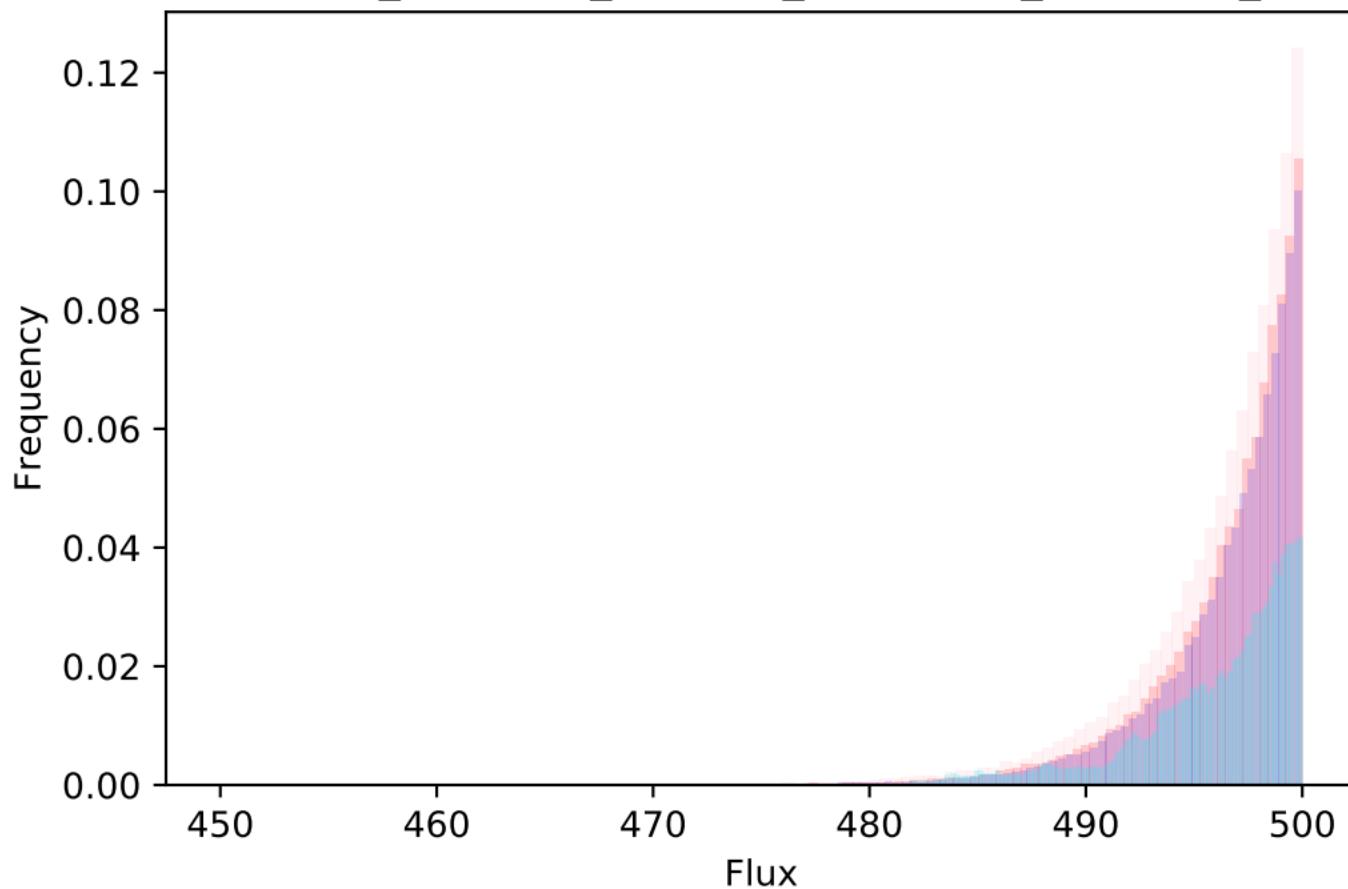
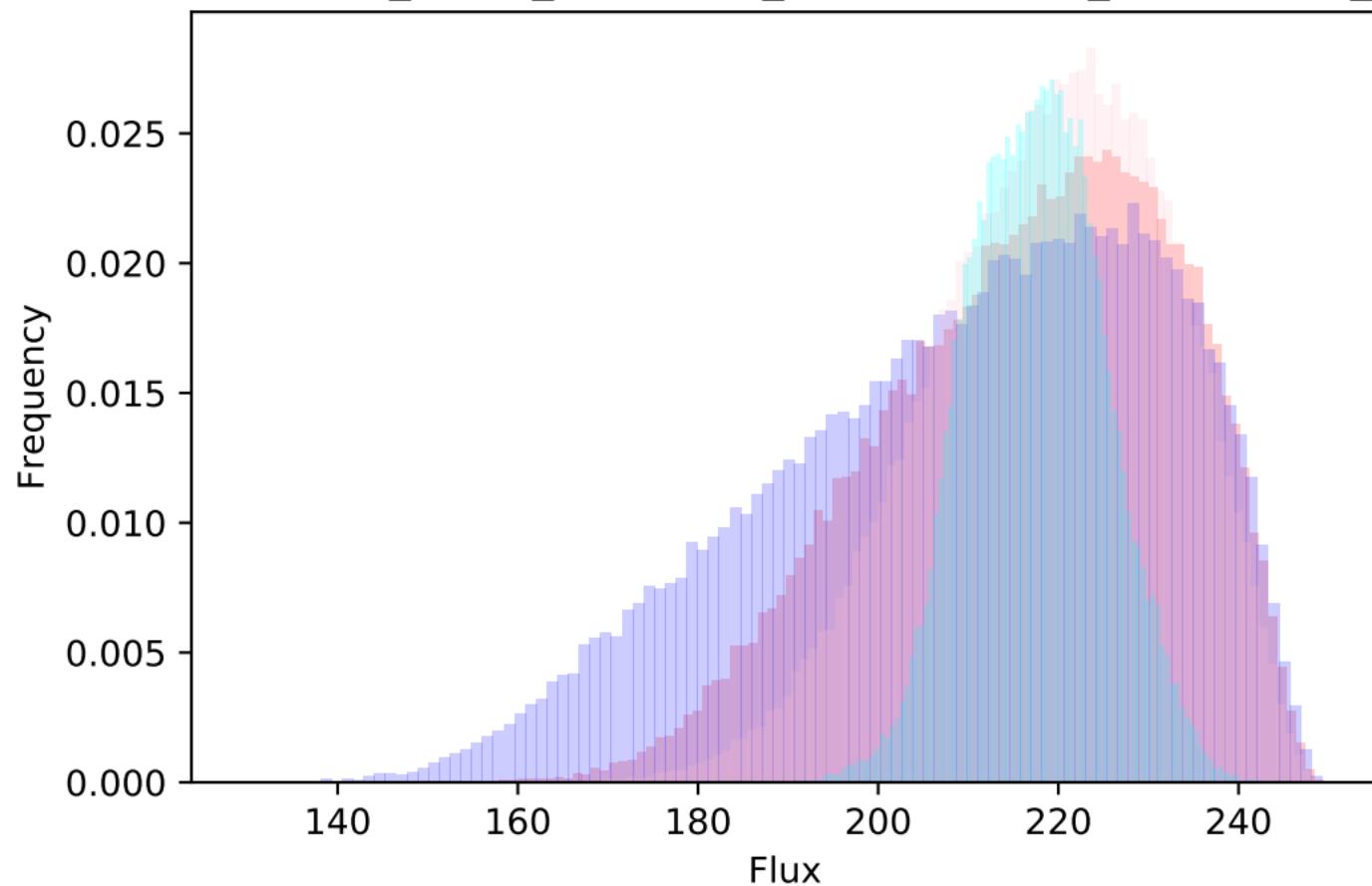
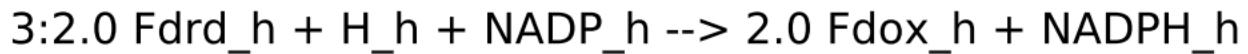
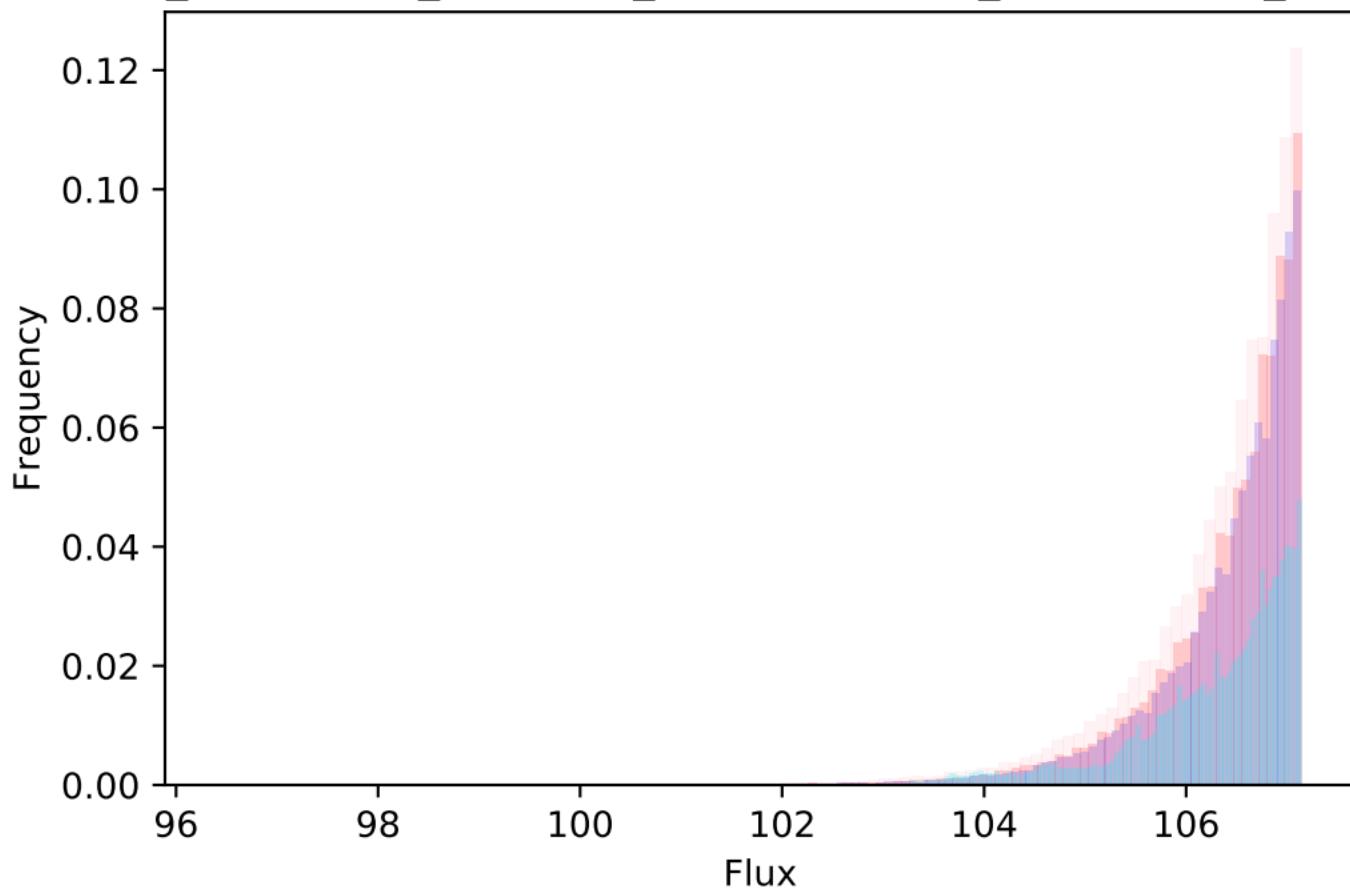
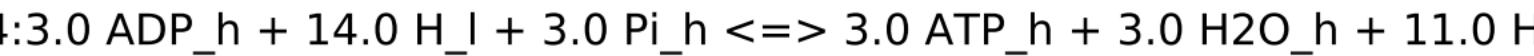
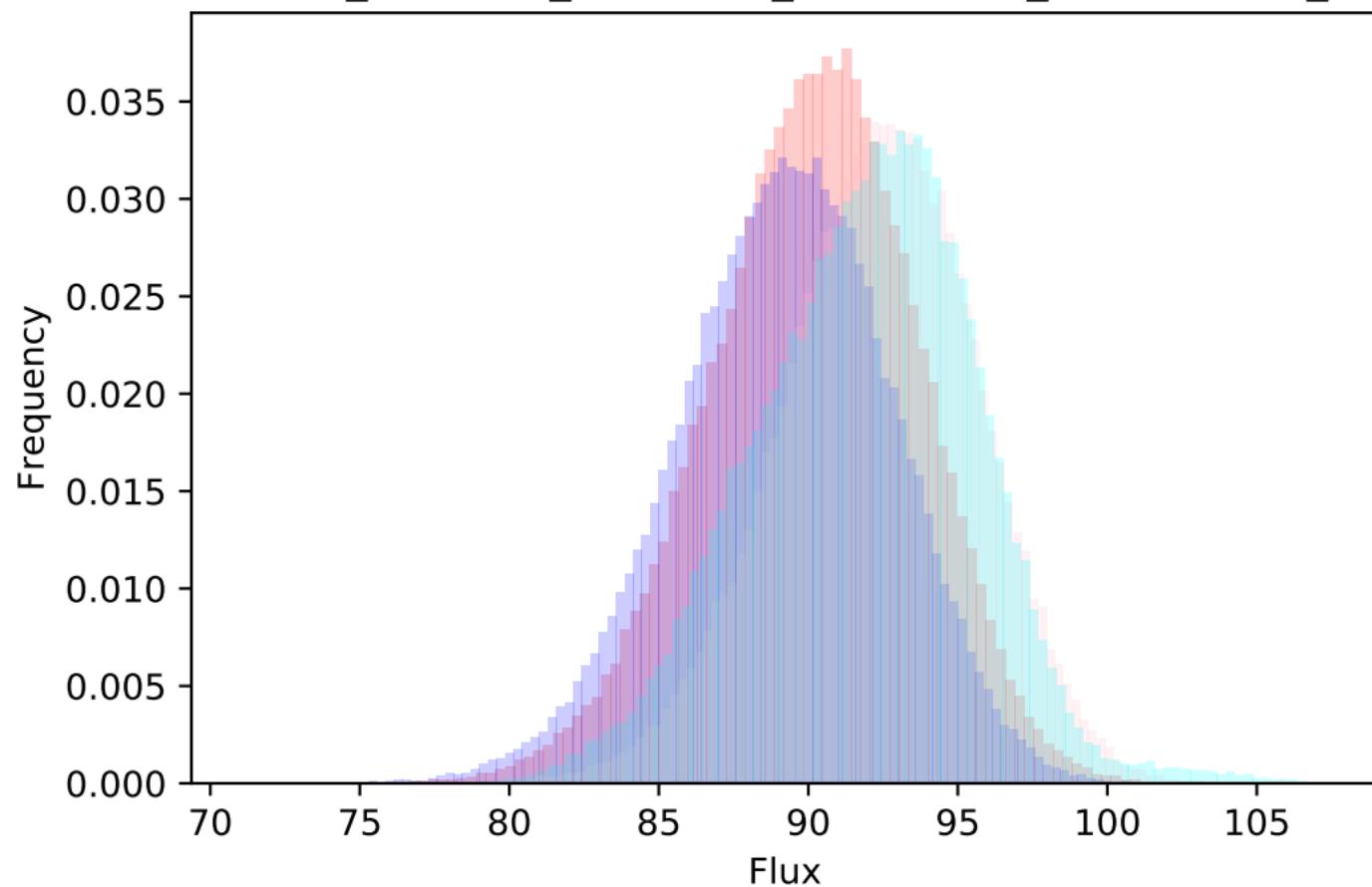
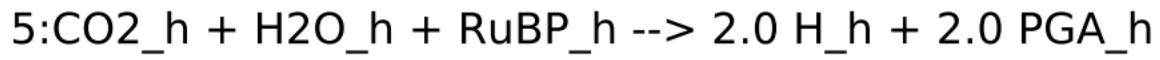


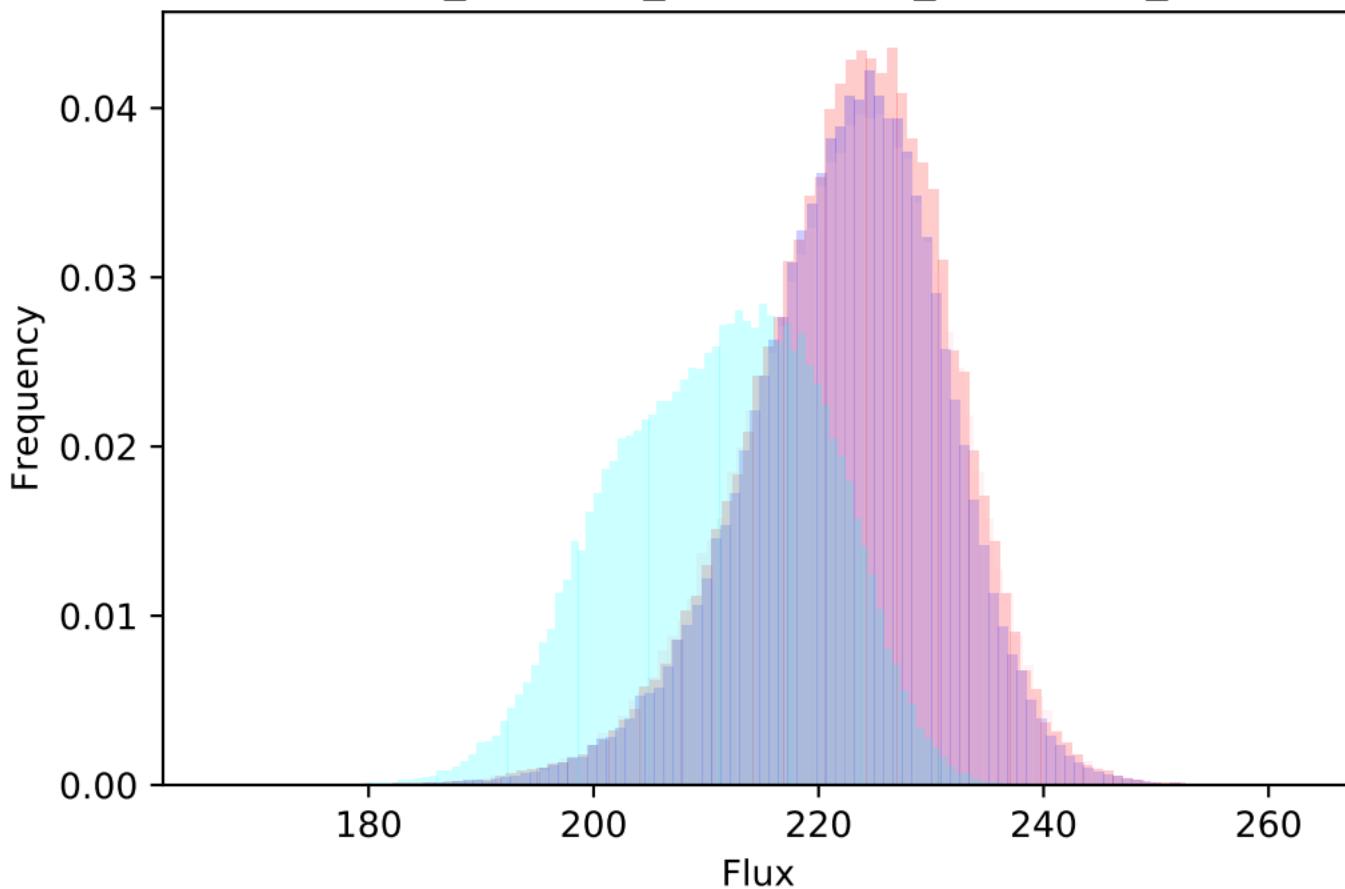
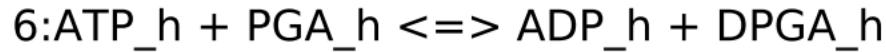
2:Fdox_h + PCrd_h + hnu_h --> Fdrd_h + PCox_h

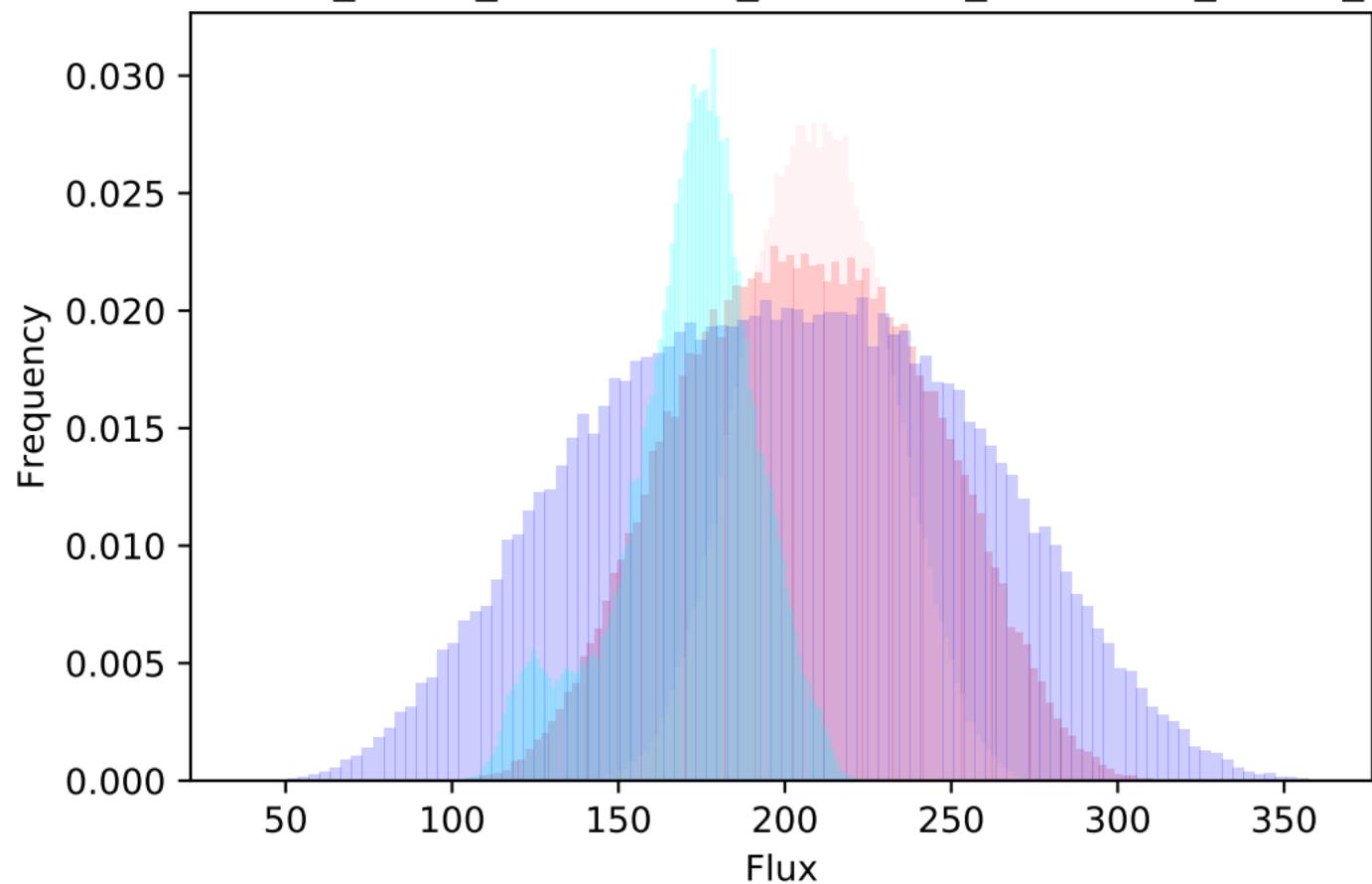
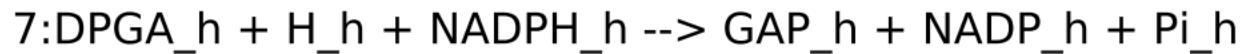




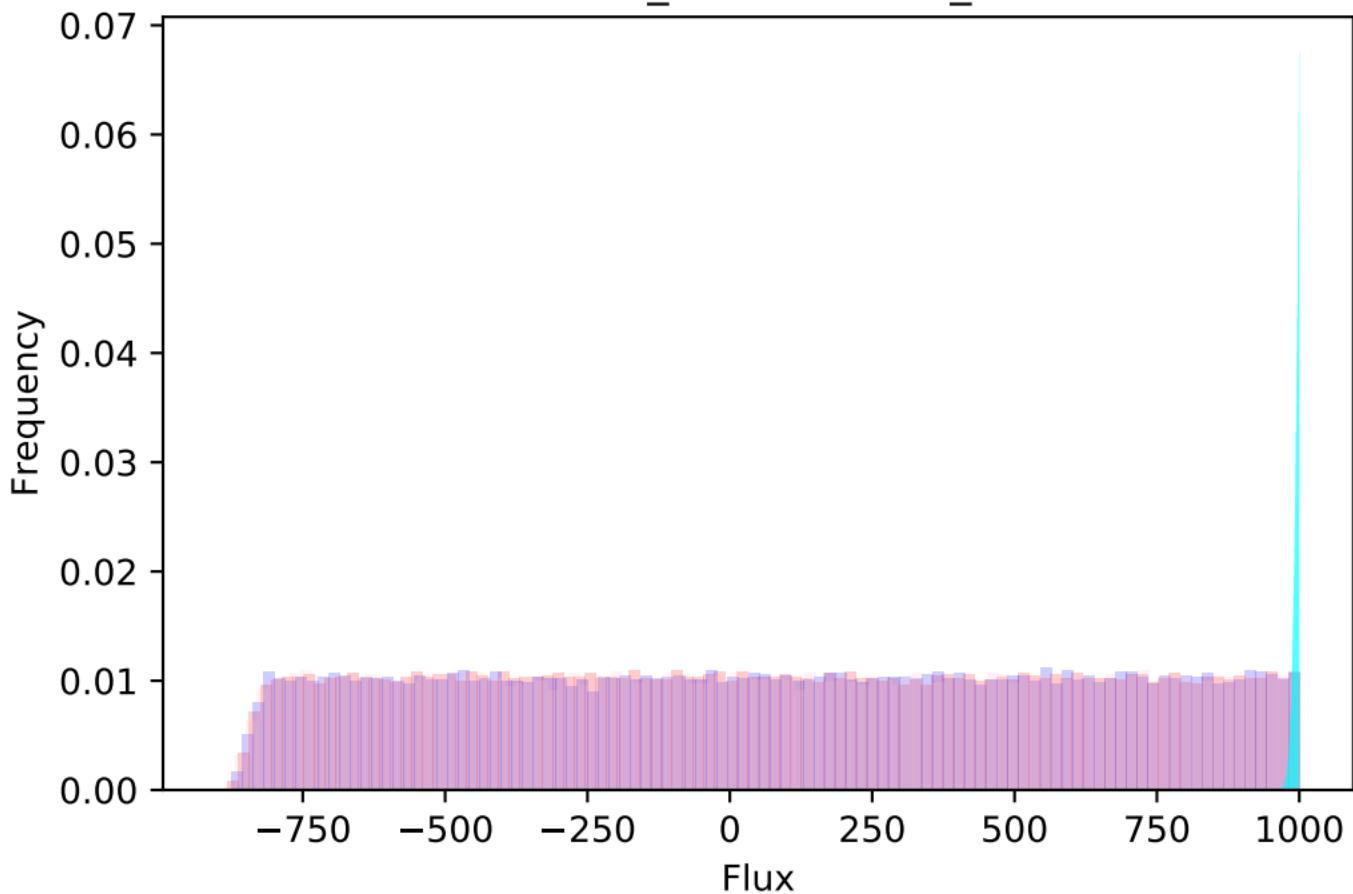




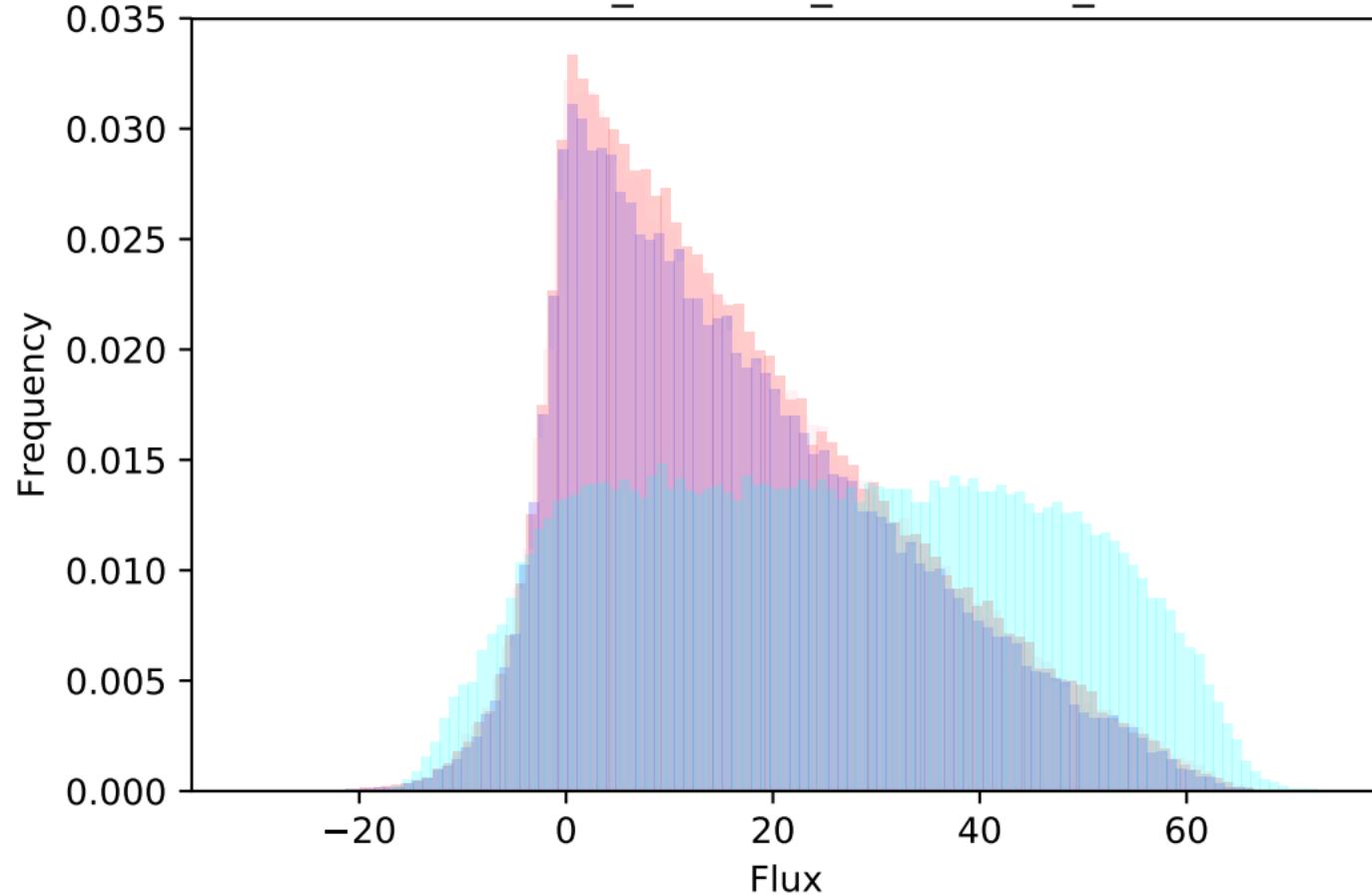


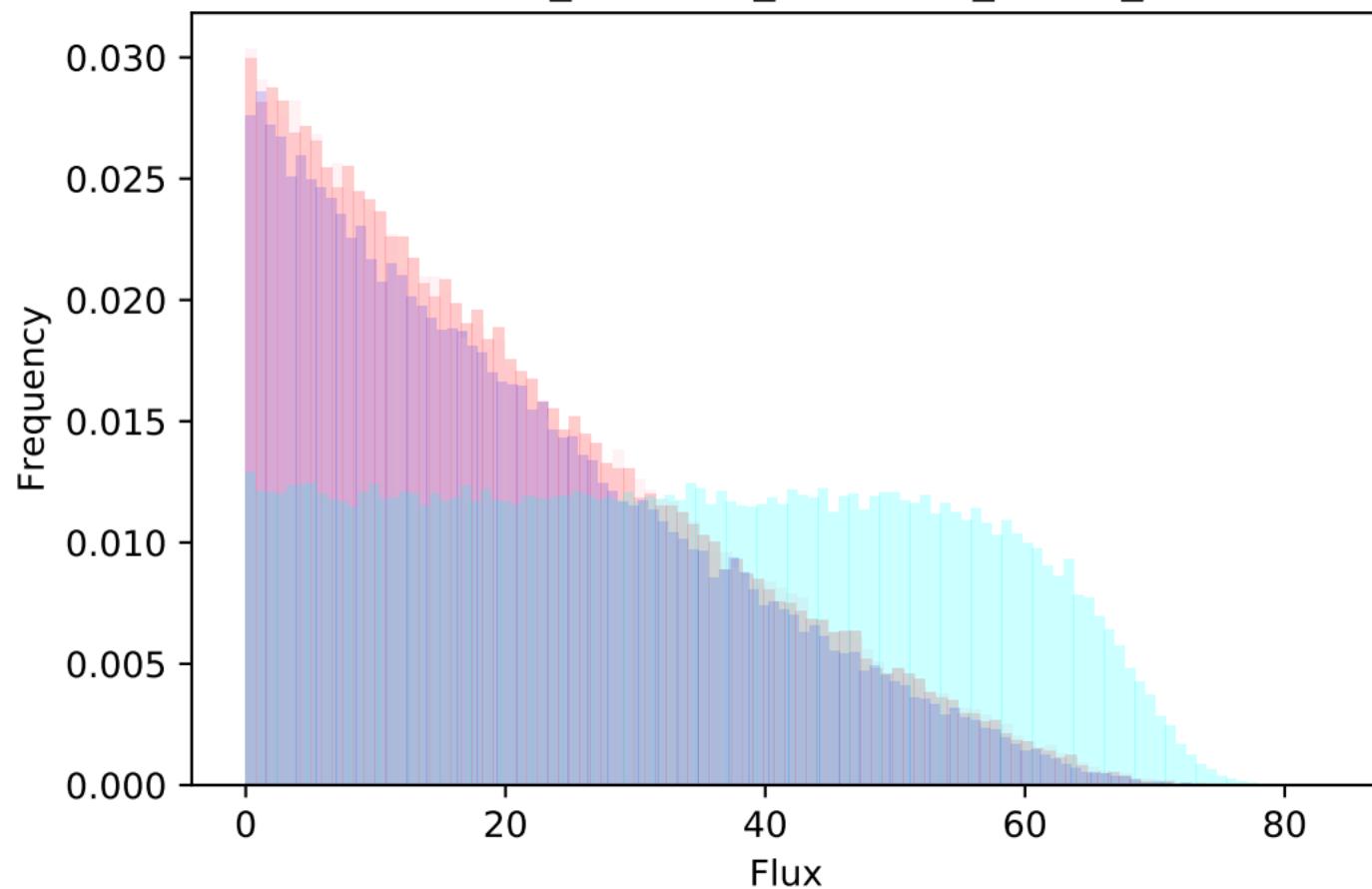
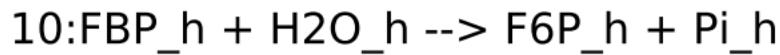


8:GAP_h <=> DHAP_h

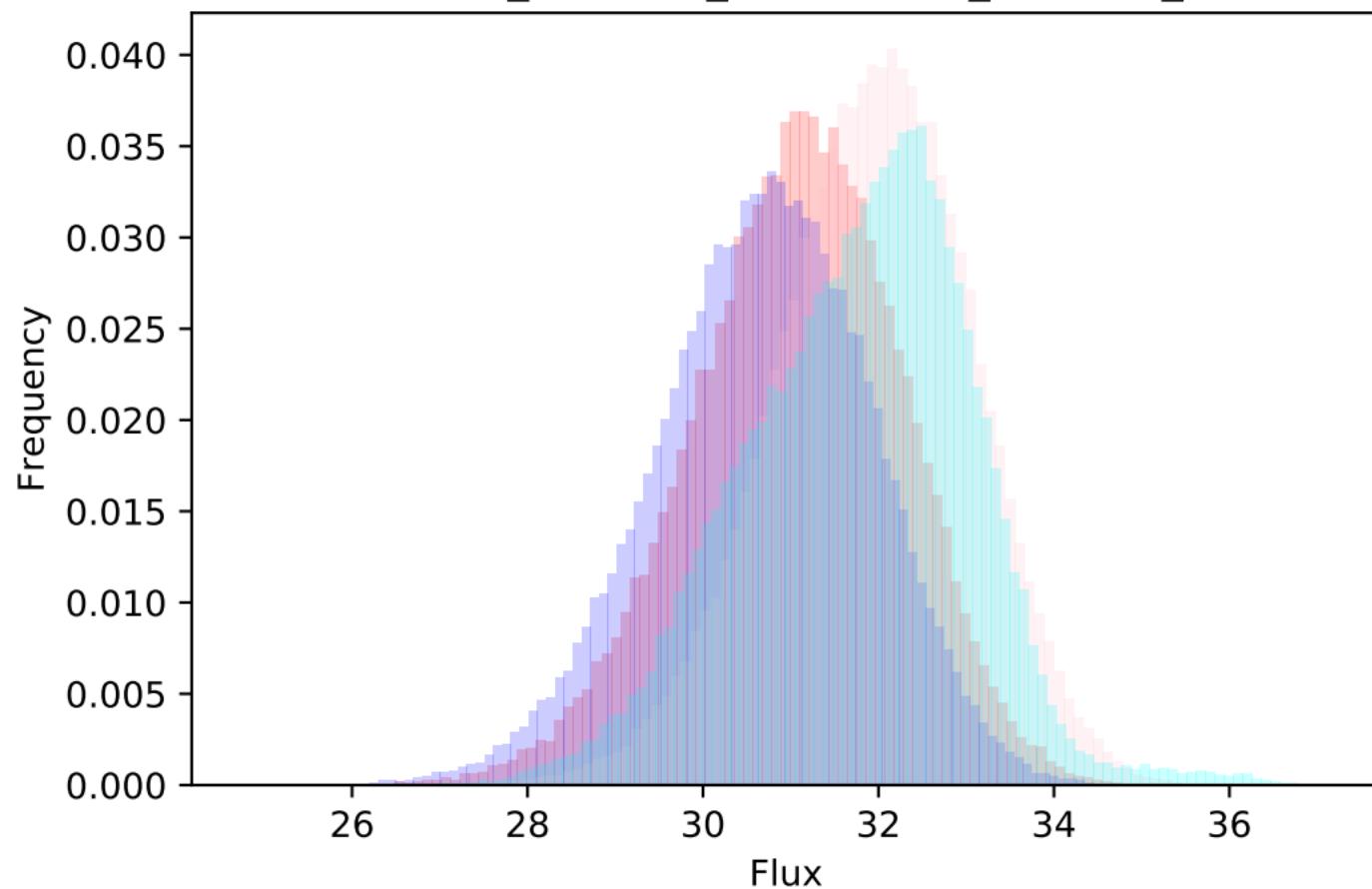


9:DHAP_h + GAP_h <=> FBP_h

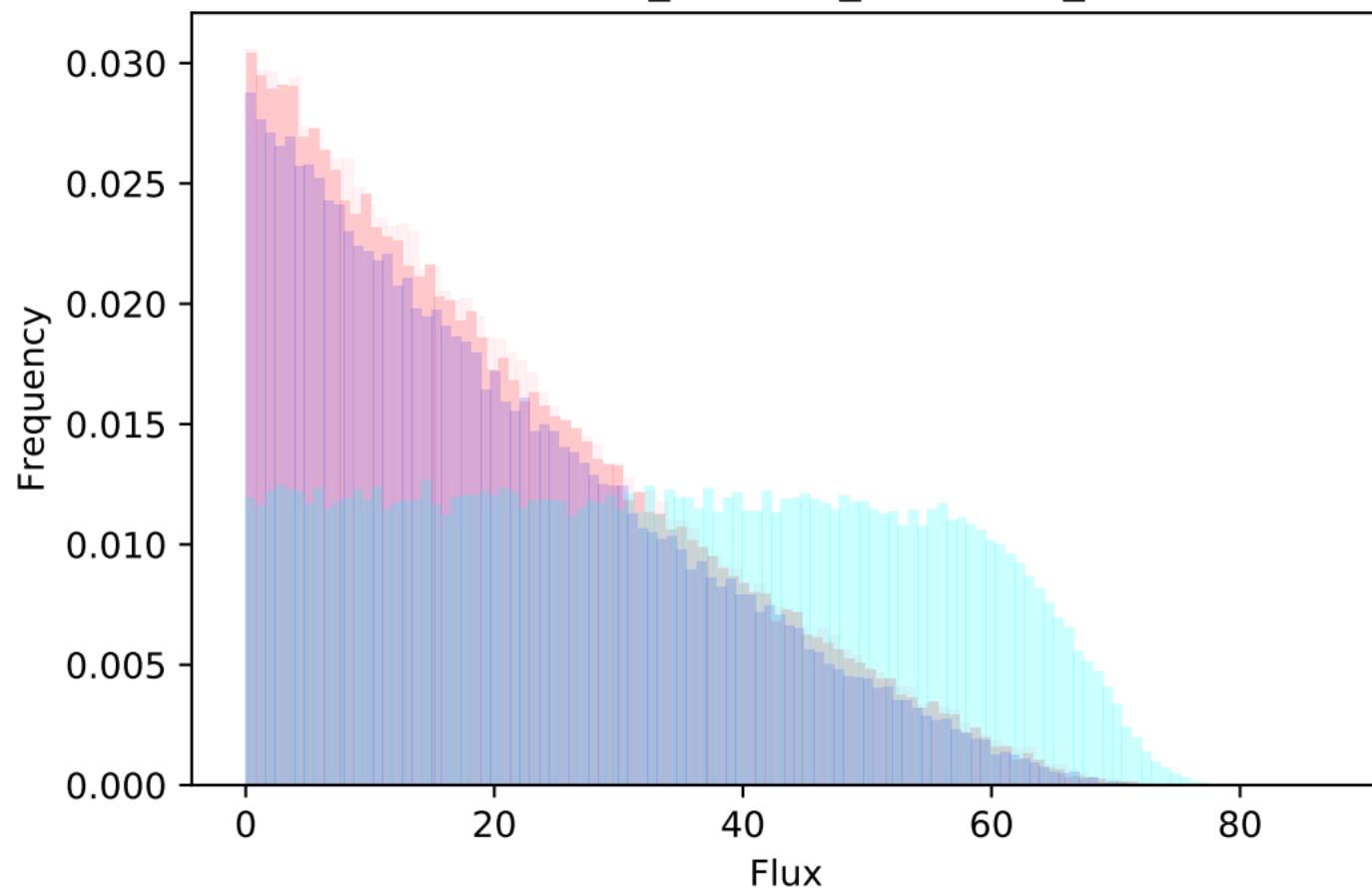


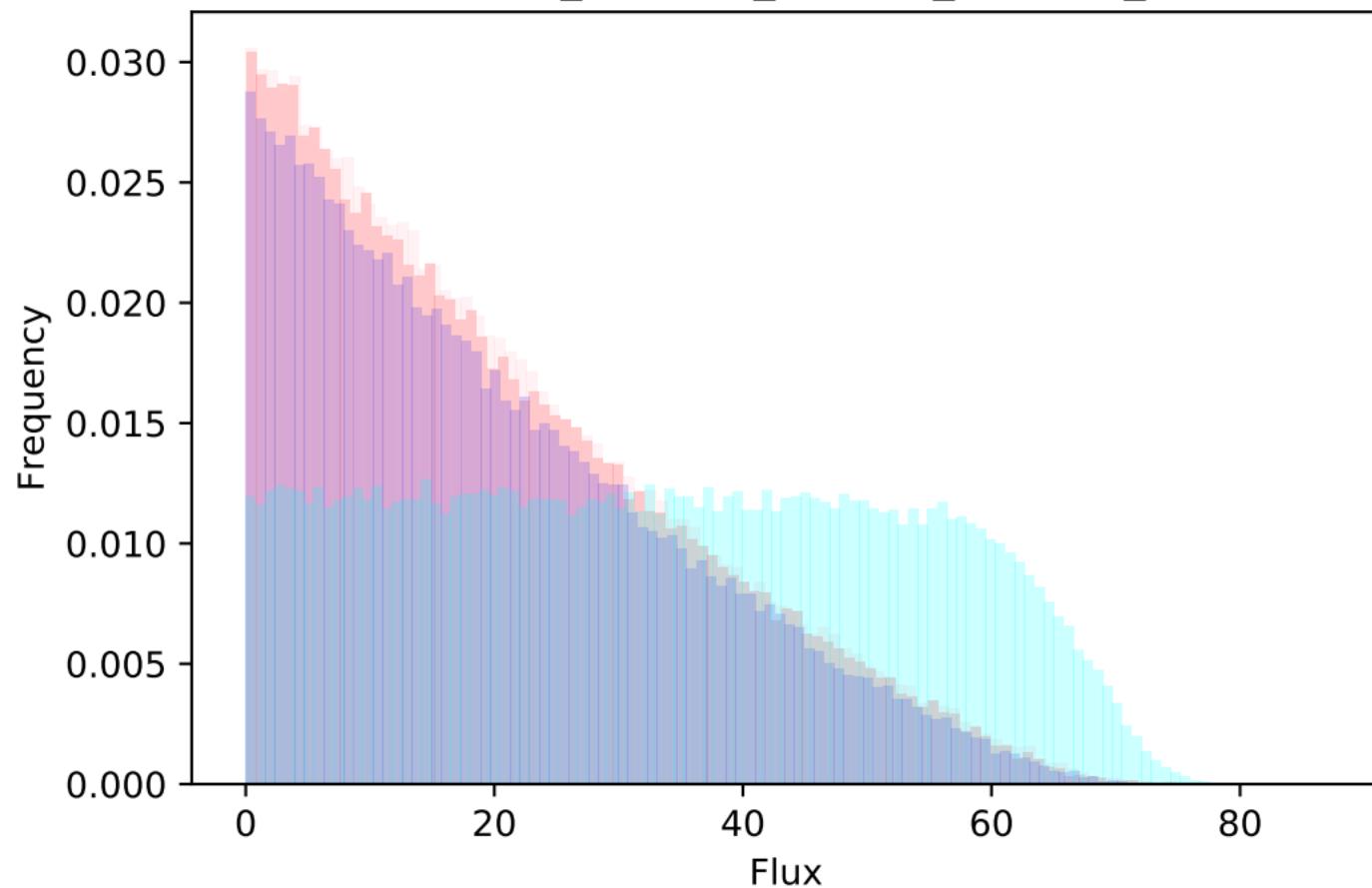
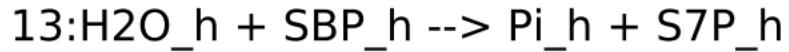


$11:\text{F6P_h} + \text{GAP_h} \rightleftharpoons \text{E4P_h} + \text{X5P_h}$

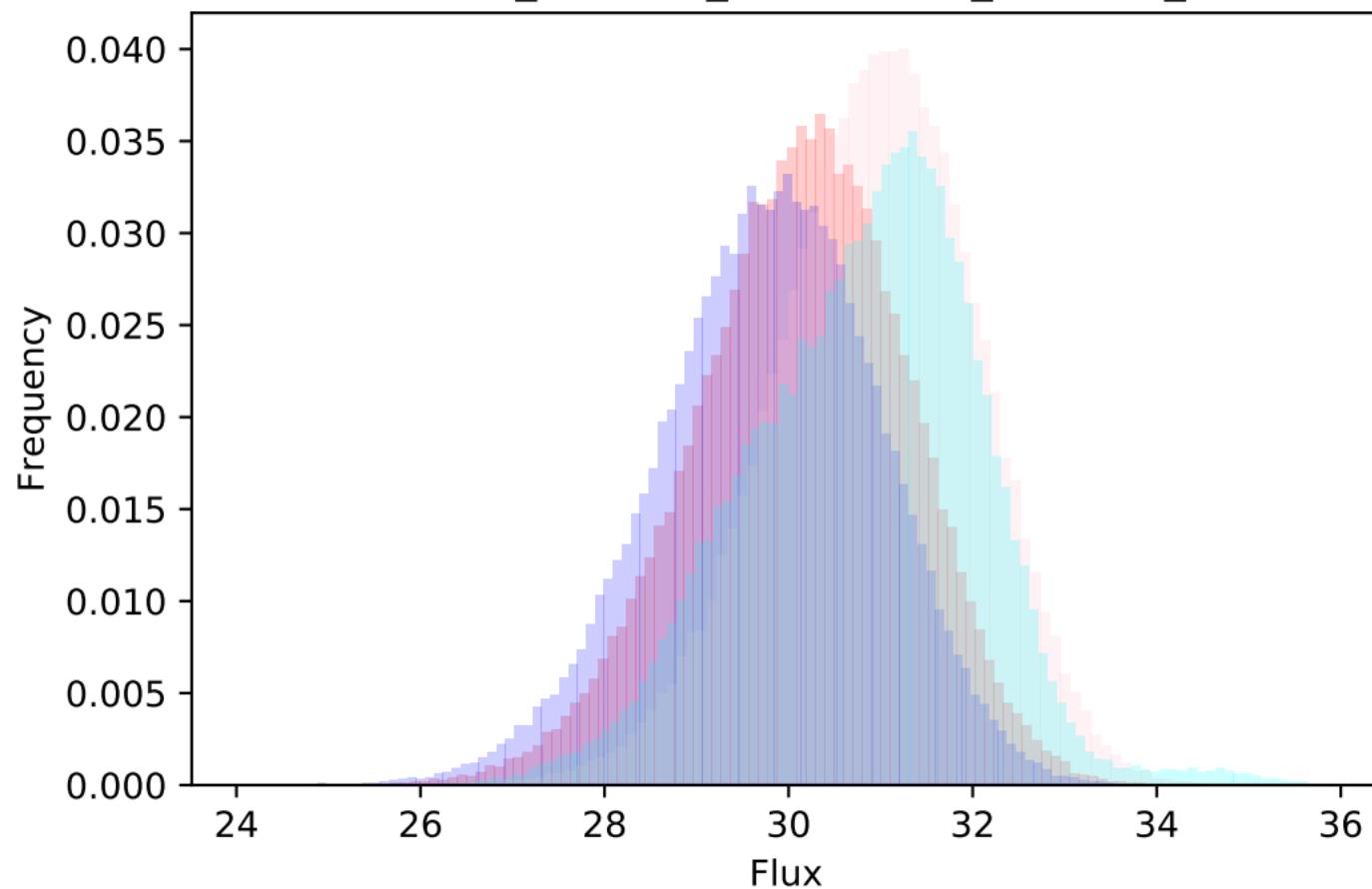


12:DHAP_h + E4P_h --> SBP_h

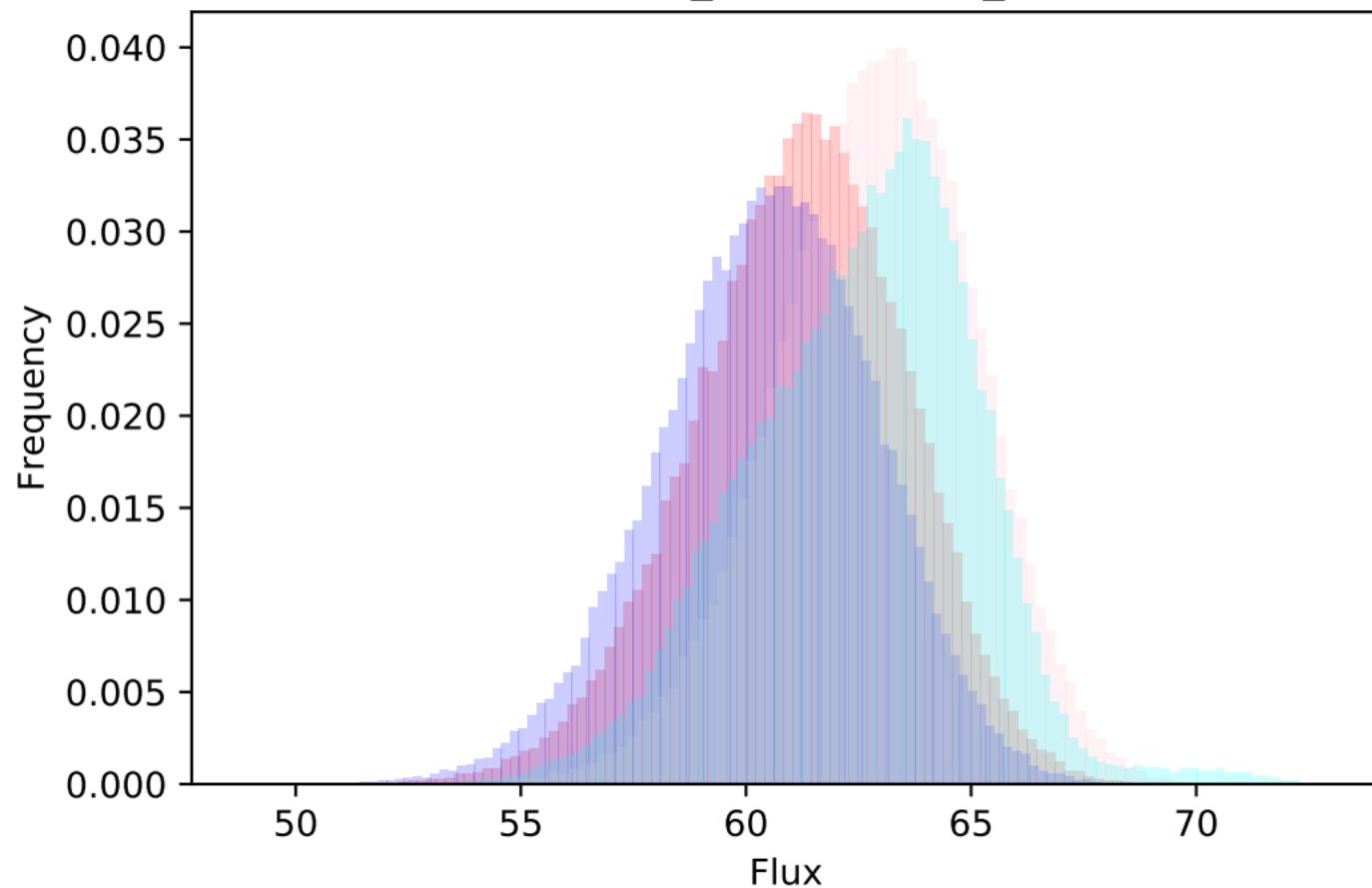




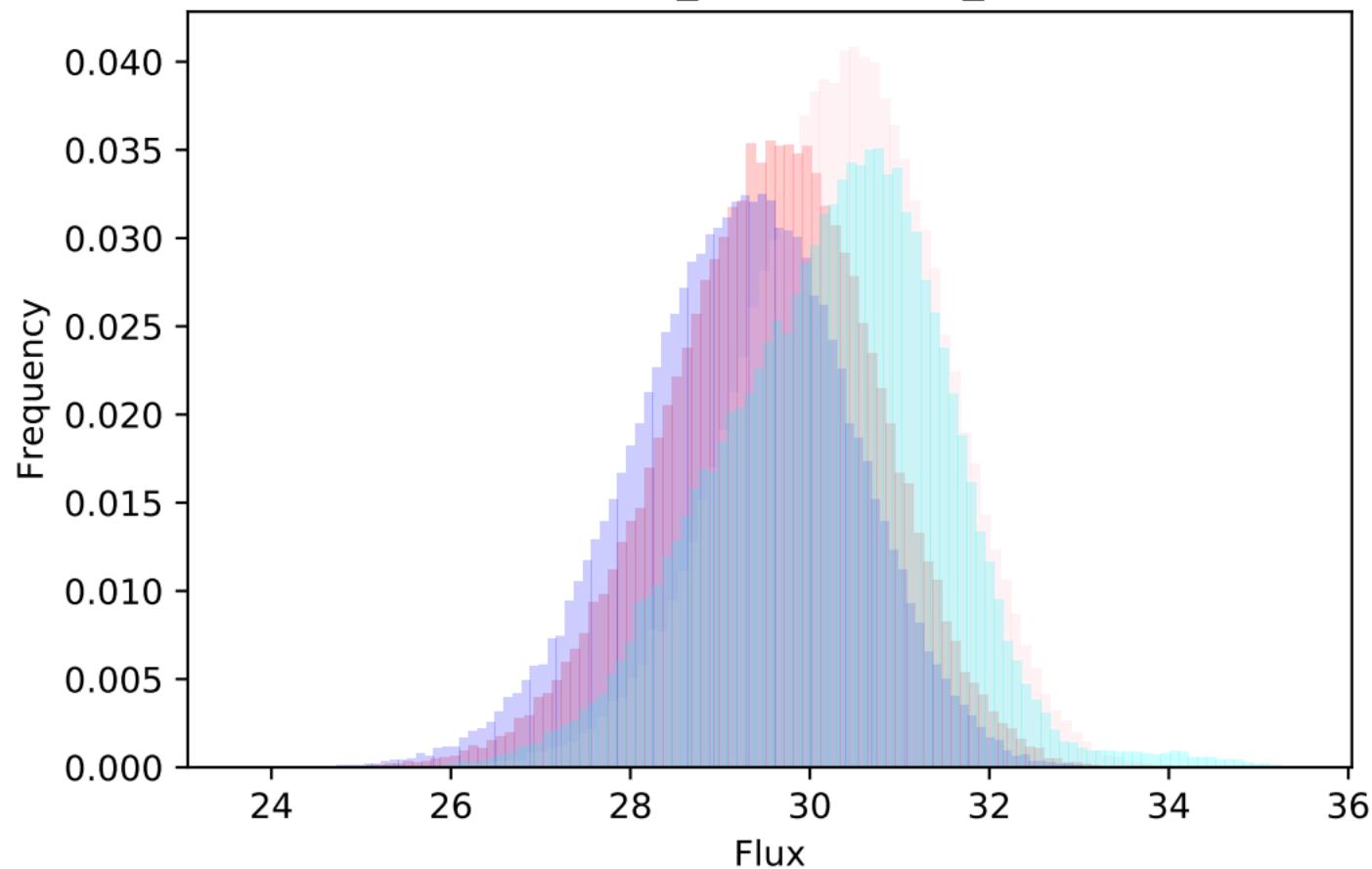
14:GAP_h + S7P_h <=> R5P_h + X5P_h



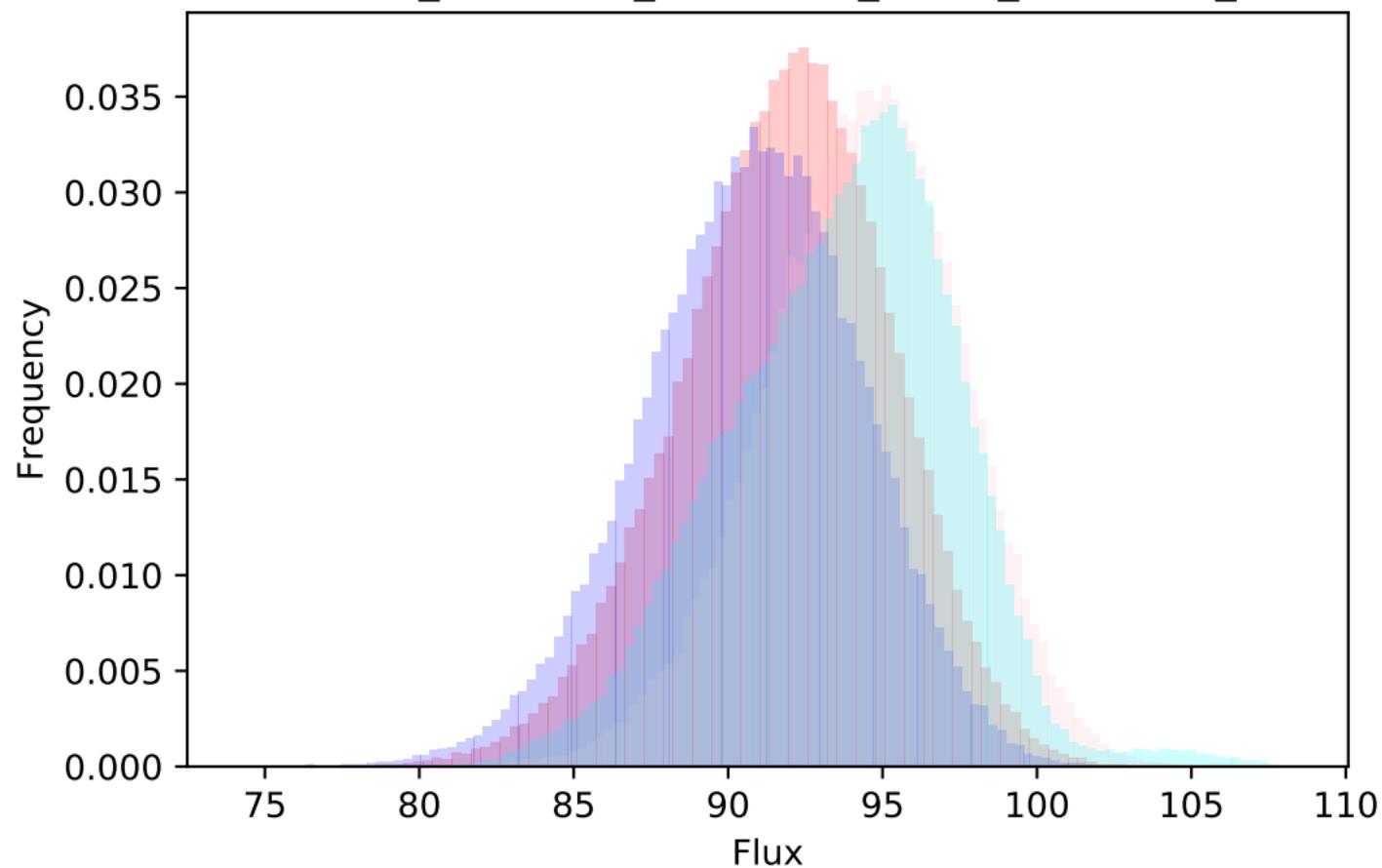
15:X5P_h <=> Ru5P_h



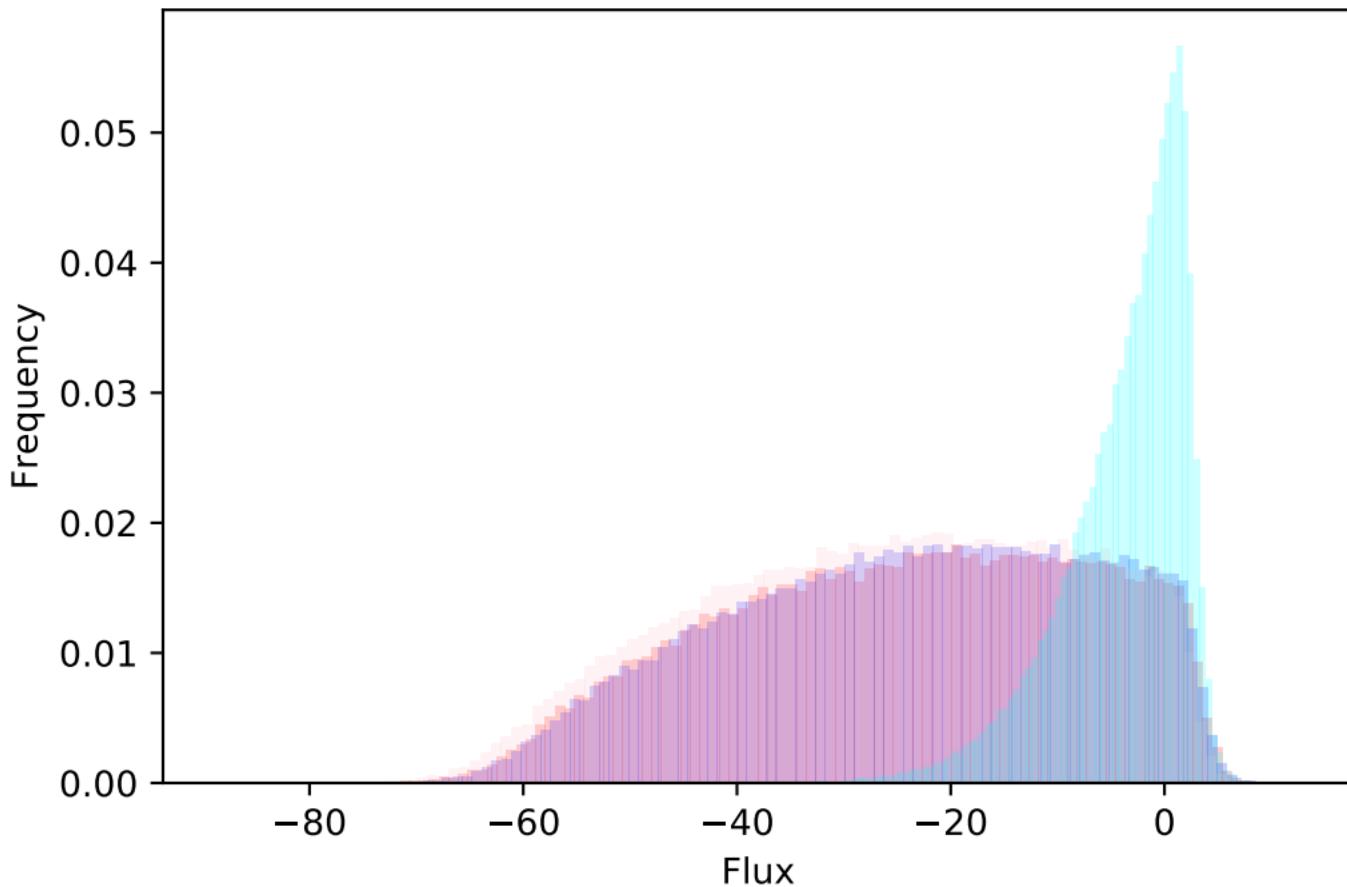
16:R5P_h <=> Ru5P_h



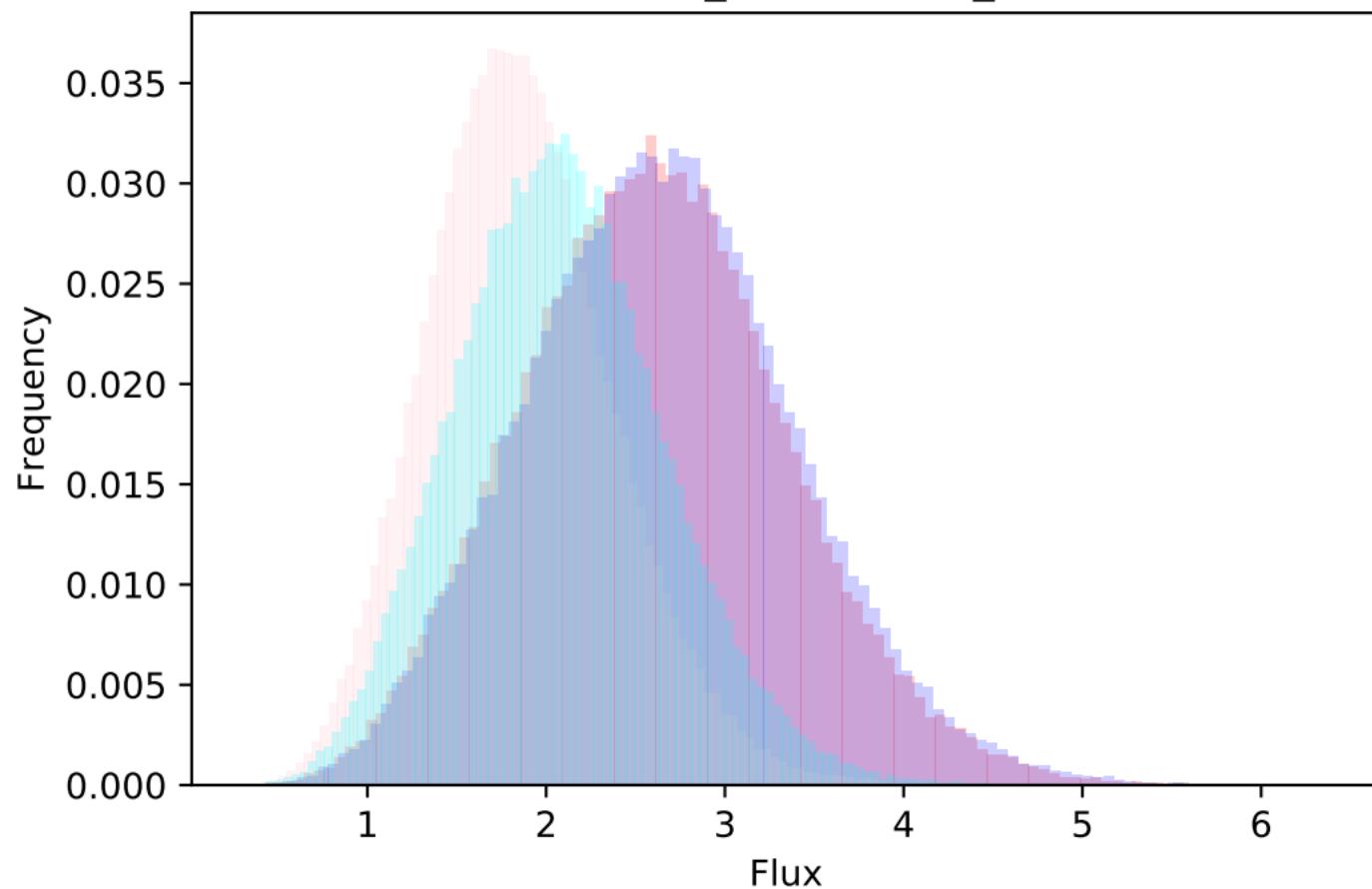
17:ATP_h + Ru5P_h --> ADP_h + H_h + RuBP_h

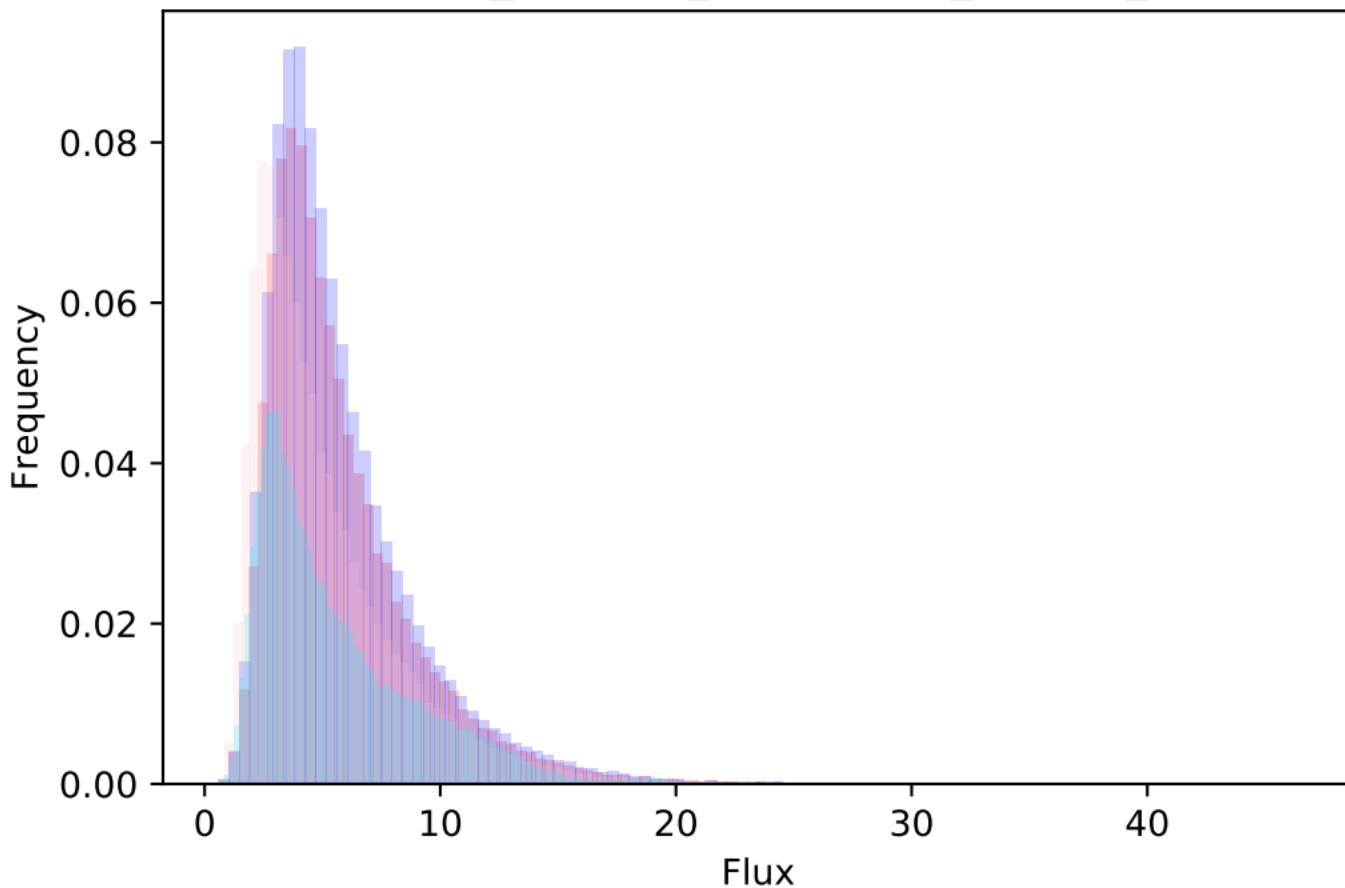
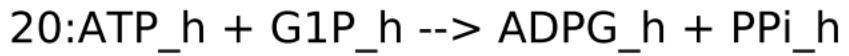


18:F6P_h <=> G6P_h

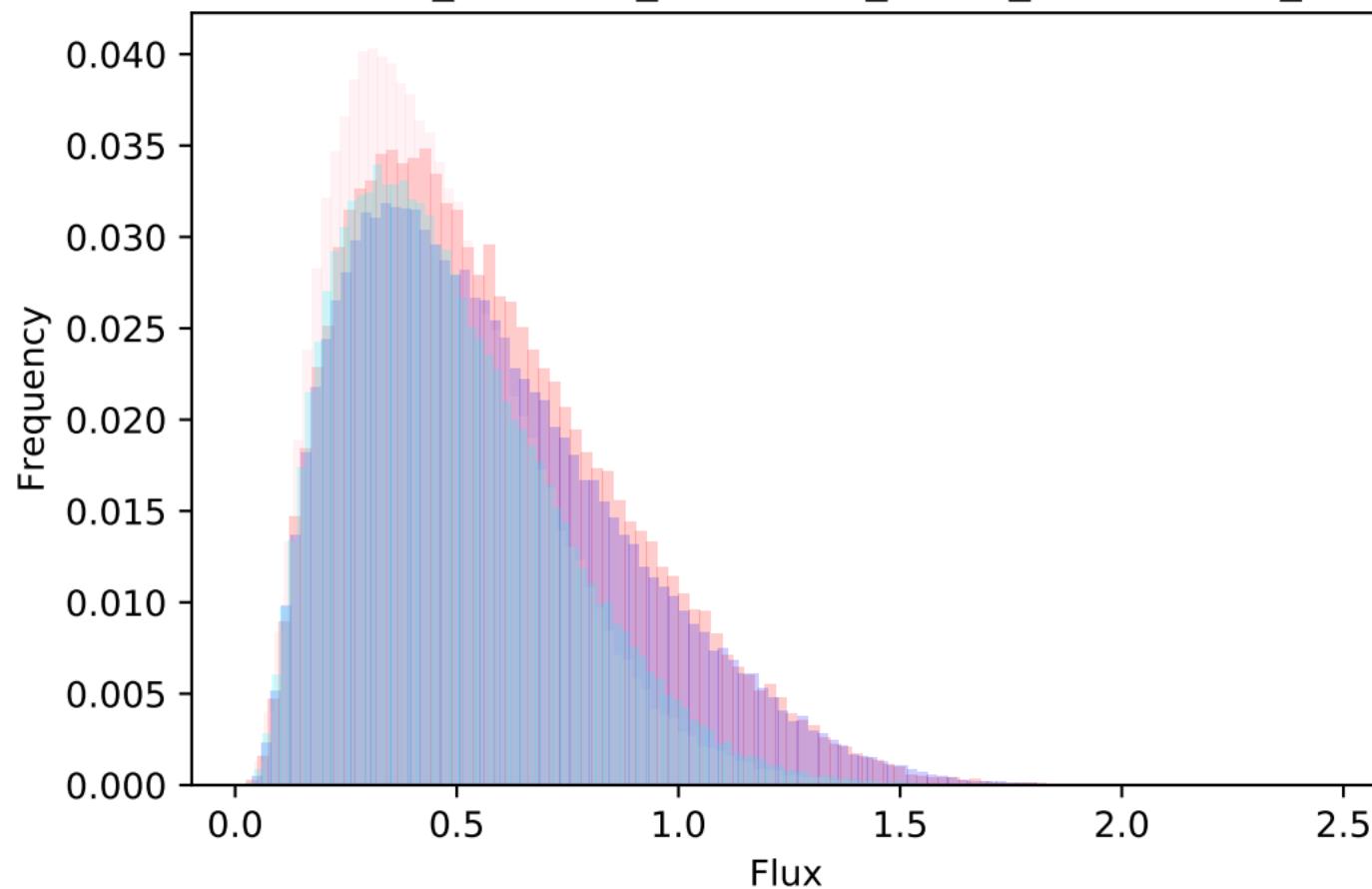


19:G6P_h <=> G1P_h

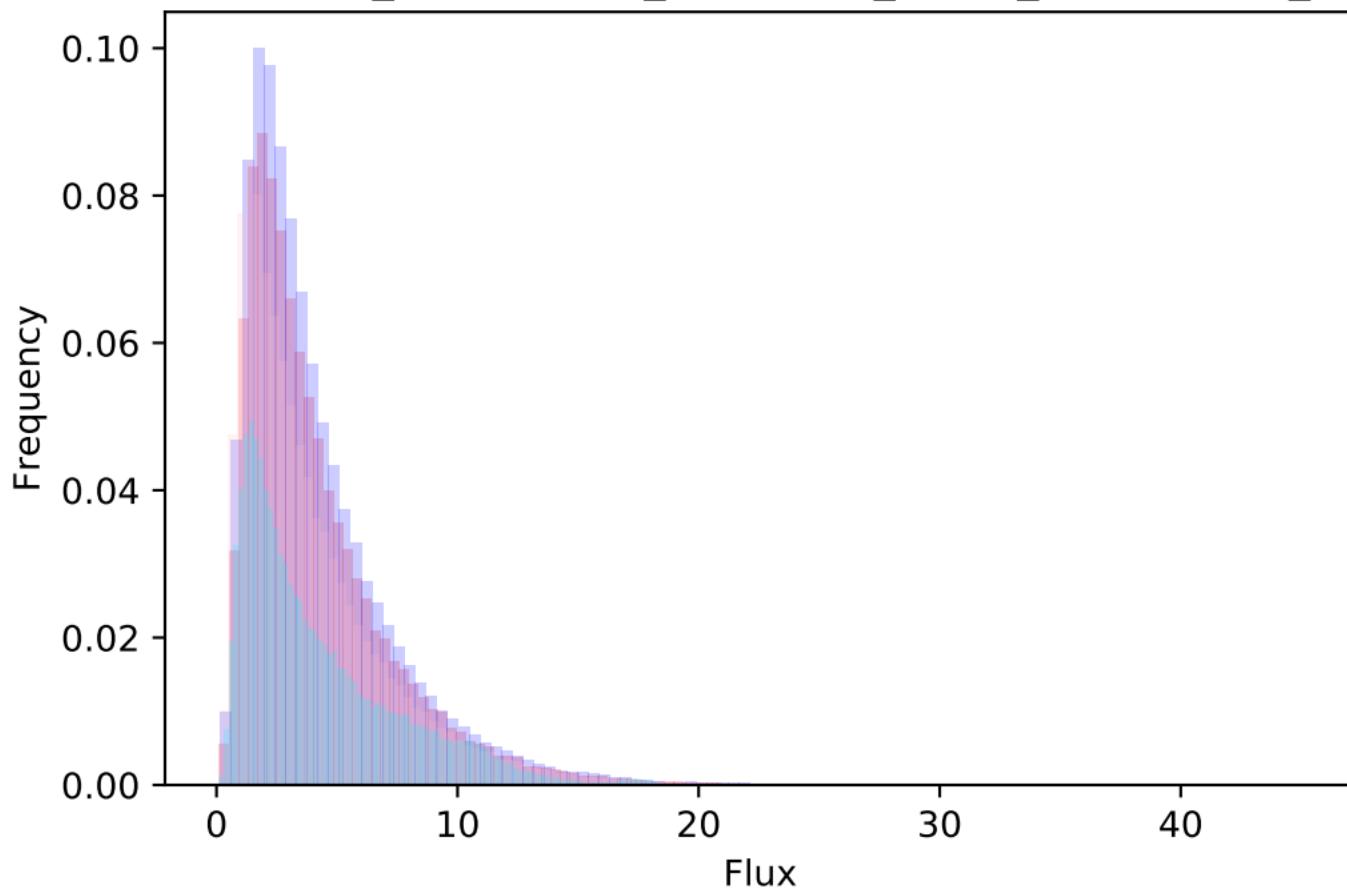




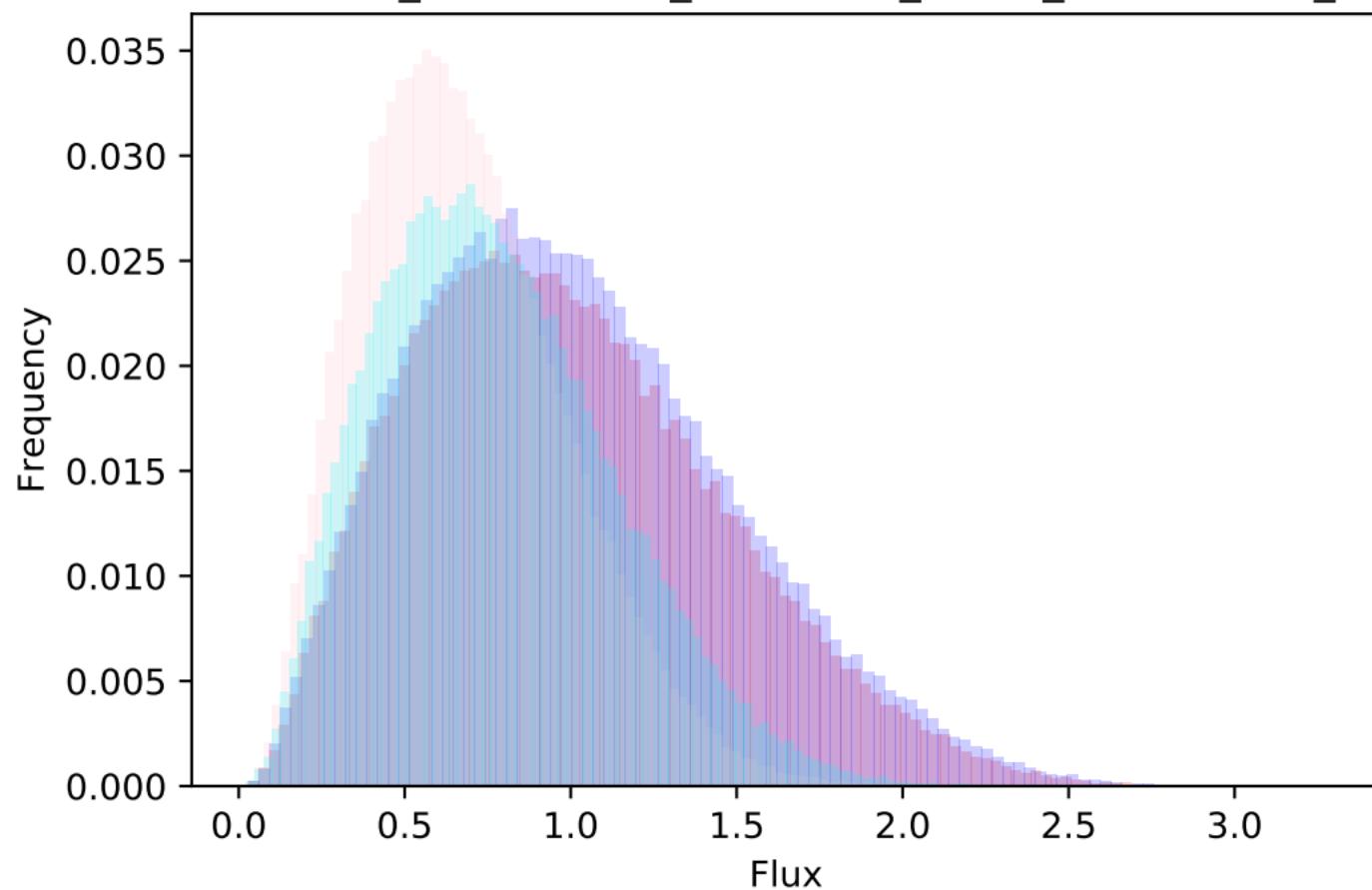
21:ADPG_h + H2O_h --> ADP_h + H_h + starch1_h

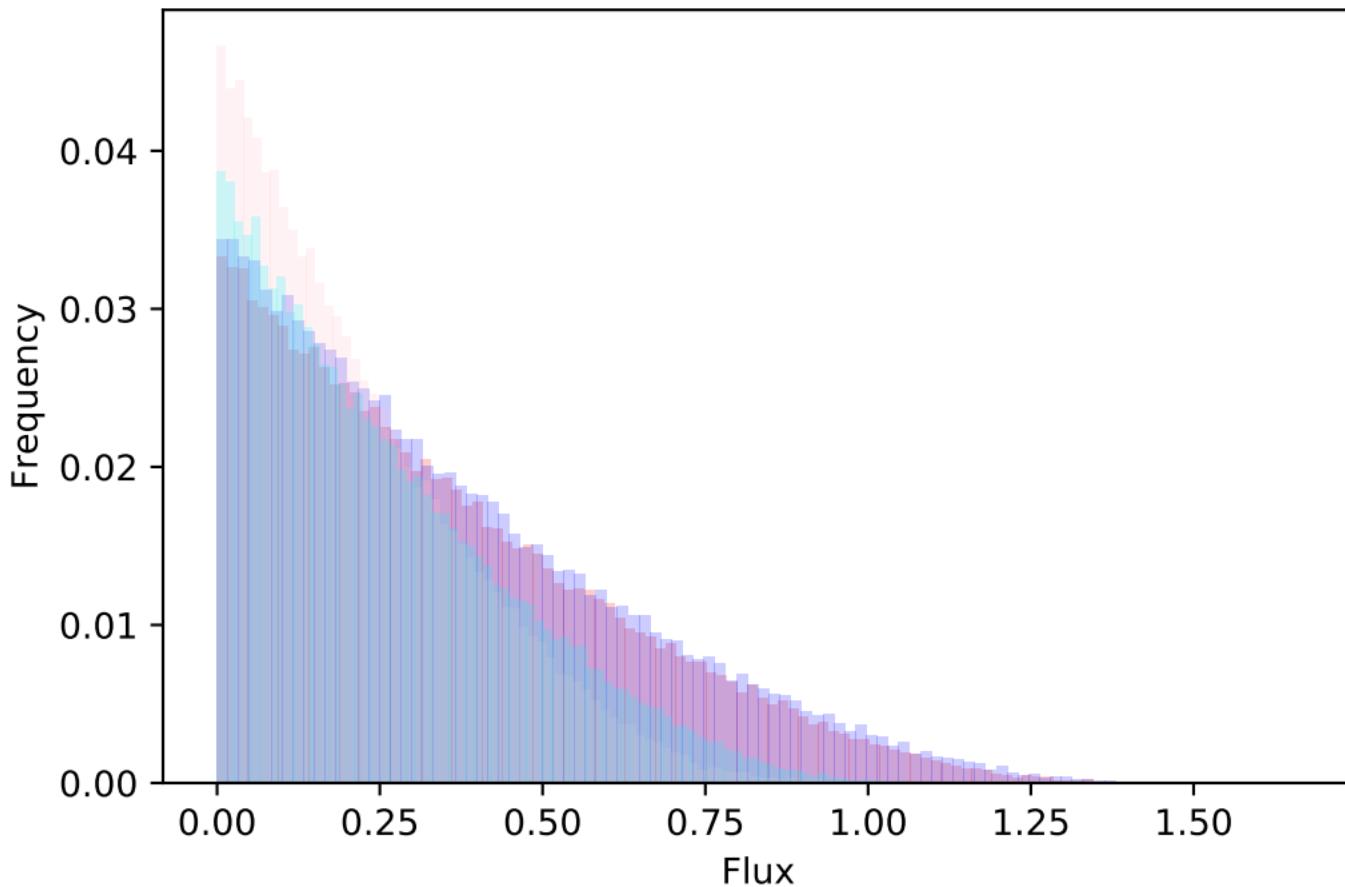
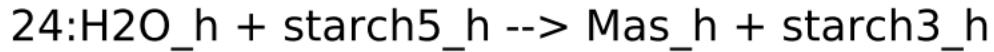


22:ADPG_h + starch1_h --> ADP_h + H_h + starch2_h

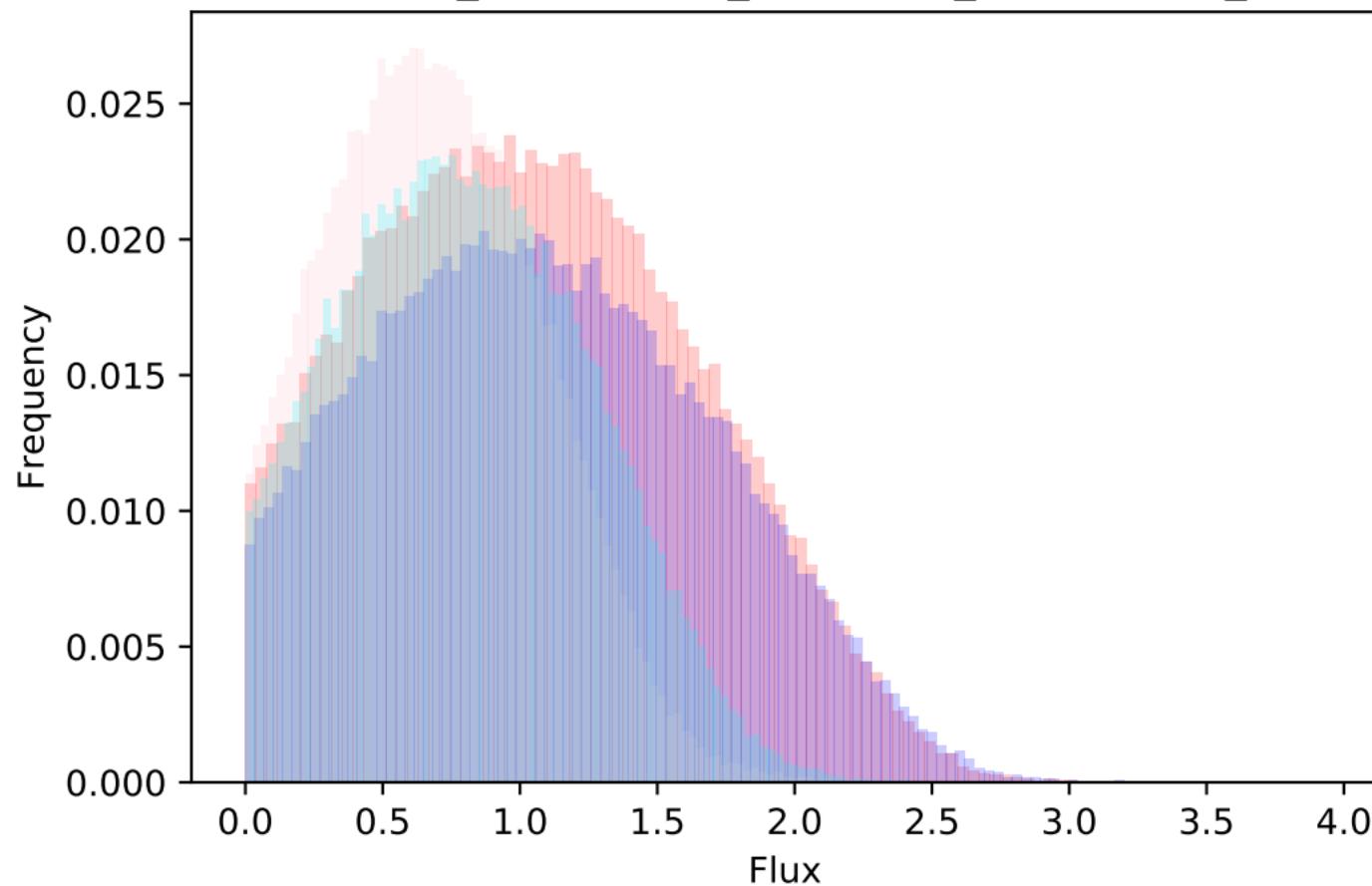


23:ADPG_h + starch2_h --> ADP_h + H_h + starch3_h

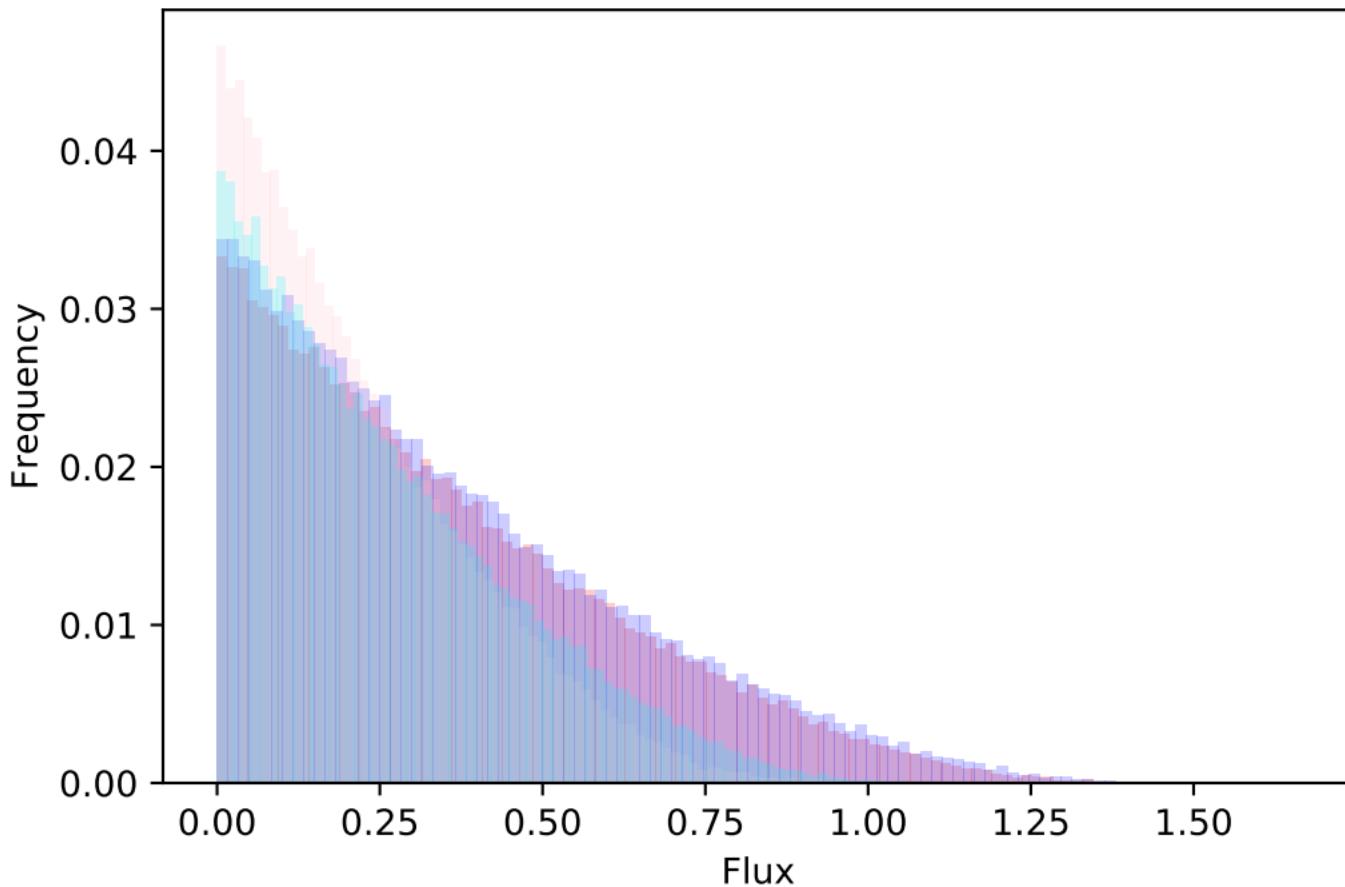




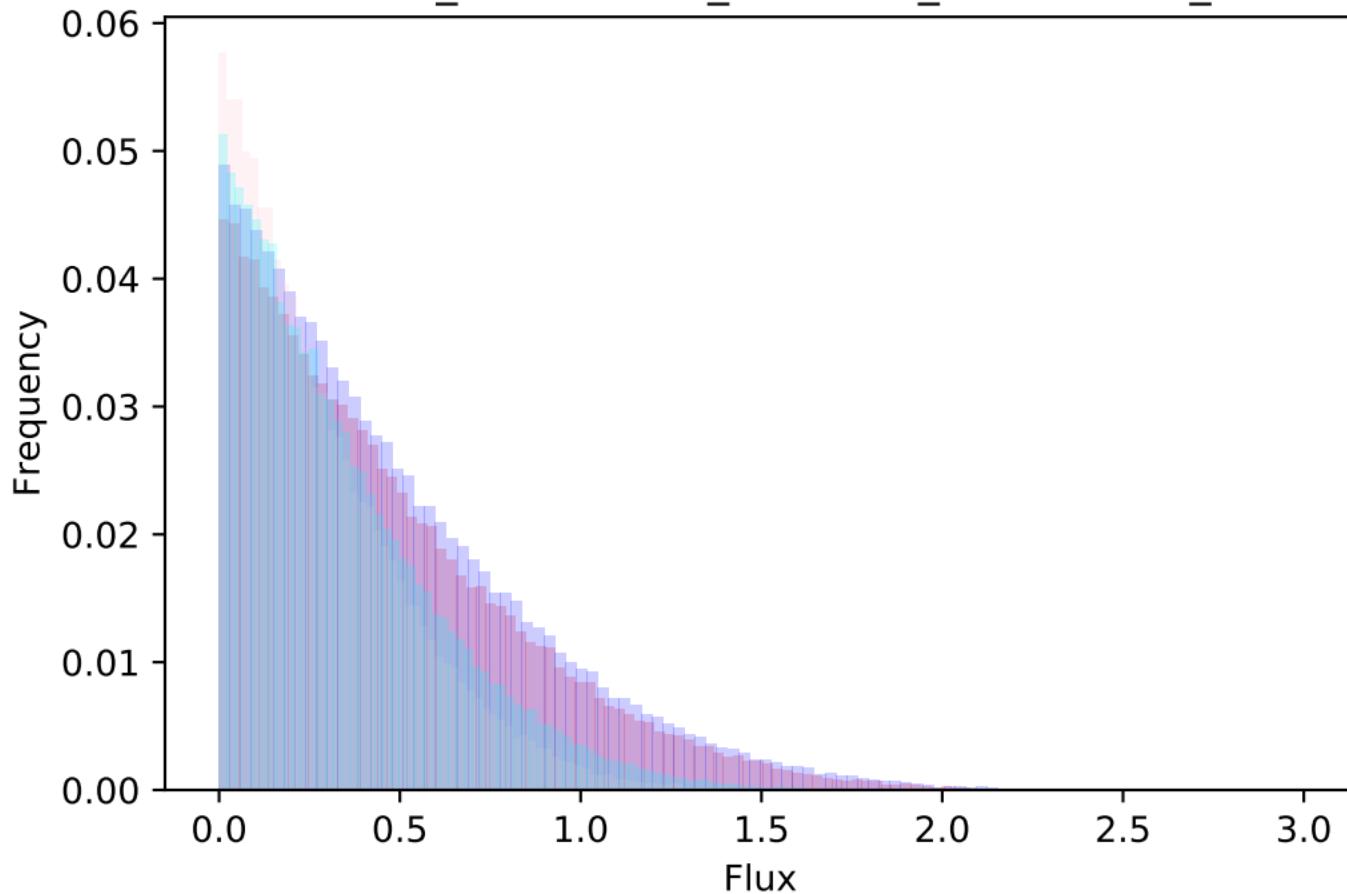
$25:\text{H}_2\text{O}_\text{h} + \text{starch3}_\text{h} \rightarrow \text{Mas}_\text{h} + \text{starch1}_\text{h}$



