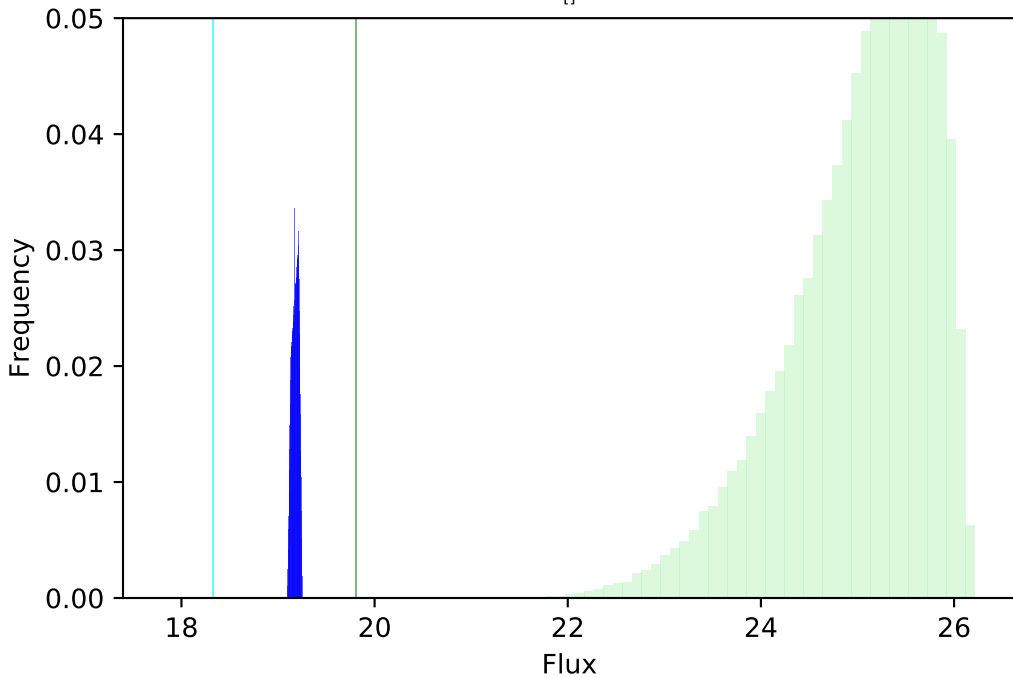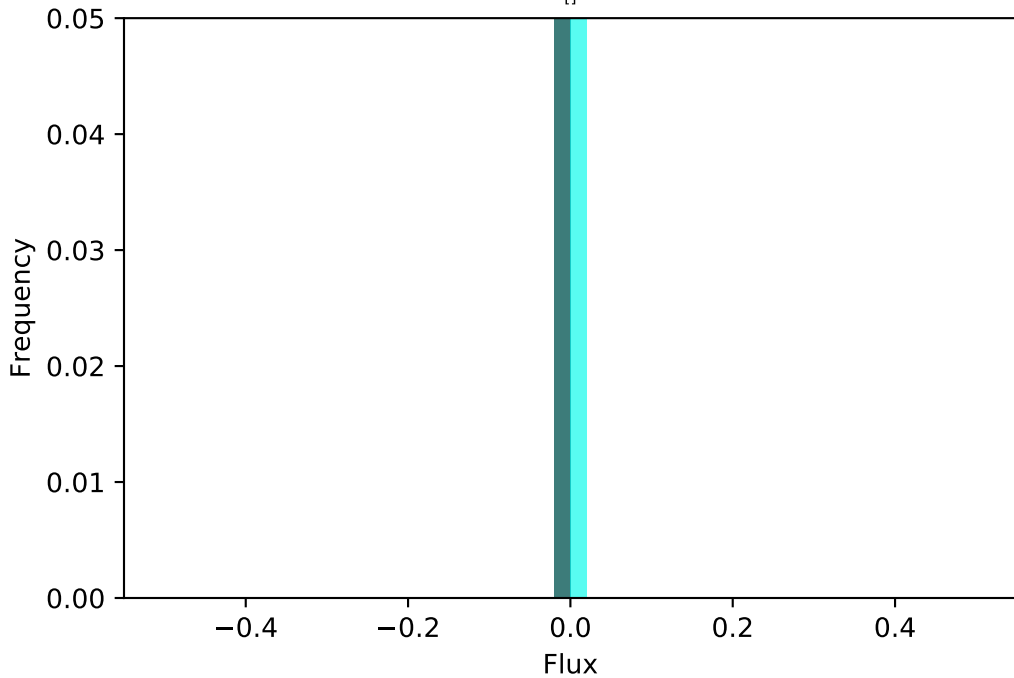
397 : Ala_c <=> Ala_p
[]
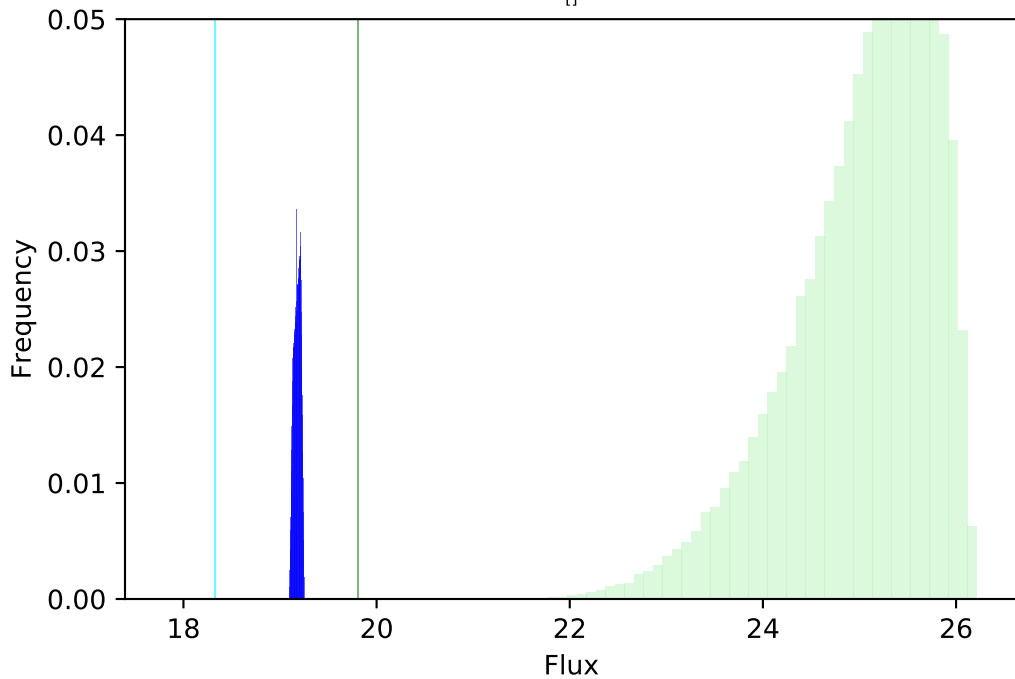
398 : Arg_c --> Arg_p
[]
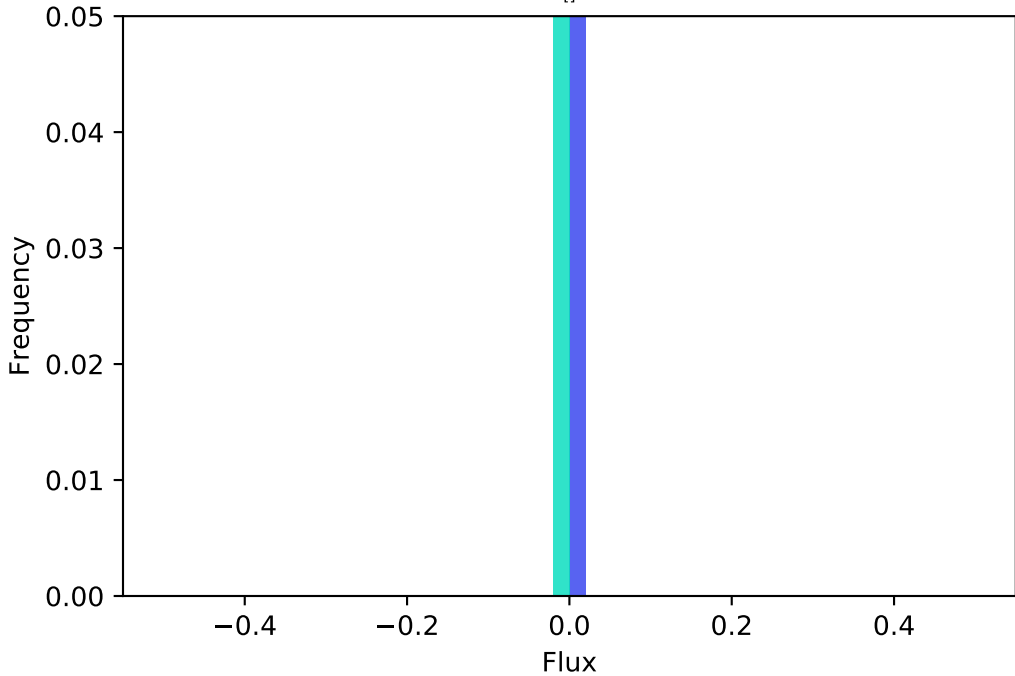
399 : Asn_c --> Asn_p + H_p
[]

400 : Asp_c <=> Asp_p
[]
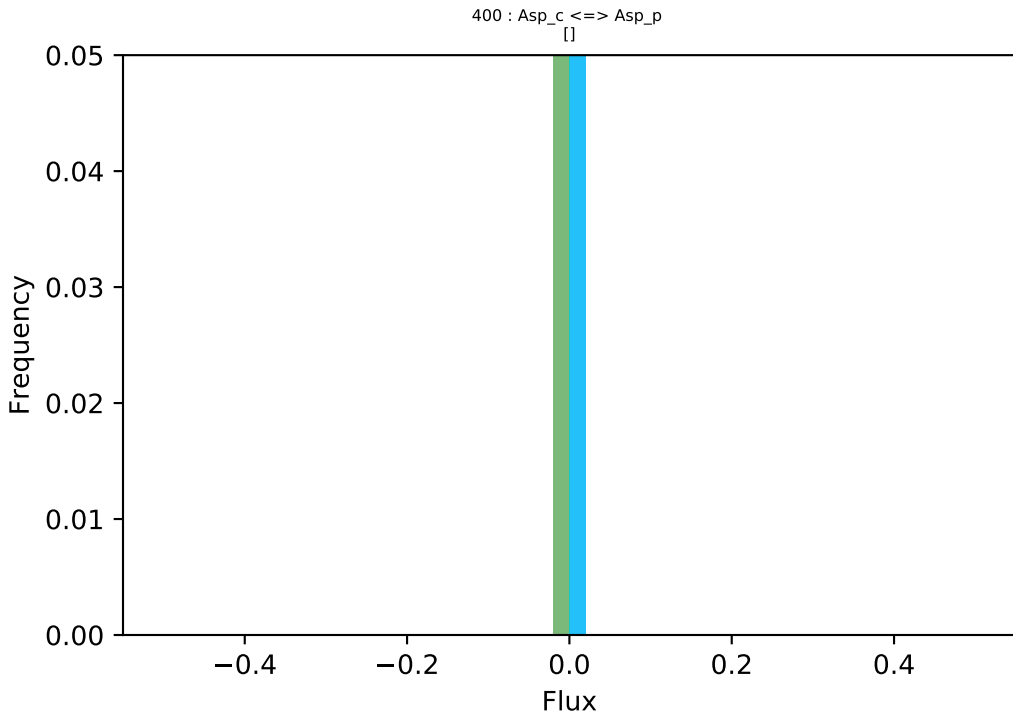
401 : Cys_c --> Cys_p
[]
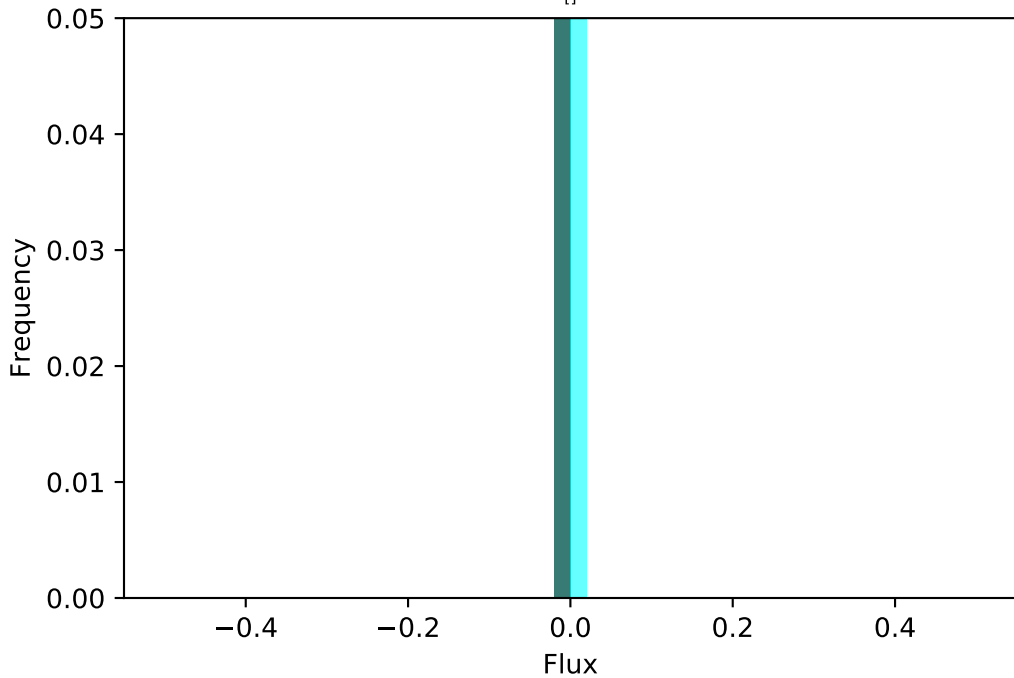
402 : Glu_c --> Glu_p
[]
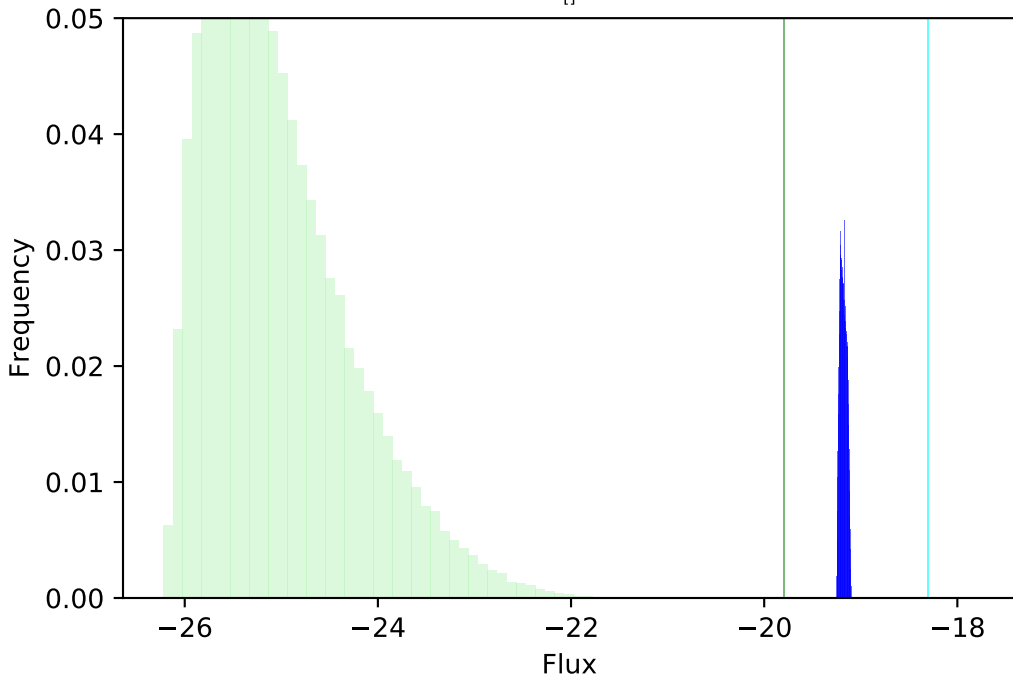
403 : Gln_c --> Gln_p + H_p
[]
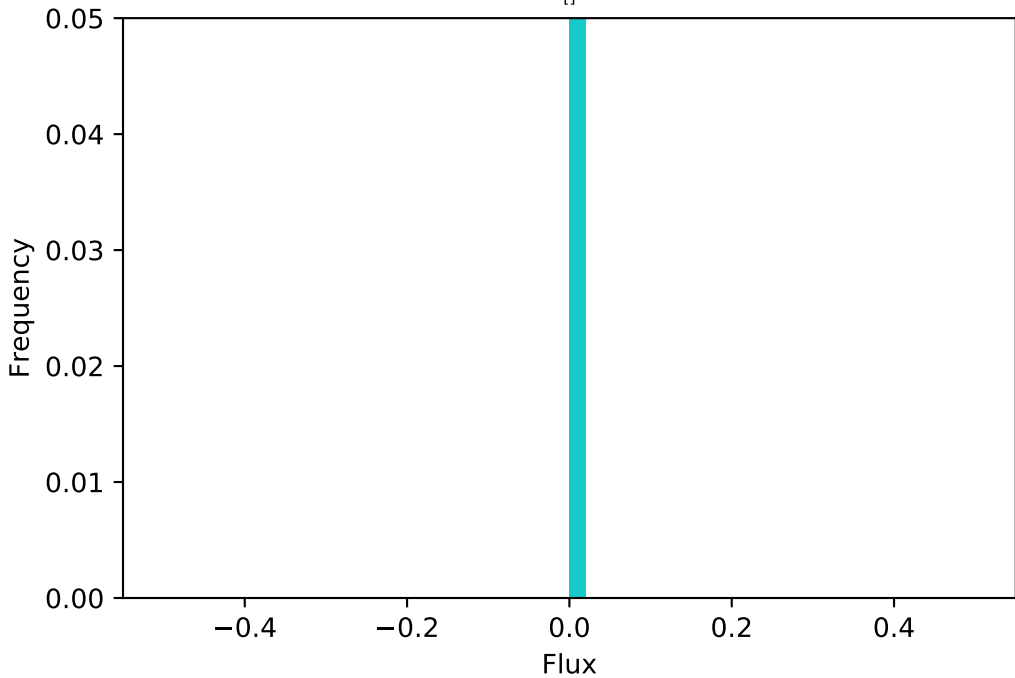
404 : Gly_c <=> Gly_p
[]

405 : His_c --> His_p
[]