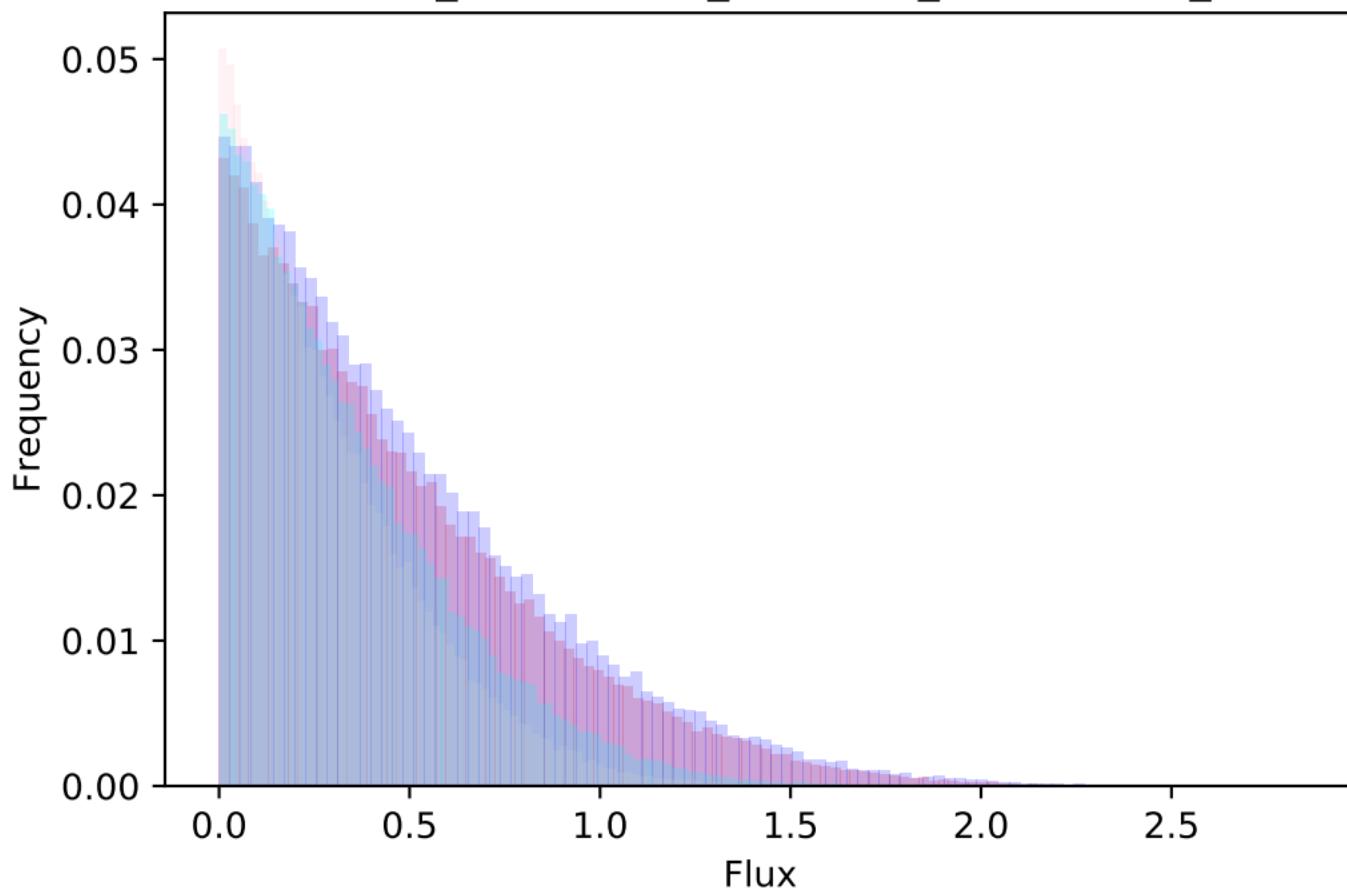
26:2.0 starch3_h --> Glc_h + starch5_h



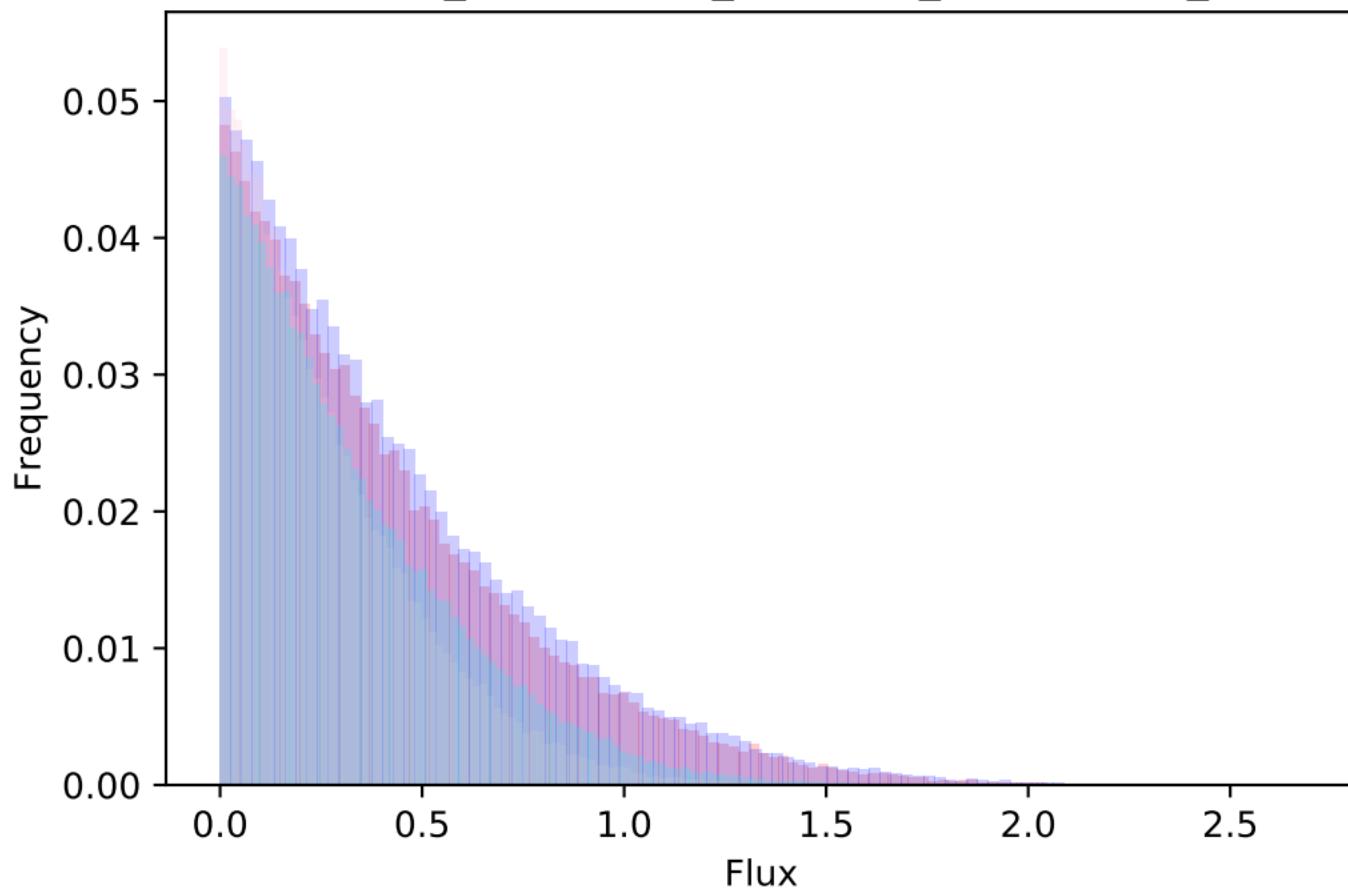
27:Mas_h + starch1_h --> Glc_h + starch2_h

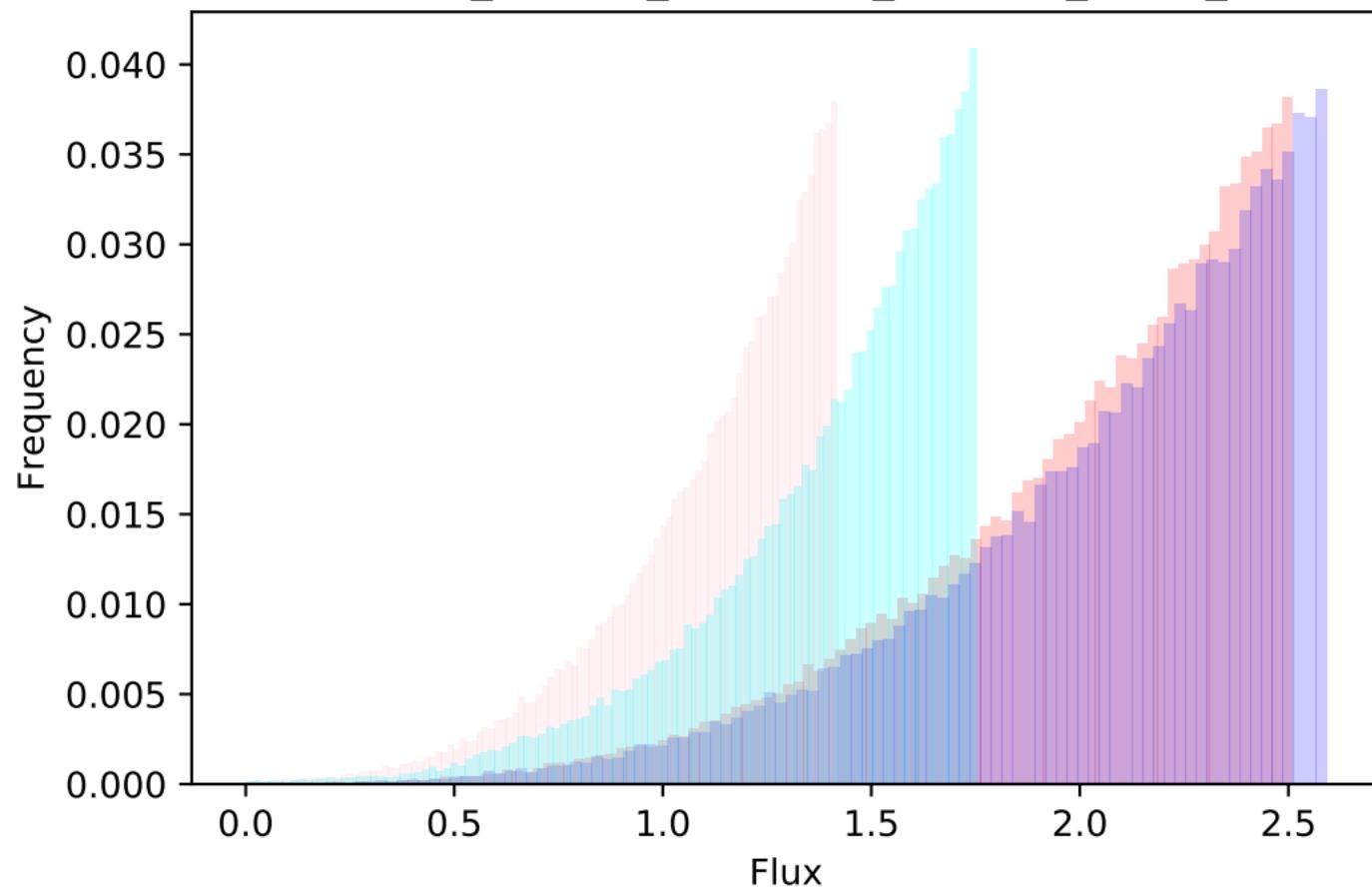
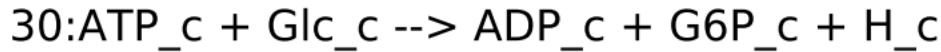


28:Mas_h + starch2_h --> Glc_h + starch3_h

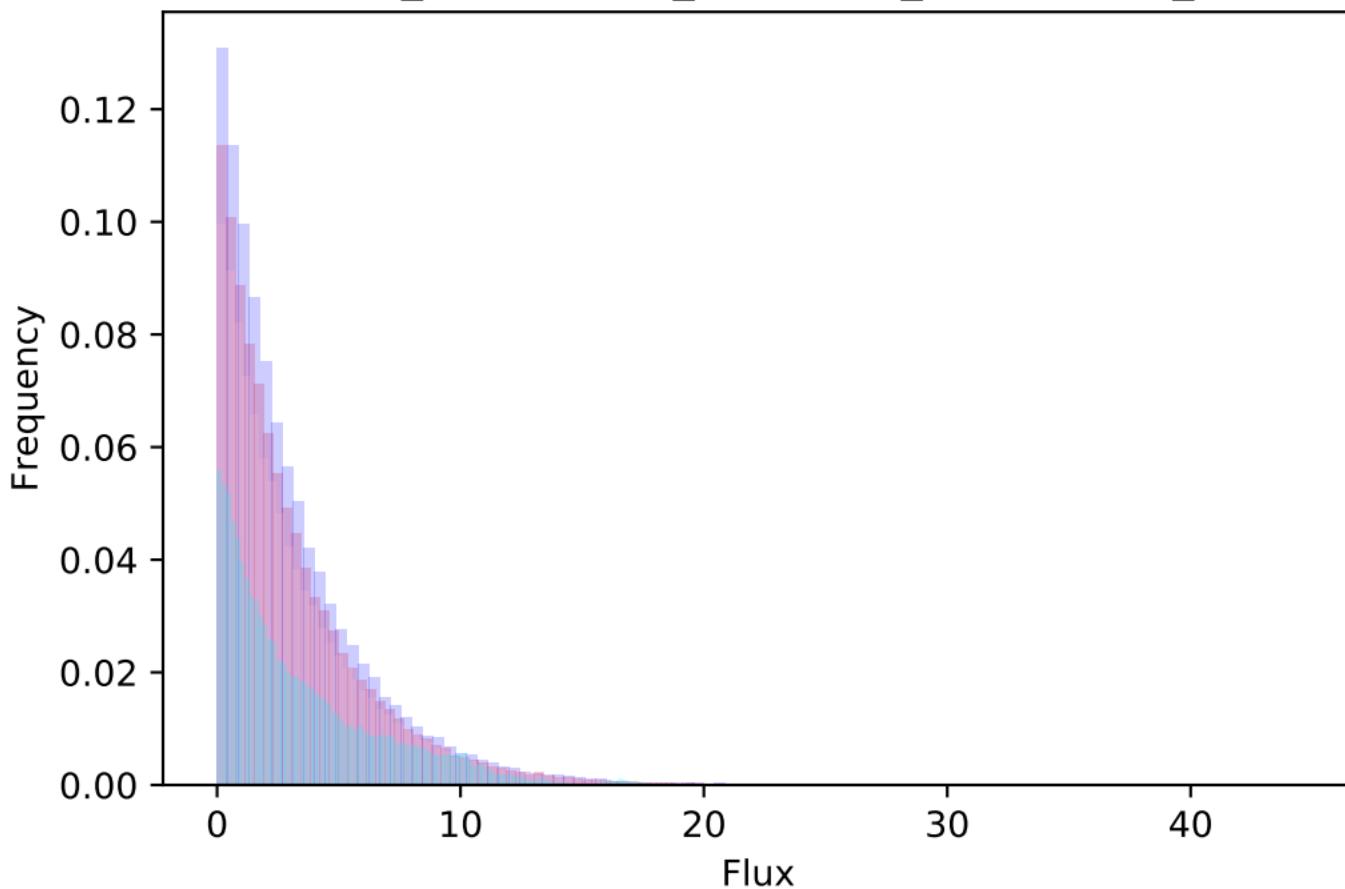


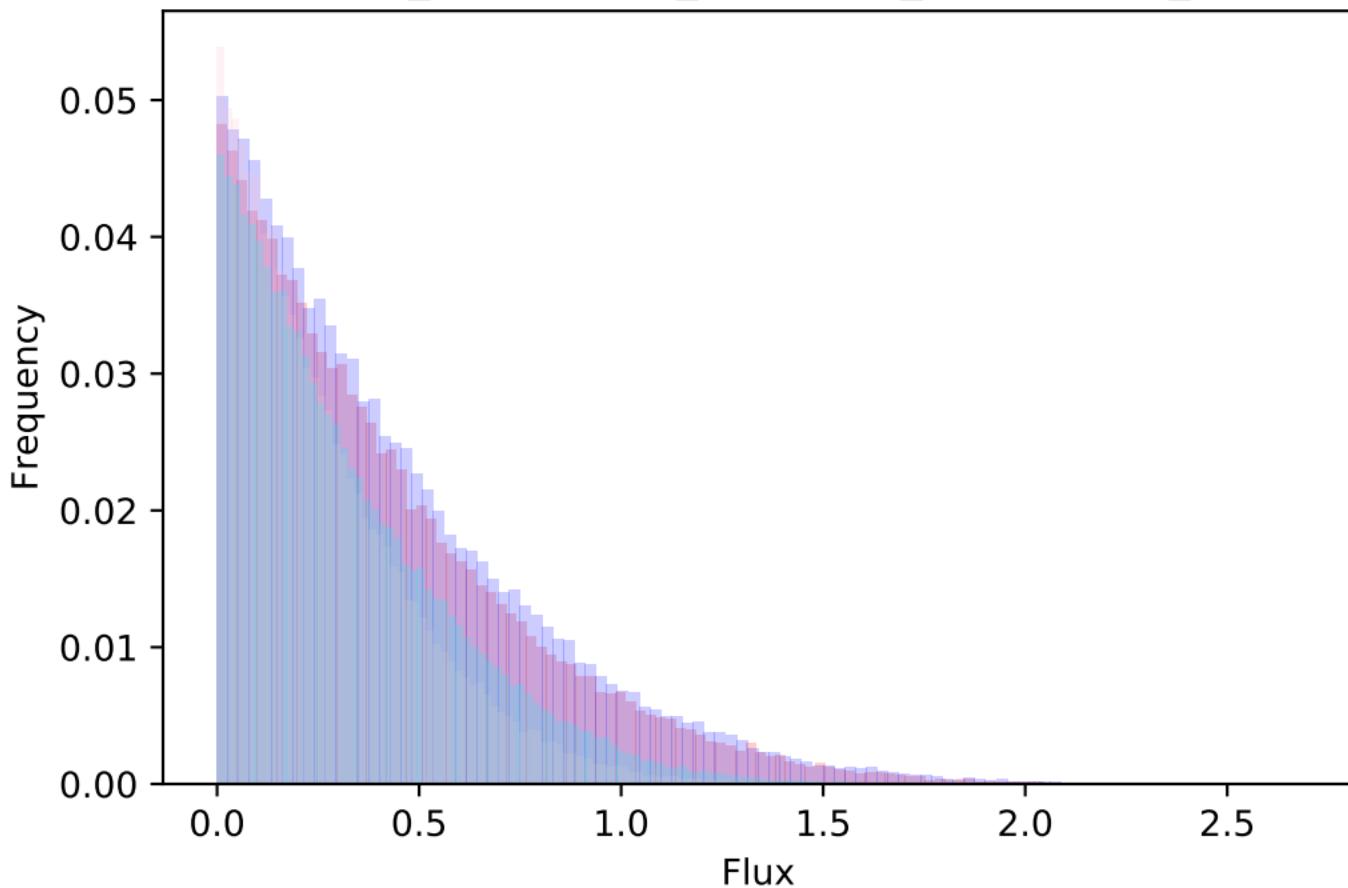
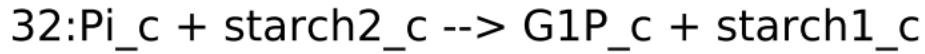
29:Mas_c + starch1_c --> Glc_c + starch2_c



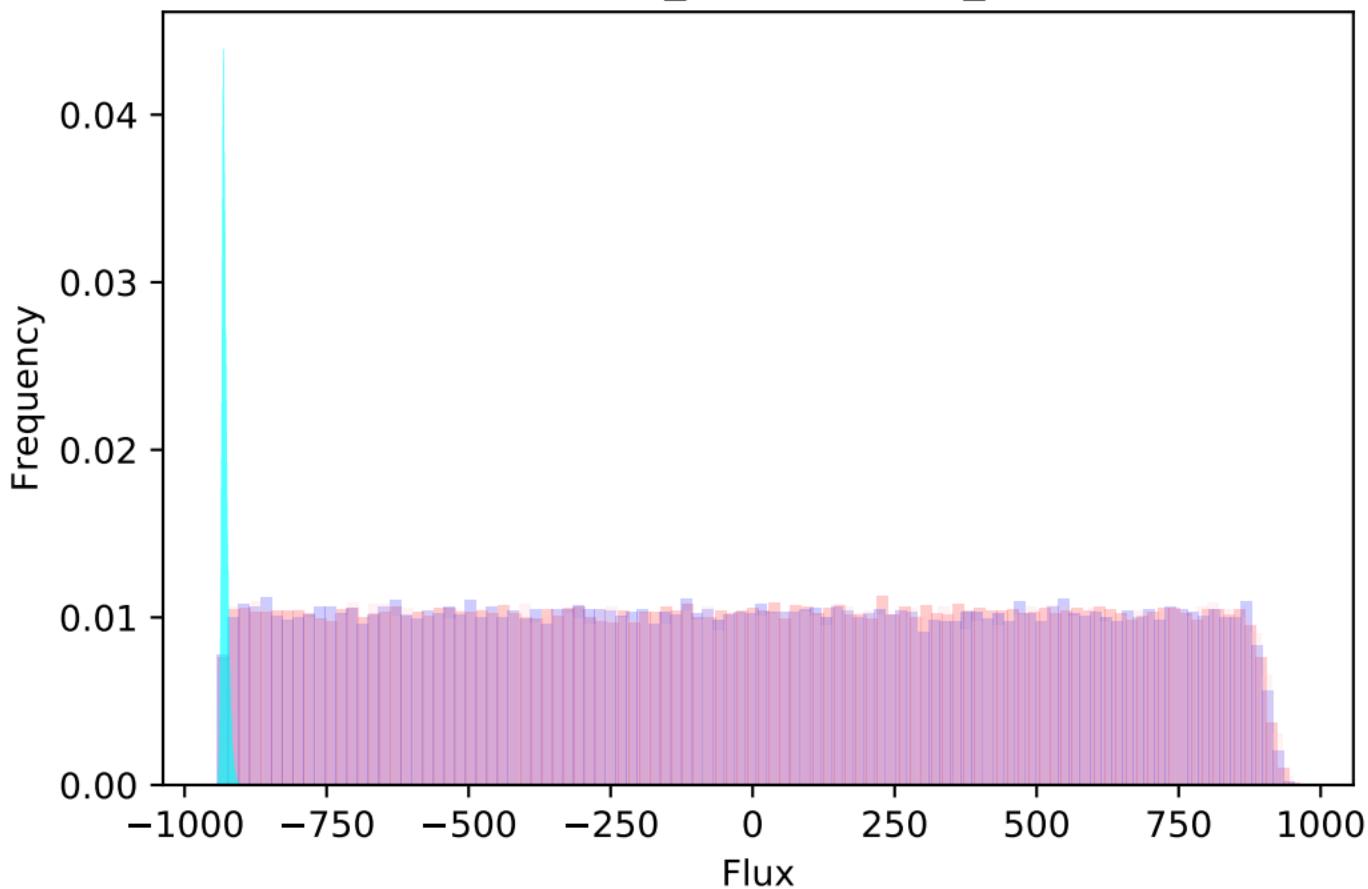


31:Pi_h + starch2_h --> G1P_h + starch1_h

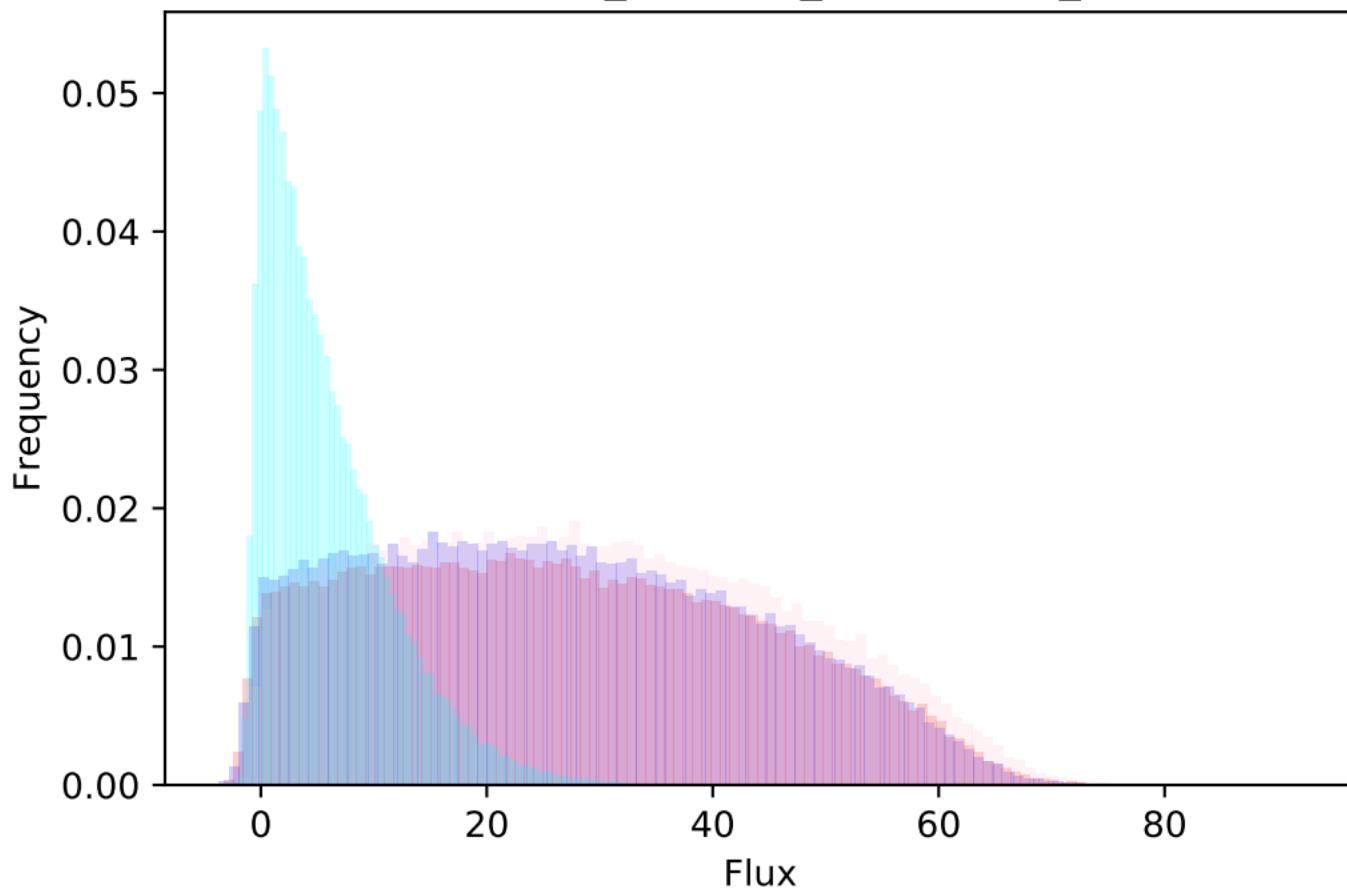


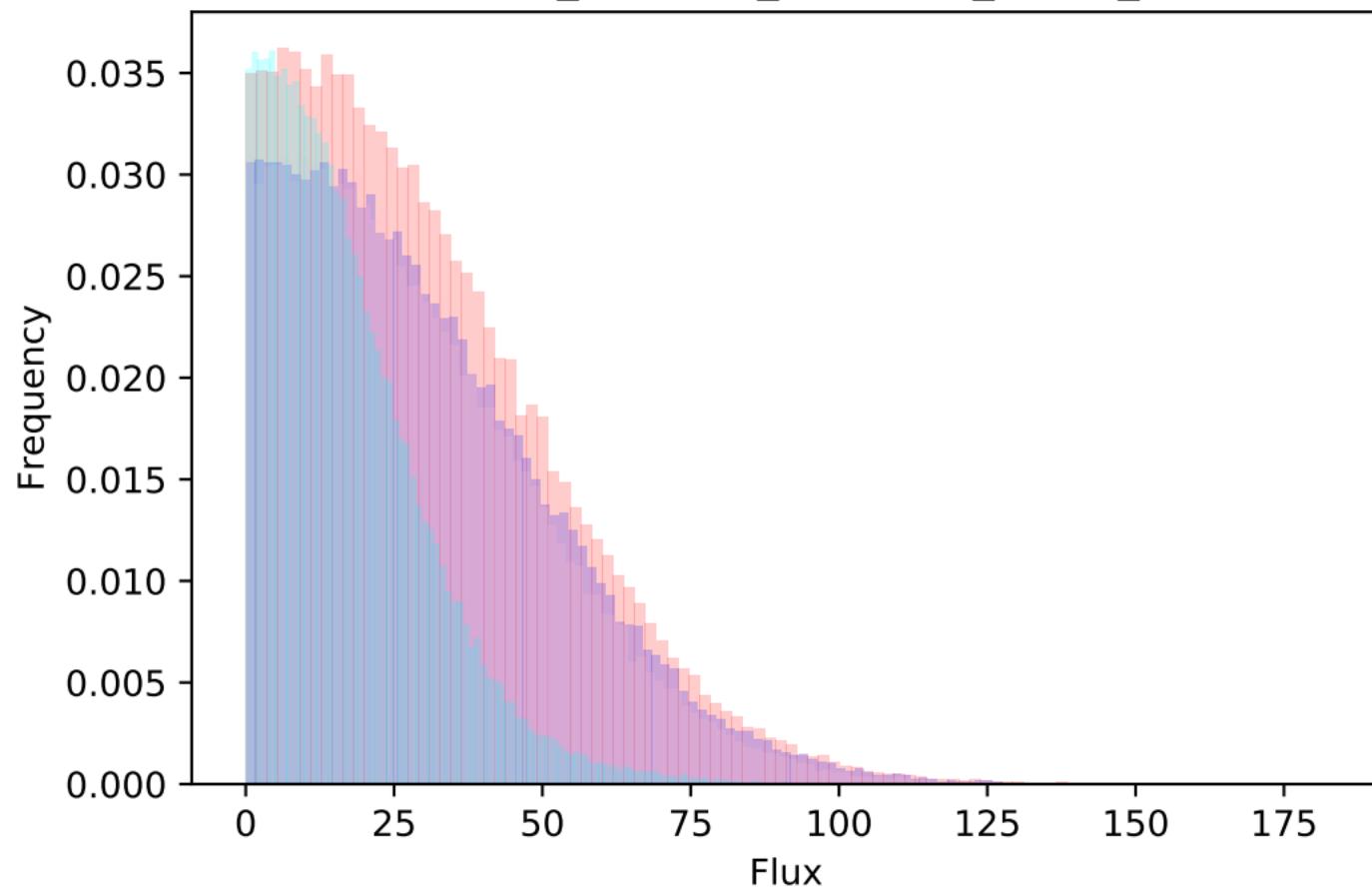


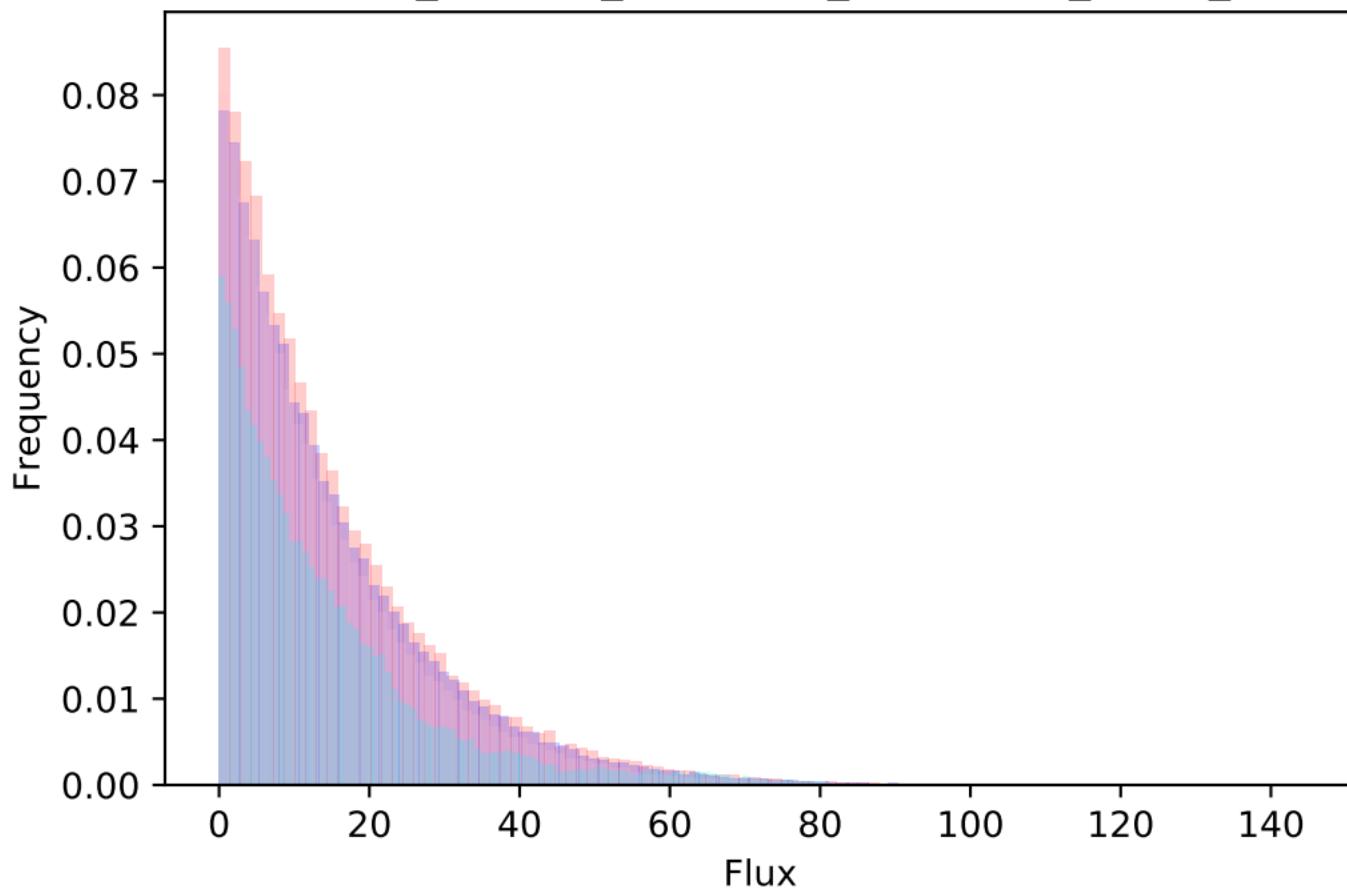
33:GAP_c <=> DHAP_c

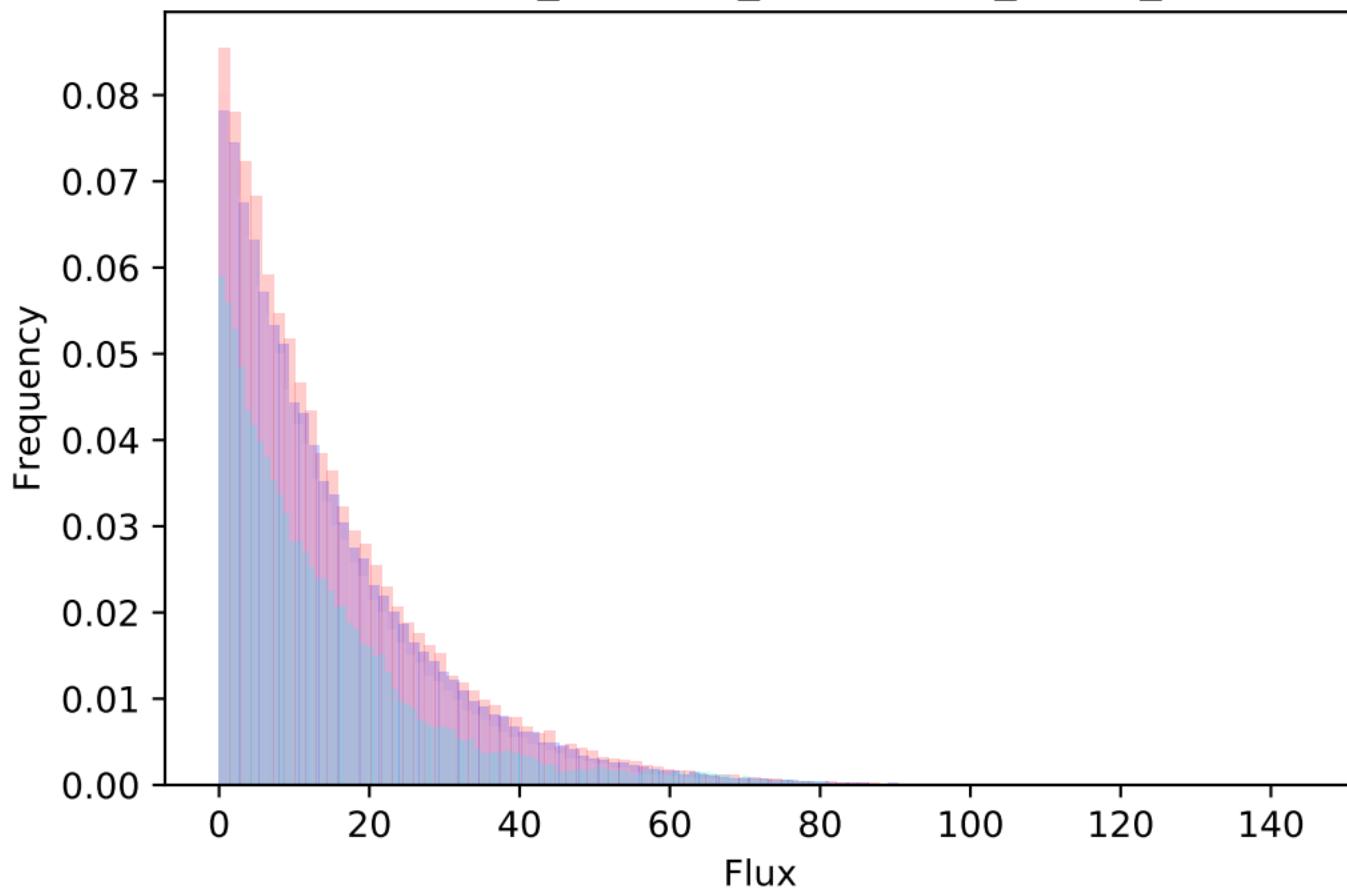
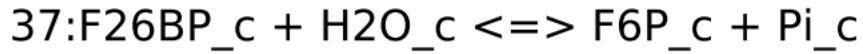


34:DHAP_c + GAP_c <=> FBP_c

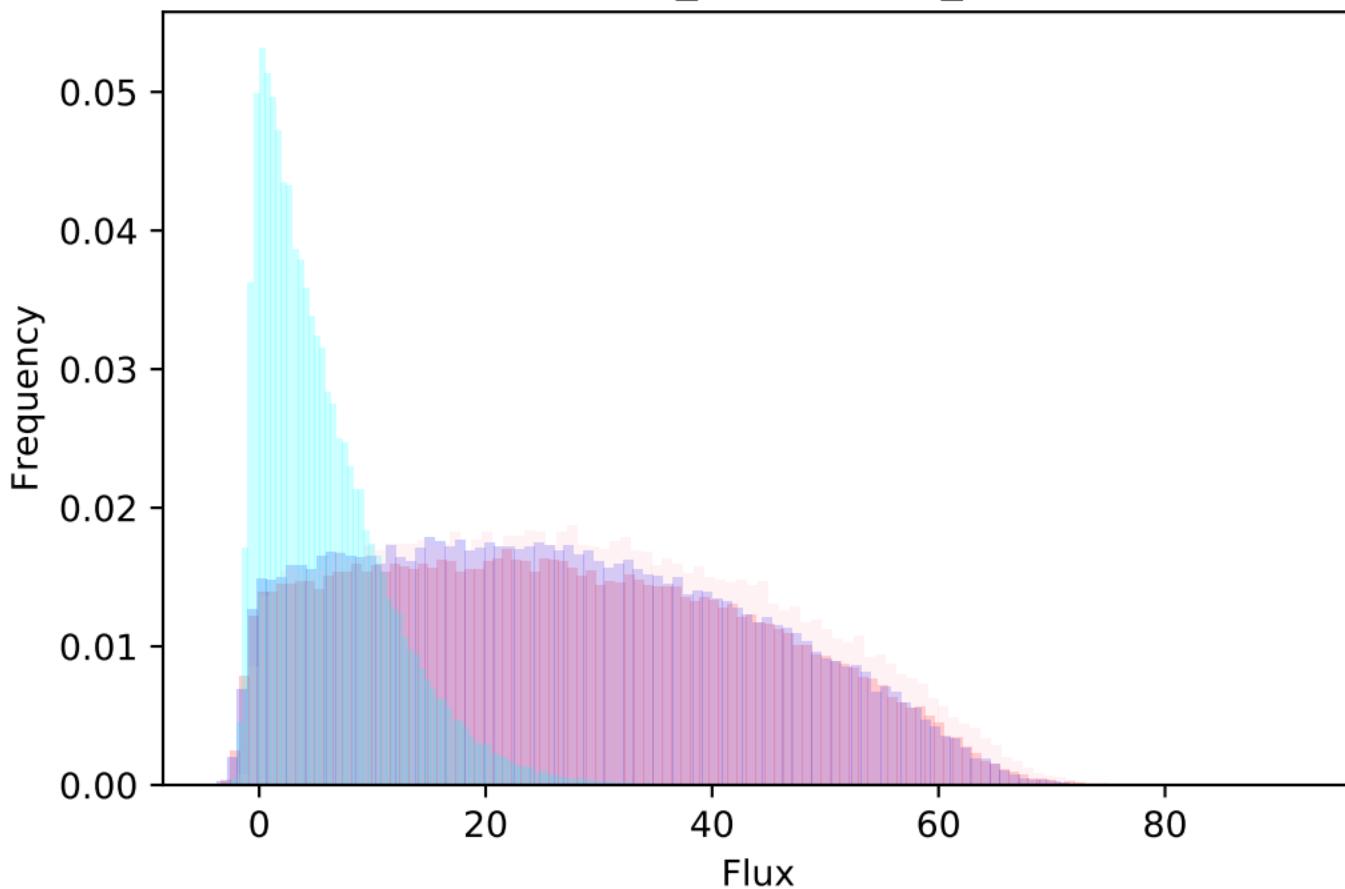




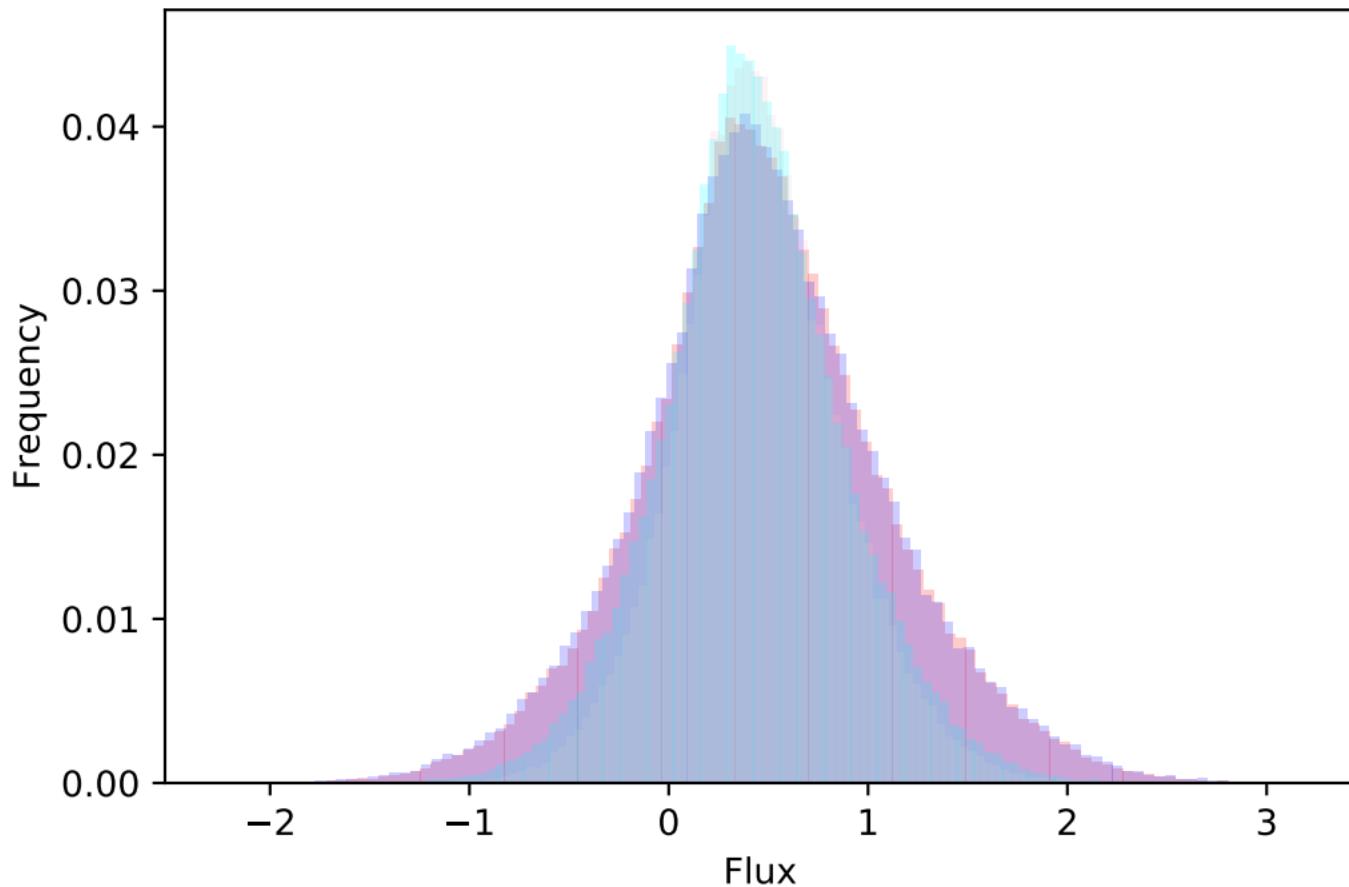




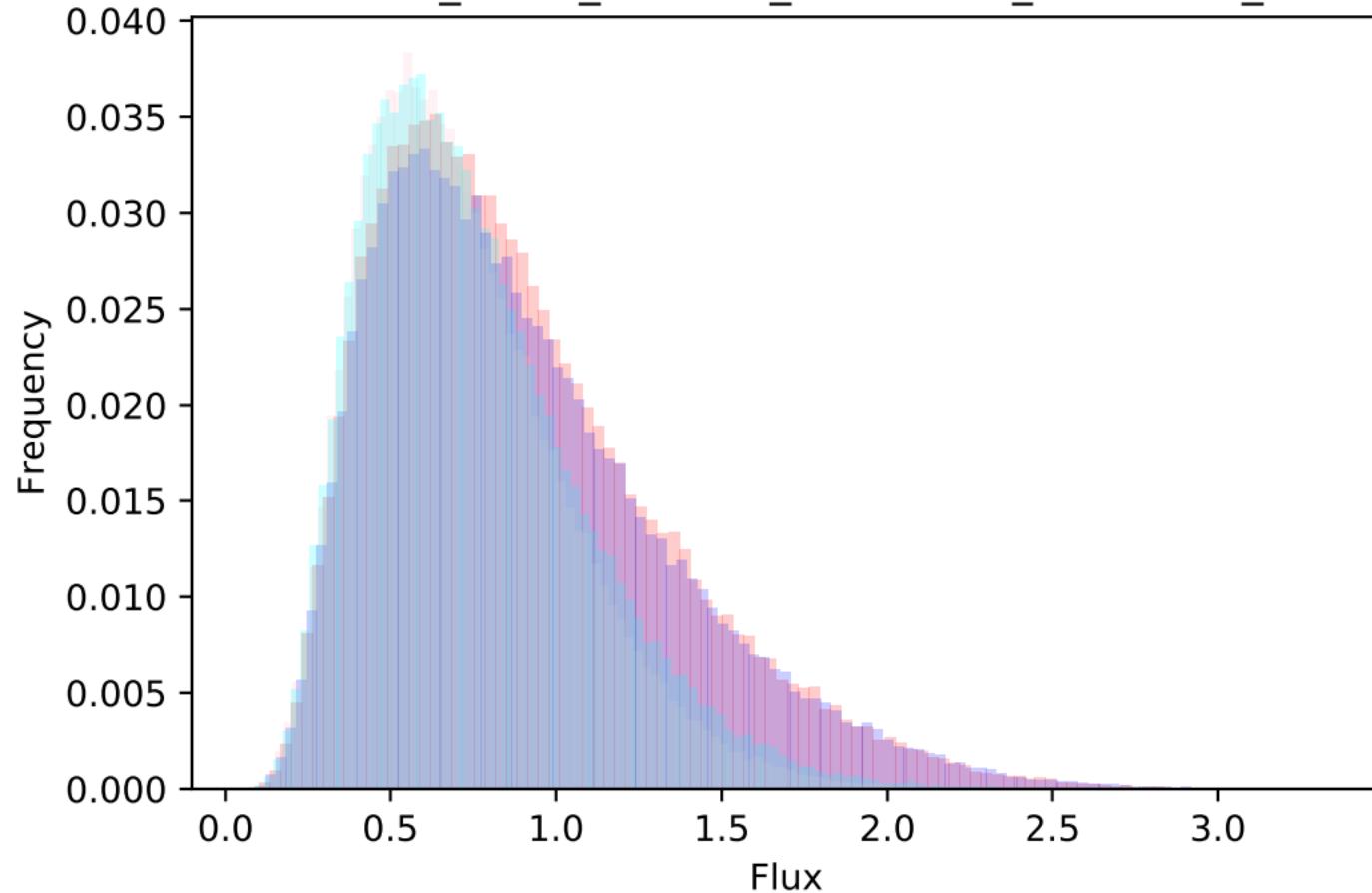
38:F6P_c <=> G6P_c

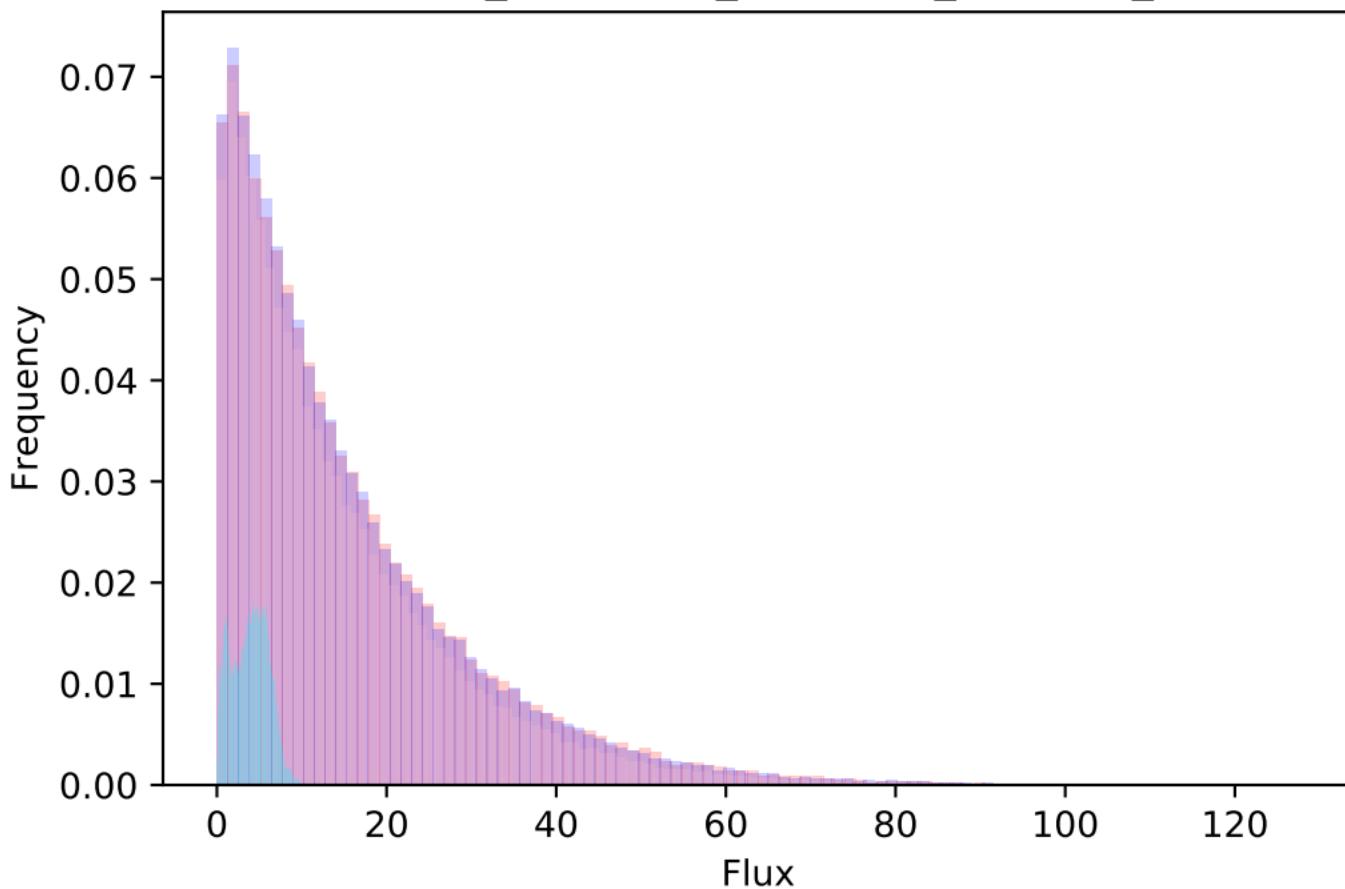
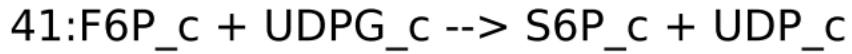


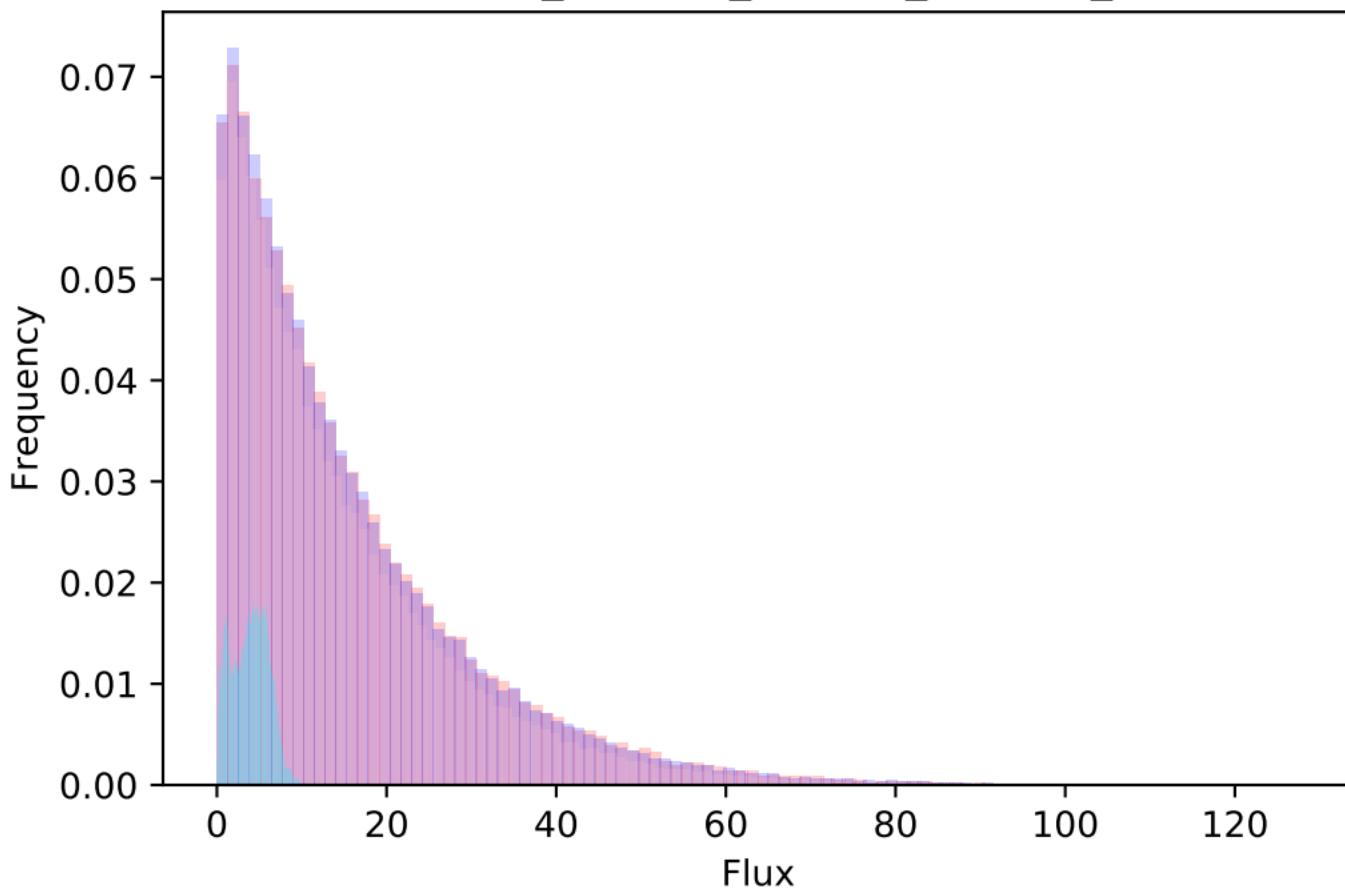
39:G6P_c <=> G1P_c



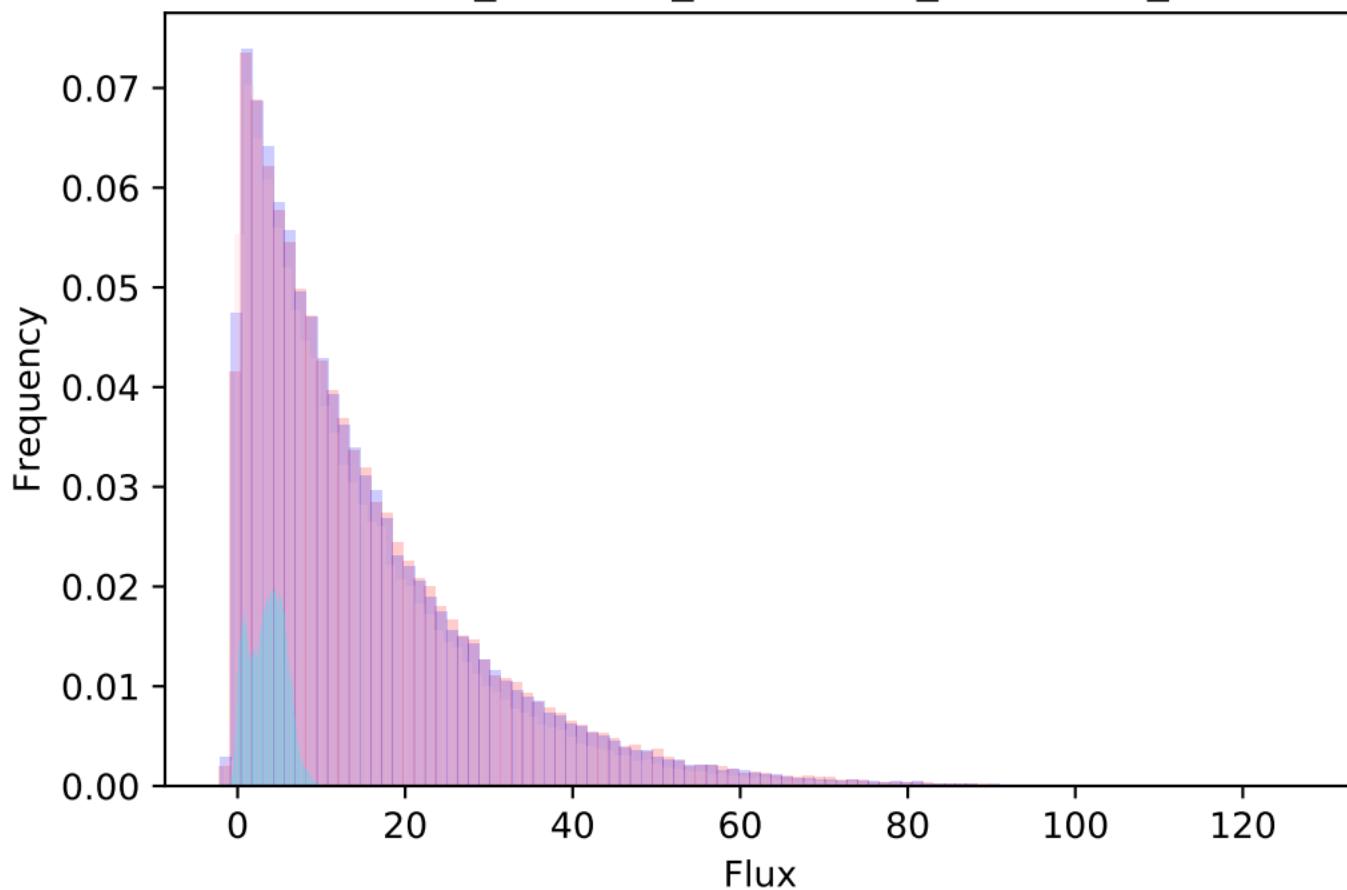
$40:\text{G1P_c} + \text{H_c} + \text{UTP_c} \rightleftharpoons \text{PPi_c} + \text{UDPG_c}$

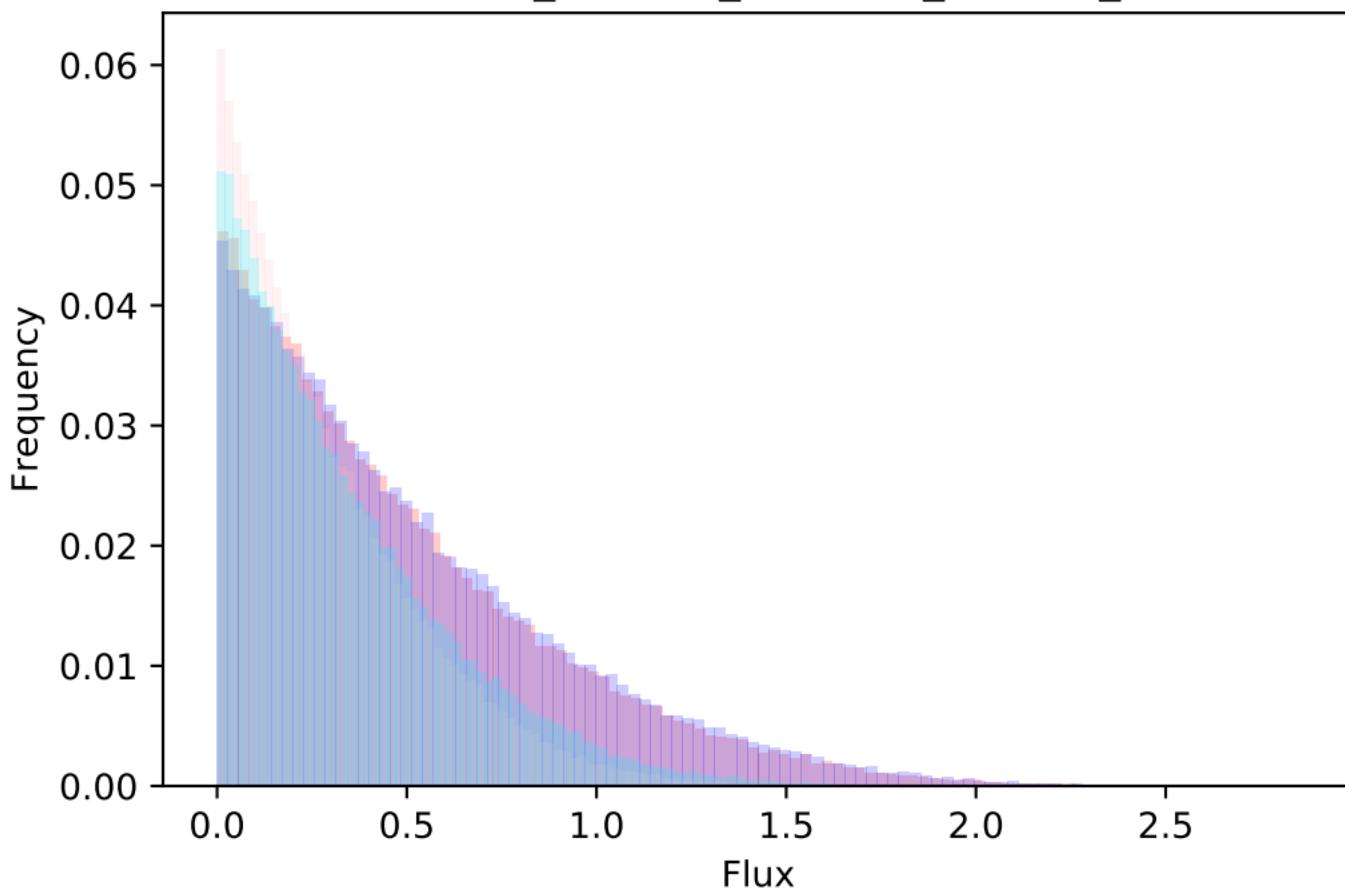
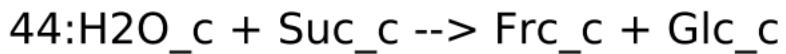


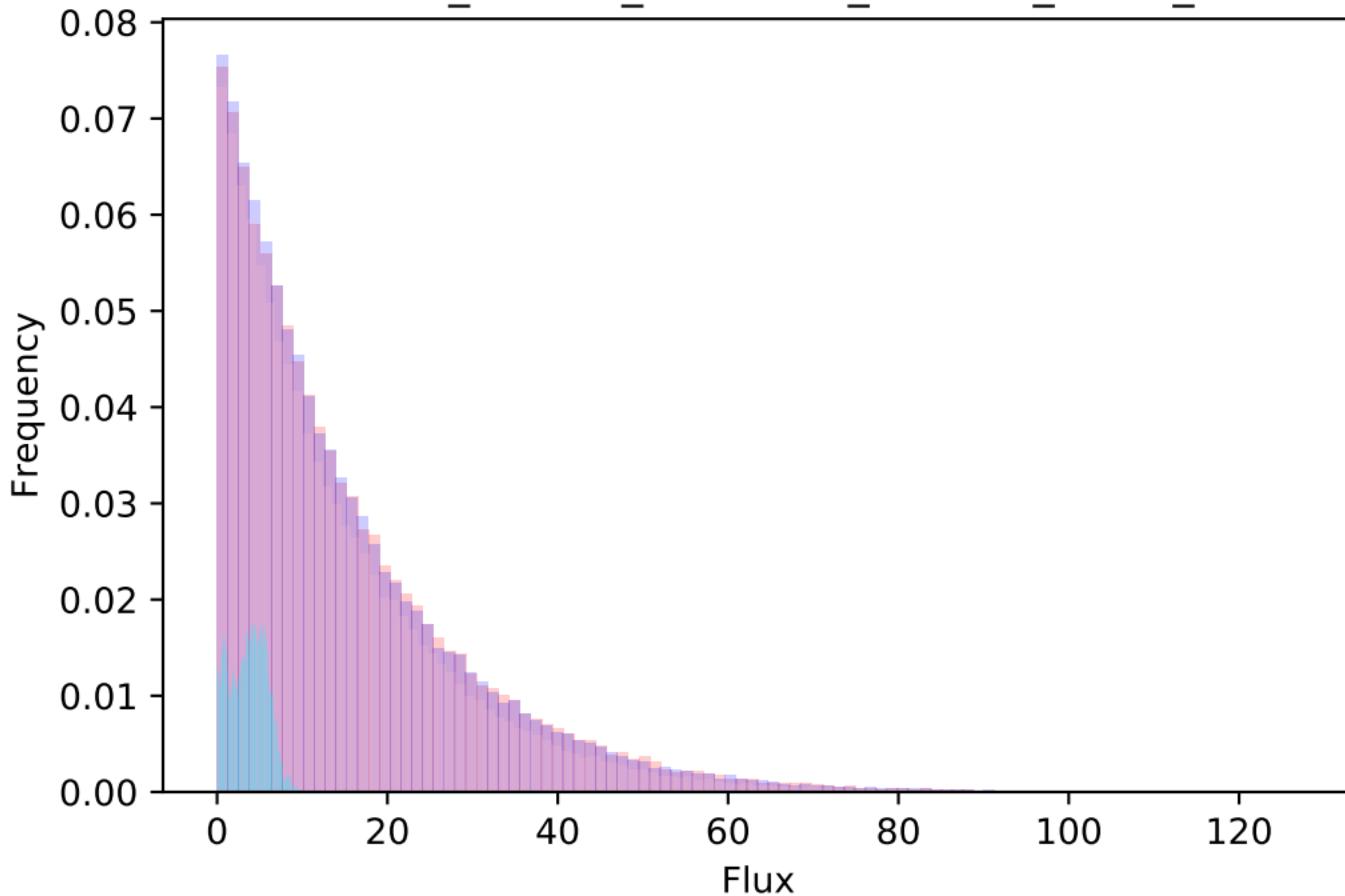
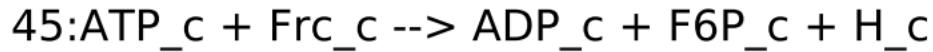


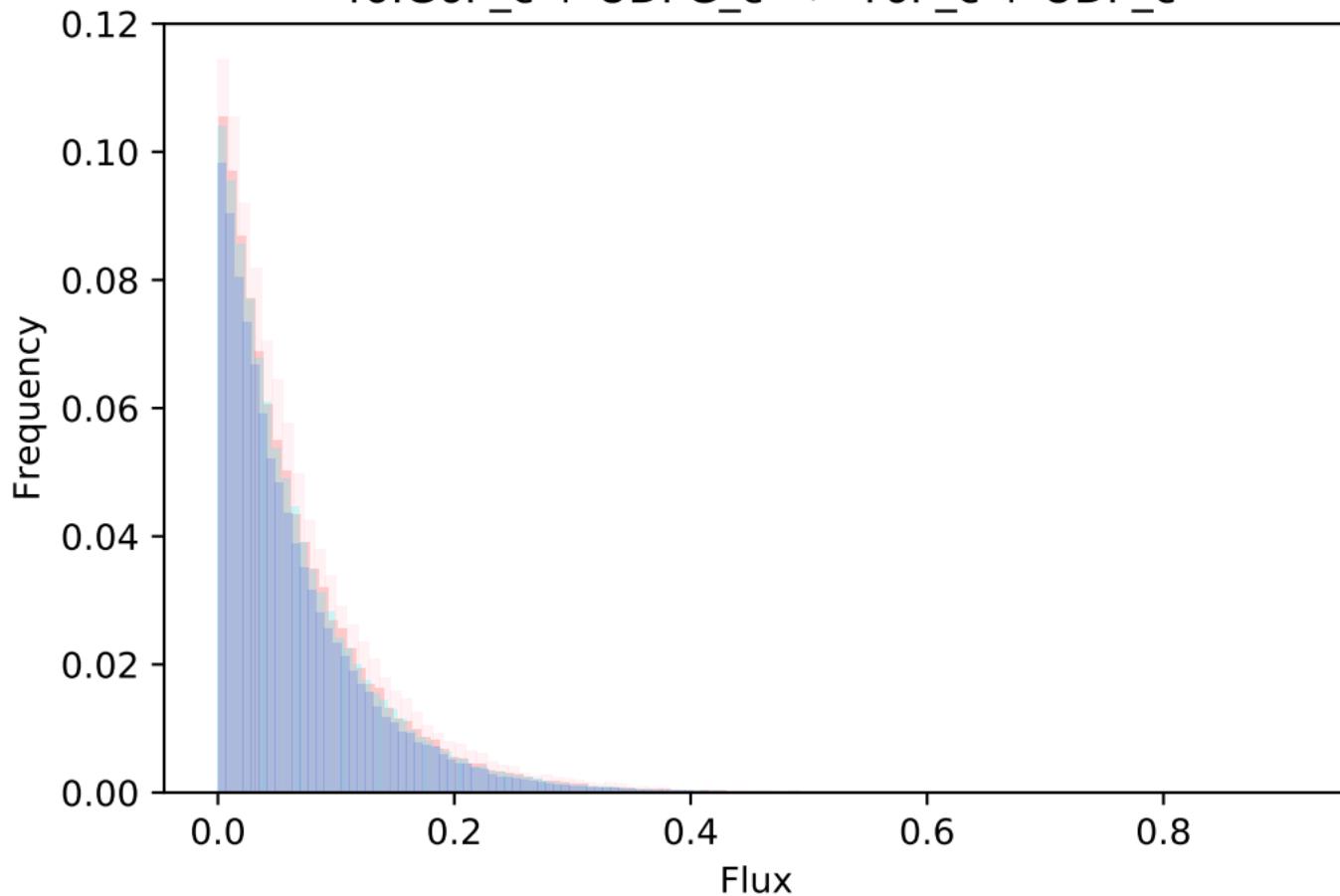


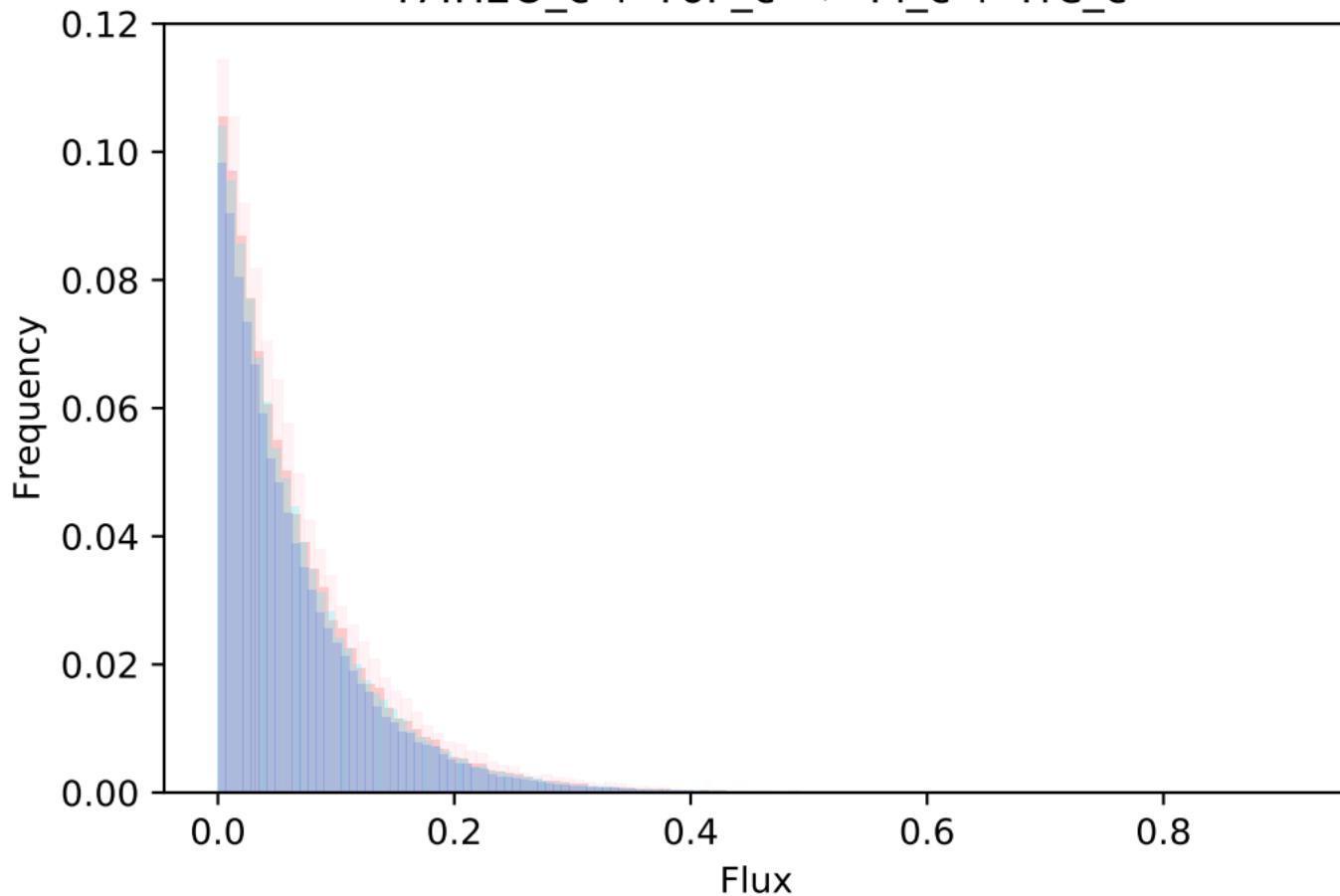
43:Suc_c + UDP_c <=> Frc_c + UDPG_c



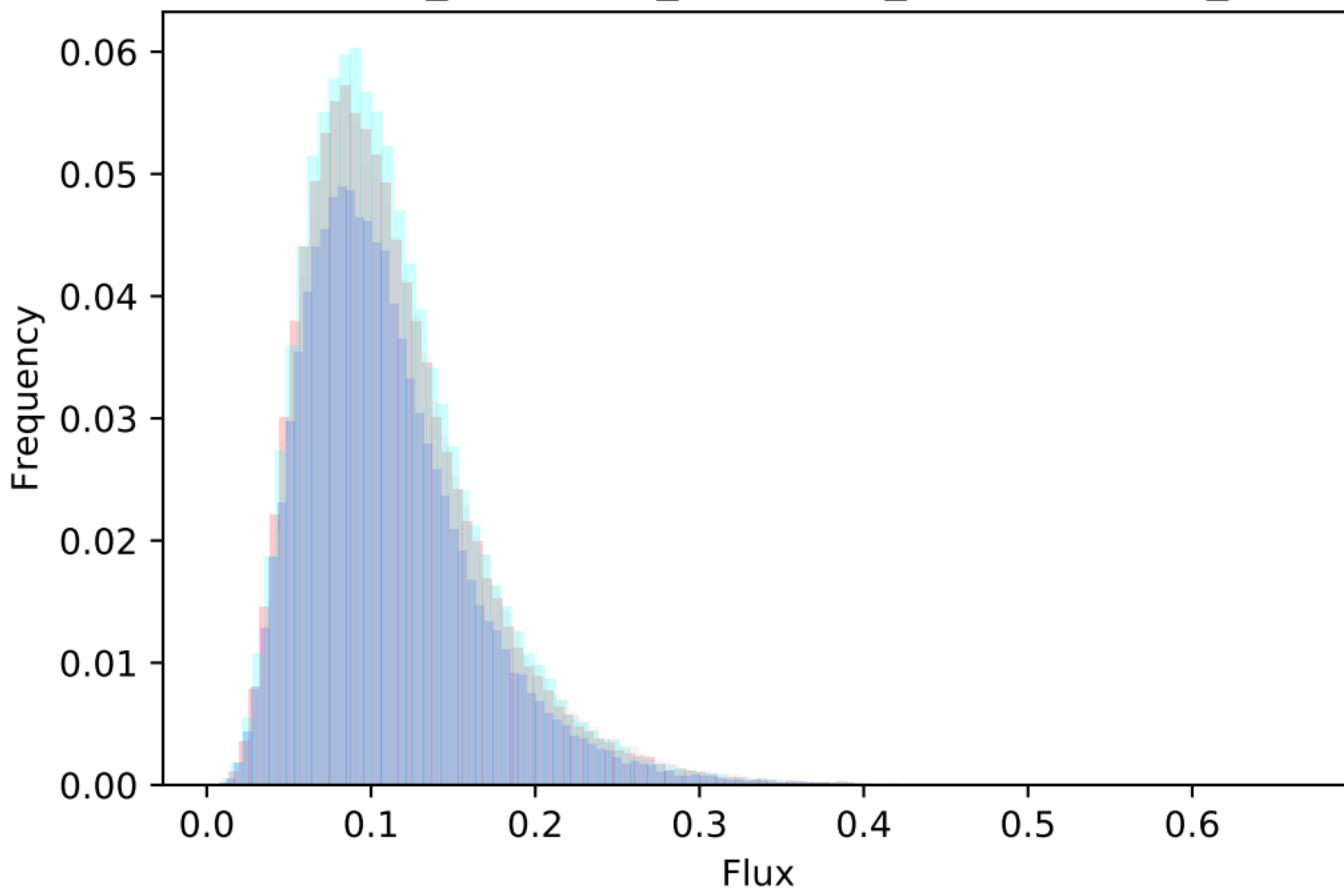




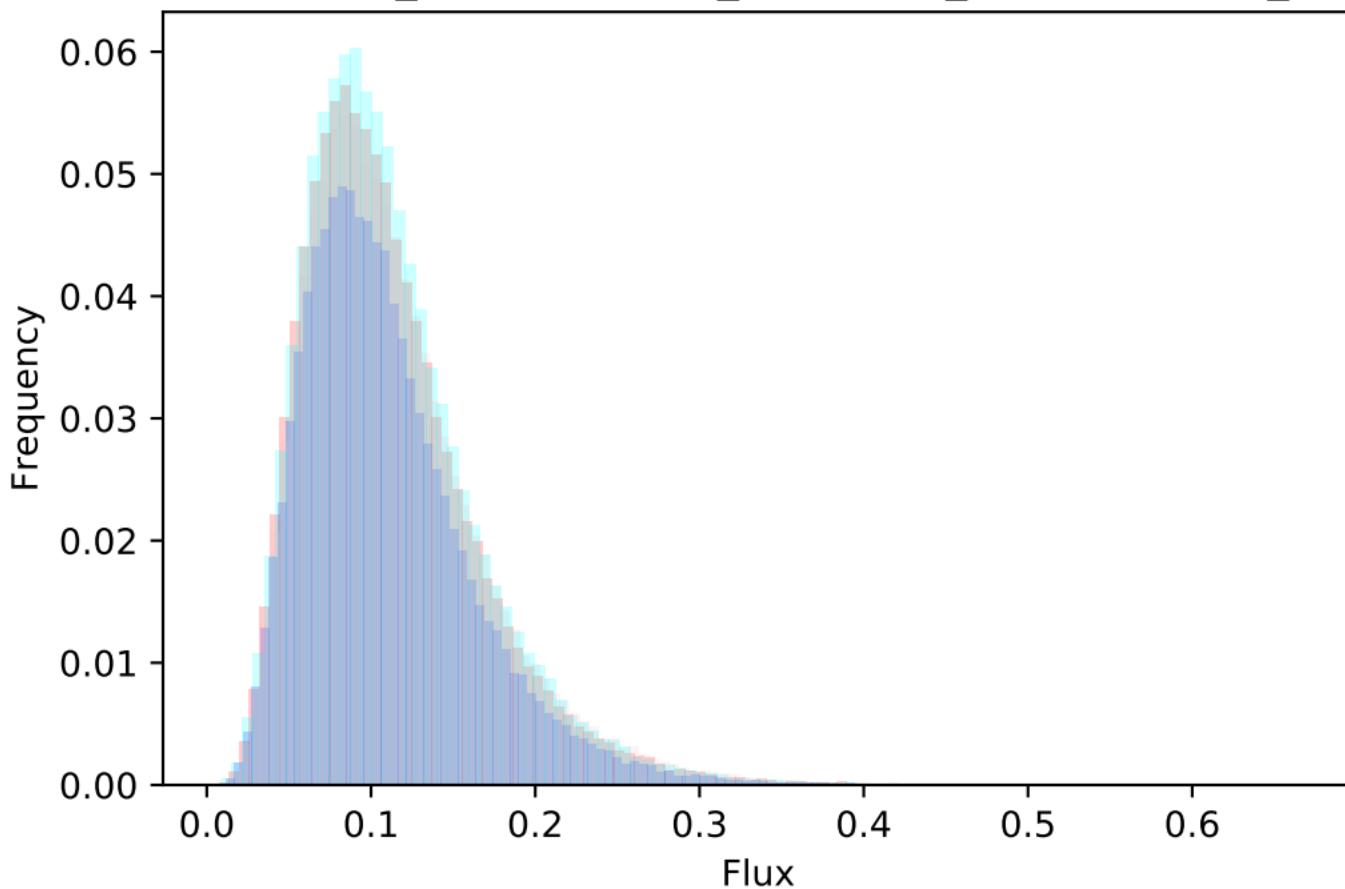




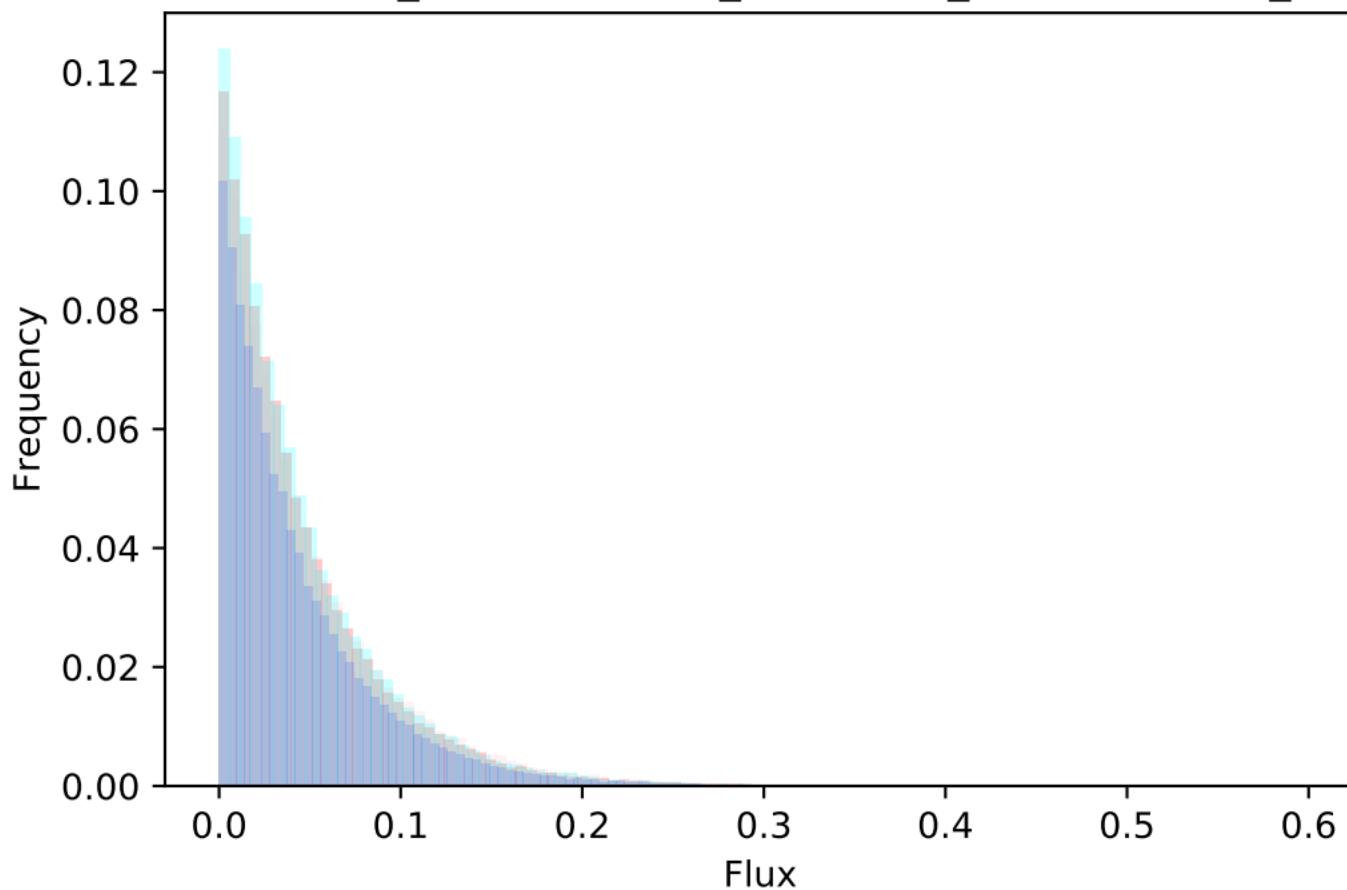
48:H2O_c + UDPG_c --> UDP_c + cellulose1_c



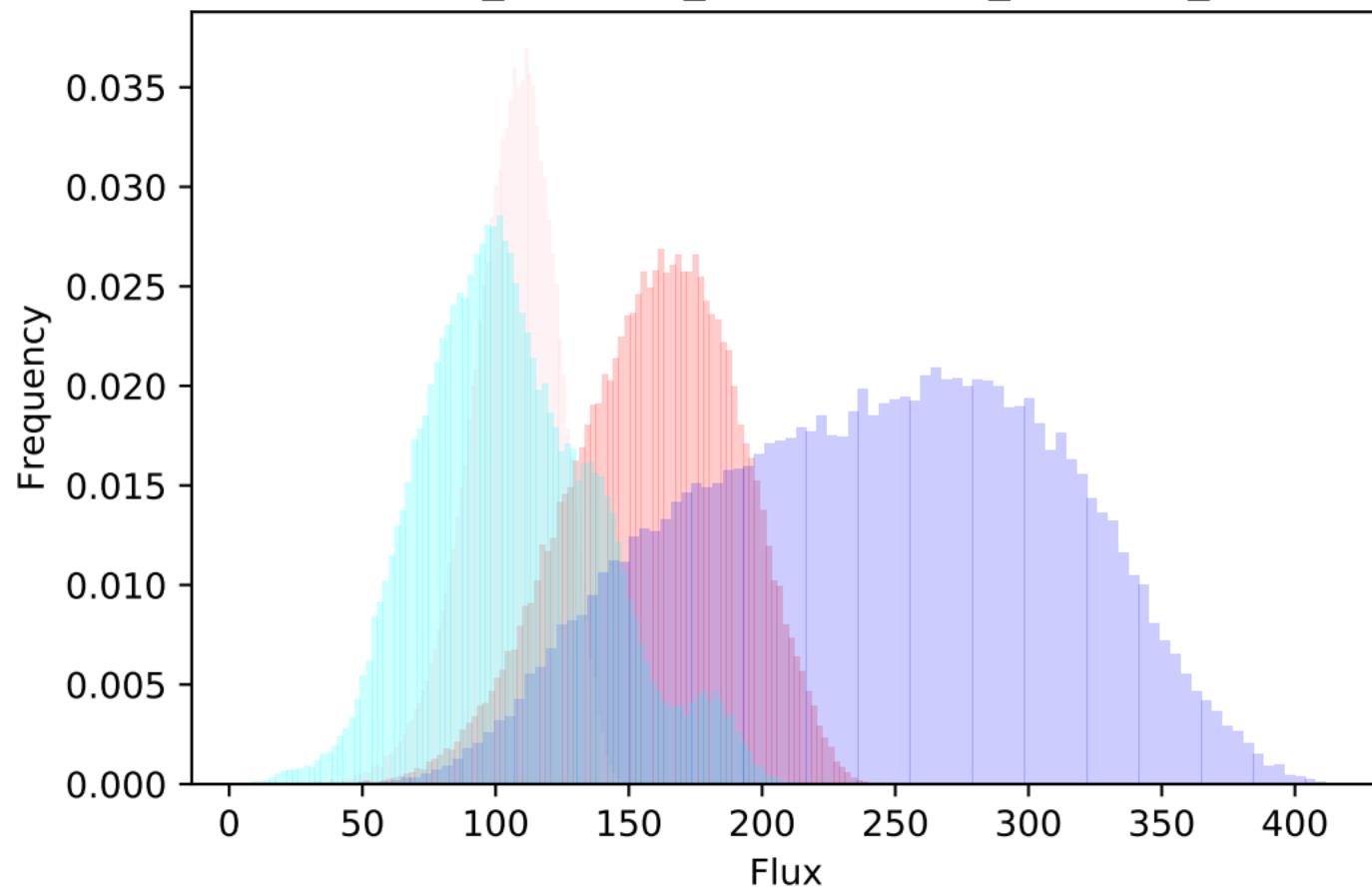
49:UDPG_c + cellulose1_c --> UDP_c + cellulose2_c