406 : Ile_c --> Ile_p
[]
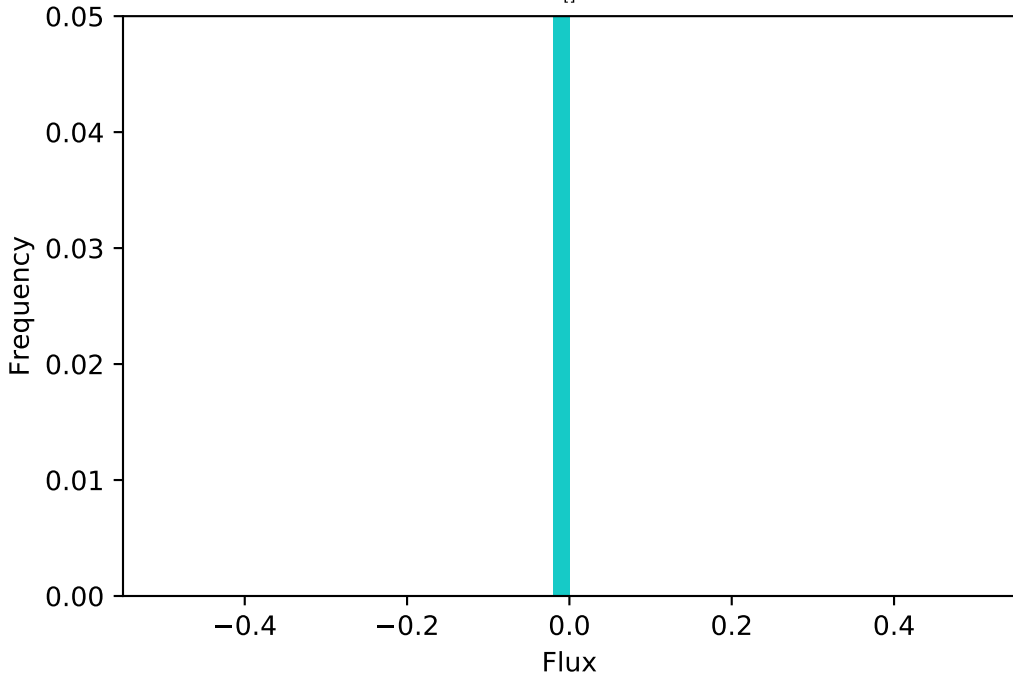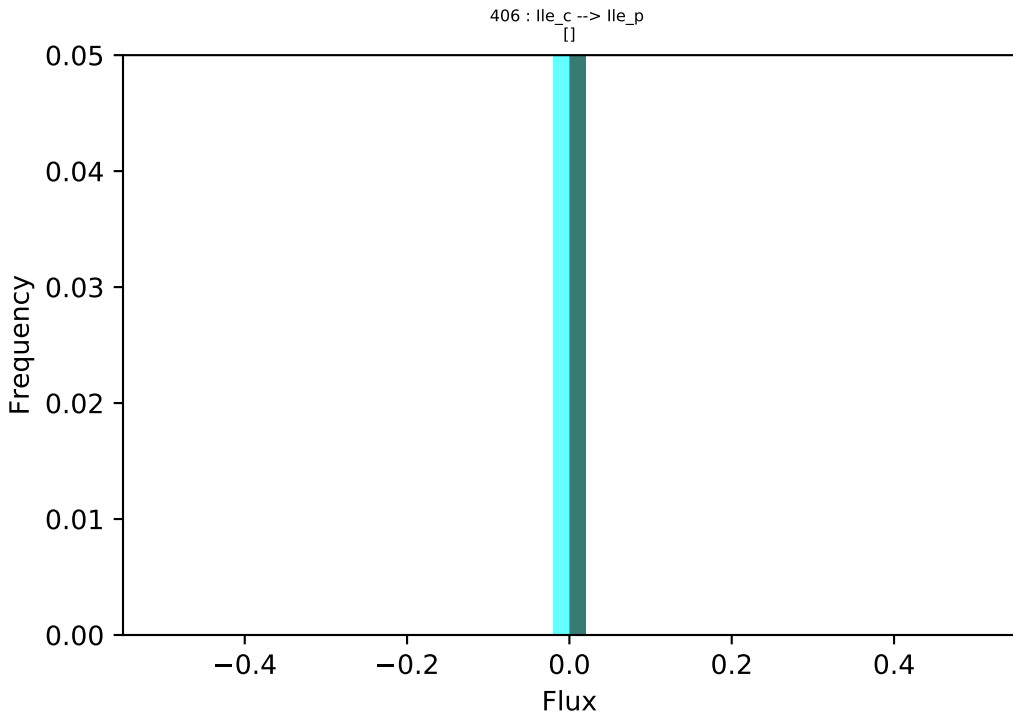
407 : Leu_c --> Leu_p
[]

408 : Lys_c --> Lys_p
[]
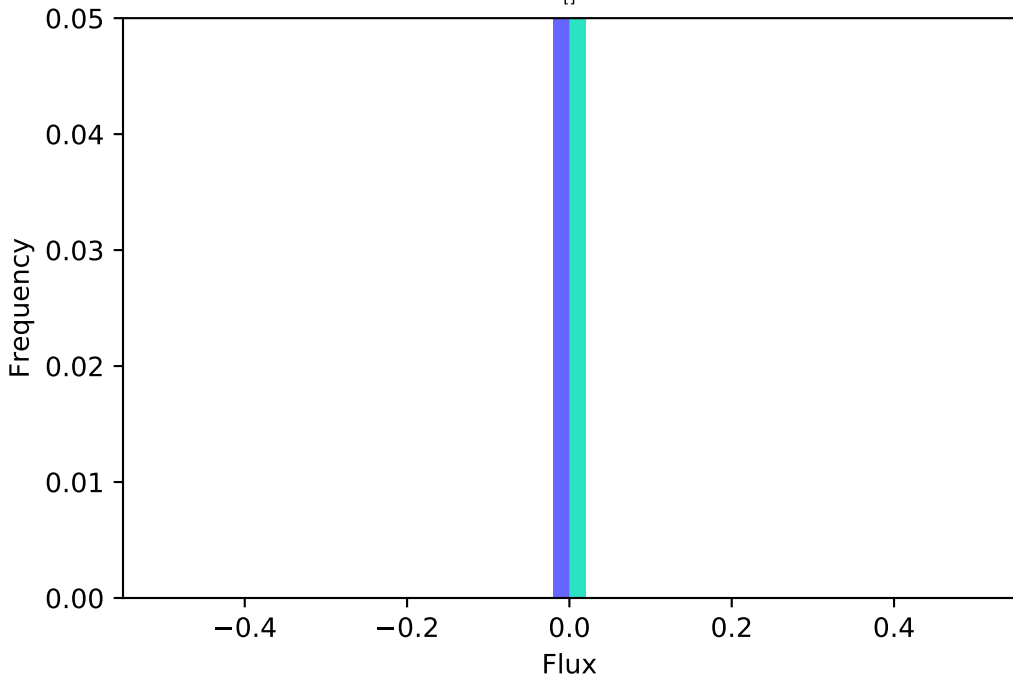
409 : Met_c <=> Met_p
[]
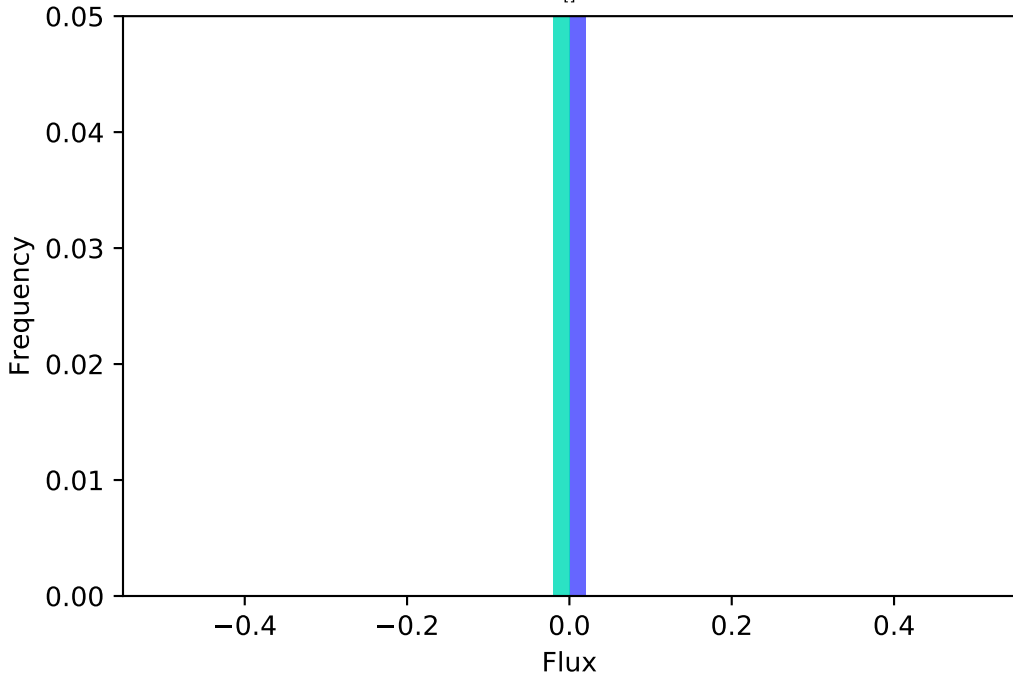
410 : Phe_c --> Phe_p
[]
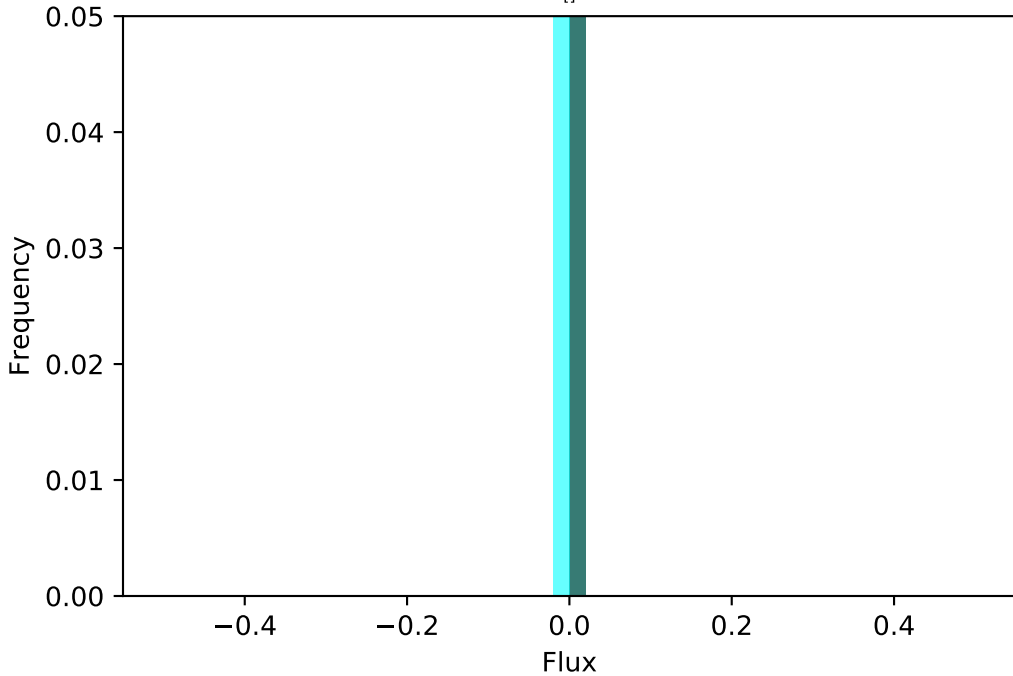
411 : Pro_c --> Pro_p
[]
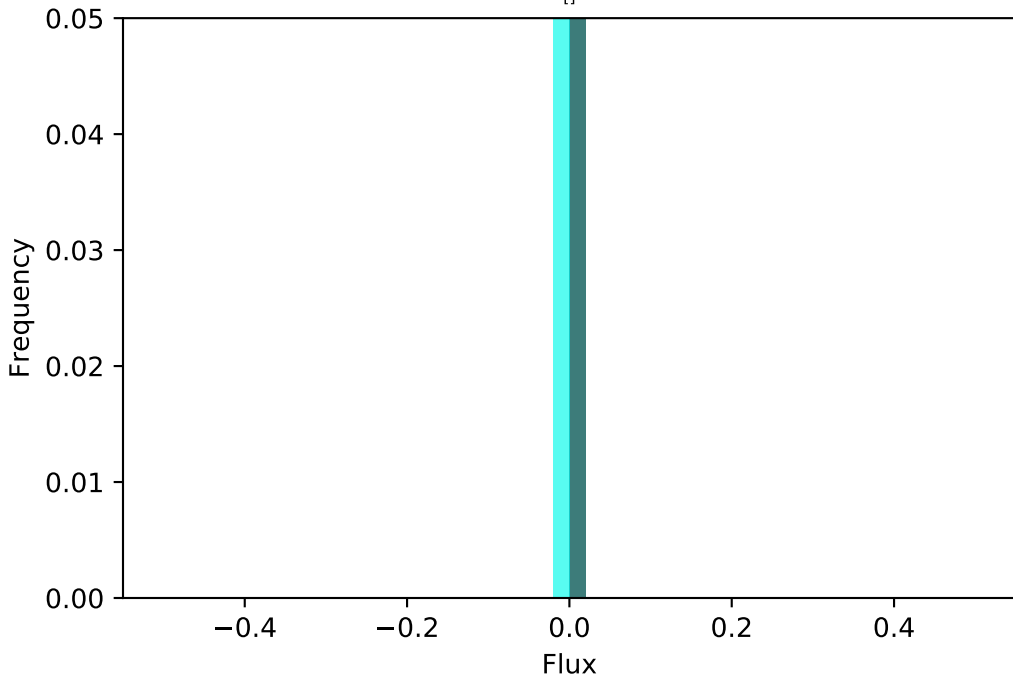
412 : Ser_c <=> Ser_p
[]
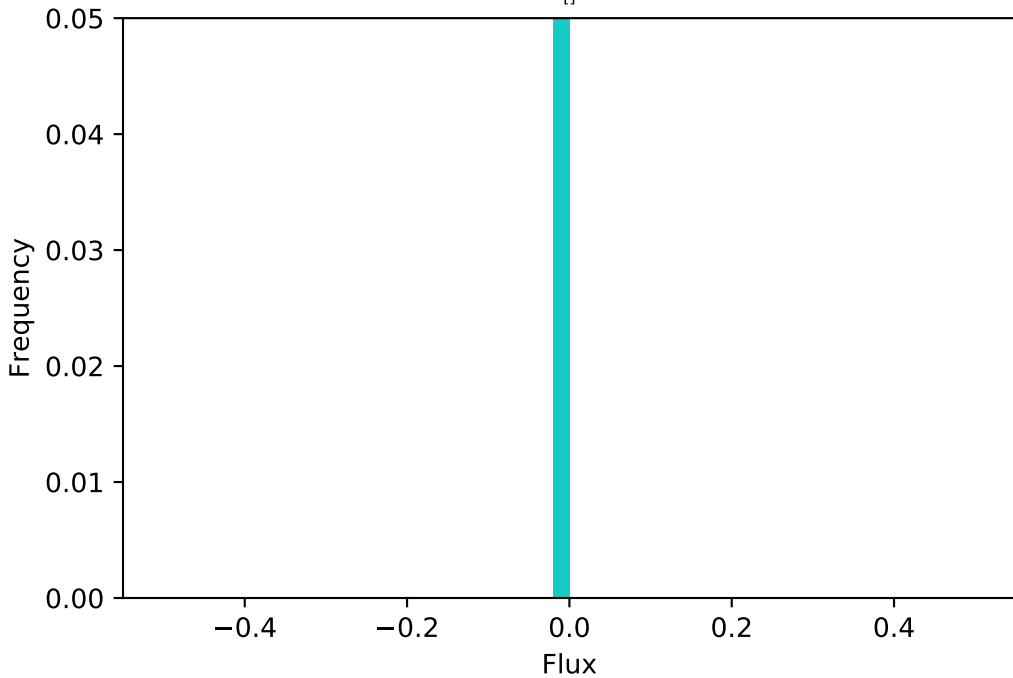
413 : Thr_c --> Thr_p
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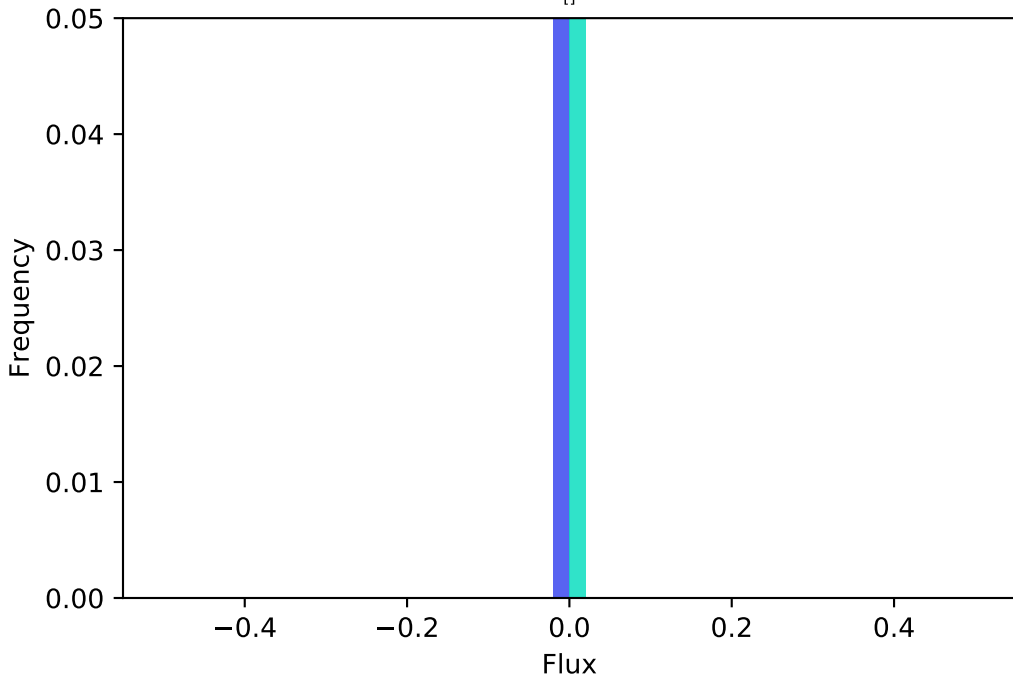
414 : Trp_c --> Trp_p
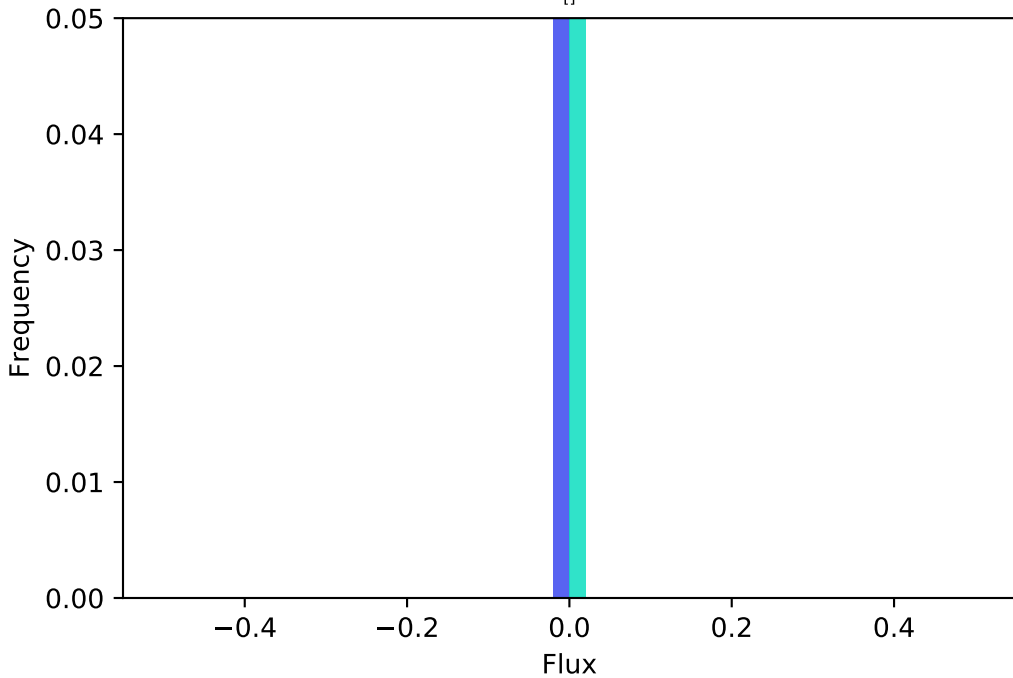[]
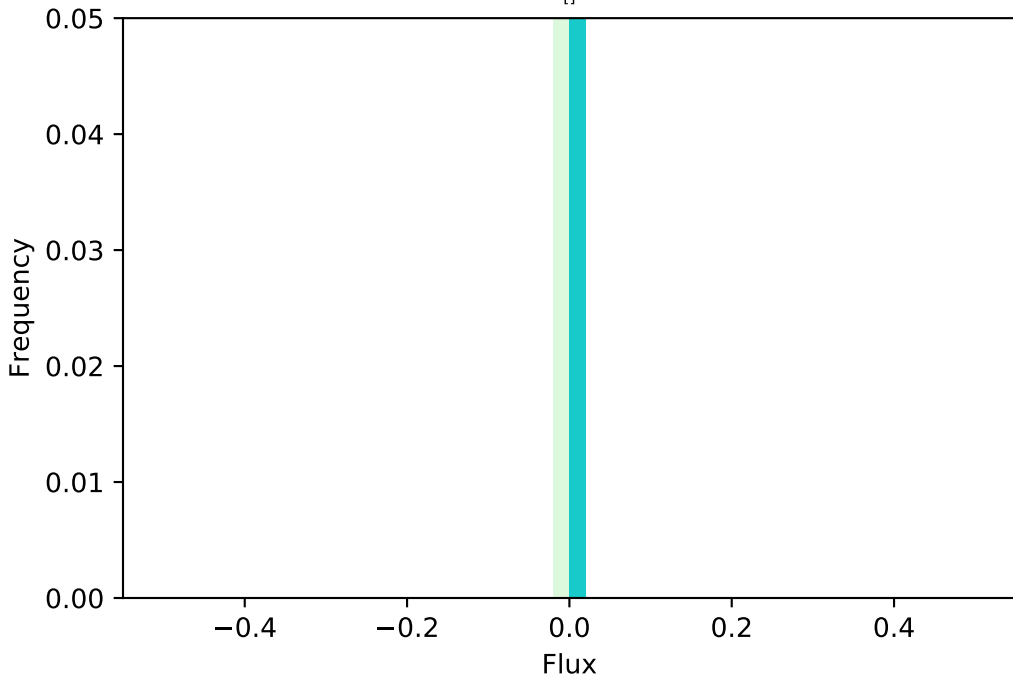
415 : Tyr_c --> Tyr_p
[]
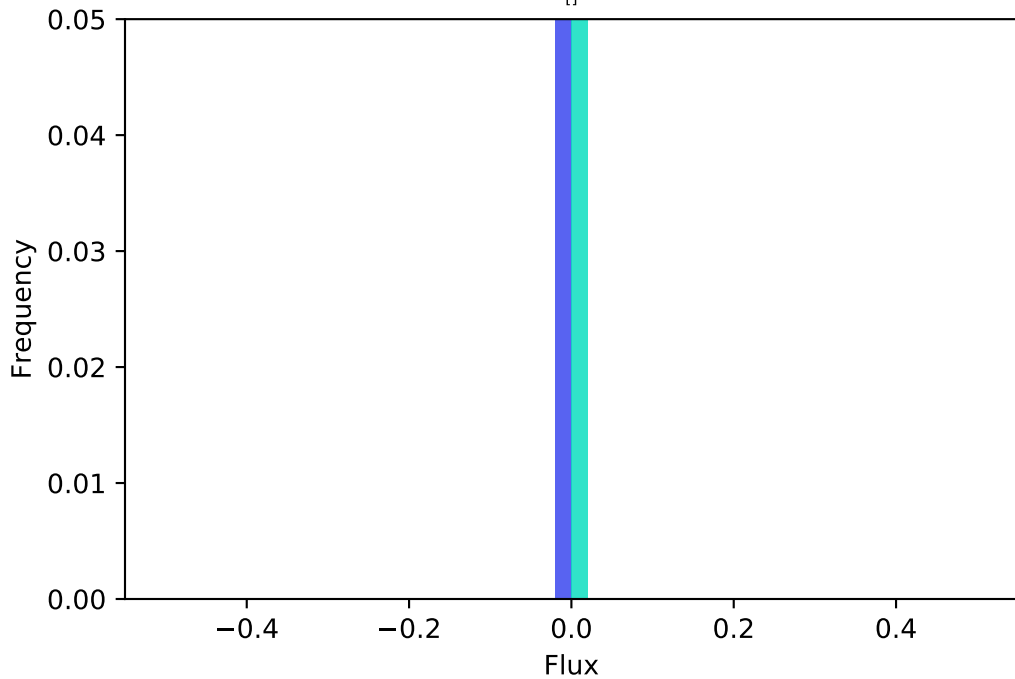
416 : Val_c --> Val_p
[]
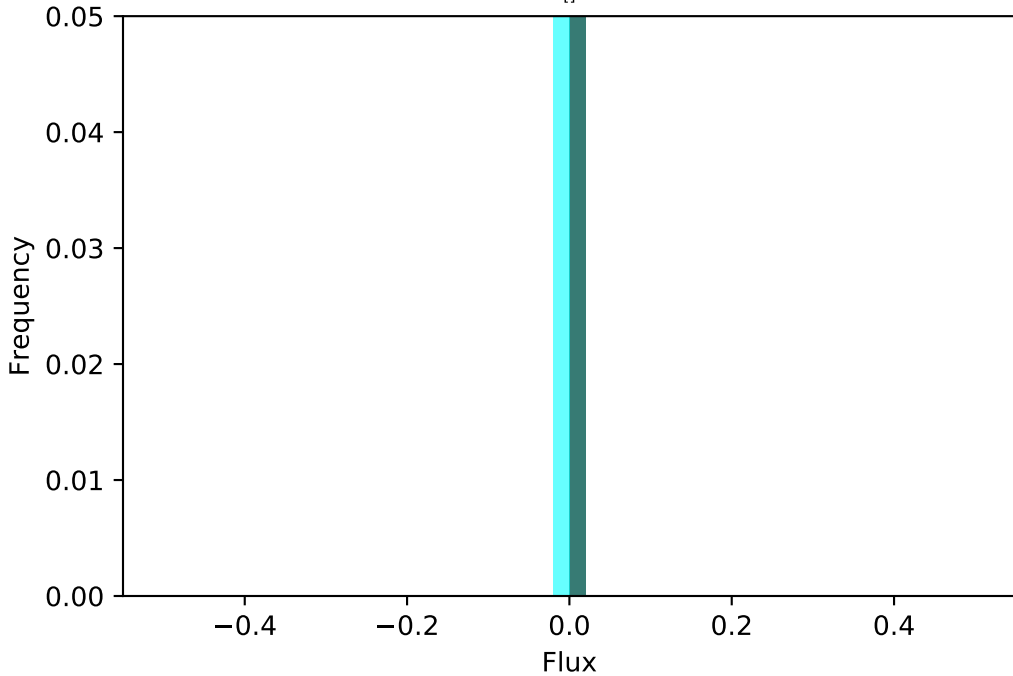
417 : Ala_h --> Ala_c
[]
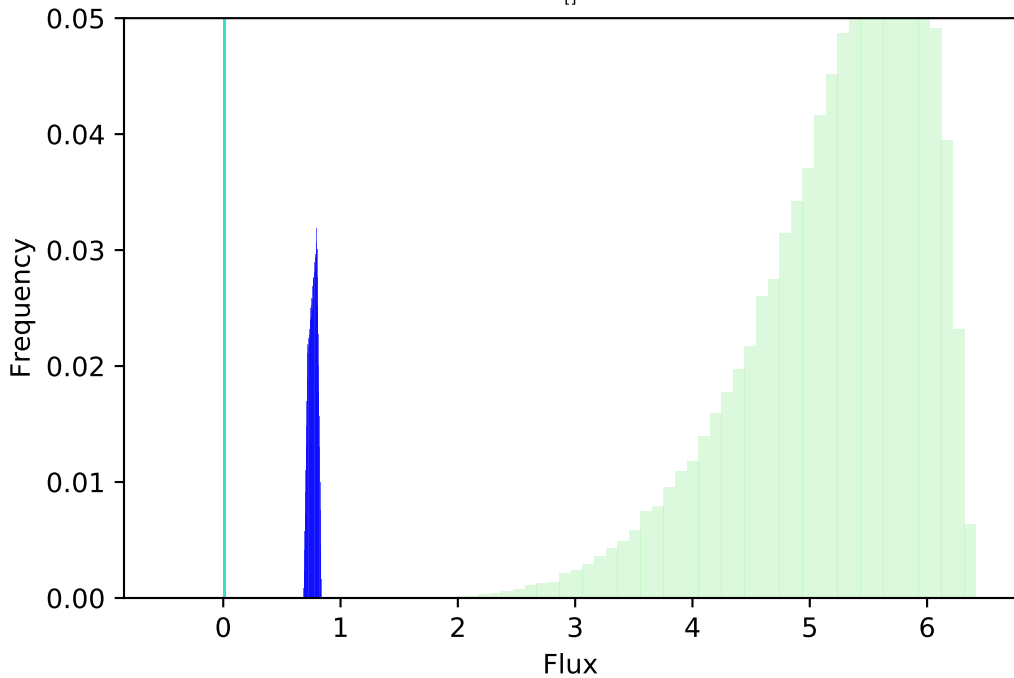
418 : Arg_h --> Arg_c
[]
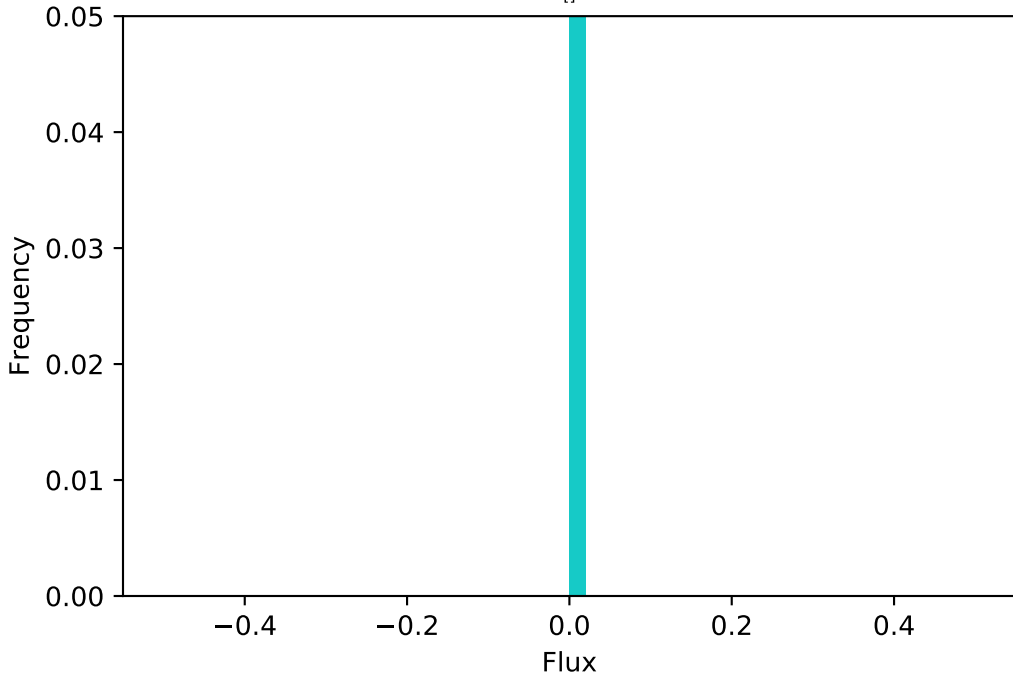
419 : Asn_c --> Asn_h + H_h
[]
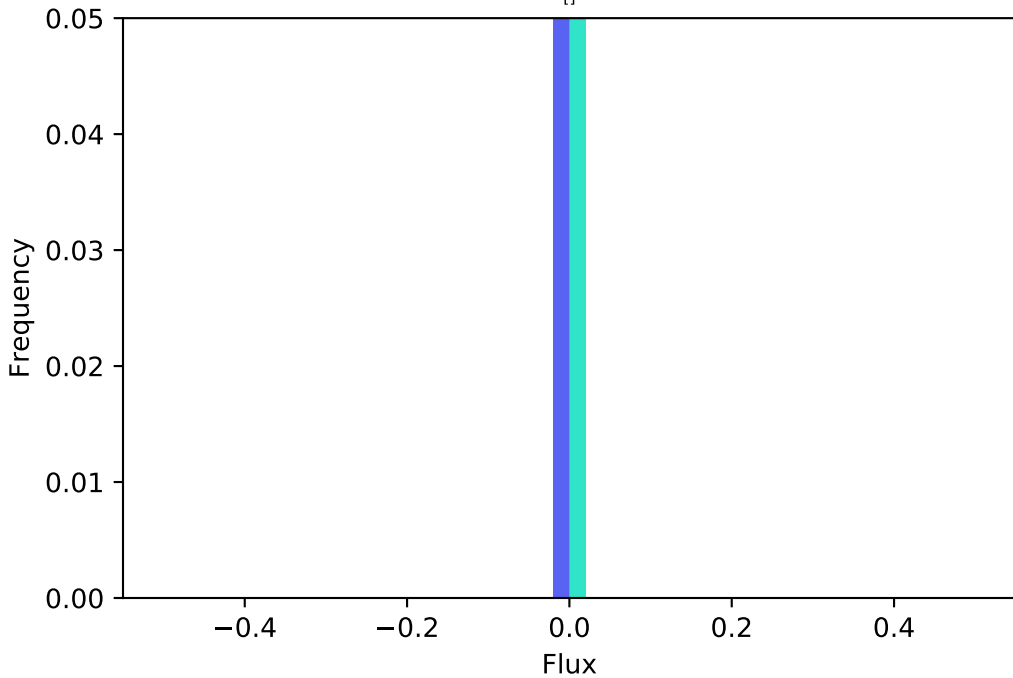
420 : Asn_c --> Asn_m
[]
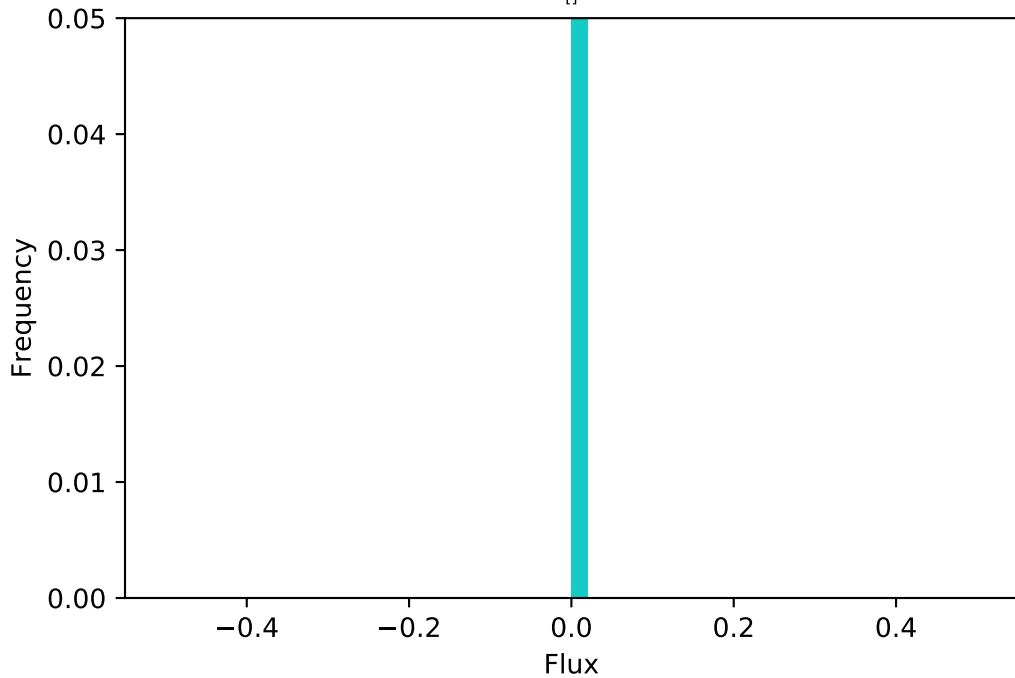
421 : Glu_c --> Glu_h
[]
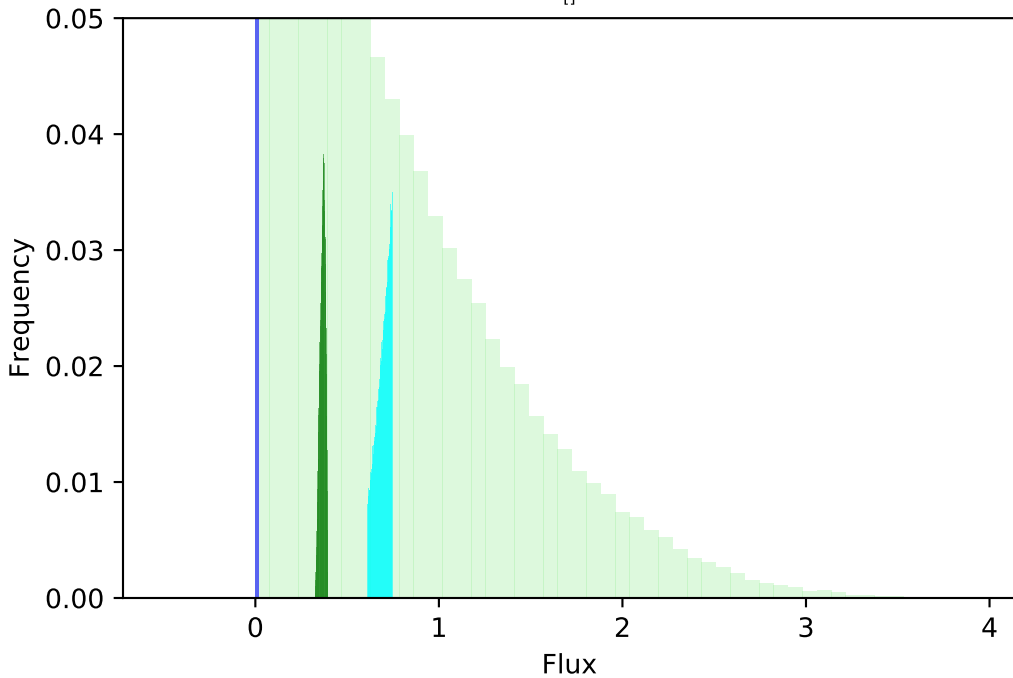
422 : His_h --> His_c
[]