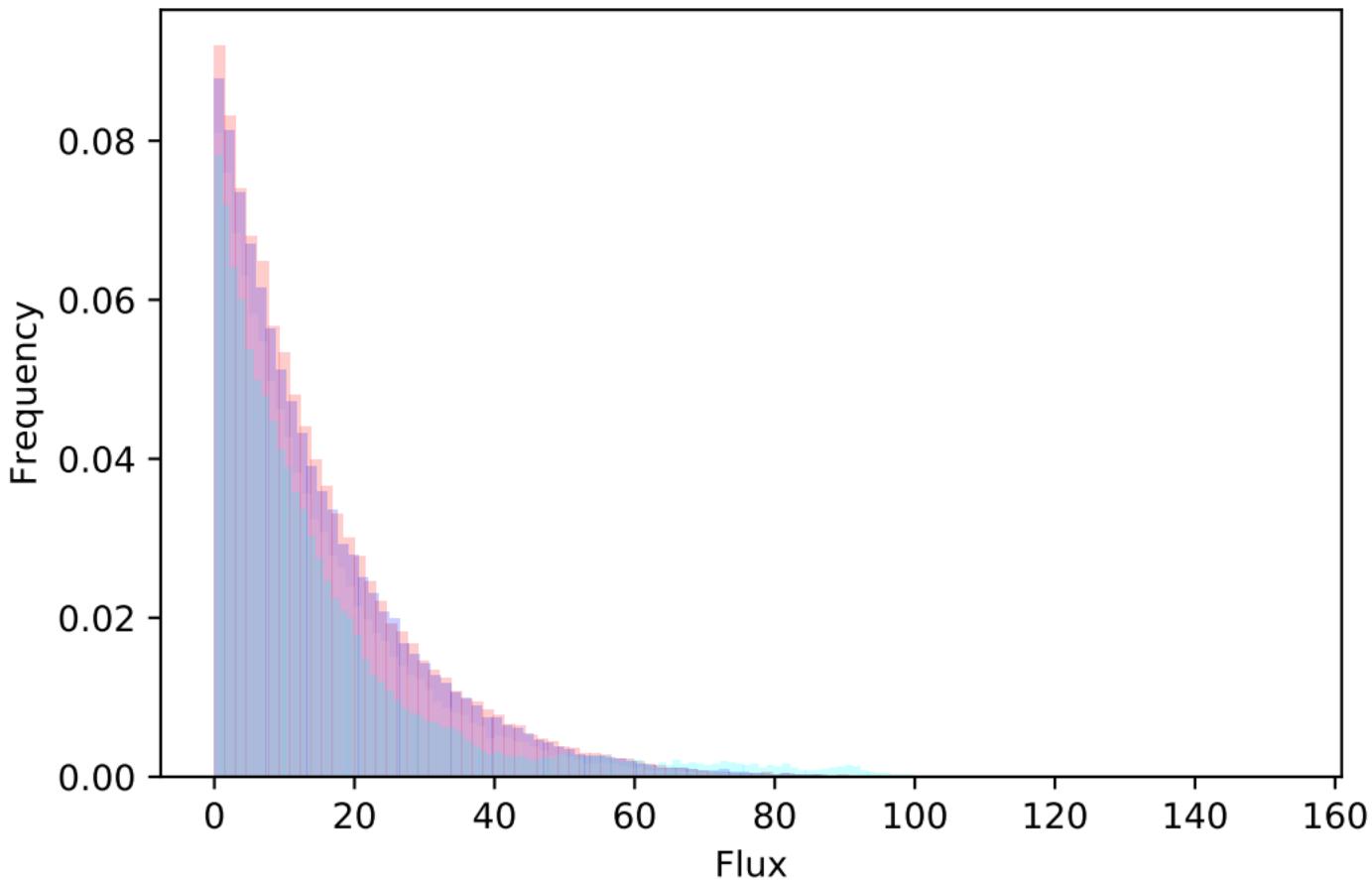


50:UDPG_c + cellulose2_c --> UDP_c + cellulose3_c

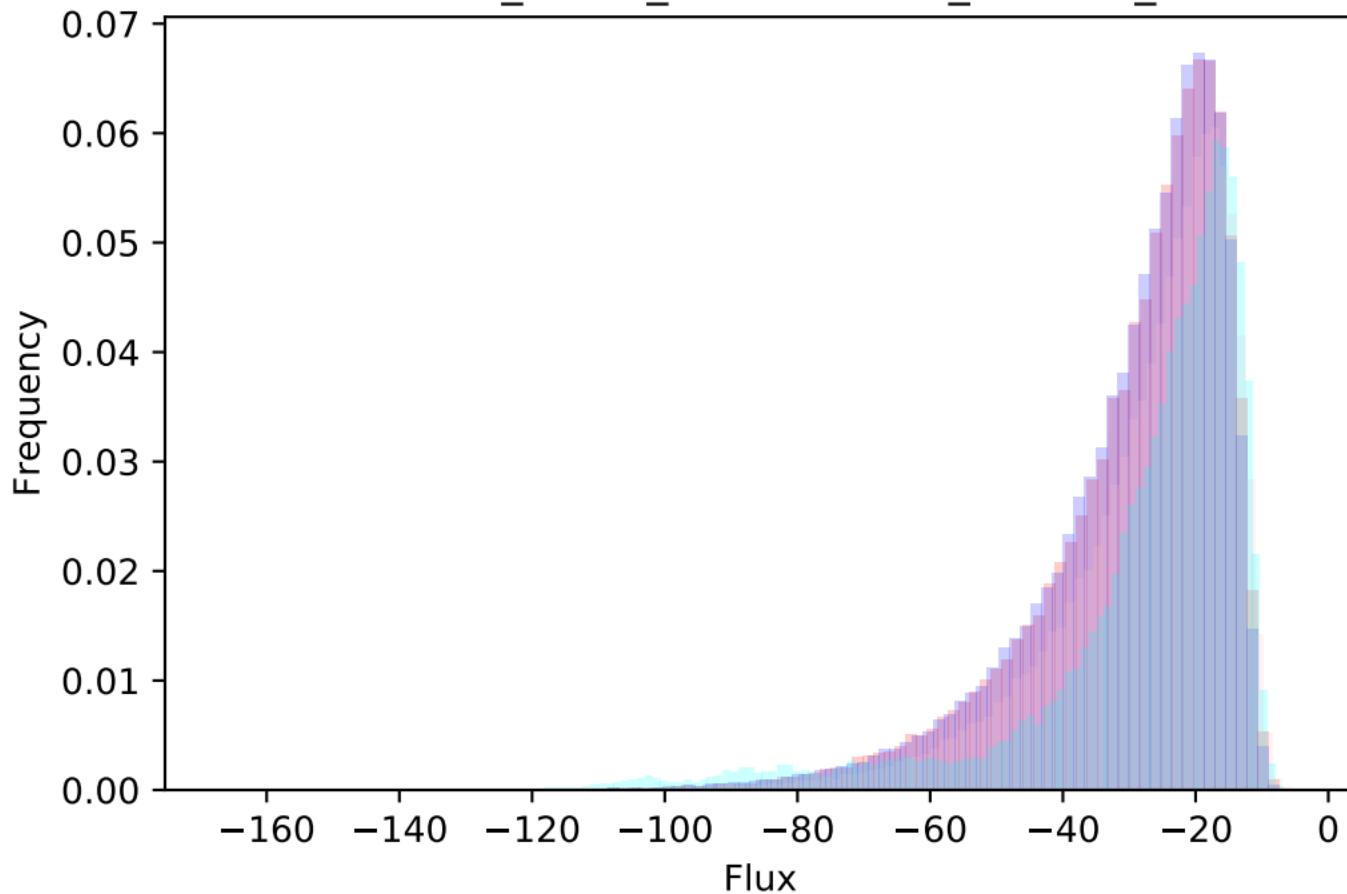


51:Mal_c + NAD_c <=> NADH_c + OAA_c

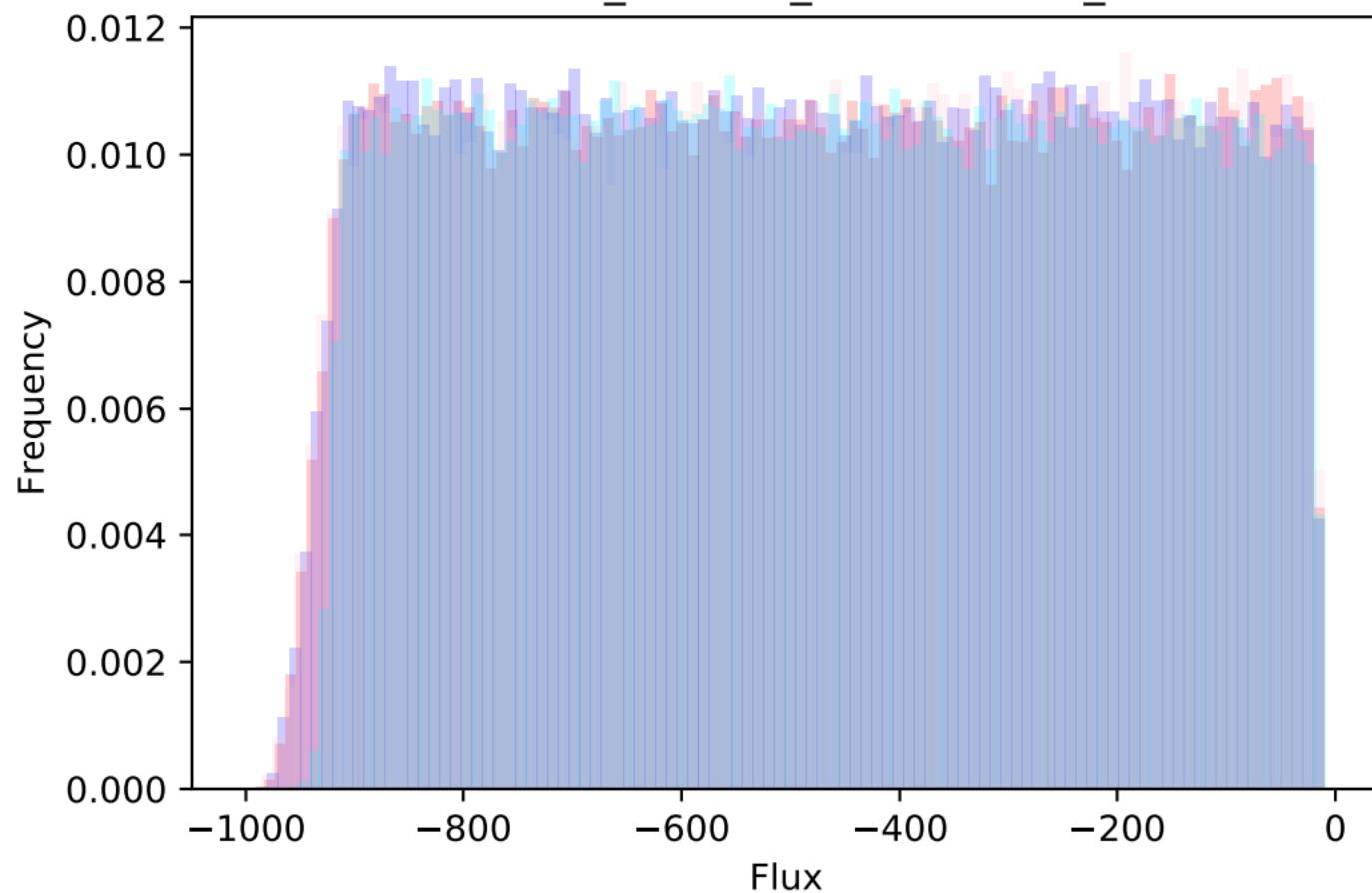




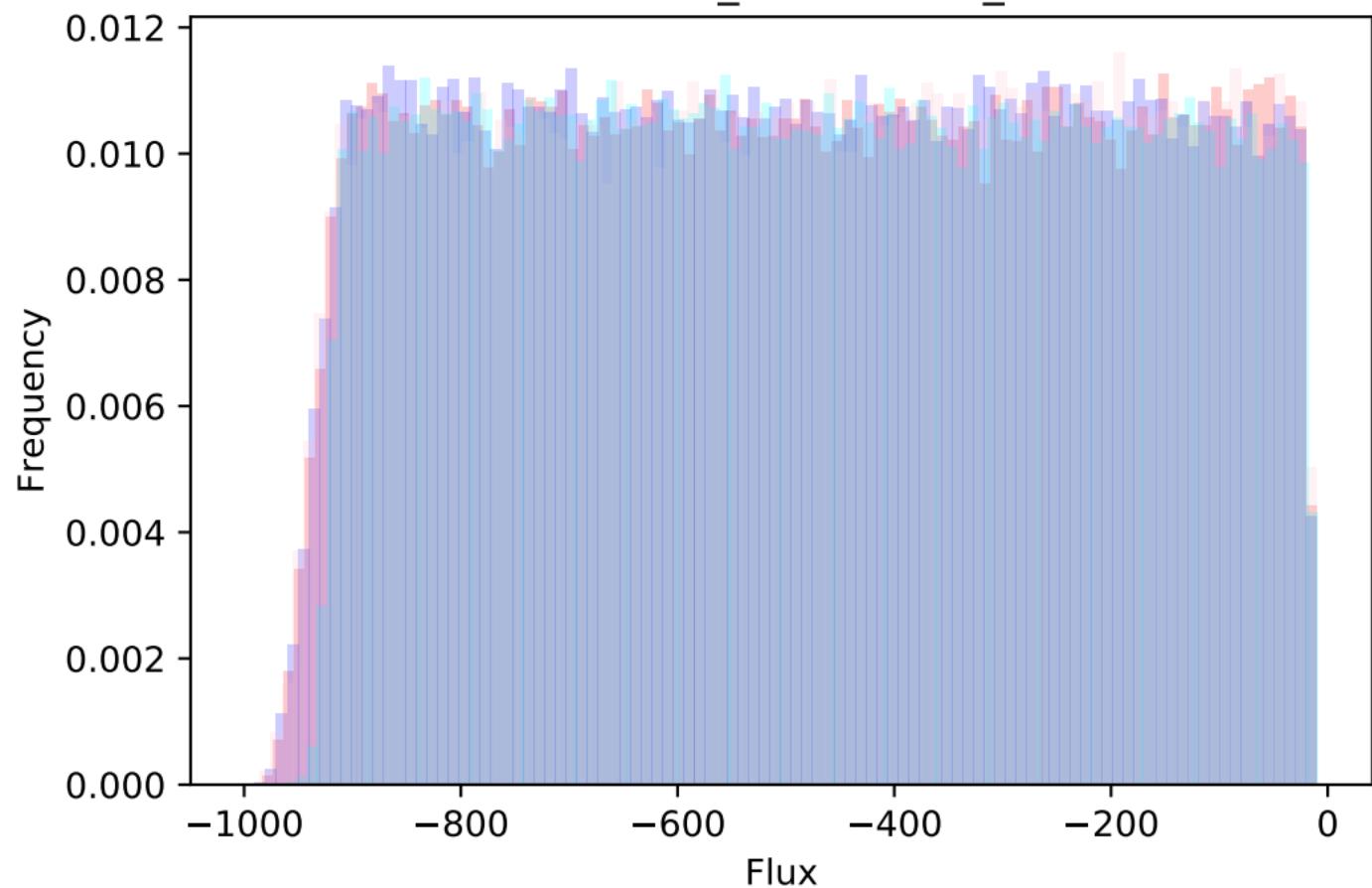
53:OAA_c + Pi_c <=> HCO3_c + PEP_c



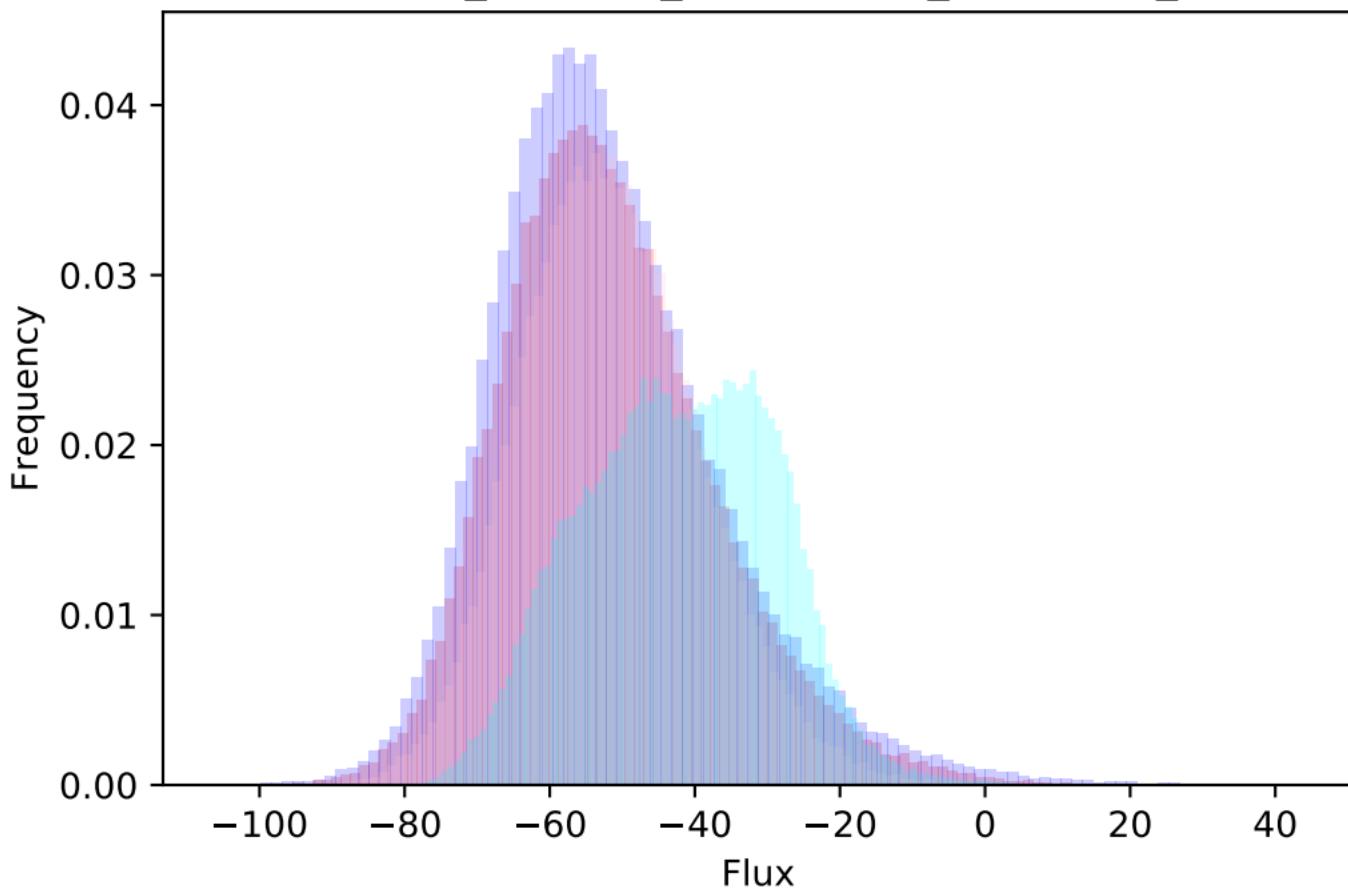
54:H2O_c + PEP_c <=> 2PGA_c

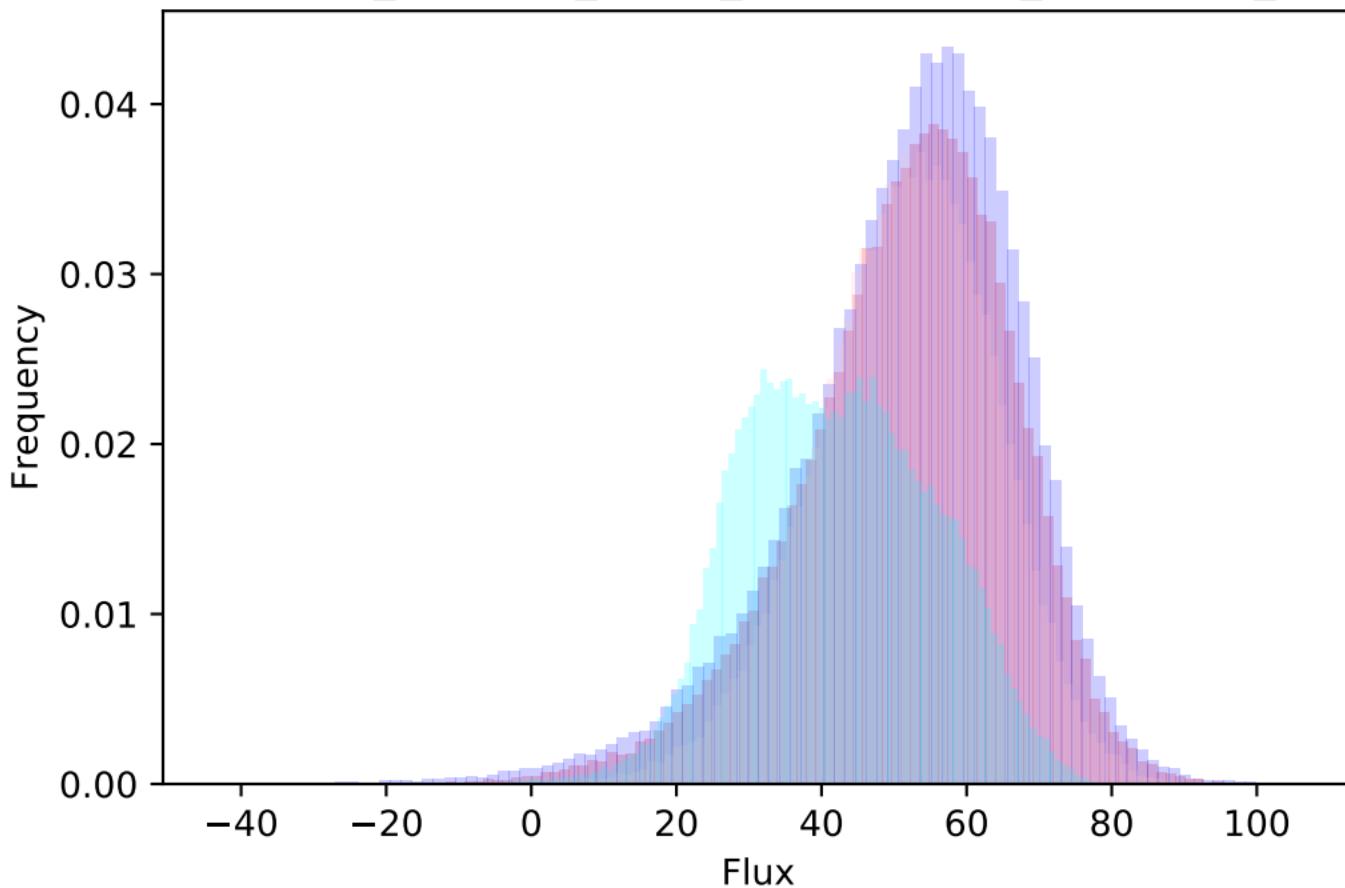


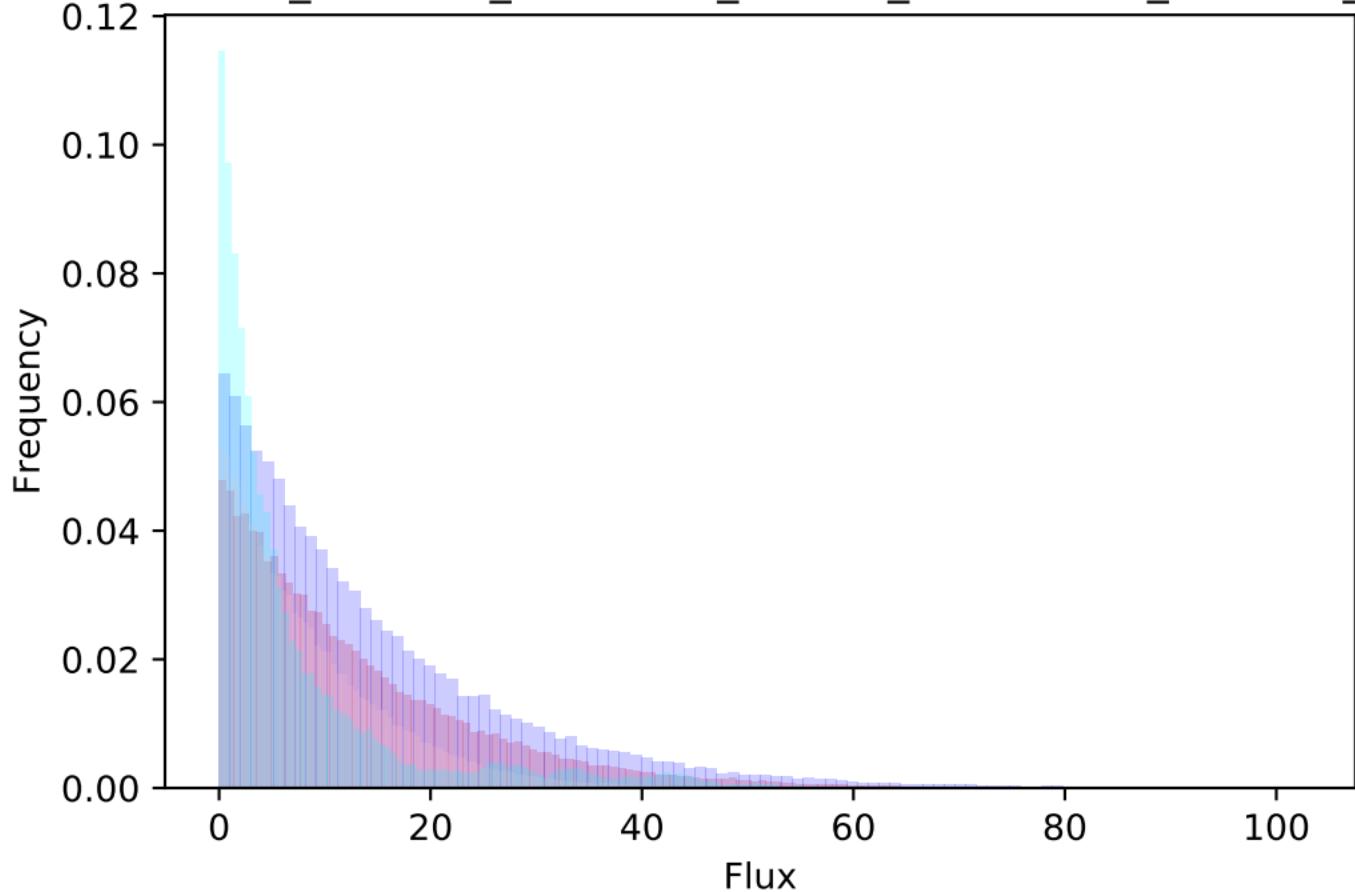
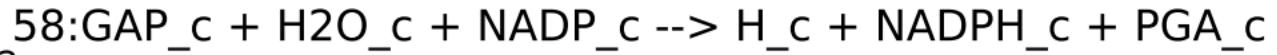
55:2PGA_c <=> PGA_c

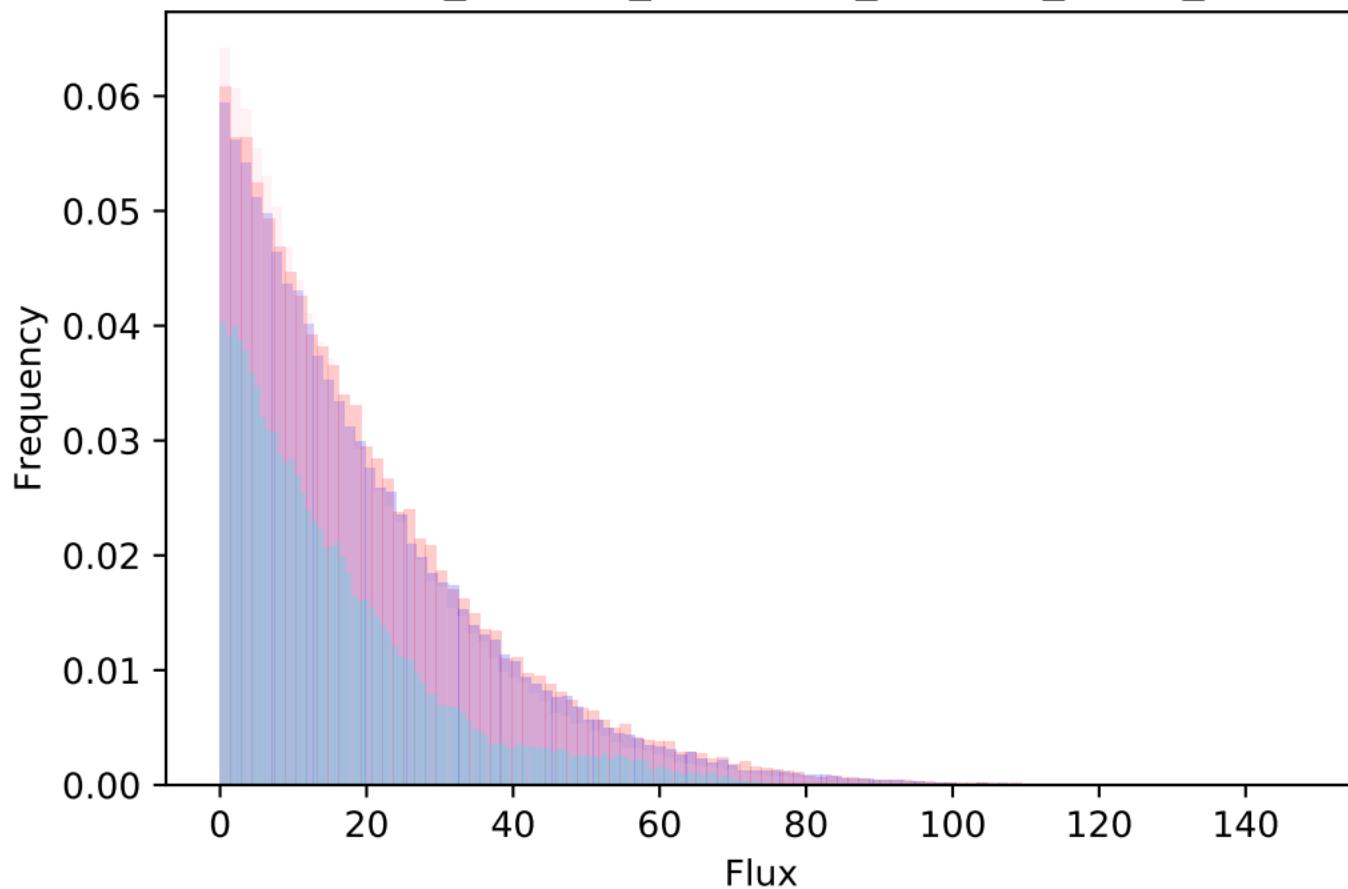
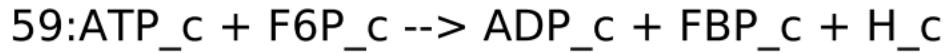


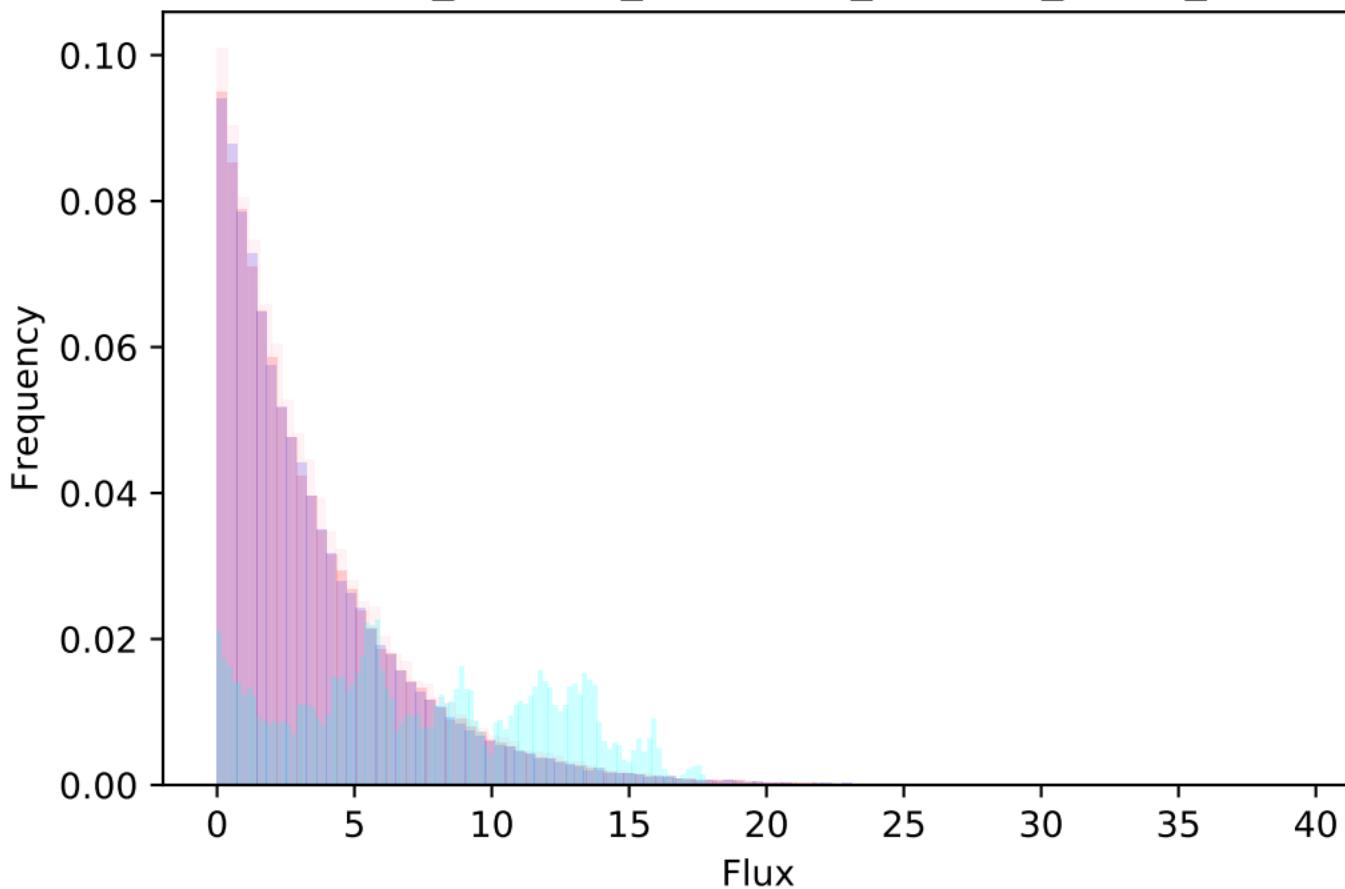
56:ATP_c + PGA_c <=> ADP_c + DPGA_c



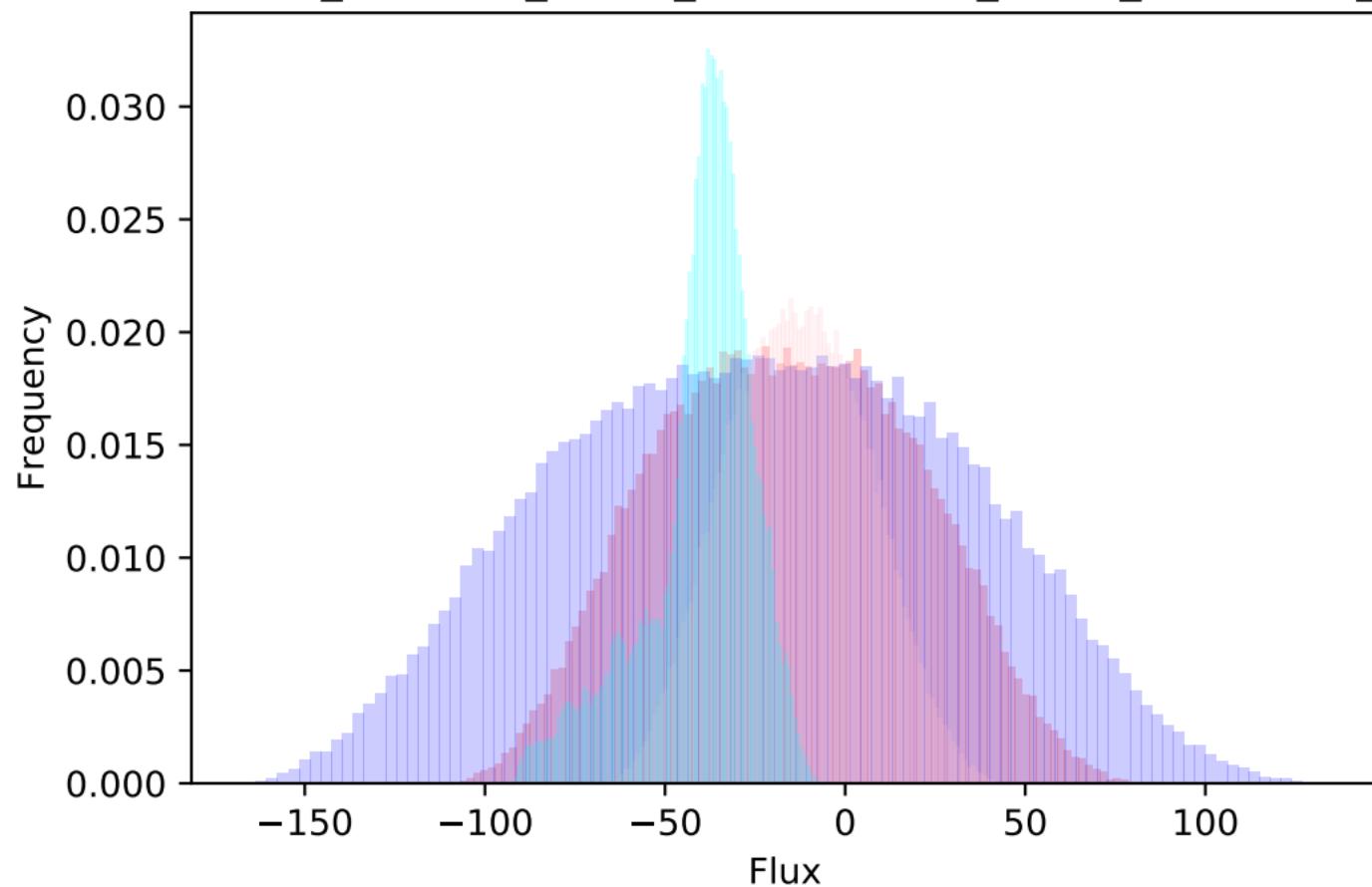




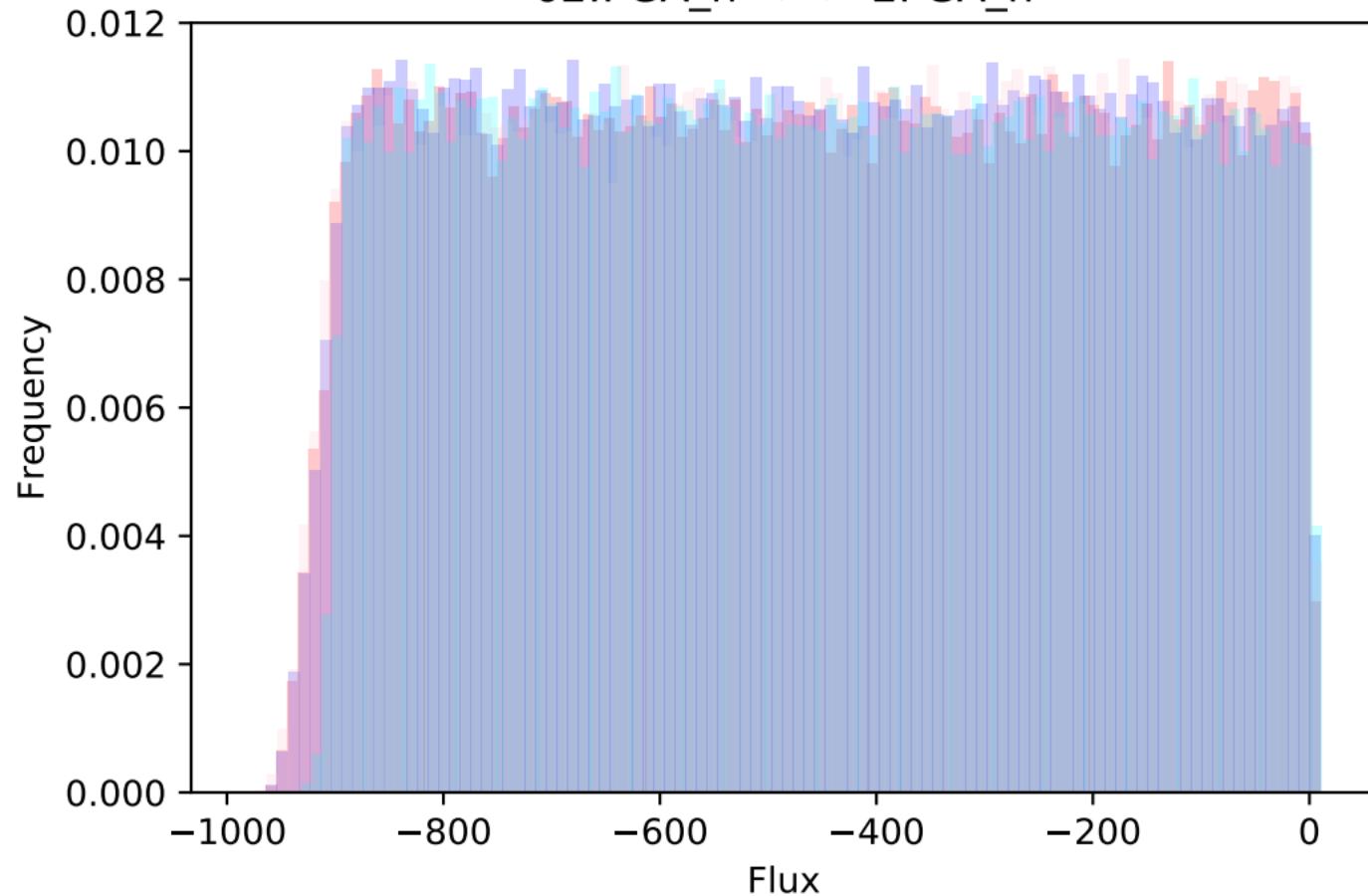




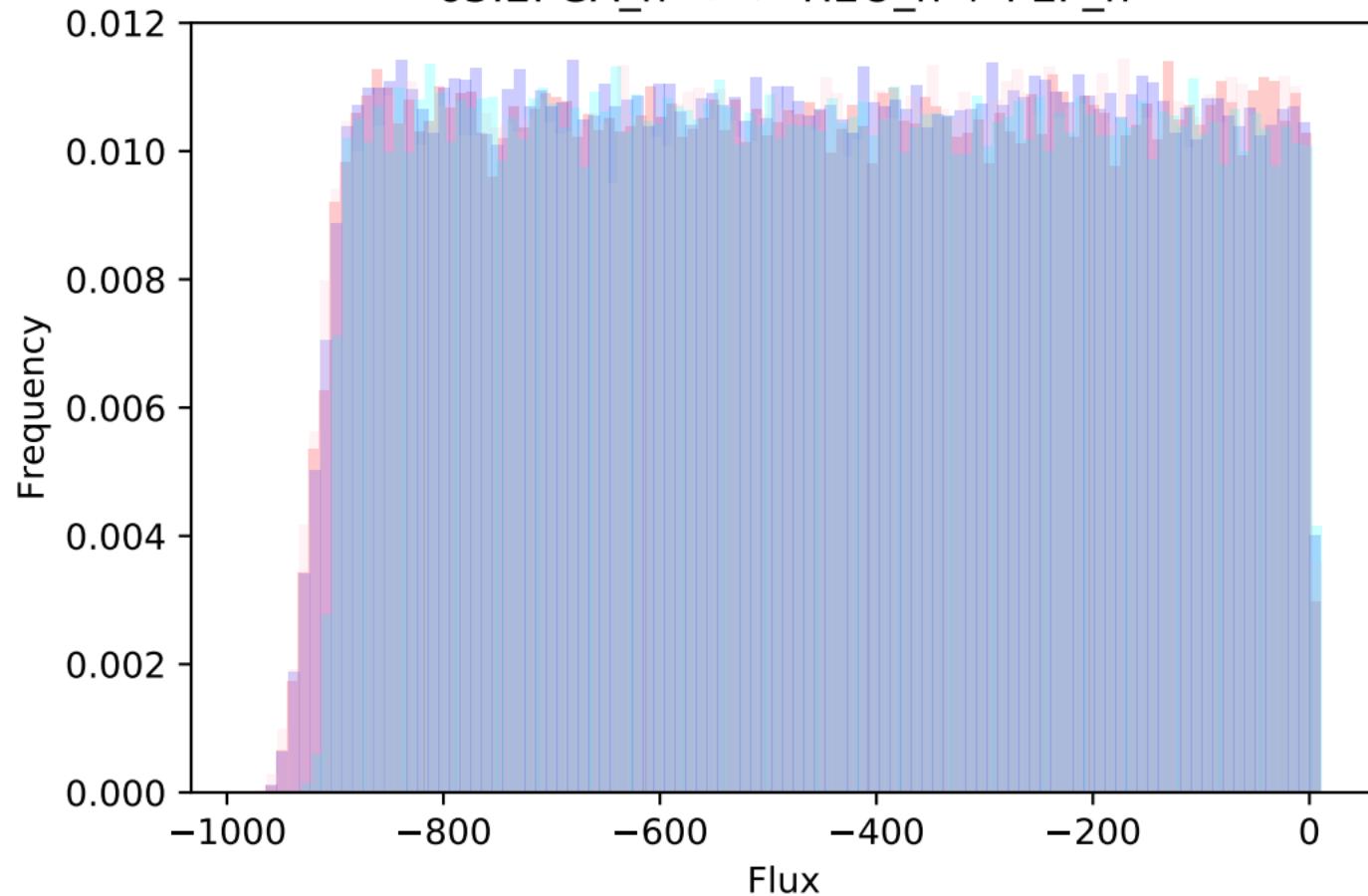
$61:\text{GAP_h} + \text{NAD_h} + \text{Pi_h} \rightleftharpoons \text{DPGA_h} + \text{H_h} + \text{NADH_h}$

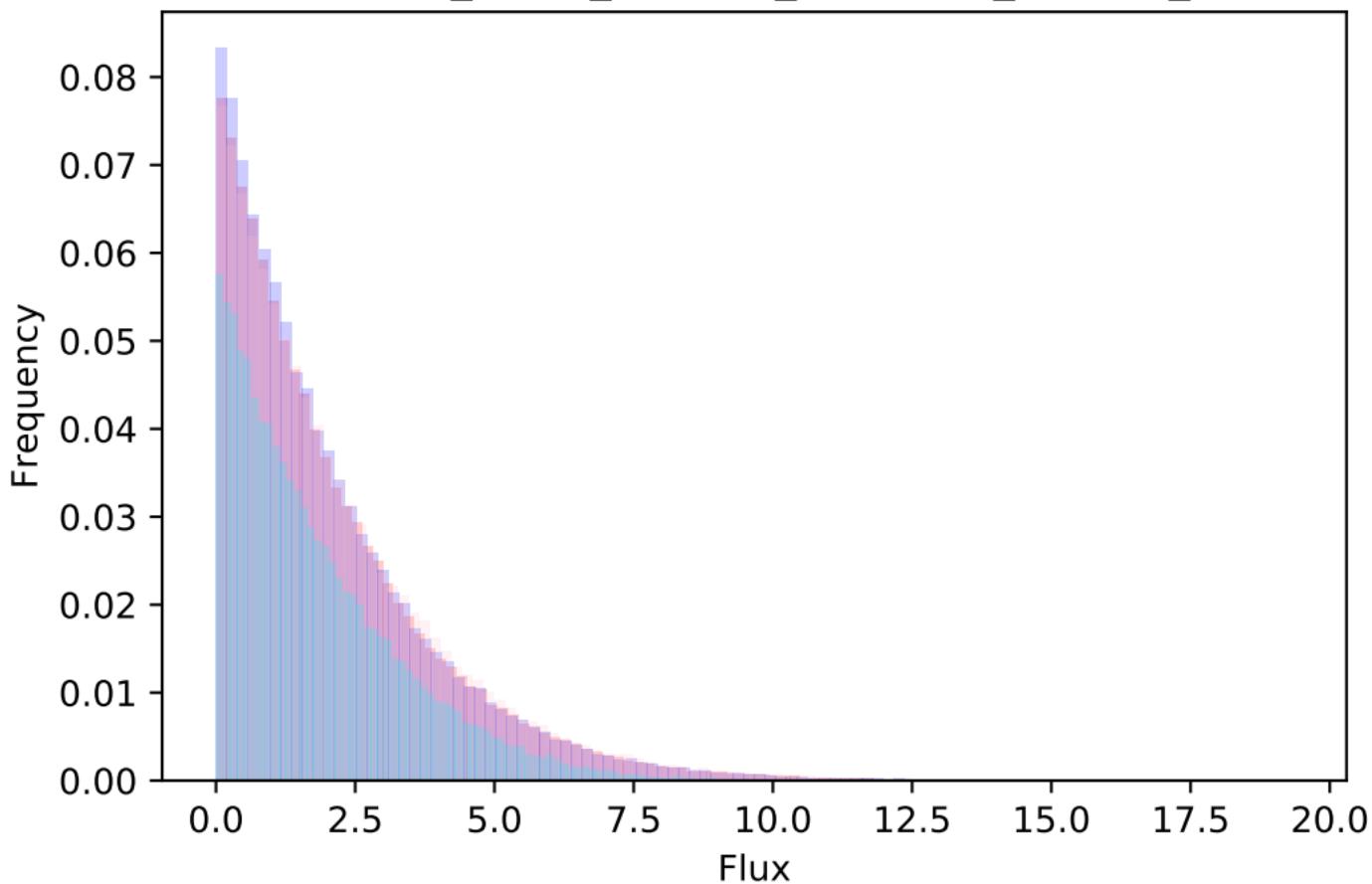


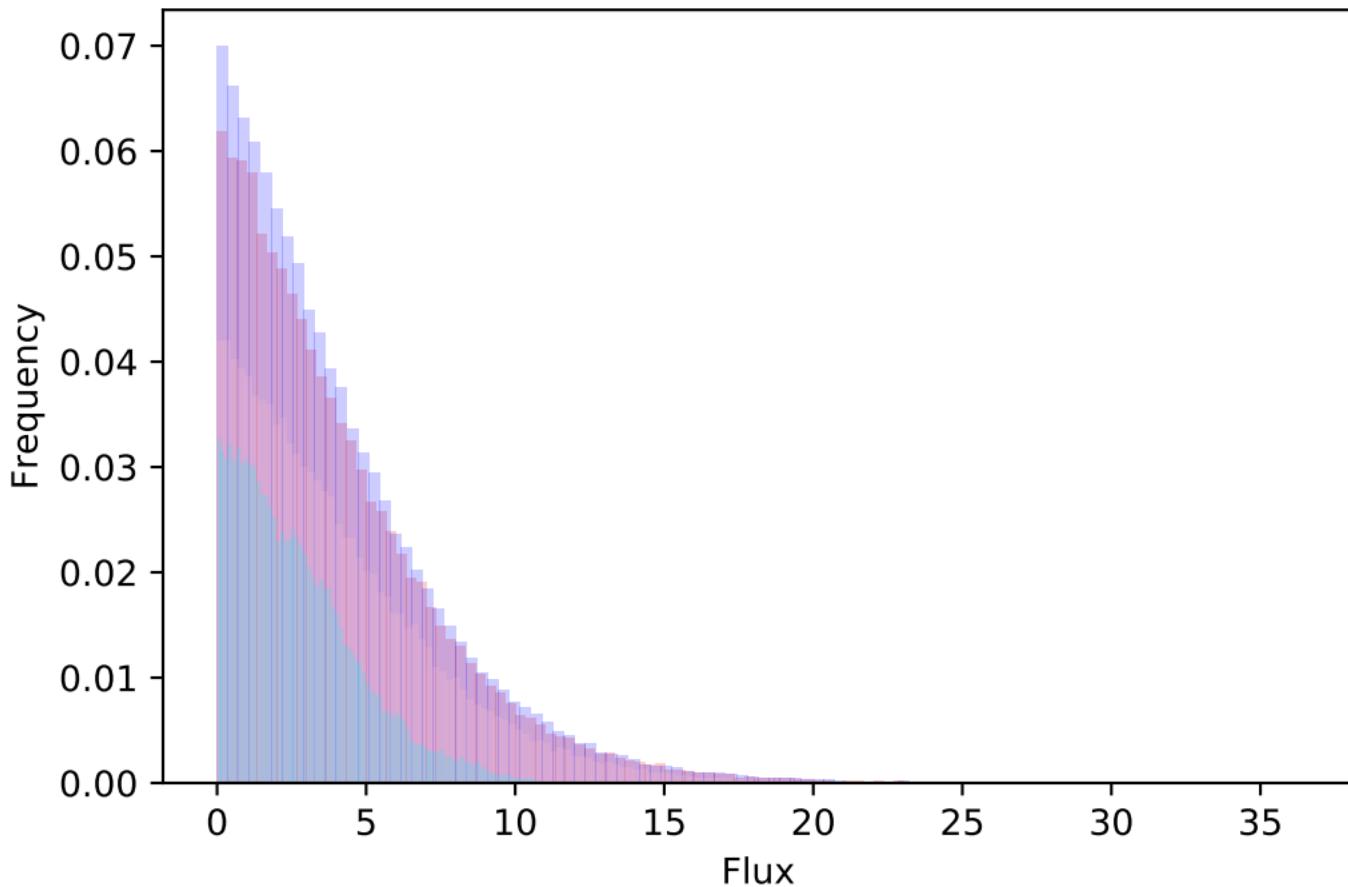
62:PGA_h <=> 2PGA_h



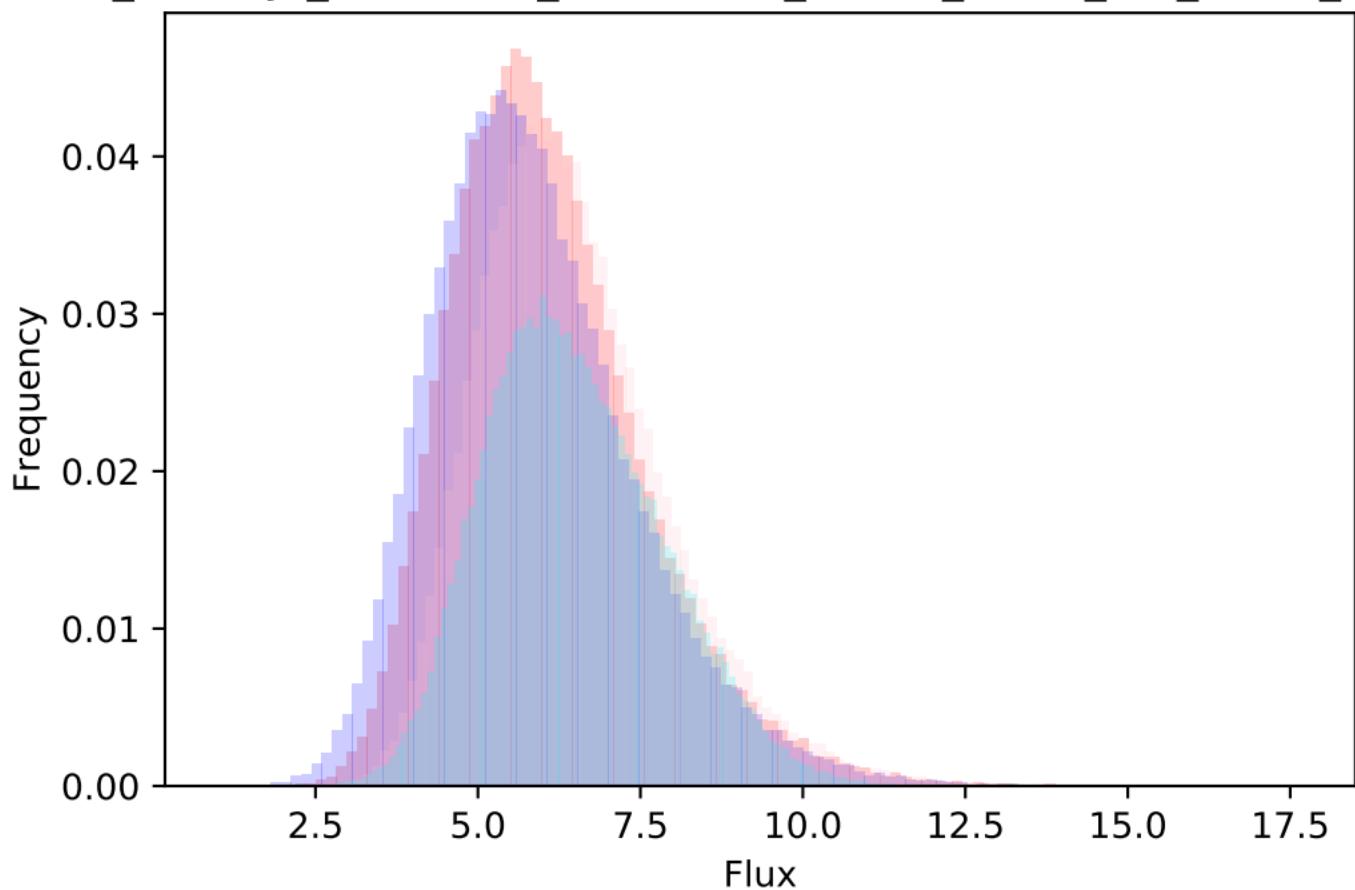
63:2PGA_h <=> H2O_h + PEP_h



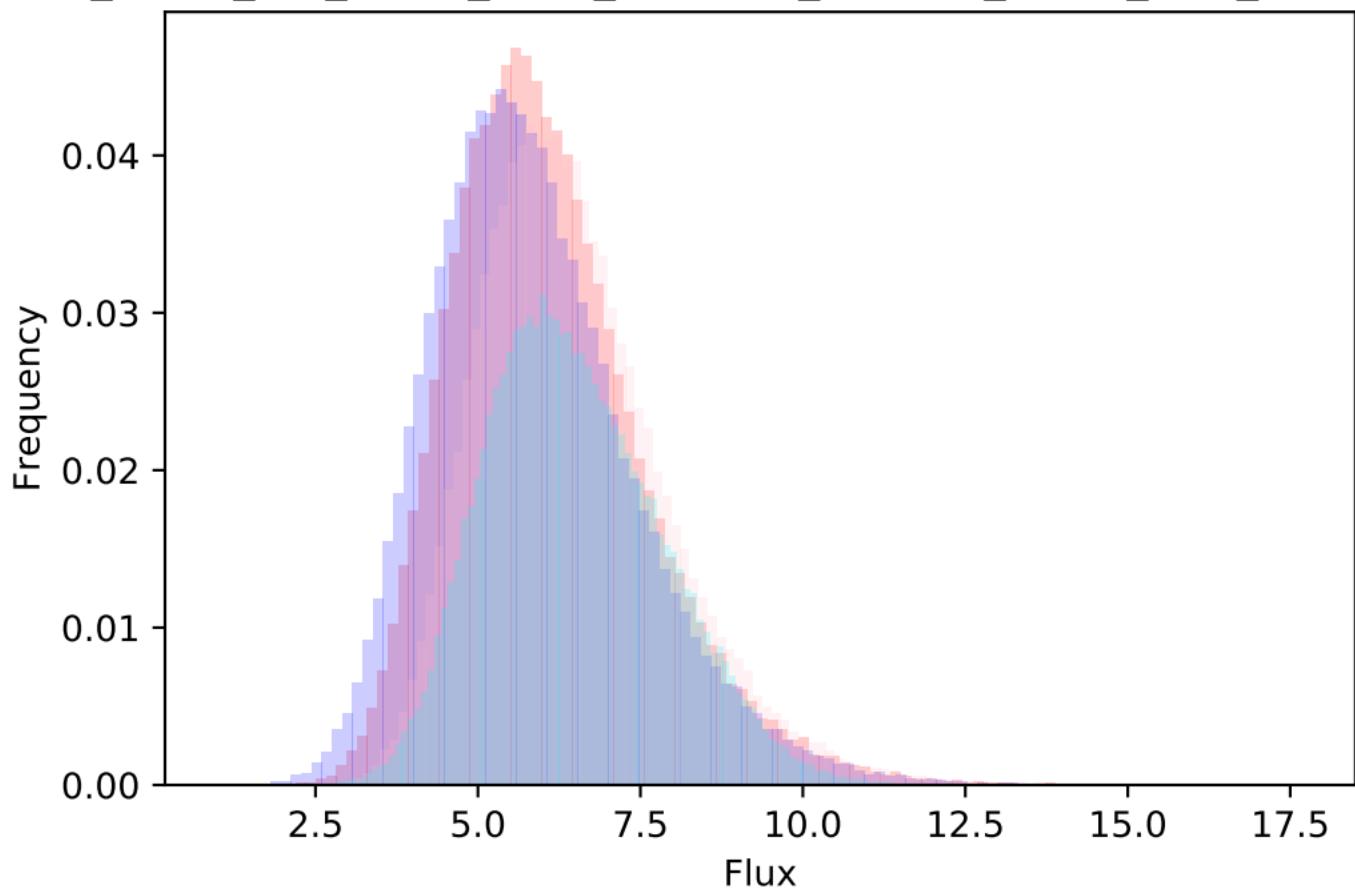




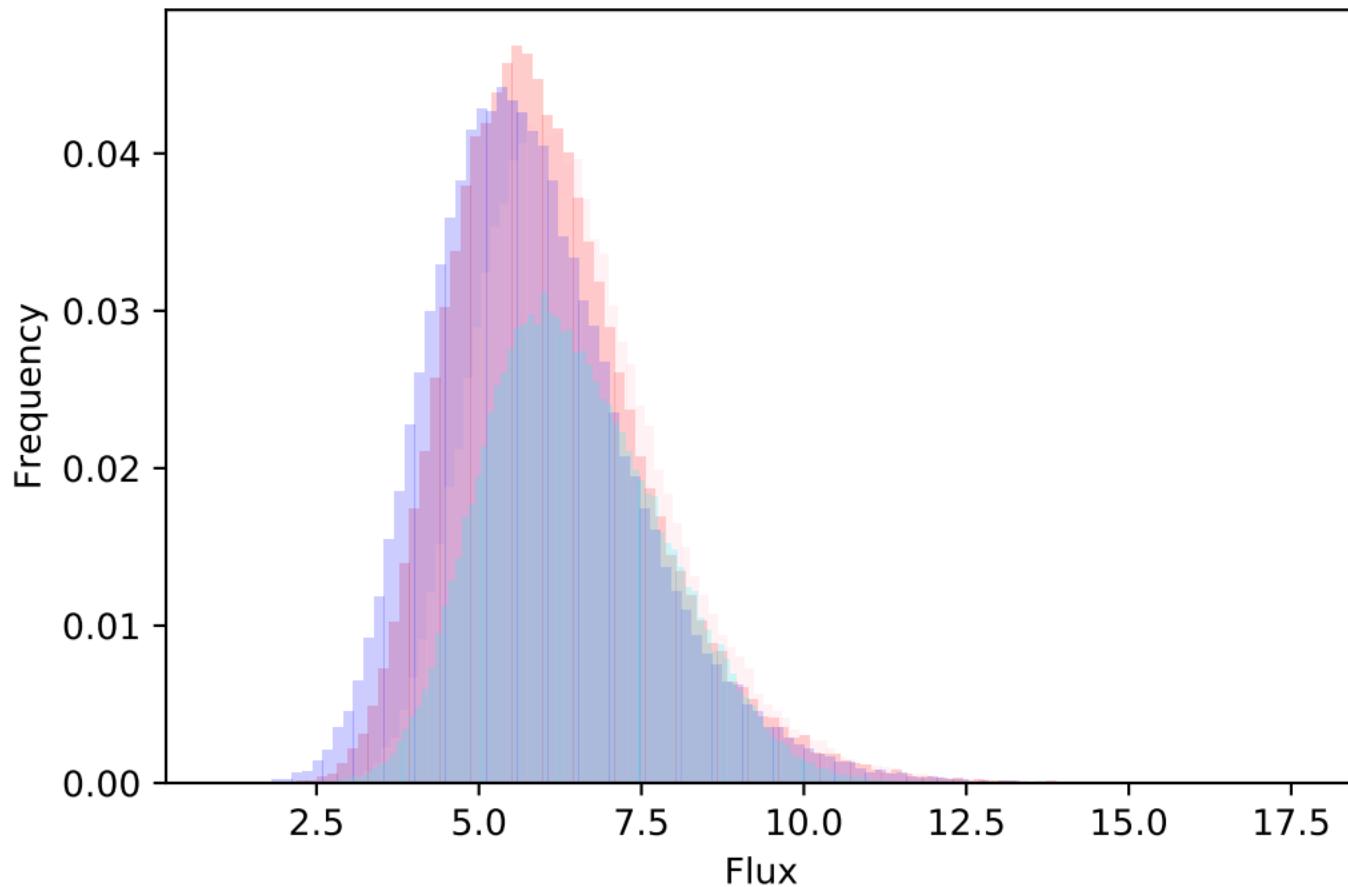
66:H_m + Pyr_m + ThPP_m --> CO2_m + H_DASH_Eth_DASH_ThPP_m

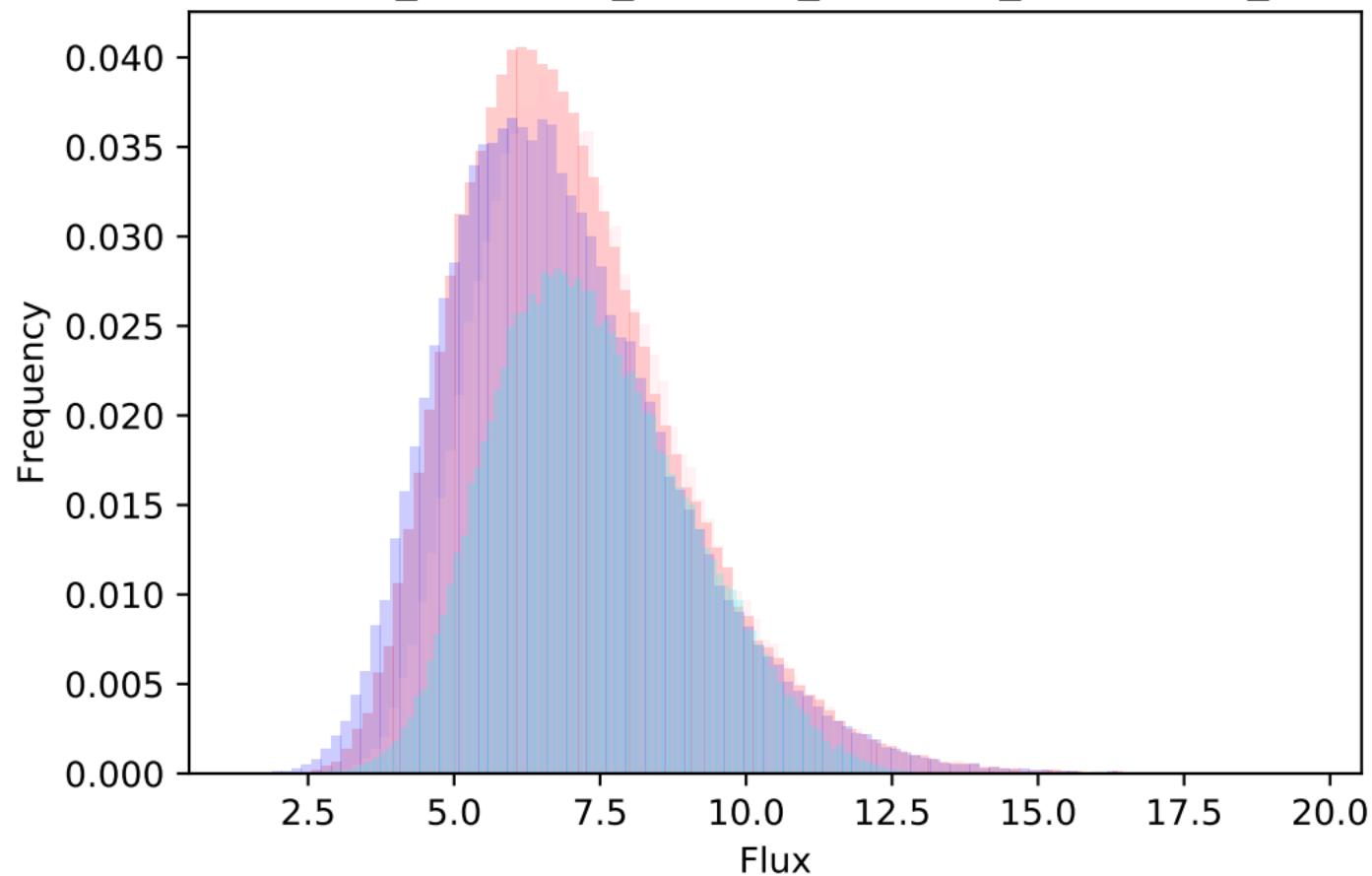


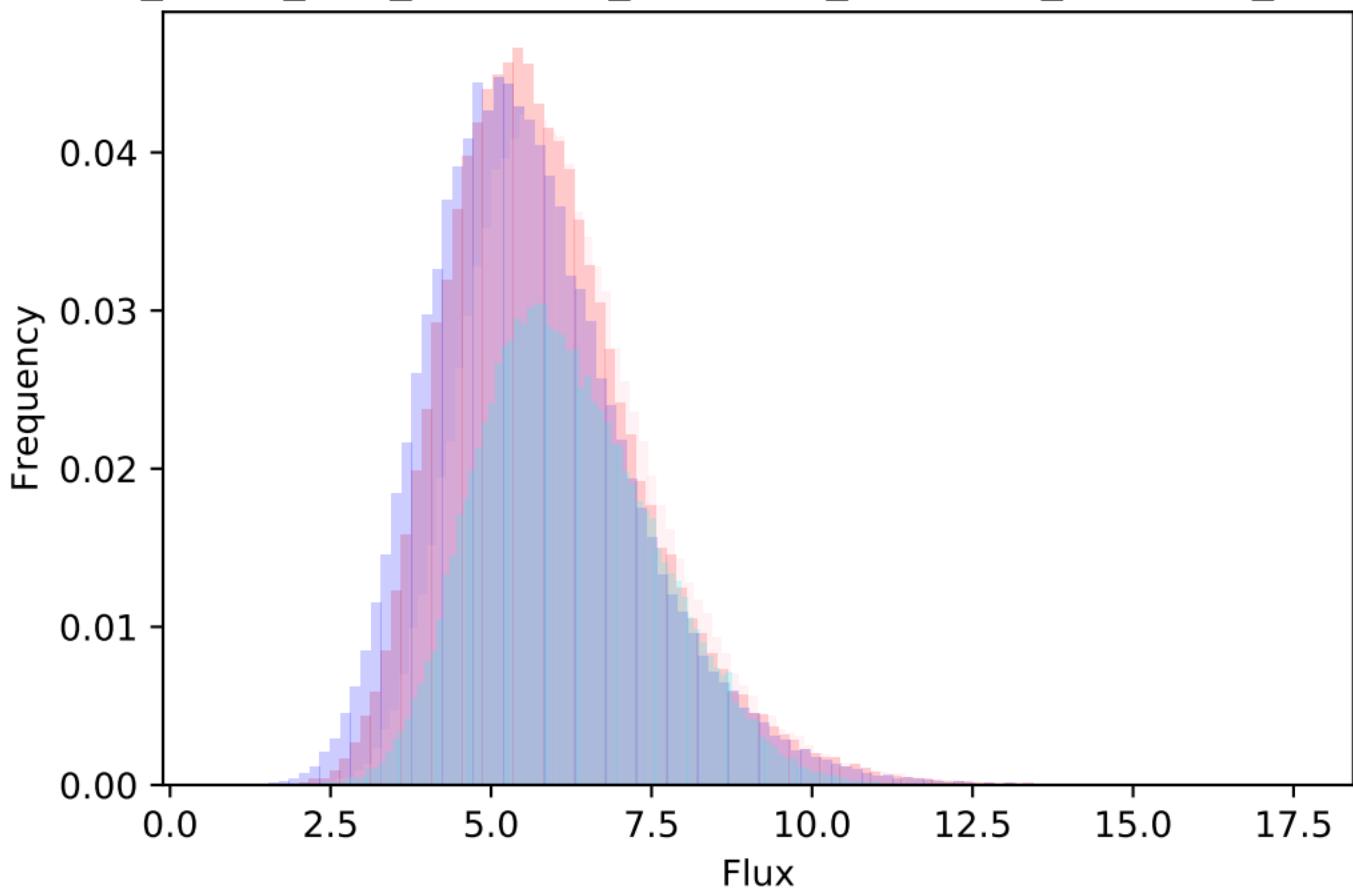
67:H_DASH_Eth_DASH_ThPP_m + LPA_m --> A_DASH_DHL_m + ThPP_m



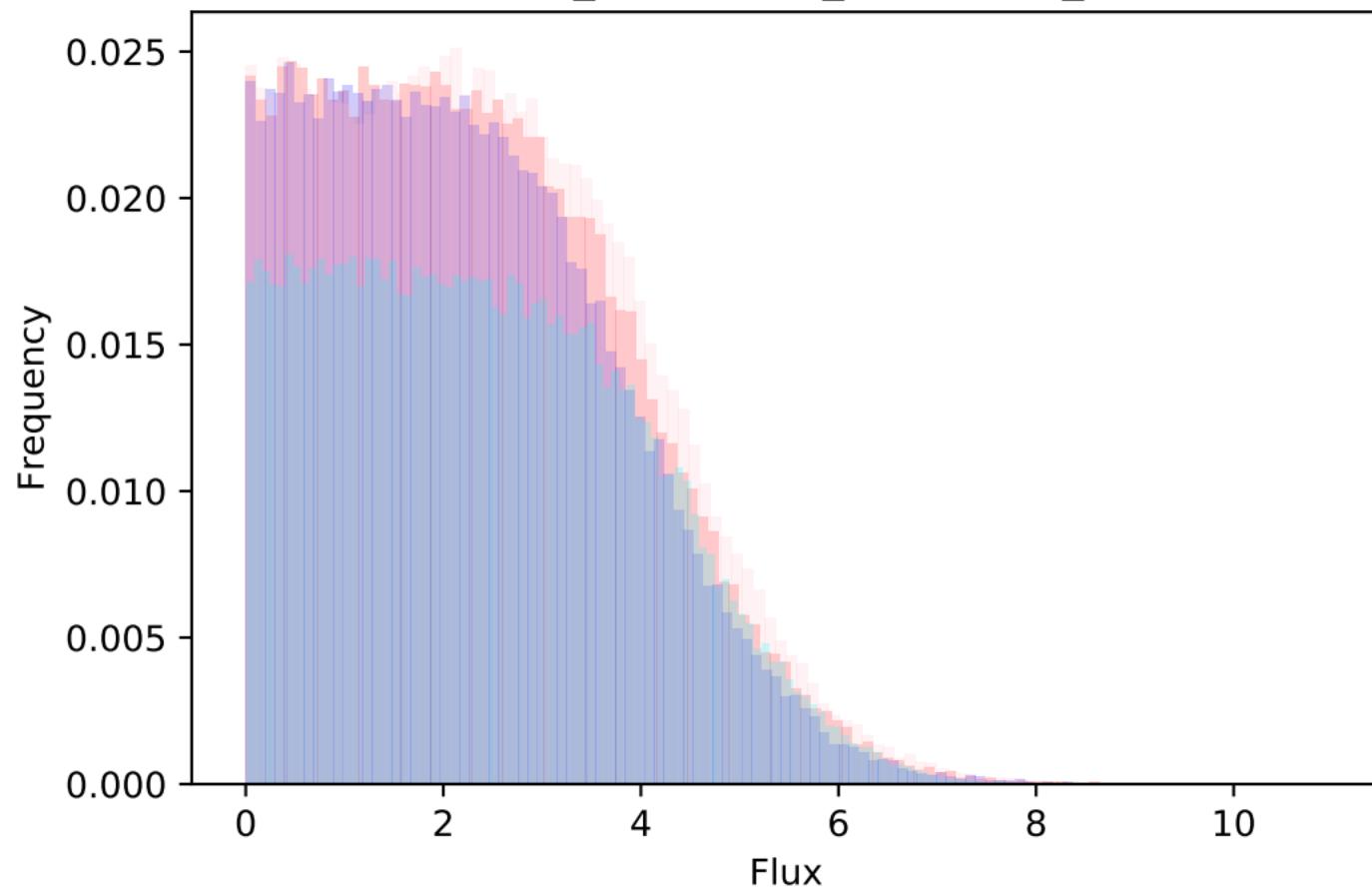
$68:\text{A_DASH_DHL_m} + \text{CoA_m} \rightarrow \text{A_DASH_CoA_m} + \text{DHL_m}$



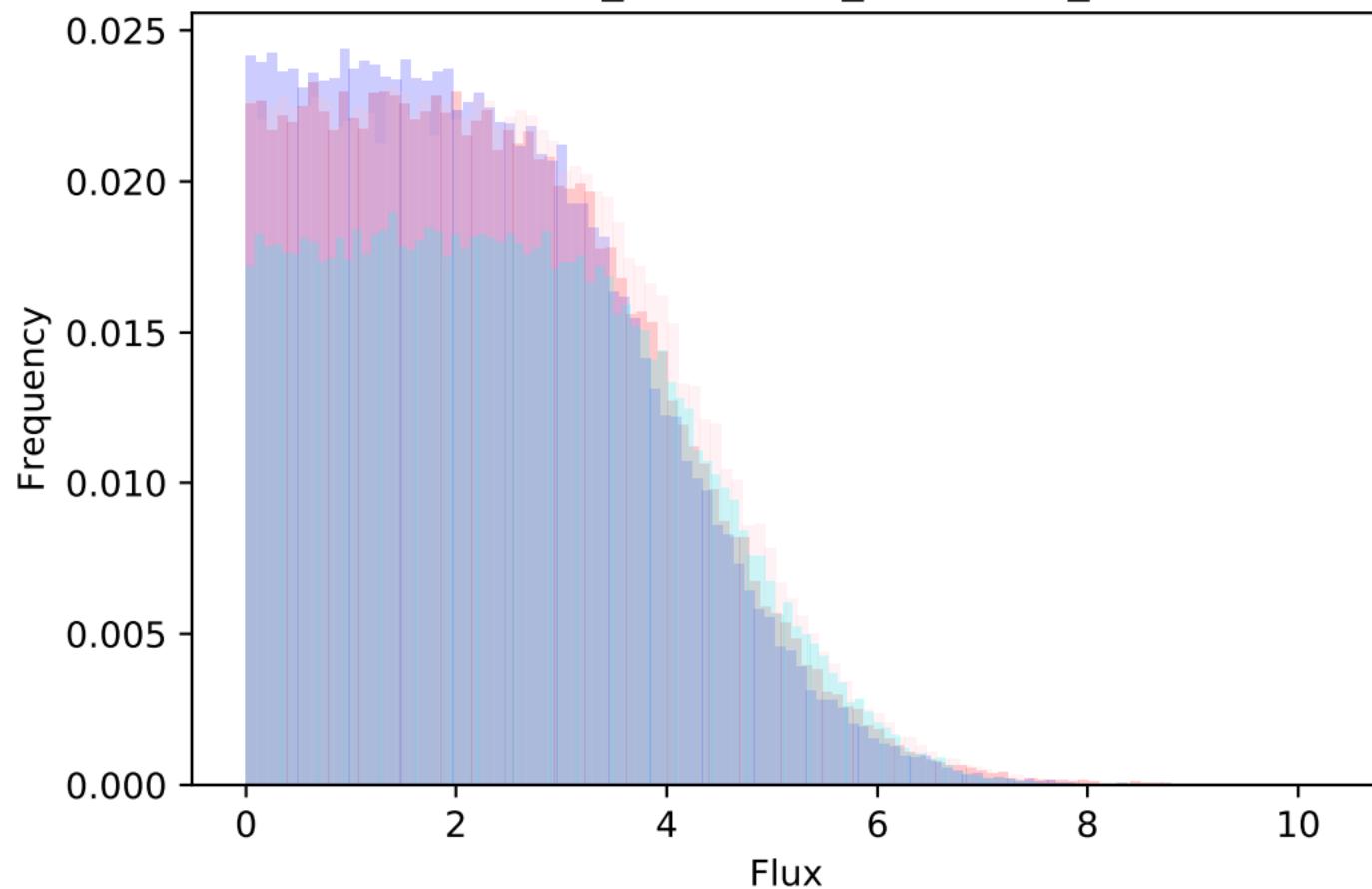




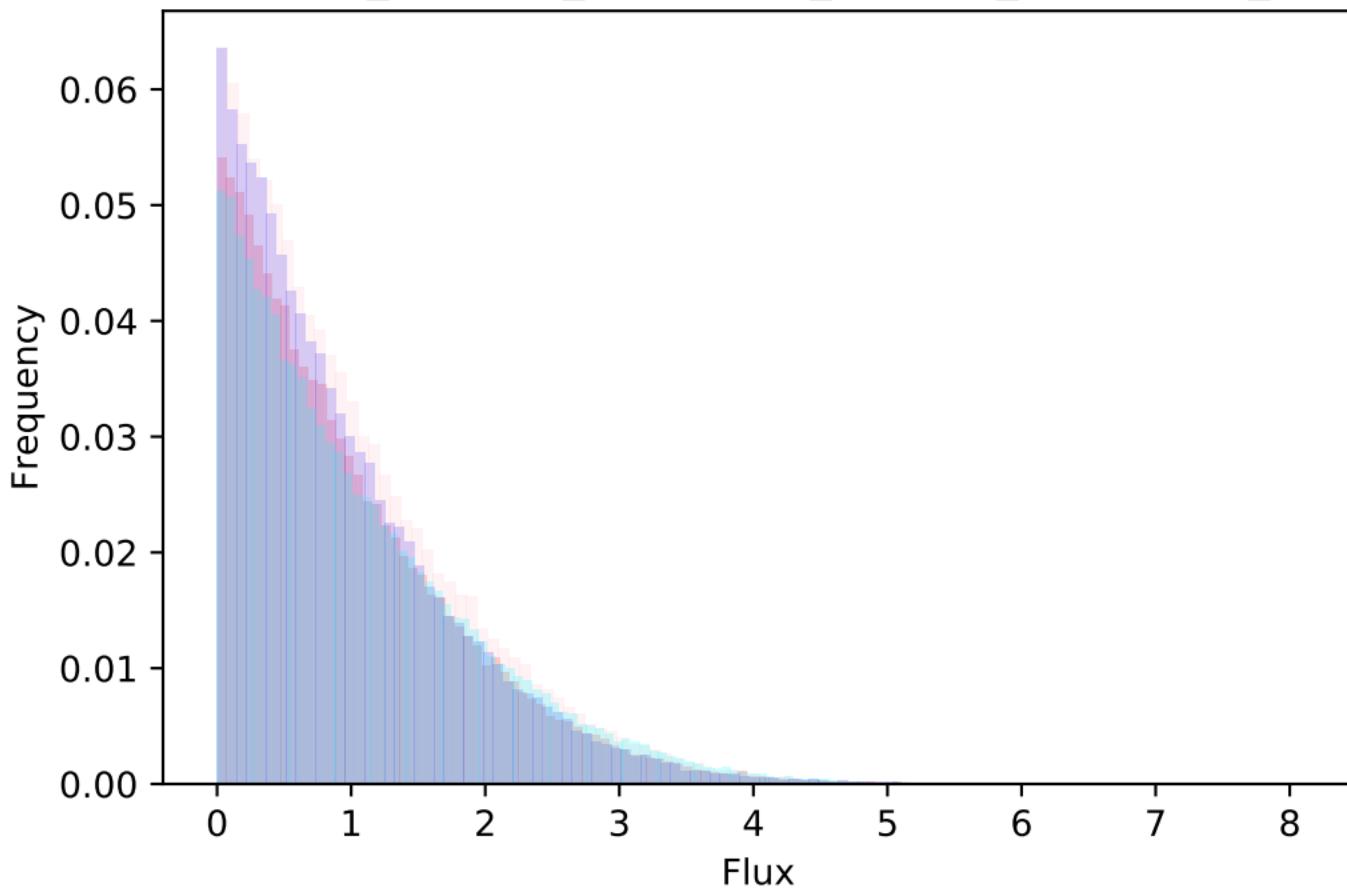
71:Cit_m --> H2O_m + cACN_m



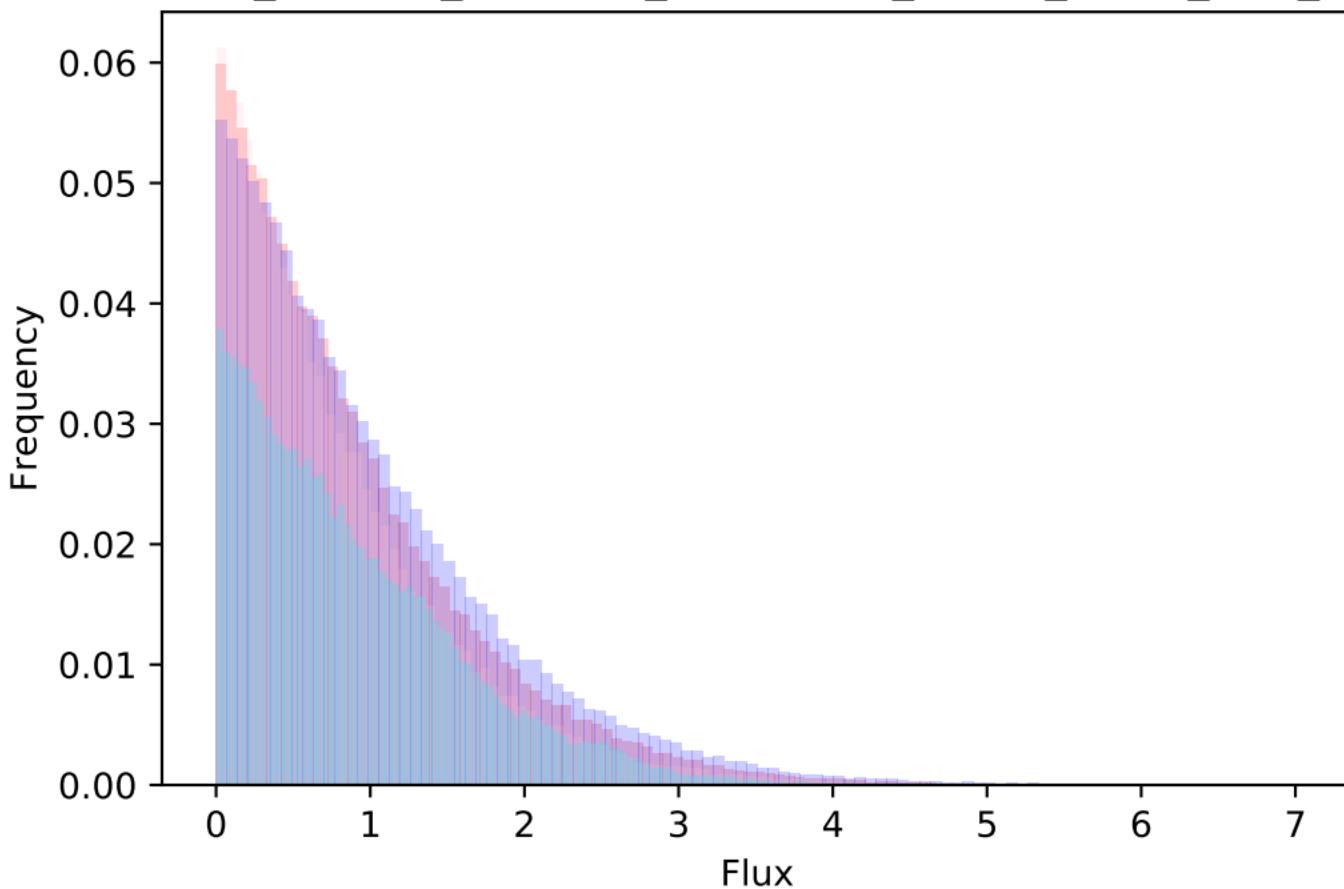
72:H2O_m + cACN_m --> iCit_m



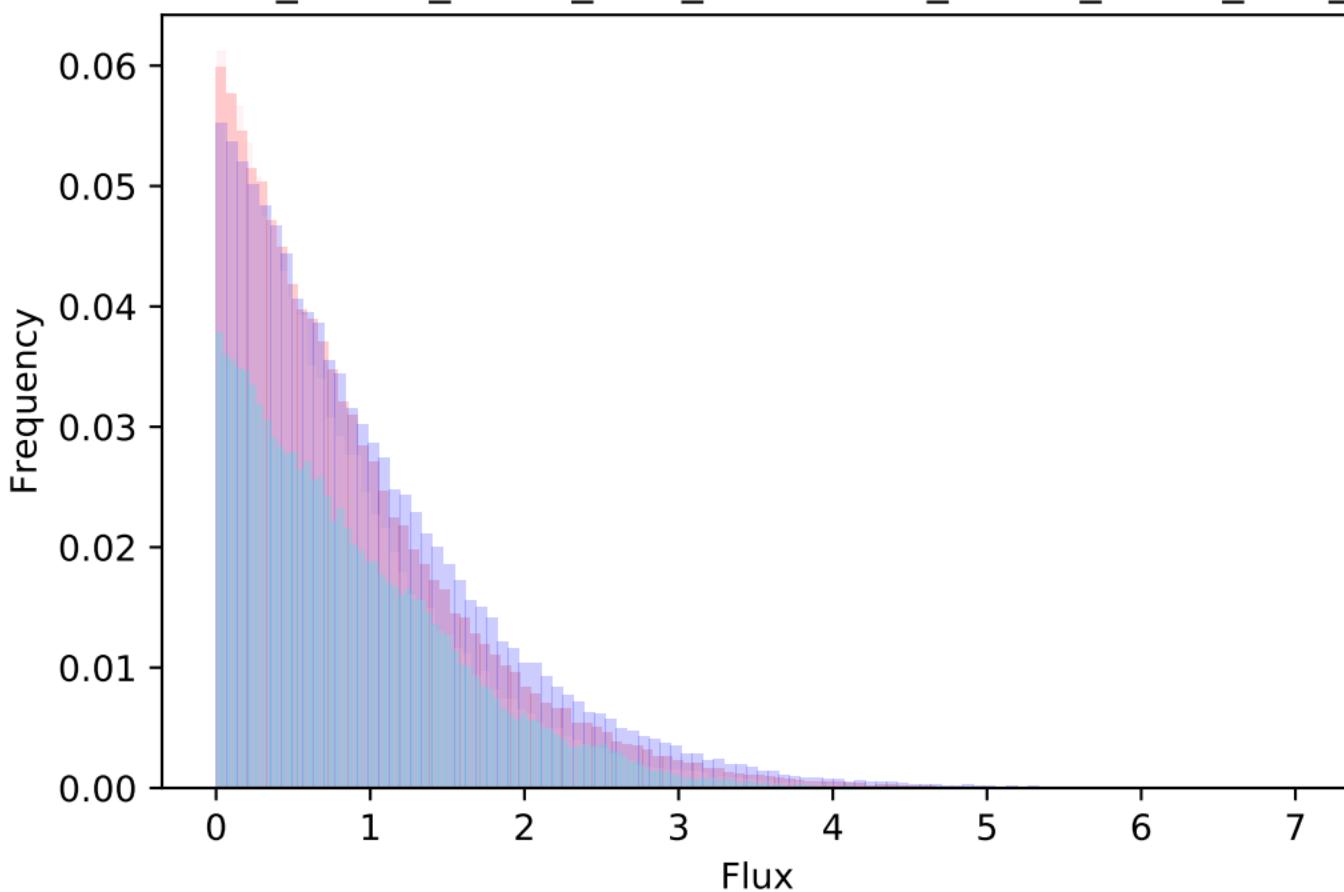
$73:\text{NAD_m} + \text{iCit_m} \rightarrow \text{CO2_m} + \text{KG_m} + \text{NADH_m}$

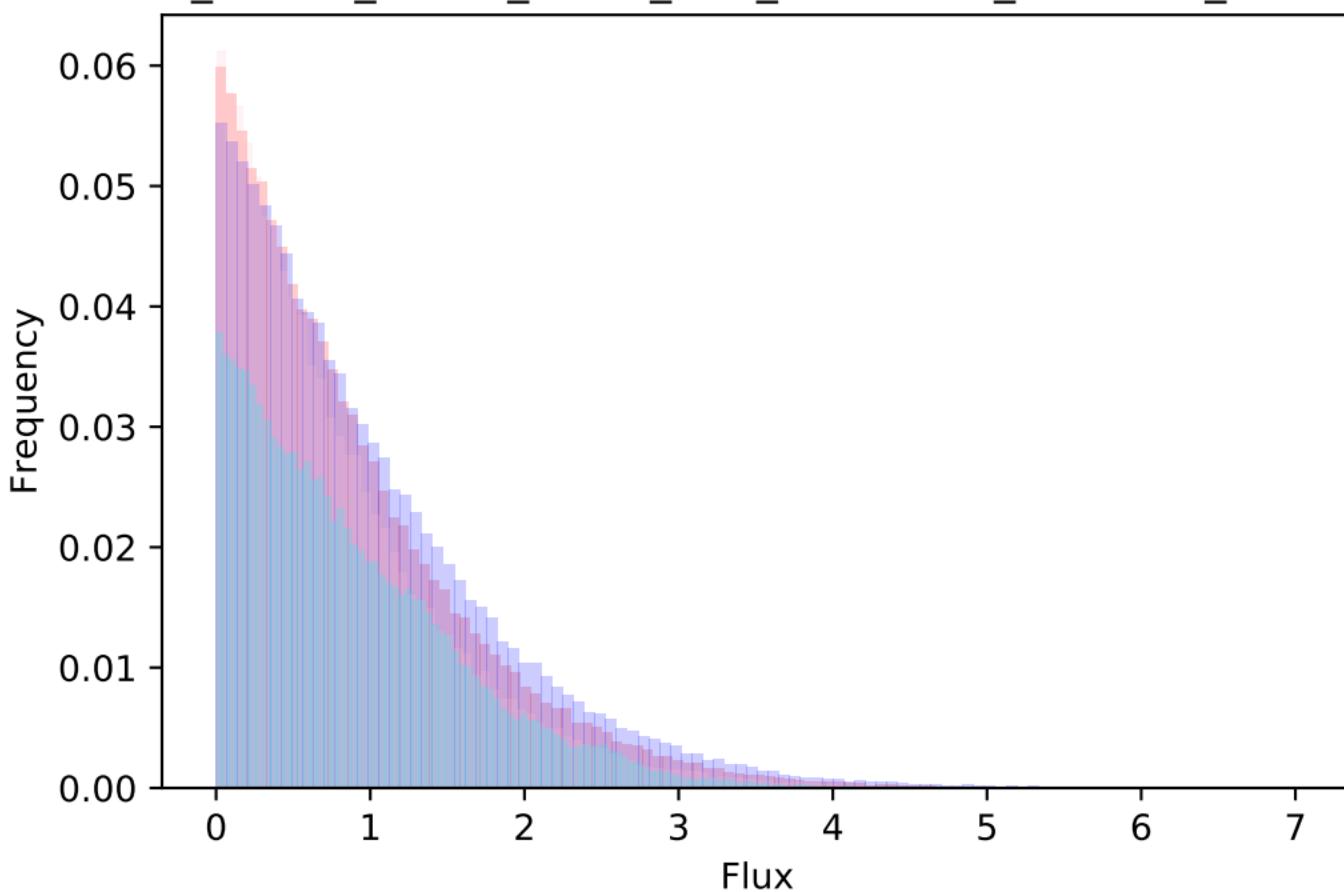


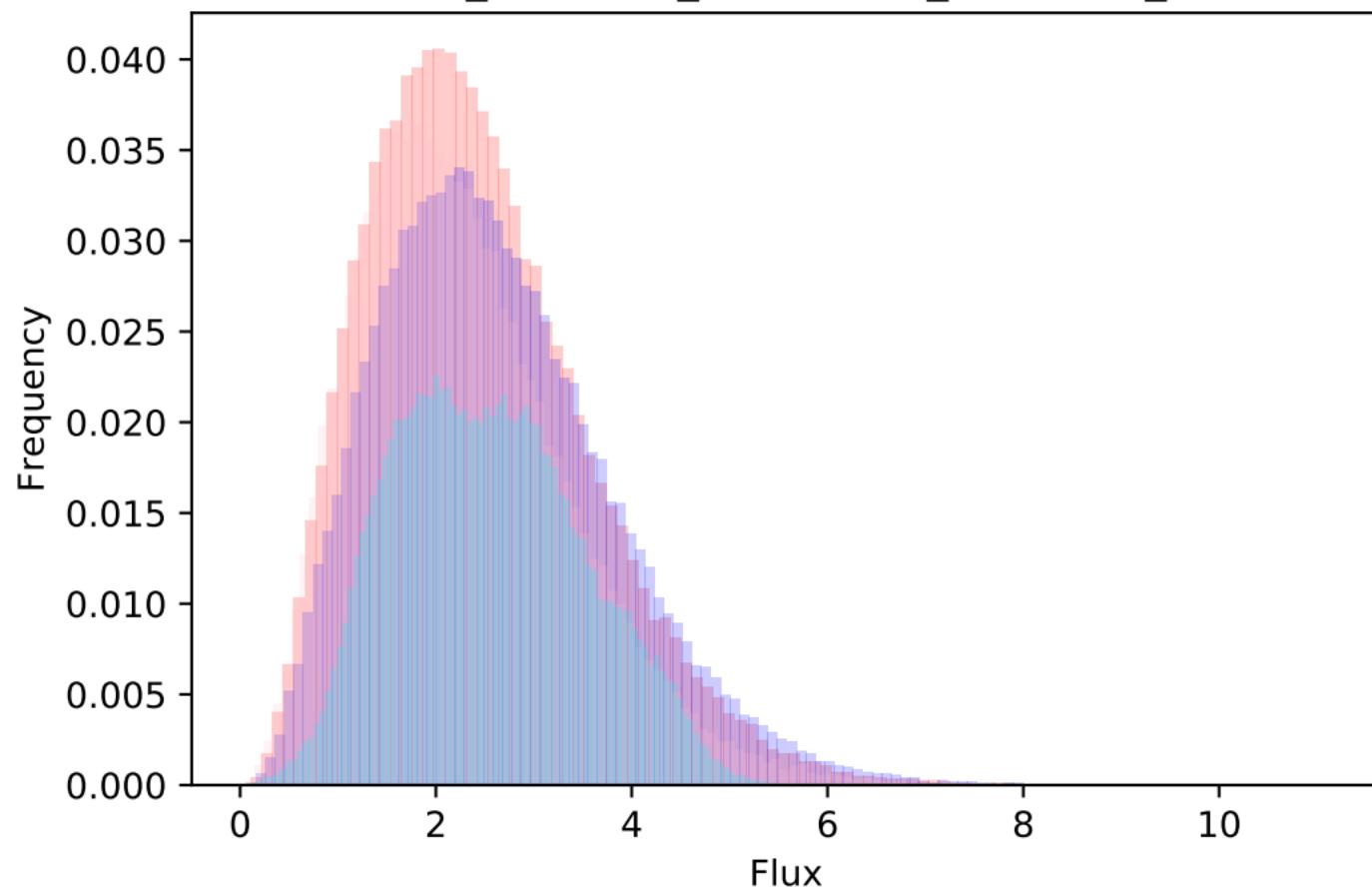
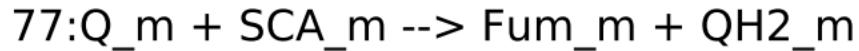
$74:H_m + KG_m + LPA_m \rightarrow CO2_m + S_DASH_DHL_m$



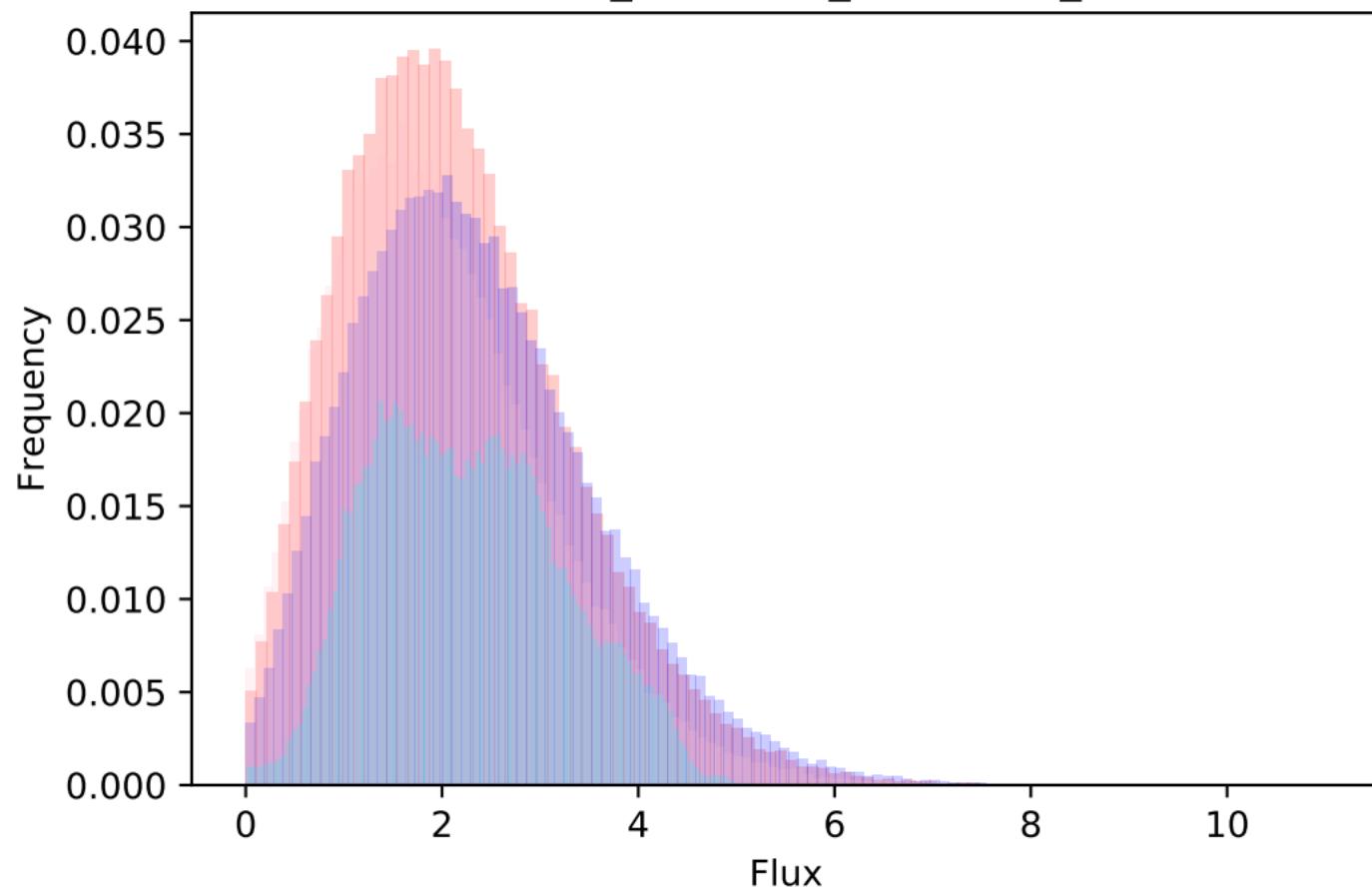
$75:\text{CoA_m} + \text{S_DASH_DHL_m} \rightarrow \text{DHL_m} + \text{S_DASH_CoA_m}$

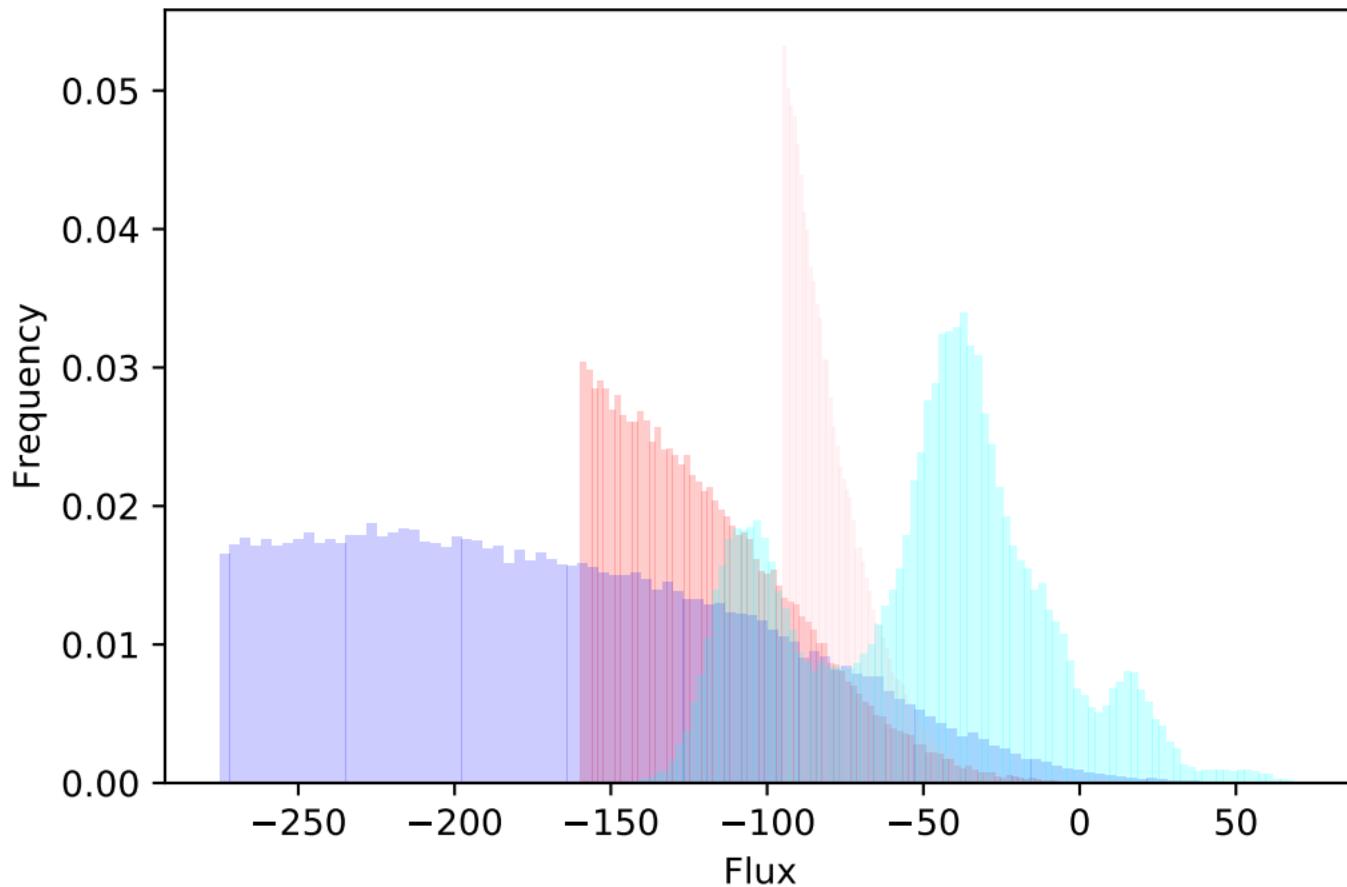
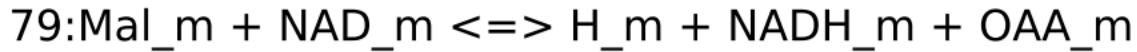


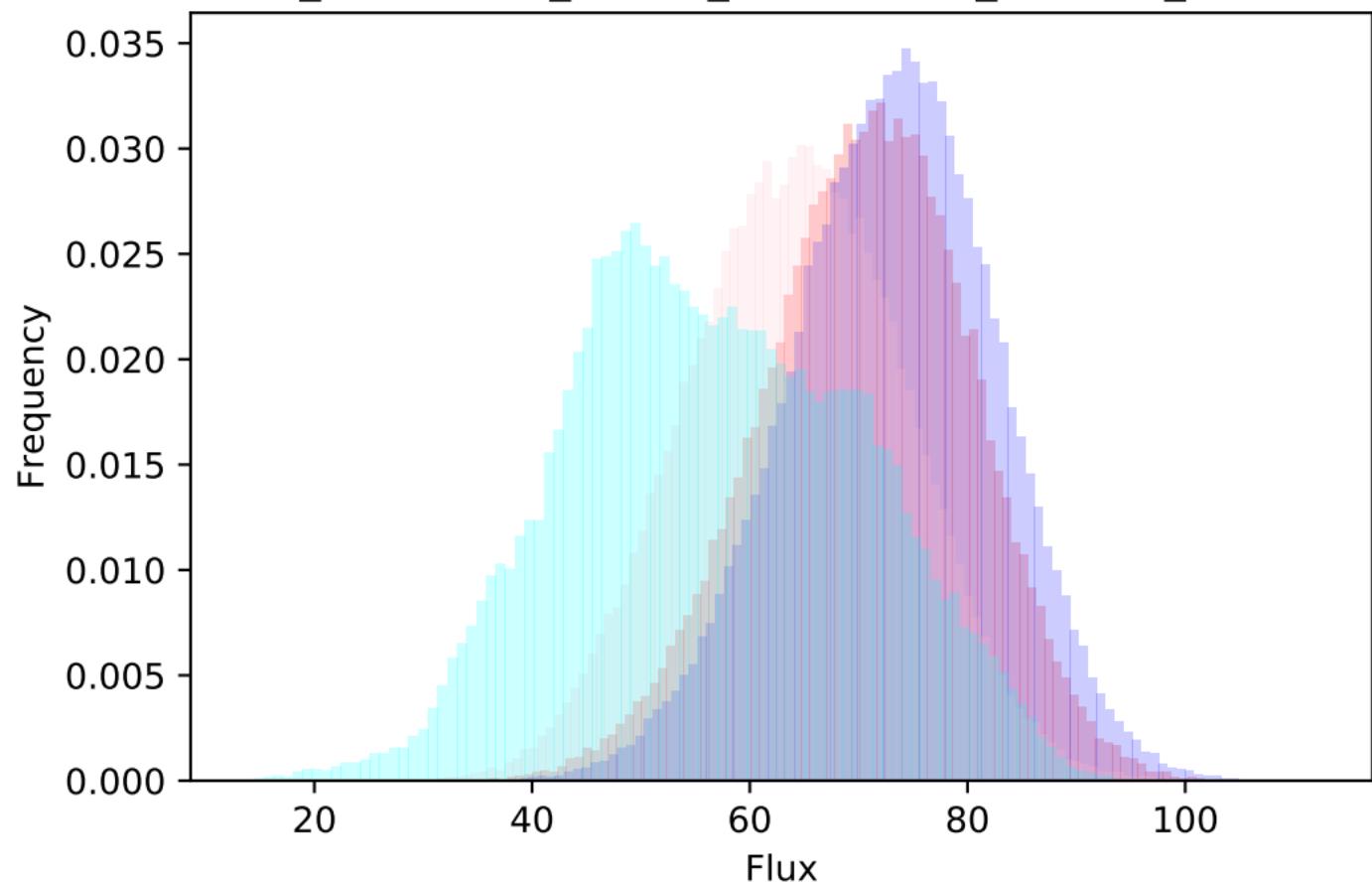
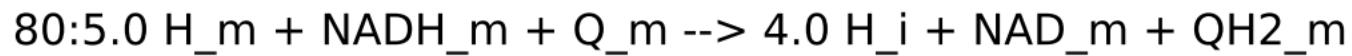


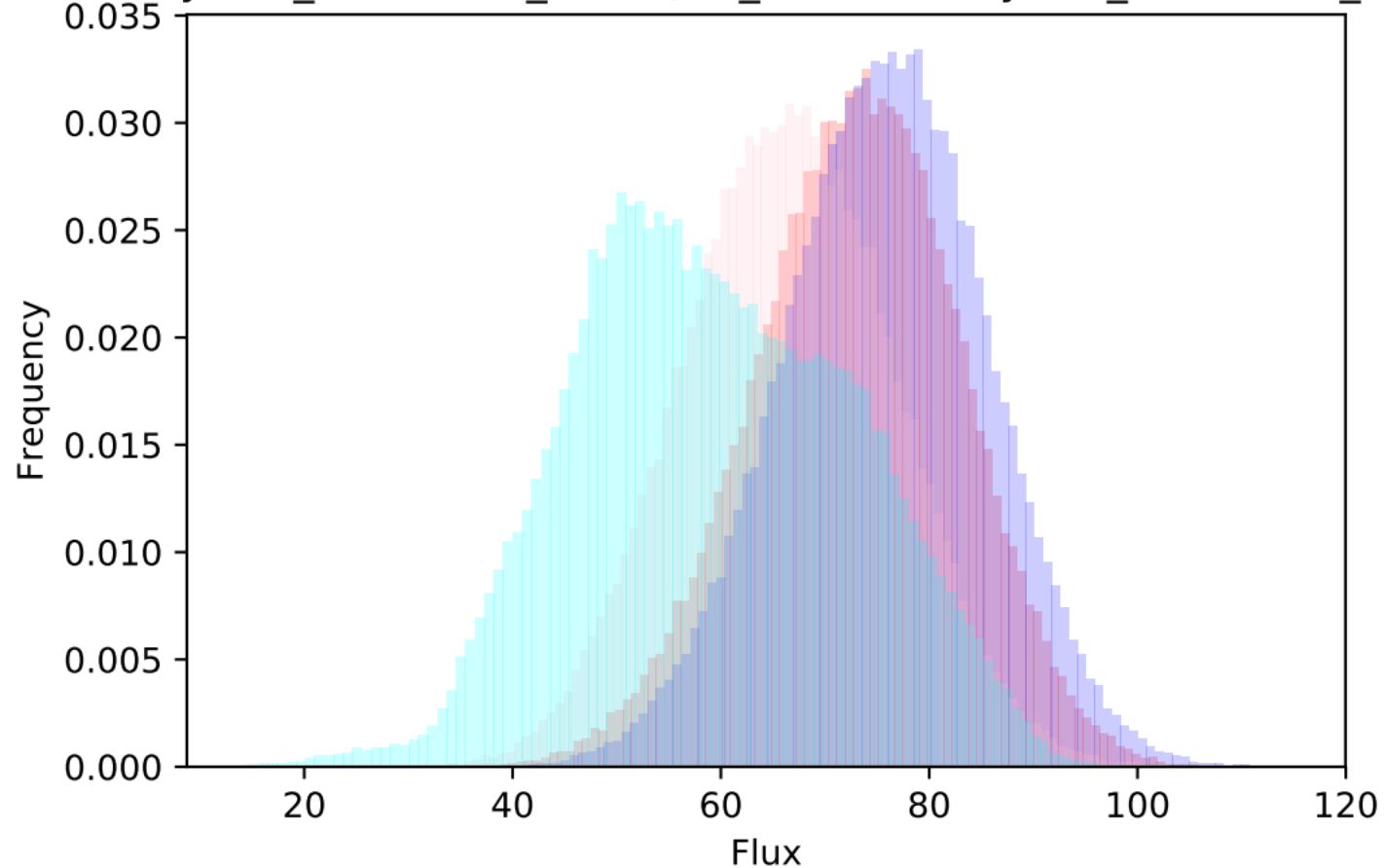
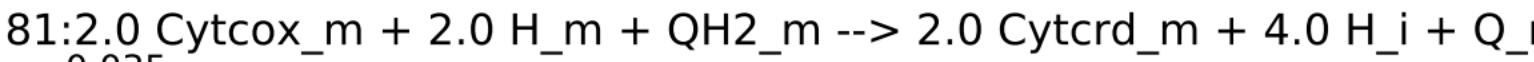


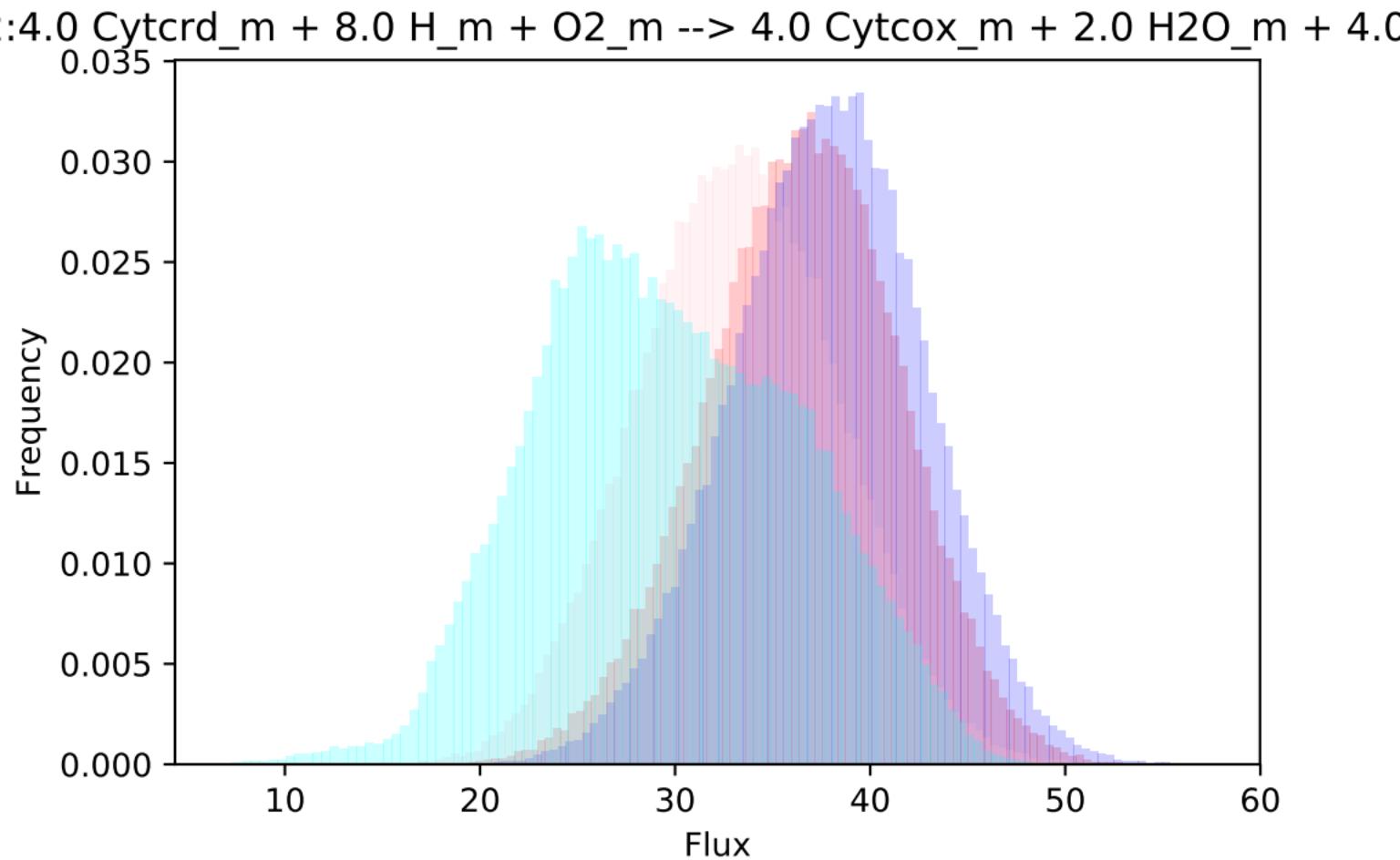
78:Fum_m + H2O_m --> Mal_m

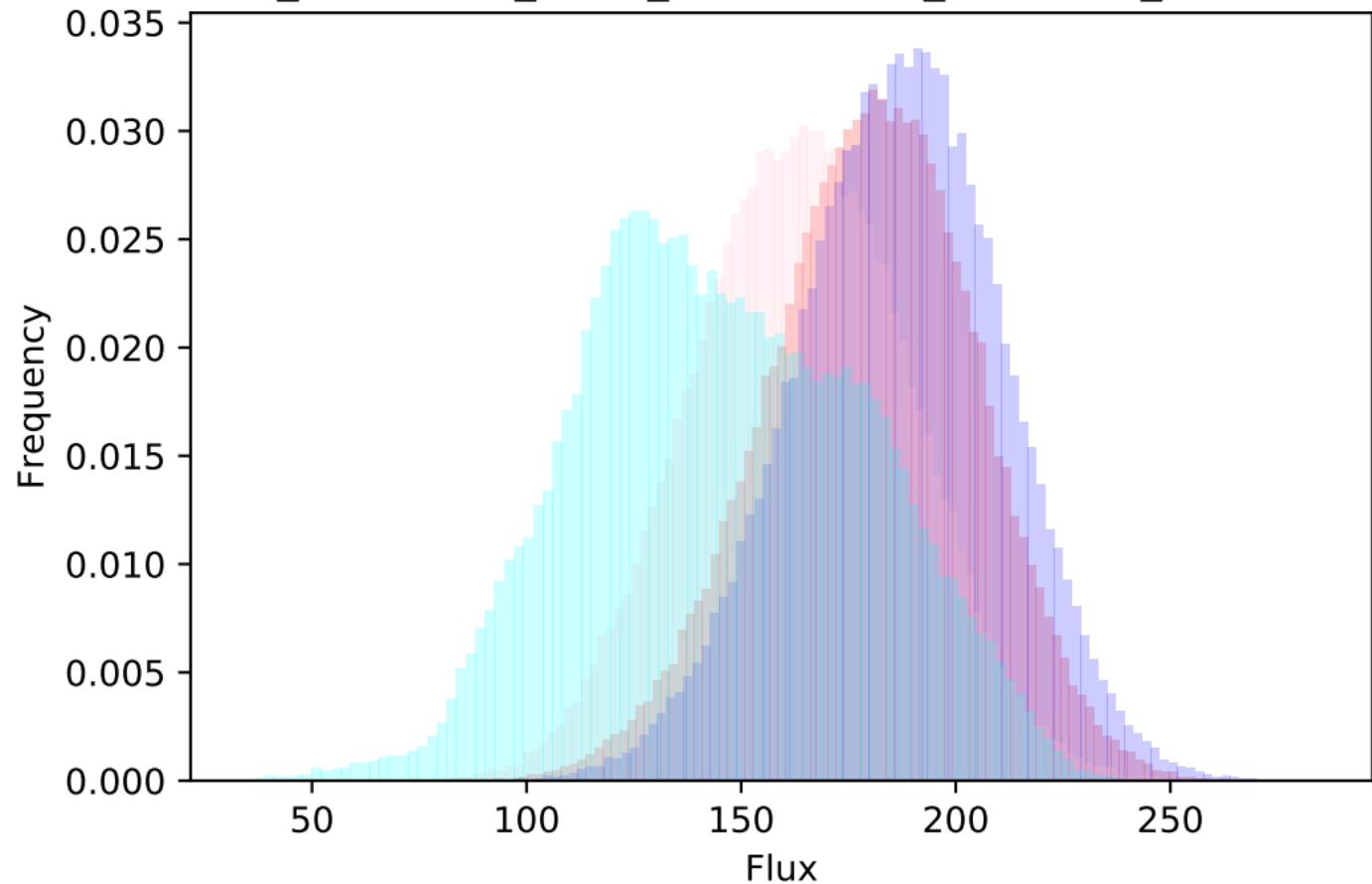
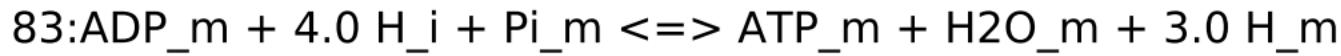


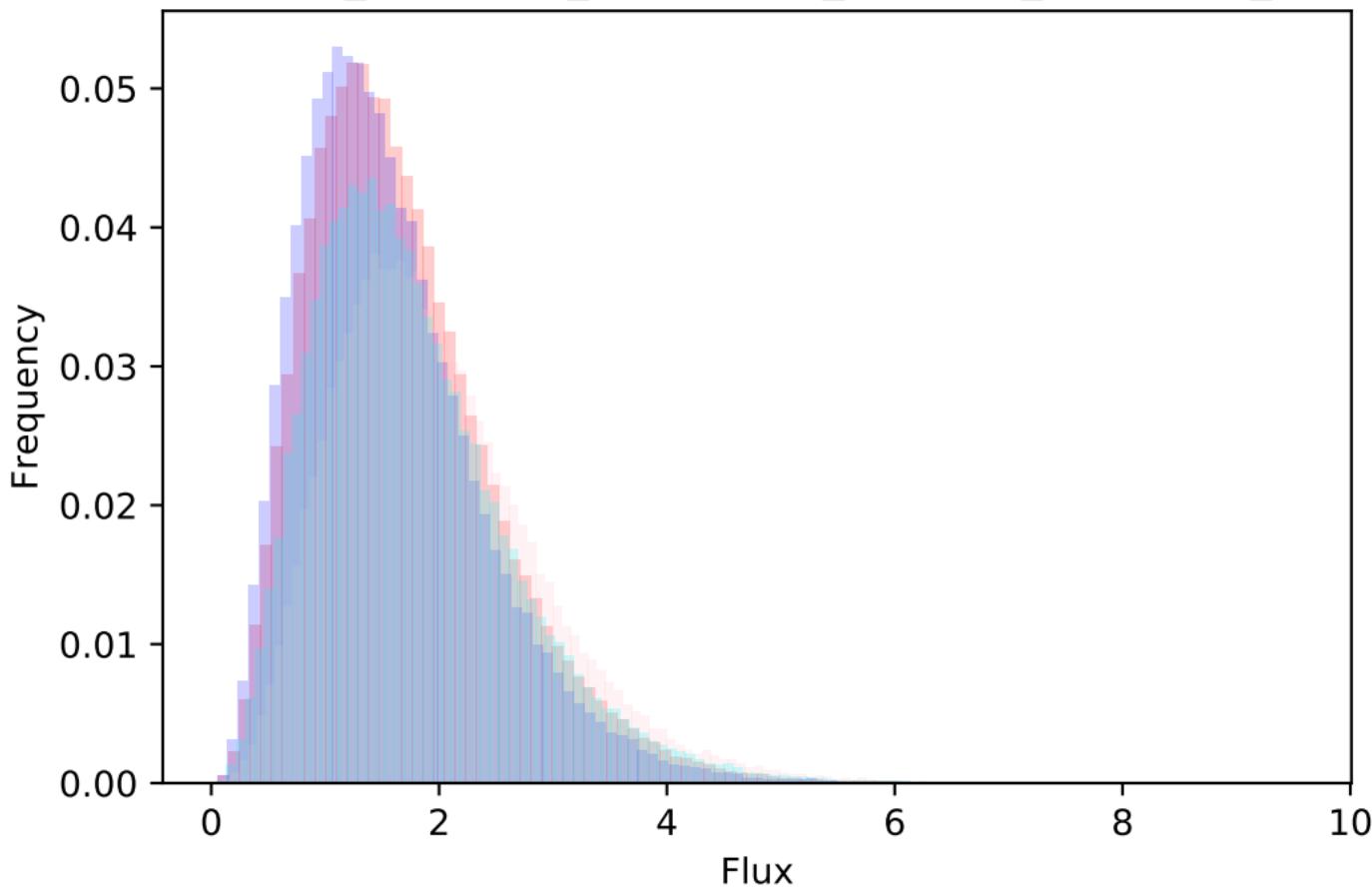




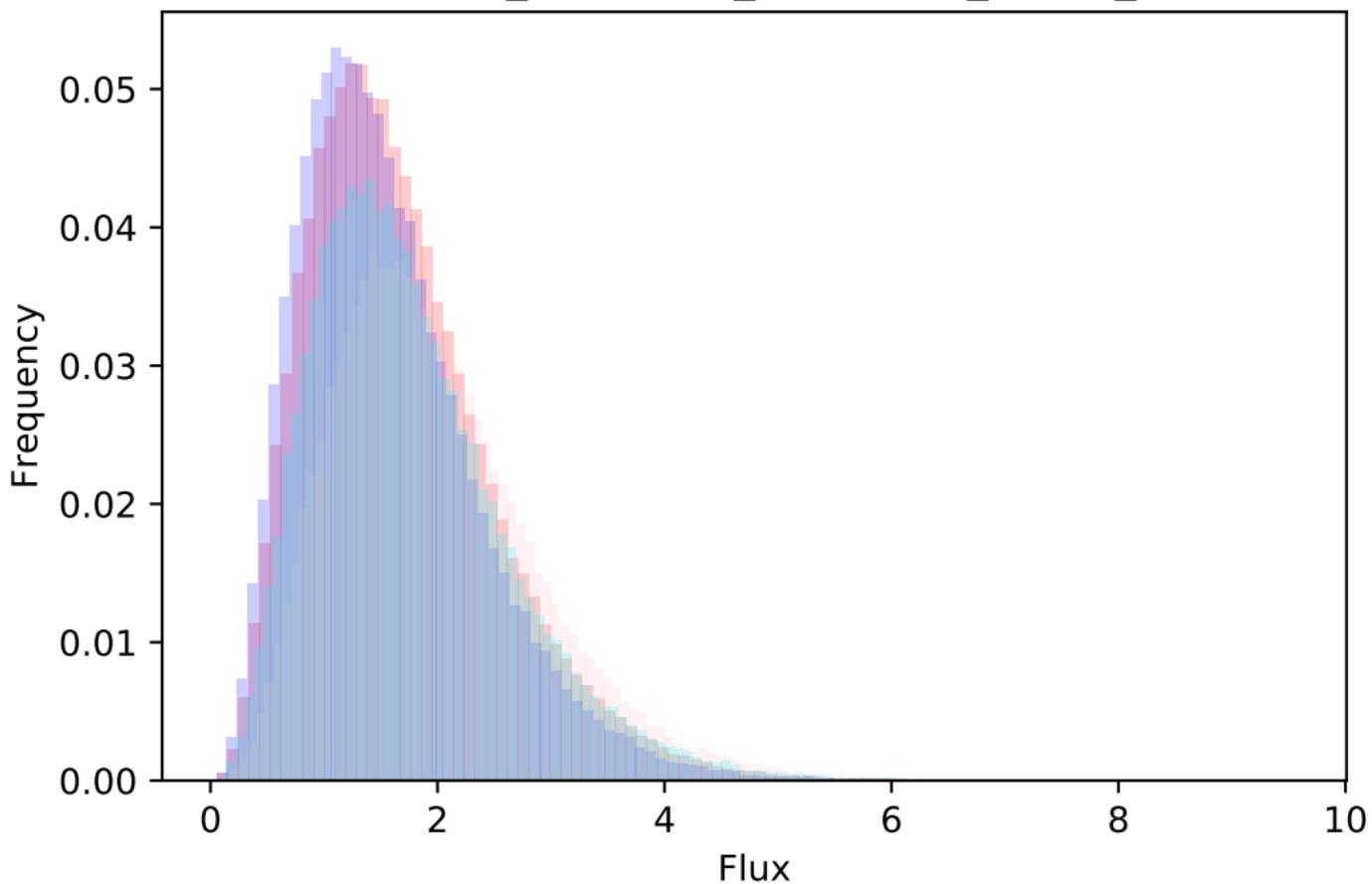




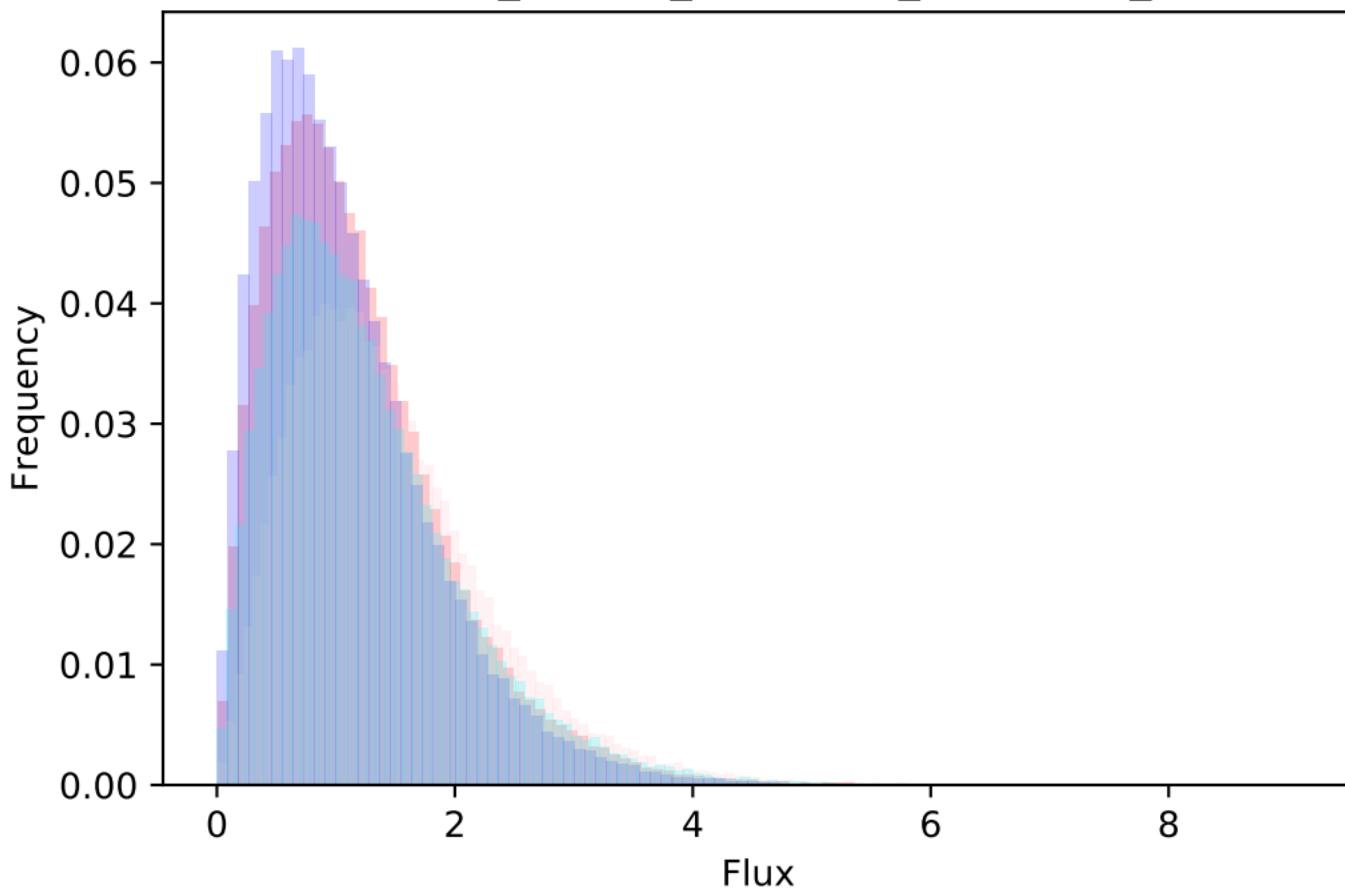


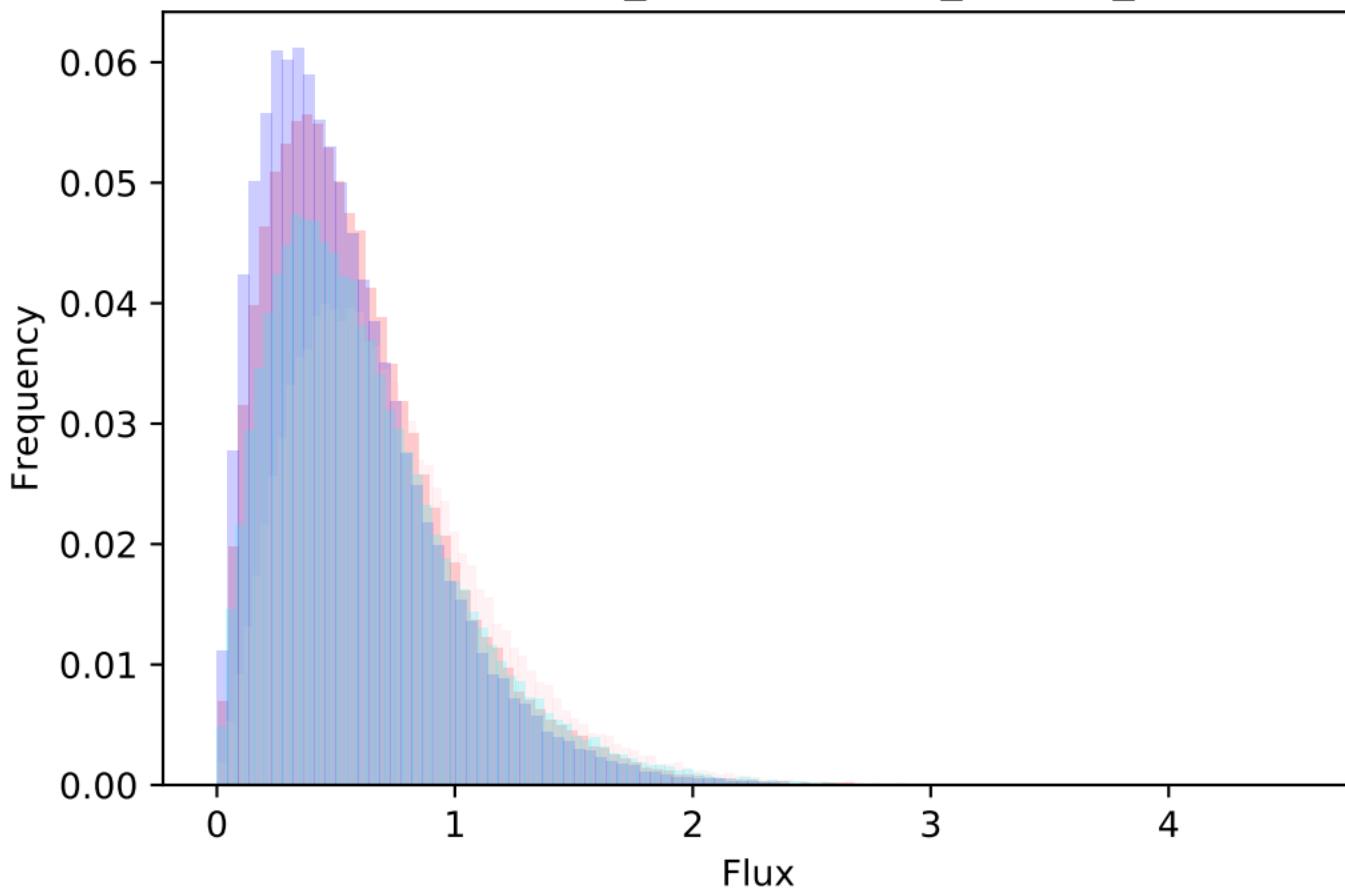
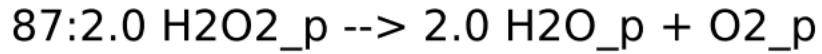


85:H2O_h + PGCA_h --> GCA_h + Pi_h

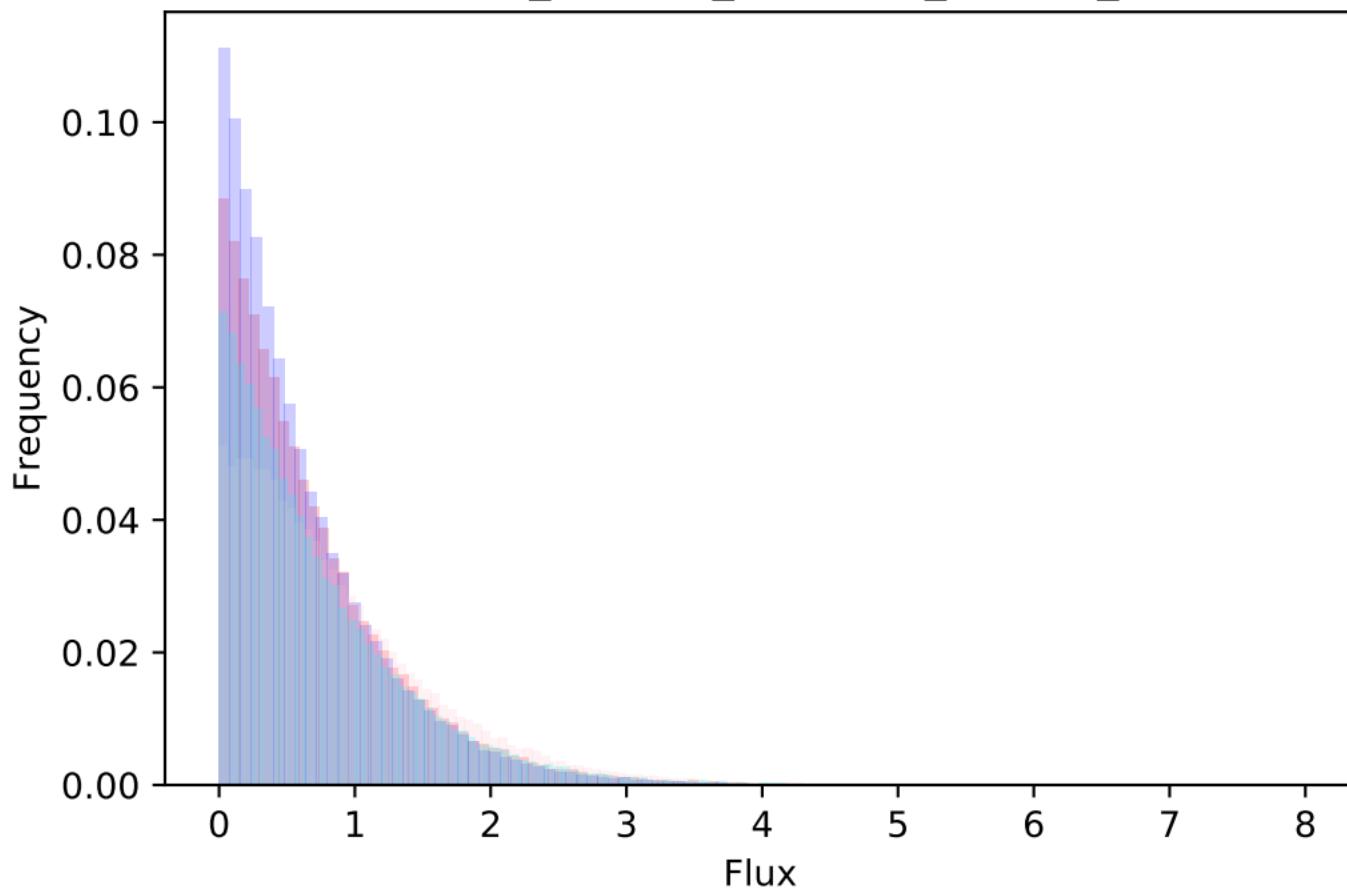


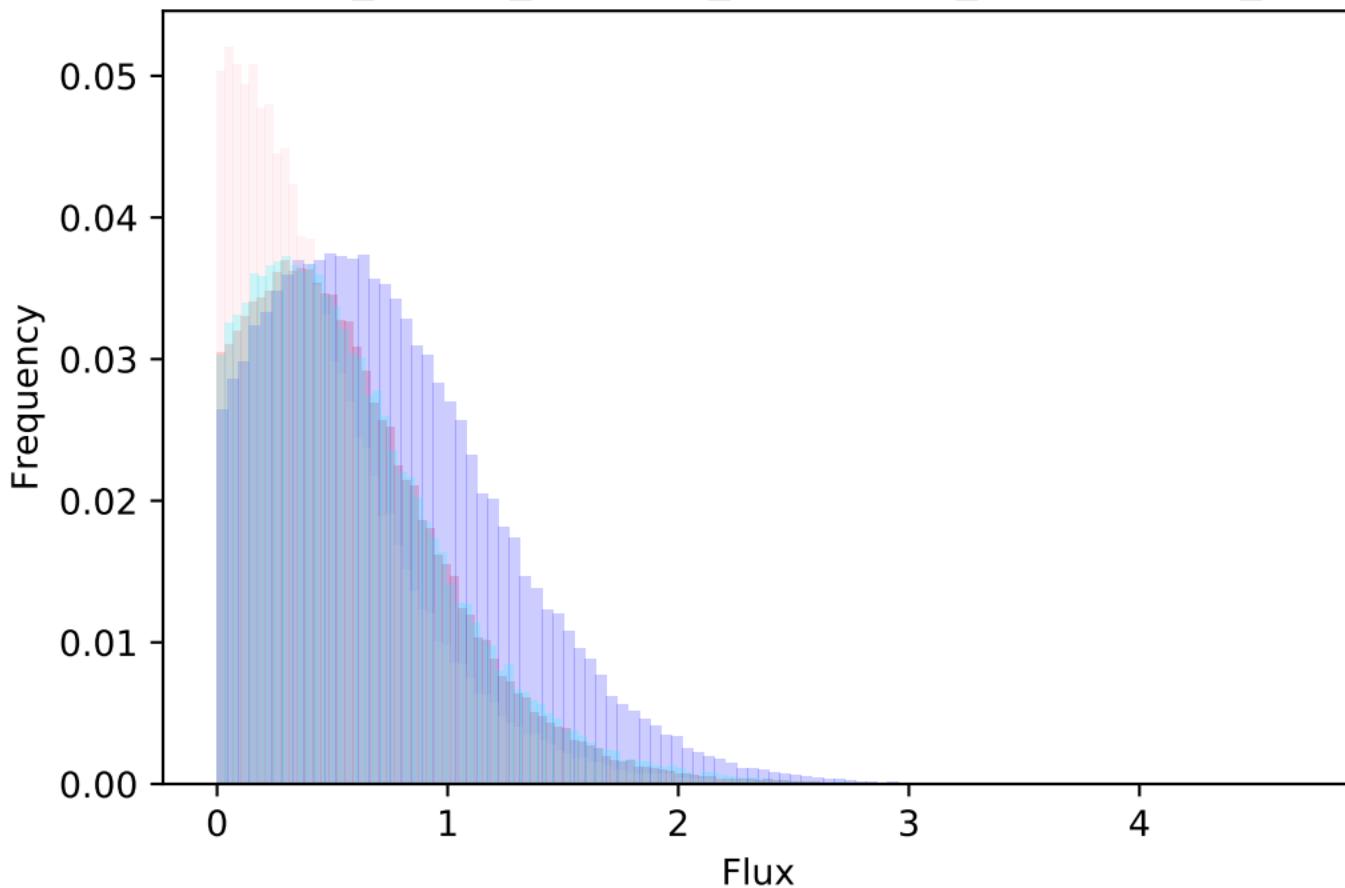
86:GCA_p + O2_p --> GLX_p + H2O2_p



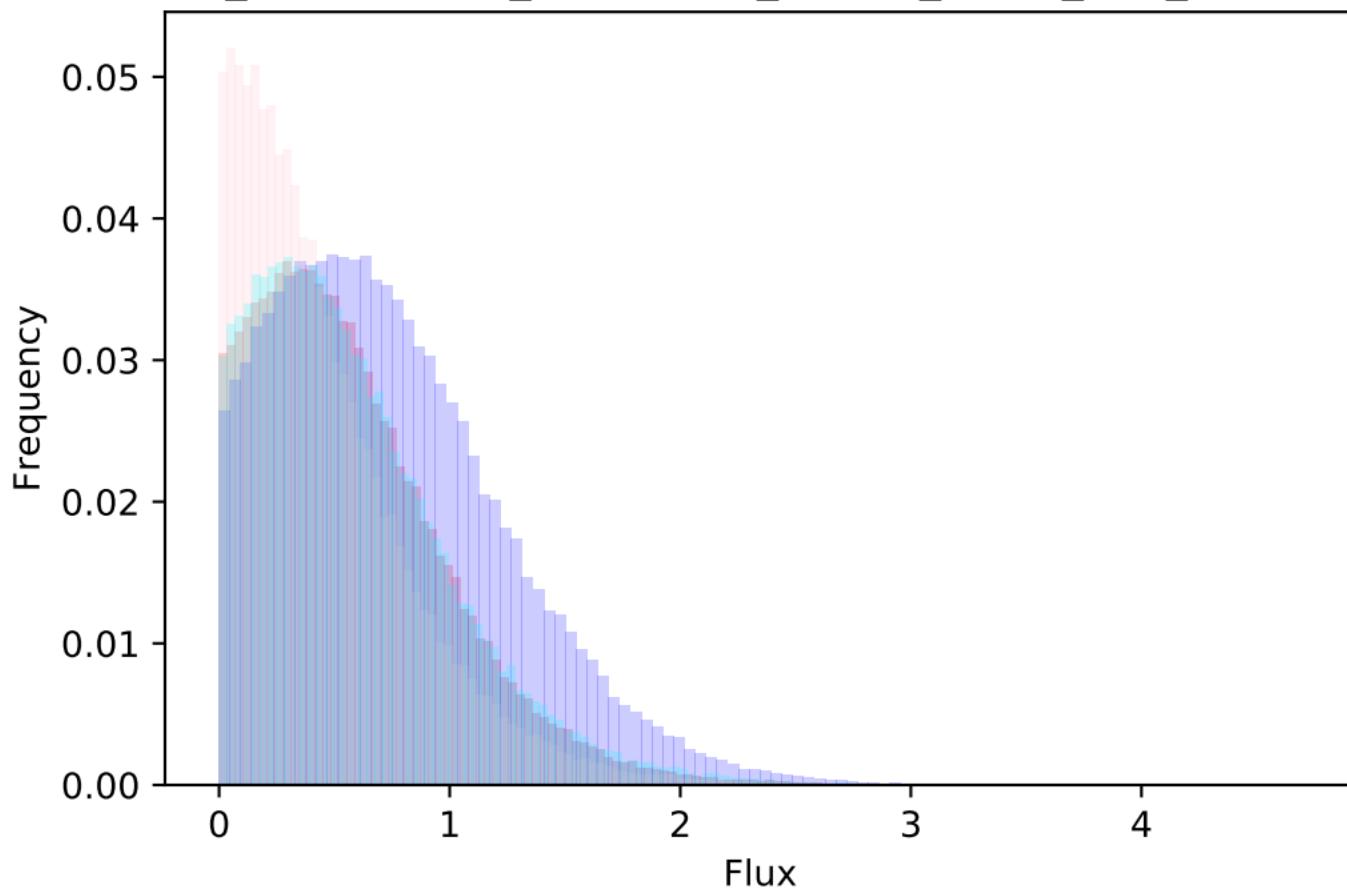


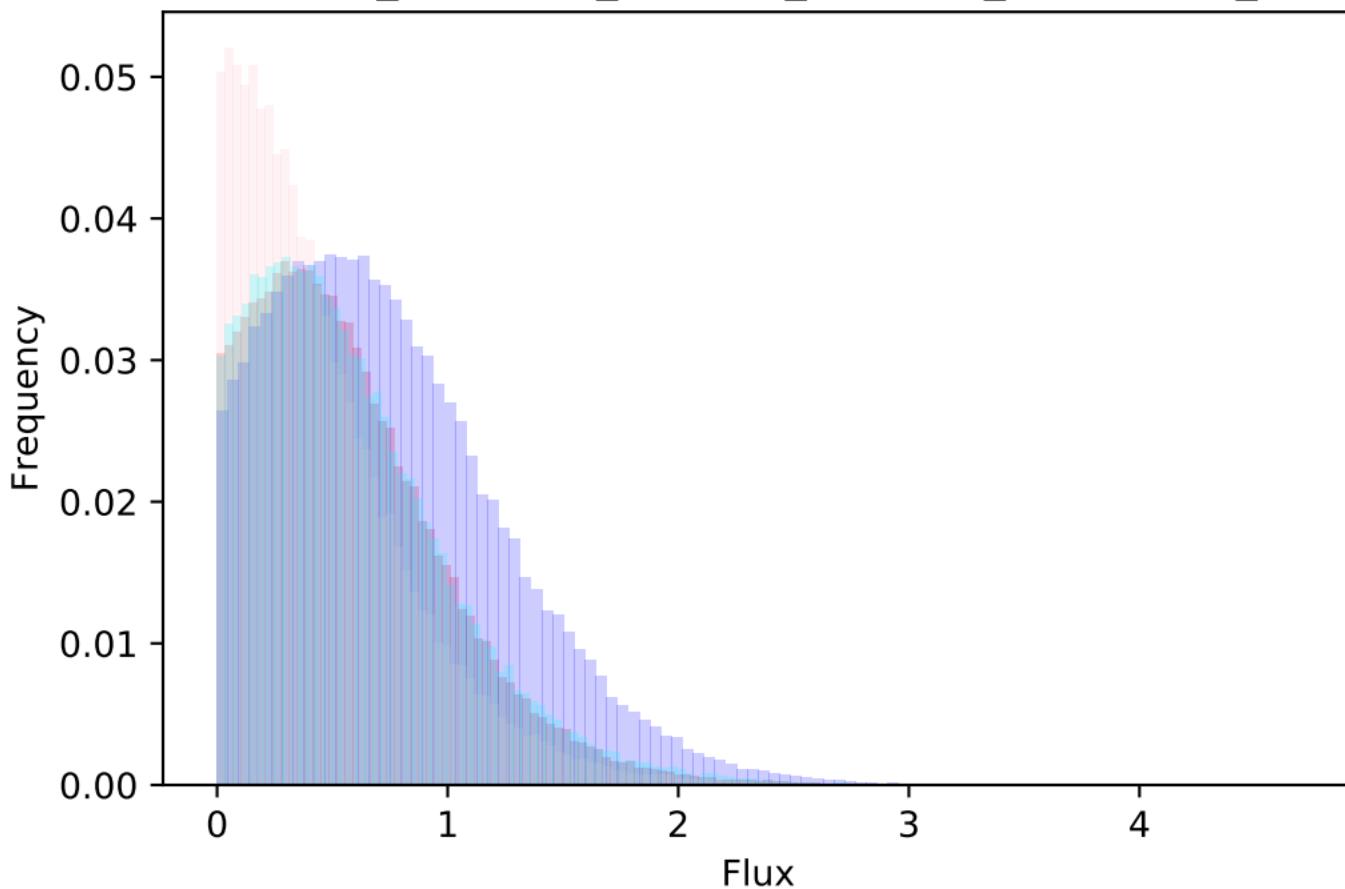
88:GLX_p + Glu_p --> Gly_p + KG_p

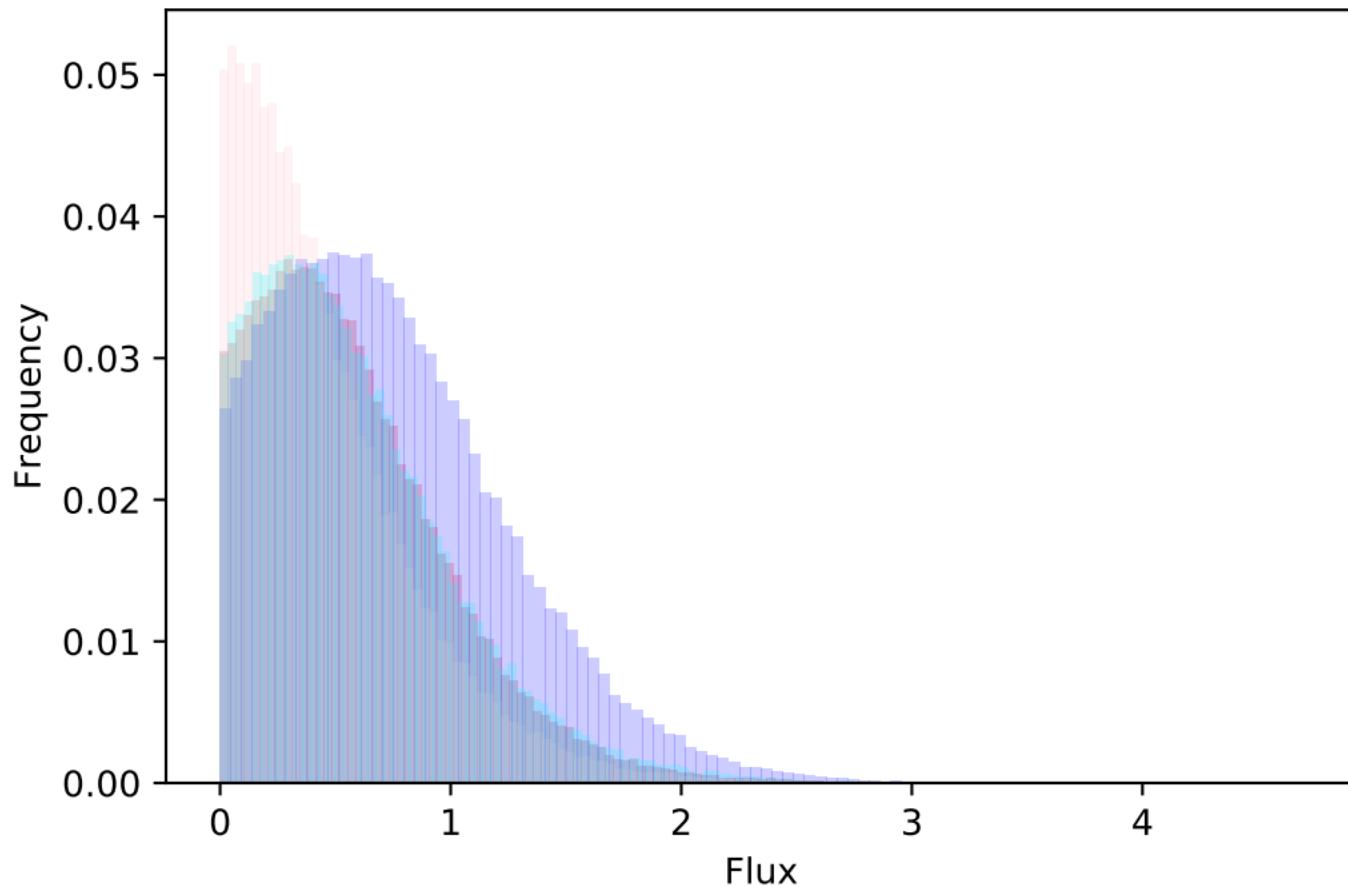
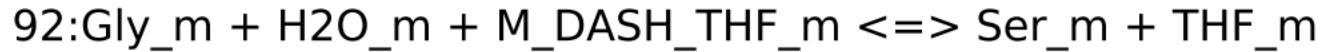


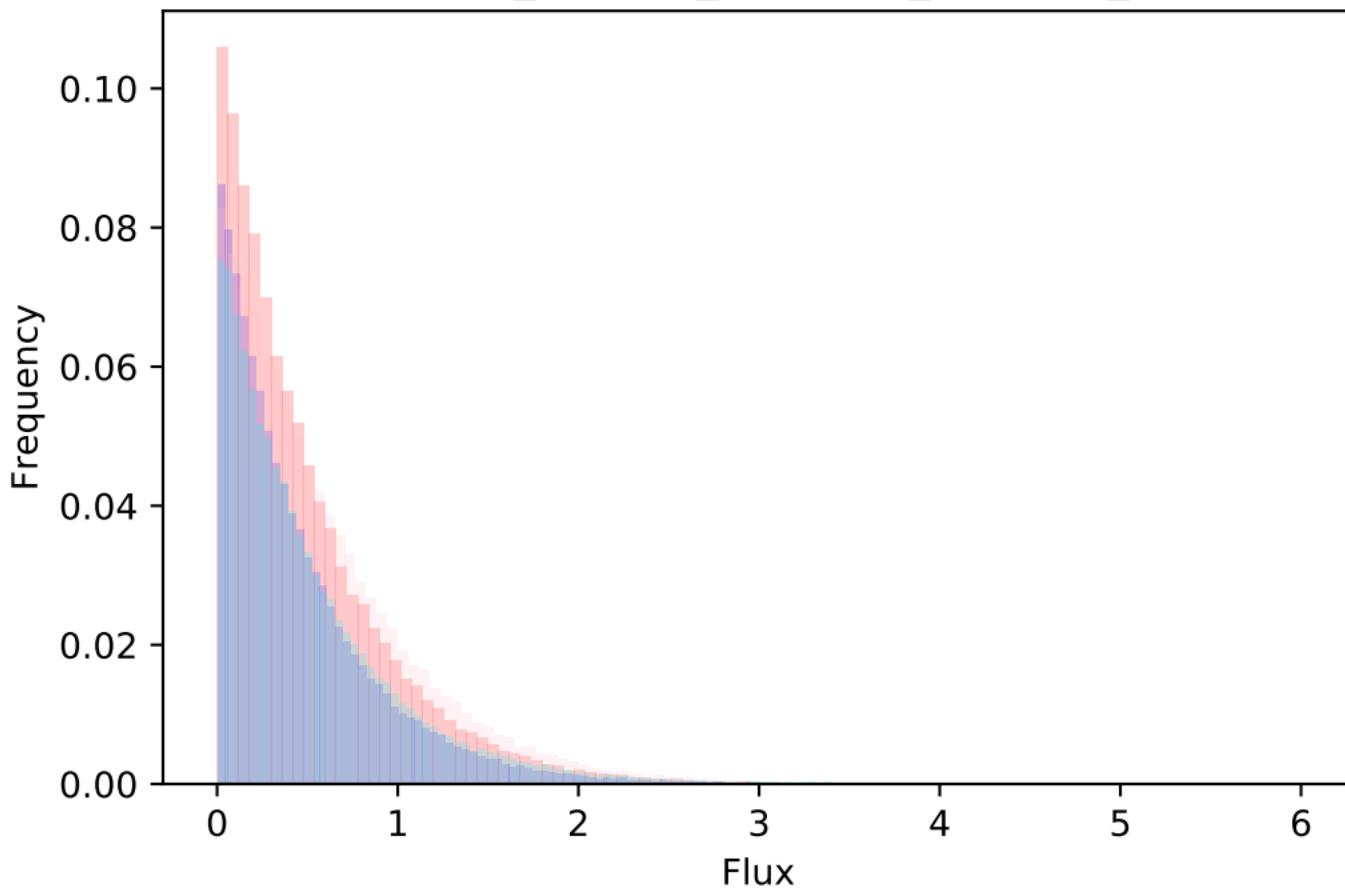
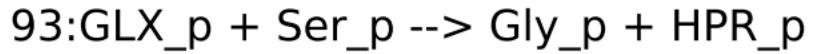


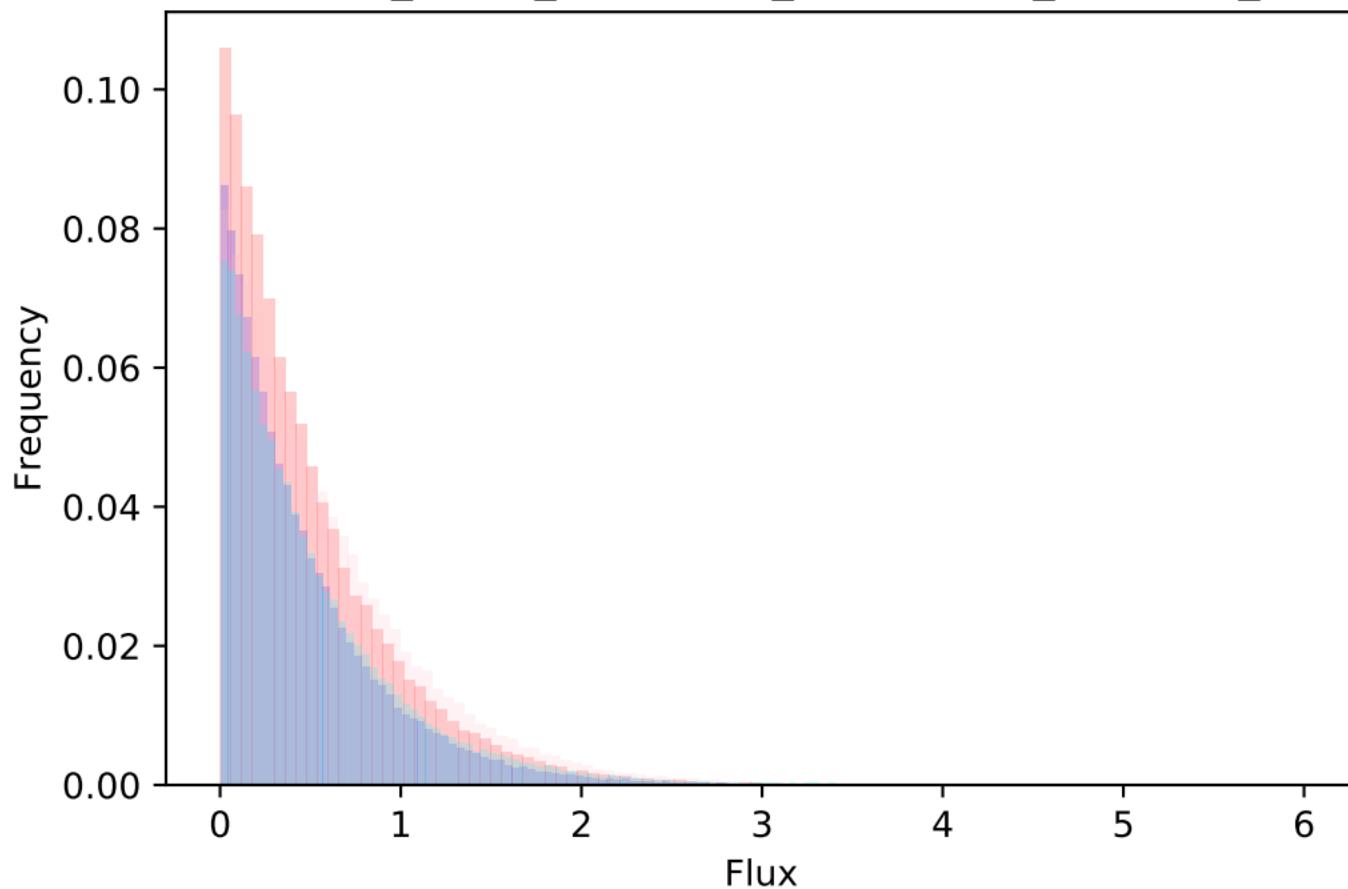
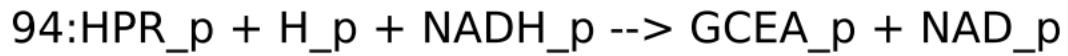
$90:\text{THF_m} + \text{amDHP_m} \rightarrow \text{DHP_m} + \text{M_DASH_THF_m} + \text{NH4_m}$

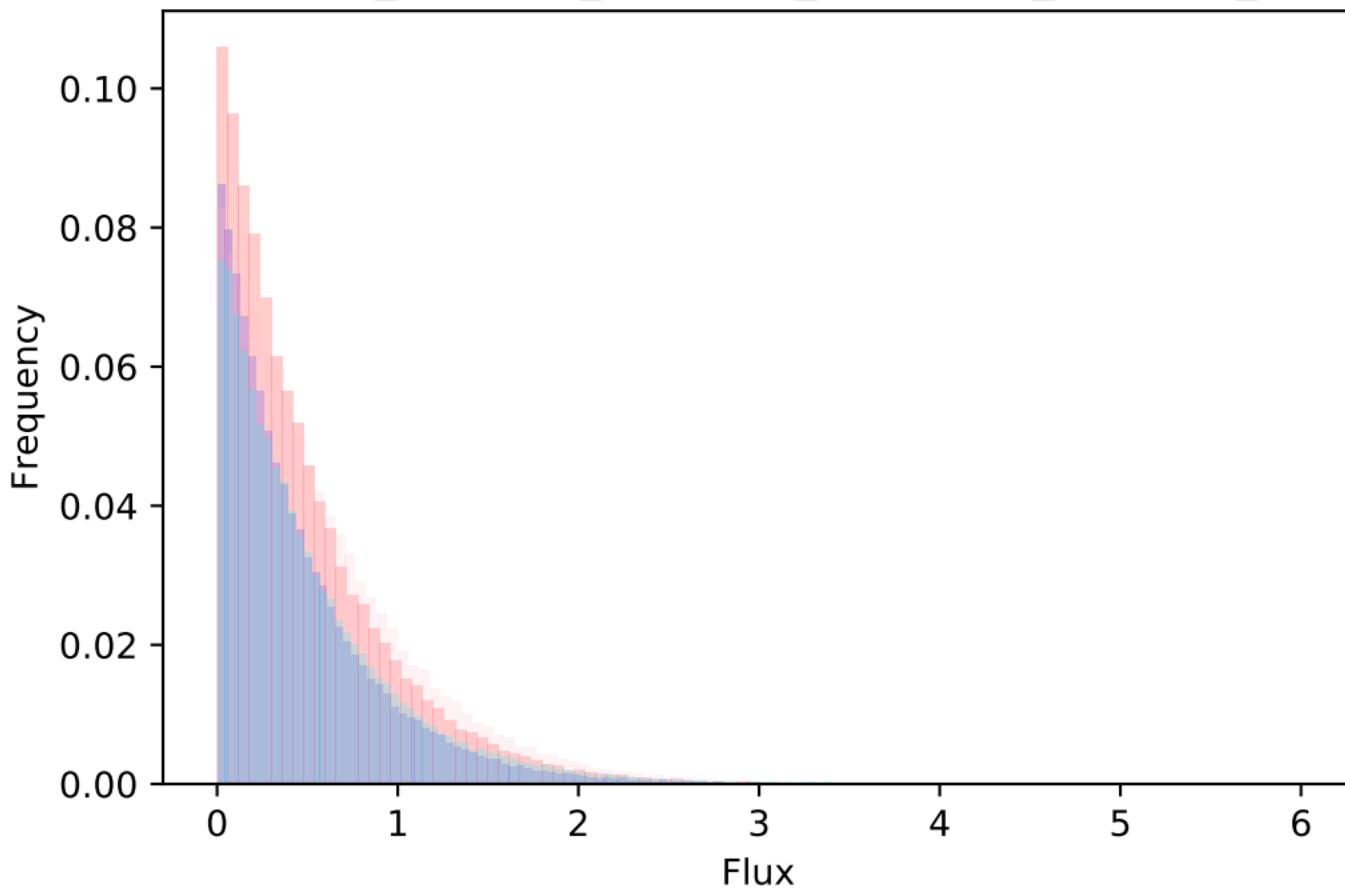
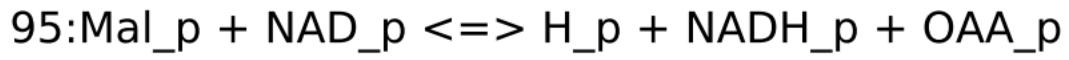


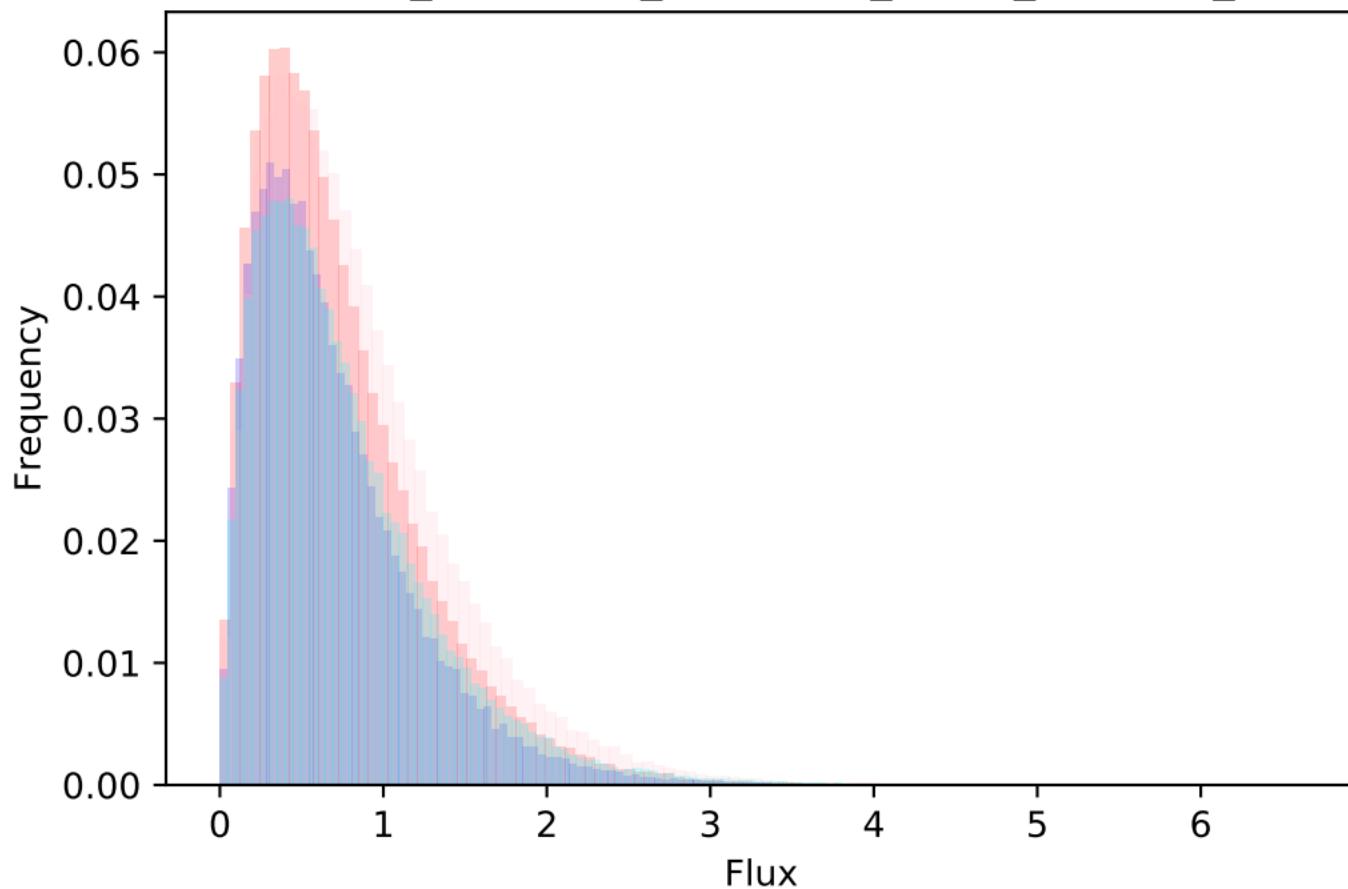
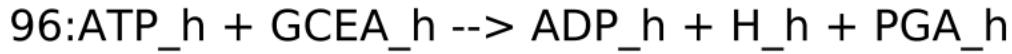


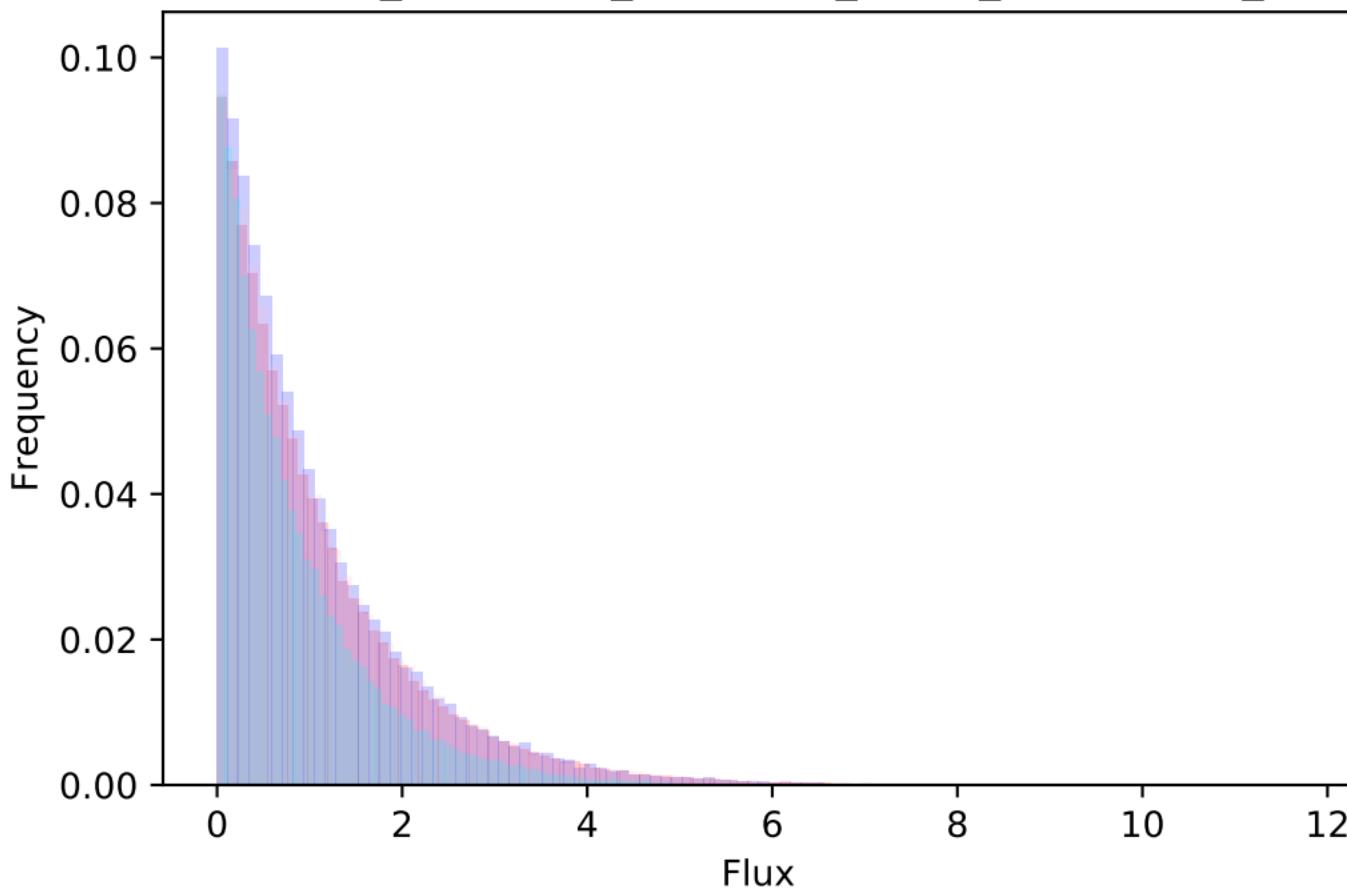


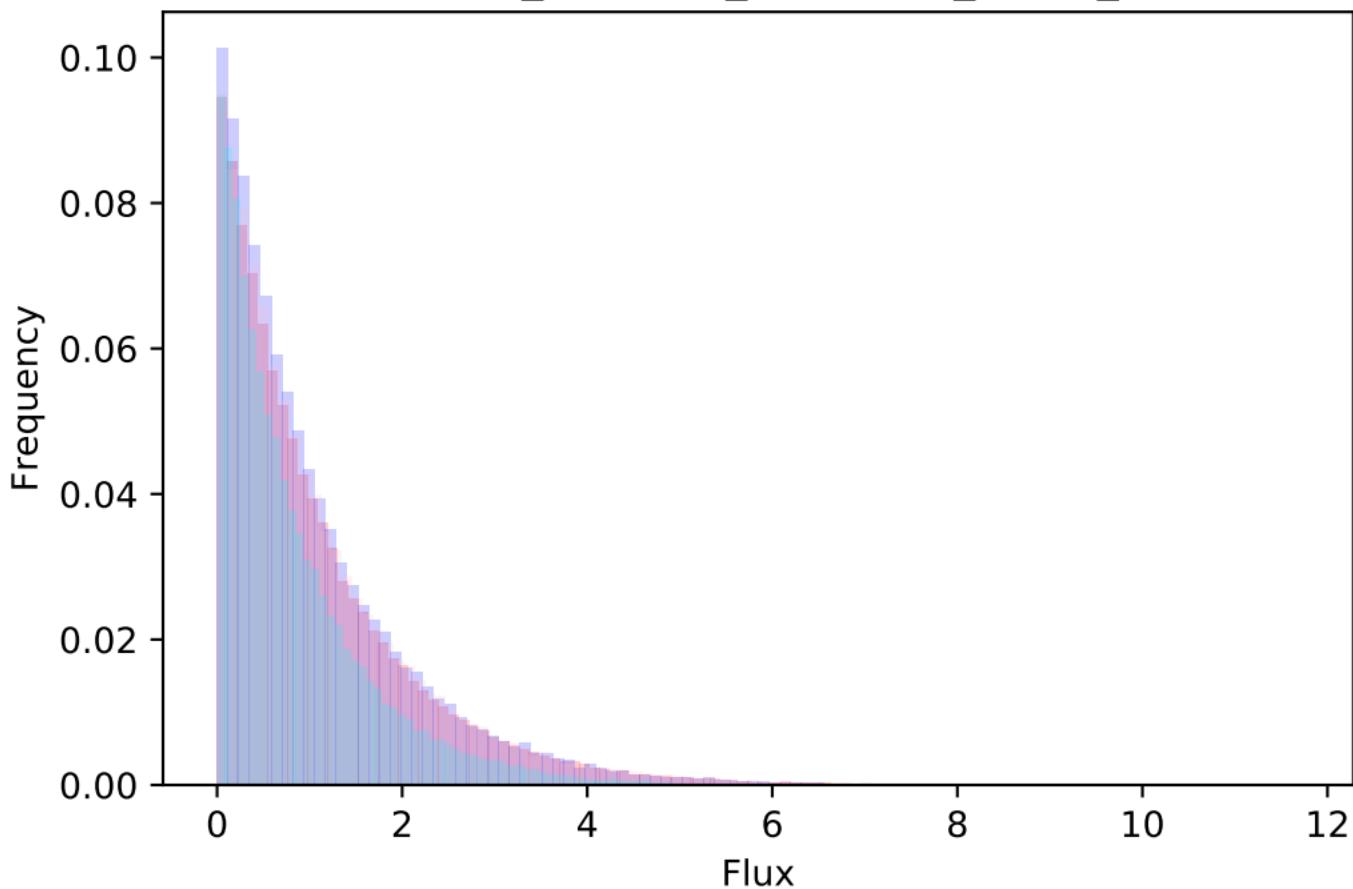
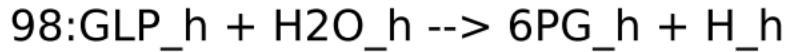