423 : His_c --> His_m
[]

424 : Ile_h --> Ile_c
[]
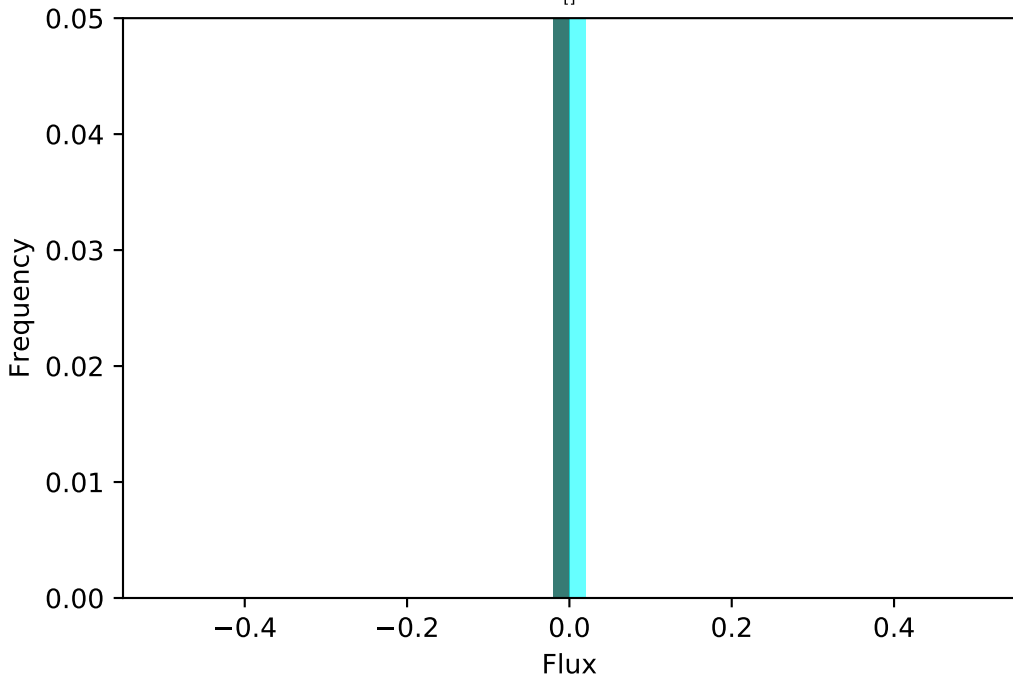
425 : Ile_c --> Ile_m
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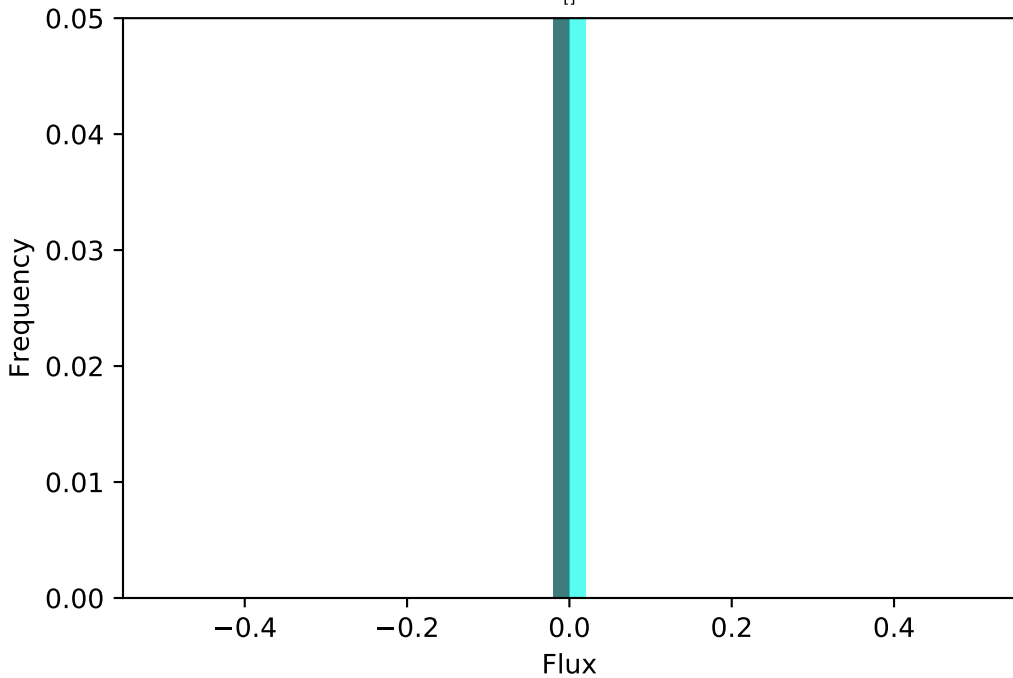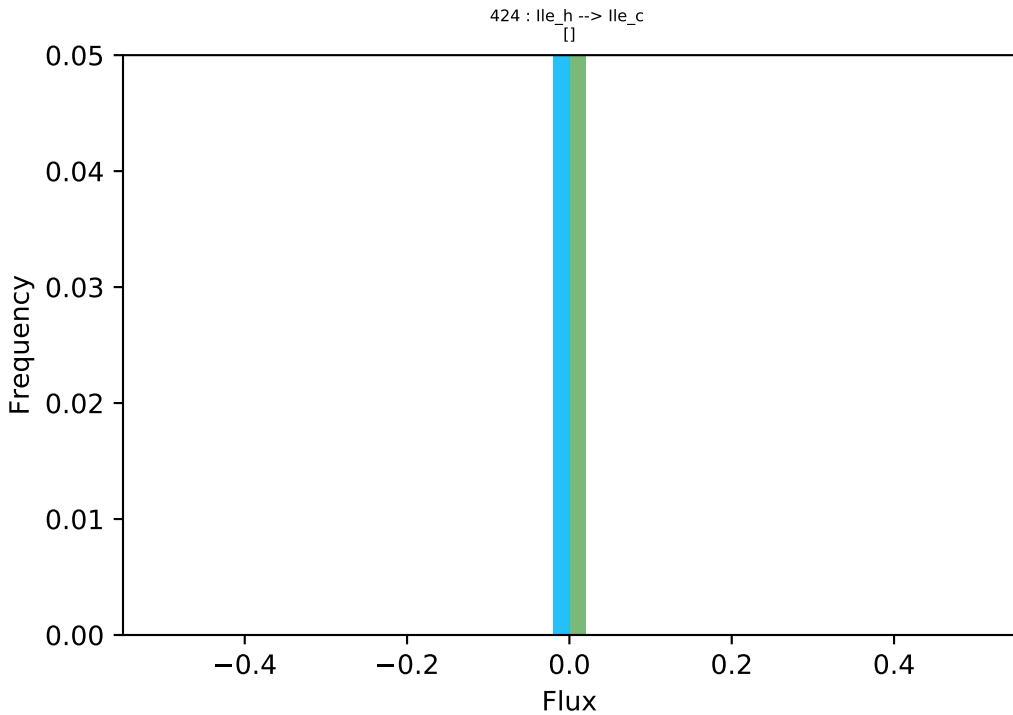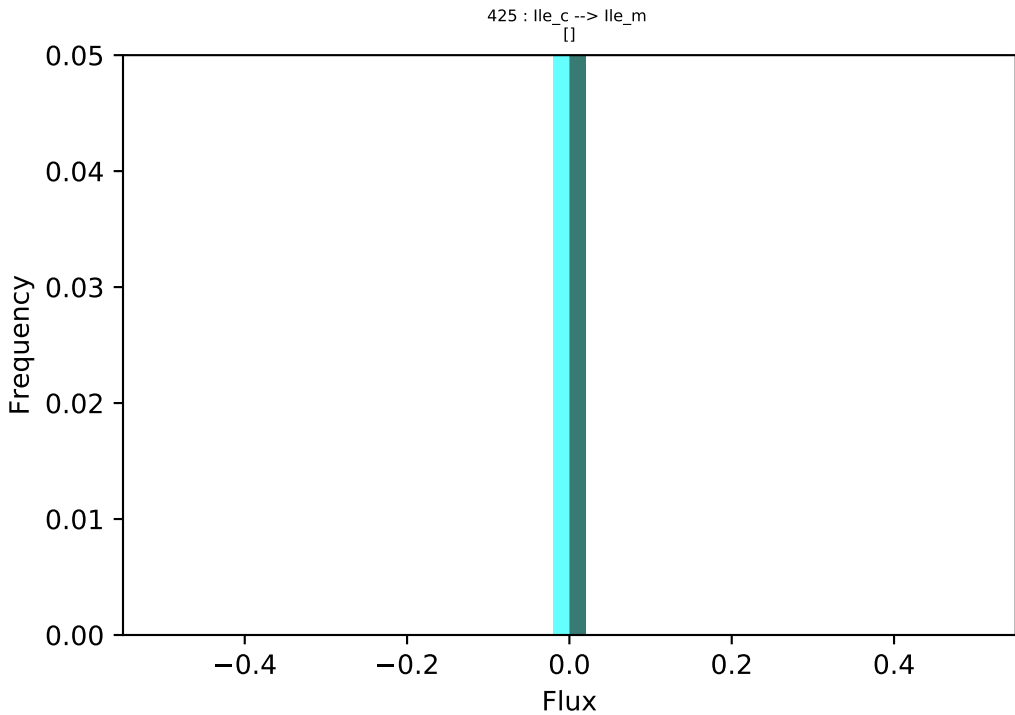
426 : Leu_h --> Leu_c
[]
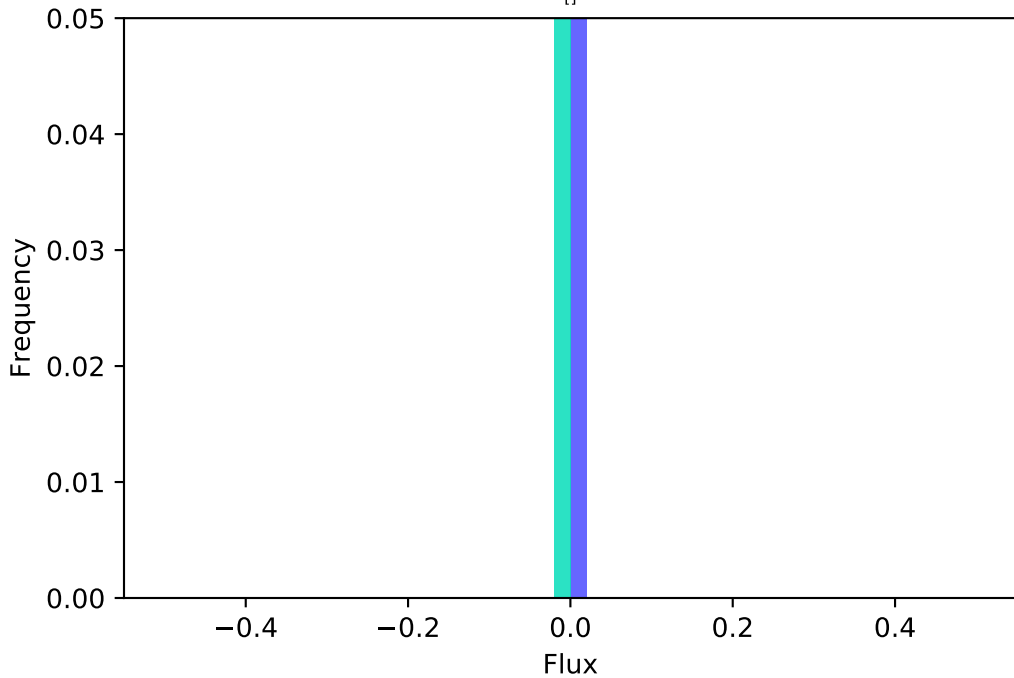
427 : Leu_c --> Leu_m
[]

428 : Lys_h --> Lys_c
[]

429 : Met_c --> Met_h
[]