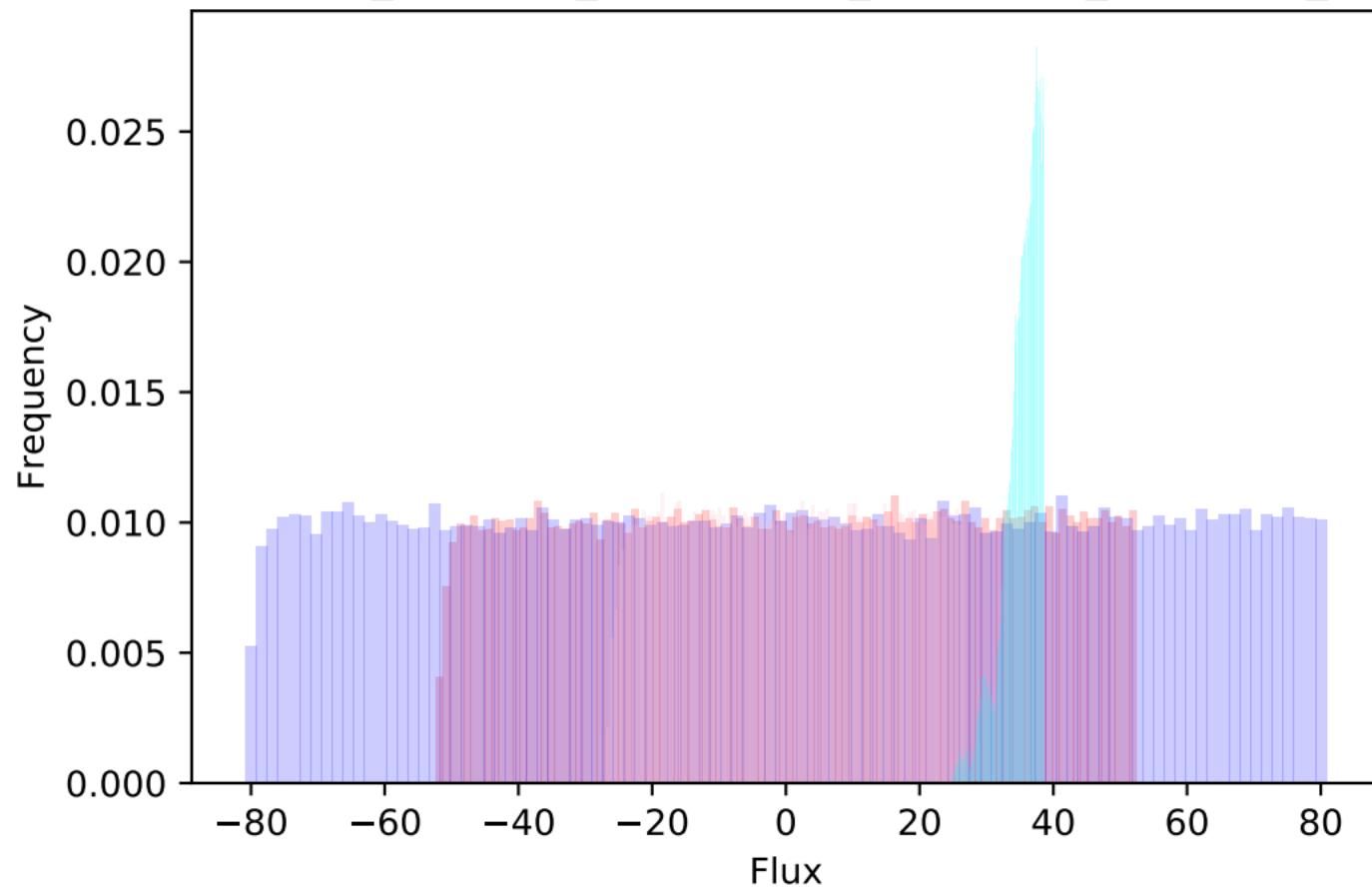














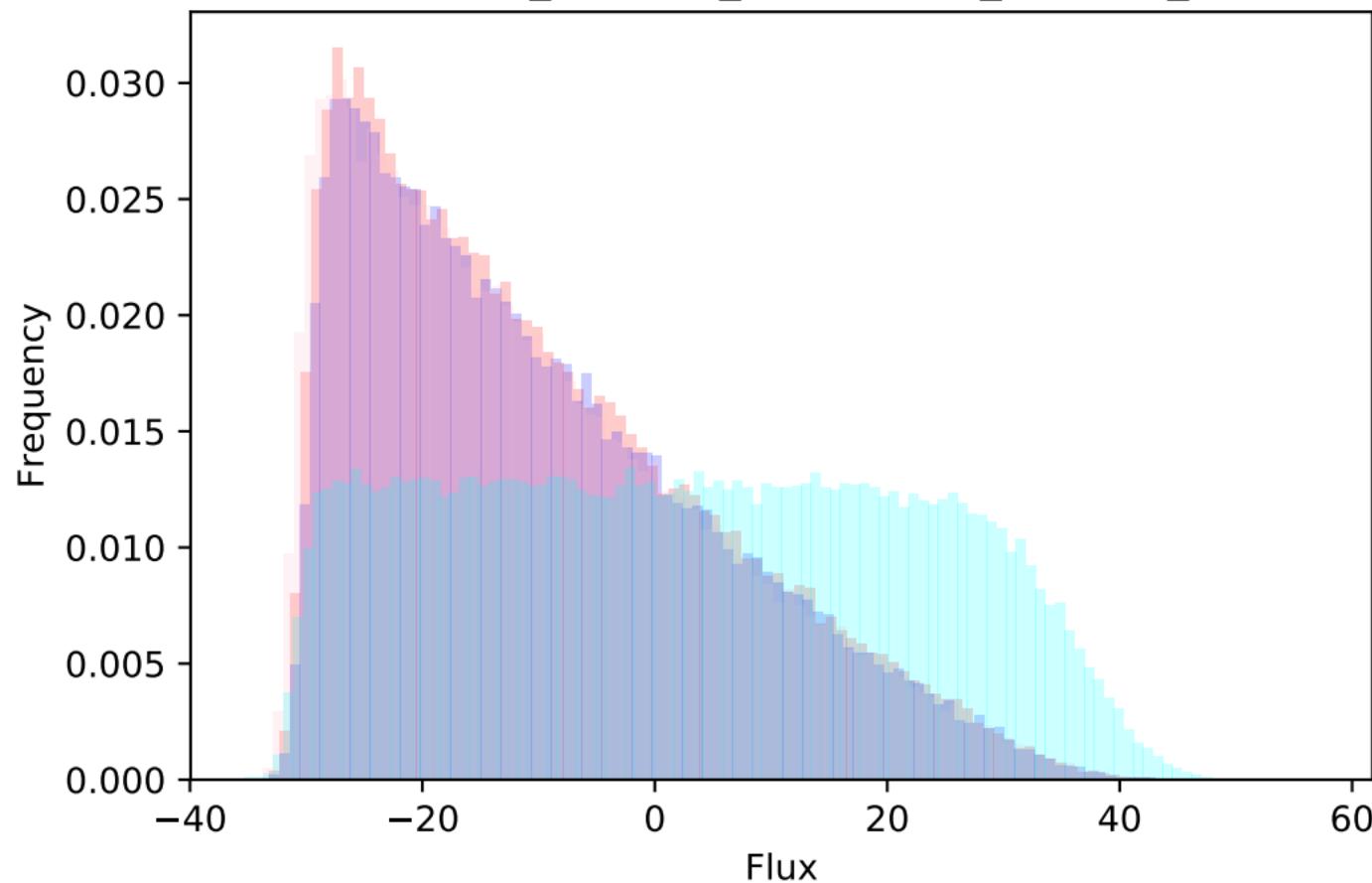
Frequency

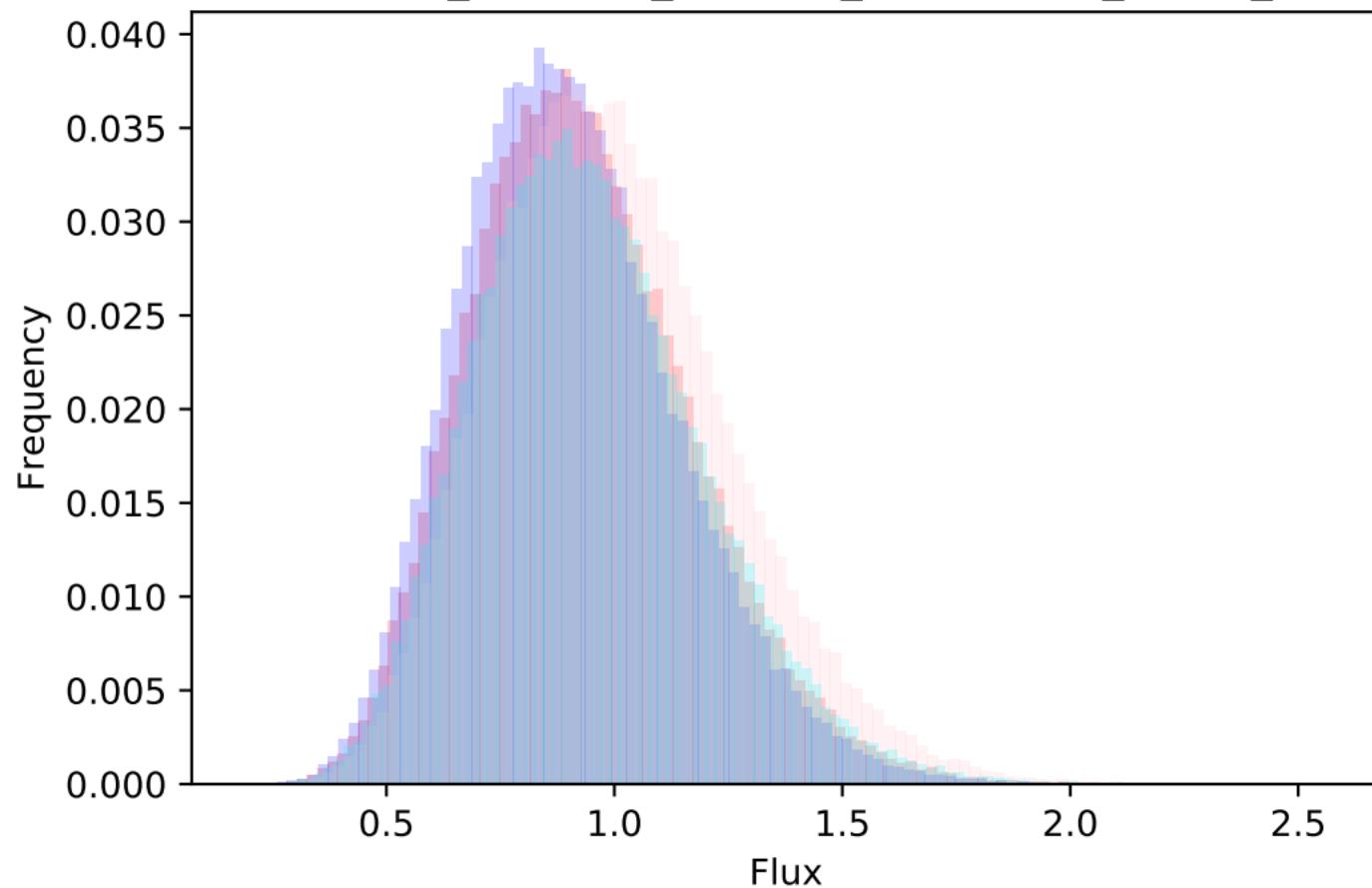
0.025
0.020
0.015
0.010
0.005
0.000

-80 -60 -40 -20 0 20 40 60 80

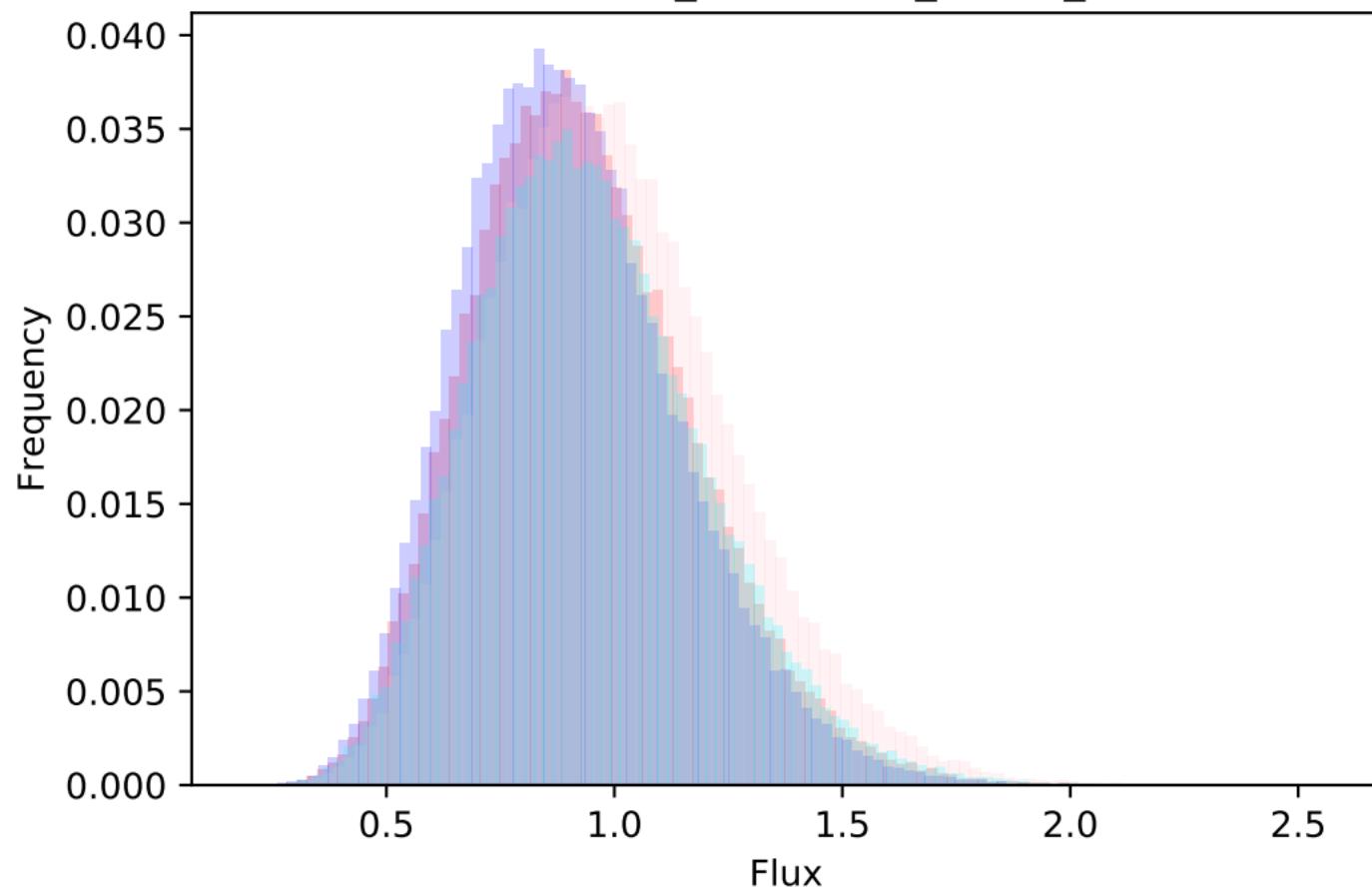
Flux

$101:\text{GAP_h} + \text{S7P_h} <=> \text{E4P_h} + \text{F6P_h}$

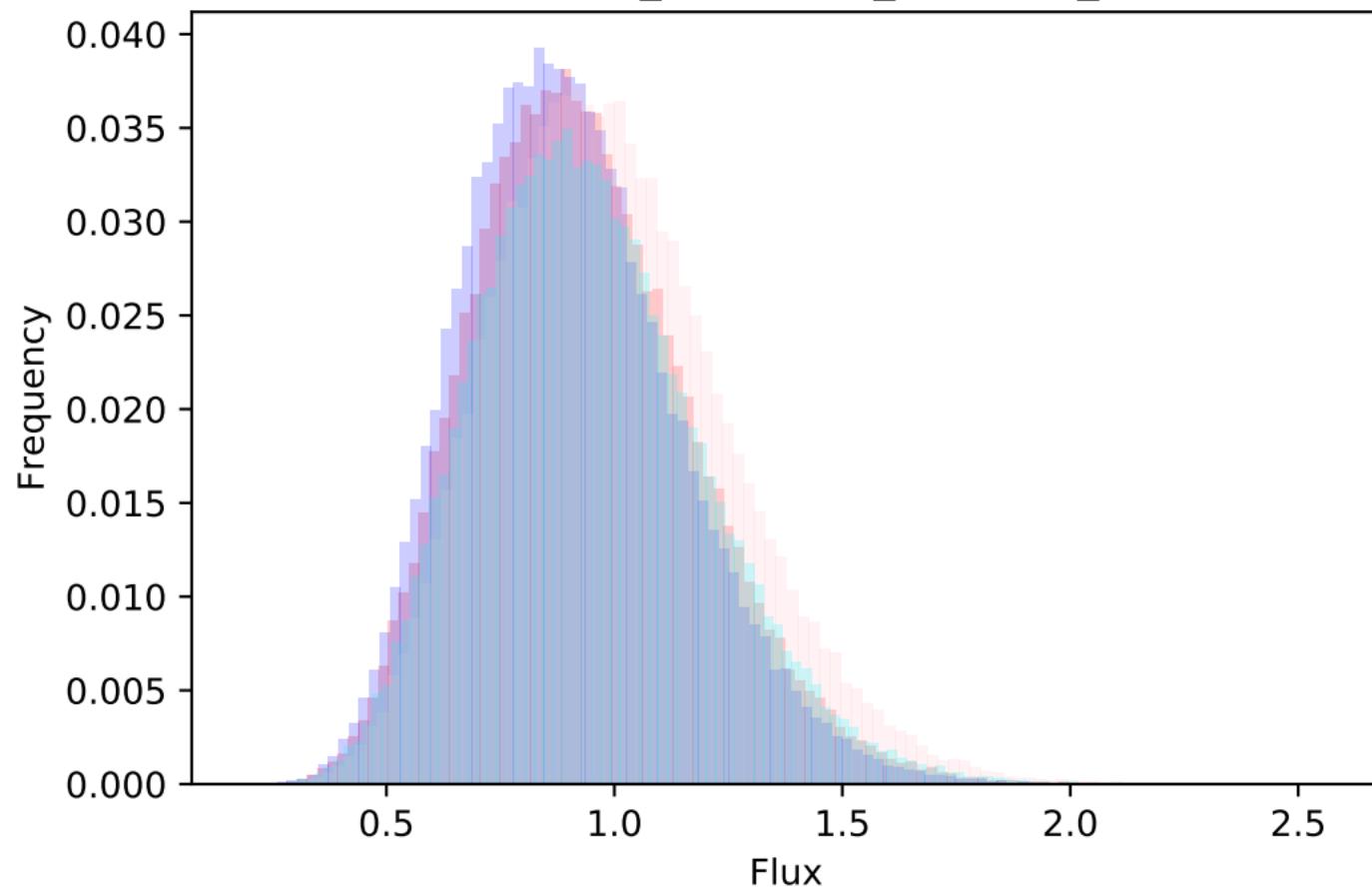




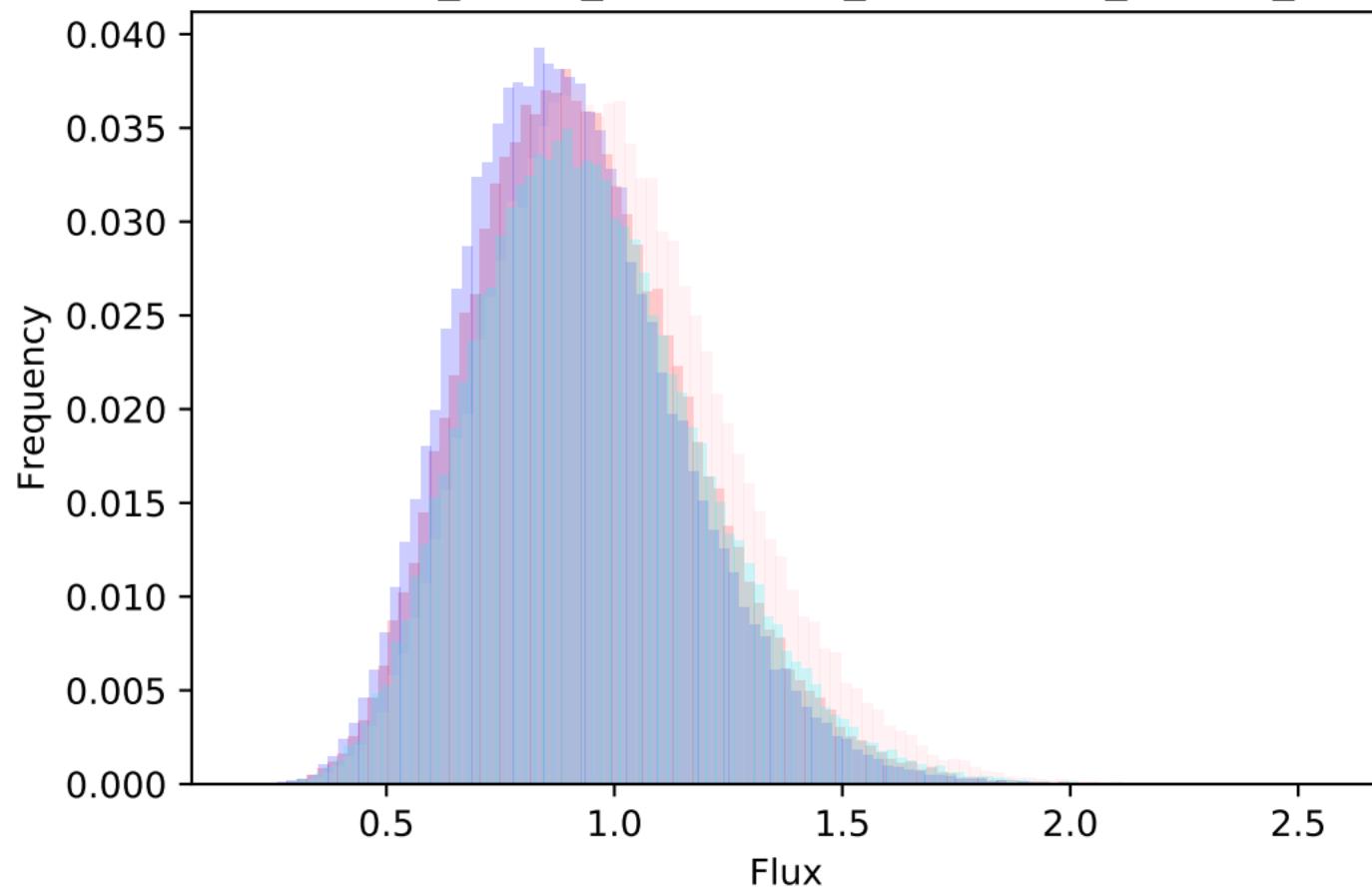
103:DAHP_h --> DHQ_h + Pi_h

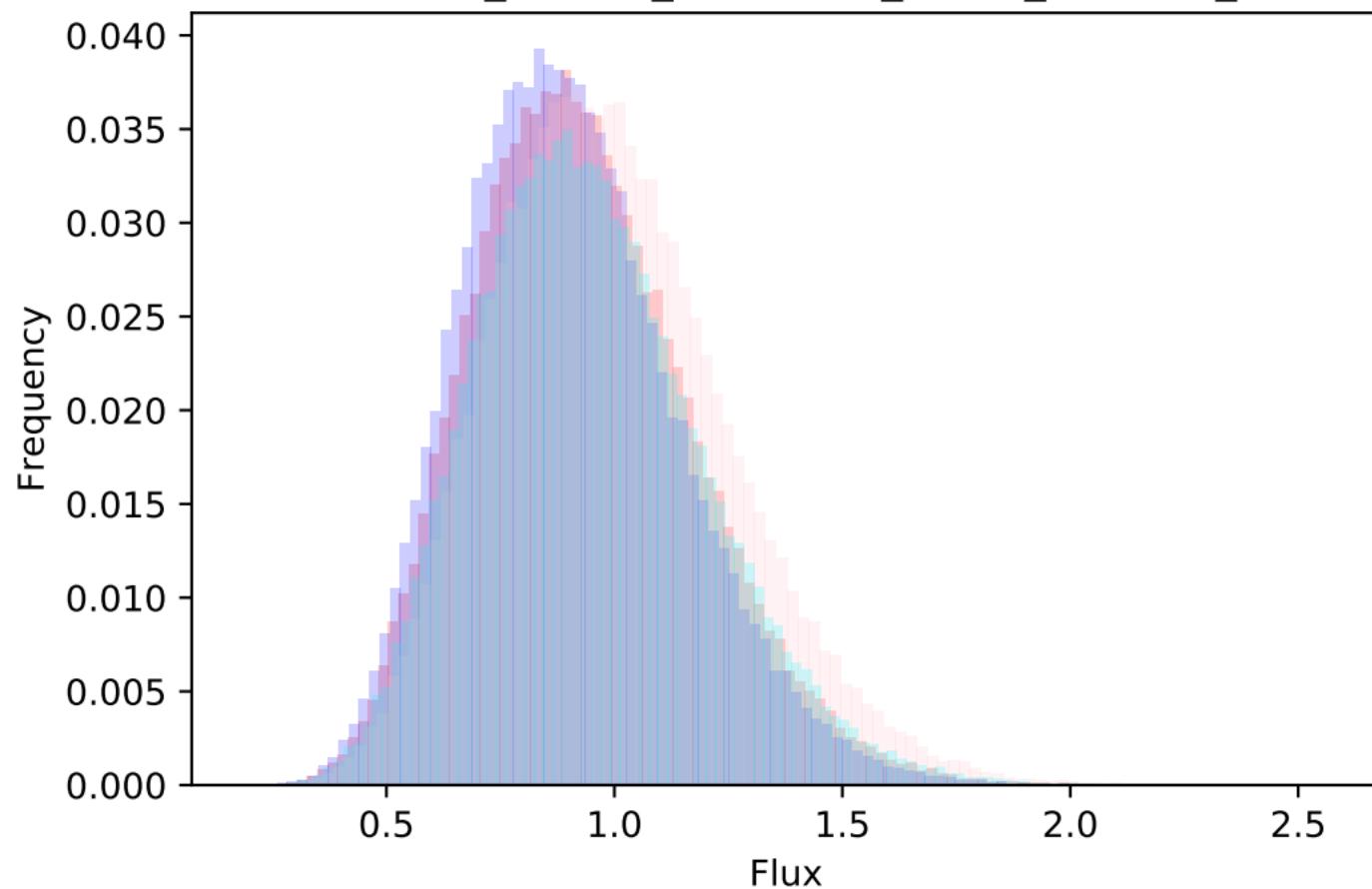


104:DHQ_h --> DHS_h + H₂O_h

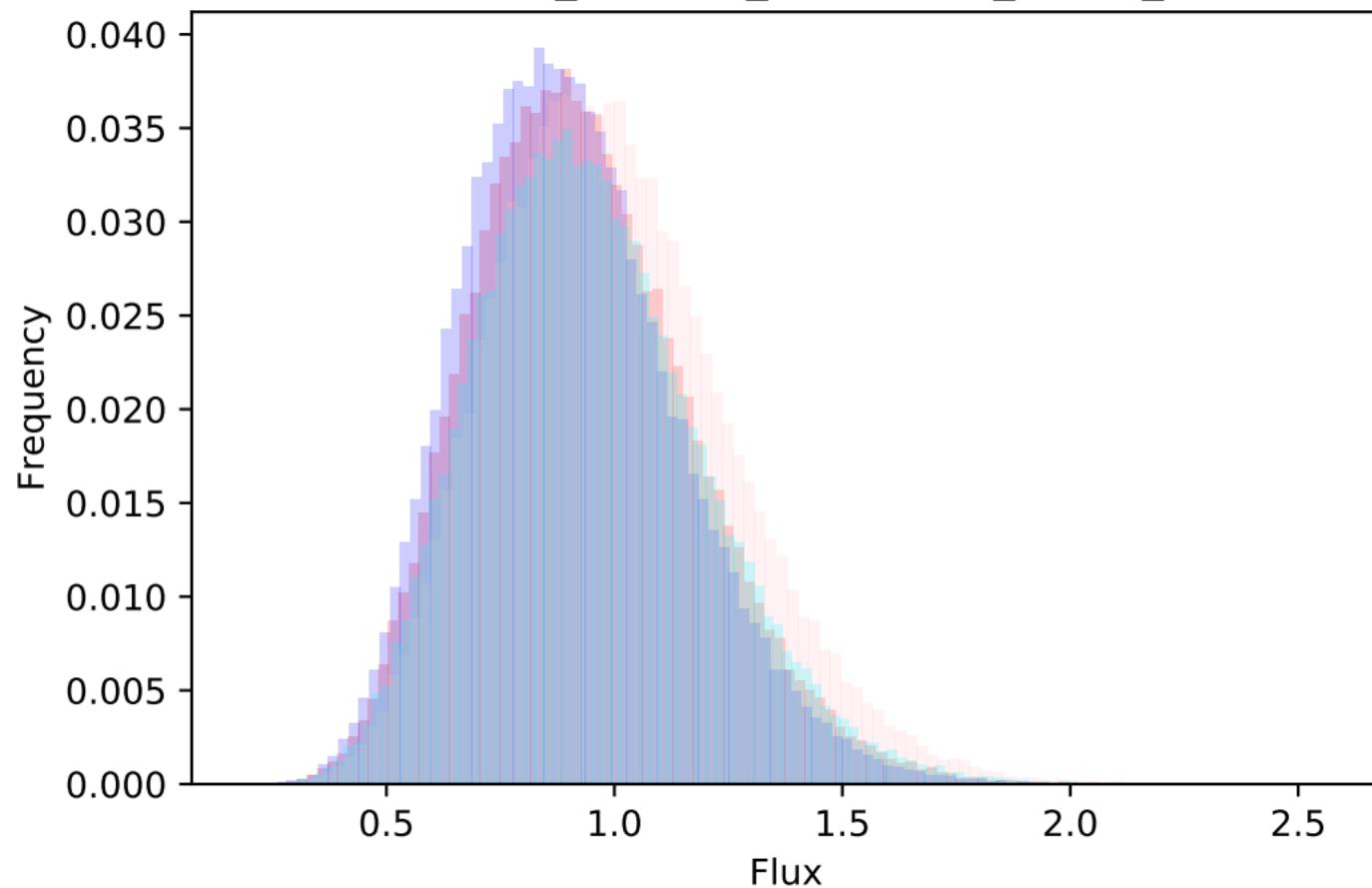


105:DHS_h + H_h + NADPH_h --> NADP_h + SA_h

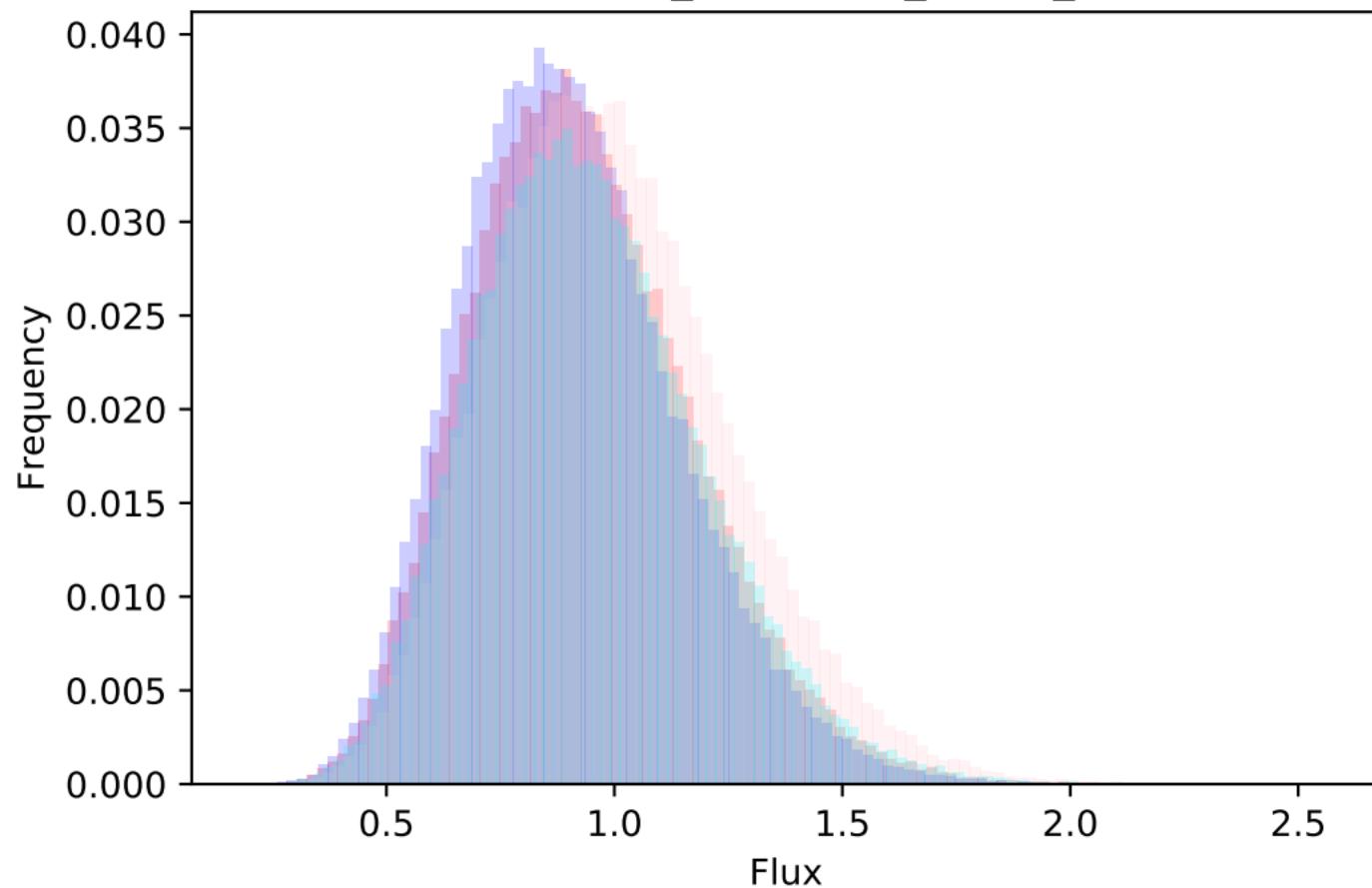


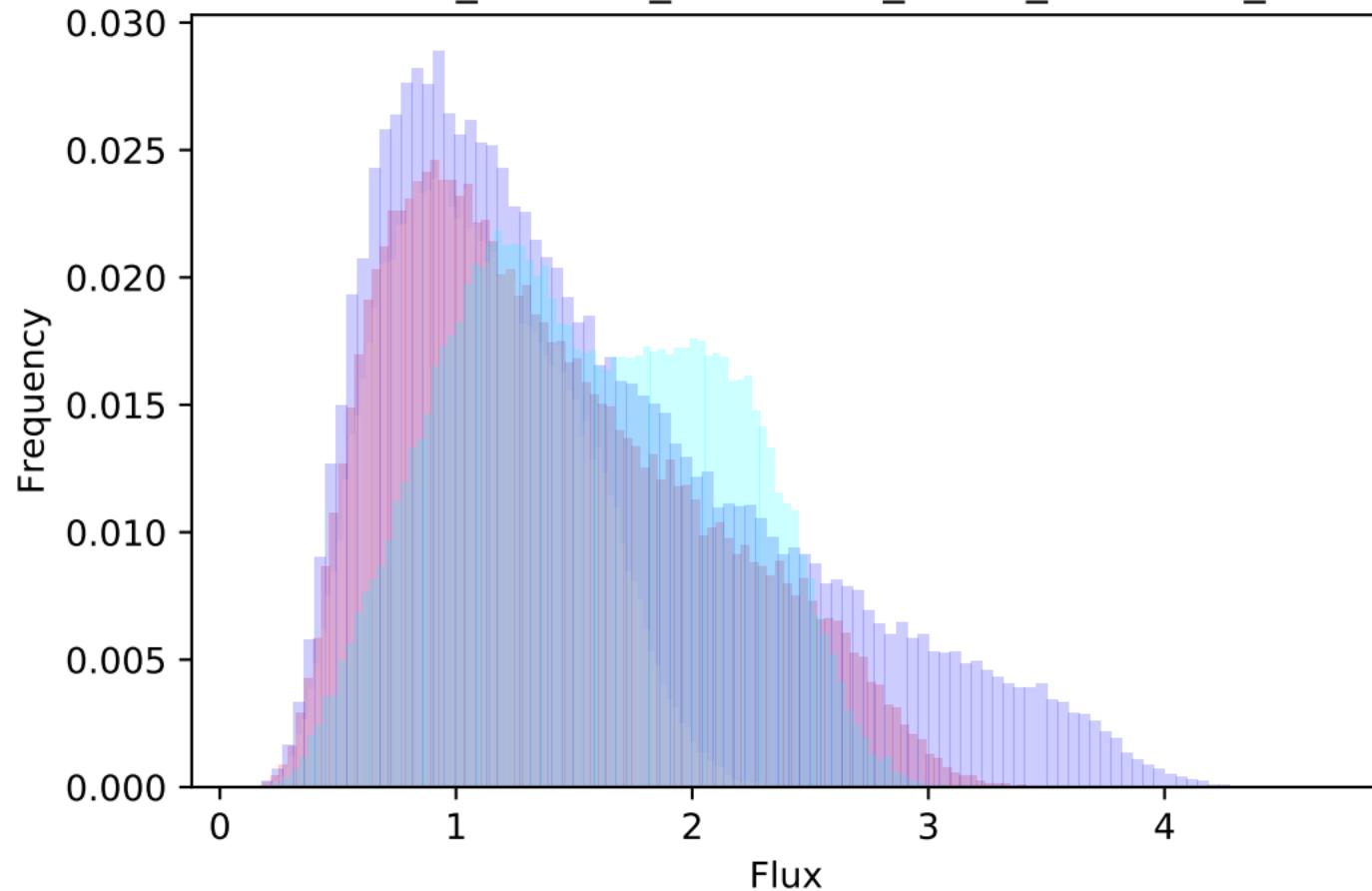


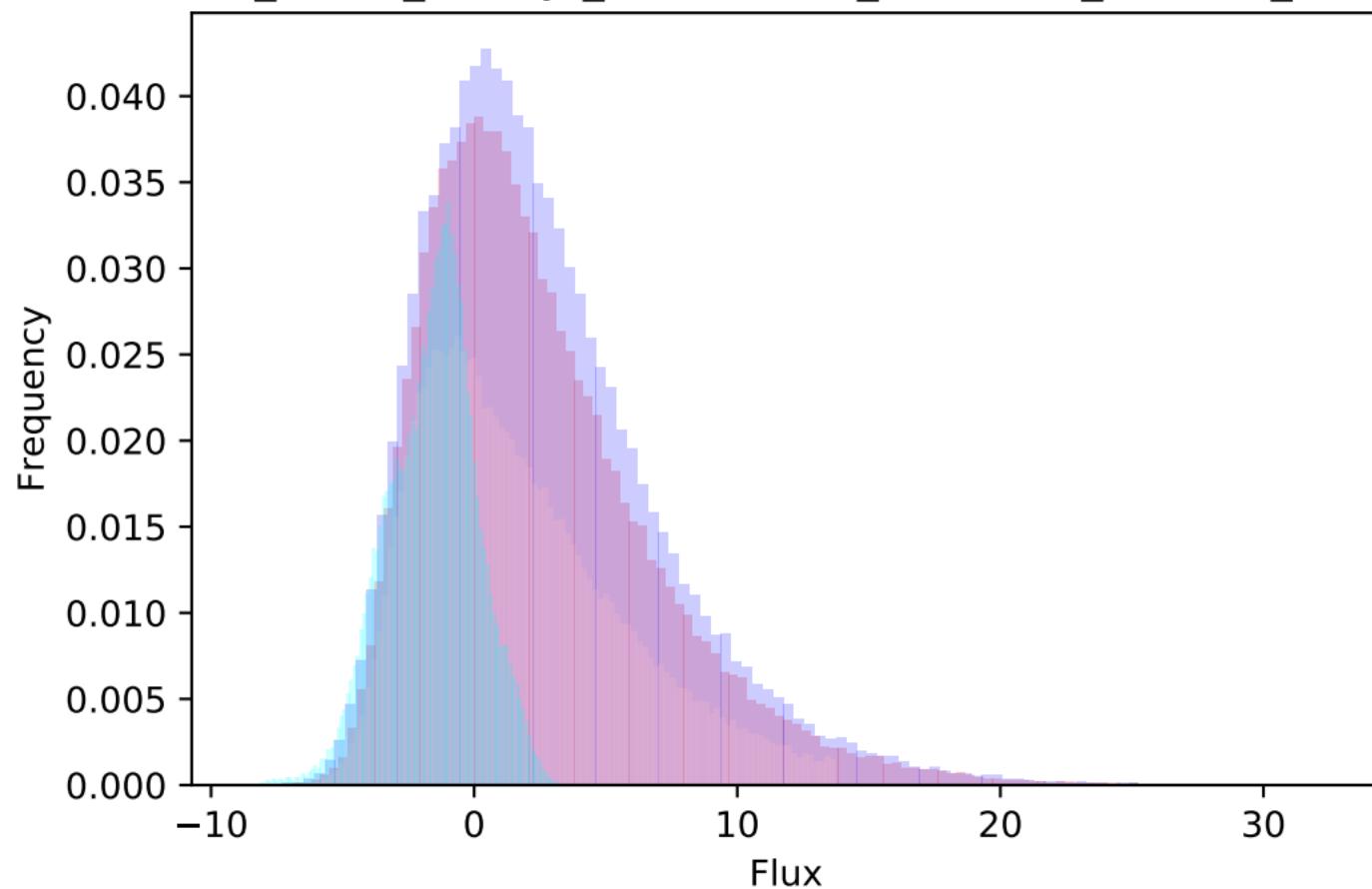
107:PEP_h + S3P_h --> EPSP_h + Pi_h

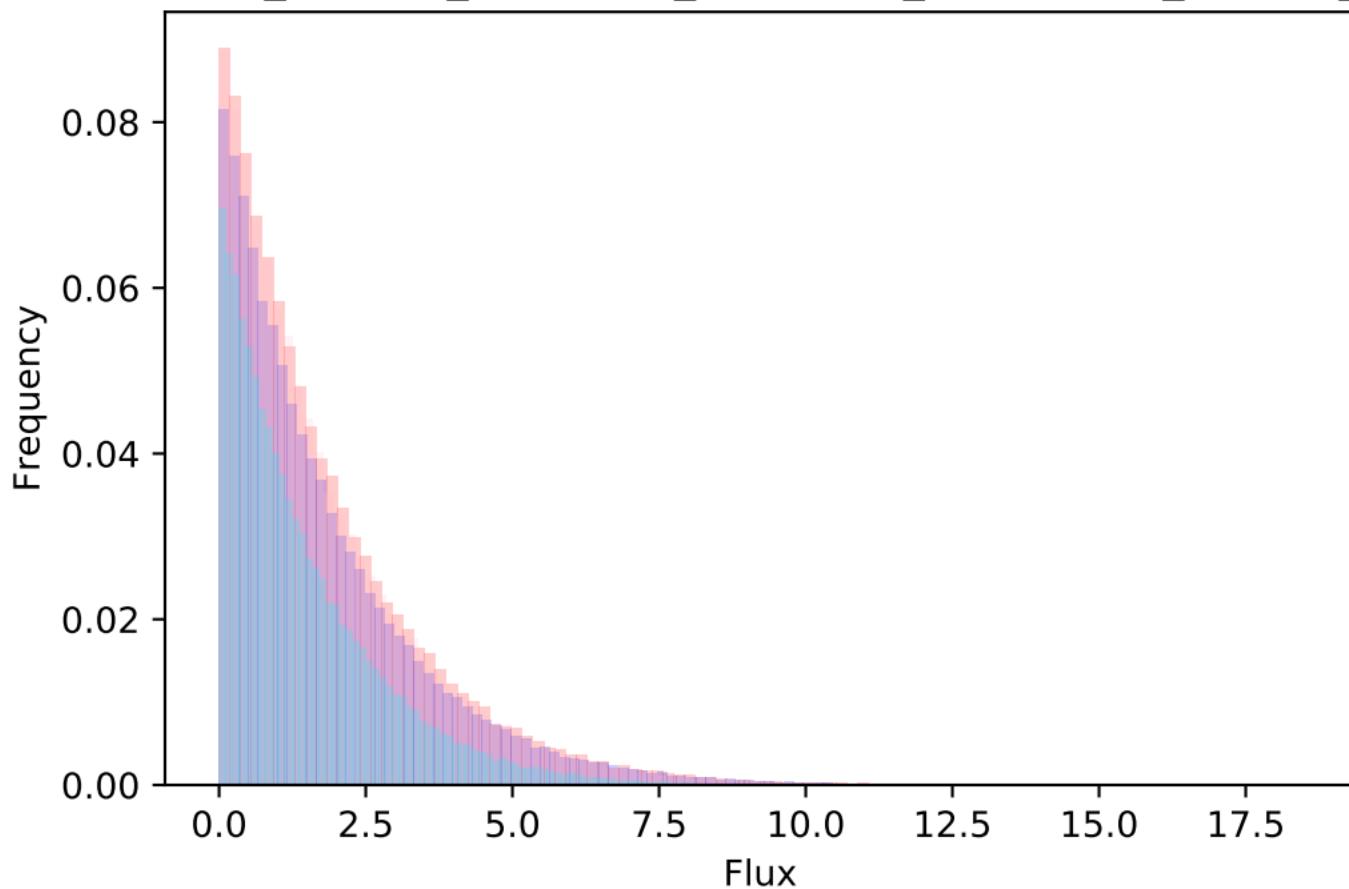
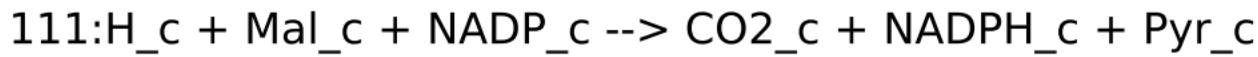


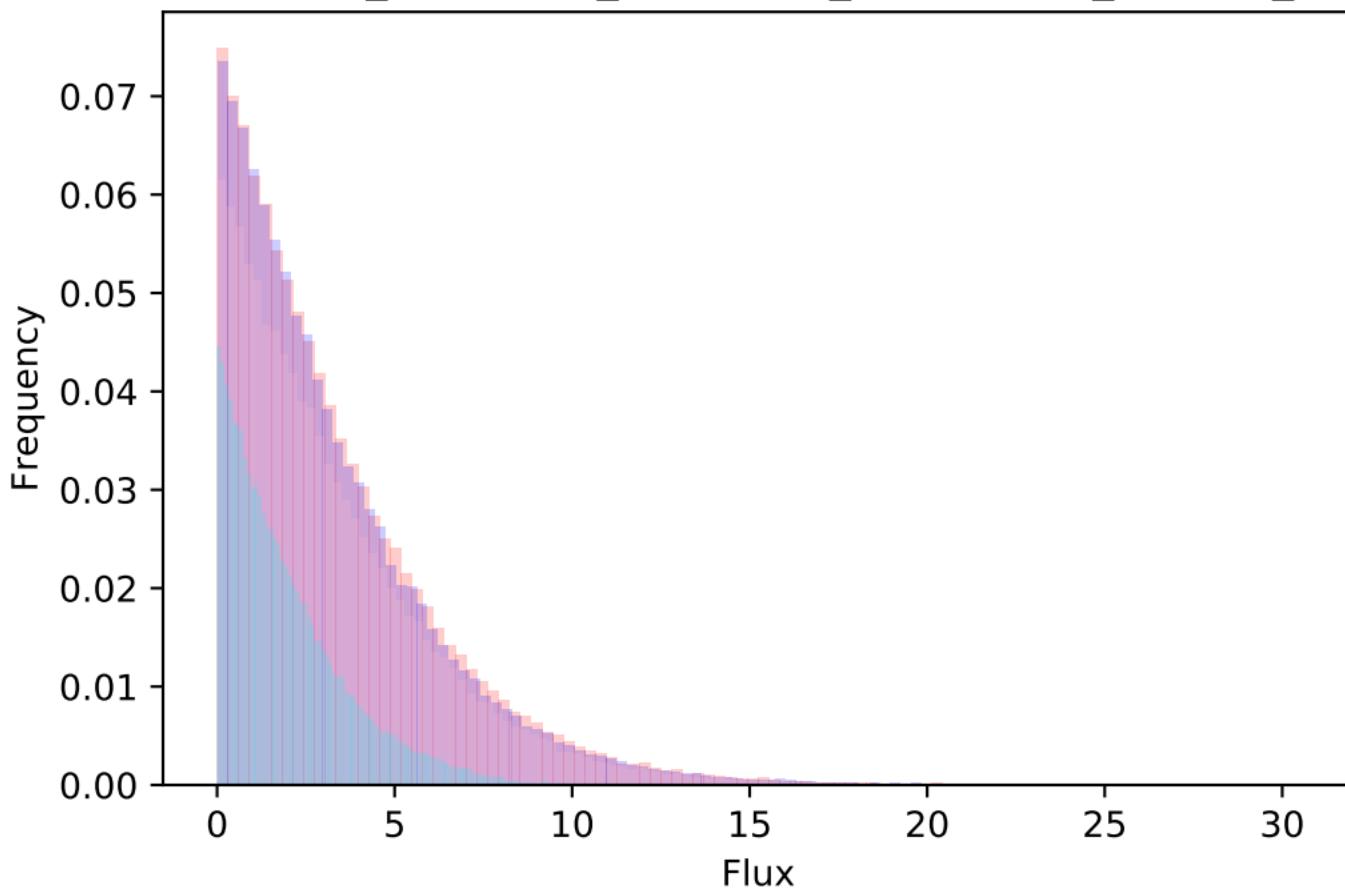
108:EPSP_h --> CHR_h + Pi_h

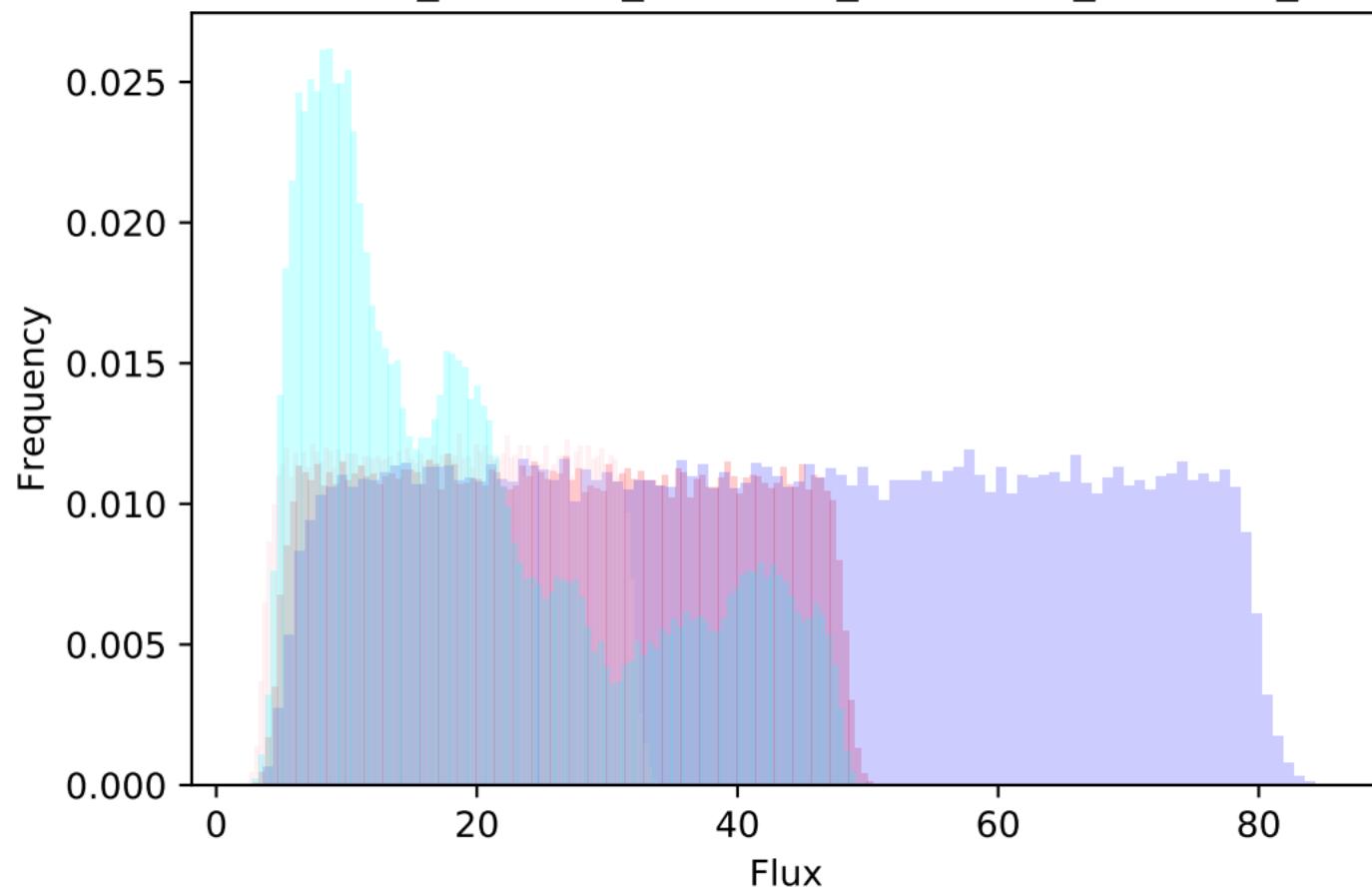
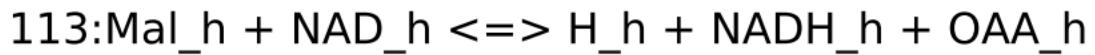


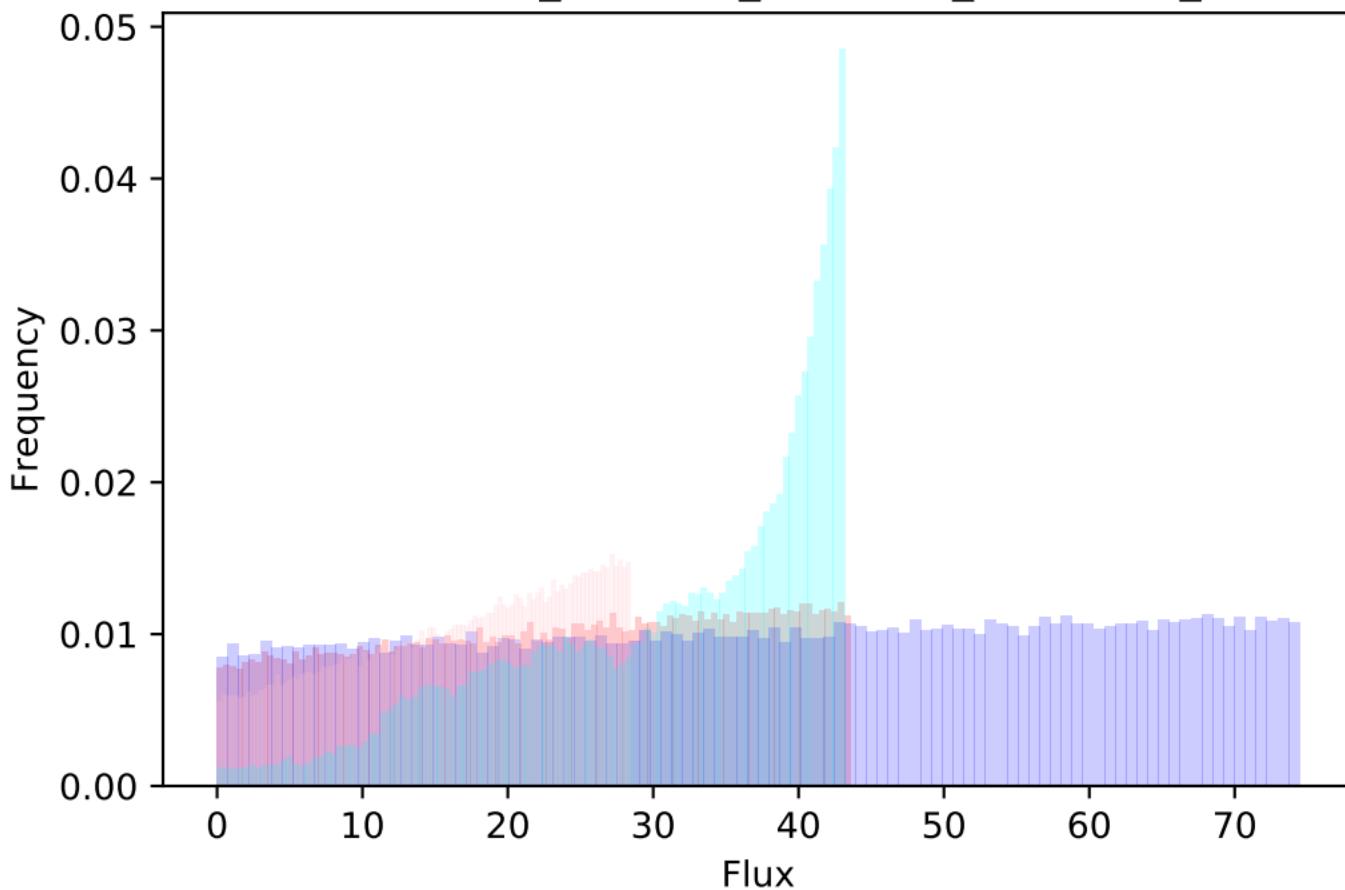


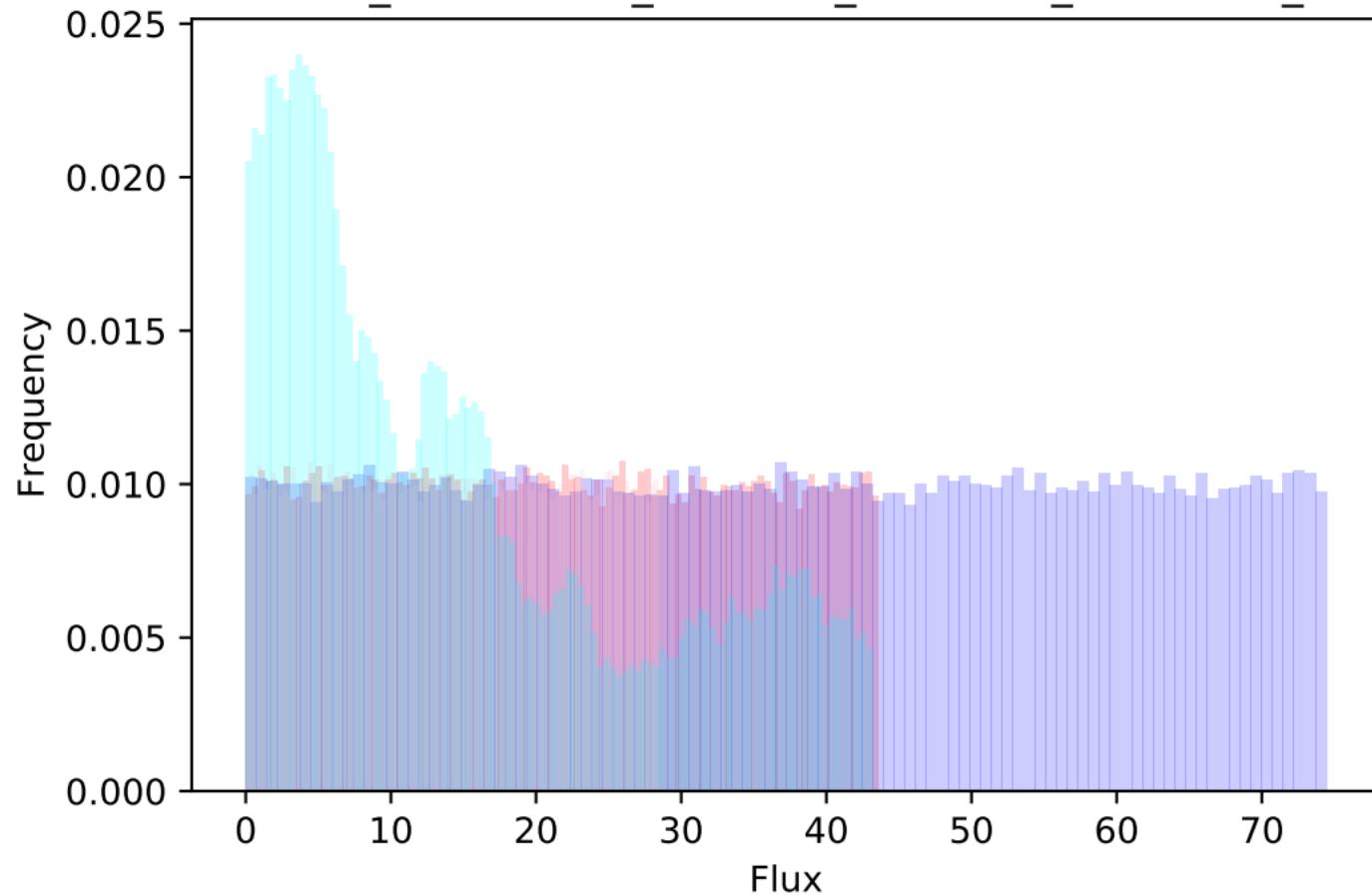


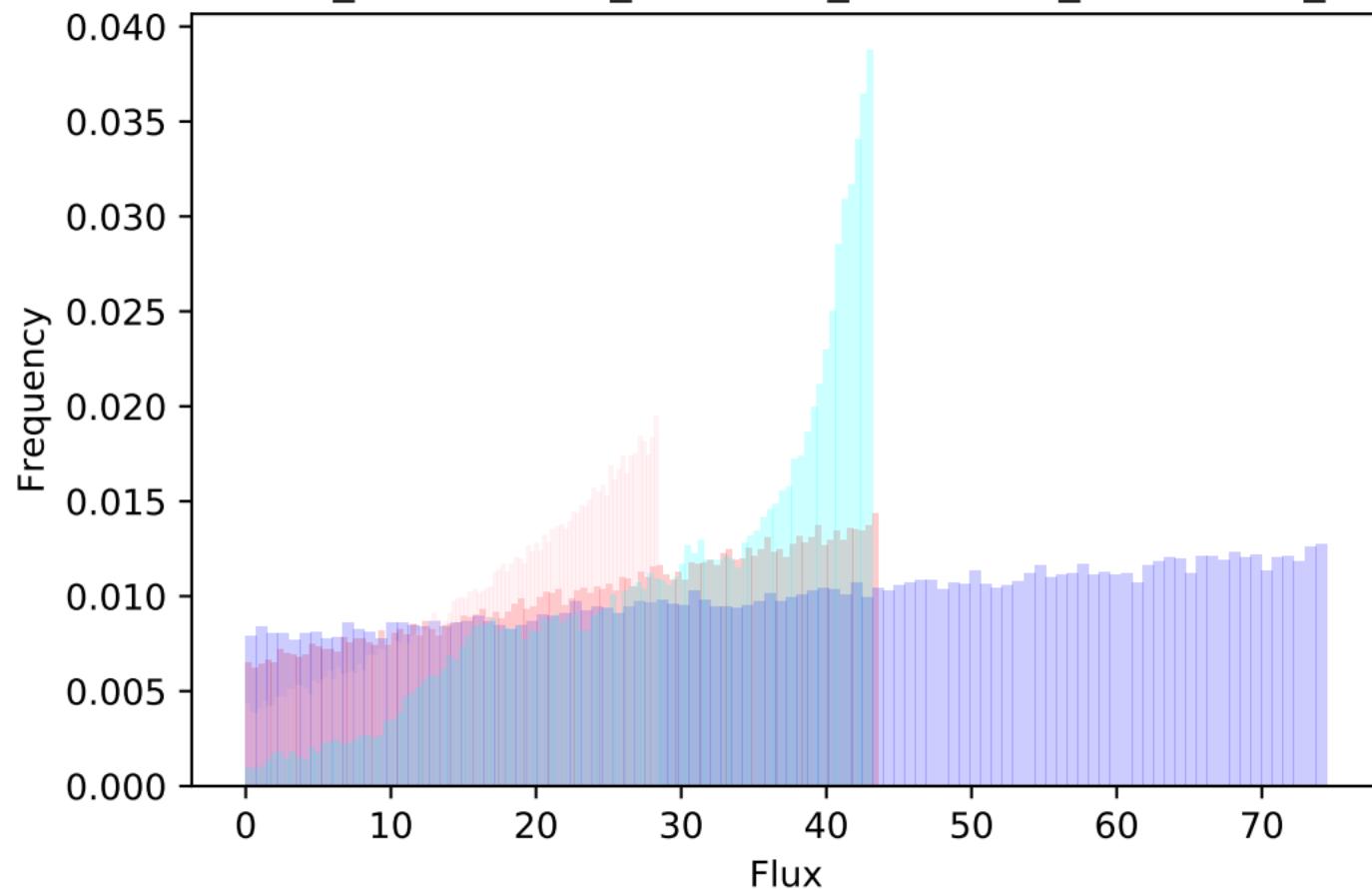




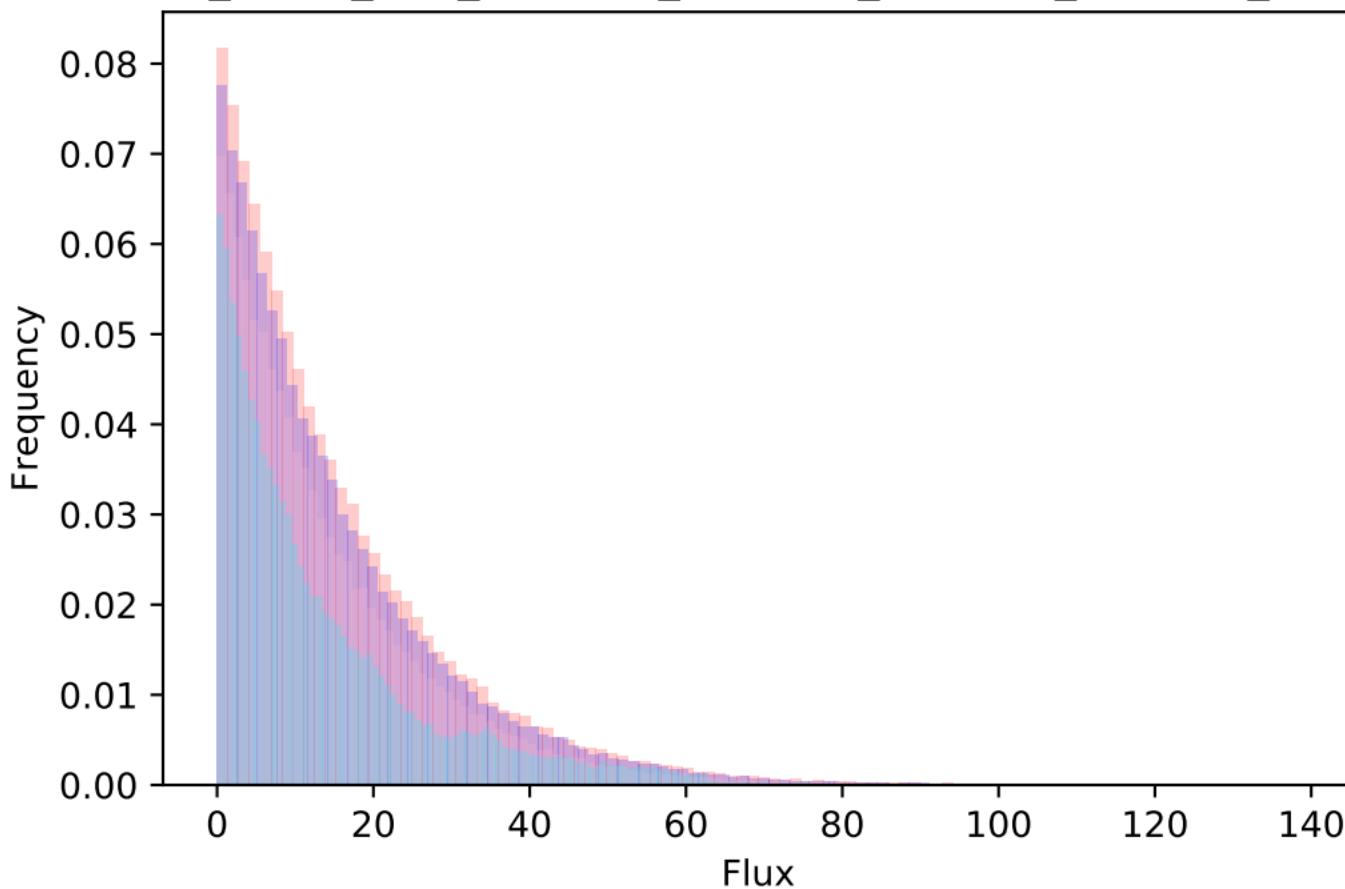


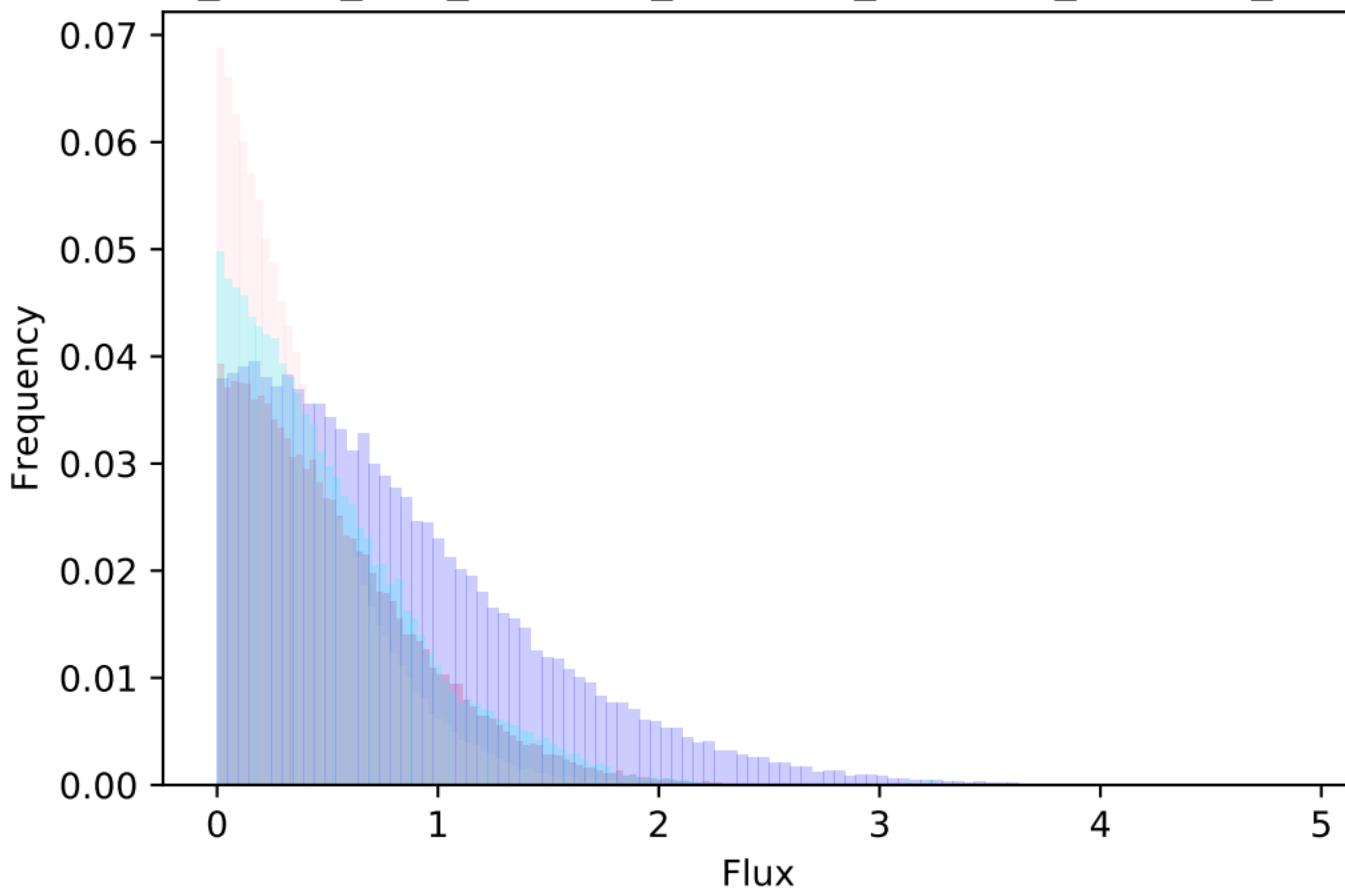
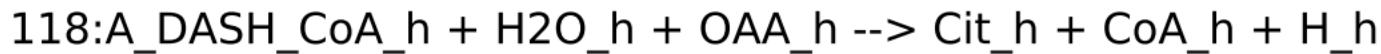




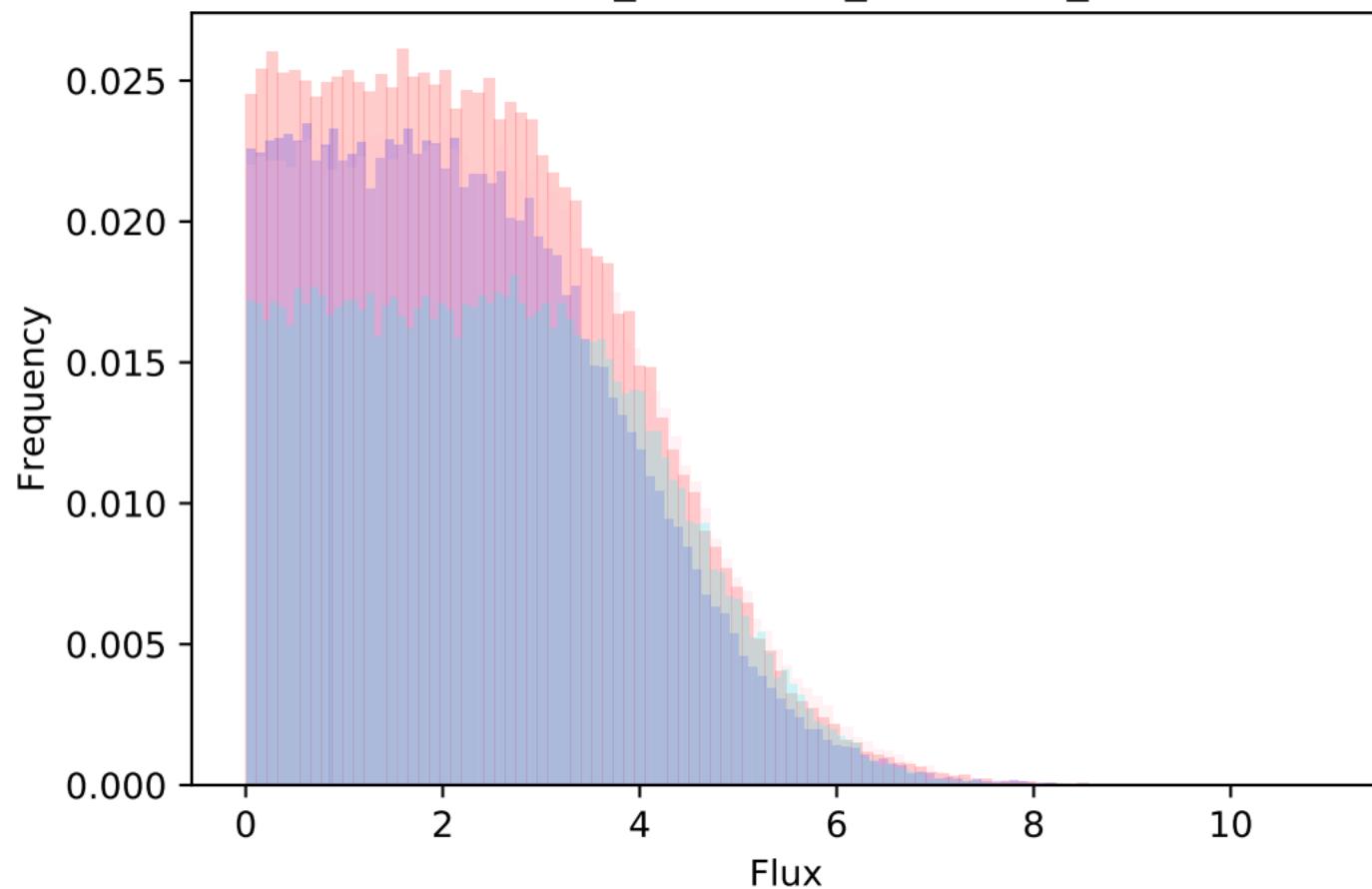


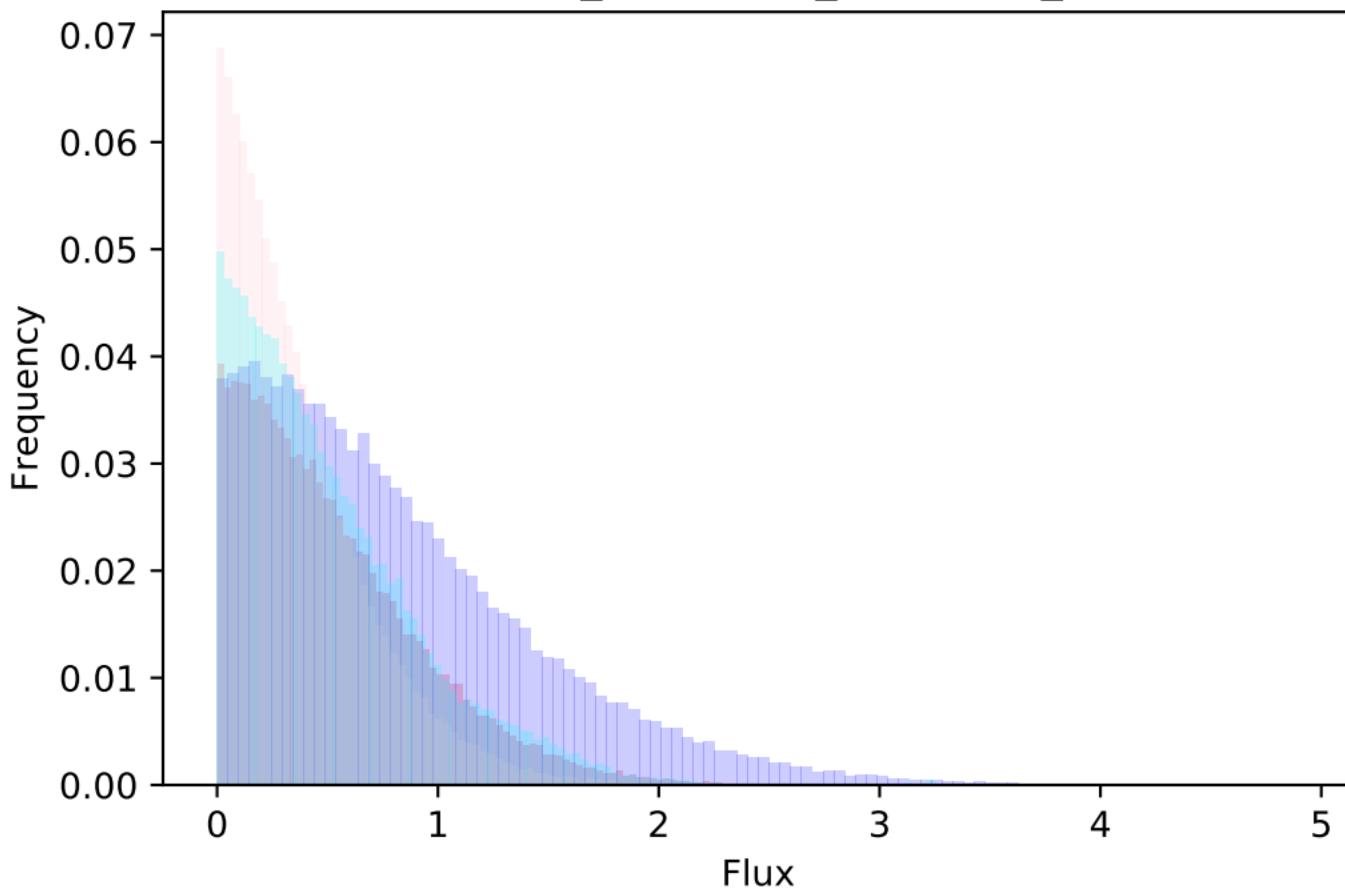
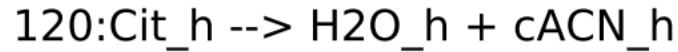
117:A_DASH_CoA_c + H2O_c + OAA_c --> Cit_c + CoA_c + H_c



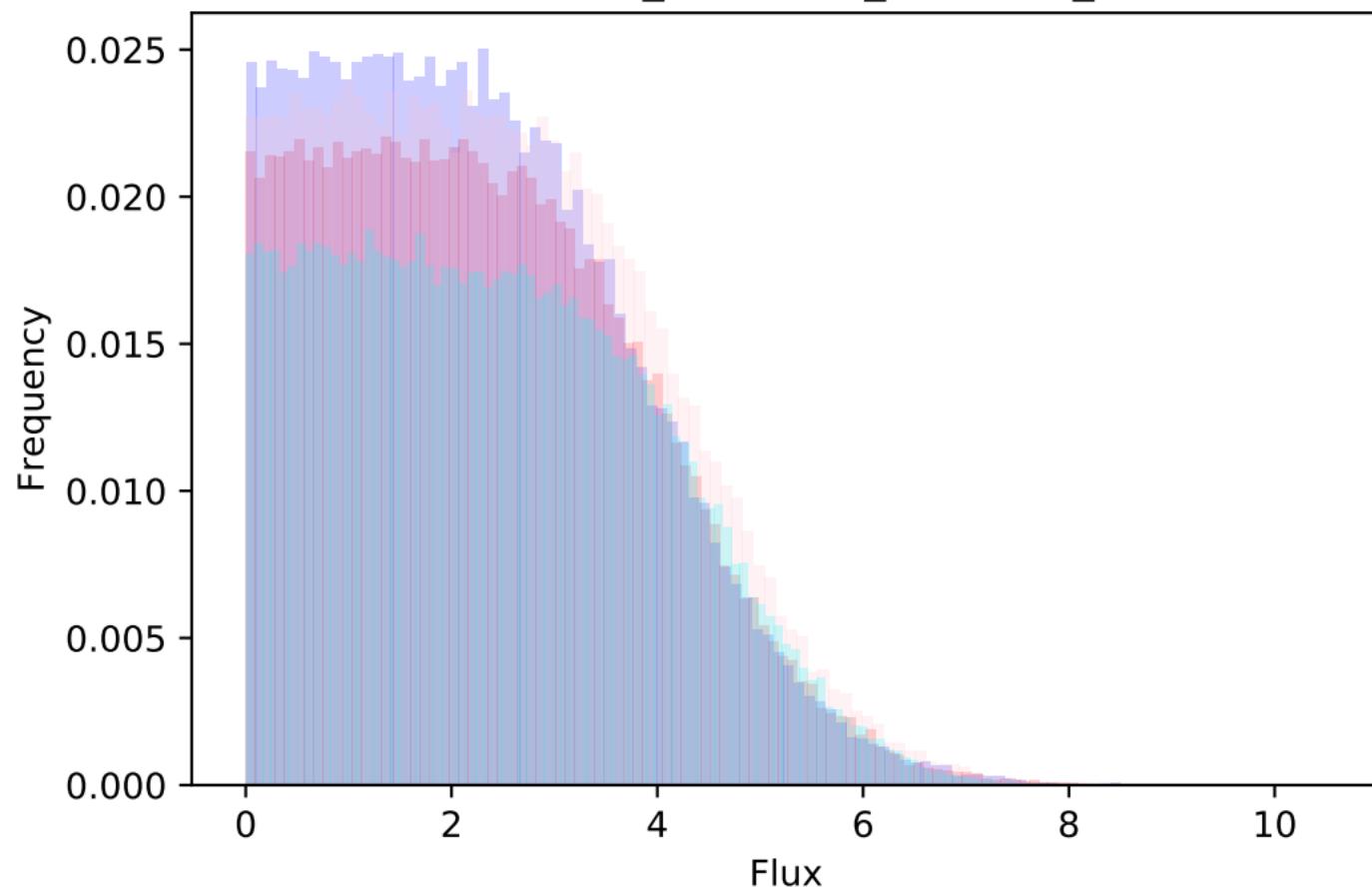


119:Cit_c --> H2O_c + cACN_c

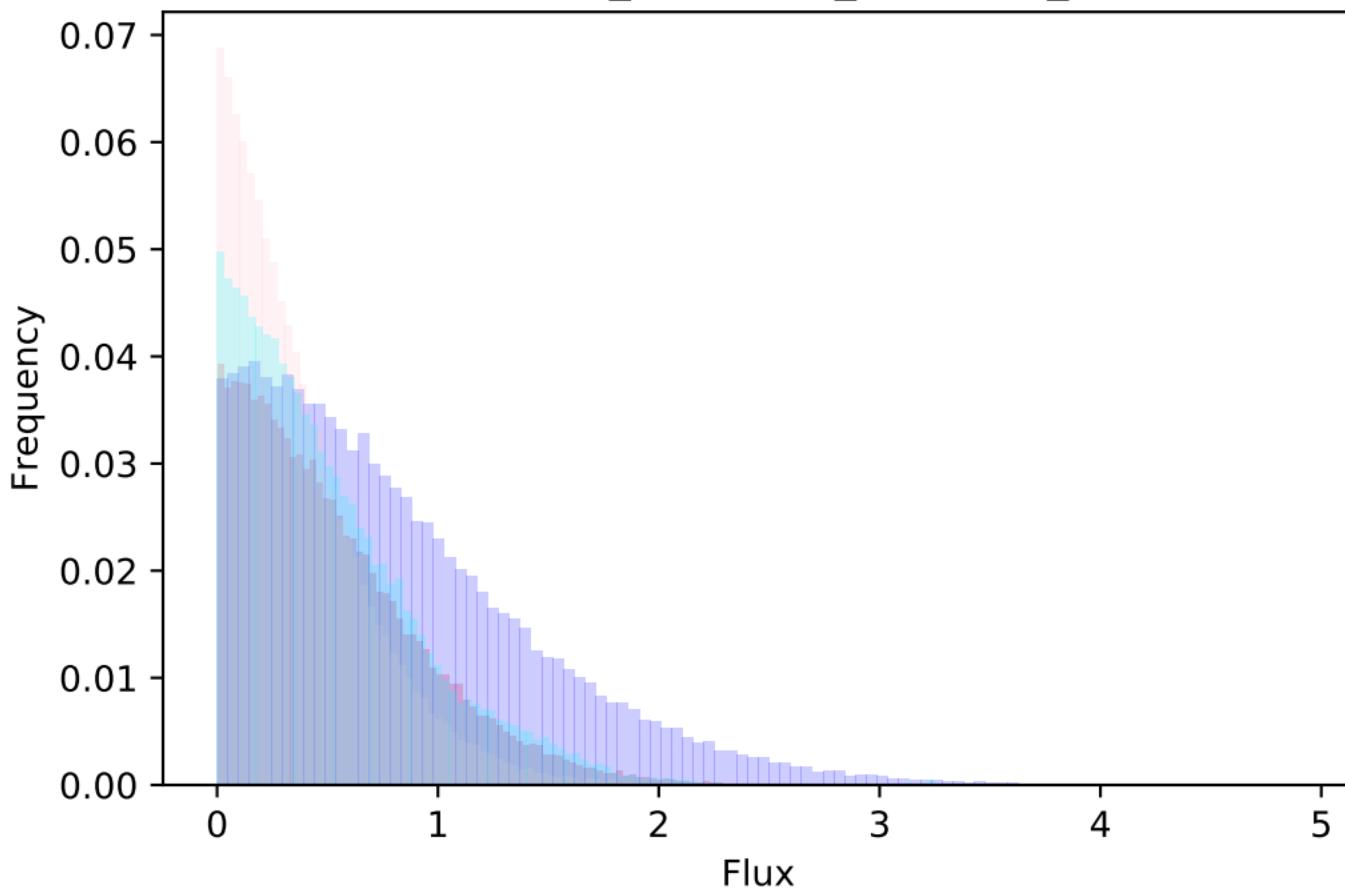




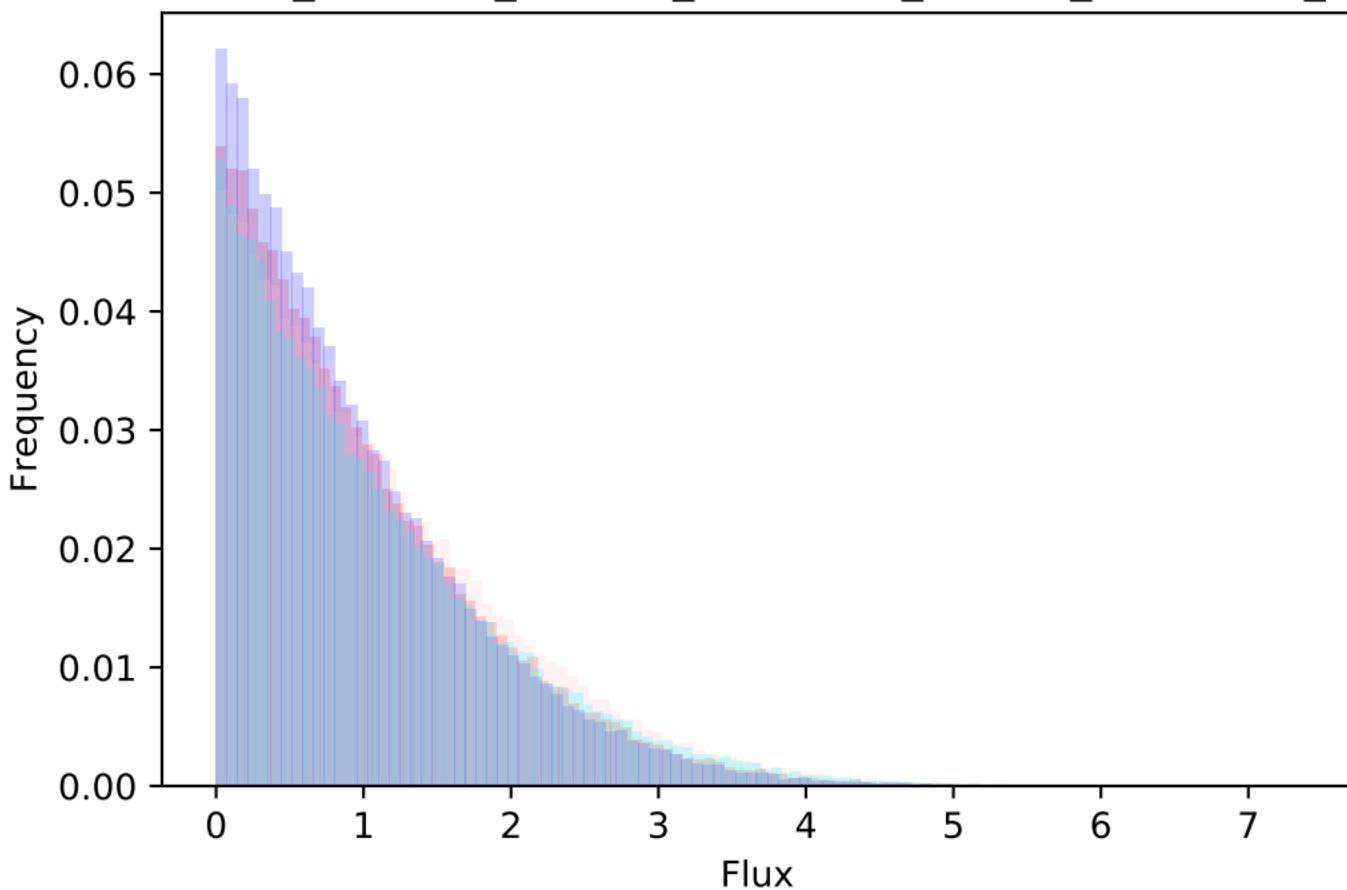
121:H2O_c + cACN_c --> iCit_c

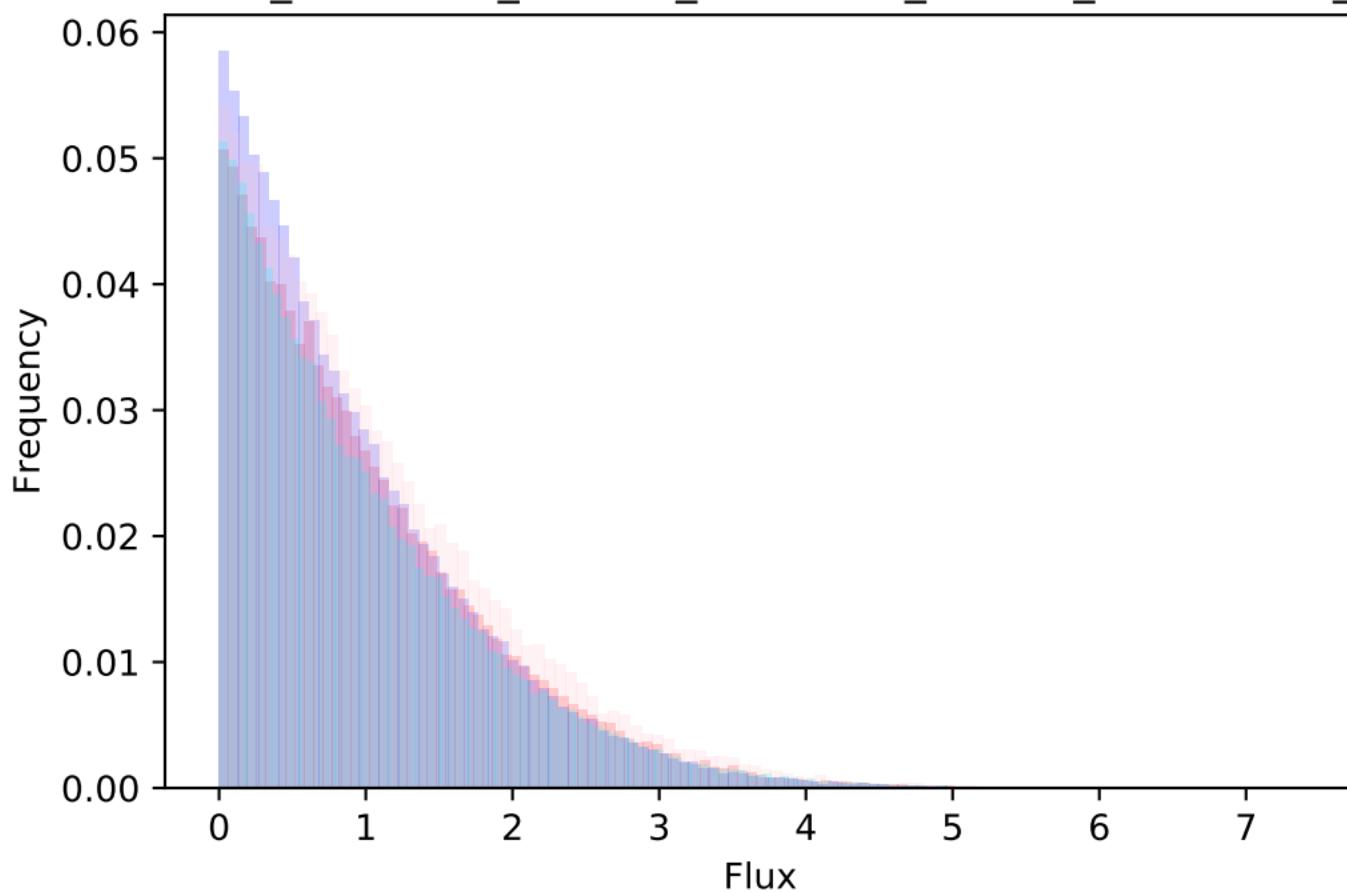
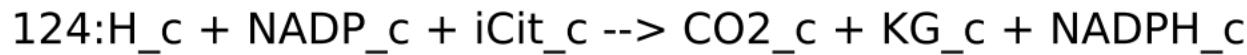


122:H2O_h + cACN_h --> iCit_h

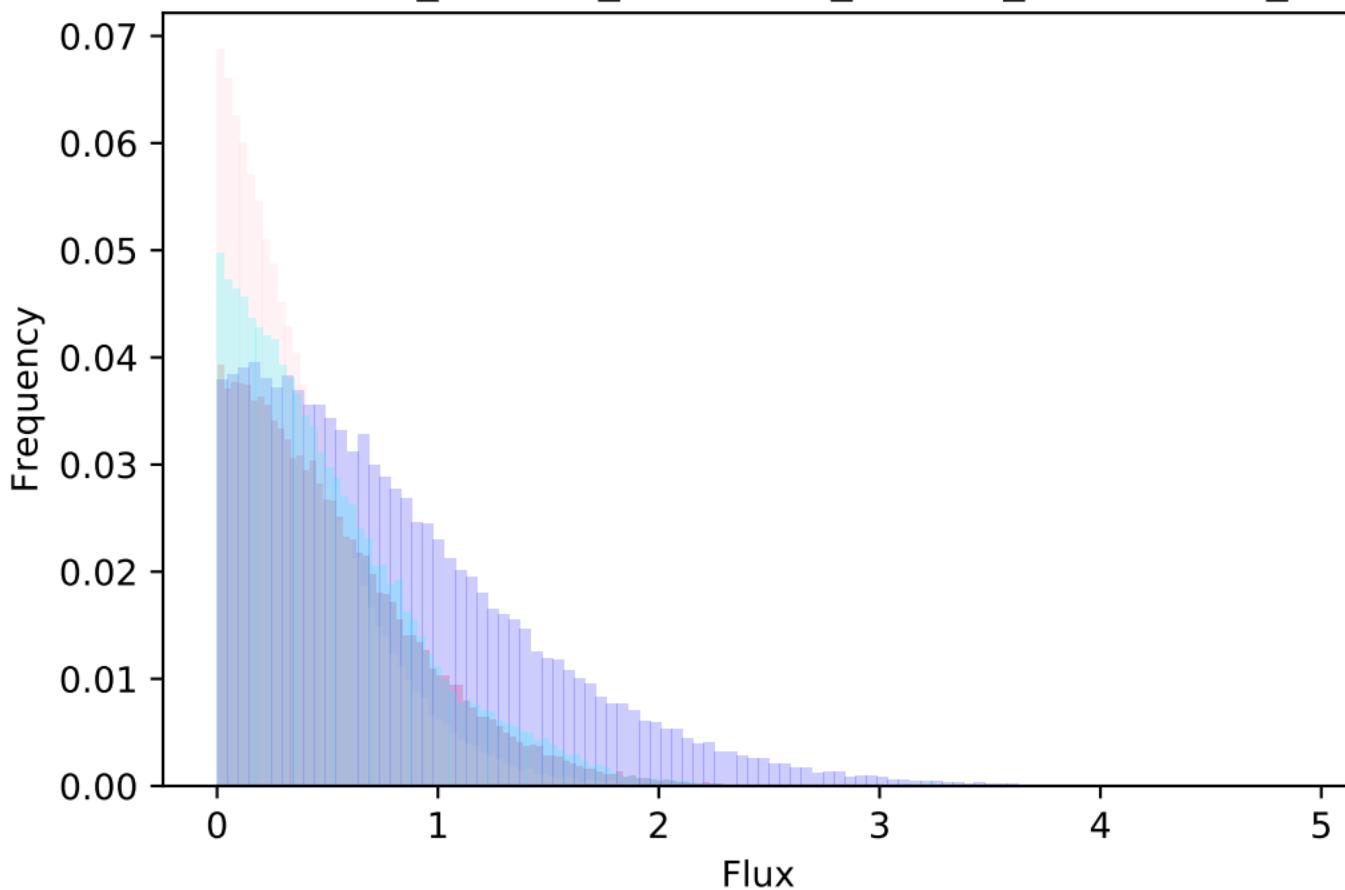


$123:\text{H_c} + \text{NAD_c} + \text{iCit_c} \rightarrow \text{CO2_c} + \text{KG_c} + \text{NADH_c}$

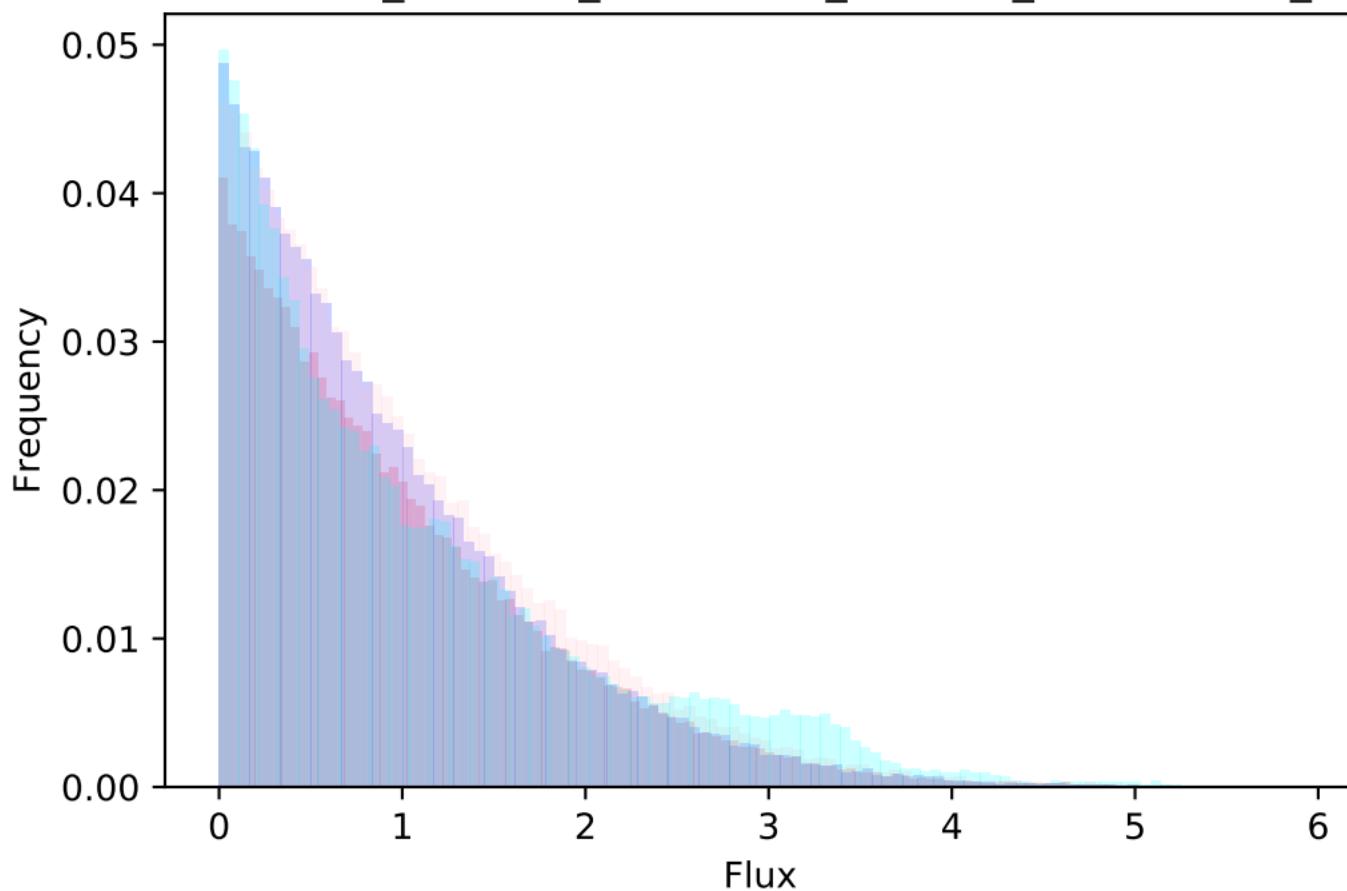




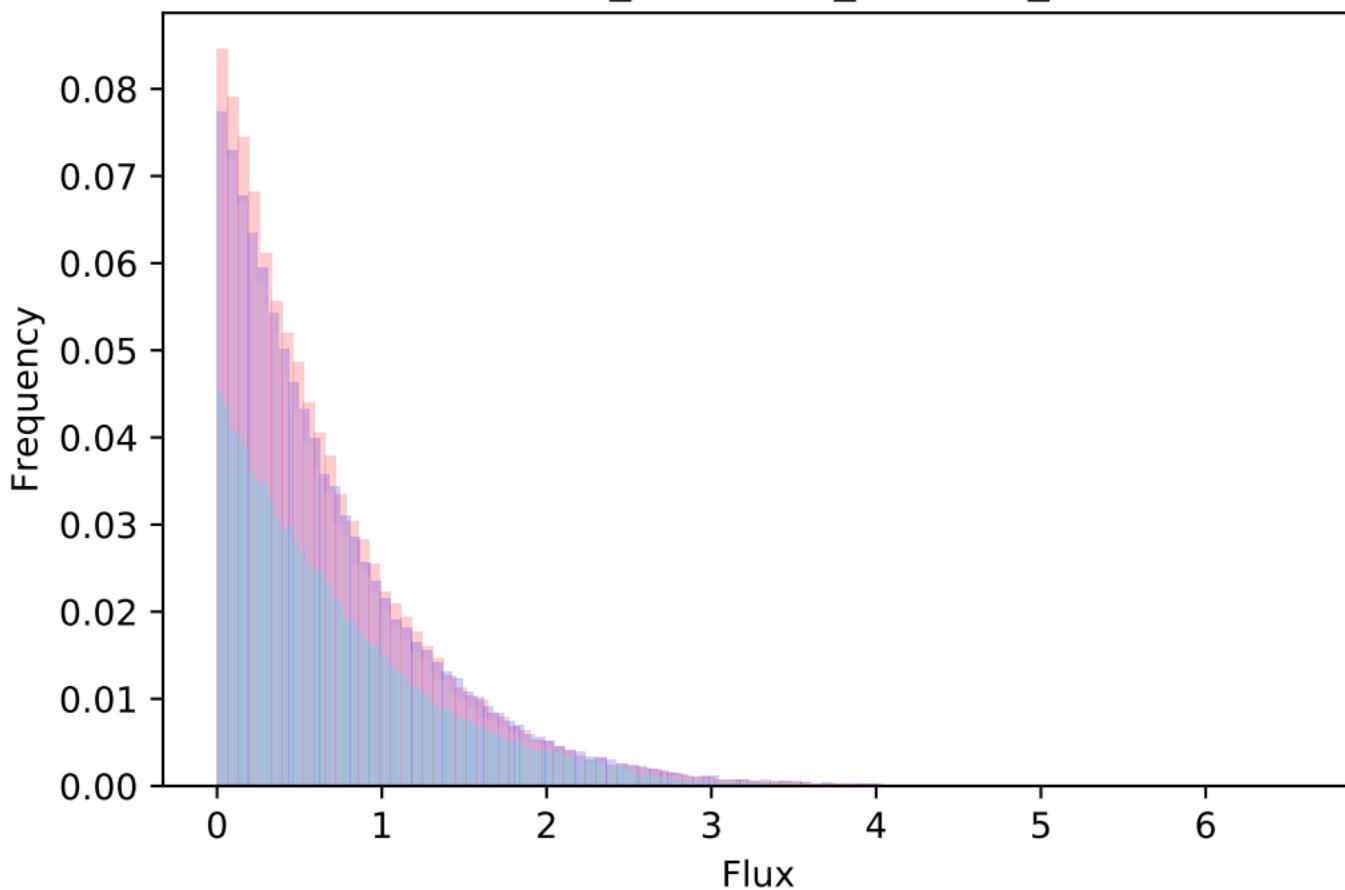
$125:\text{NADP_h} + \text{iCit_h} \rightarrow \text{CO2_h} + \text{KG_h} + \text{NADPH_h}$



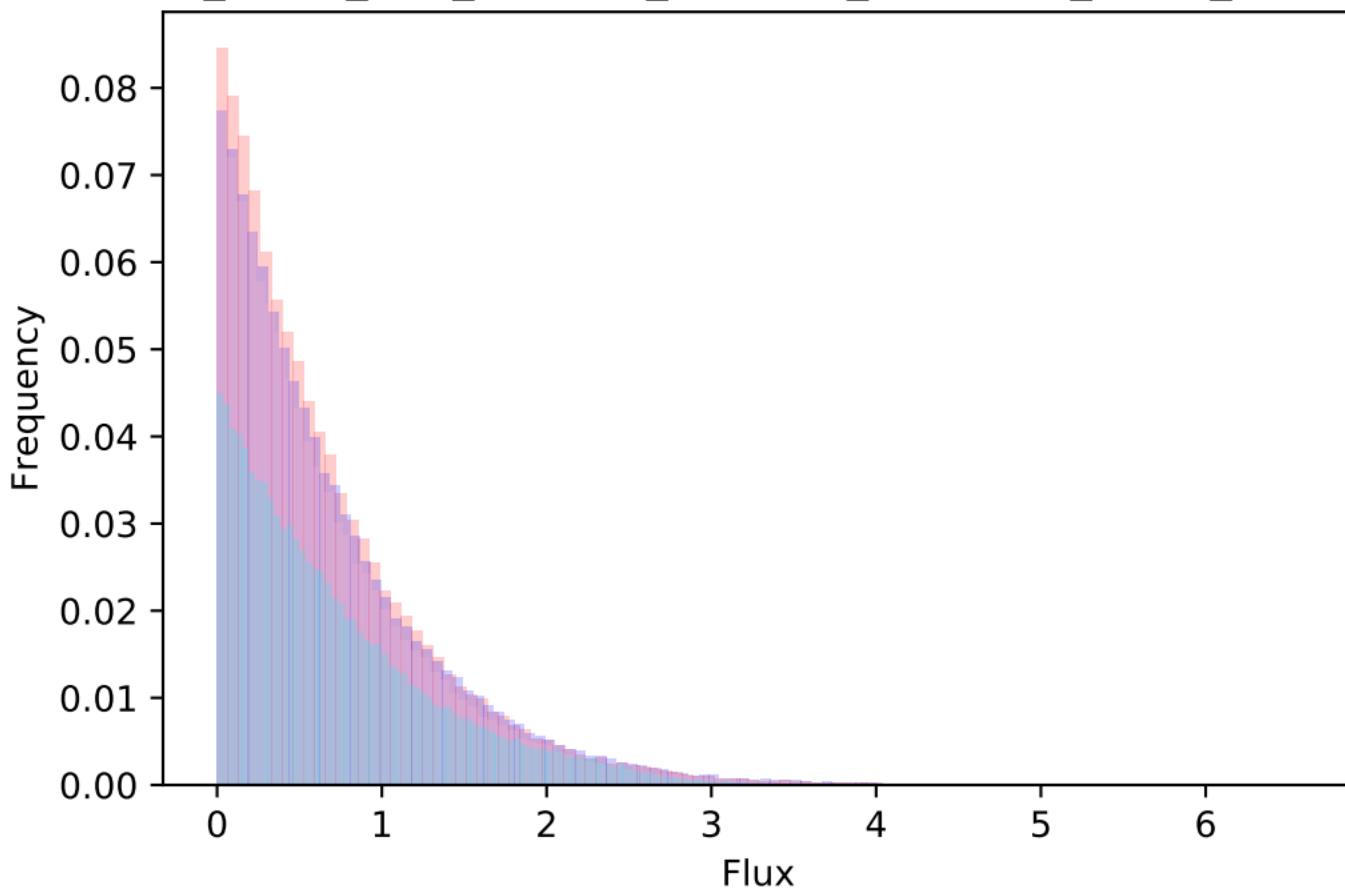
126:NADP_m + iCit_m --> CO2_m + KG_m + NADPH_m