430 : Met_c --> Met_m
[]
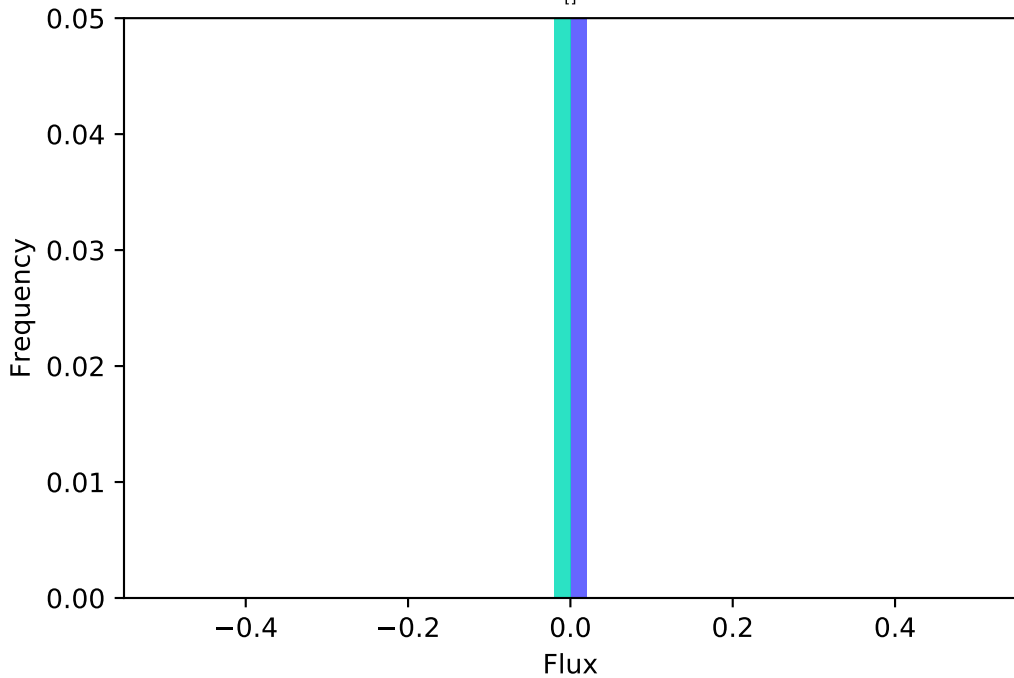
431 : Phe_h --> Phe_c
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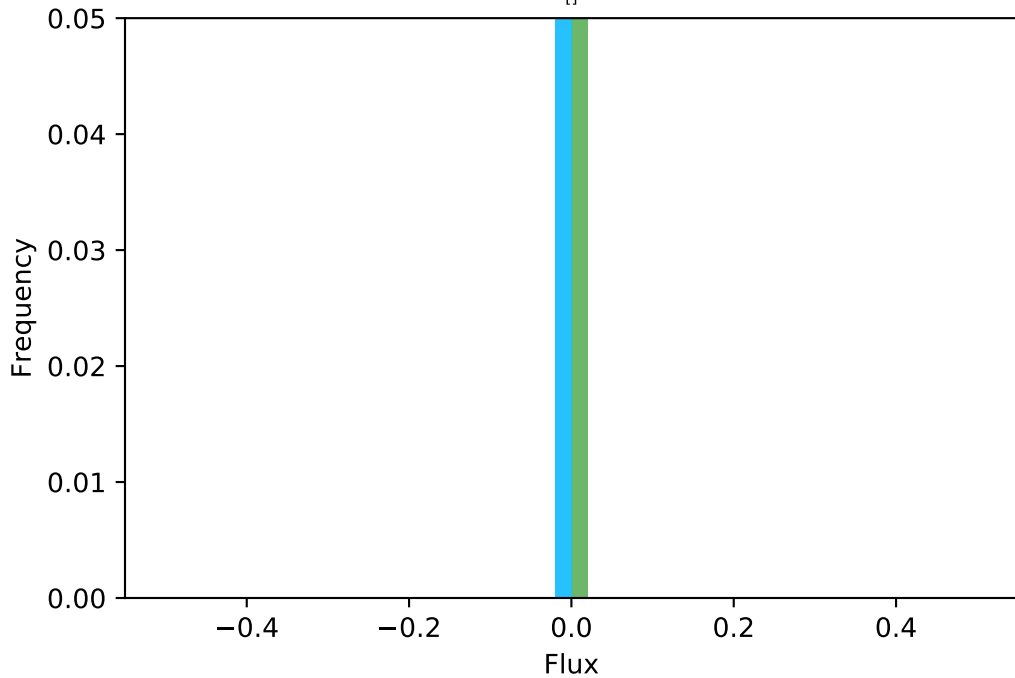
432 : Phe_c --> Phe_m
[]
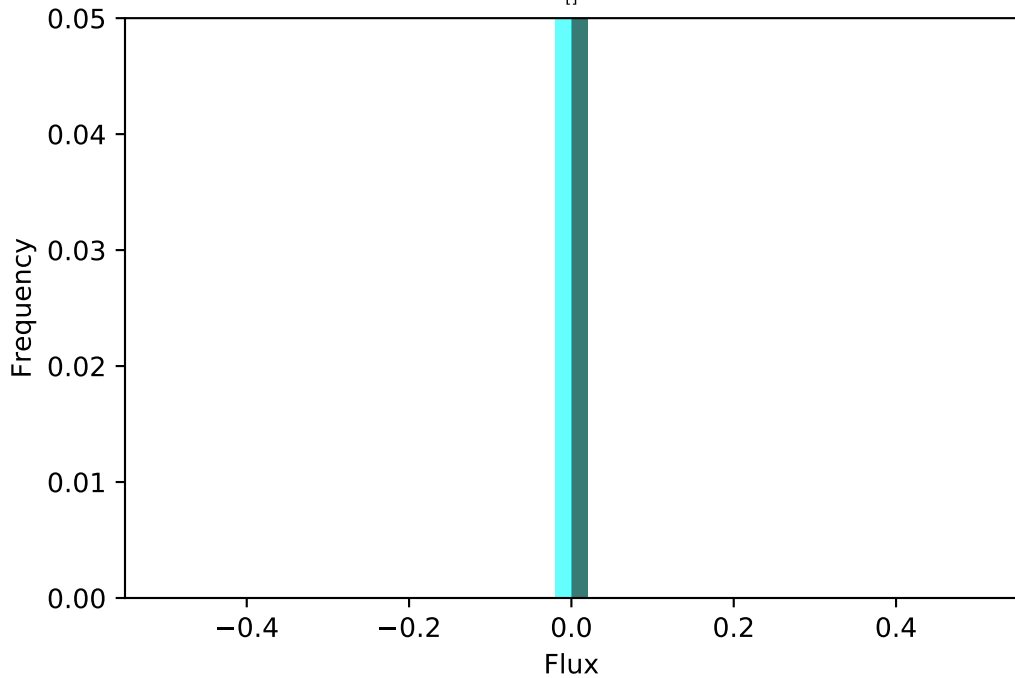
433 : Pro_c --> Pro_h
[]
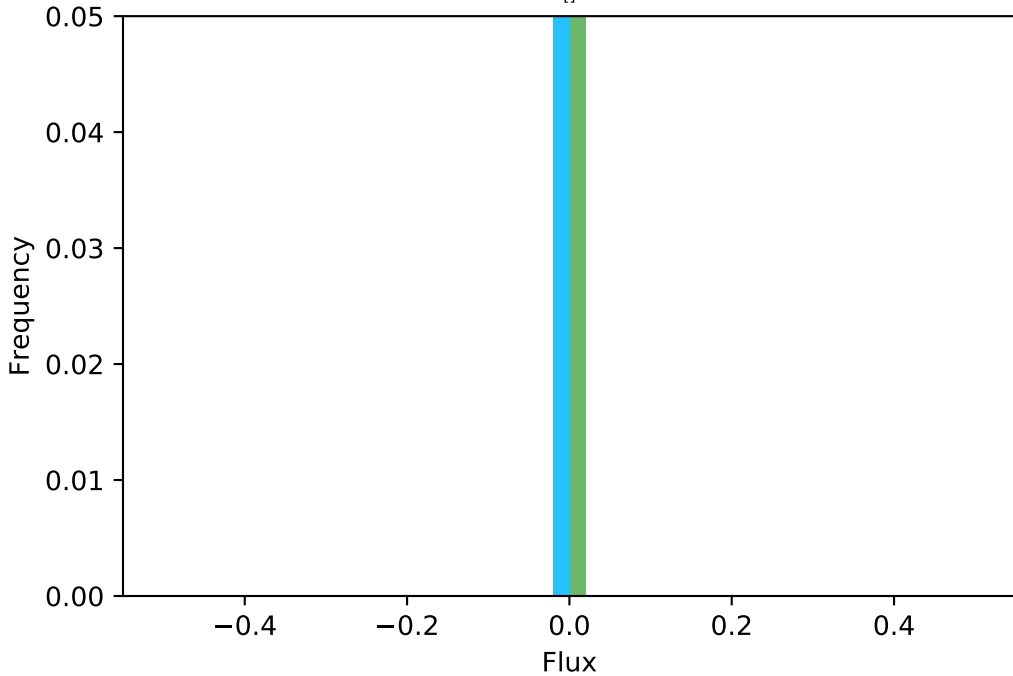
434 : Ser_h --> Ser_c
[]
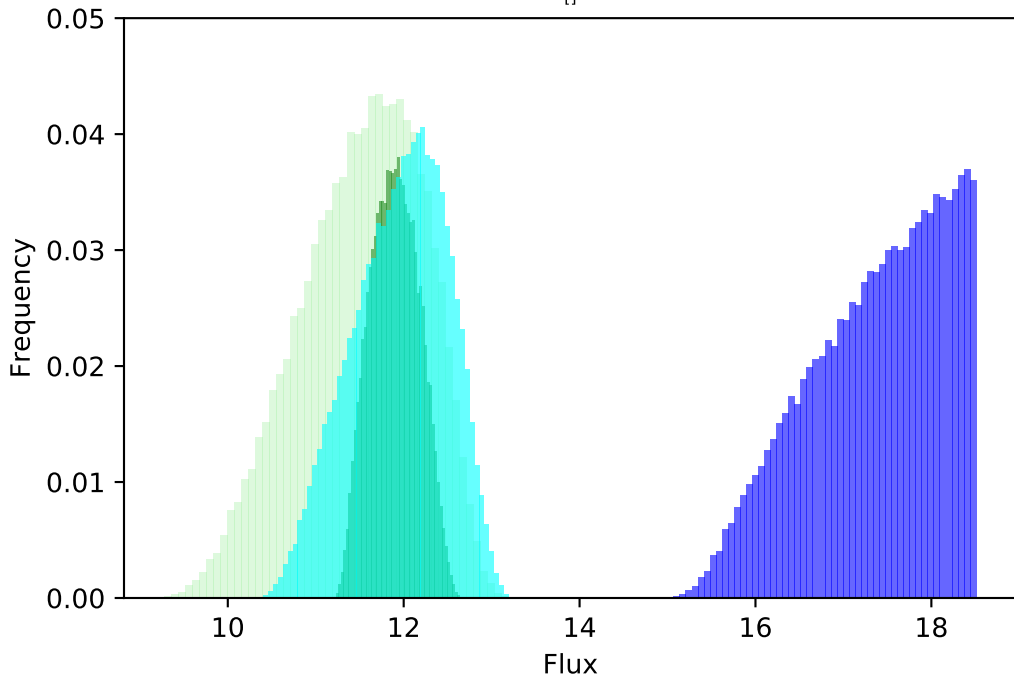
435 : Ser_c --> Ser_m
[]
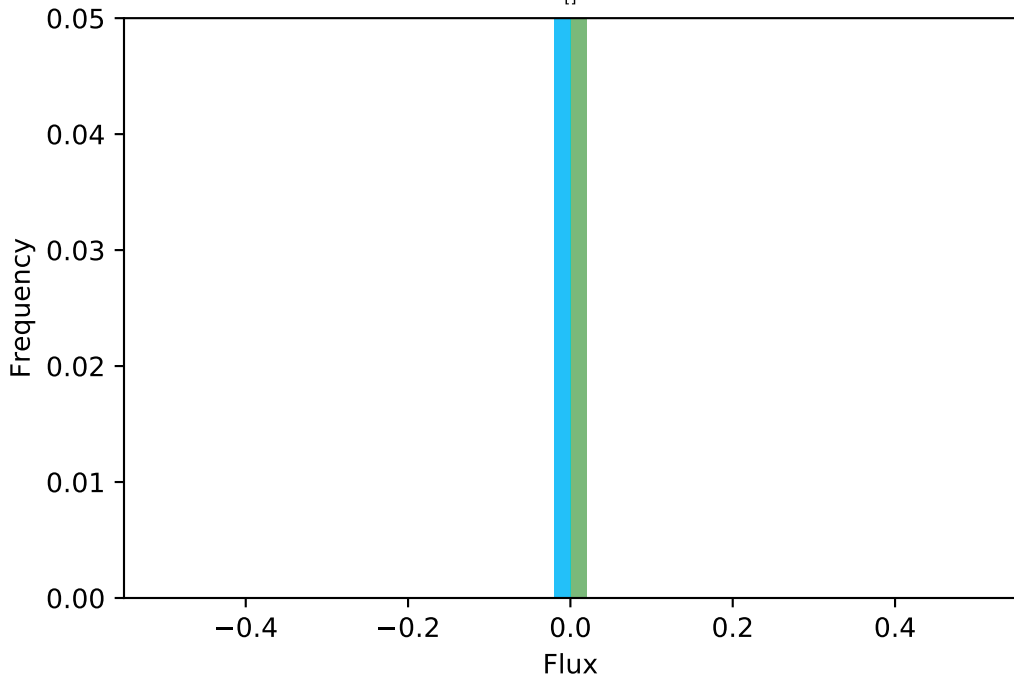
436 : Thr_h --> Thr_c
[]
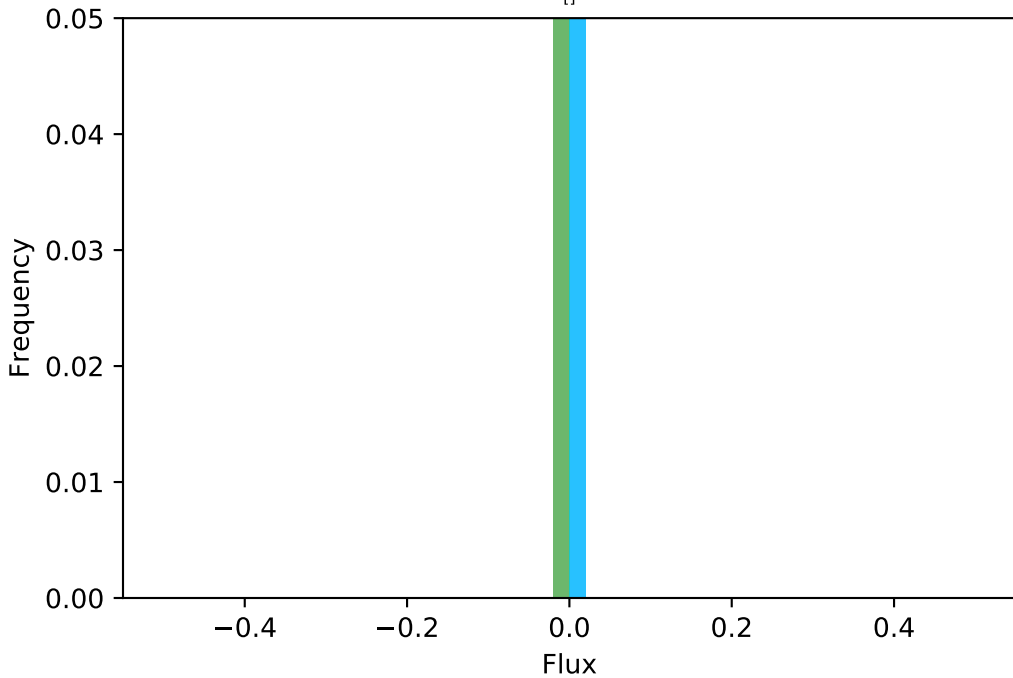
437 : Thr_c --> Thr_m
[]
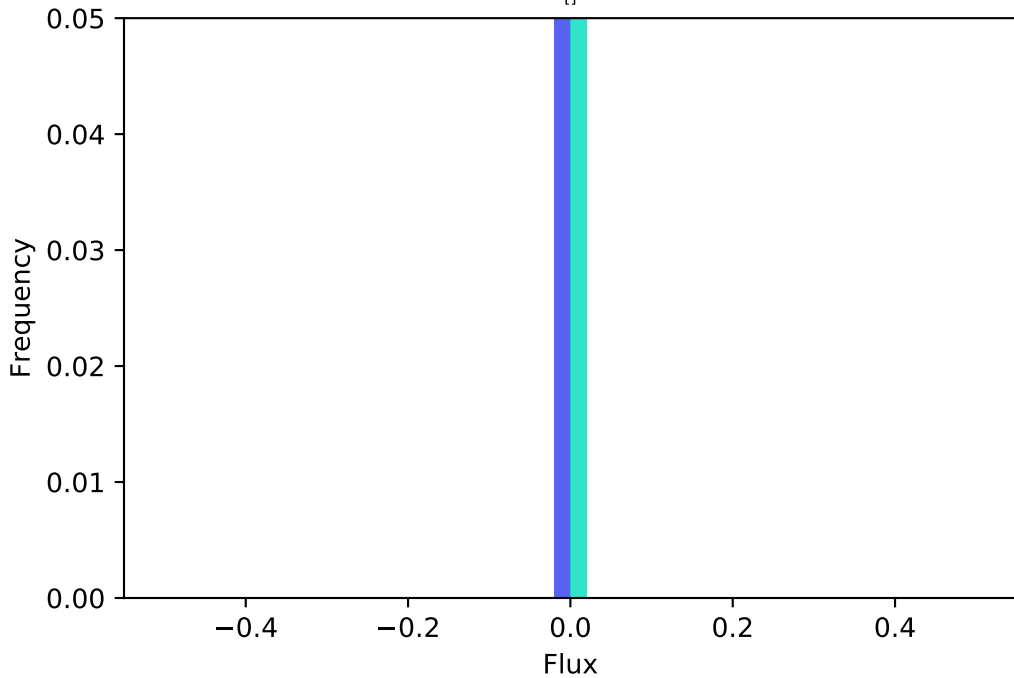
438 : Trp_h --> Trp_c
[]
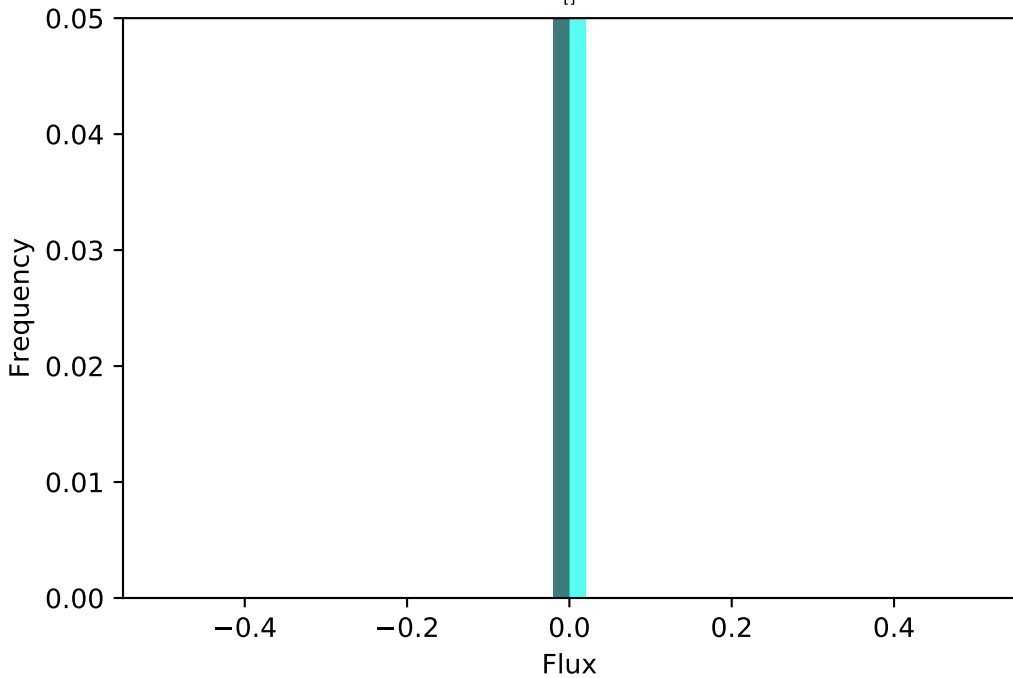
439 : Trp_c --> Trp_m
[]
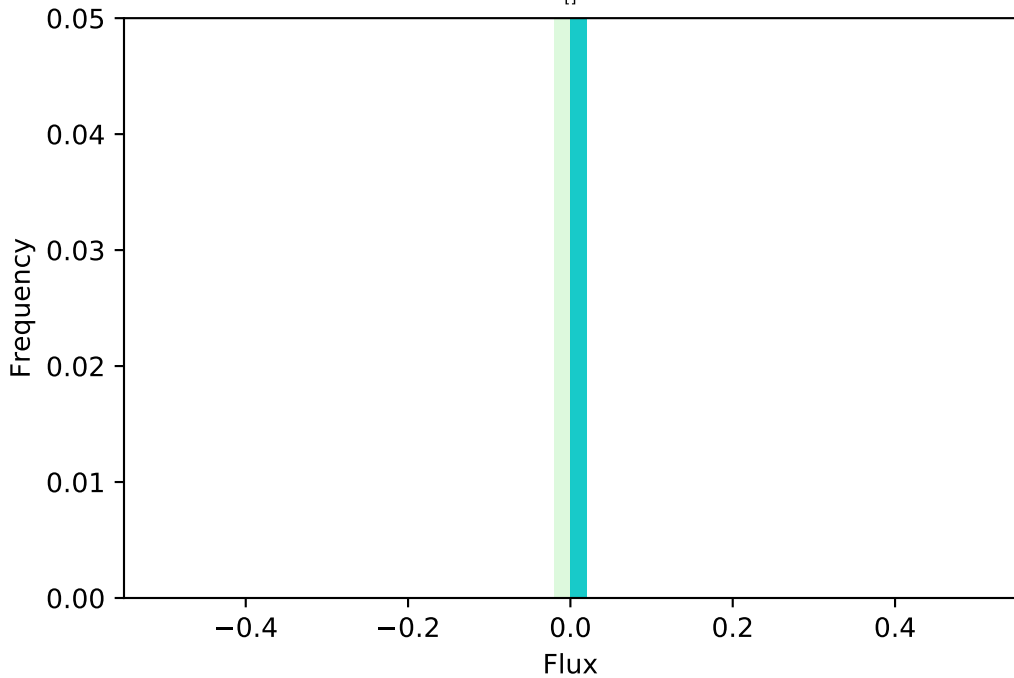
440 : Tyr_h --> Tyr_c
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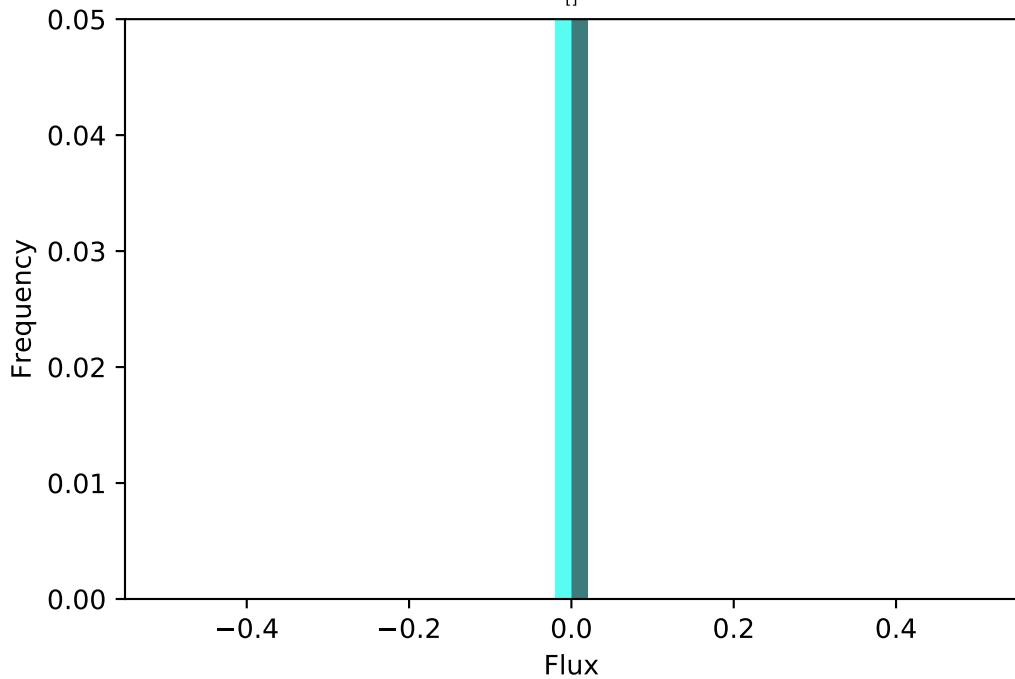
441 : Tyr_c --> Tyr_m
[]
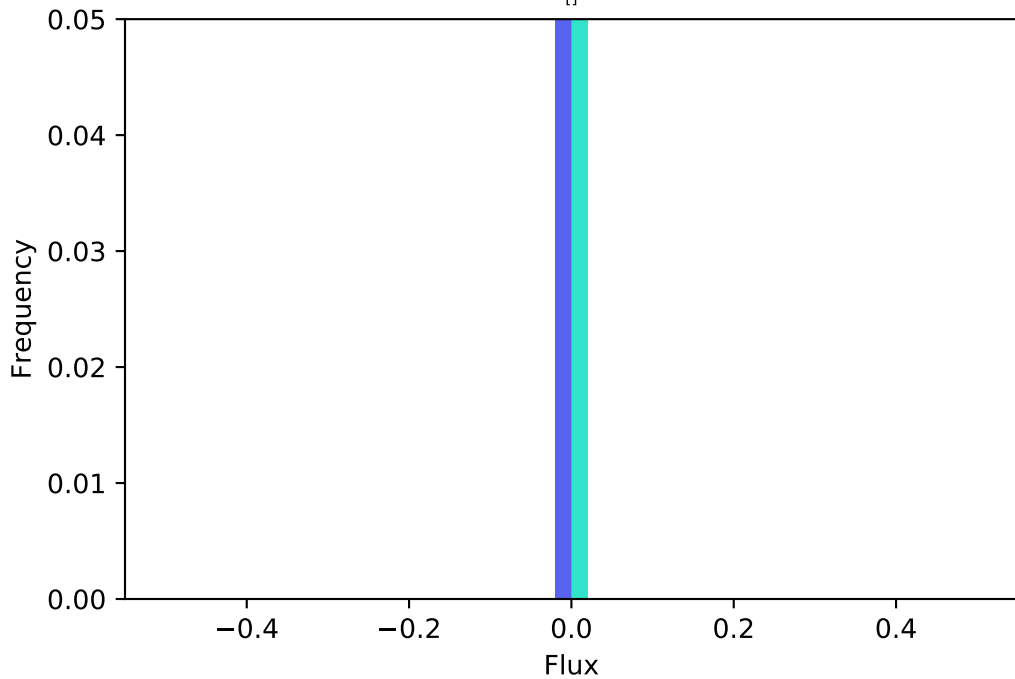
442 : Val_h --> Val_c
[]

443 : Val_c --> Val_m
[]
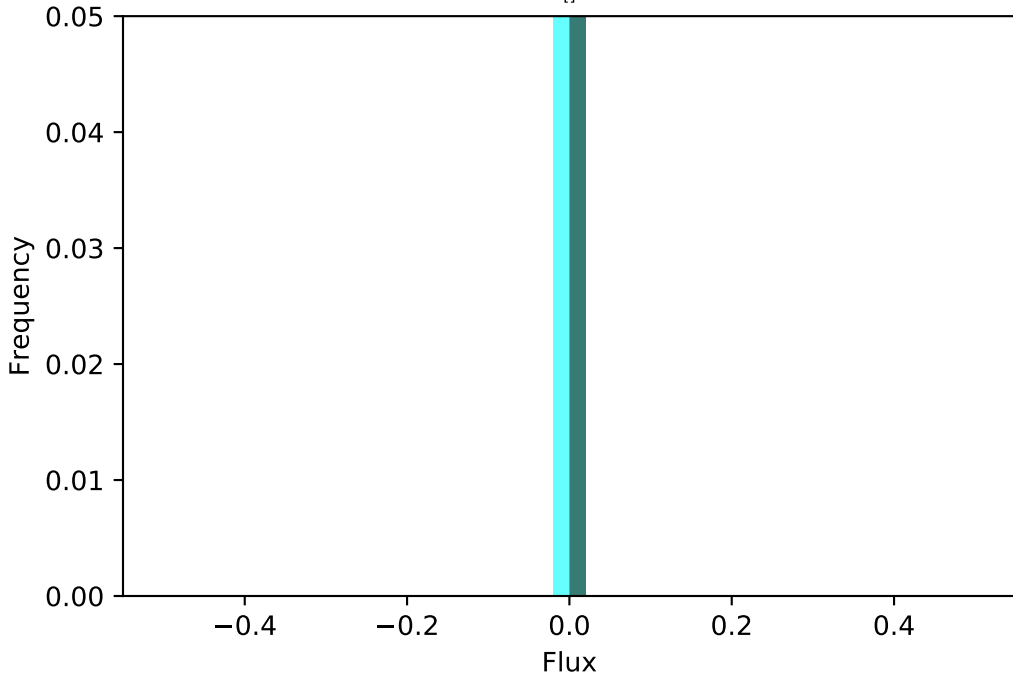
444 : <=> H_c
[]
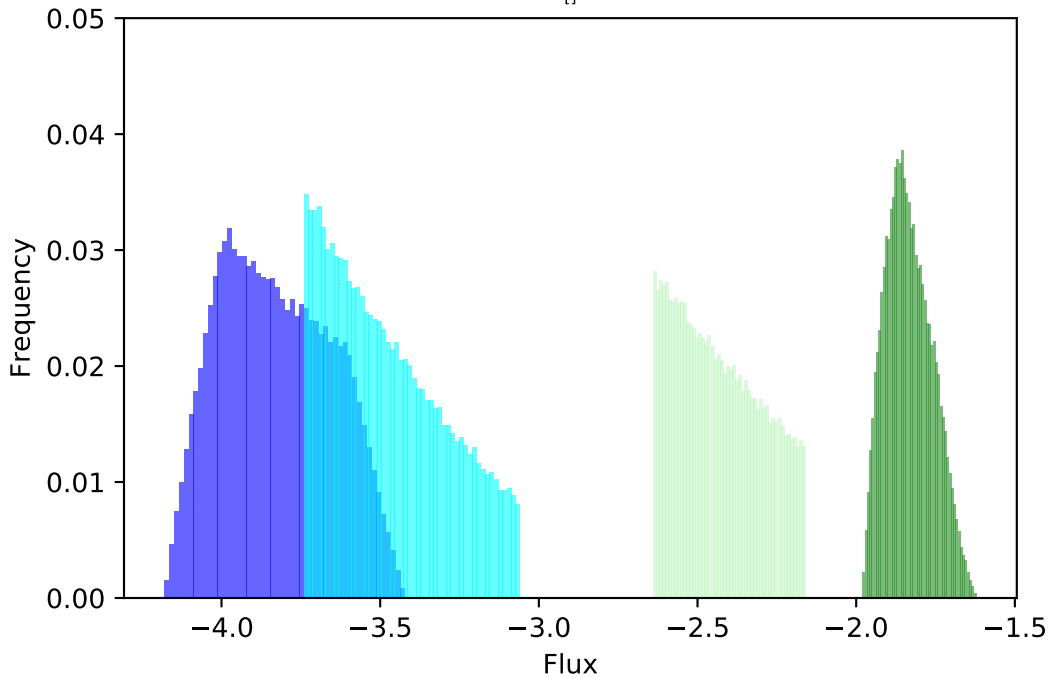
445 :   --> hnu_h
[]
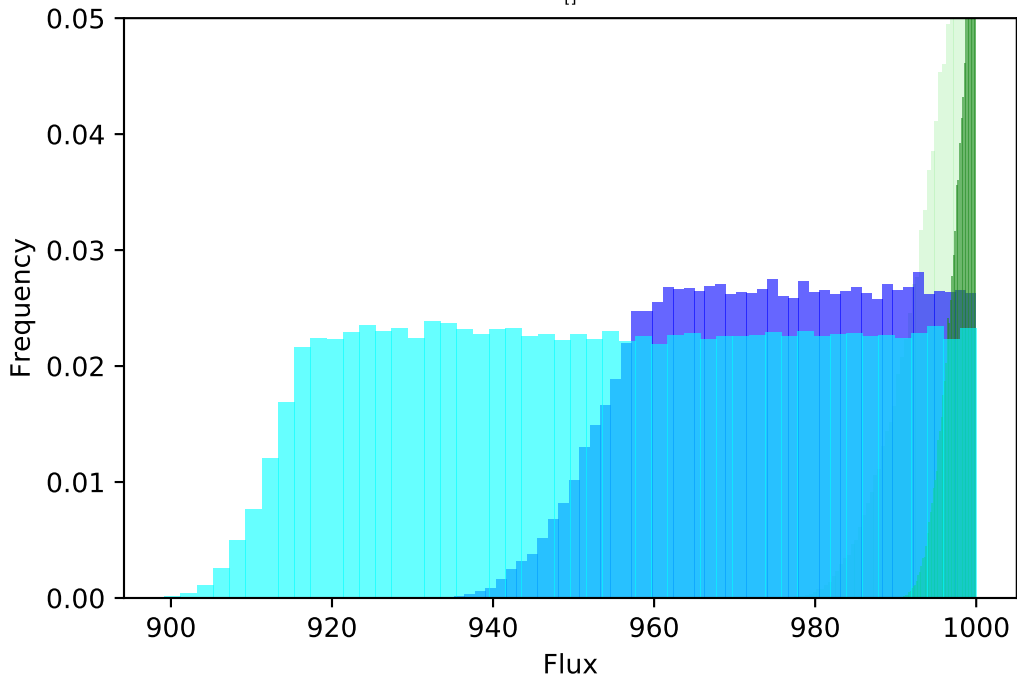
446 : --> CO2_c
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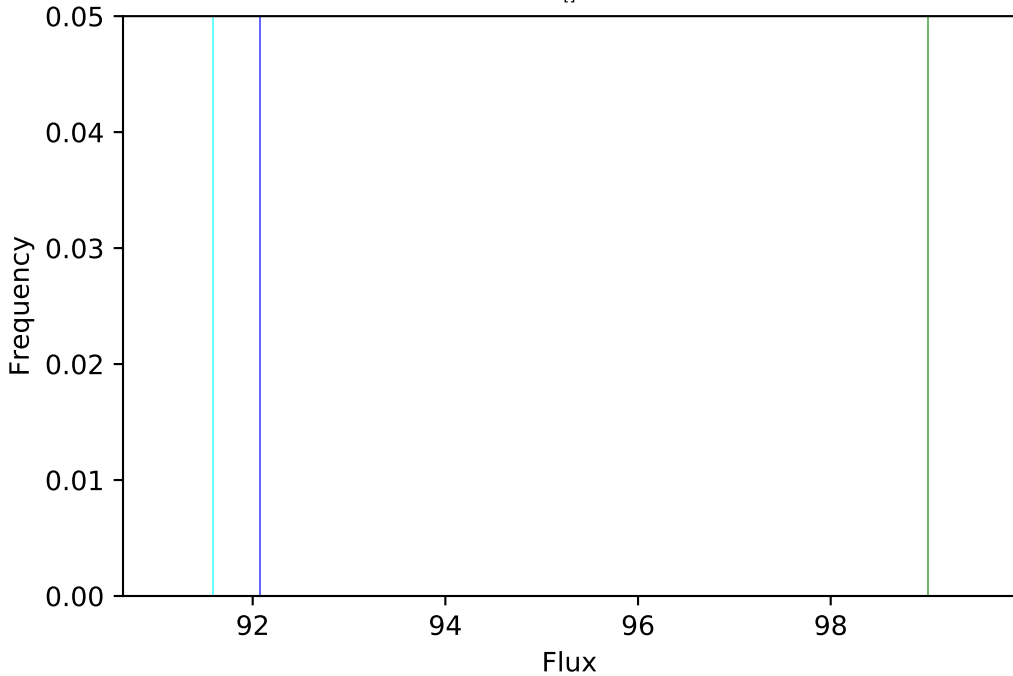
447 : --> H2O_c
[]
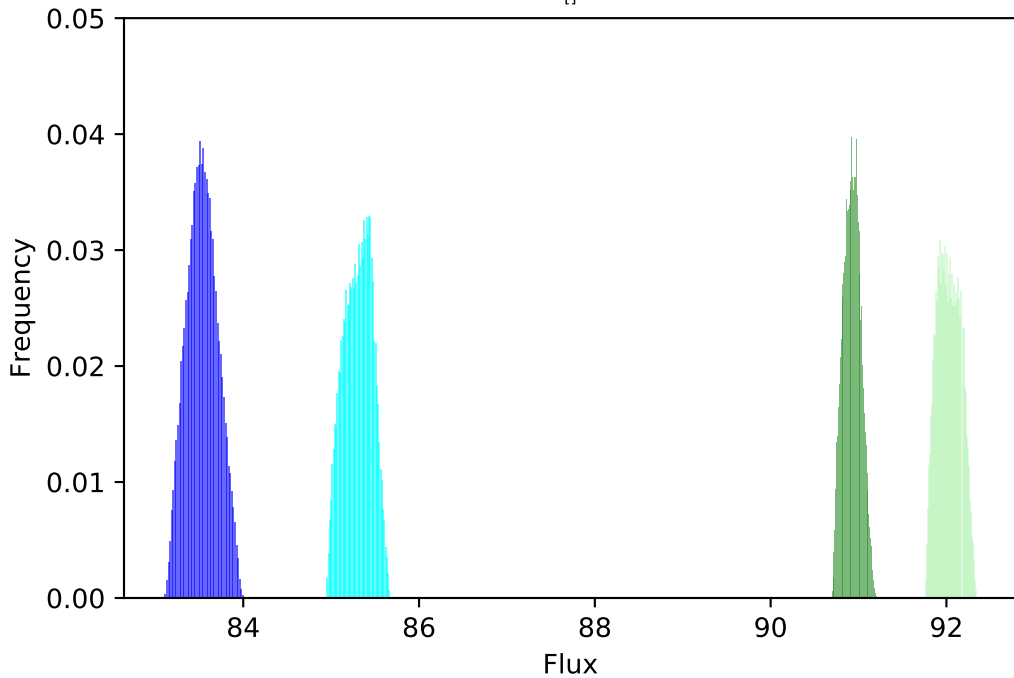
448 : 3.0 ATP_c + 3.0 H2O_c --> 3.0 ADP_c + 2.0 H_h + 3.0 Pi_c + Pi_h
[]
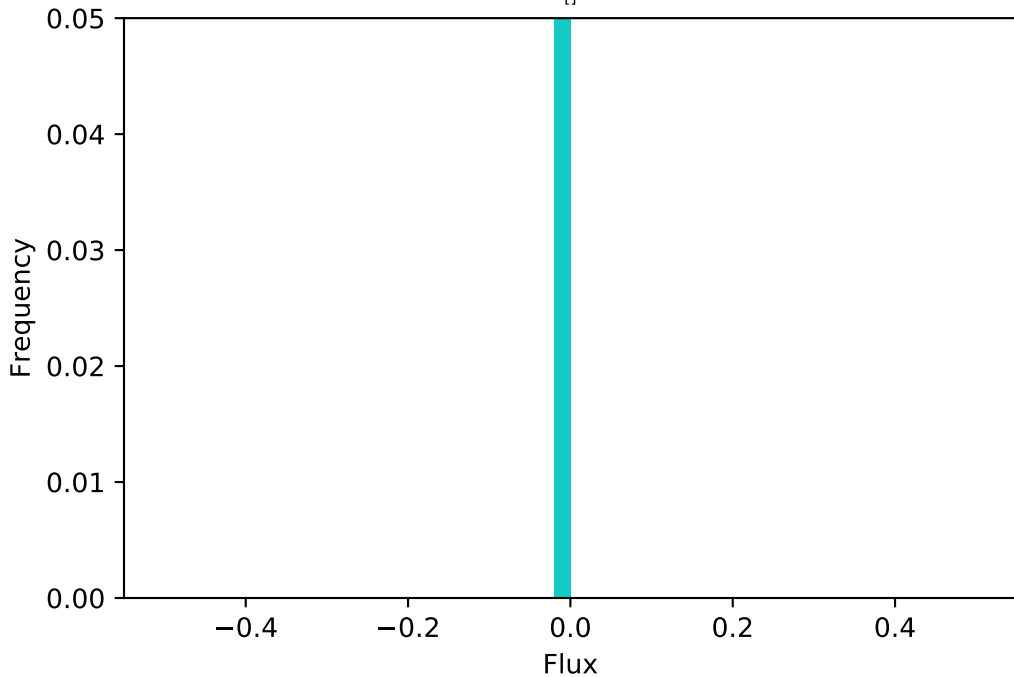
449 : 2.0 ATP_c + 2.0 H2O_c --> 2.0 ADP_c + 2.0 H_c + NO3_c + 2.0 Pi_c
[]

450 : --> NH4_c
[]
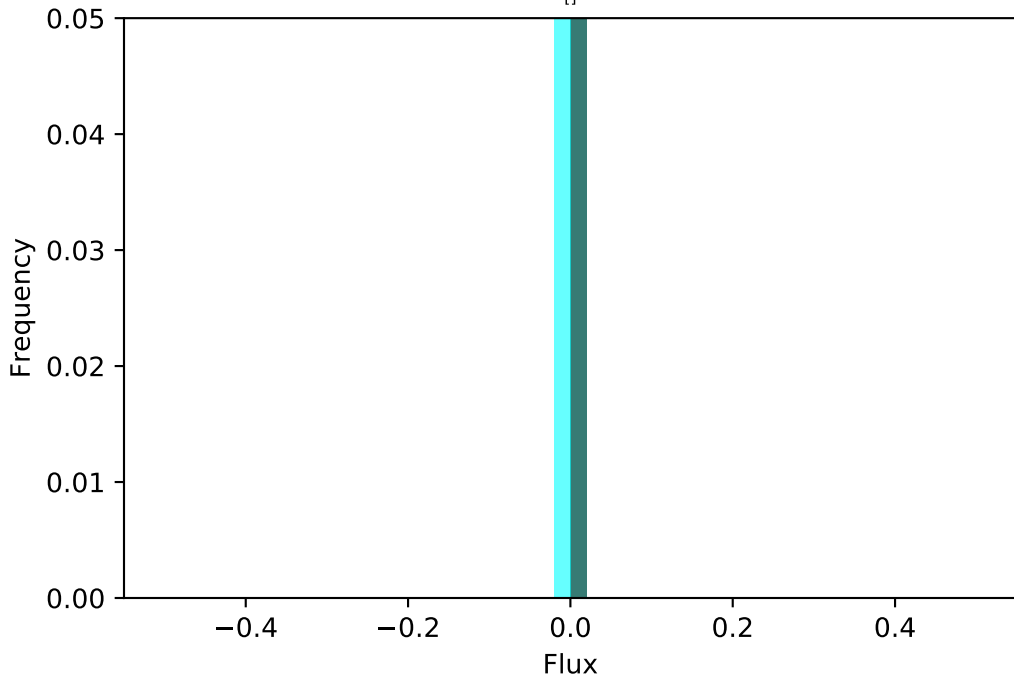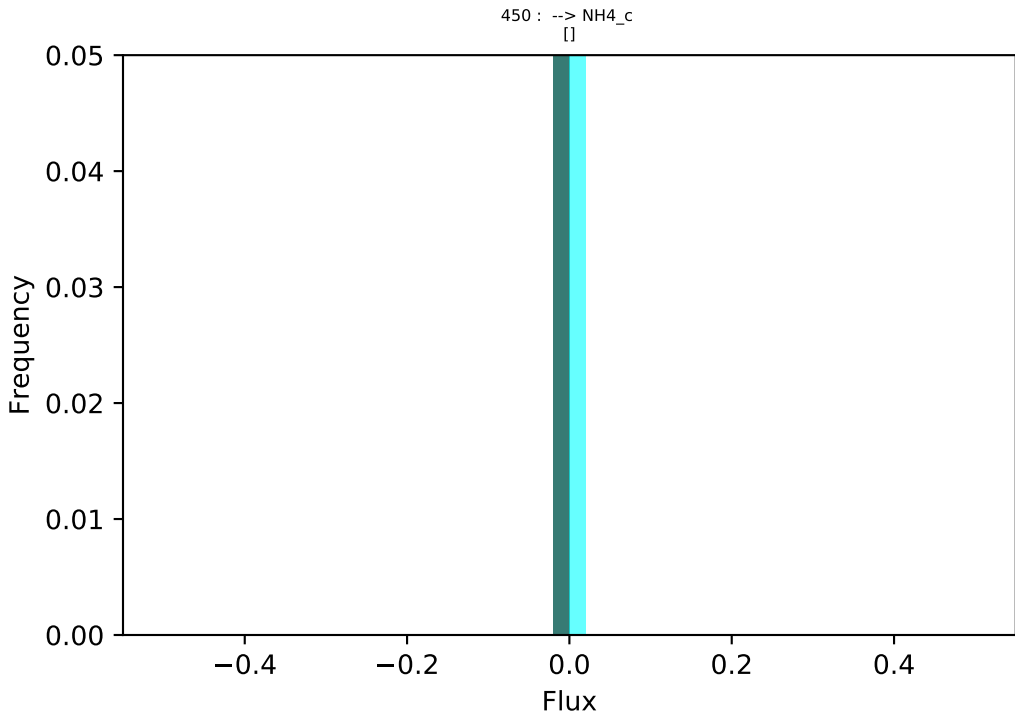
451 : 3.0 ATP_c + 3.0 H2O_c --> 3.0 ADP_c + 3.0 H_c + 3.0 Pi_c + SO4_c
[]