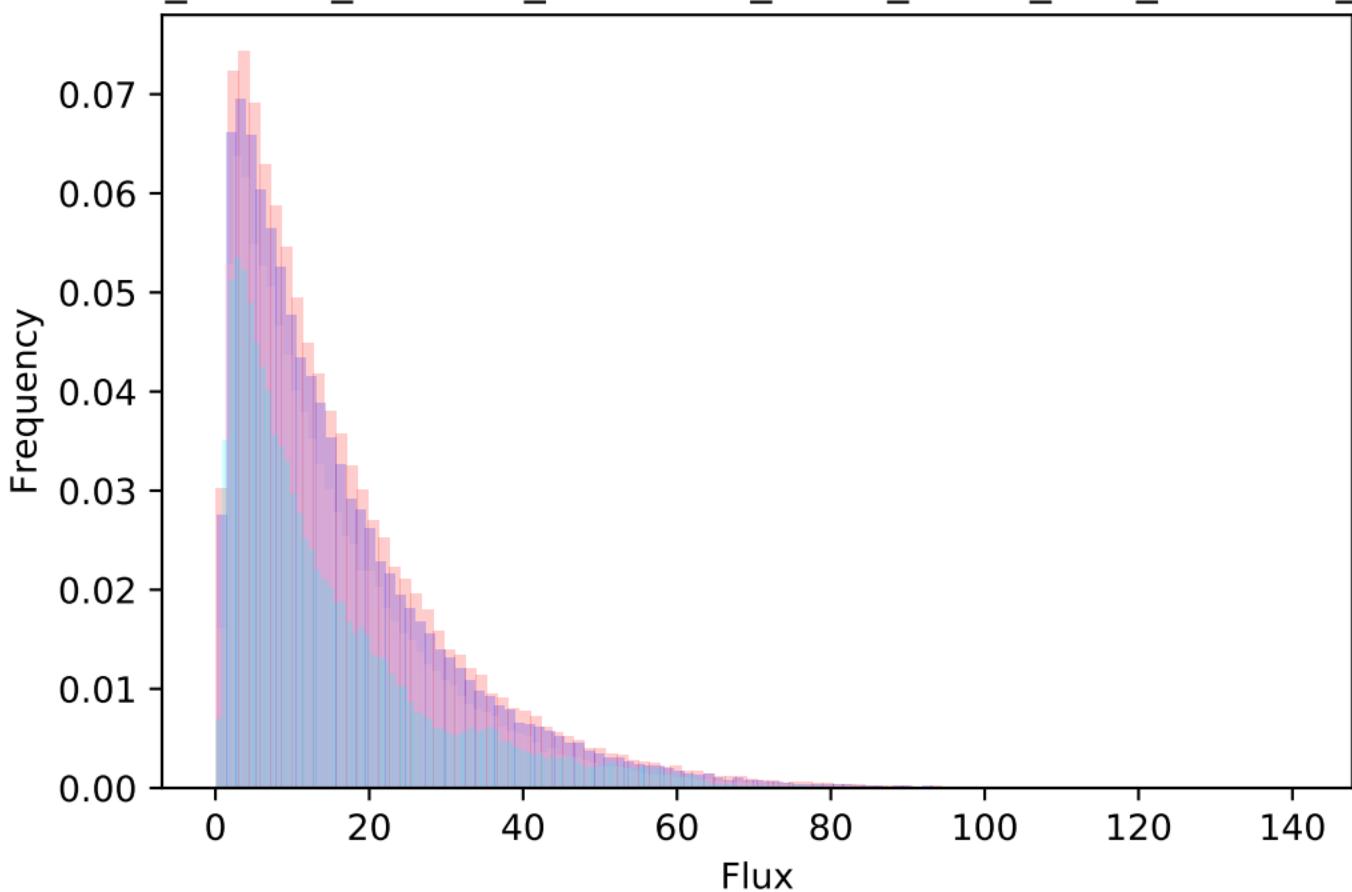
127:iCit_c --> GLX_c + SCA_c

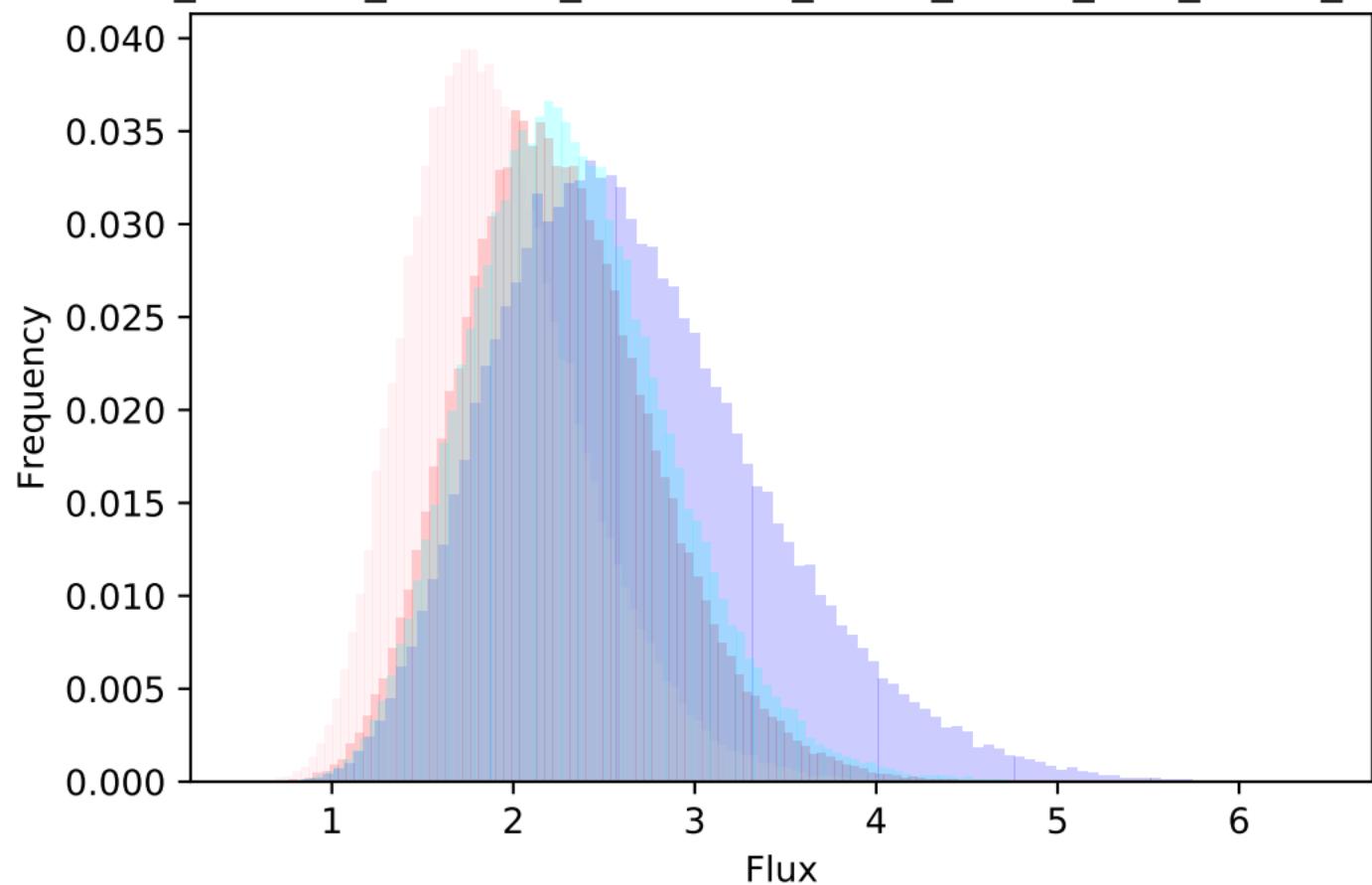


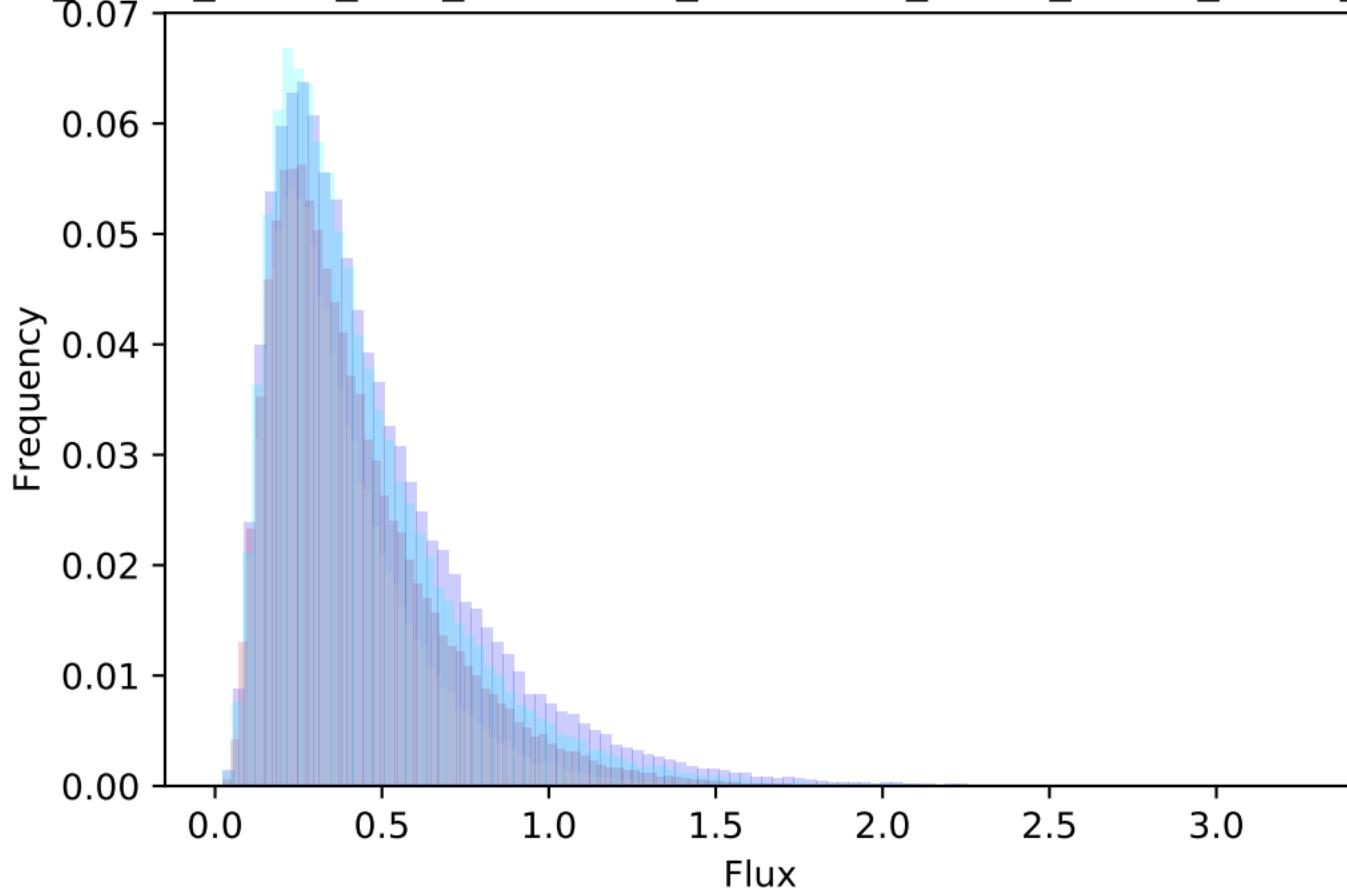
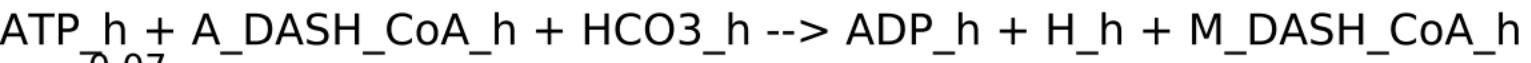
128:A_DASH_CoA_c + GLX_c + H2O_c --> CoA_c + H_c + Mal_c



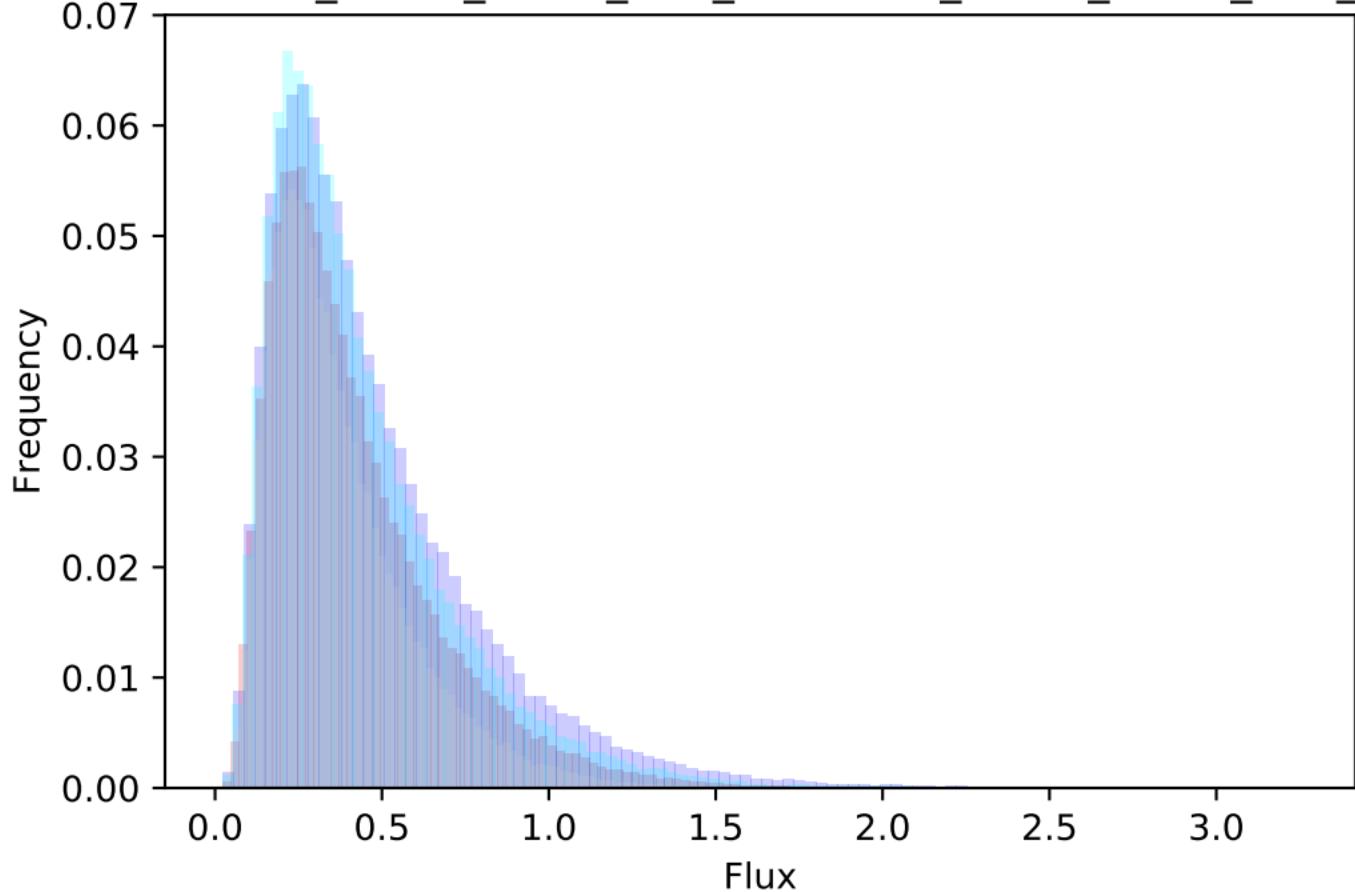
129:ATP_c + Cit_c + CoA_c --> ADP_c + A_DASH_CoA_c + OAA_c + Pi_c



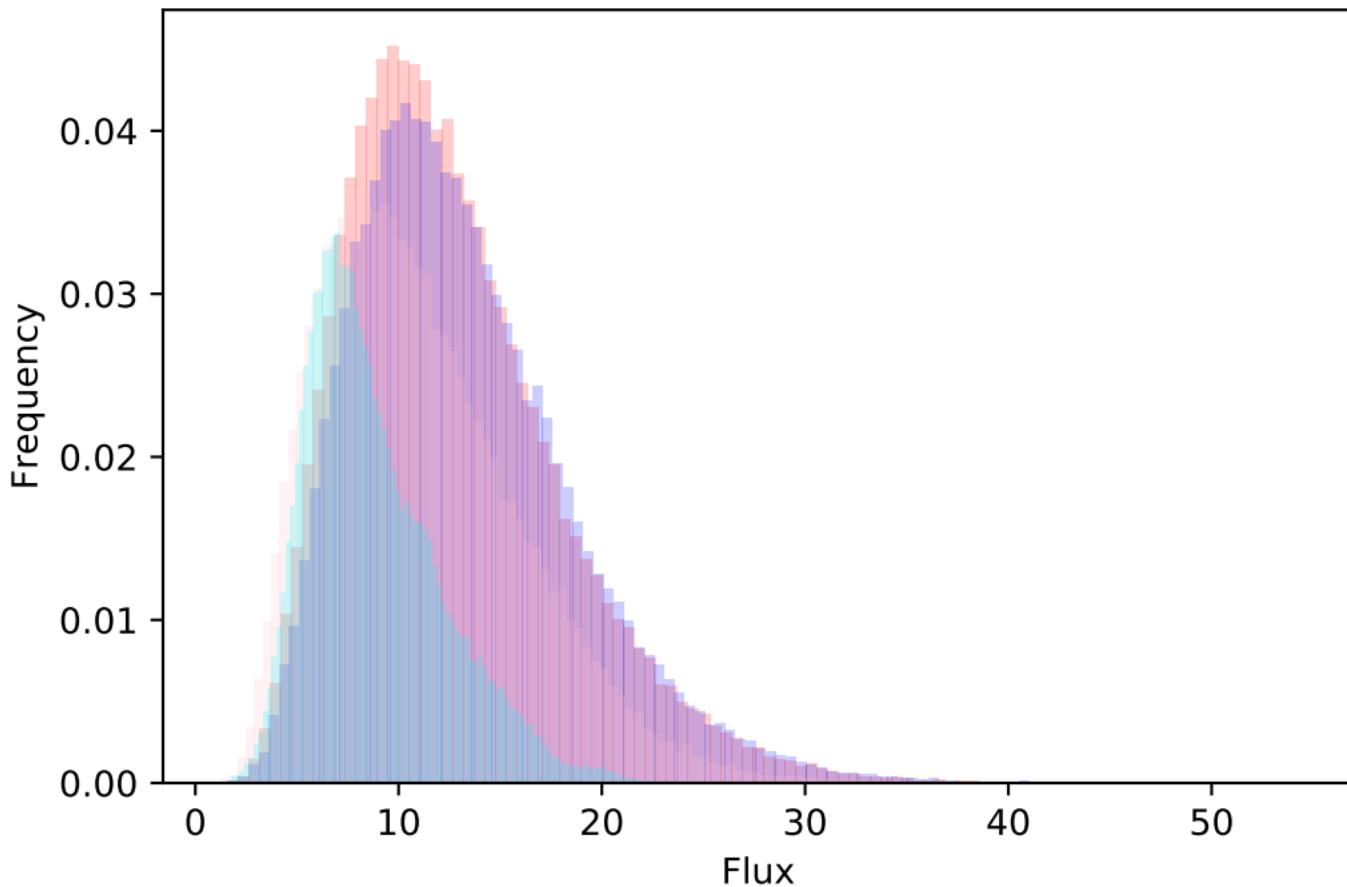


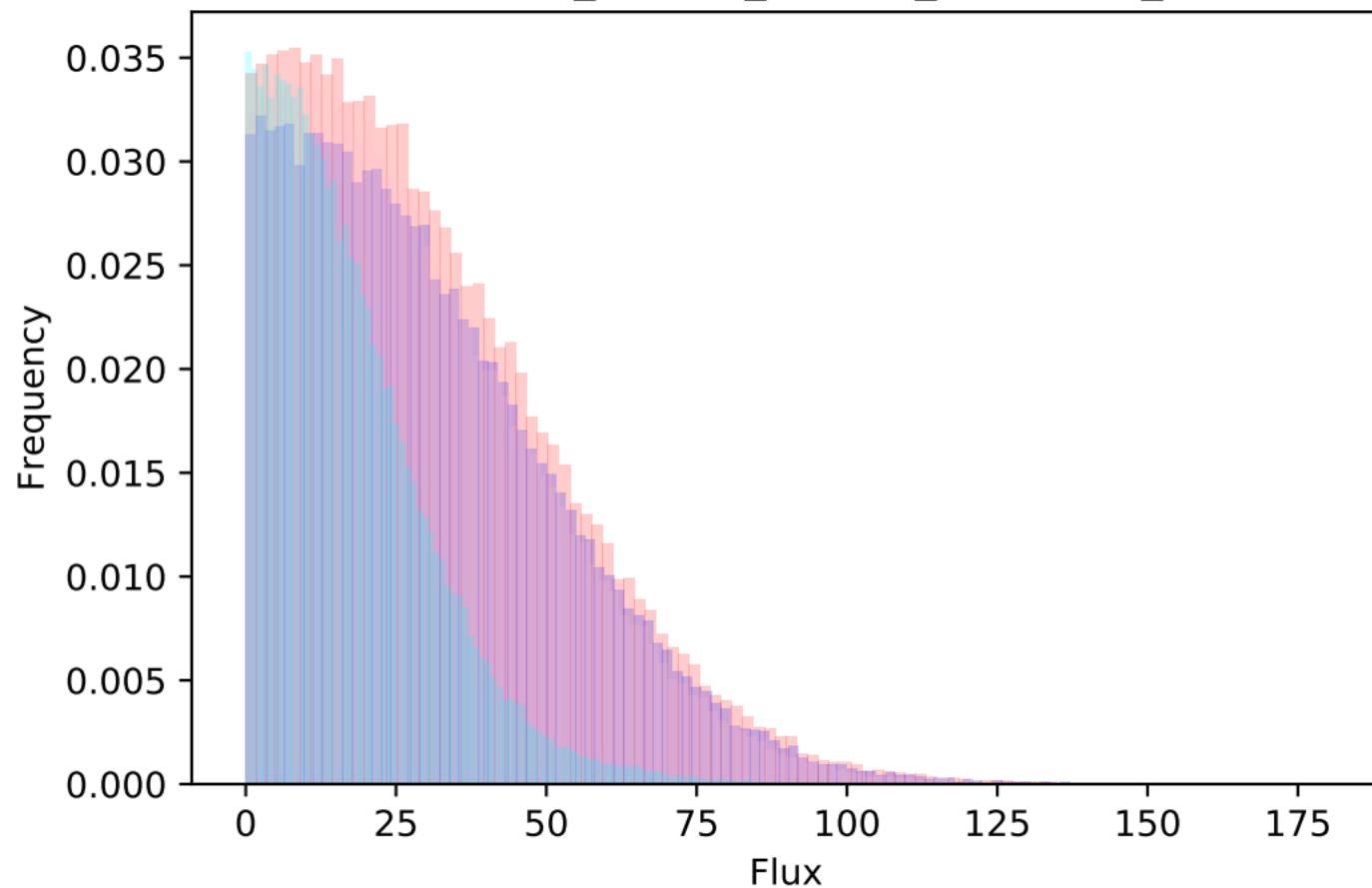
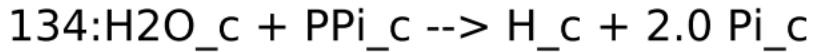


$132:\text{ACP_h} + \text{M_DASH_CoA_h} \rightarrow \text{CoA_h} + \text{M_DASH_ACP_h}$

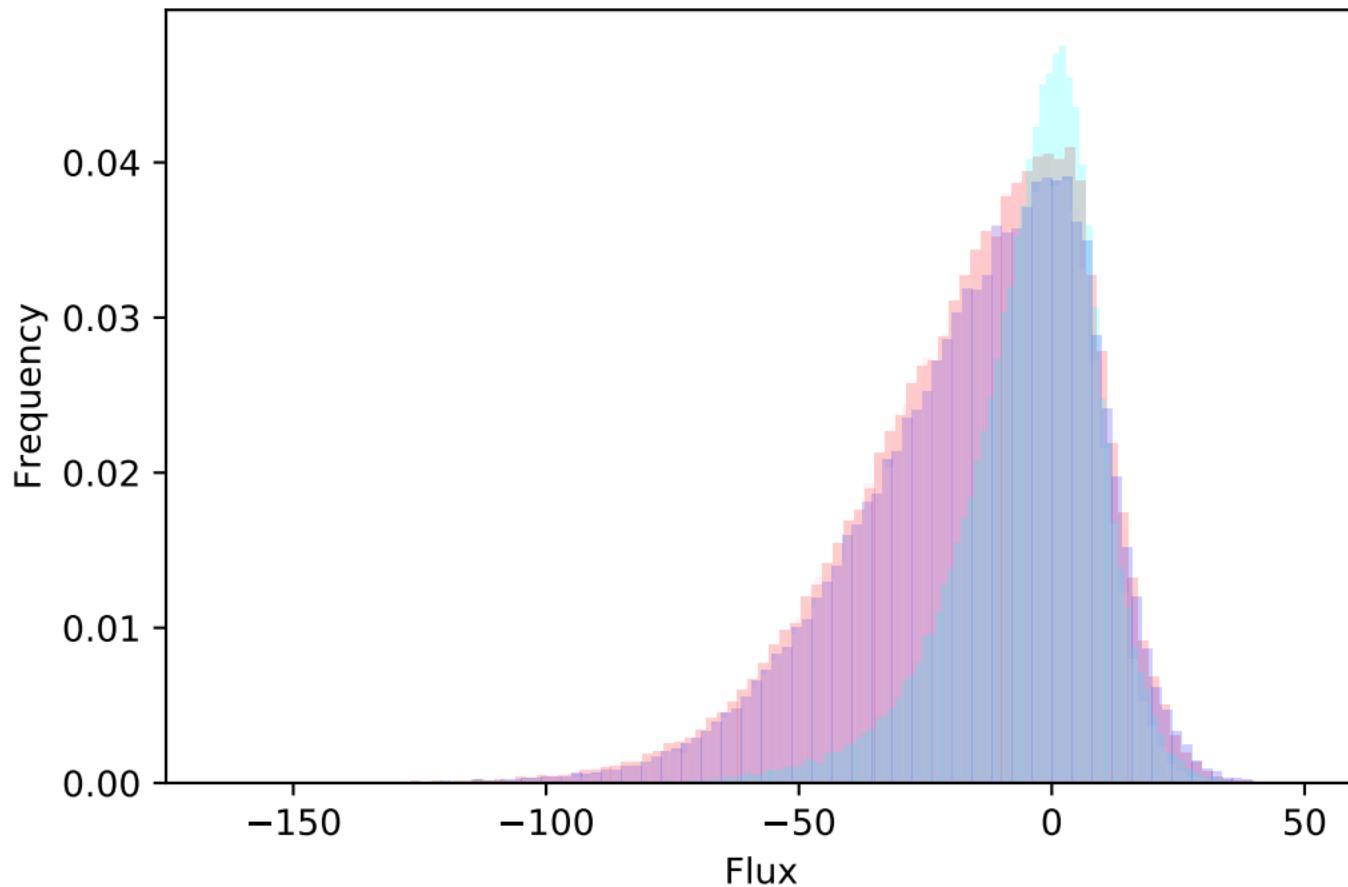


133:H2O_h + PPi_h --> 2.0 Pi_h

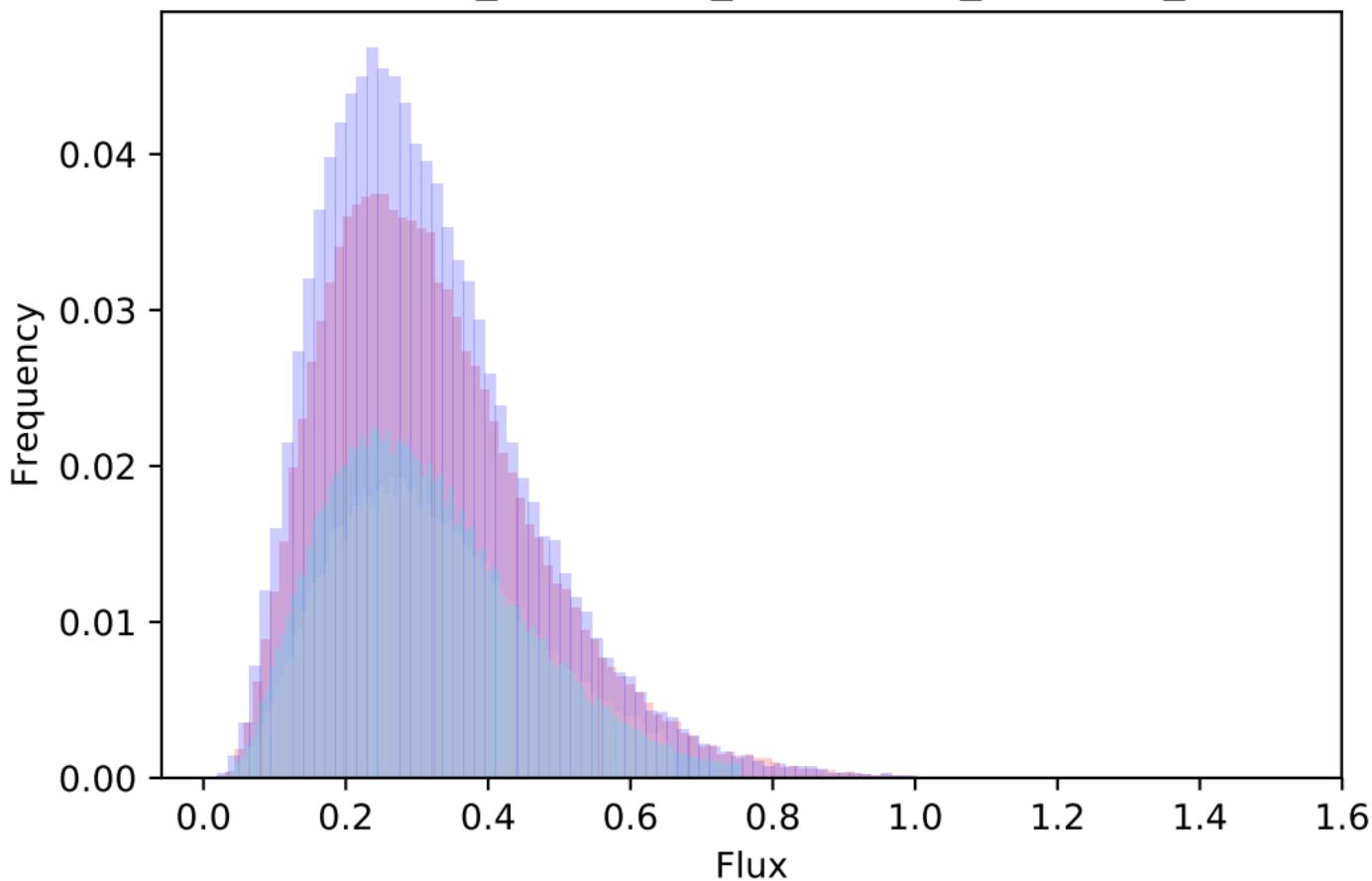




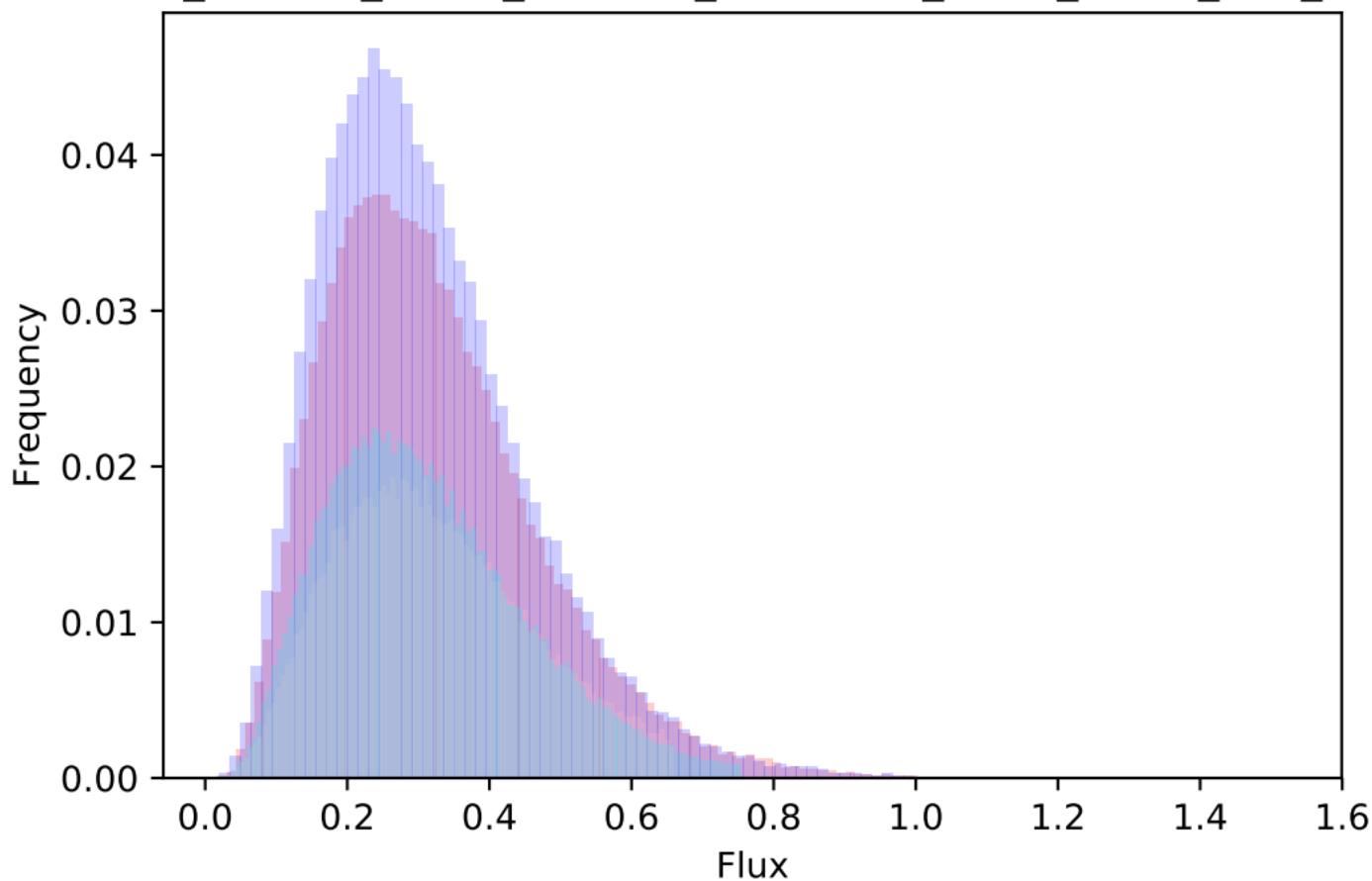
$135:\text{F6P_c} + \text{PPi_c} \rightleftharpoons \text{FBP_c} + \text{H_c} + \text{Pi_c}$



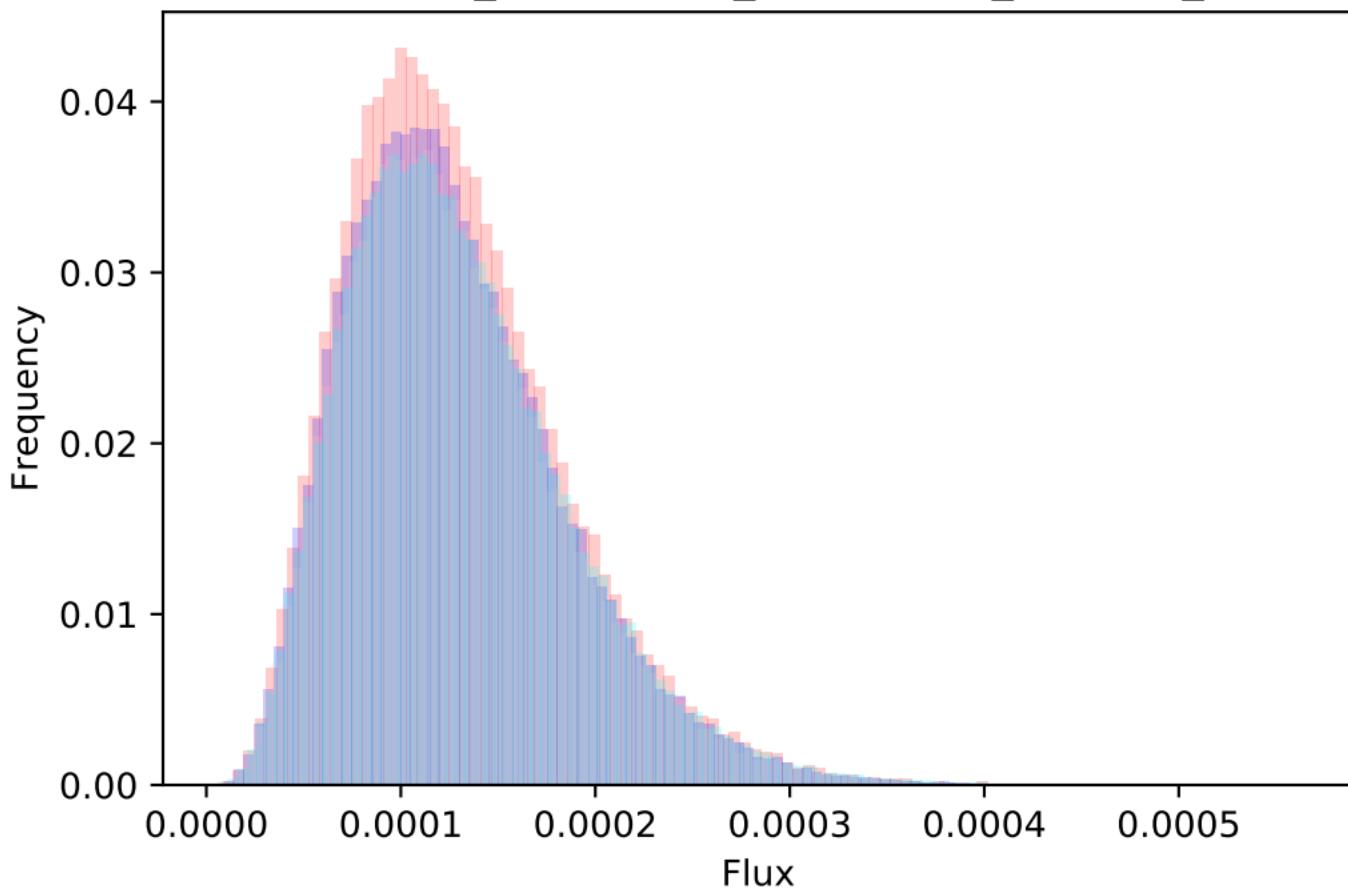
$136:\text{CO}_2\text{-h} + \text{NADH-h} \rightleftharpoons \text{For-h} + \text{NAD-h}$



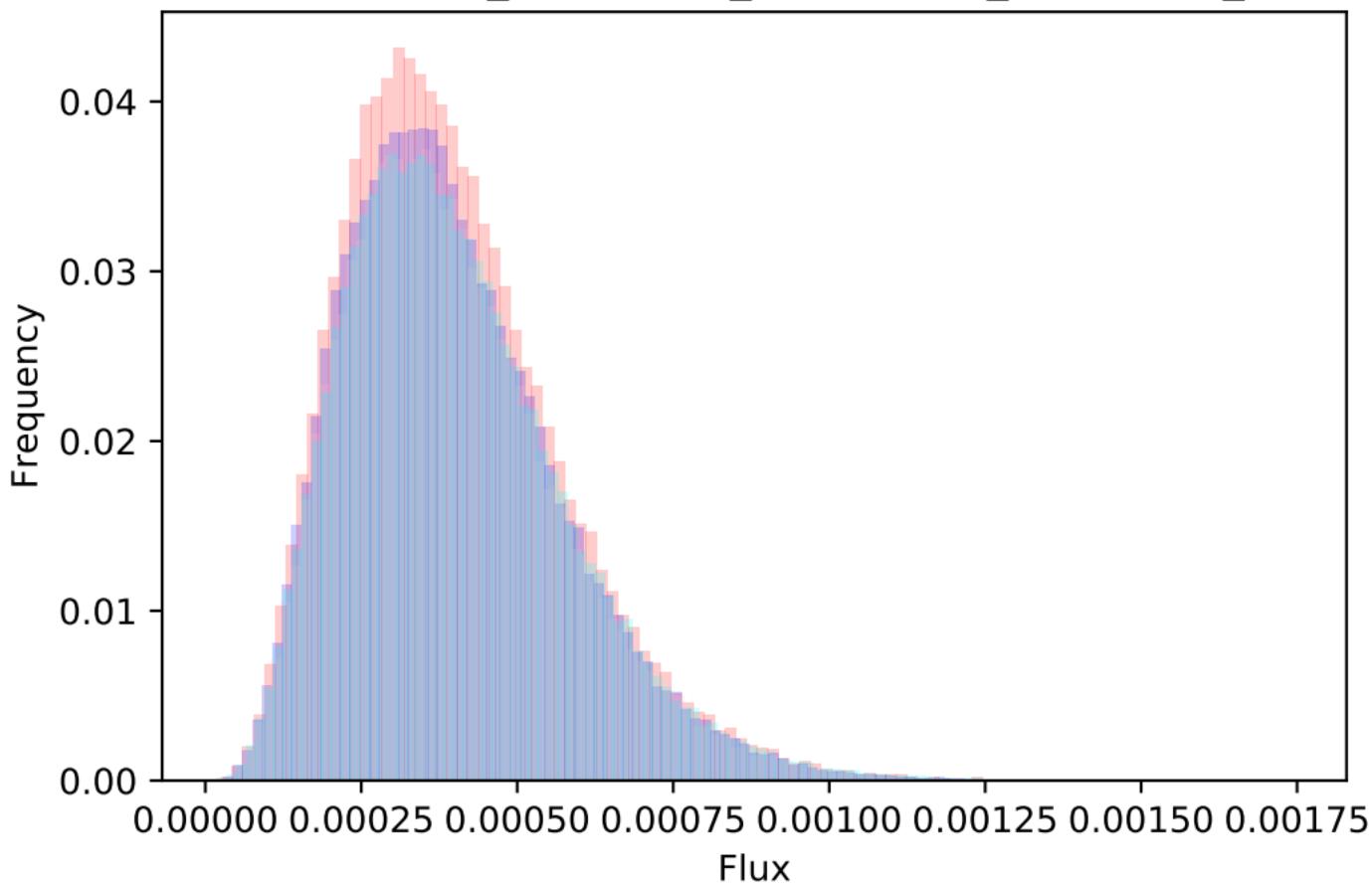
137:ATP_h + For_h + H_h + THF_h --> ADP_h + F_DASH_THF_h + Pi_h

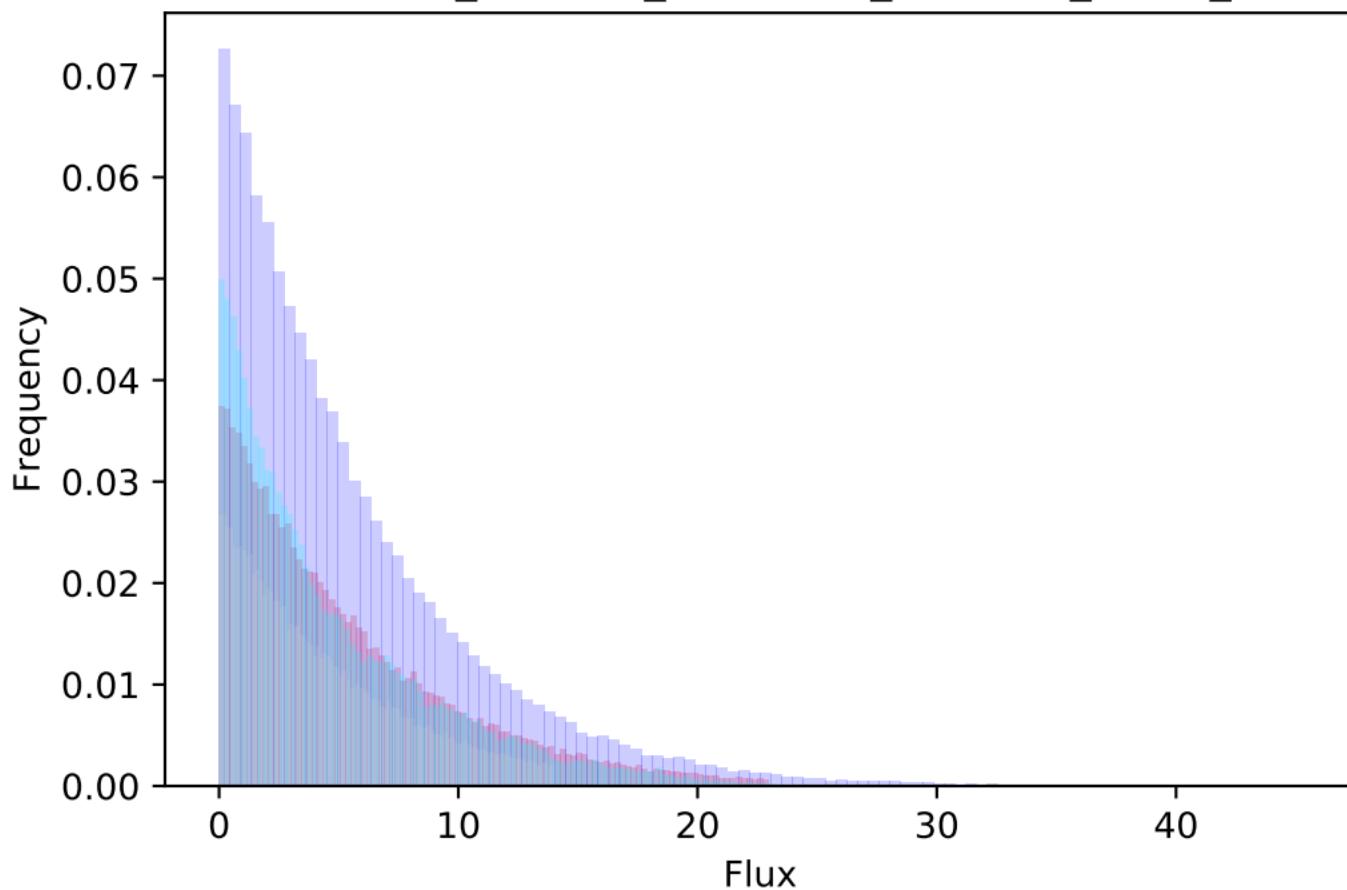
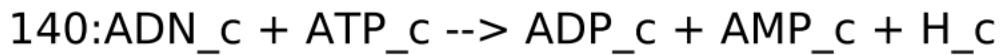


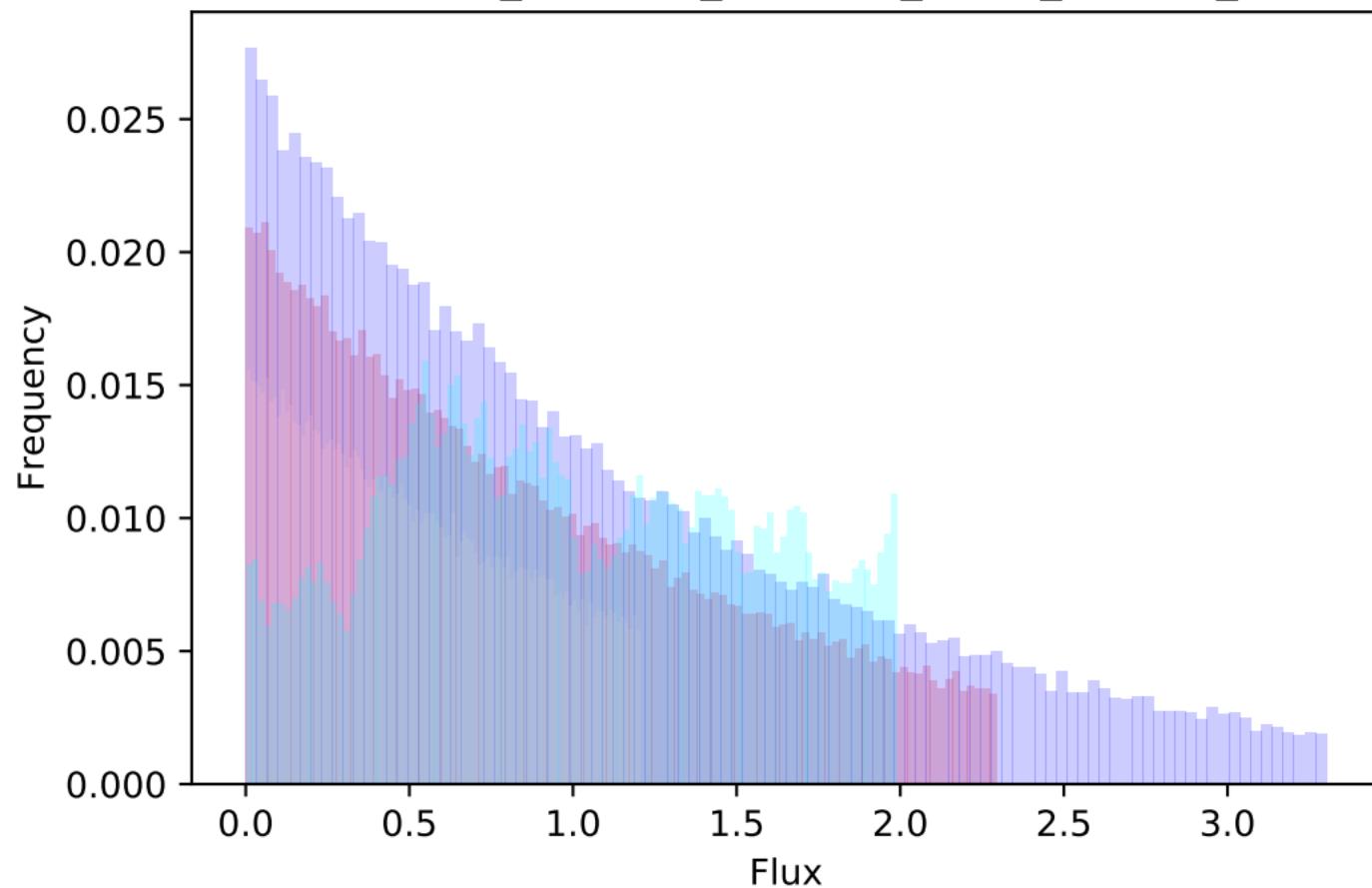
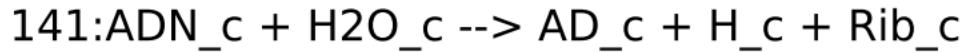
138:DHF_c + NADPH_c --> NADP_c + THF_c

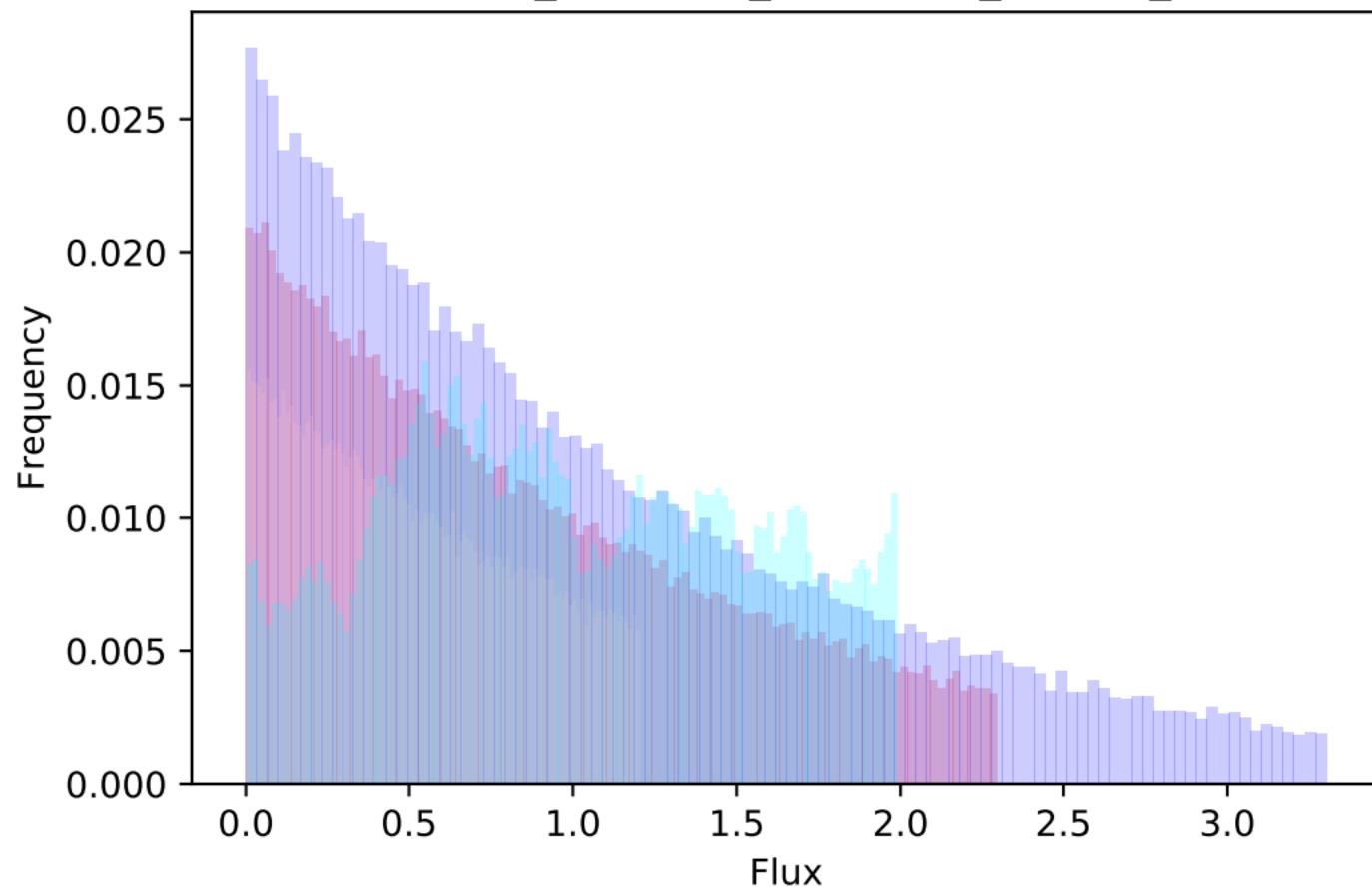
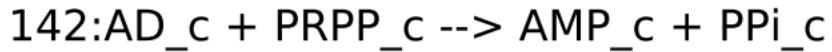


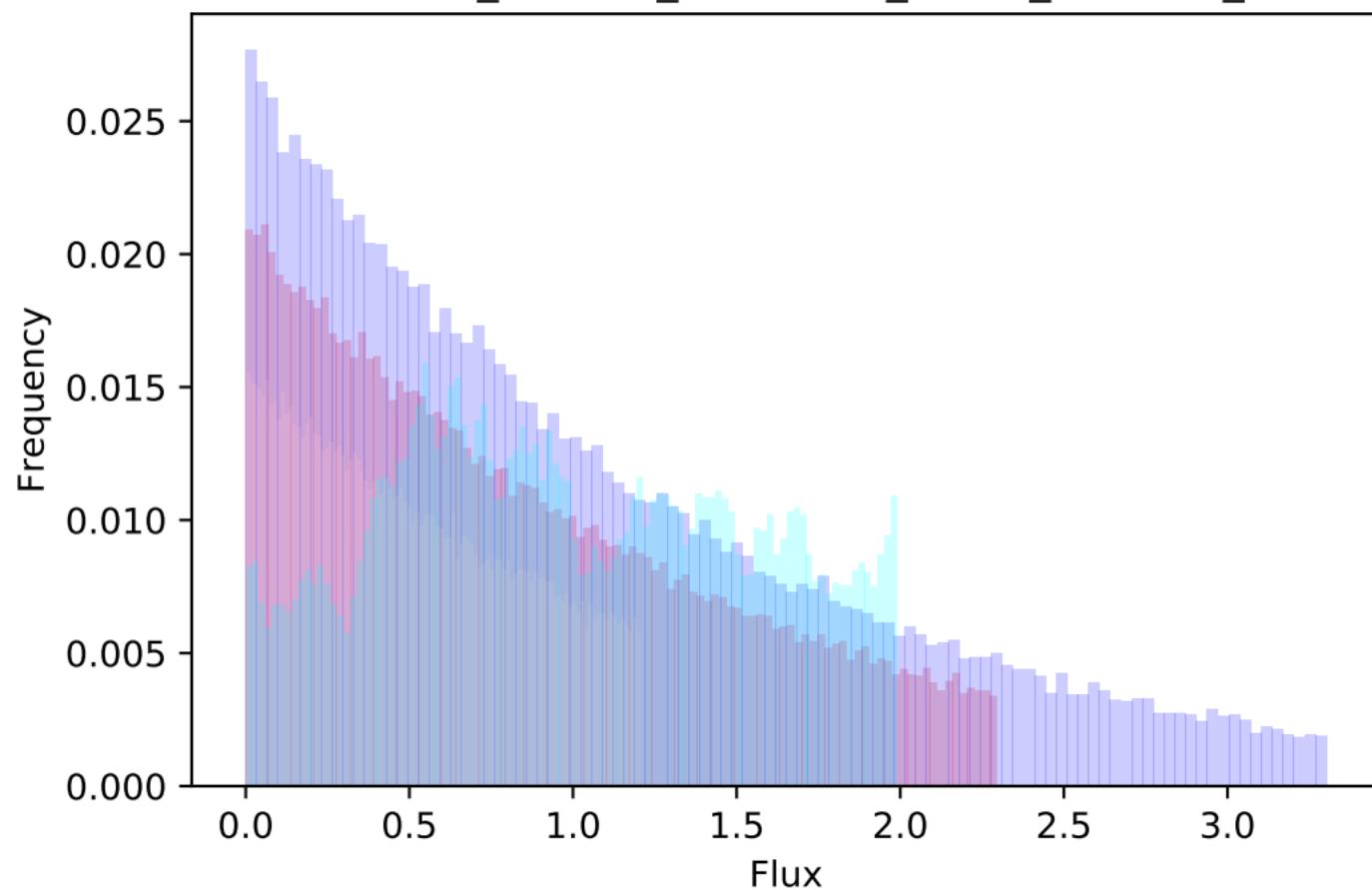
139:NADPH_c + TRXox_c --> NADP_c + TRXrd_c

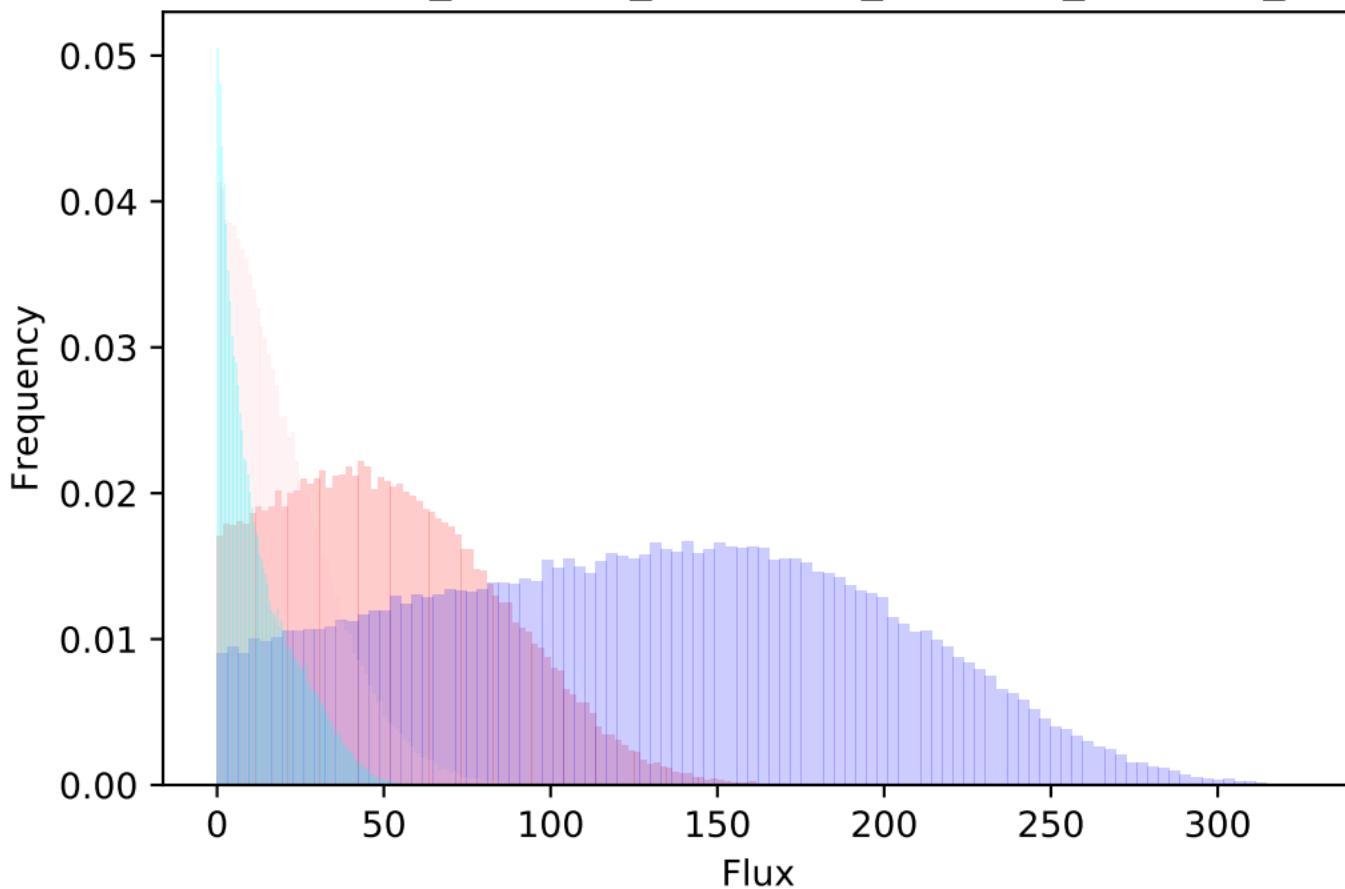
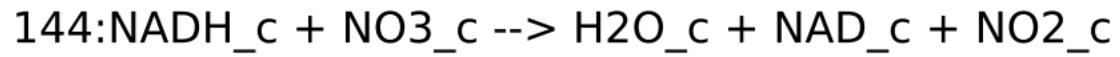


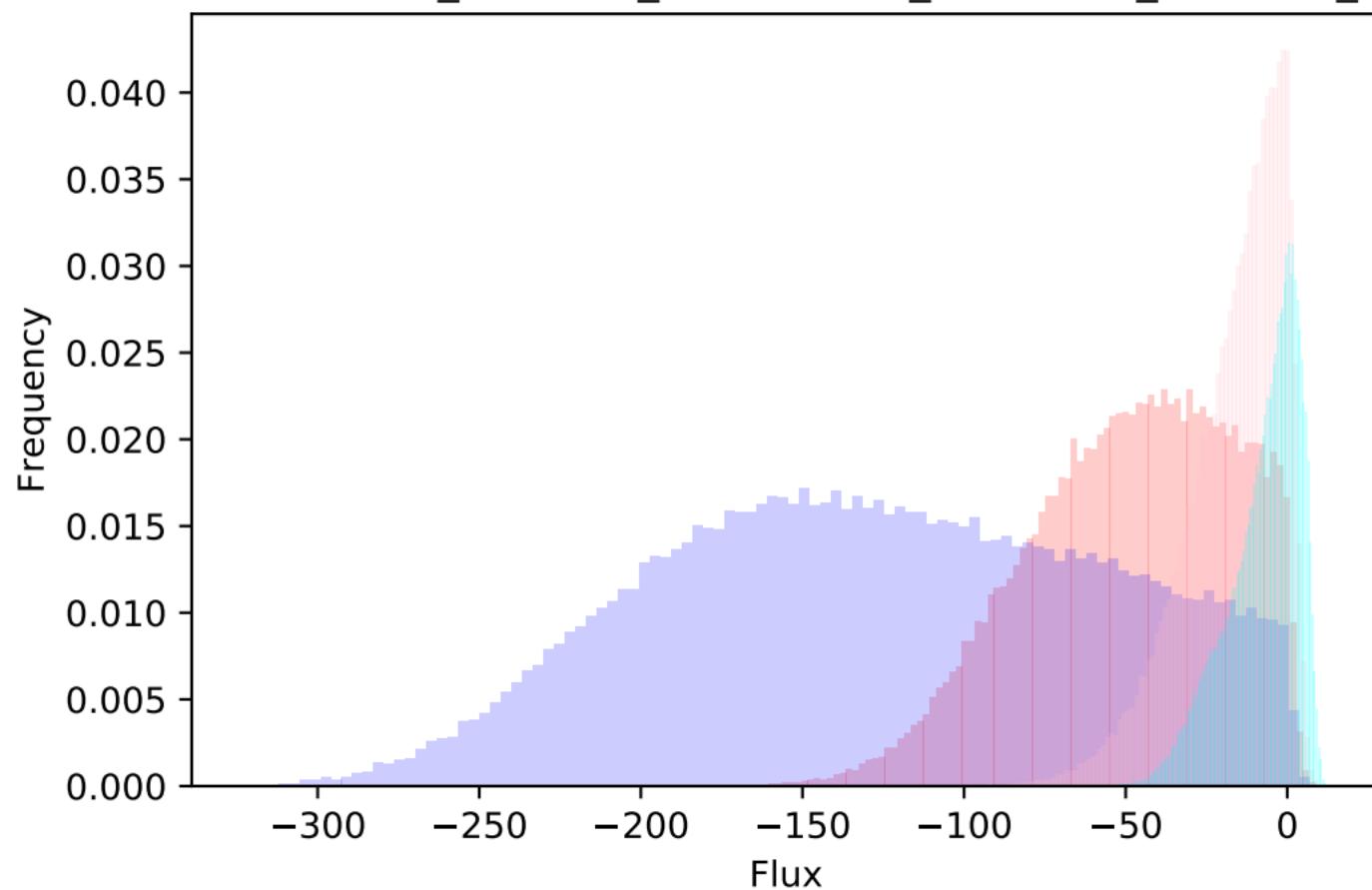
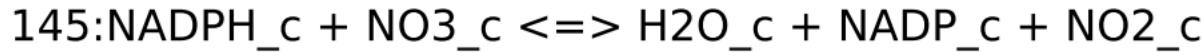


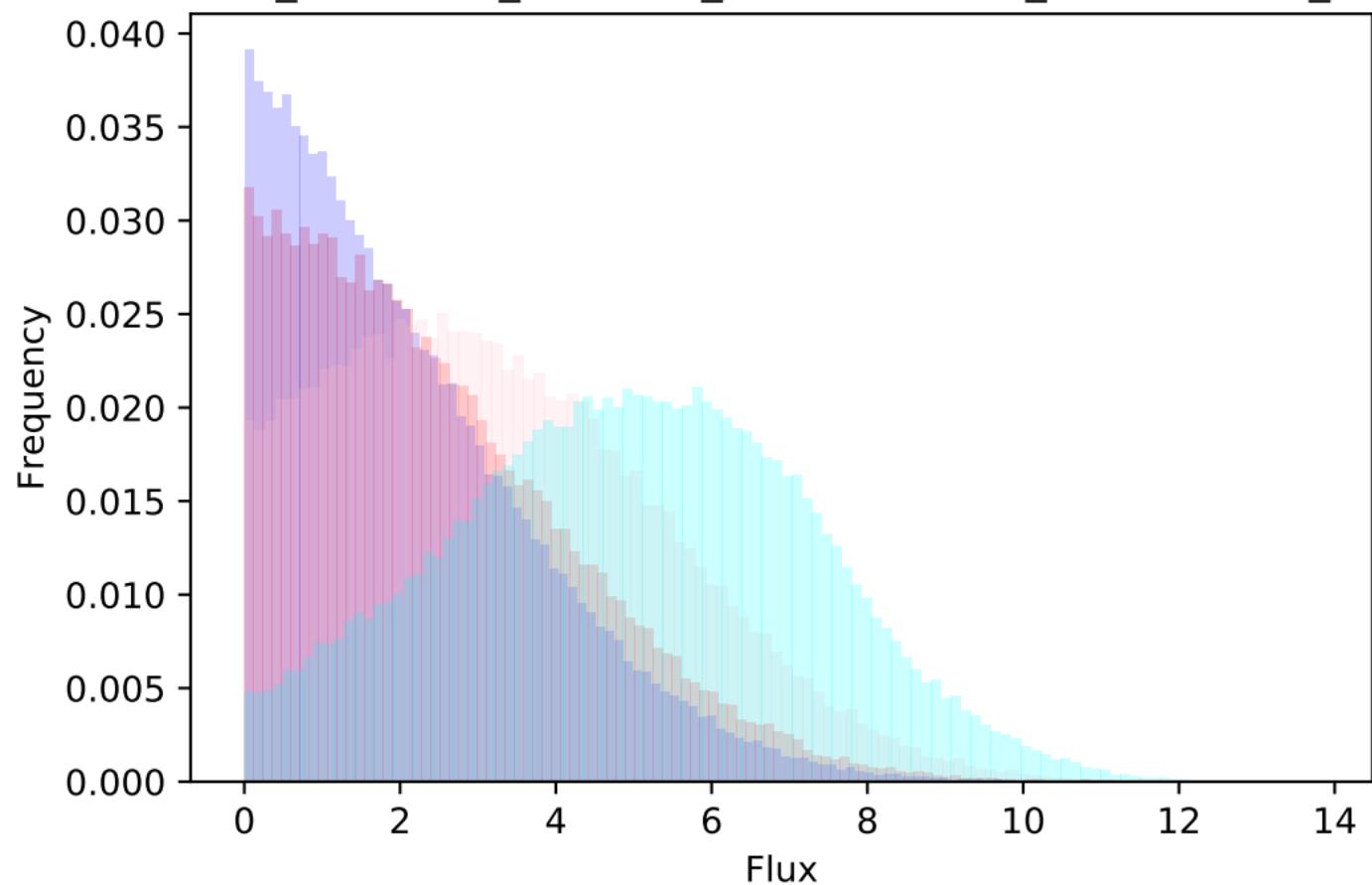
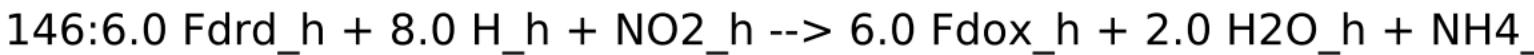


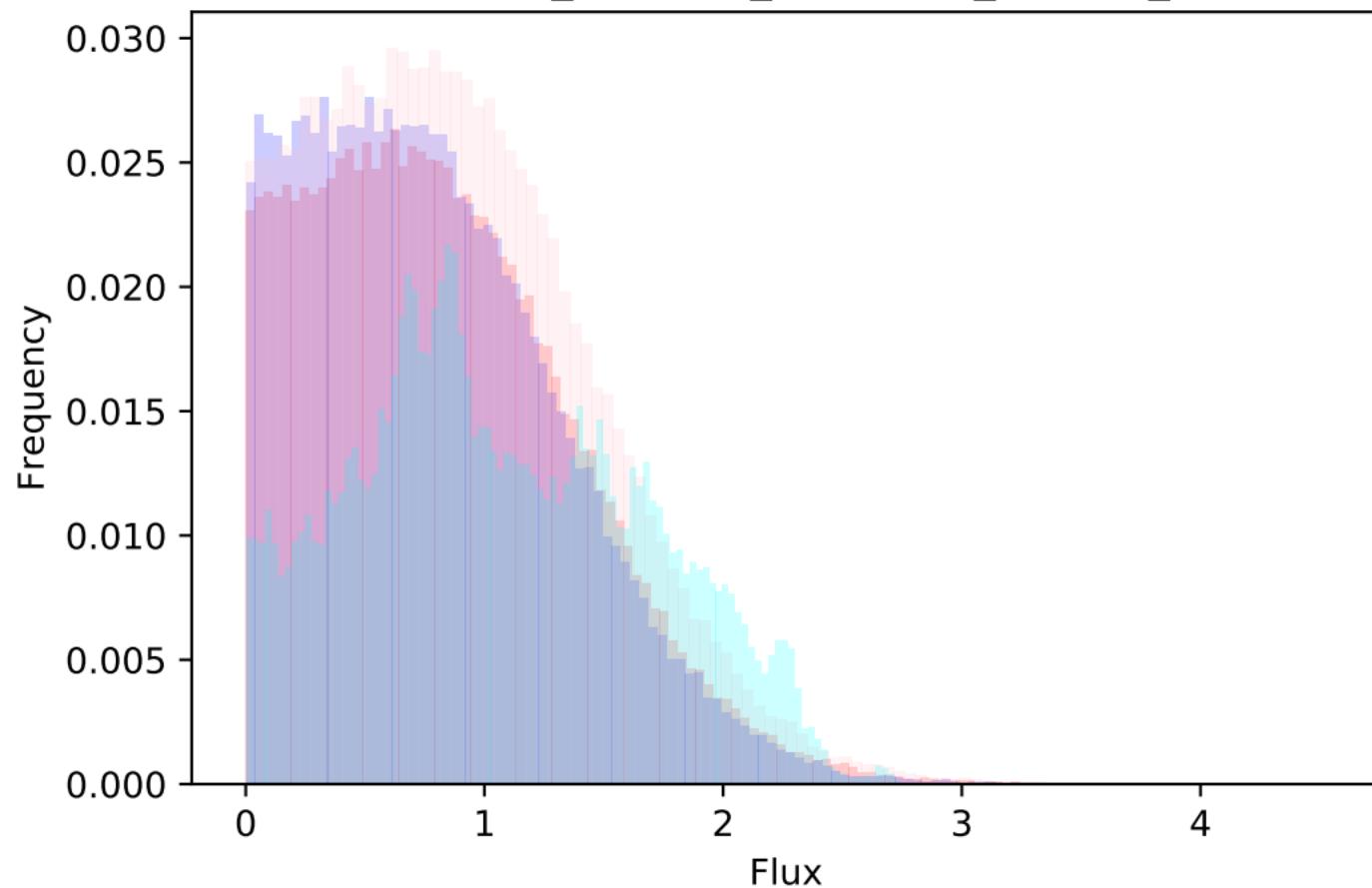
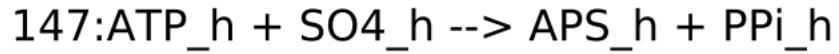


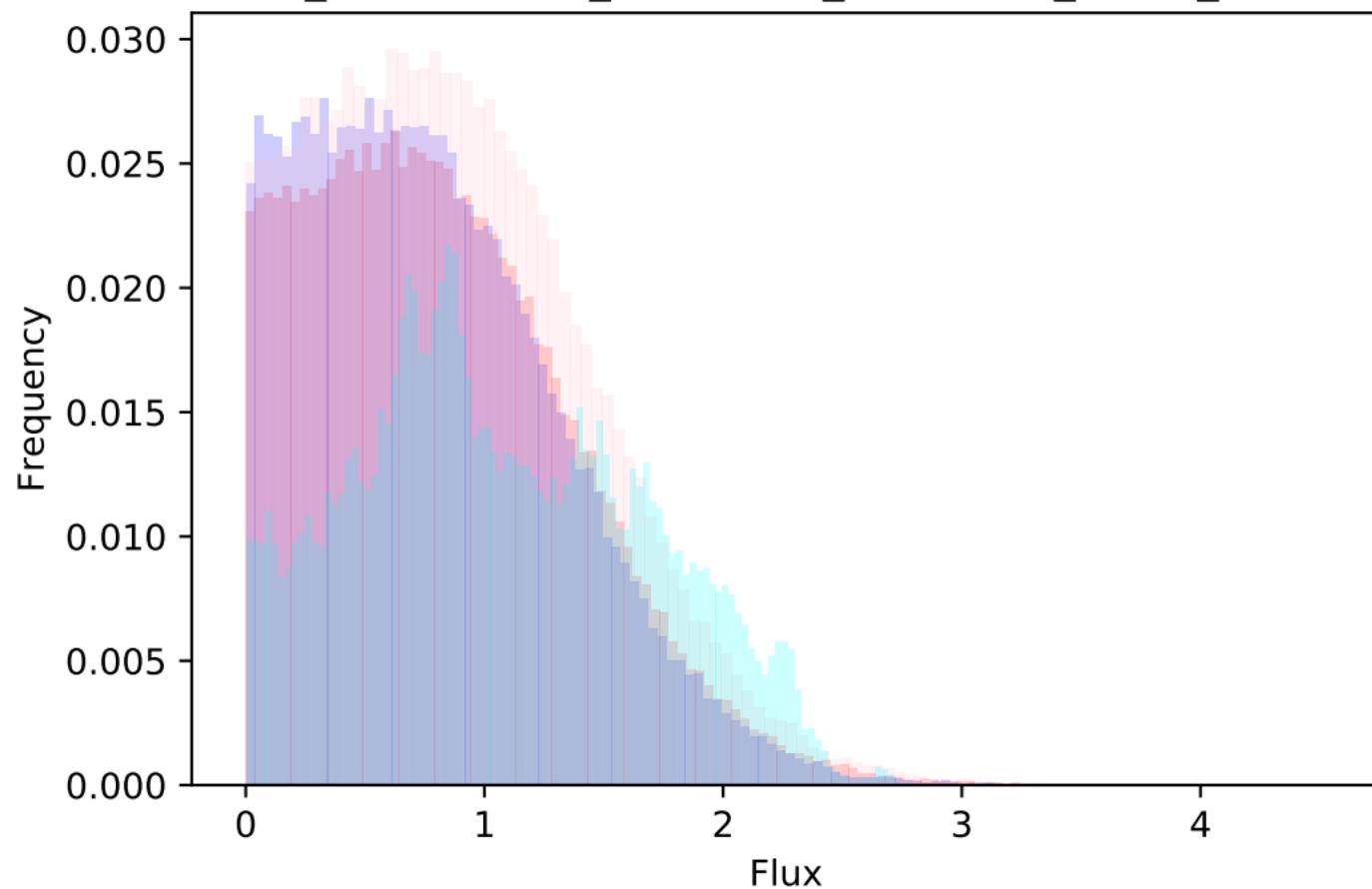


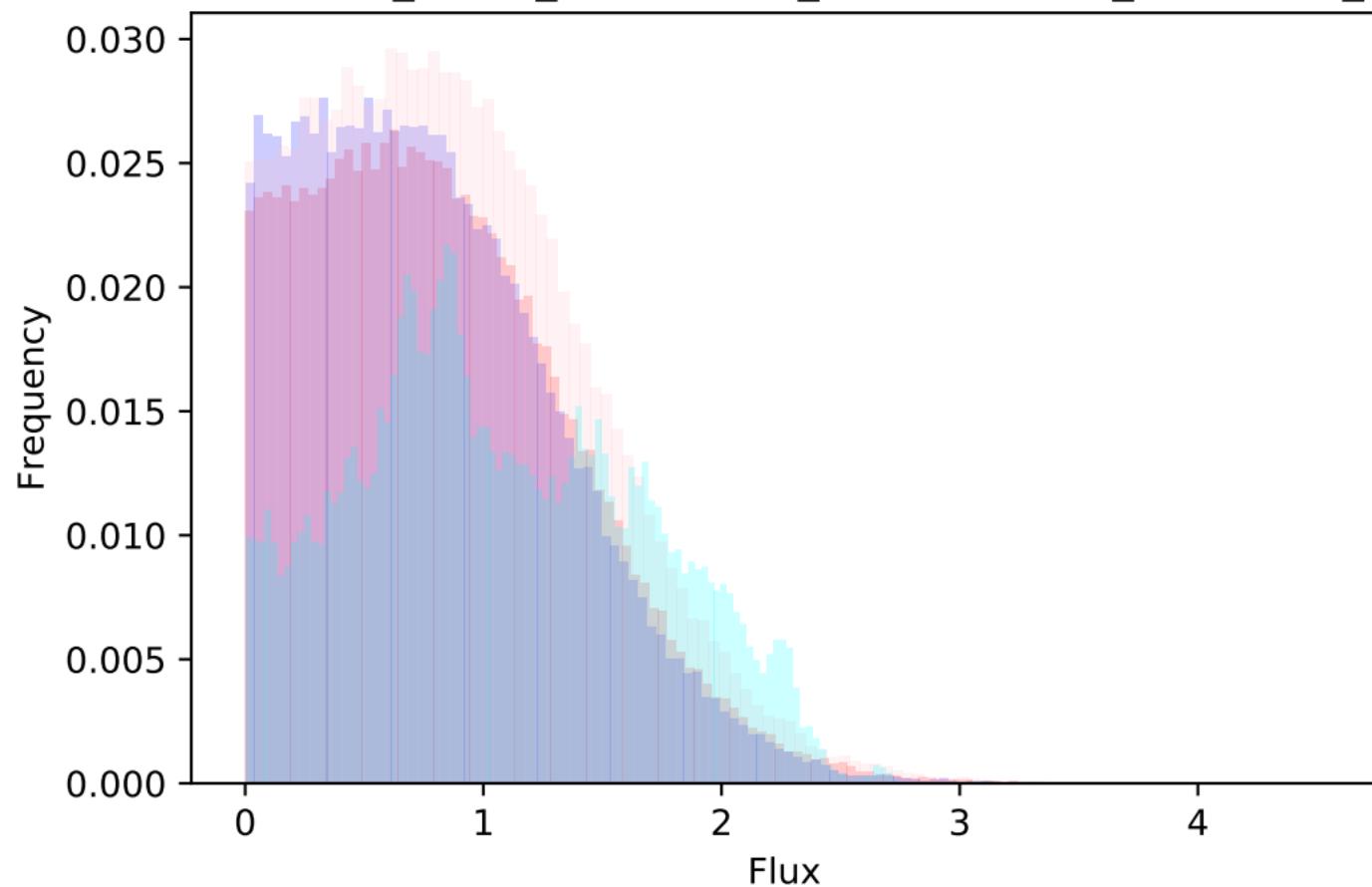
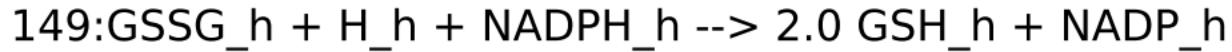


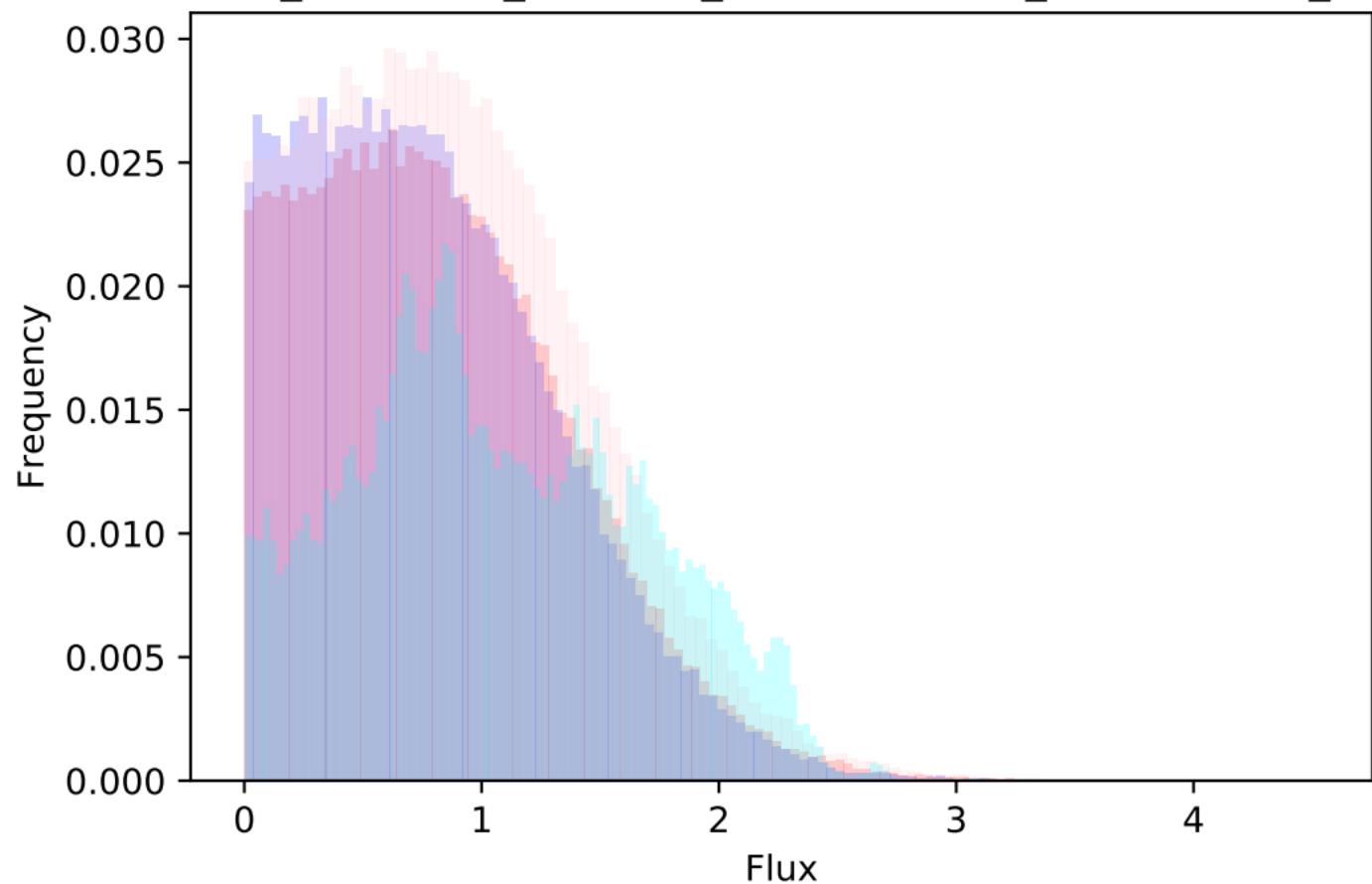
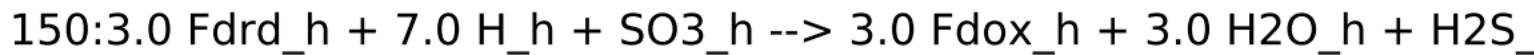


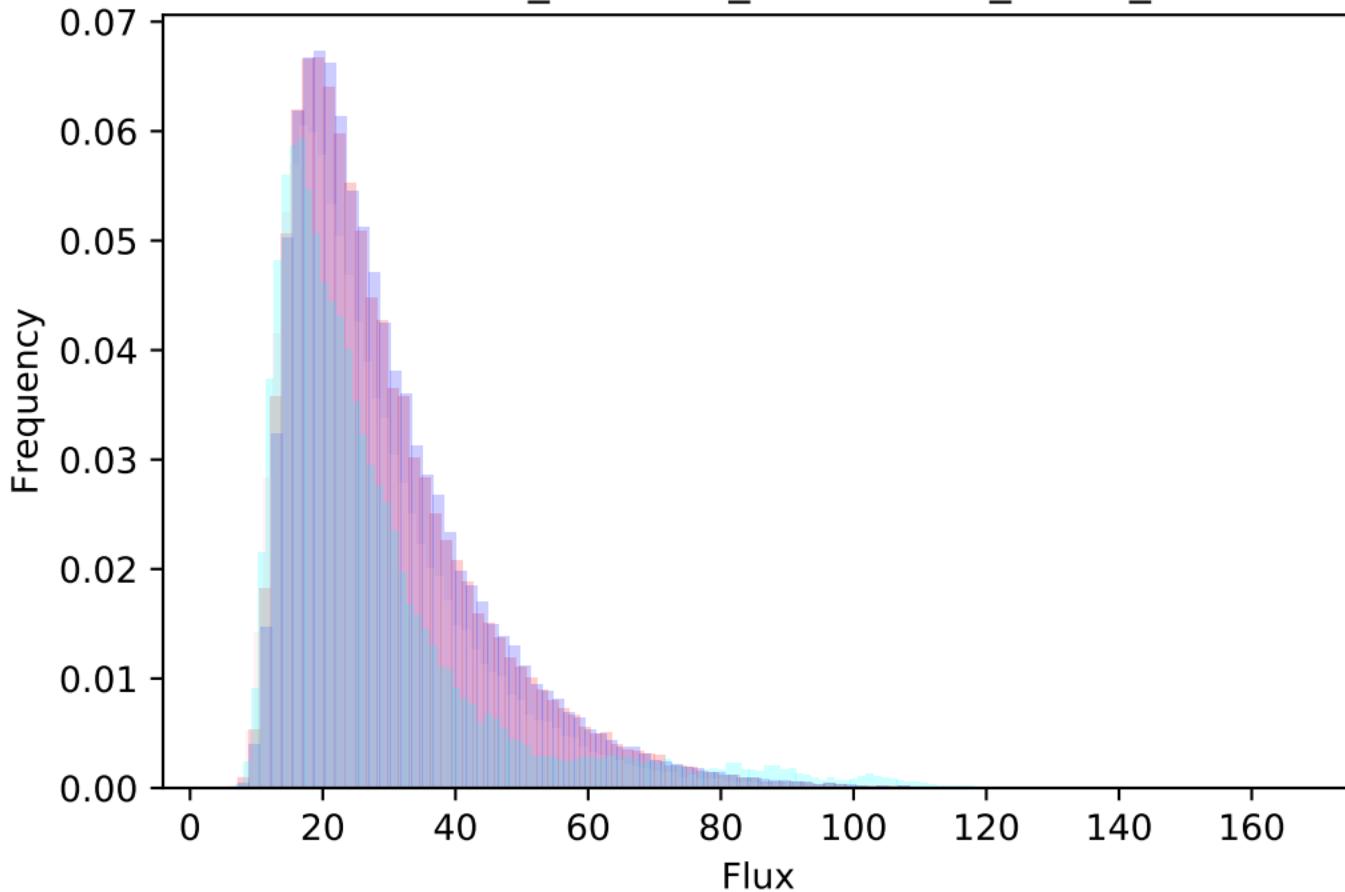


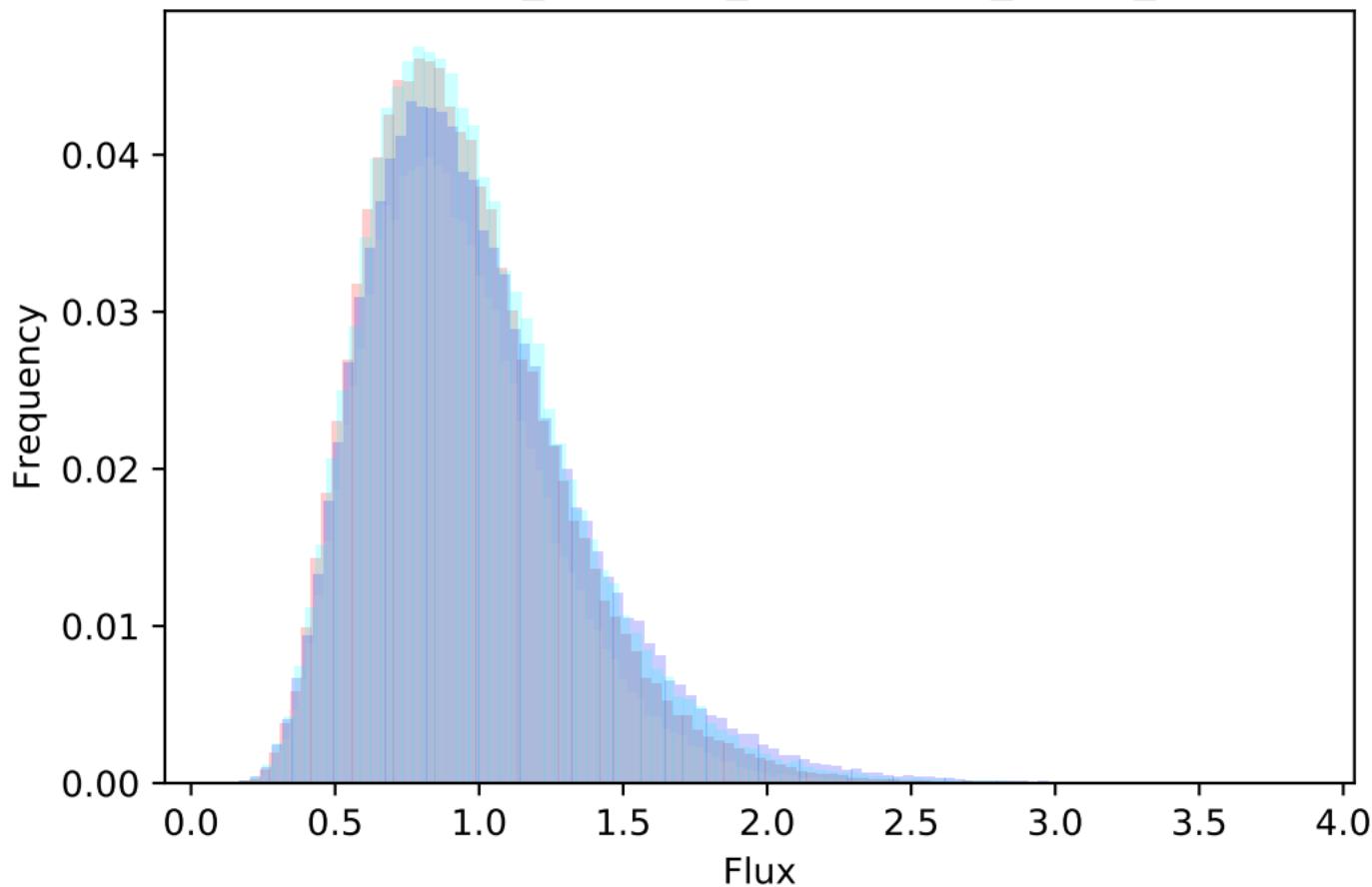
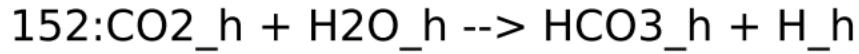


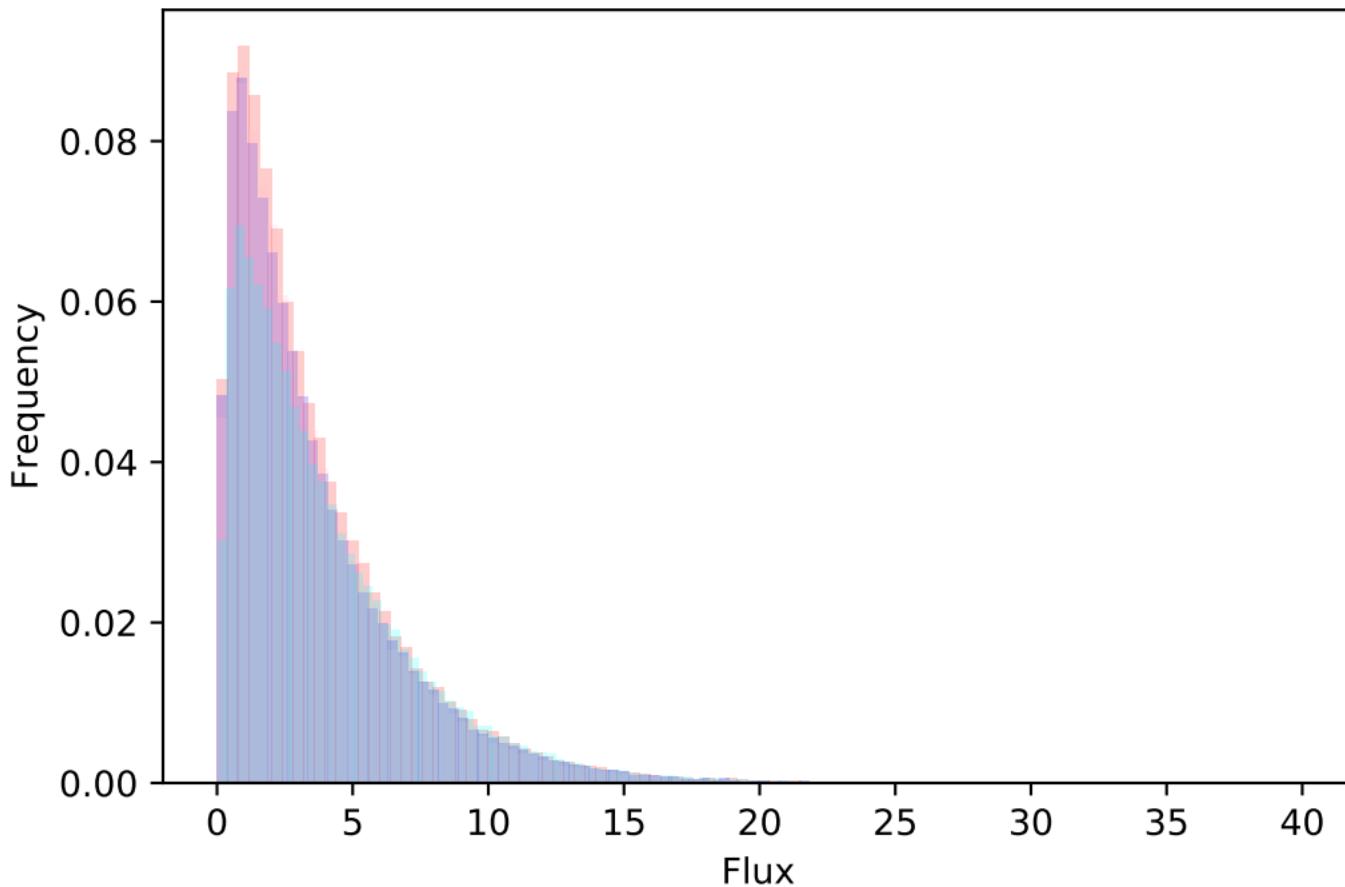
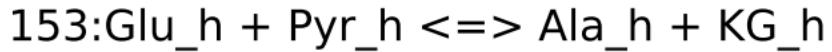




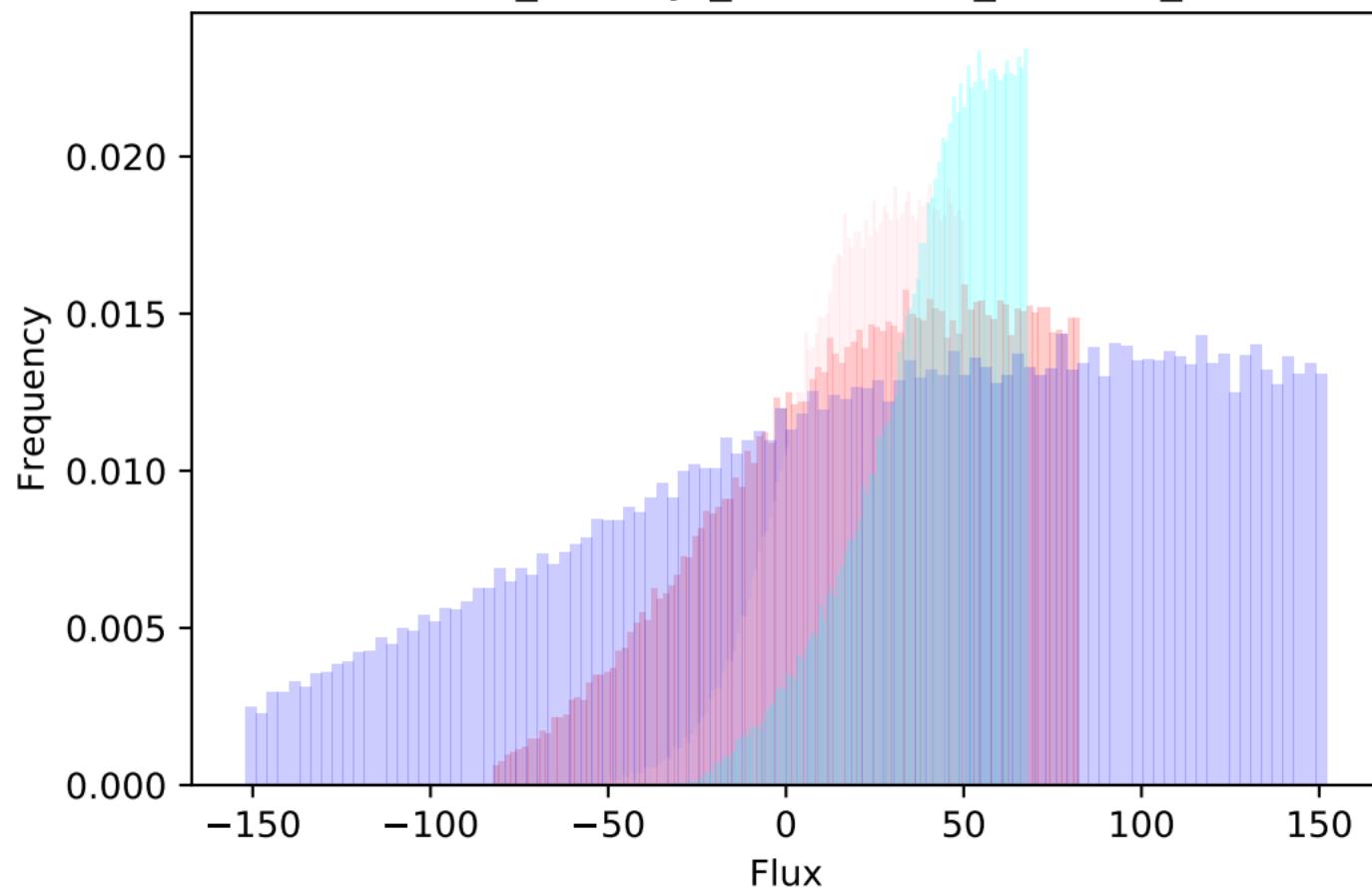




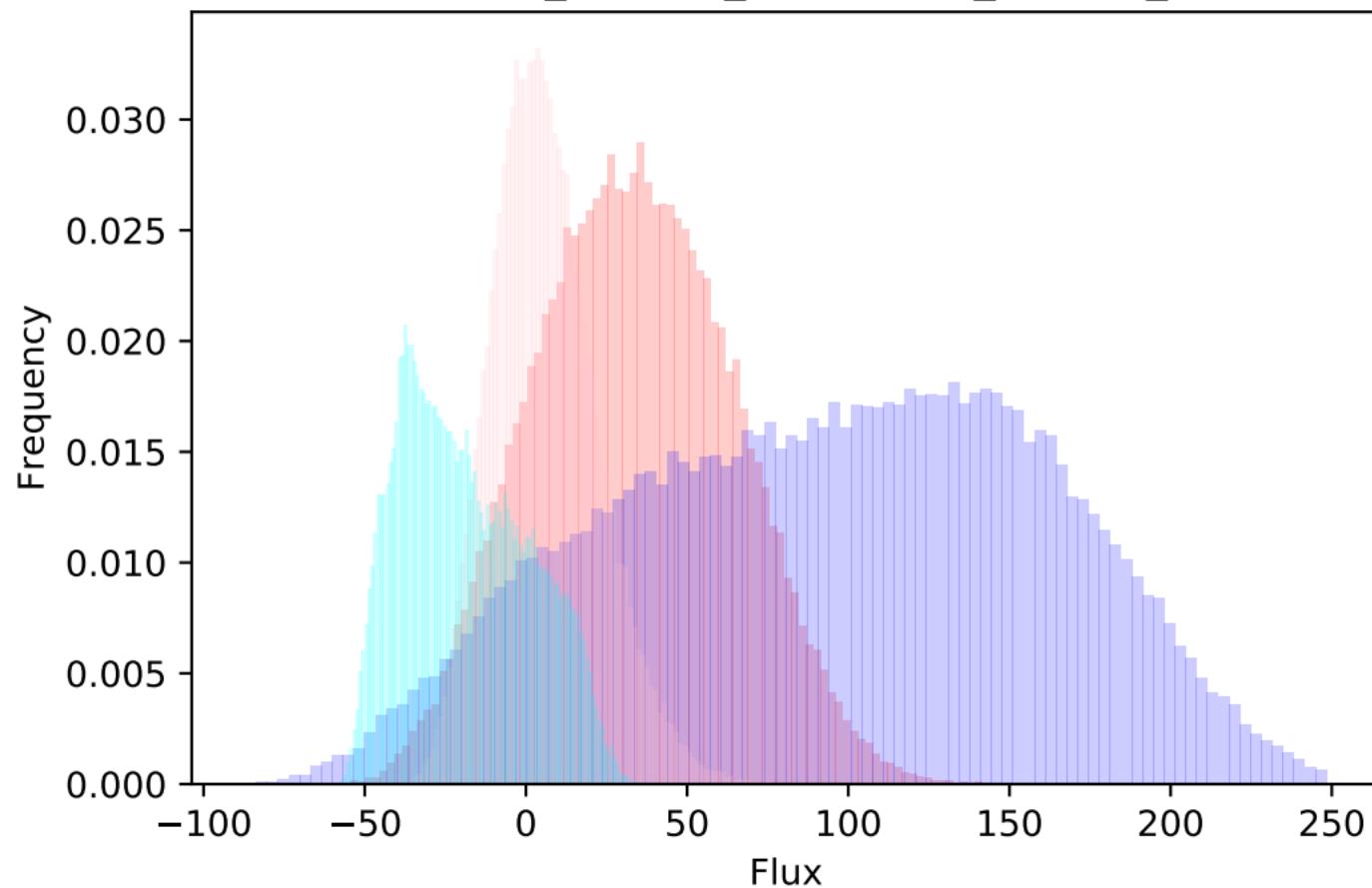




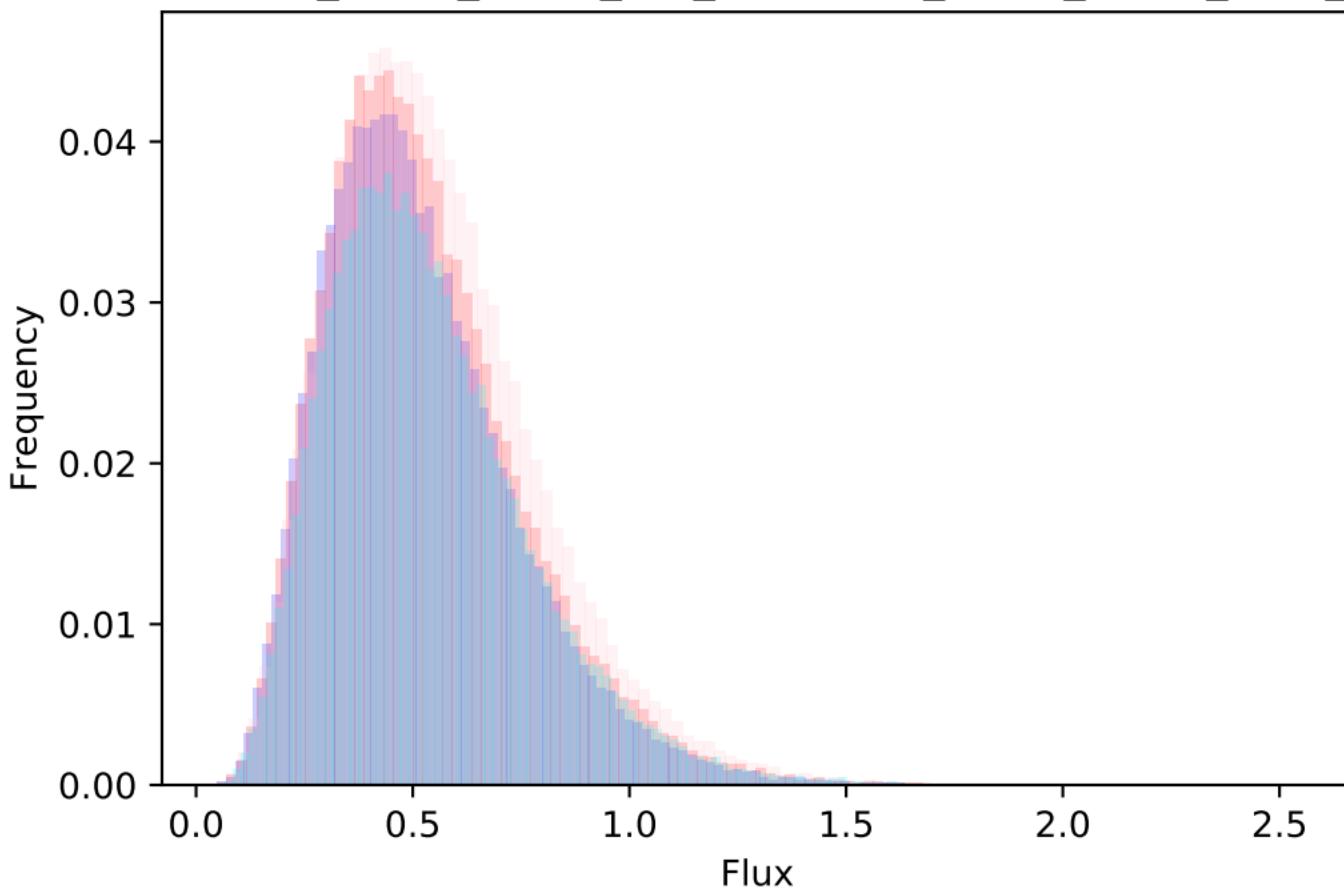
154:Glu_m + Pyr_m <=> Ala_m + KG_m

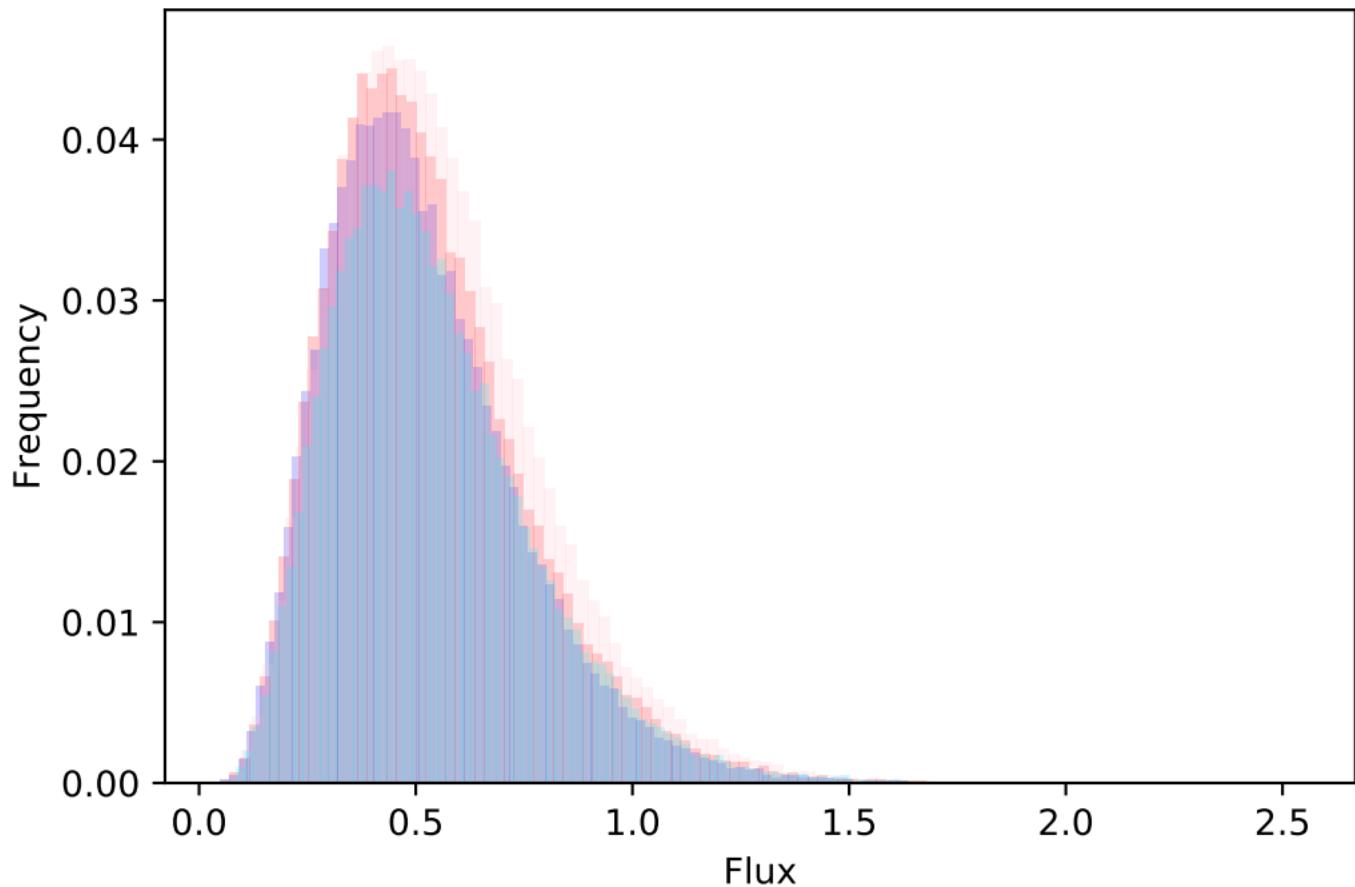
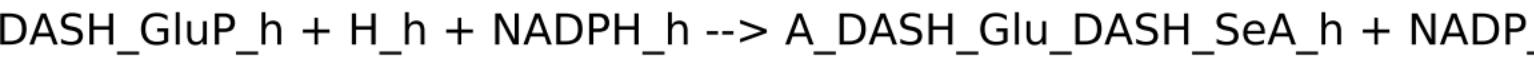


155:Glu_p + Pyr_p <=> Ala_p + KG_p

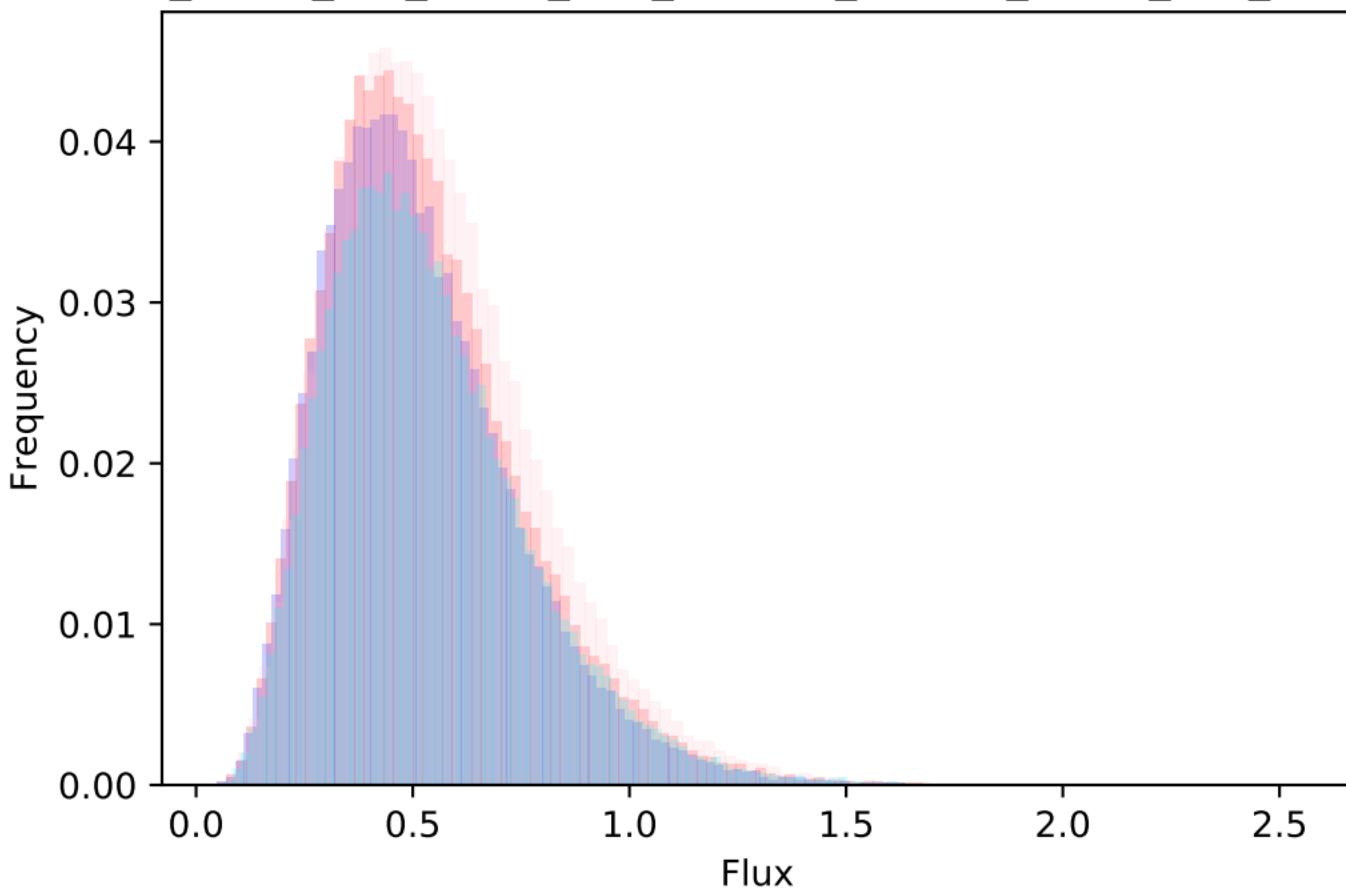


156:ATP_h + A_DASH_Glu_h --> ADP_h + A_DASH_GluP_h

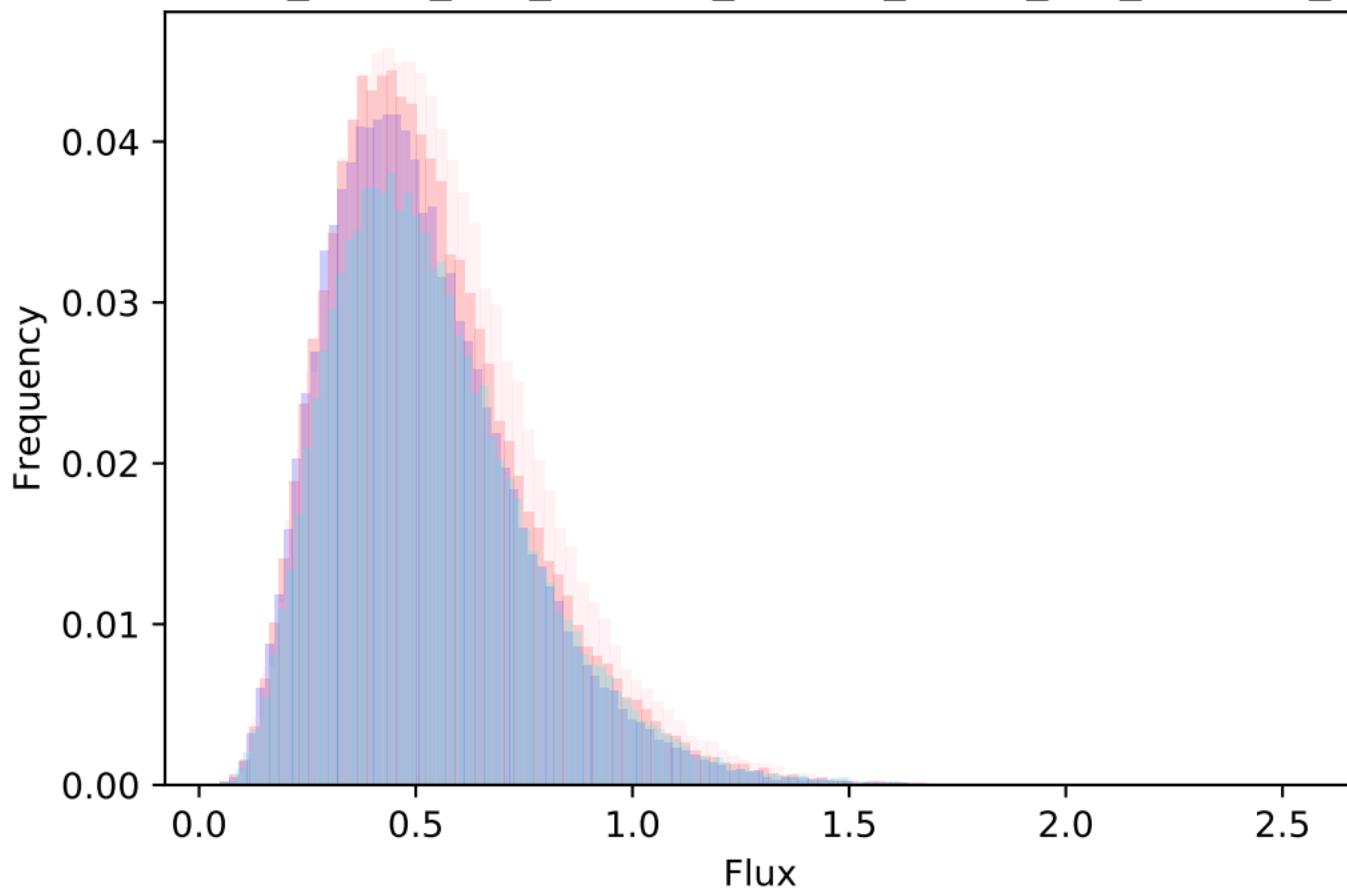


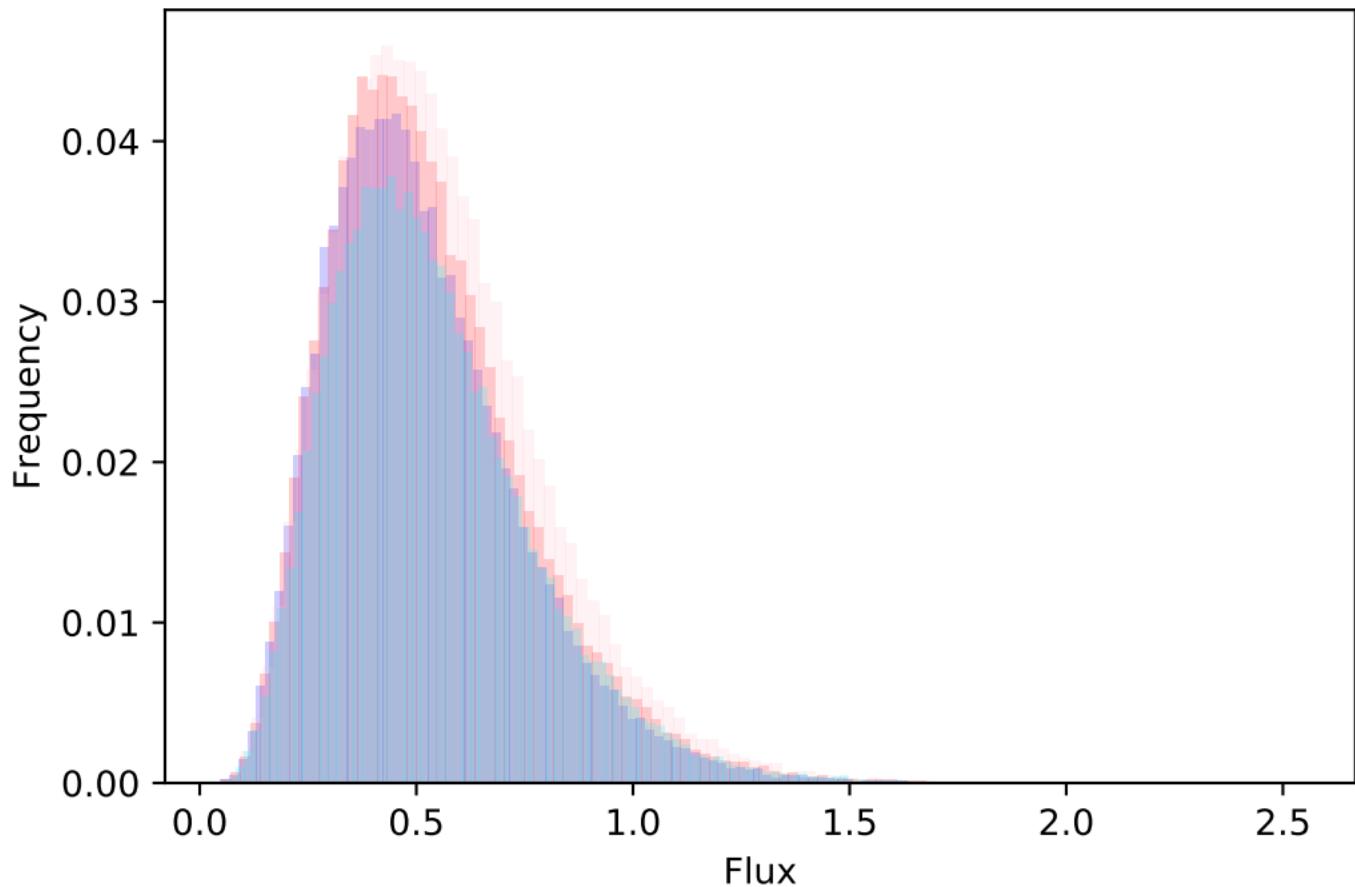
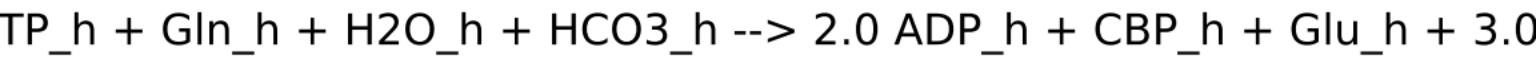


158:A_DASH_Glu_DASH_SeA_h + Glu_h --> A_DASH_Orn_h + KG_h

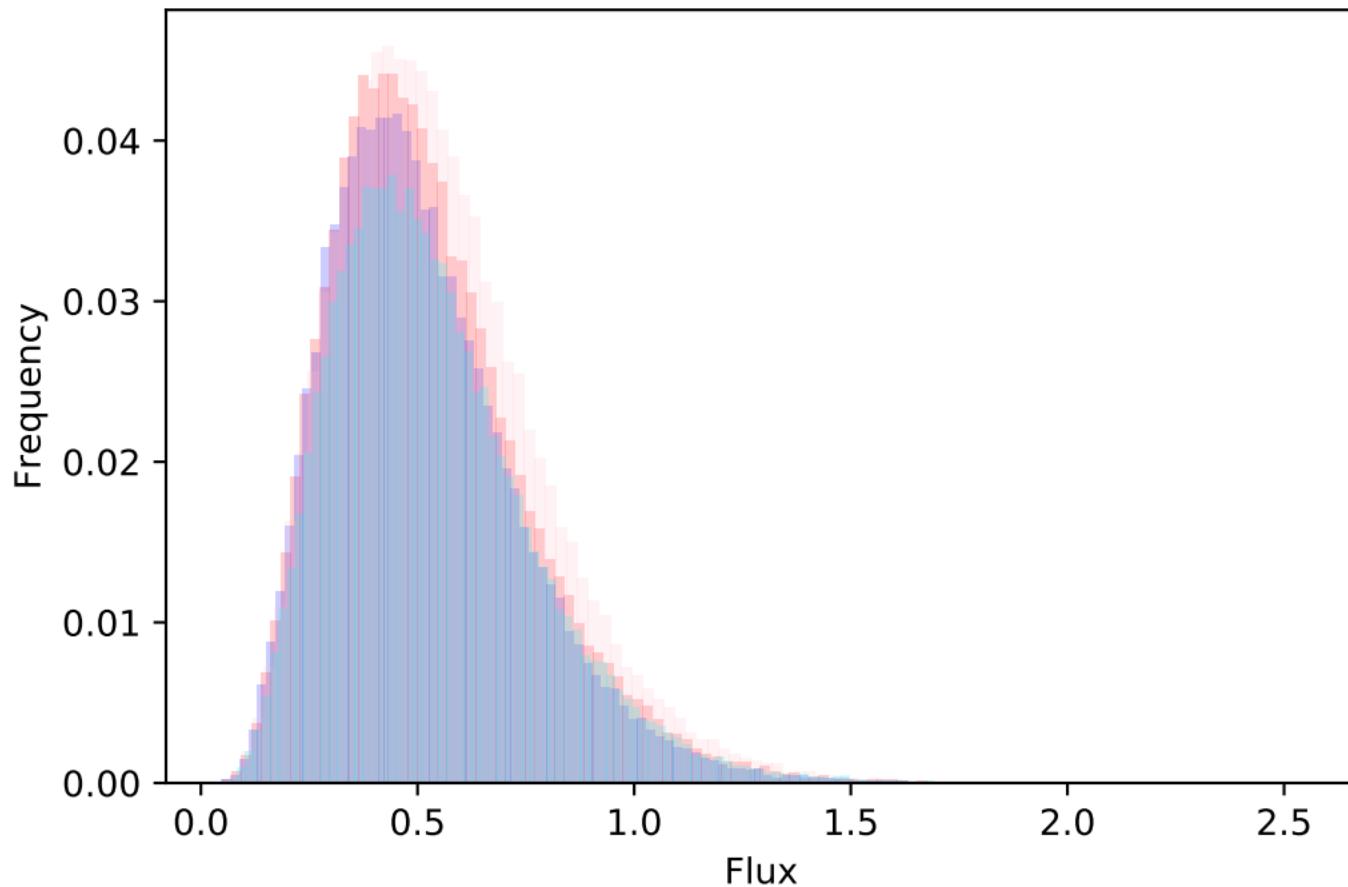


159:A_DASH_Orn_h + Glu_h --> A_DASH_Glu_h + Orn_h

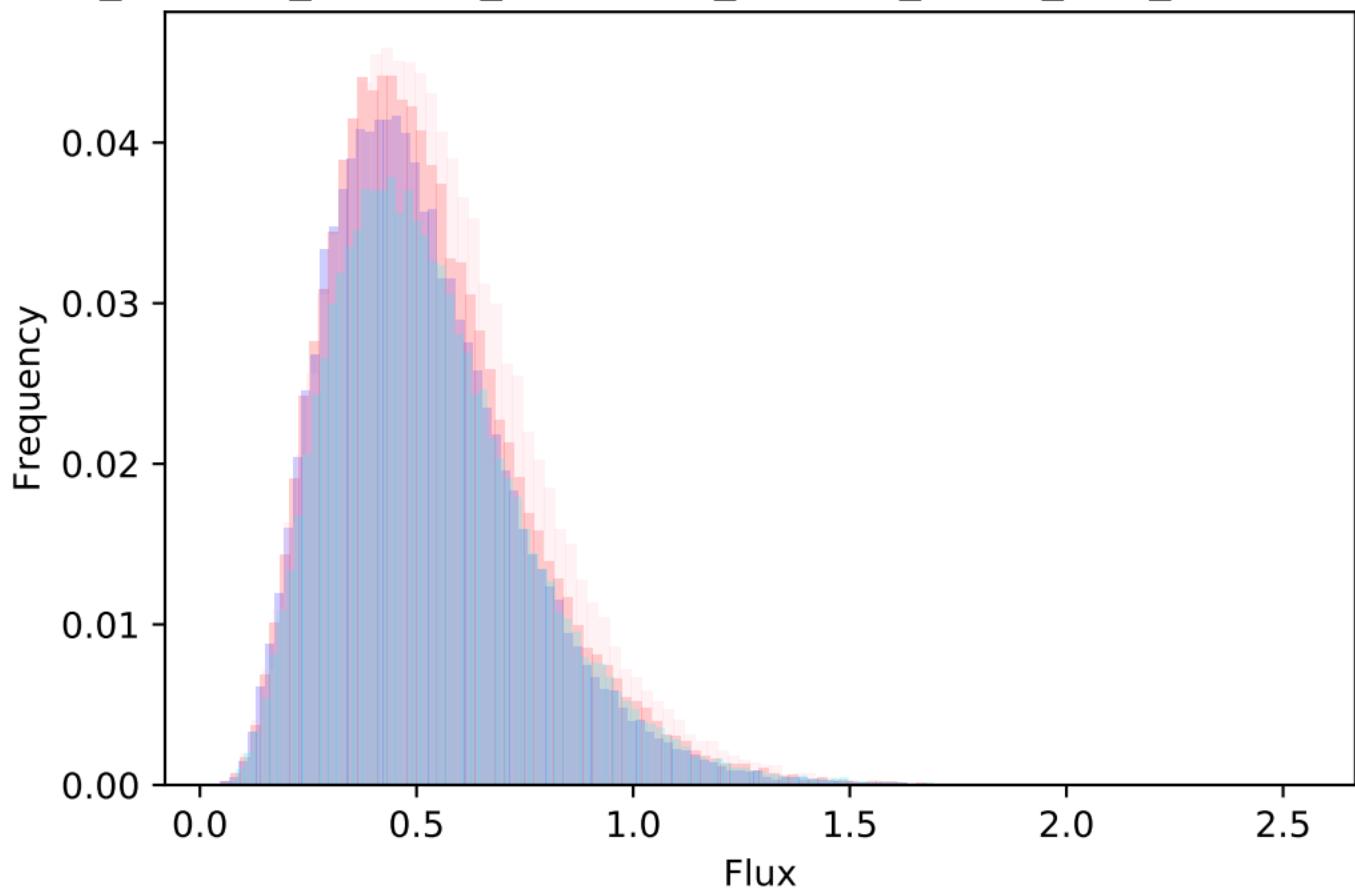




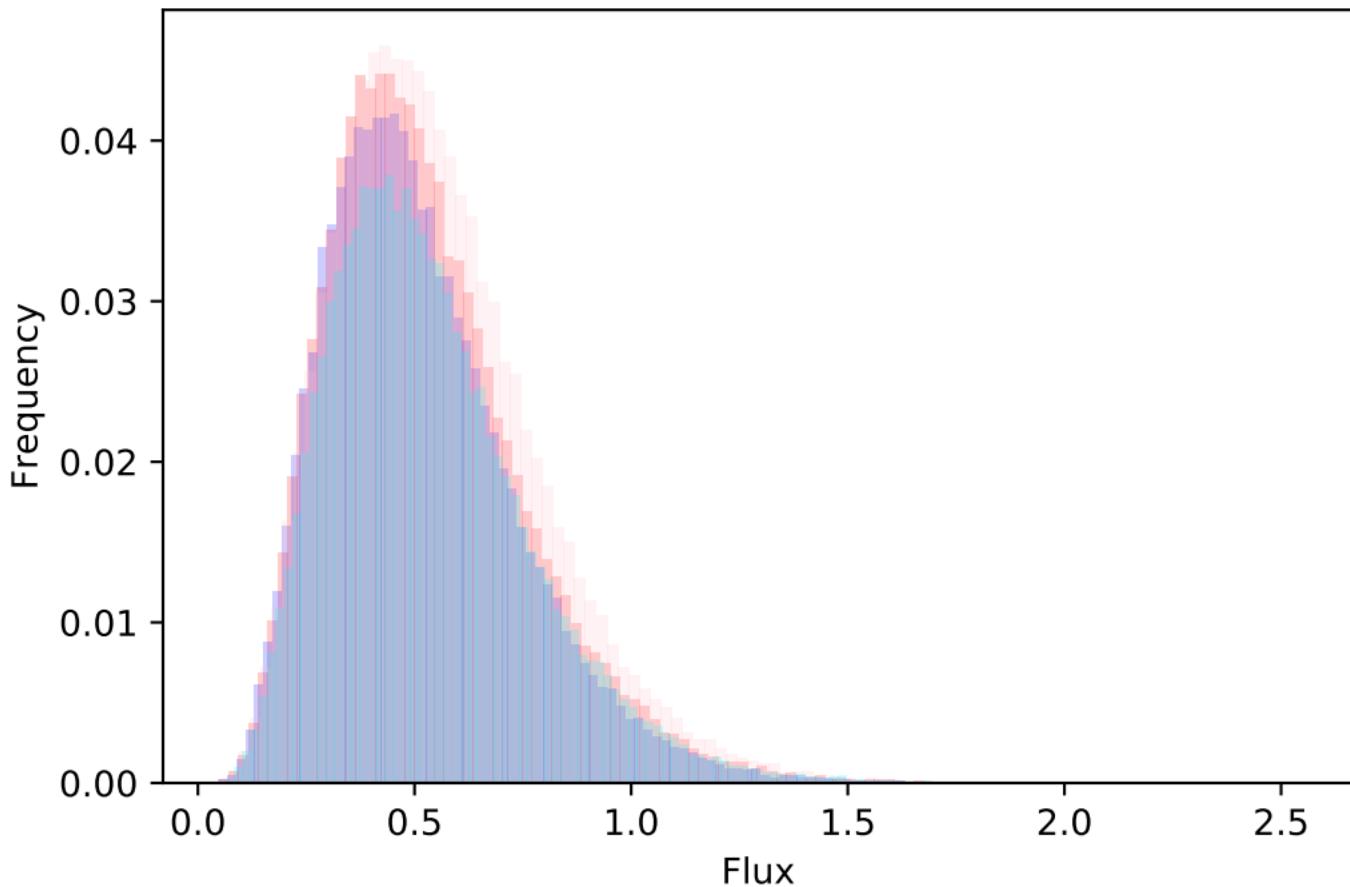
$161:\text{CBP_h} + \text{H_h} + \text{Orn_h} \rightleftharpoons \text{CTL_h} + \text{Pi_h}$



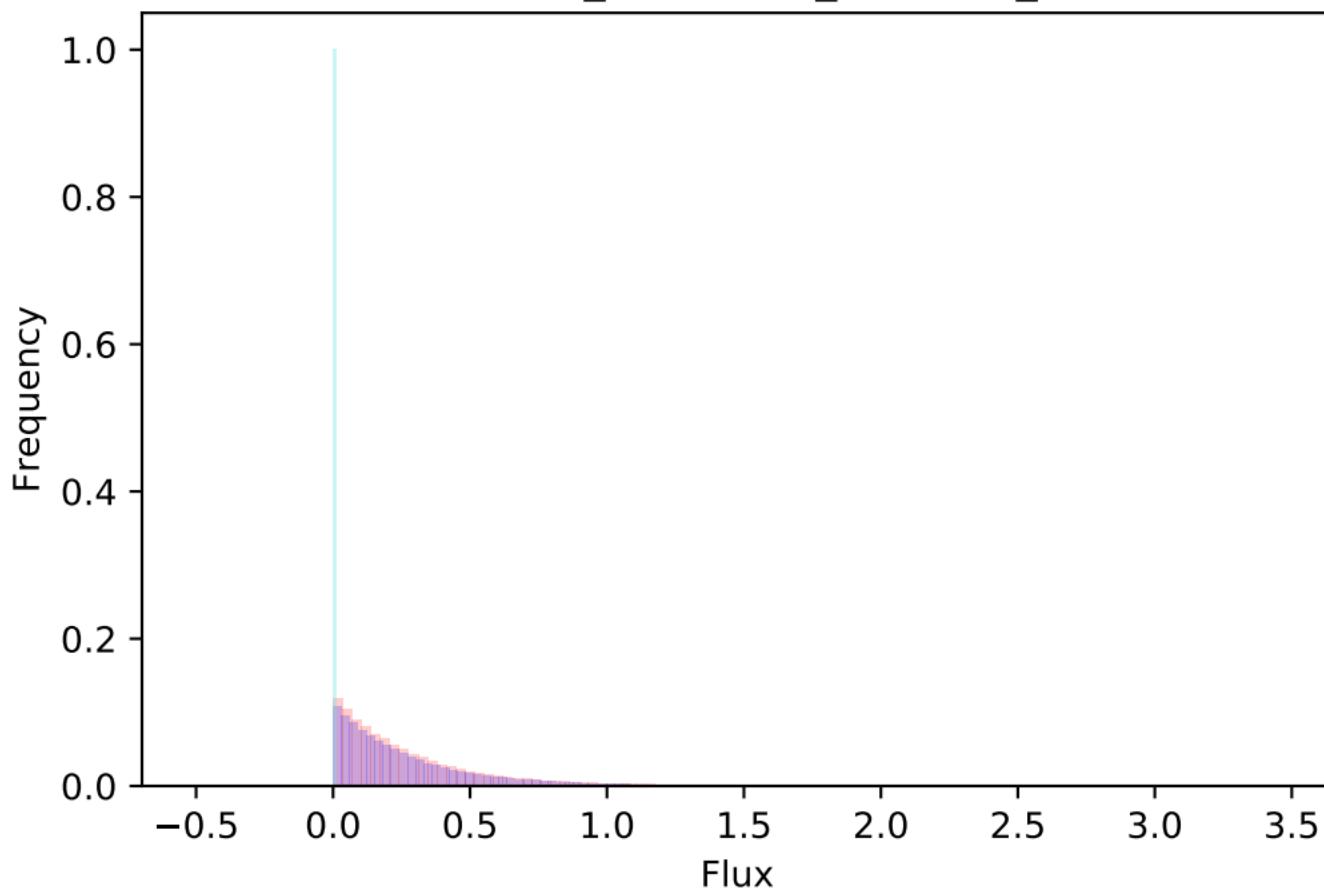
$\text{G2:ATP_h} + \text{Asp_h} + \text{CTL_h} \rightarrow \text{AMP_h} + \text{Arg_DASH_SCA_h} + 3.0 \text{ H_h} + \text{P}$

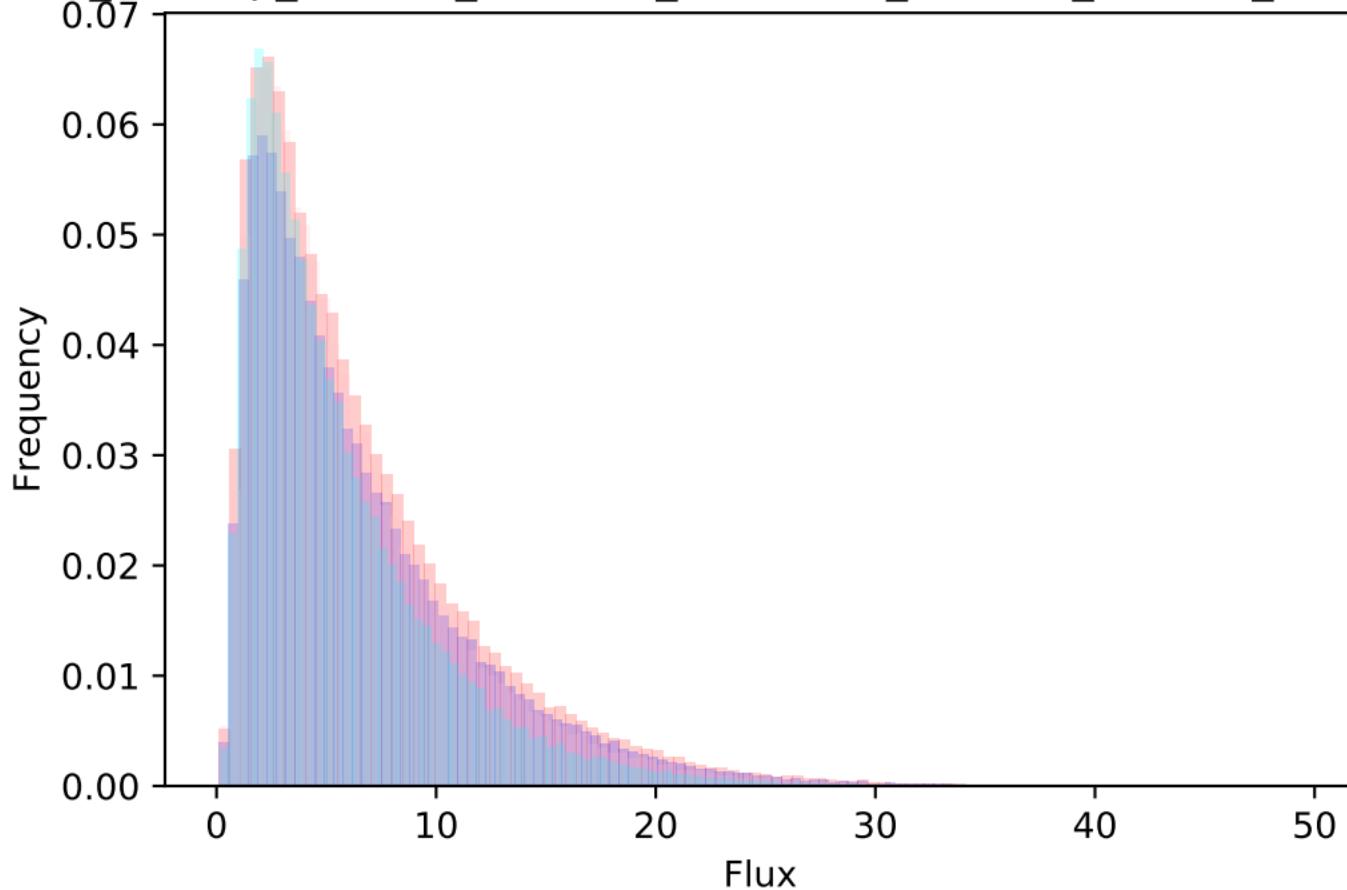
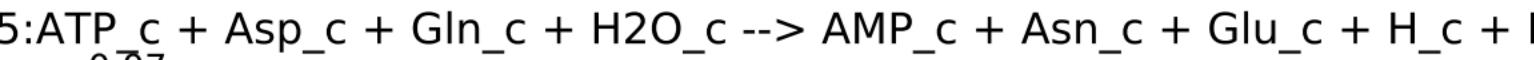


163:Arg_DASH_SCA_h --> Arg_h + Fum_h

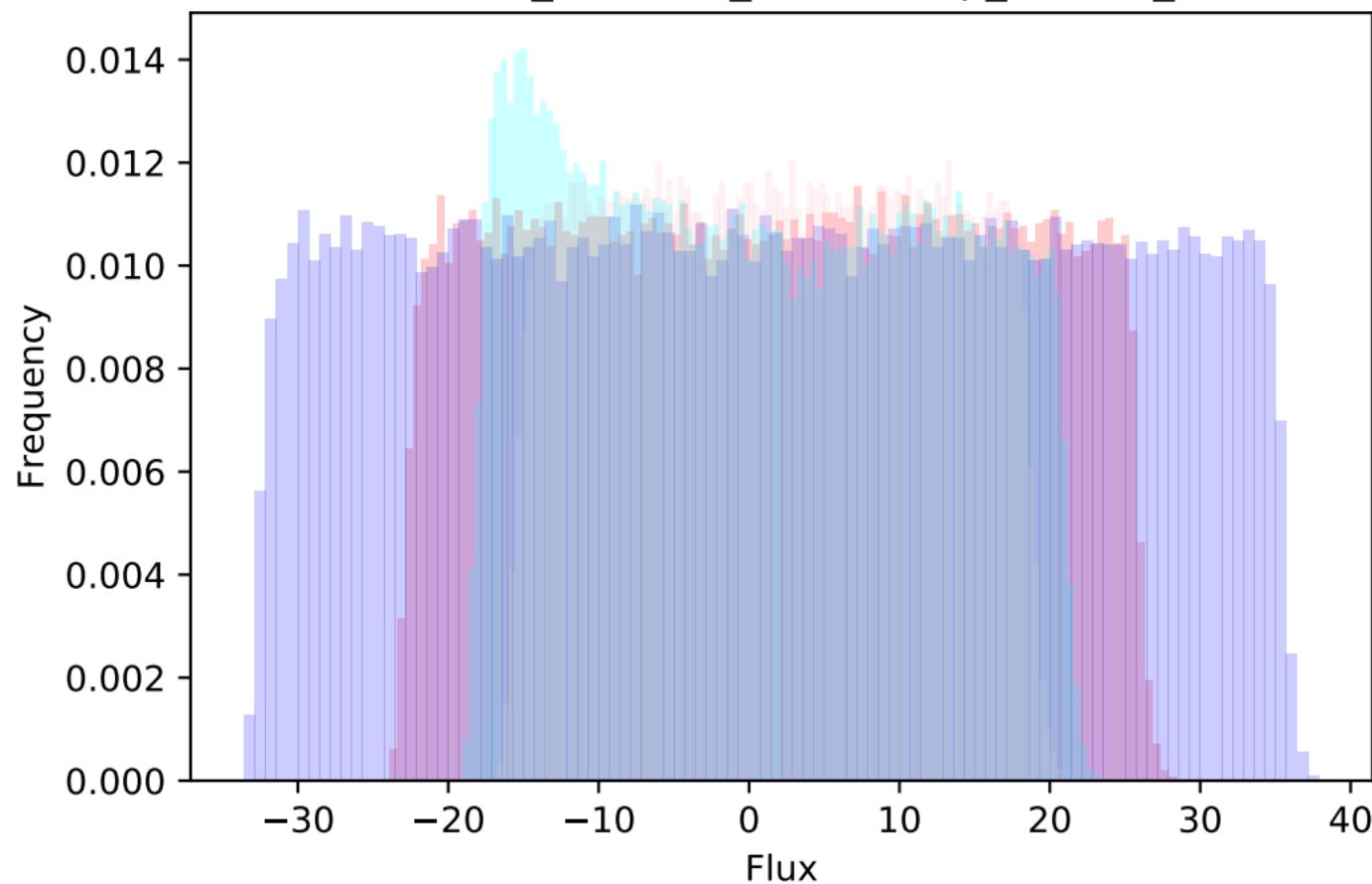


164:Mal_c --> Fum_c + H2O_c

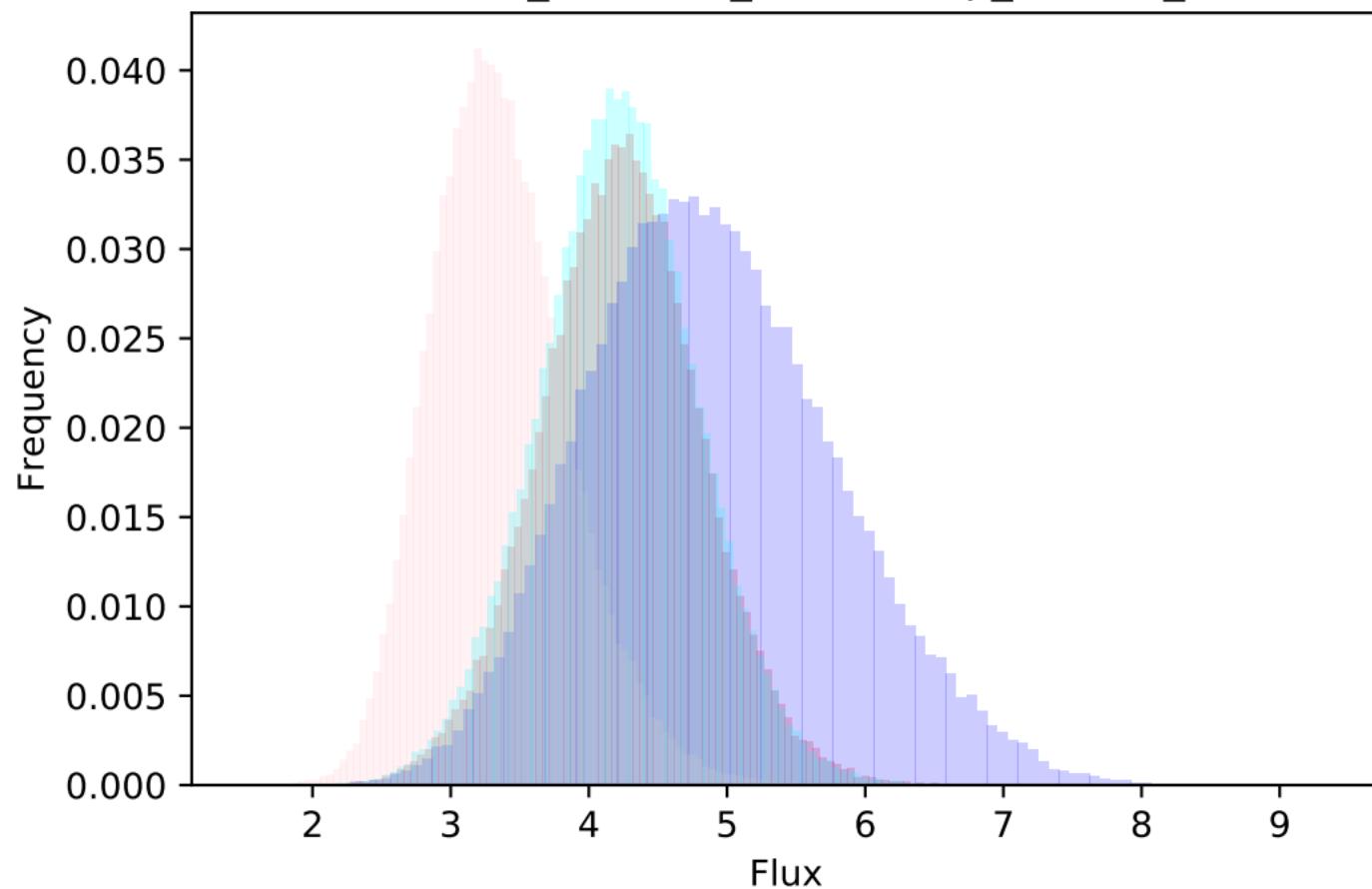




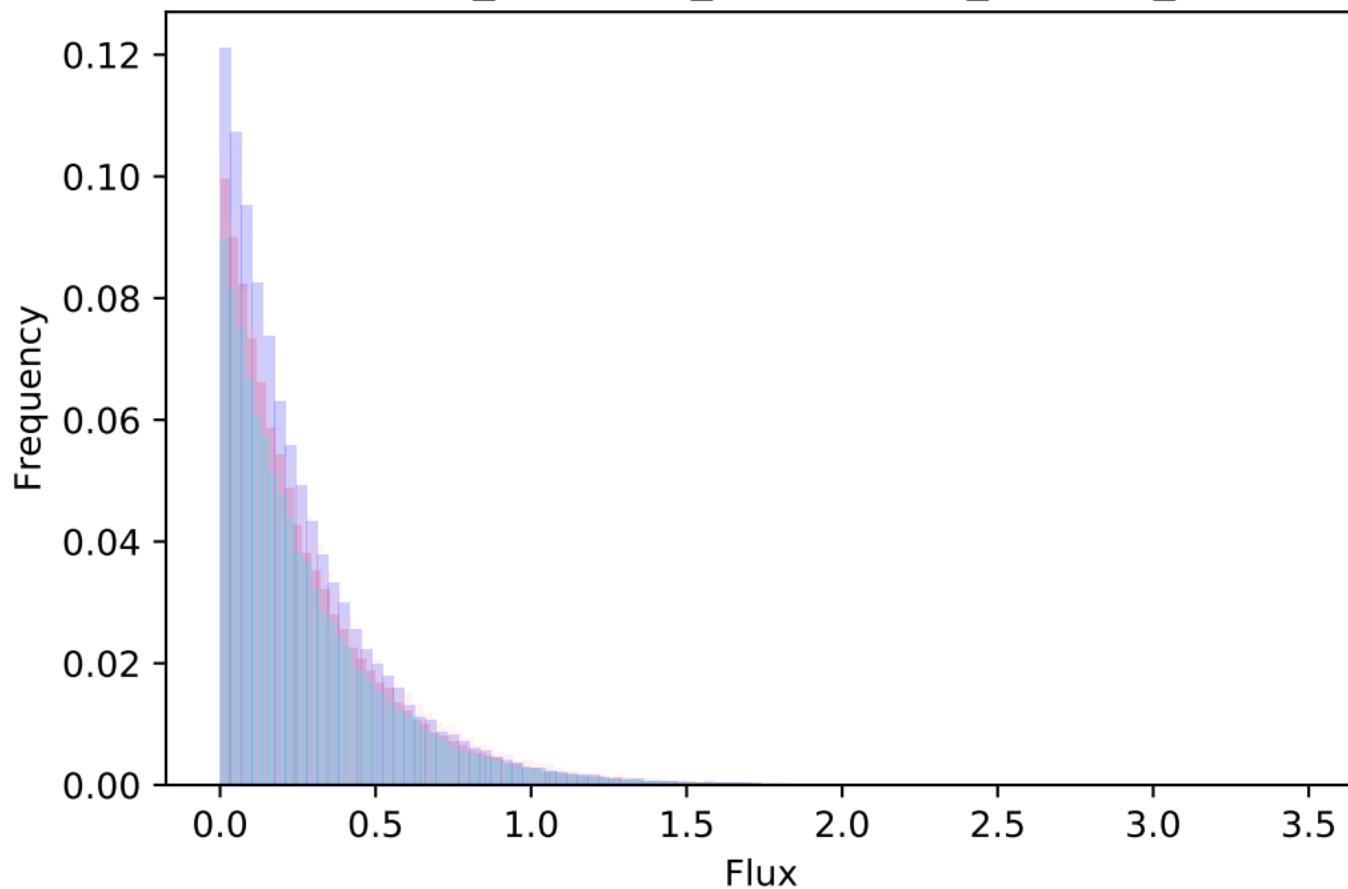
166:Glu_c + OAA_c <=> Asp_c + KG_c



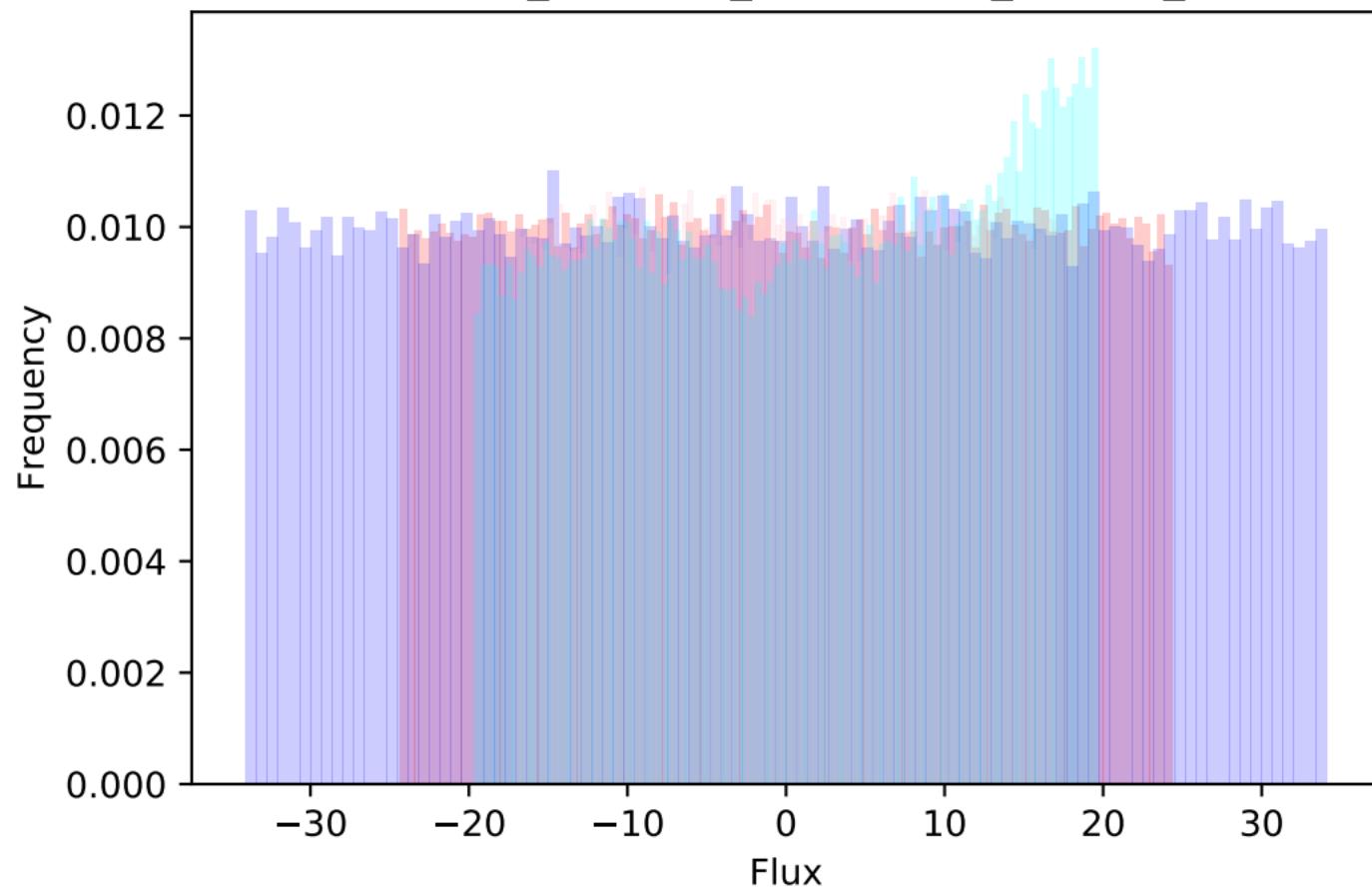
167:Glu_h + OAA_h <=> Asp_h + KG_h

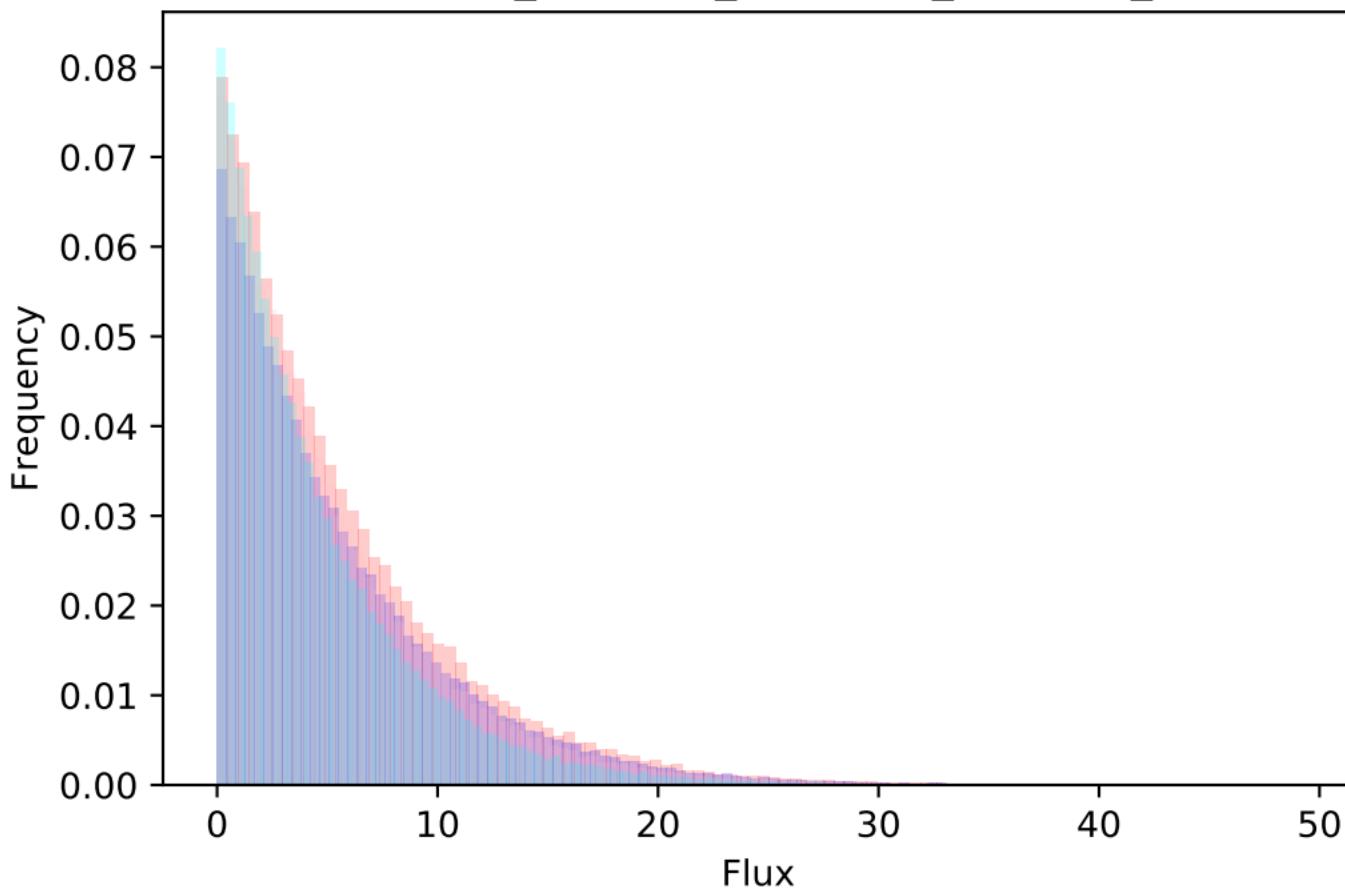
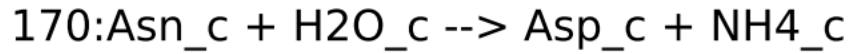


168:Glu_m + OAA_m <=> Asp_m + KG_m

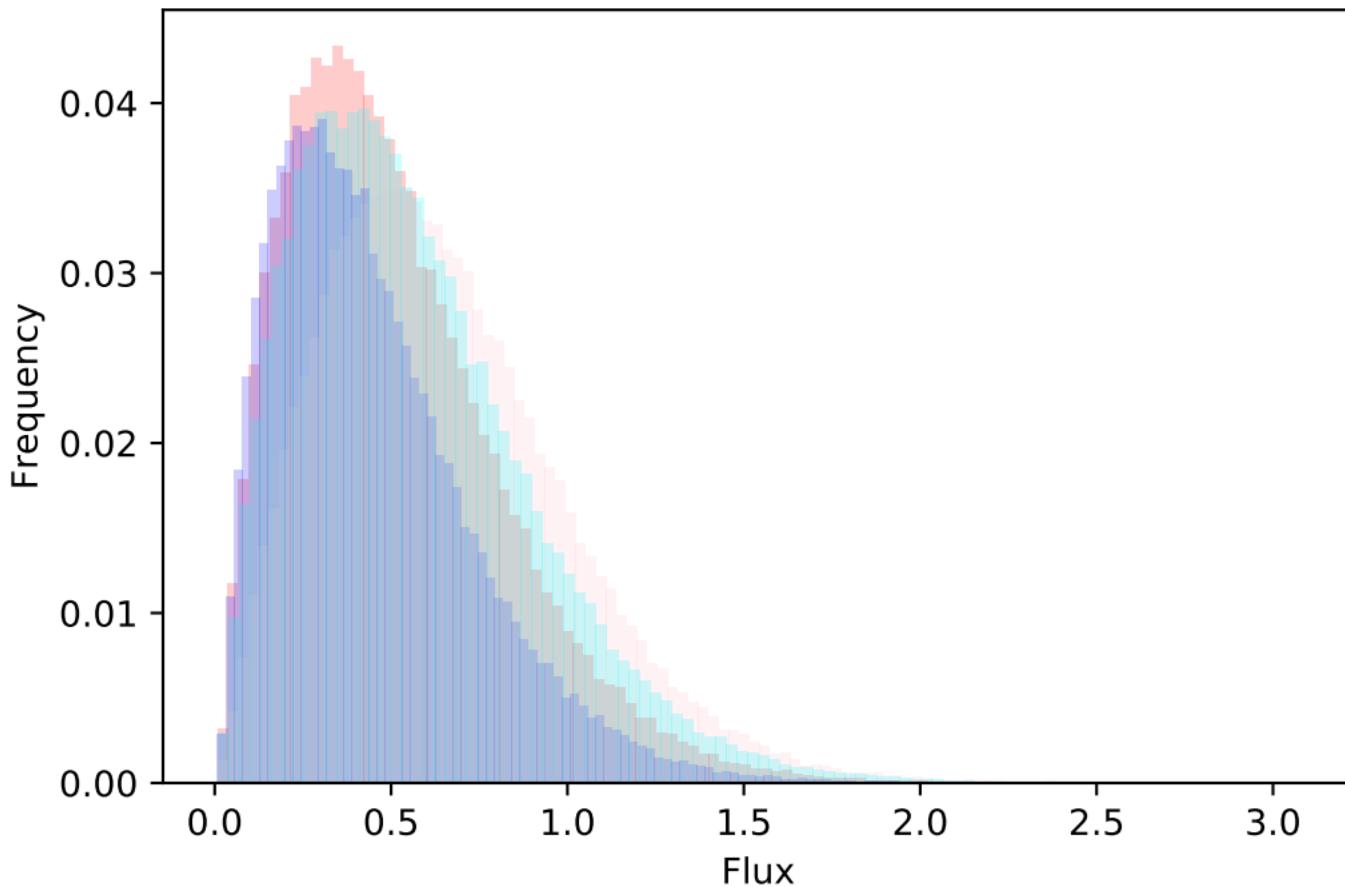


169:Glu_p + OAA_p <=> Asp_p + KG_p

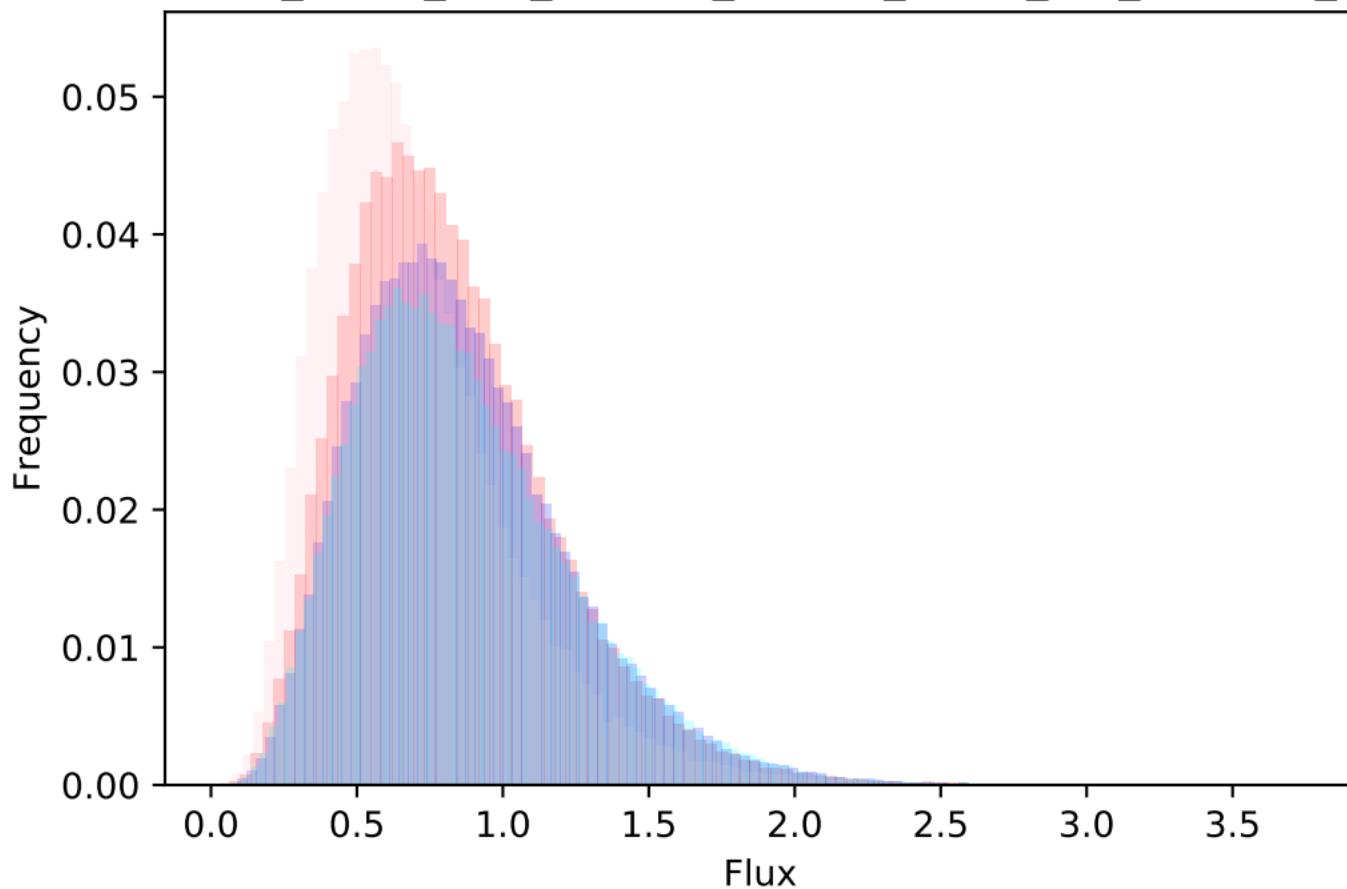




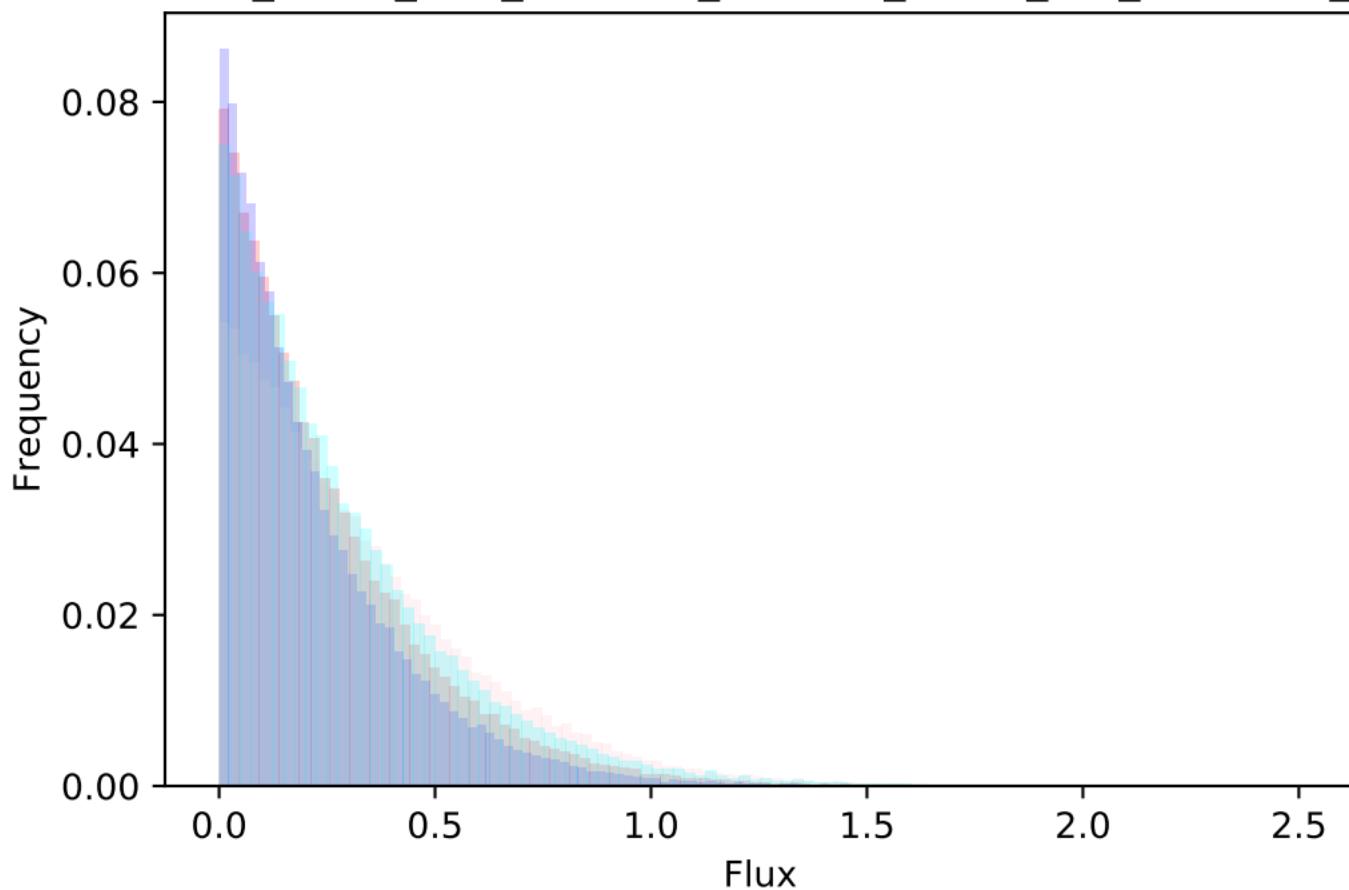
171:A_DASH_CoA_c + Ser_c --> A_DASH_Ser_c + CoA_c



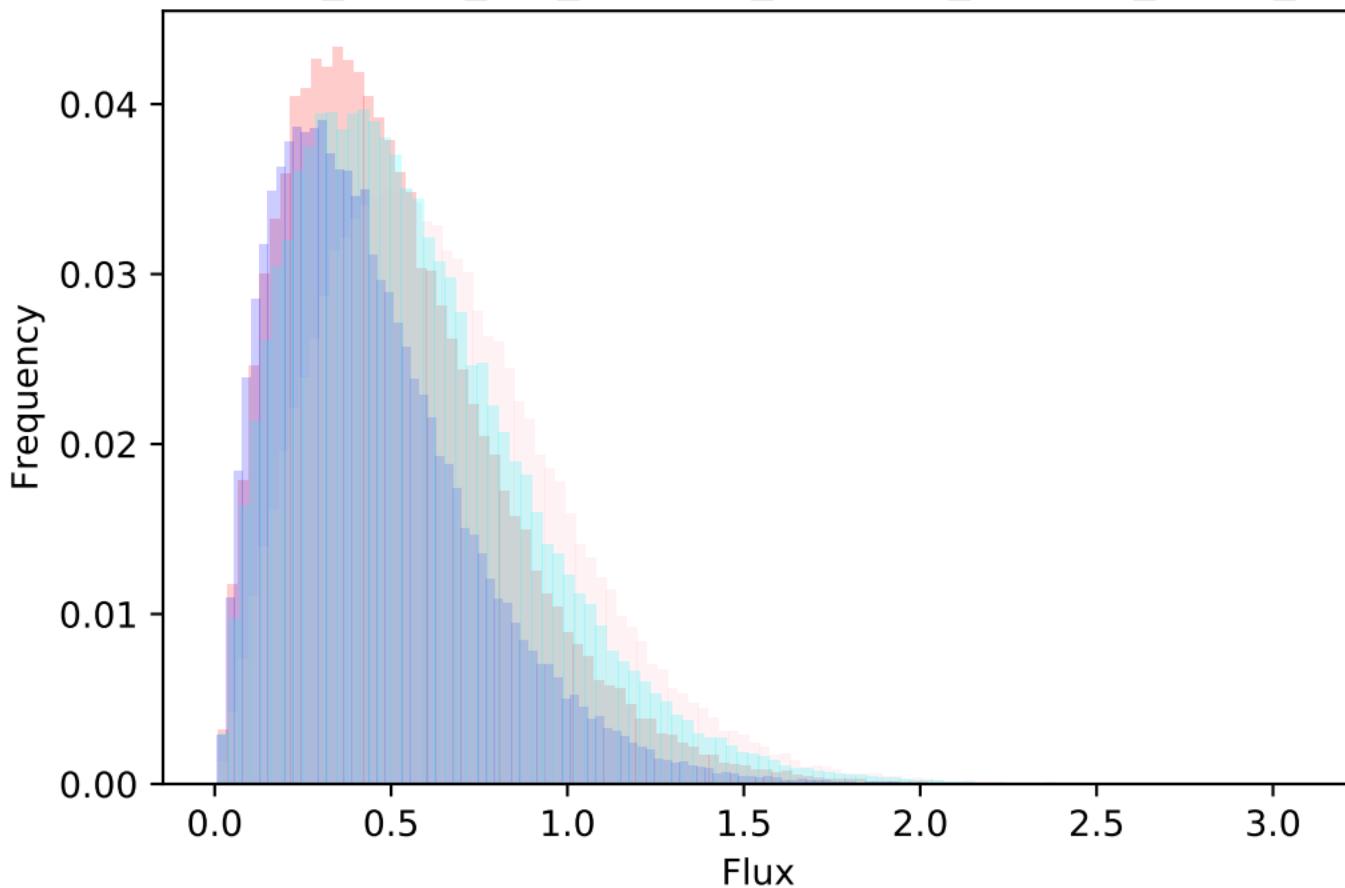
172:A_DASH_CoA_h + Ser_h --> A_DASH_Ser_h + CoA_h



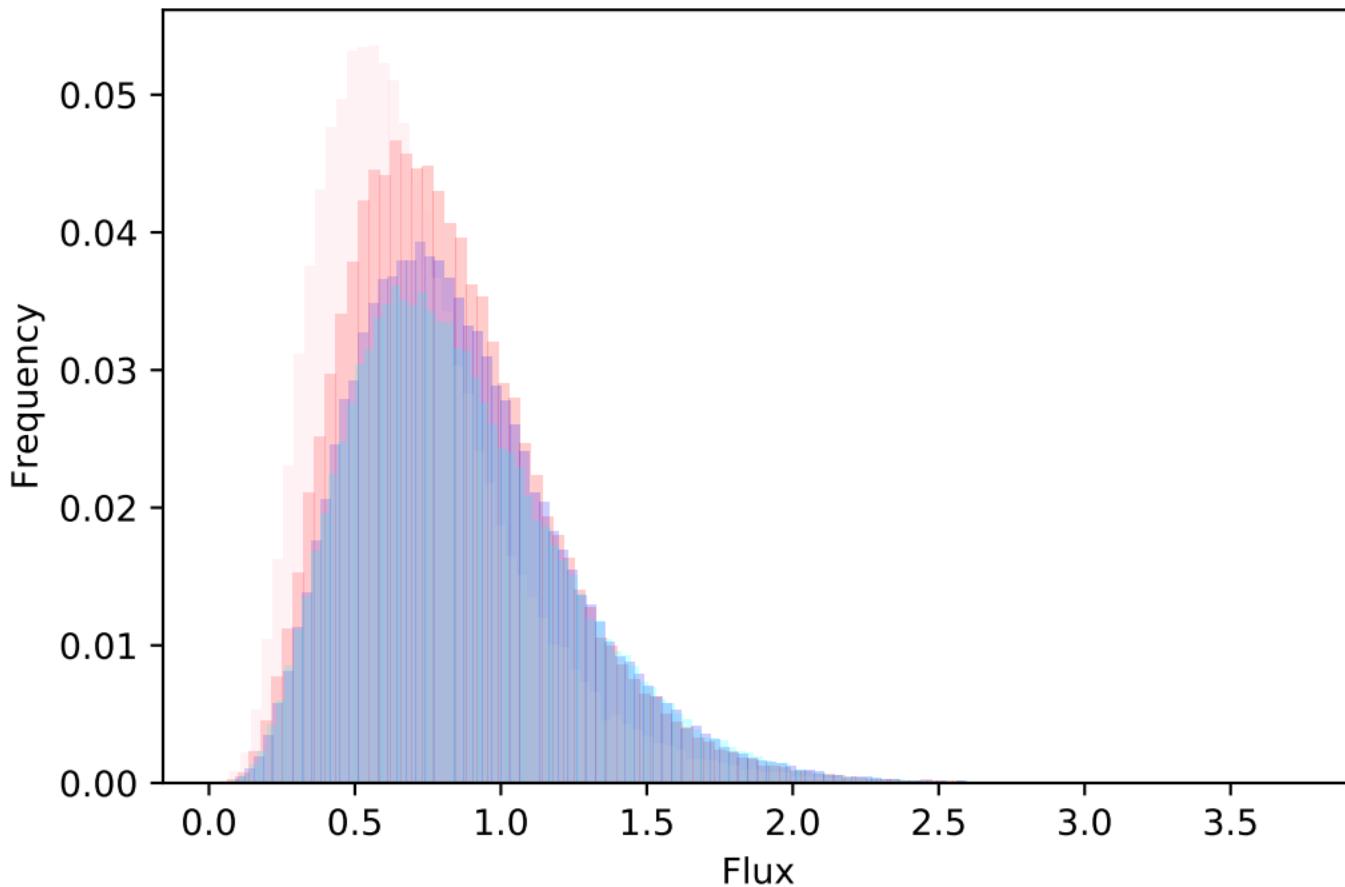
173:A_DASH_CoA_m + Ser_m --> A_DASH_Ser_m + CoA_m



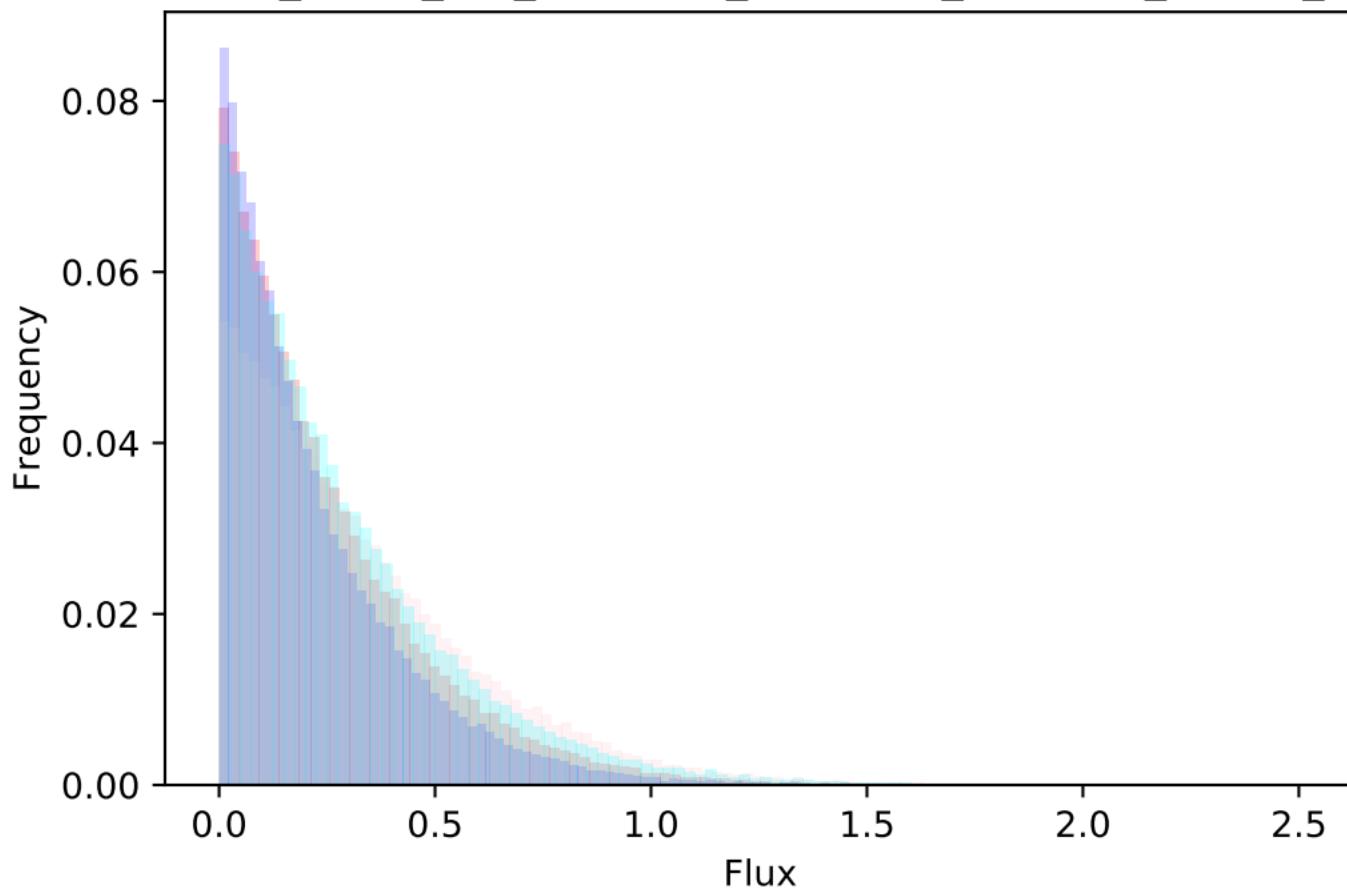
174:A_DASH_Ser_c + H2S_c --> AC_c + Cys_c + H_c

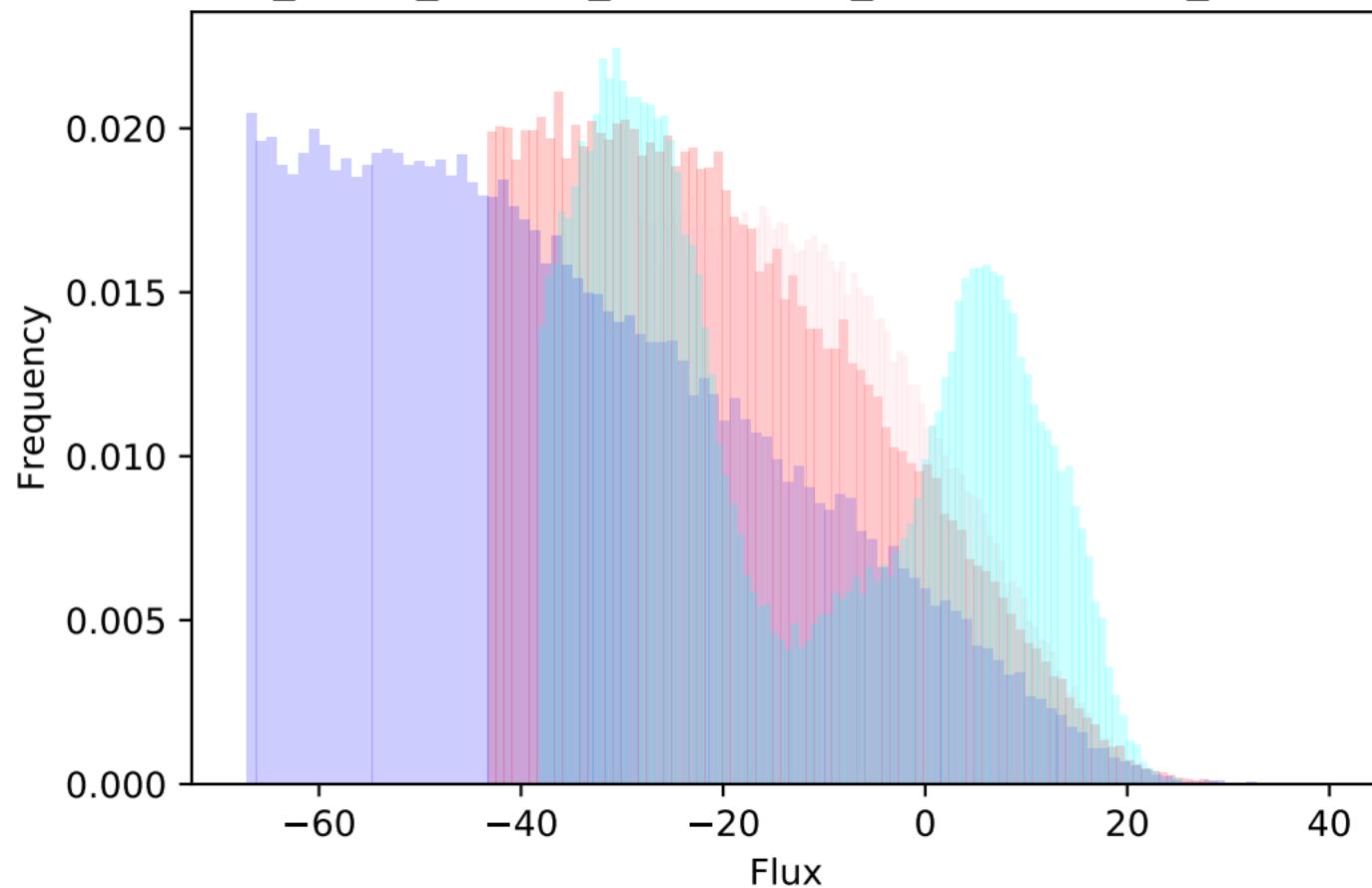


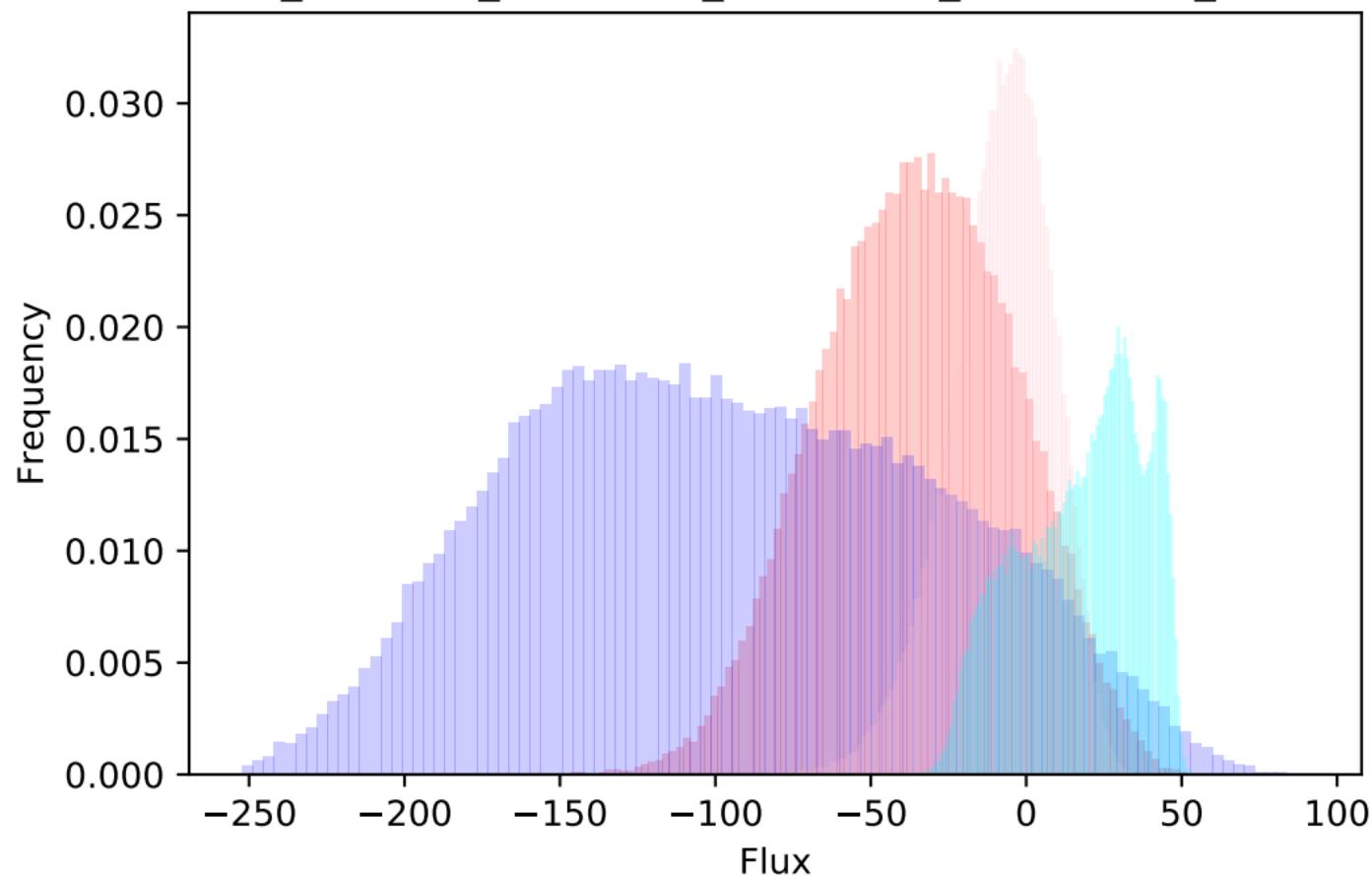
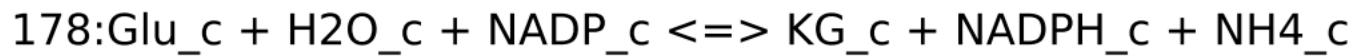
175:A_DASH_Ser_h + H2S_h --> AC_h + Cys_h + H_h