452 : --> H2S_c
[]

453 : O2_c -->
[]

454 : Ala_c -->
[]

455 : Ala_h -->
[]

456 : Ala_m -->
[]

457 : Ala_p -->
[]

458 : Arg_c -->
[]

459 : Arg_h -->
[]

460 : Arg_m -->
[]

461 : Arg_p -->
[]

462 : Asn_c -->
[]

463 : Asn_h -->
[]

464 : Asn_m -->
[]

465 : Asn_p -->
[]

466 : Asp_c -->
[]

467 : Asp_h -->
[]

468 : Asp_m -->
[]

469 : Asp_p -->
[]

470 : Cys_c -->
[]

471 : Cys_h -->
[]

472 : Cys_m -->
[]

473 : Cys_p -->
[]

474 : Gln_c -->
[]

475 : Gln_h -->
[]

476 : Gln_m -->
[]

477 : Gln_p -->
[]

478 : Glu_c -->
[]

479 : Glu_h -->
[]

480 : Glu_m -->
[]

481 : Glu_p -->
[]

482 : Gly_c -->
[]

483 : Gly_h -->
[]

484 : Gly_m -->
[]

485 : Gly_p -->
[]

486 : His_c -->
[]

487 : His_h -->
[]

488 : His_m -->
[]

489 : His_p -->
[]

490 : Ile_c -->
[]

491 : Ile_h -->
[]

492 : Ile_m -->
[]

493 : Ile_p -->
[]

494 : Leu_c -->
[]

495 : Leu_h -->
[]

496 : Leu_m -->
[]

497 : Leu_p -->
[]

498 : Lys_c -->
[]

499 : Lys_h -->
[]

500 : Lys_m -->
[]

501 : Lys_p -->
[]

502 : Met_c -->
[]

503 : Met_h -->
[]

504 : Met_m -->
[]

505 : Met_p -->
[]

506 : Phe_c -->
[]

507 : Phe_h -->
[]

508 : Phe_m -->
[]

509 : Phe_p -->
[]

510 : Pro_c -->
[]

511 : Pro_h -->
[]

512 : Pro_m -->
[]

513 : Pro_p -->
[]

514 : Ser_c -->
[]

515 : Ser_h -->
[]

516 : Ser_m -->
[]

517 : Ser_p -->
[]

518 : Thr_c -->
[]

519 : Thr_h -->
[]

520 : Thr_m -->
[]

521 : Thr_p -->
[]

522 : Trp_c -->
[]

523 : Trp_h -->
[]

524 : Trp_m -->
[]

525 : Trp_p -->
[]

526 : Tyr_c -->
[]

527 : Tyr_h -->
[]

528 : Tyr_m -->
[]

529 : Tyr_p -->
[]

530 : Val_c -->
[]

531 : Val_h -->
[]

532 : Val_m -->
[]

533 : Val_p -->
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534 : starch3_h -->
[]

535 : Glc_c -->
[]

536 : Frc_c -->
[]

537 : Suc_c -->
[]

538 : cellulose3_c -->
[]

539 : Mas_c -->
[]

540 : M_DASH_ACP_h --> ACP_h + H_h
[]

541 : Tre_c -->
[]

542 : ATP_c + H2O_c --> ADP_c + H_c + Pi_c
[]

543 : ATP_h + H2O_h --> ADP_h + H_h + Pi_h
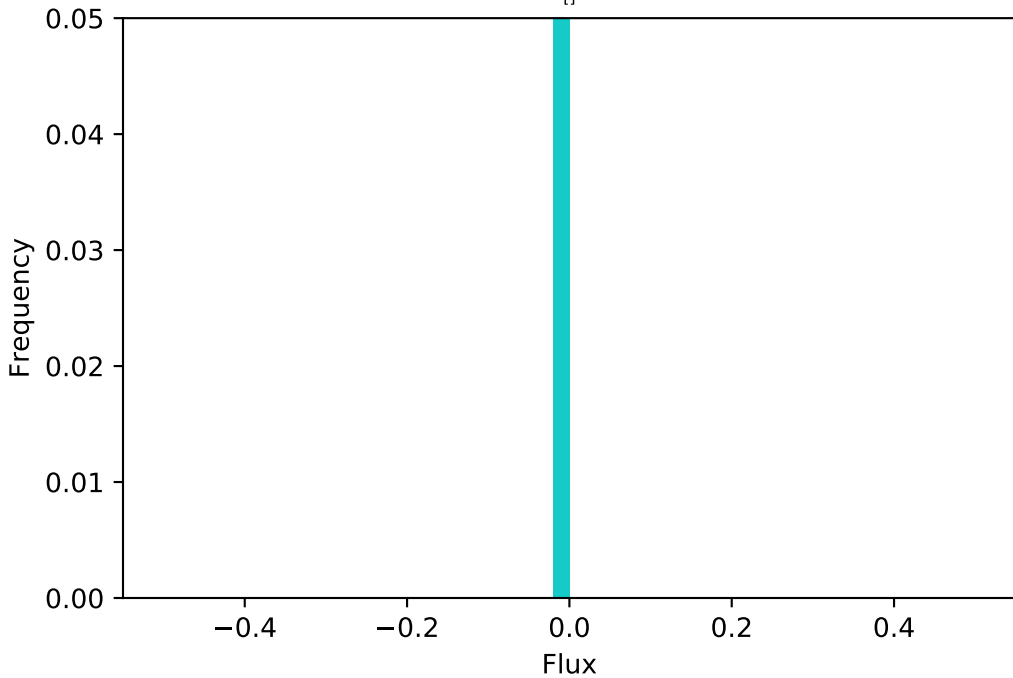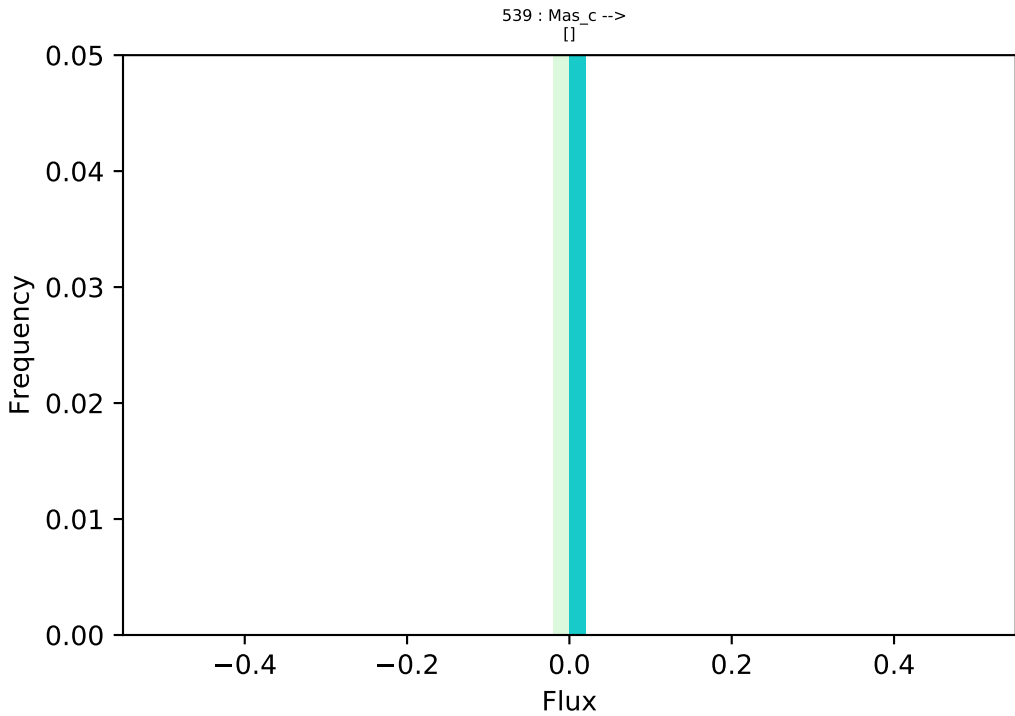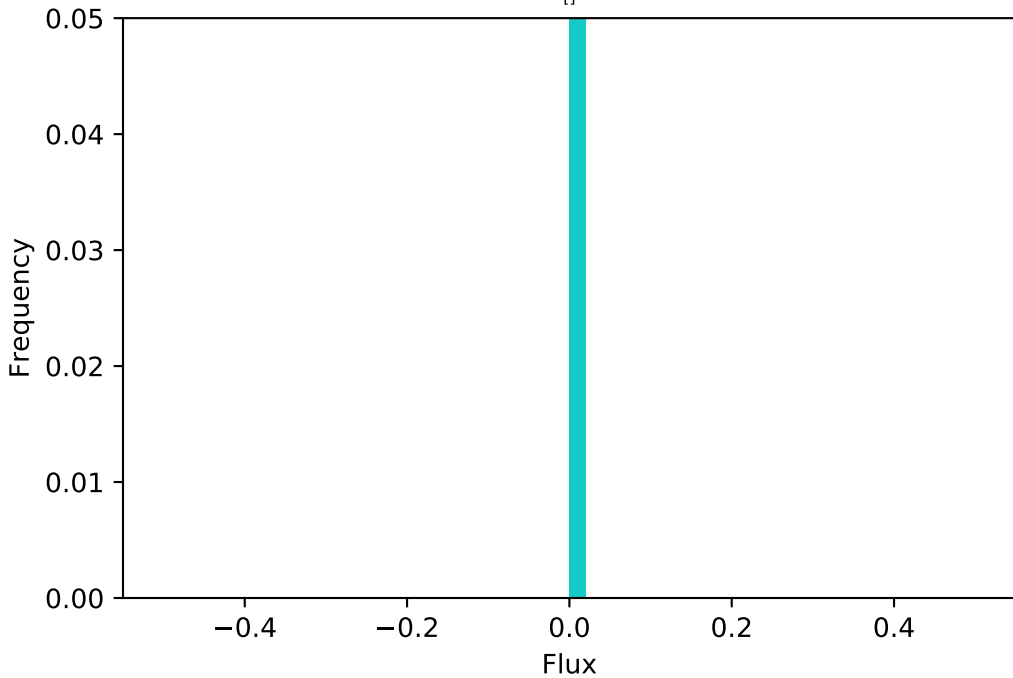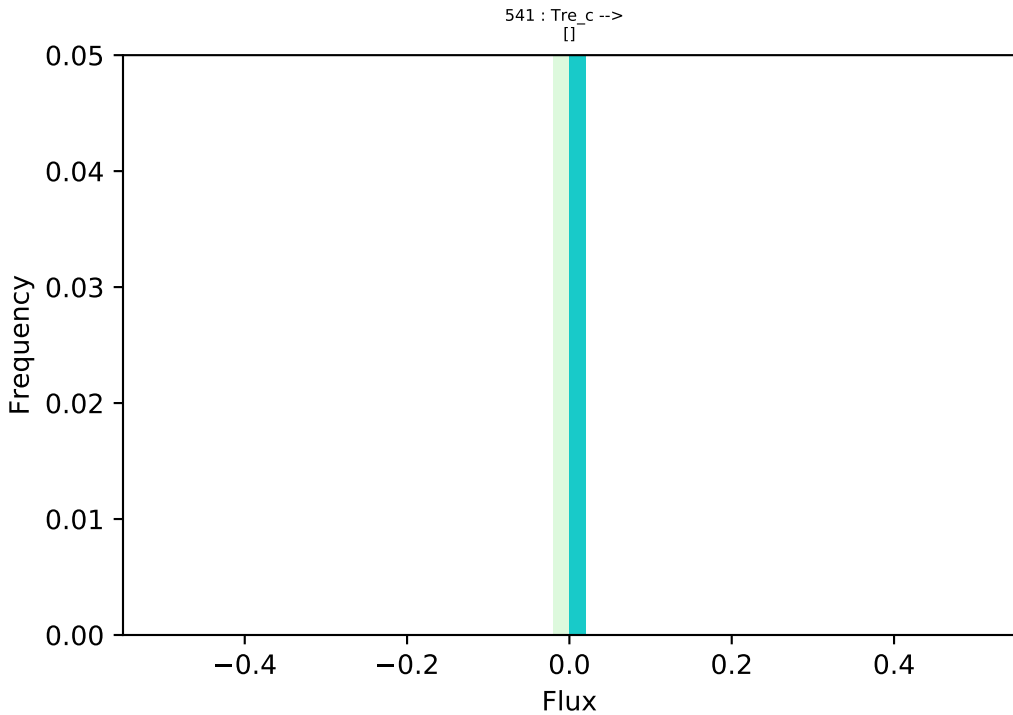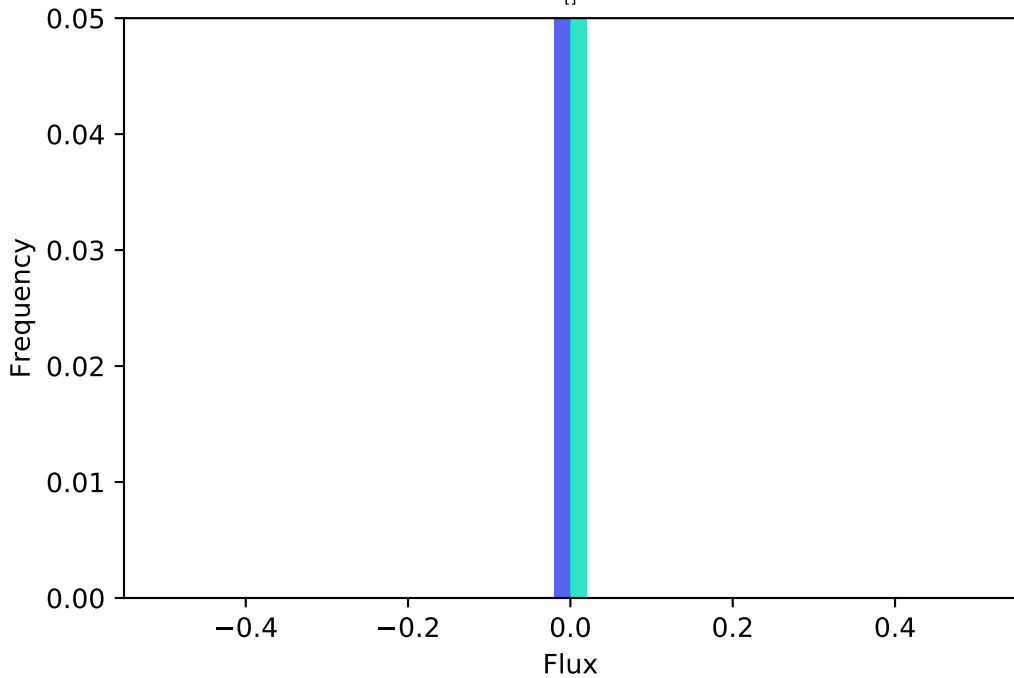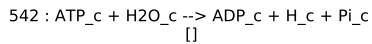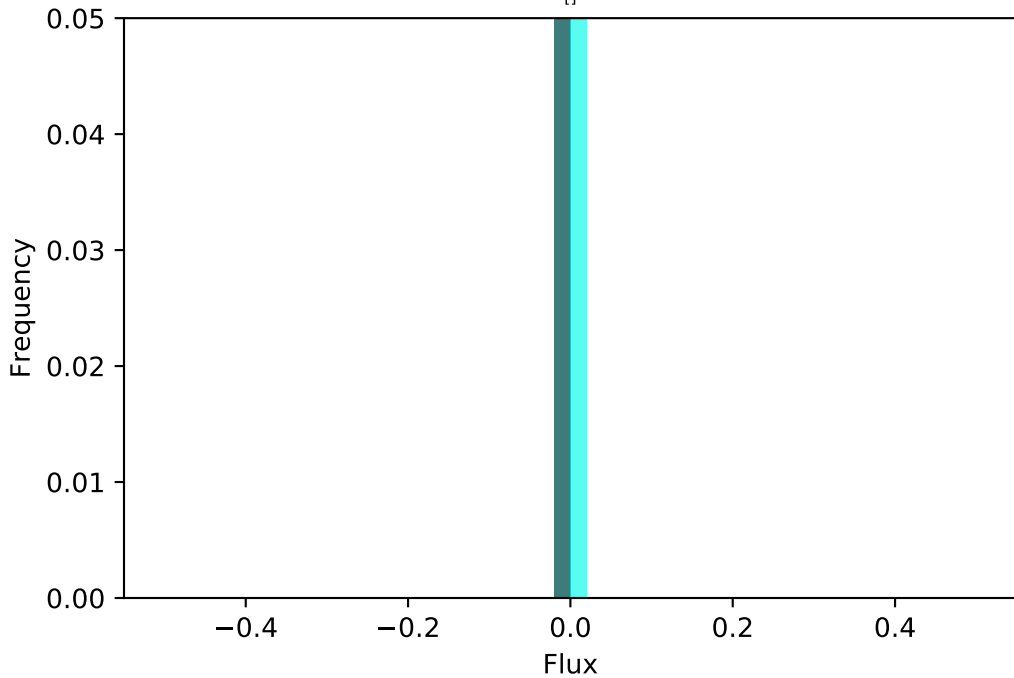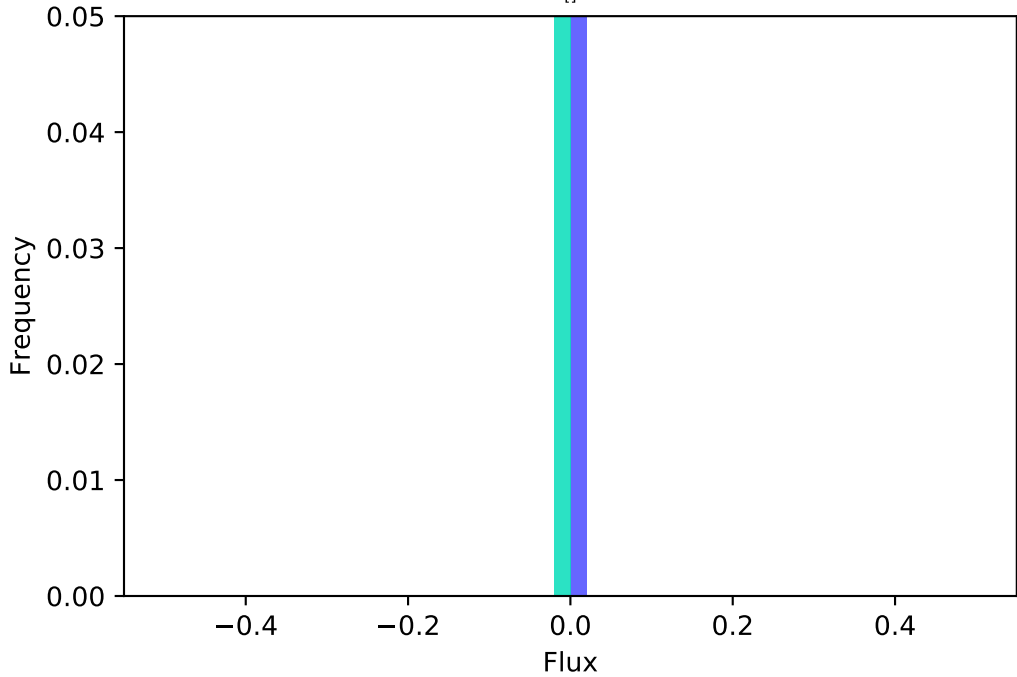[]
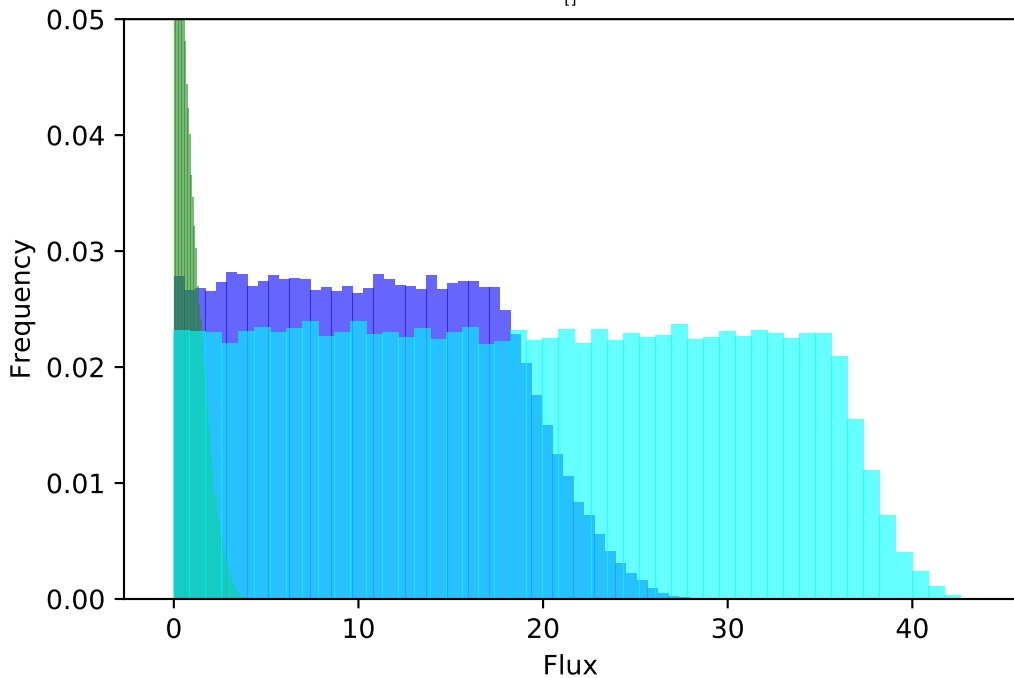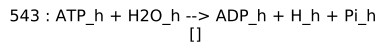
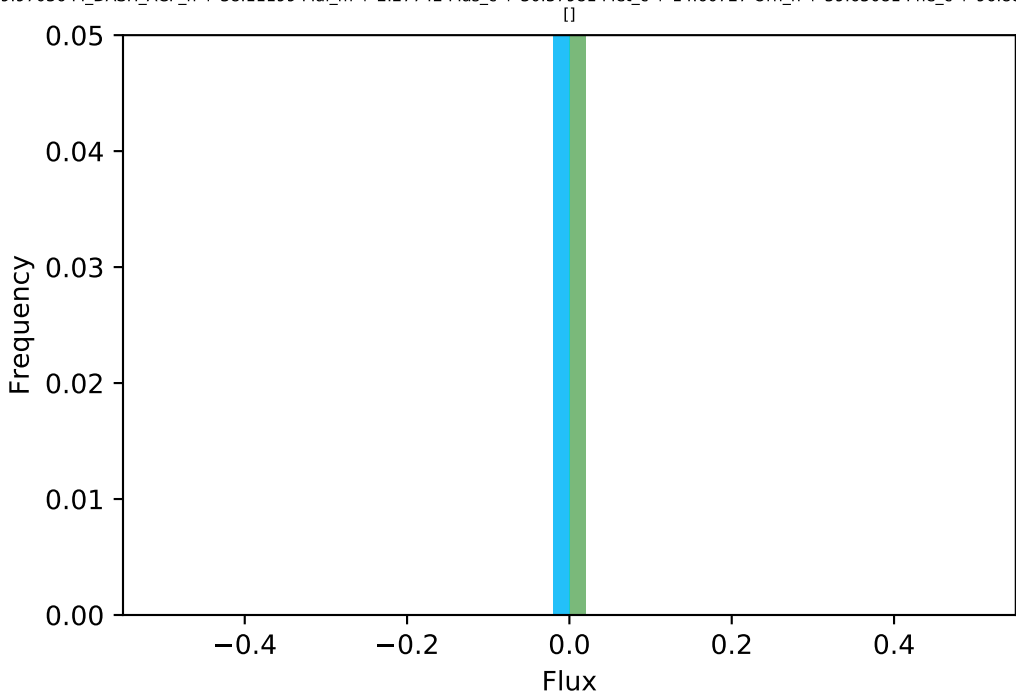544 : ATP_m + H2O_m --> ADP_m + H_m + Pi_m
[]

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
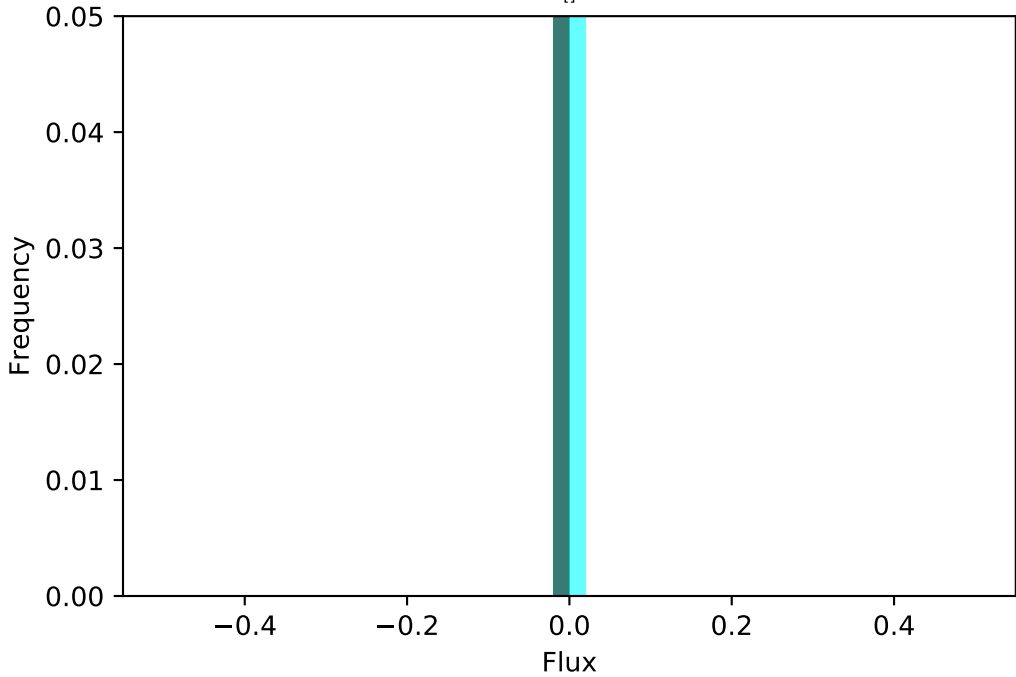[]

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
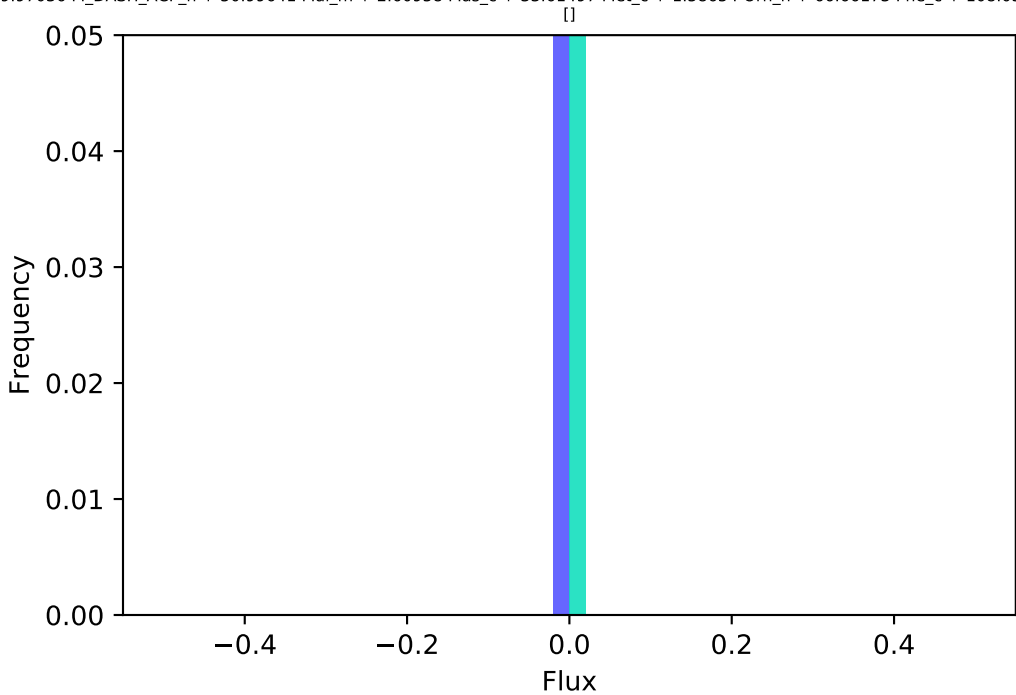
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_c + 826.95653 M_DASH_ACP_h + 10.89856 Mal_m + 5.37965 Mas_c + 51.81818 Met_c + 9.64682 Orn_h + 101.65645 Phe_c + 164.00331 Pro_
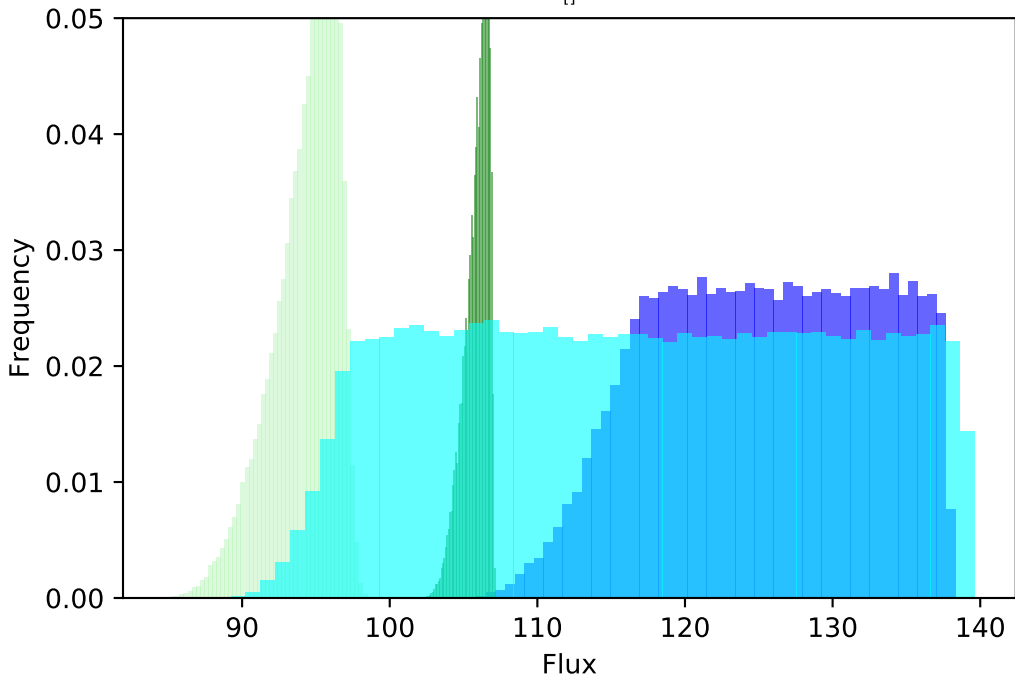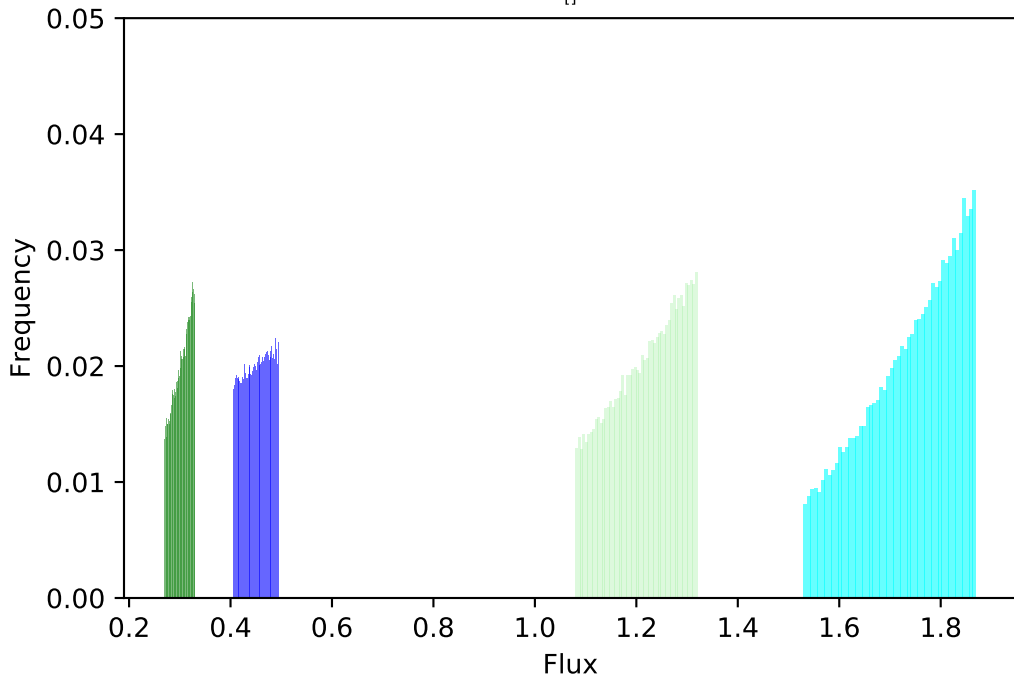
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779.97036 M_DASH_ACP_h + 50.99641 Mal_m + 2.60958 Mas_c + 33.61497 Met_c + 1.58654 Orn_h + 66.66173 Phe_c + 108.03688 Pro_c + 0
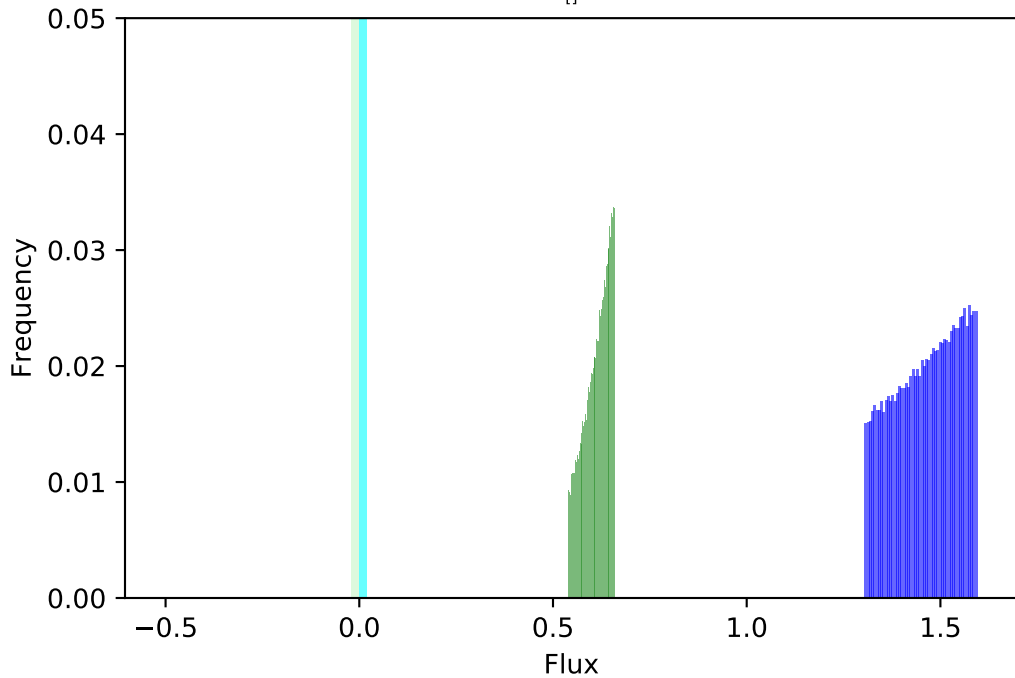
[]

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 -->
[]