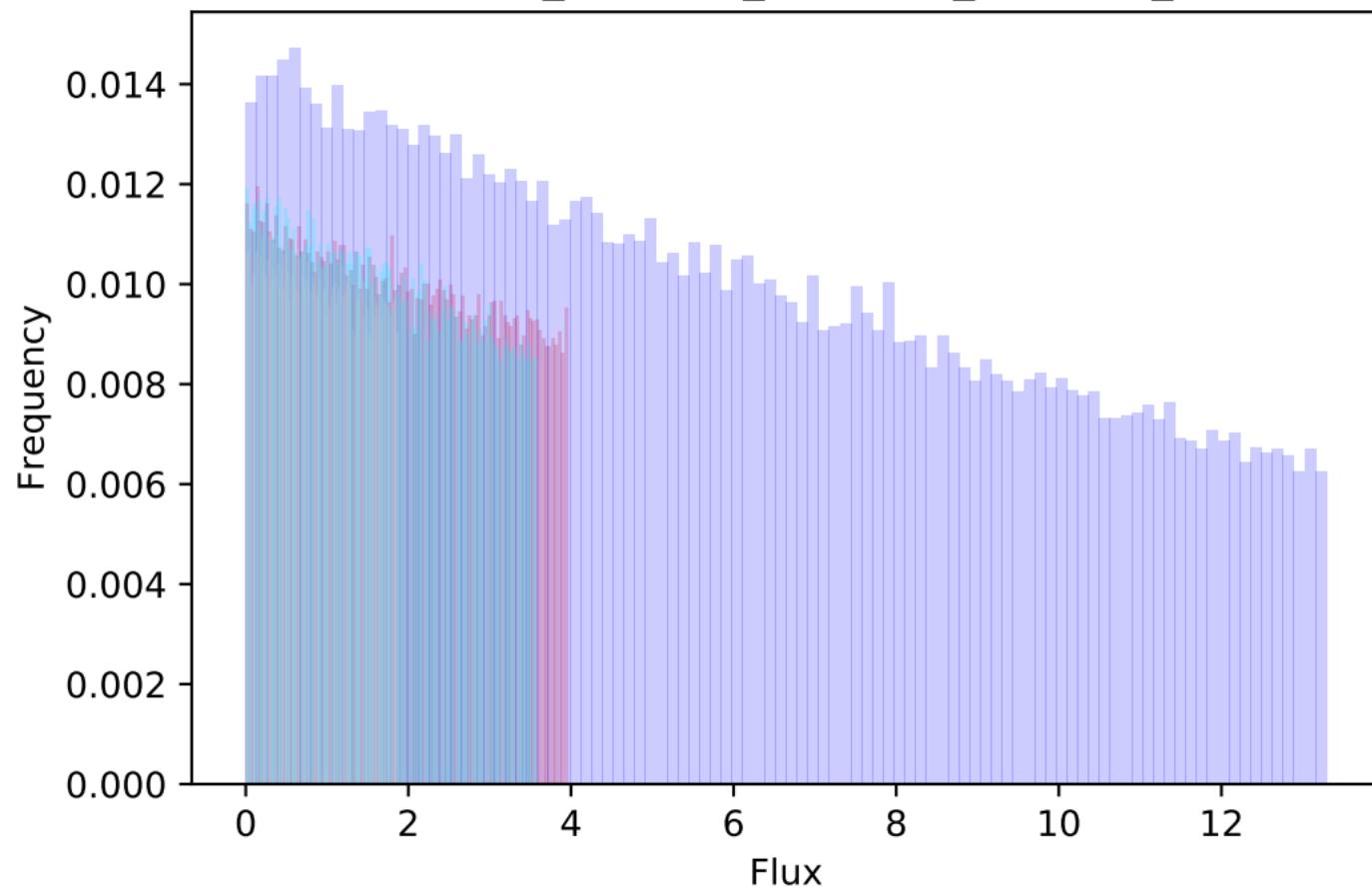
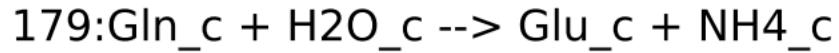


176:A_DASH_Ser_m + H2S_m --> AC_m + Cys_m + H_m

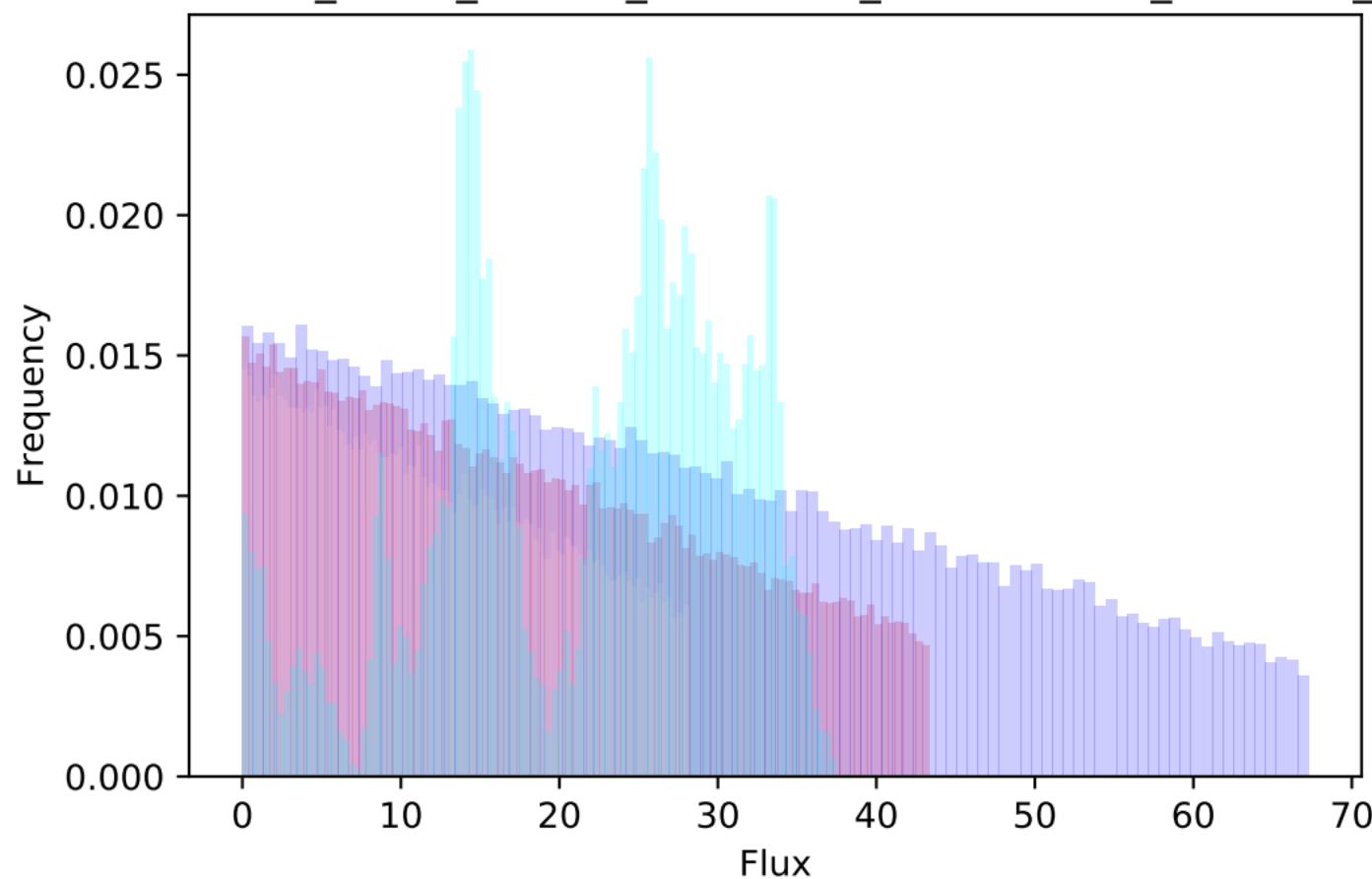




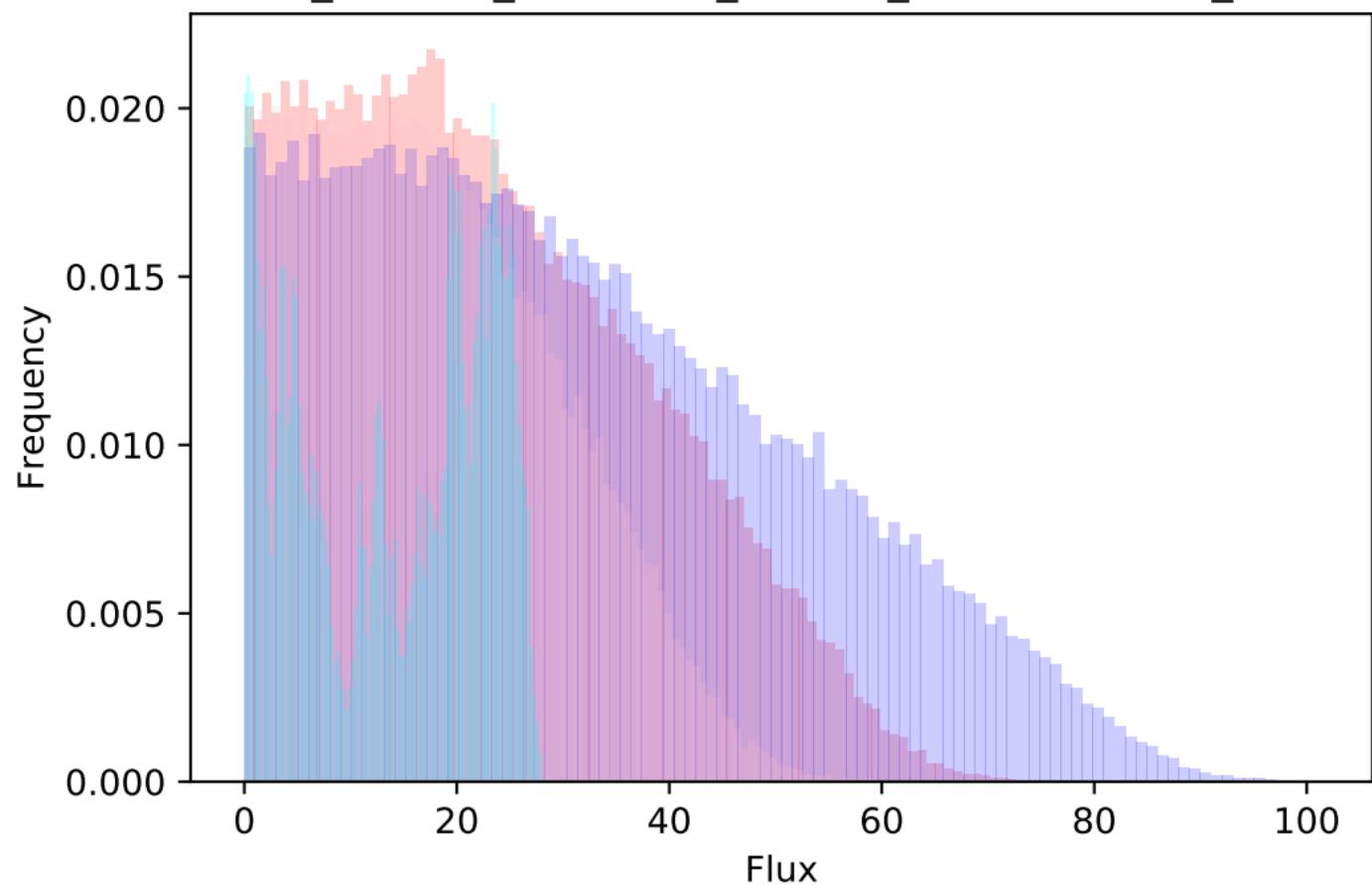


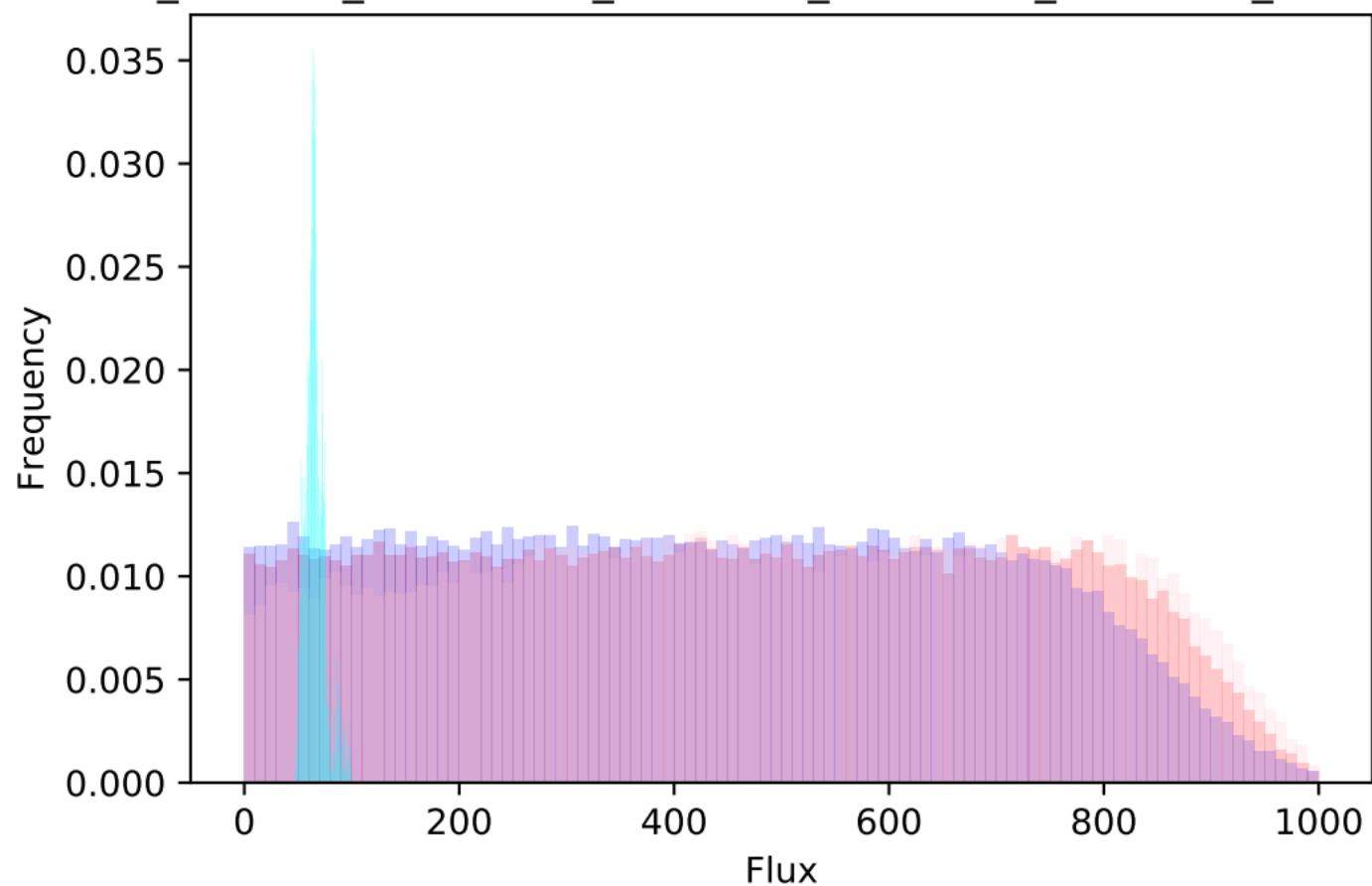
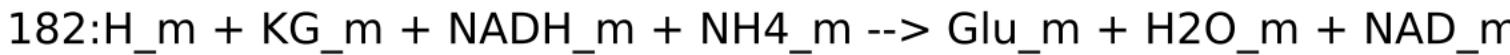


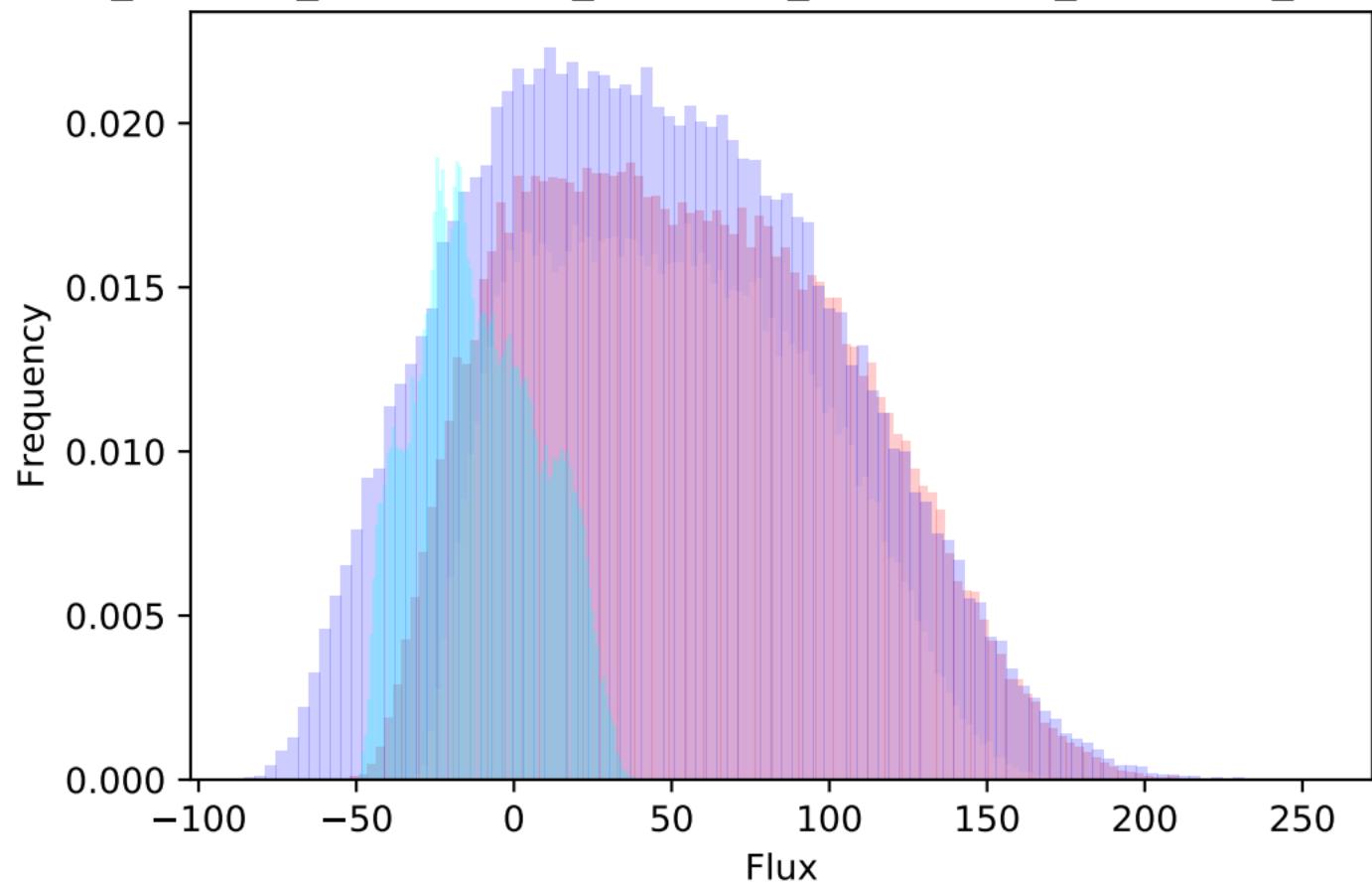
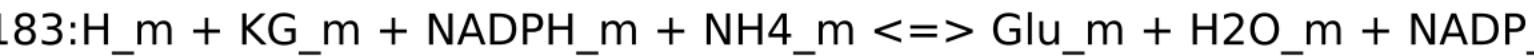
$180:\text{Gln_h} + \text{H_h} + \text{KG_h} + \text{NADH_h} \rightarrow 2.0 \text{ Glu_h} + \text{NAD_h}$

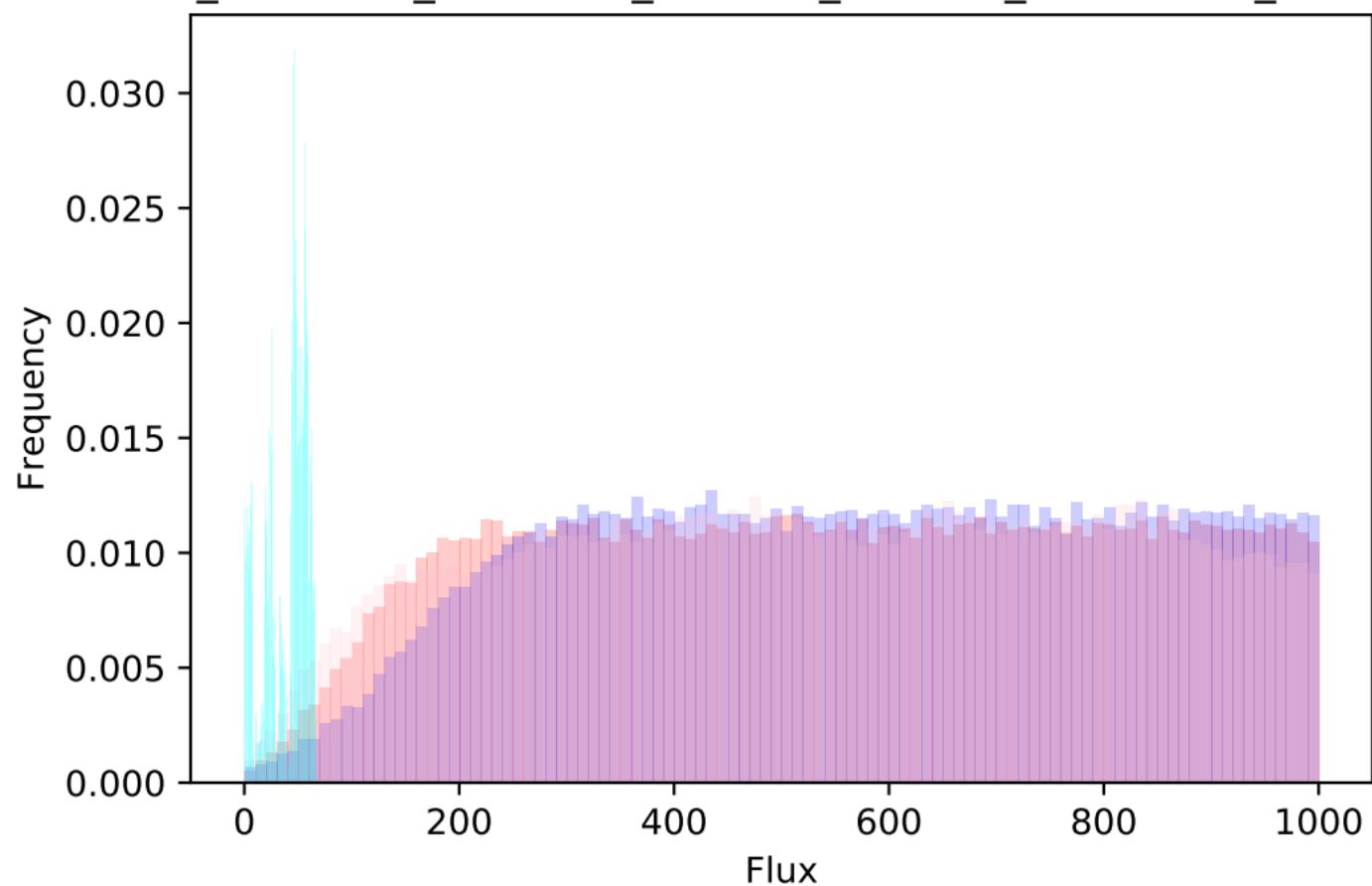


$181:2.0 \text{ Fdrd_h} + \text{Gln_h} + 2.0 \text{ H_h} + \text{KG_h} \rightarrow 2.0 \text{ Fdox_h} + 2.0 \text{ Glu_h}$

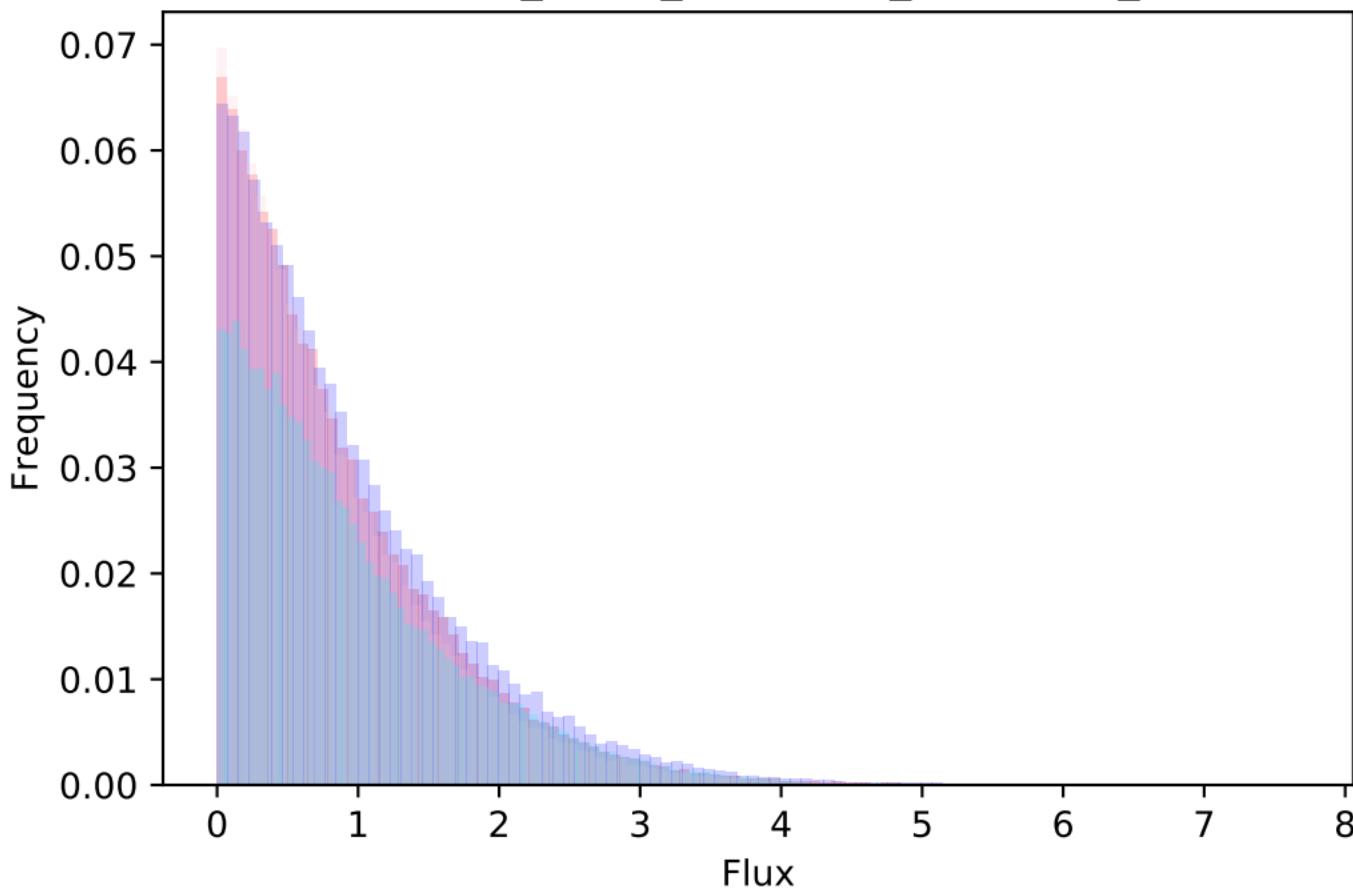




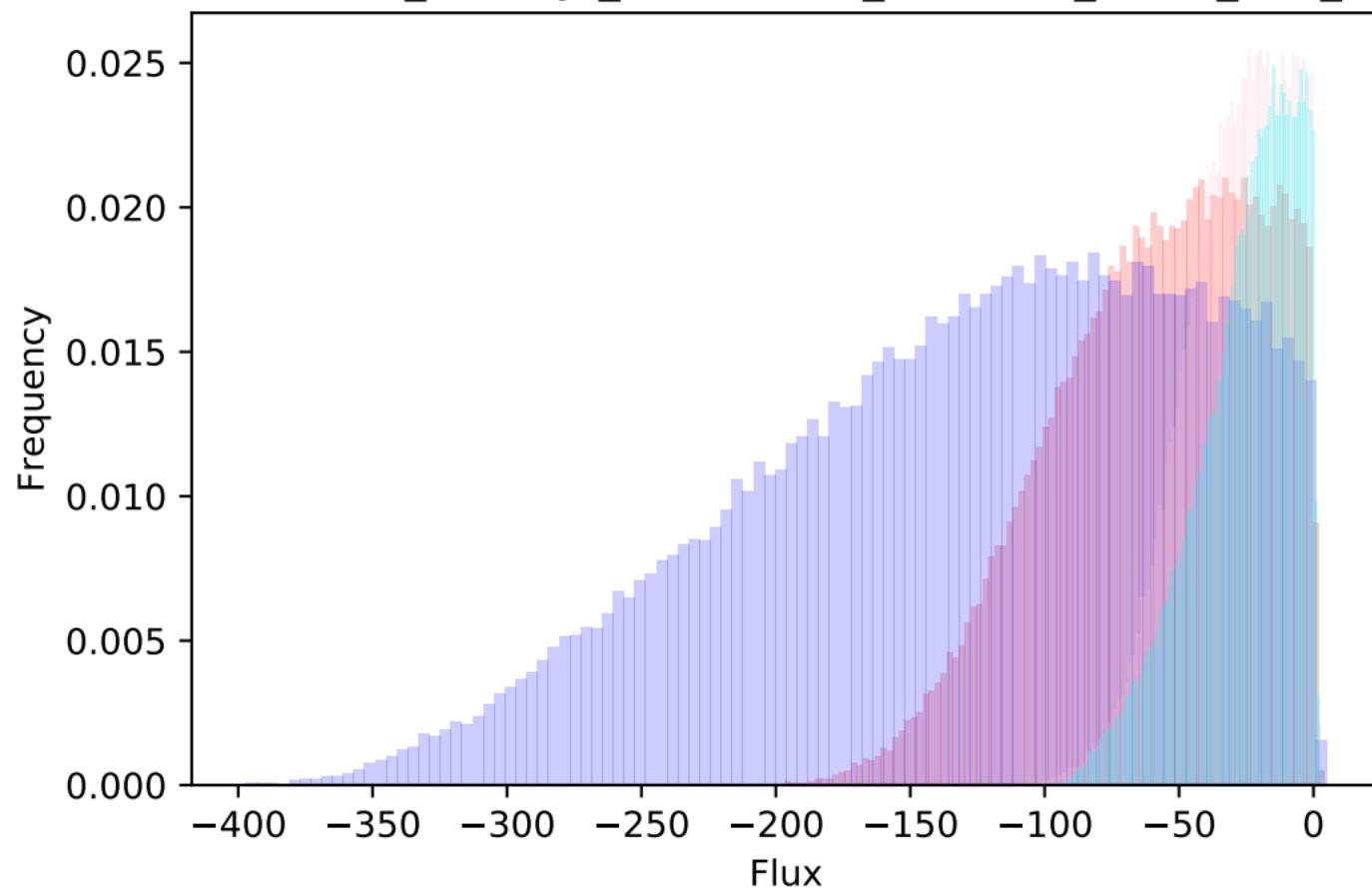




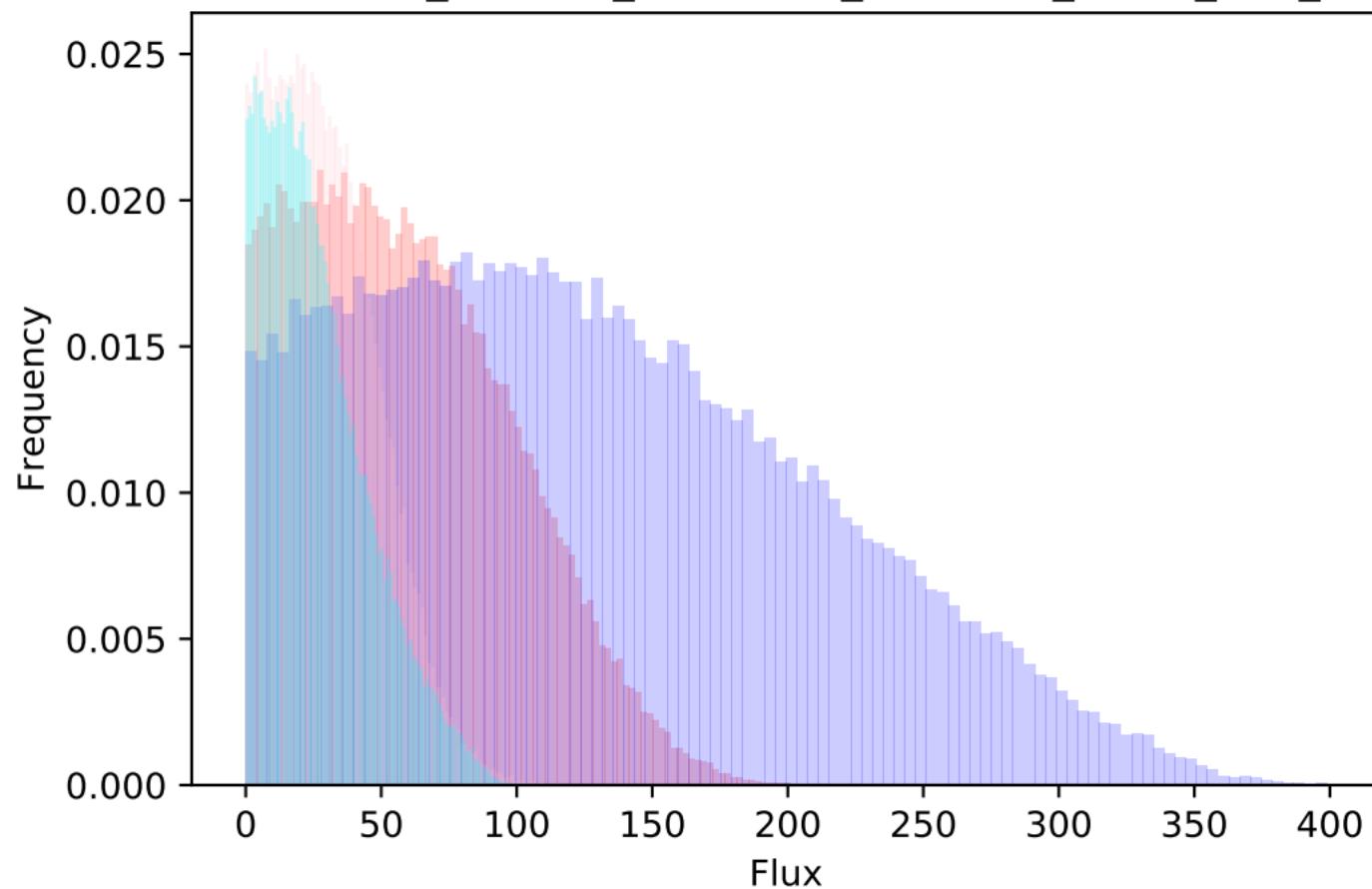
185:Glu_c + H_c --> CO2_c + GABA_c

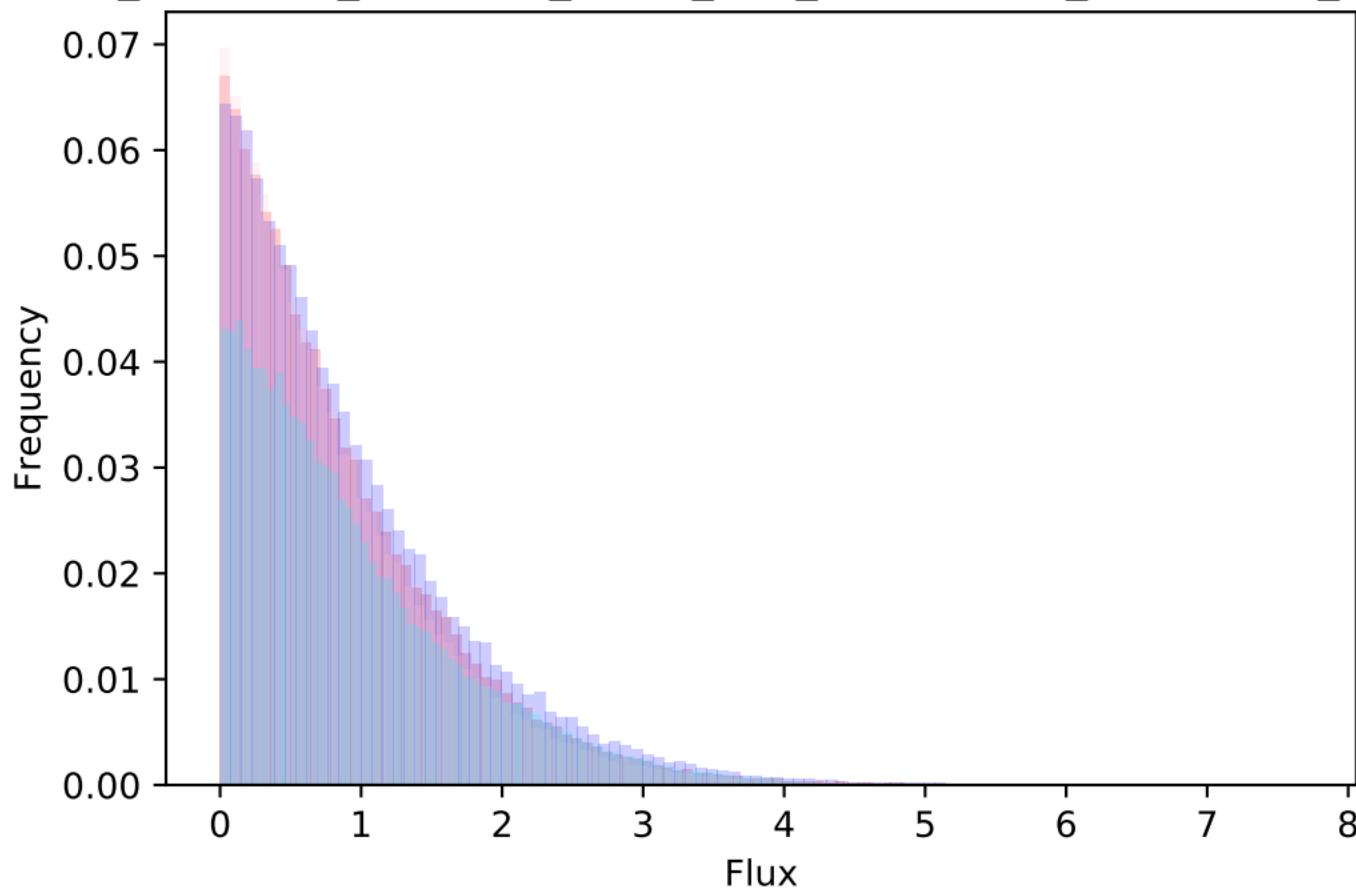


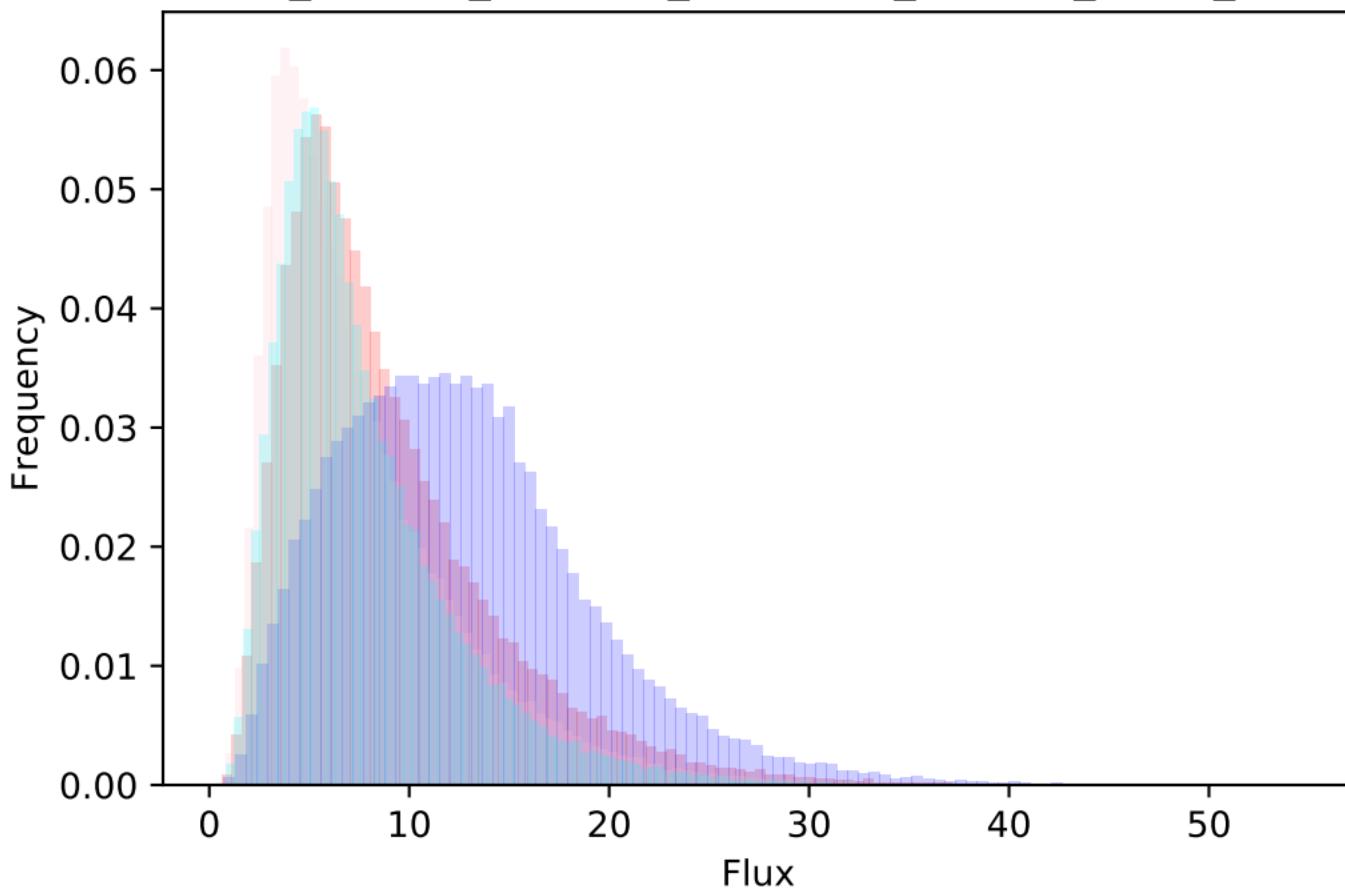
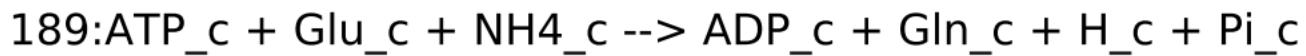
$186:\text{GABA_m} + \text{Pyr_m} \rightleftharpoons \text{Ala_m} + \text{SCA_DASH_SeA_m}$

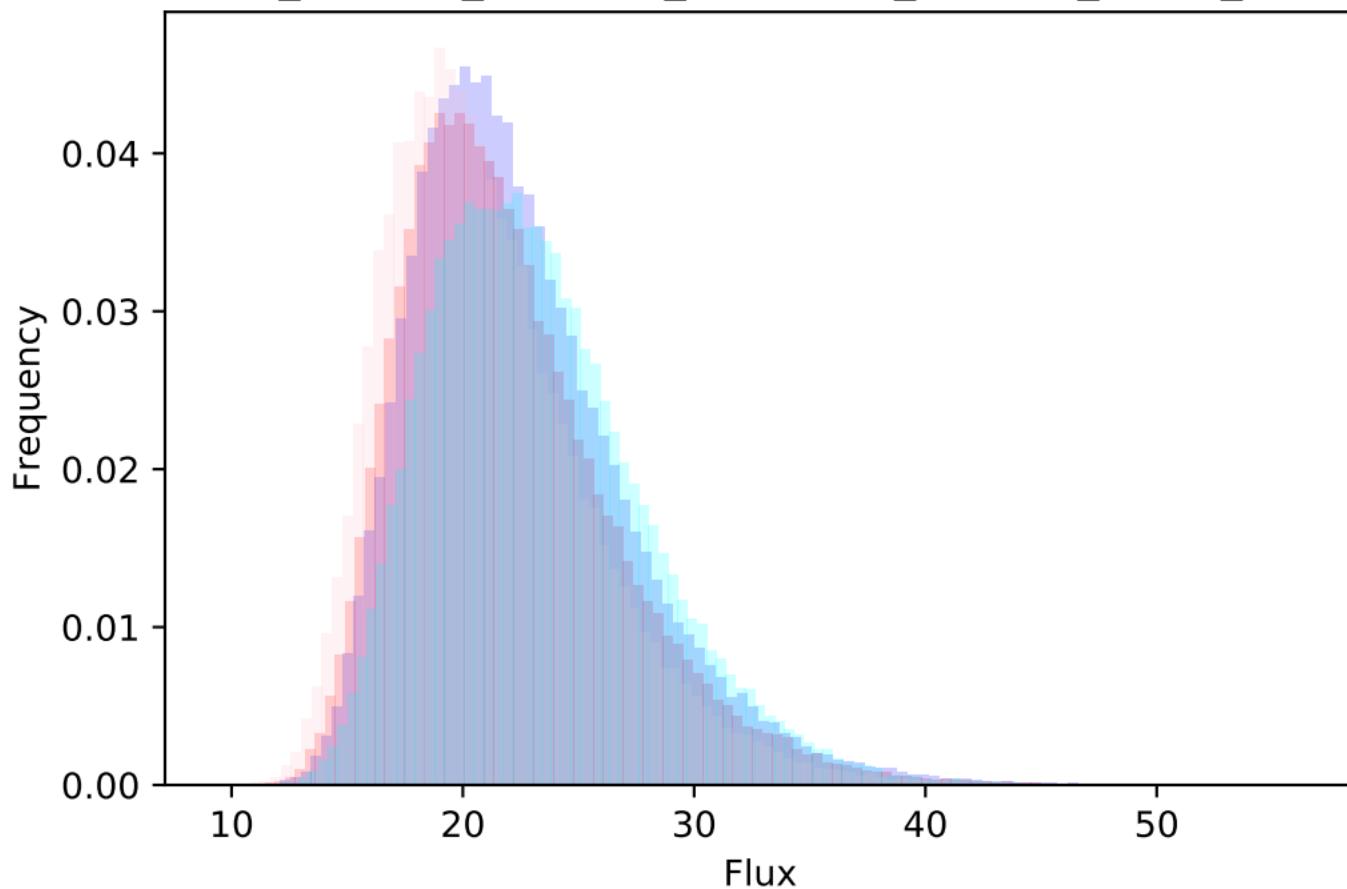
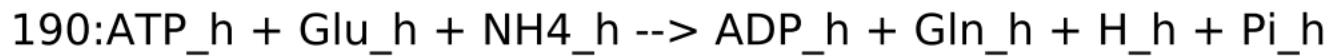


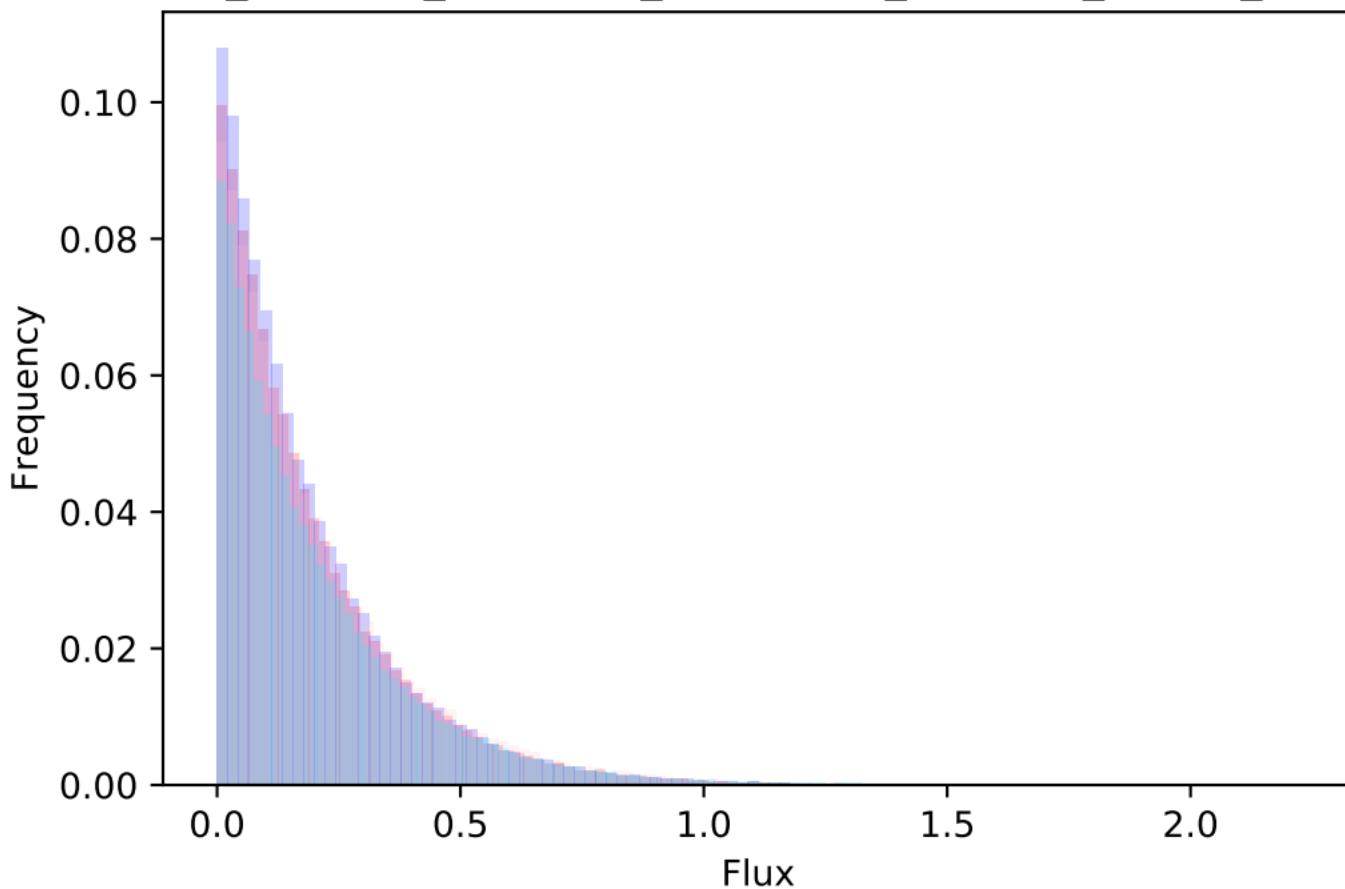
187:GABA_m + KG_m --> Glu_m + SCA_DASH_SeA_m



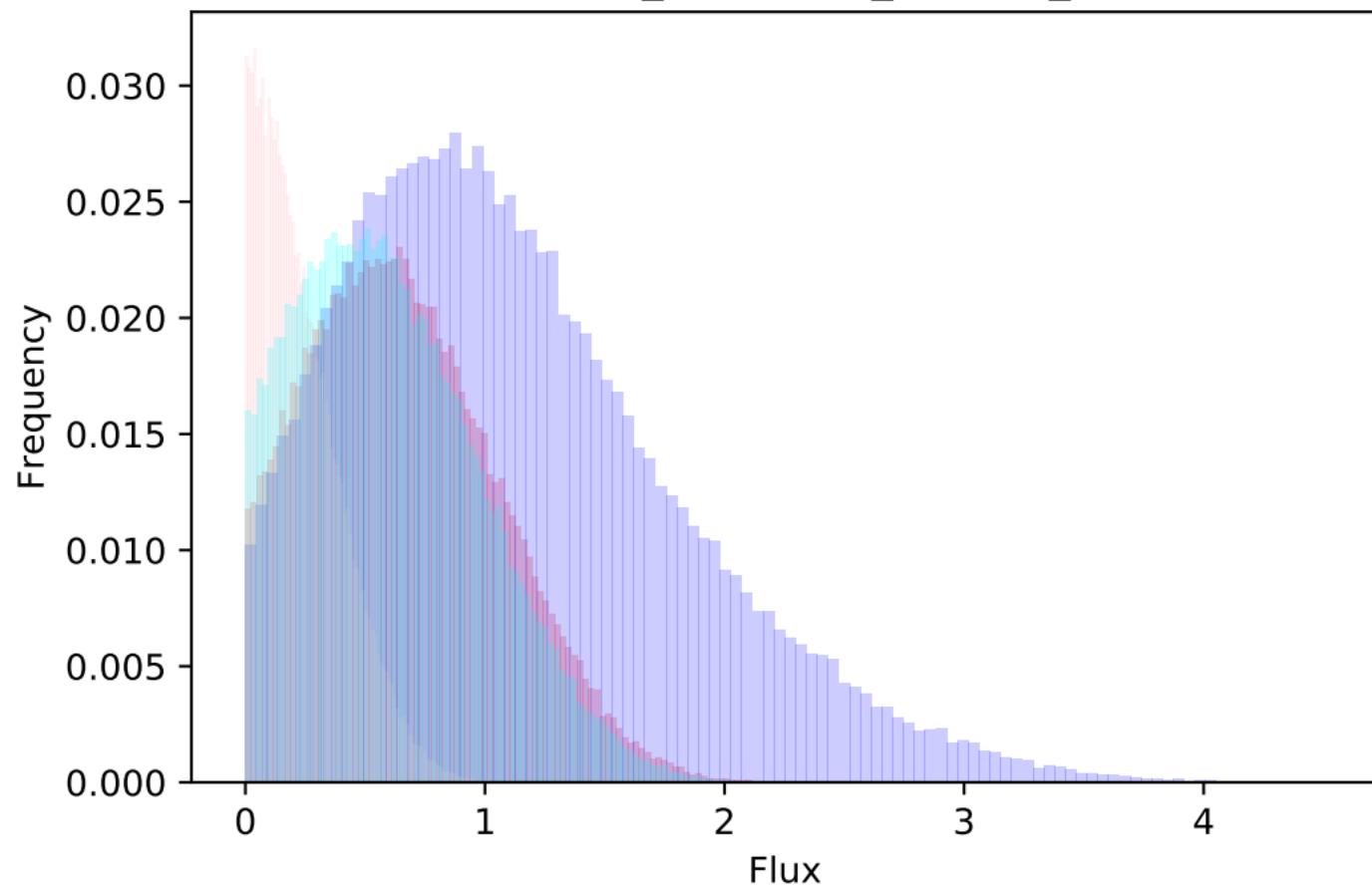




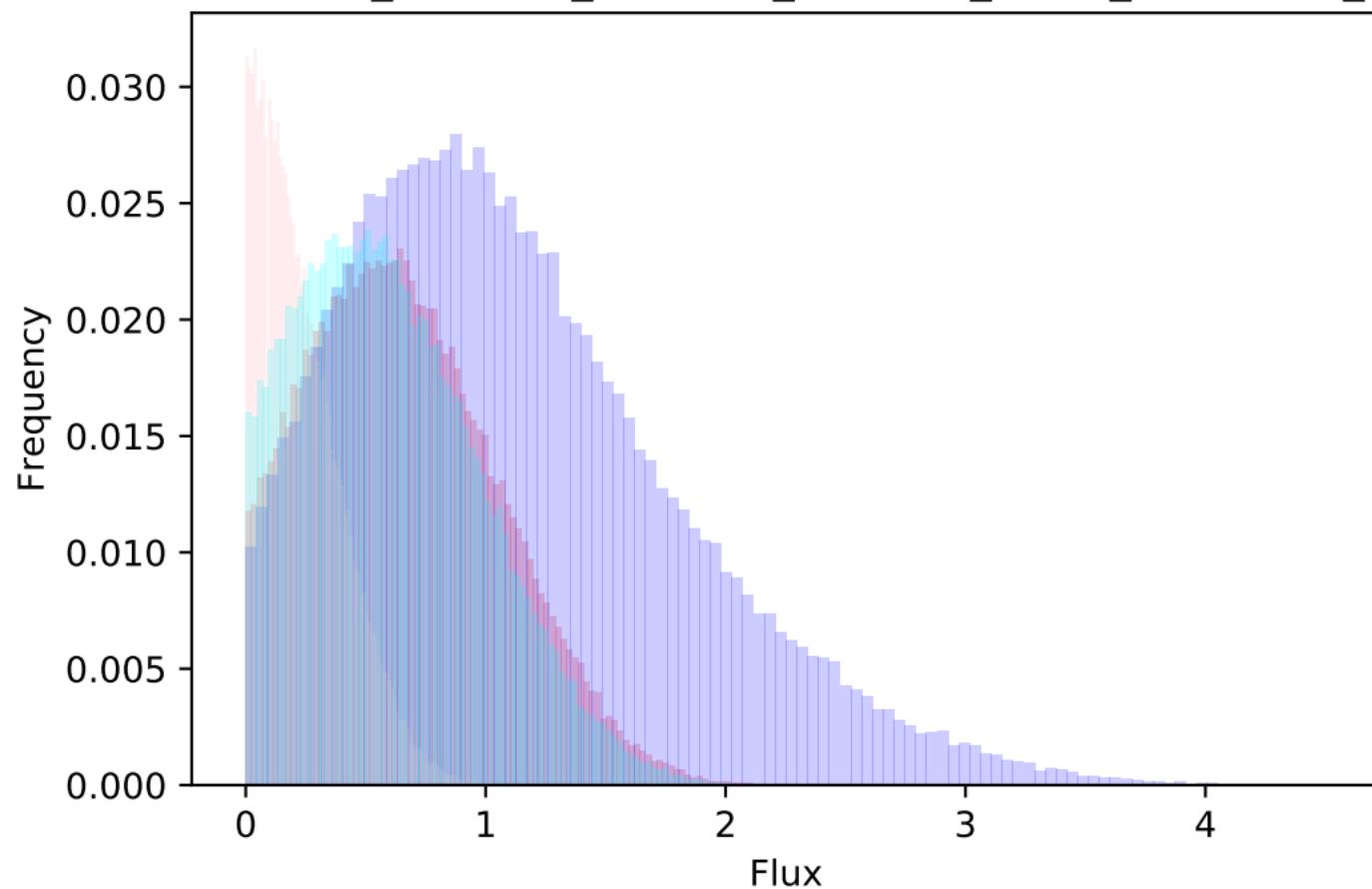


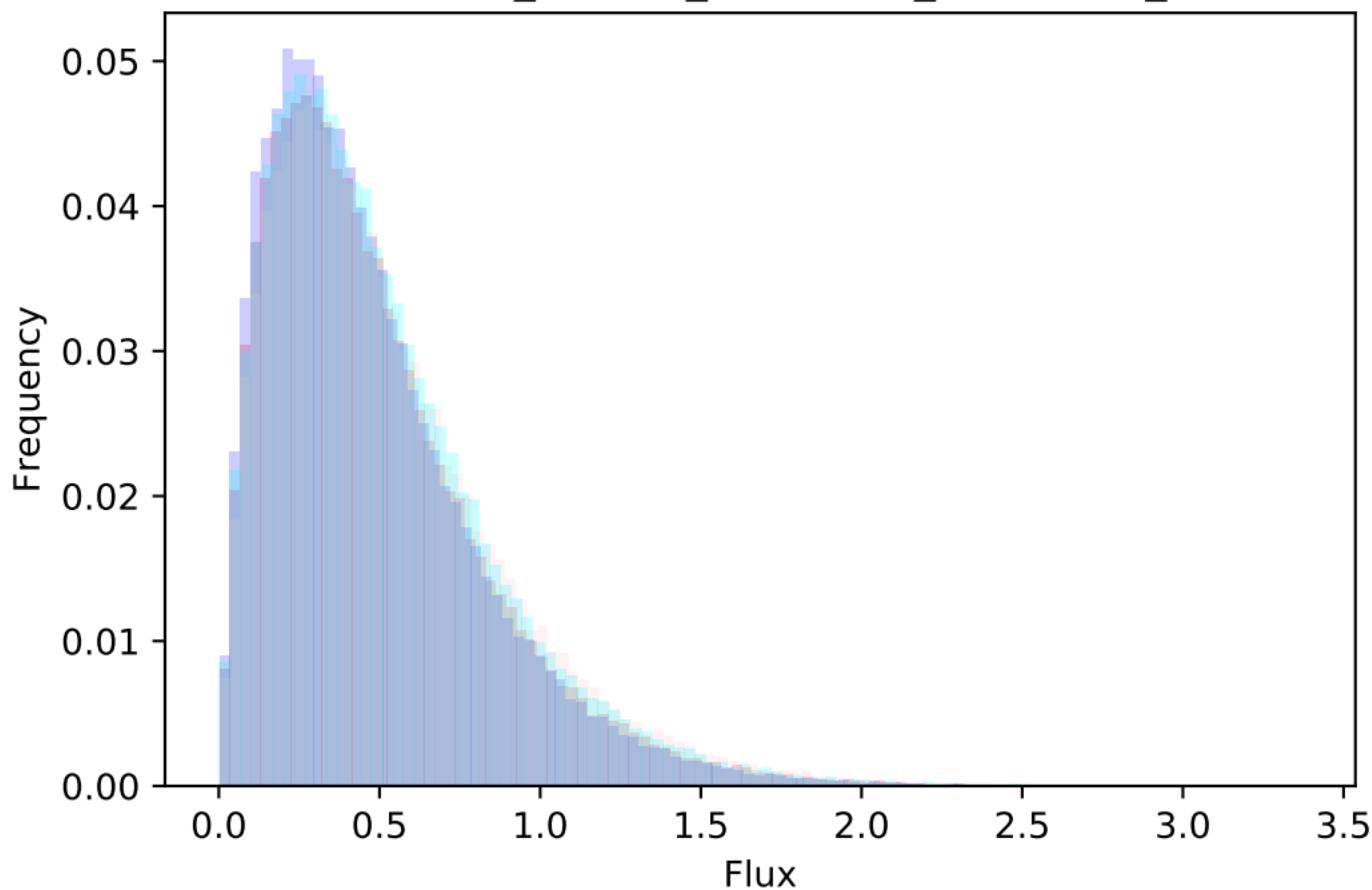
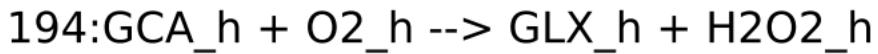


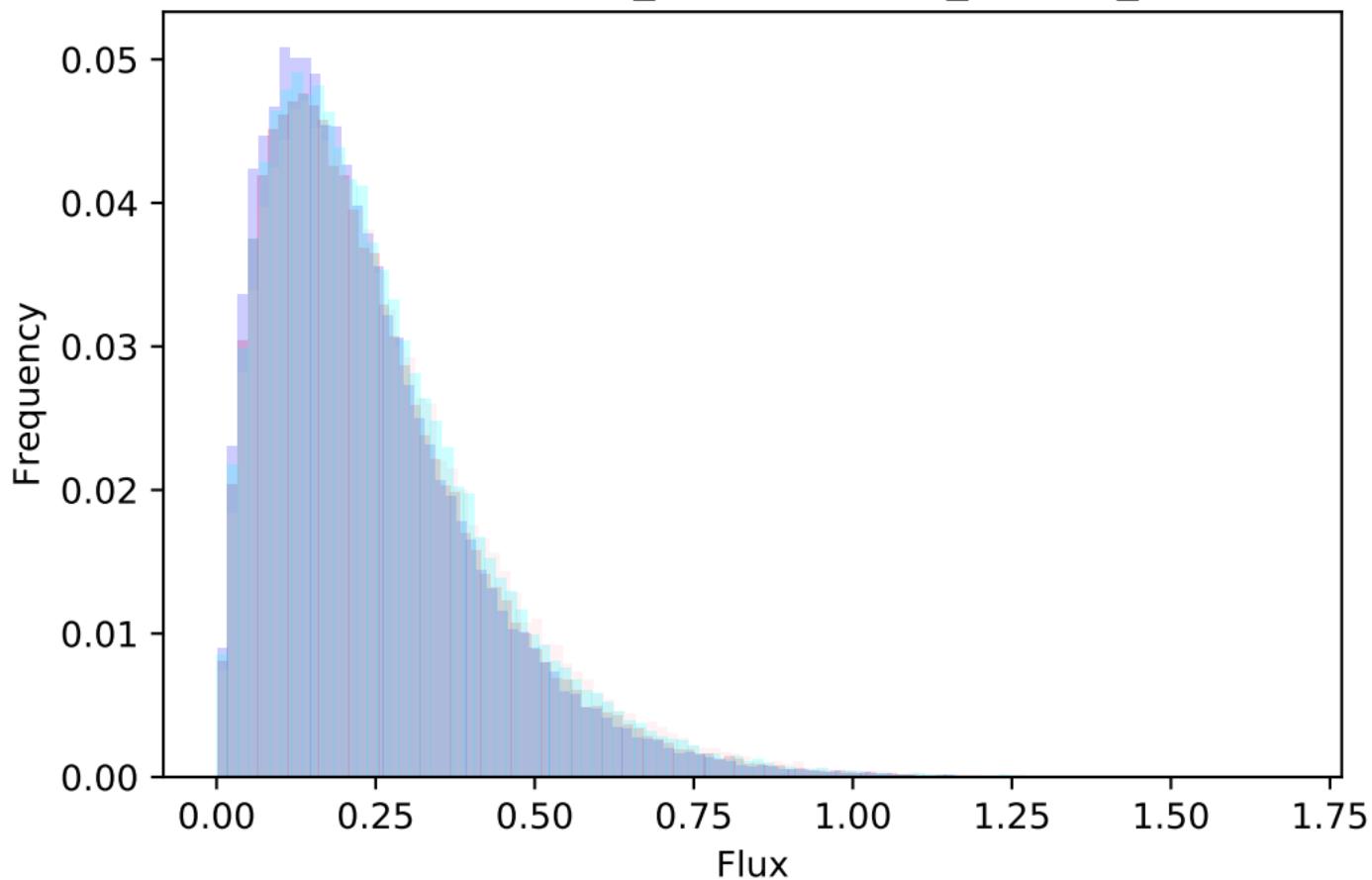
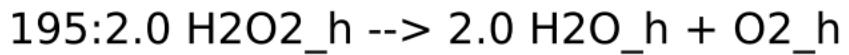
192:Thr_c --> ACD_c + Gly_c

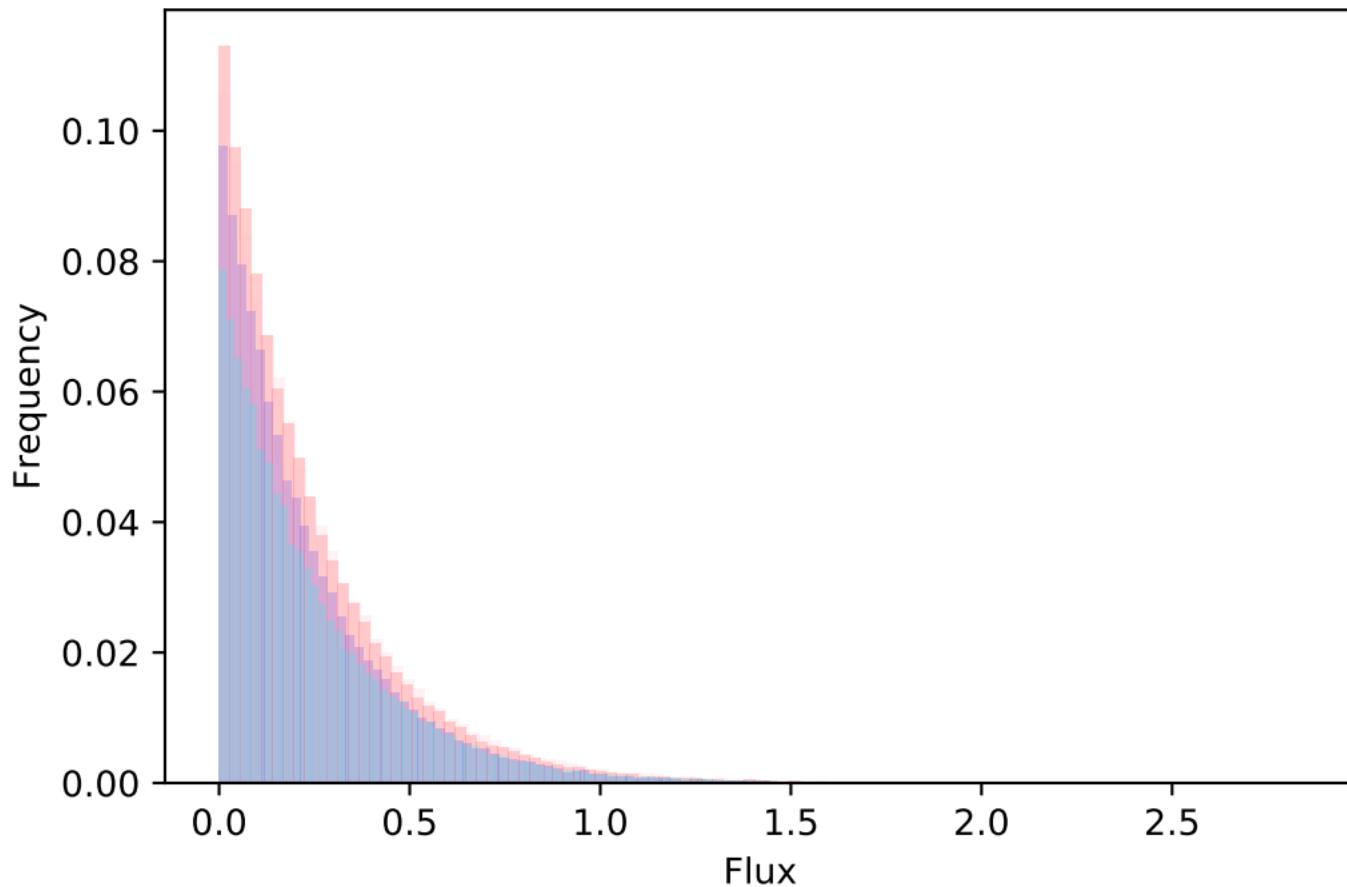
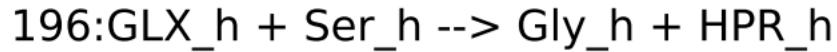


$193:\text{ACD_c} + \text{H}_2\text{O_c} + \text{NAD_c} \rightarrow \text{AC_c} + \text{H_c} + \text{NADH_c}$

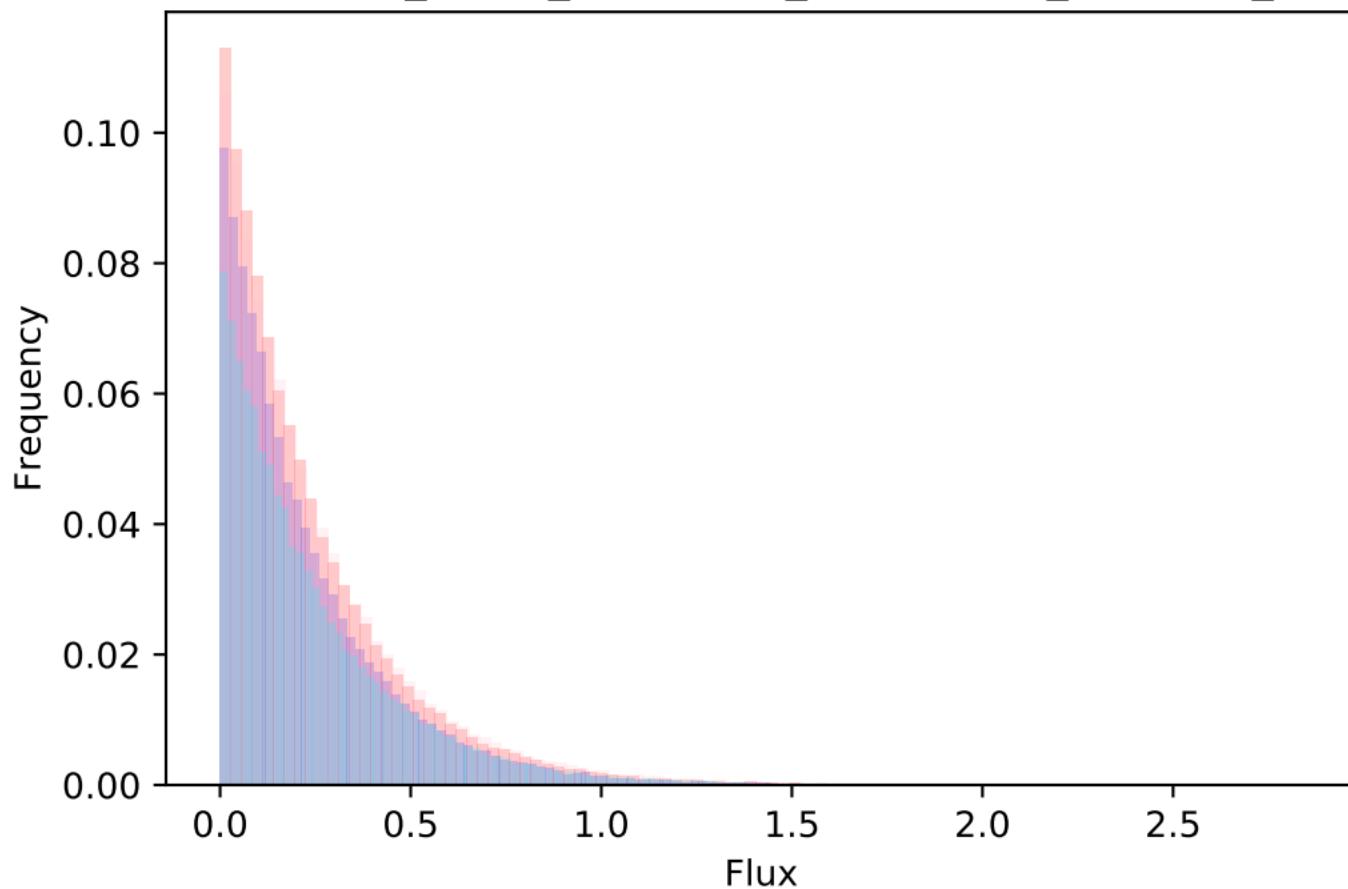




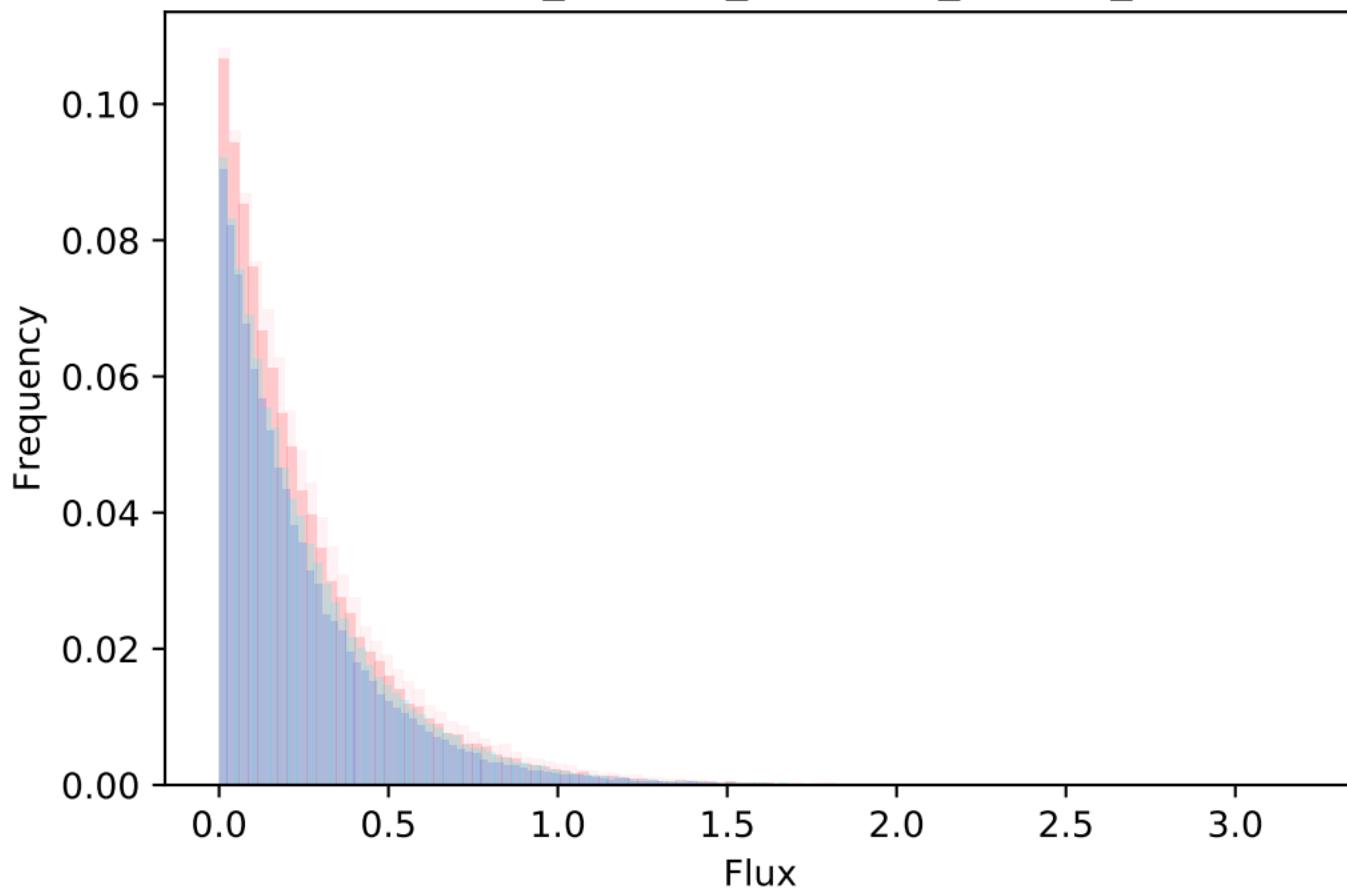




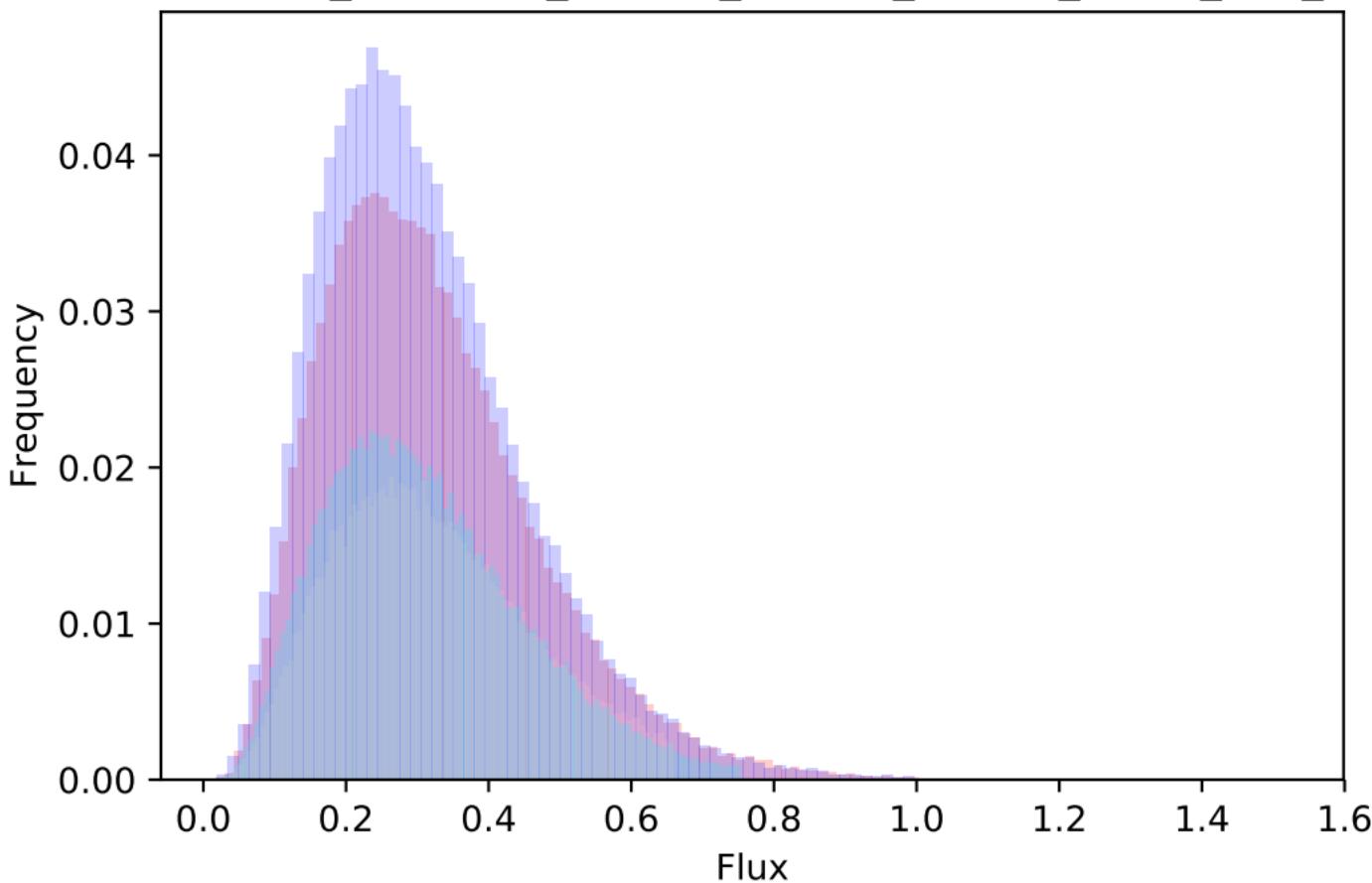
$$197:\text{HPR_h} + \text{H_h} + \text{NADH_h} \rightarrow \text{GCEA_h} + \text{NAD_h}$$

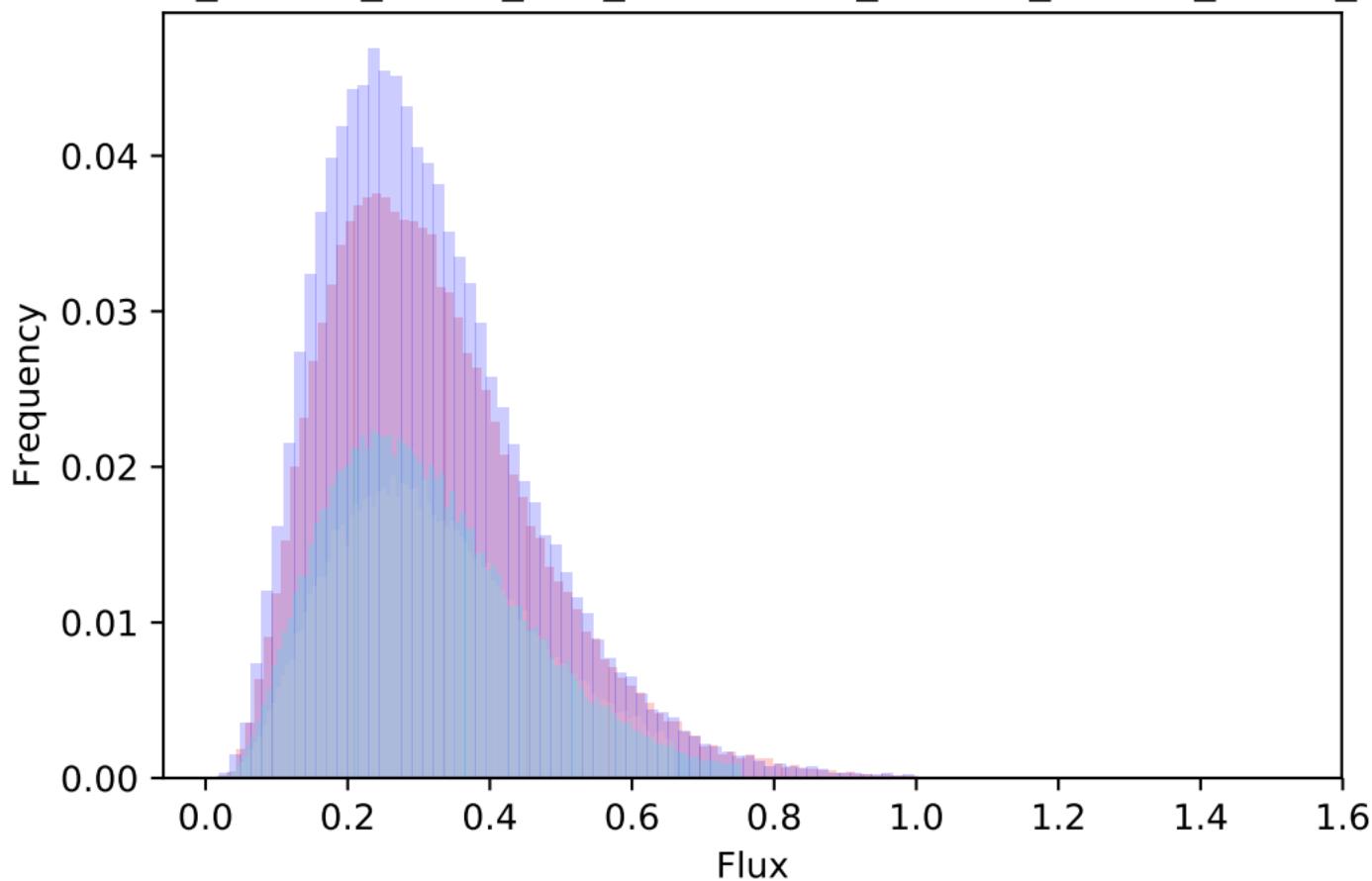
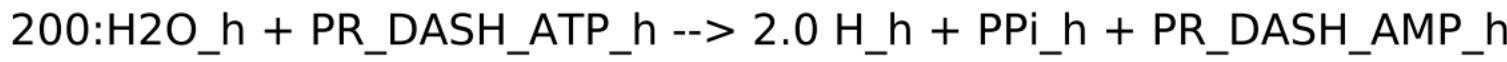


198:GLX_h + Glu_h --> Gly_h + KG_h

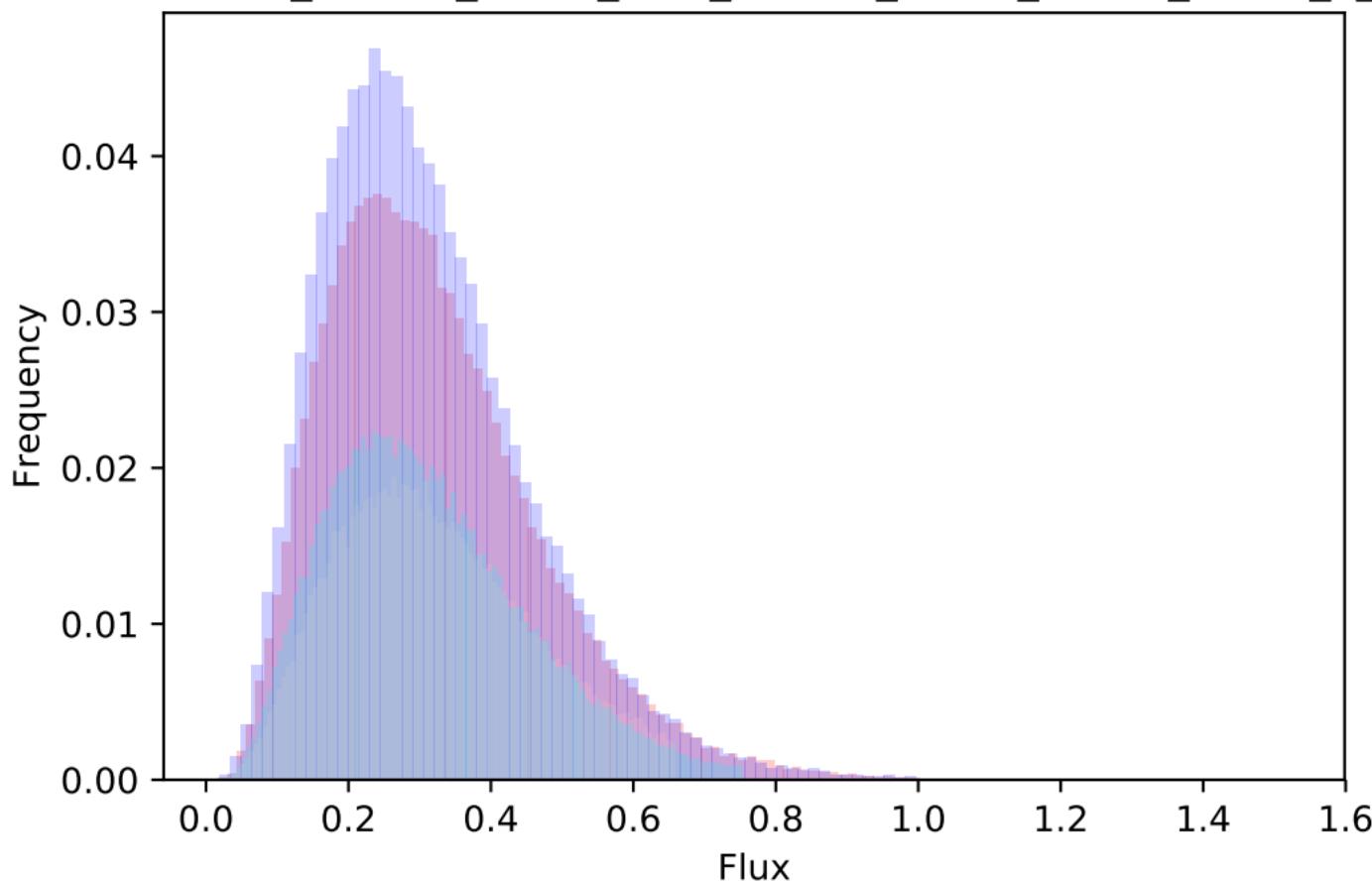


199:ATP_h + PRPP_h \rightarrow H_h + PPi_h + PR_DASH_ATP_h

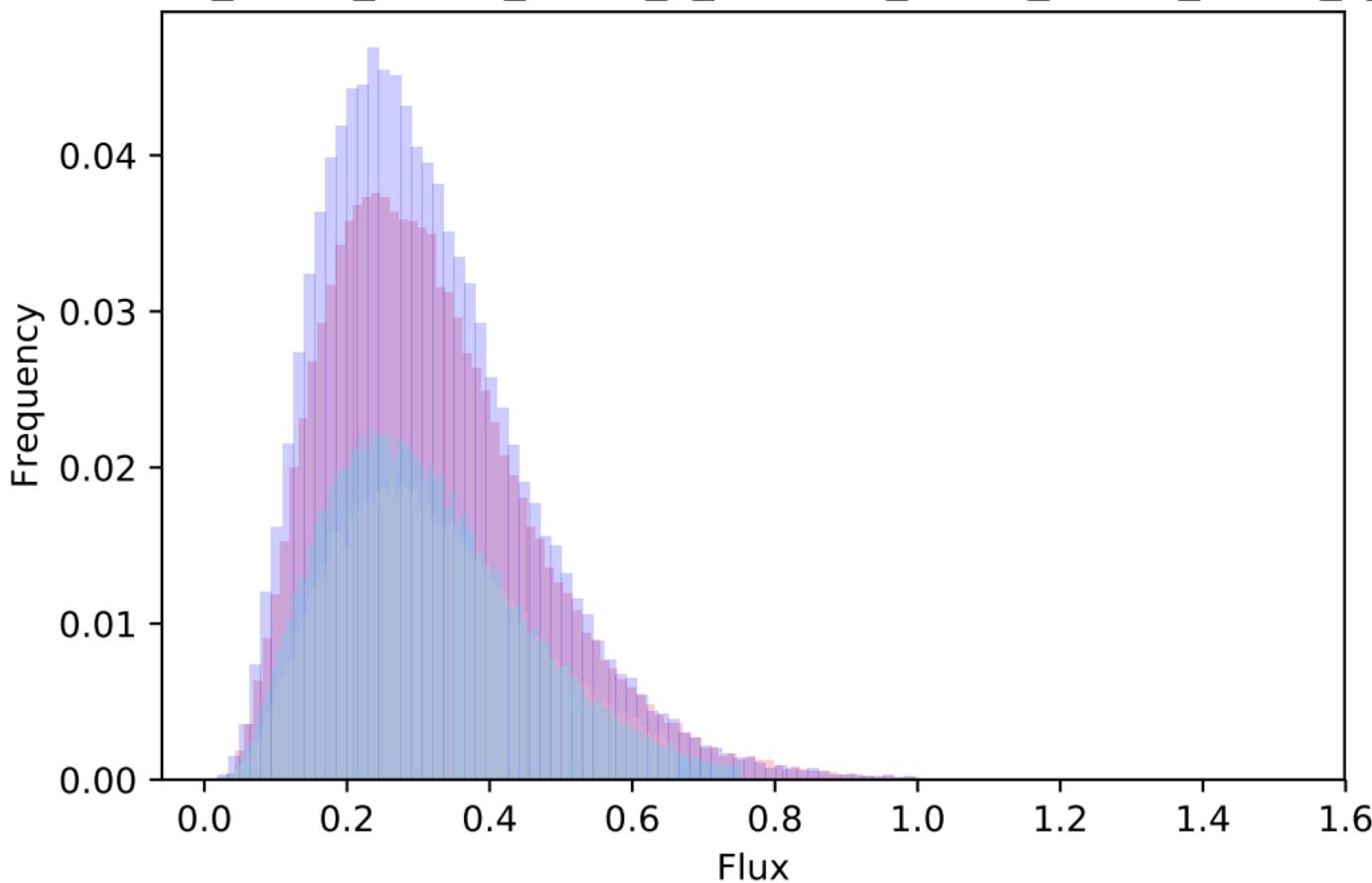




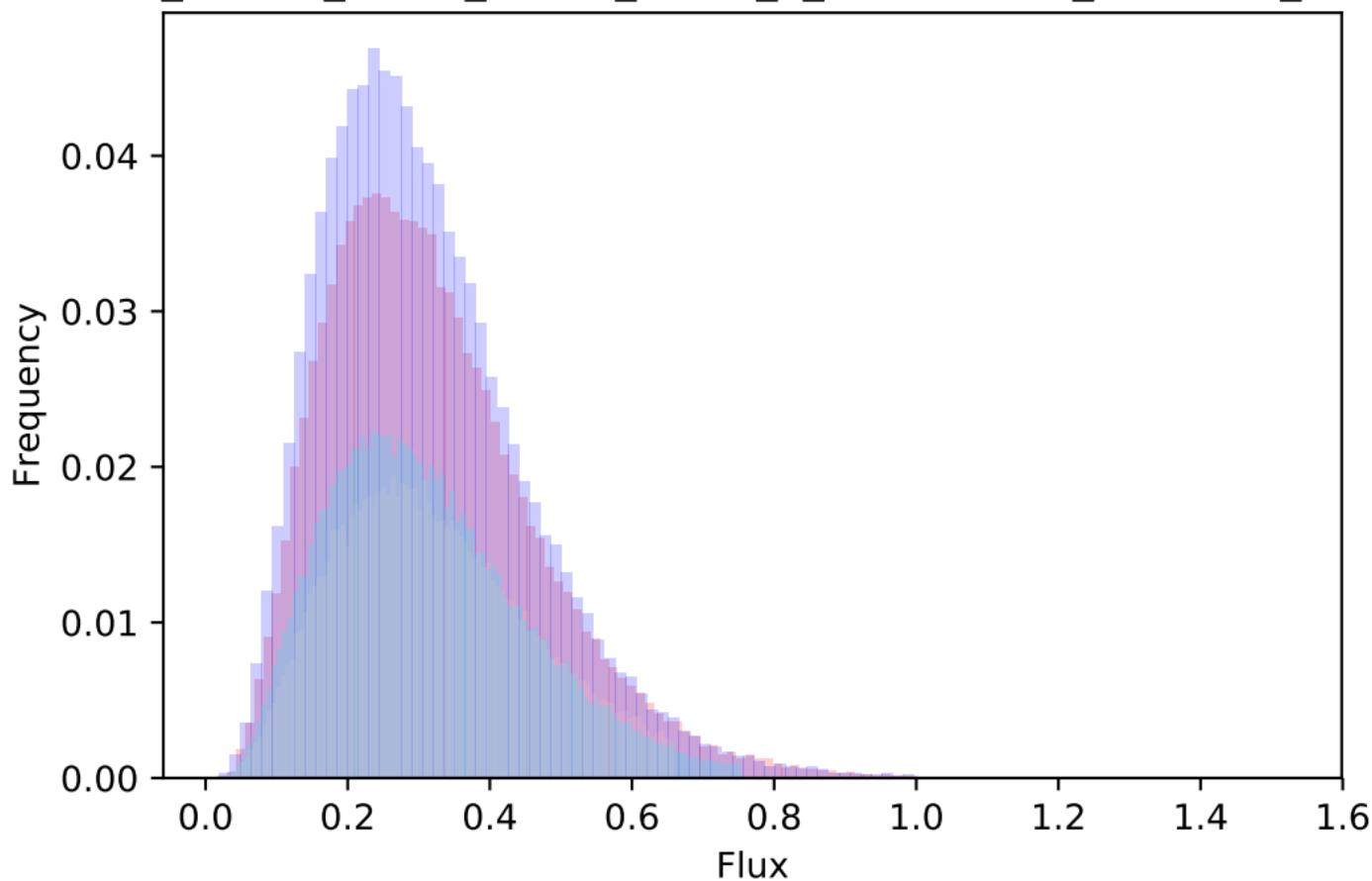
201:H2O_h + PR_DASH_AMP_h --> P_DASH_AICAR_DASH_P_h



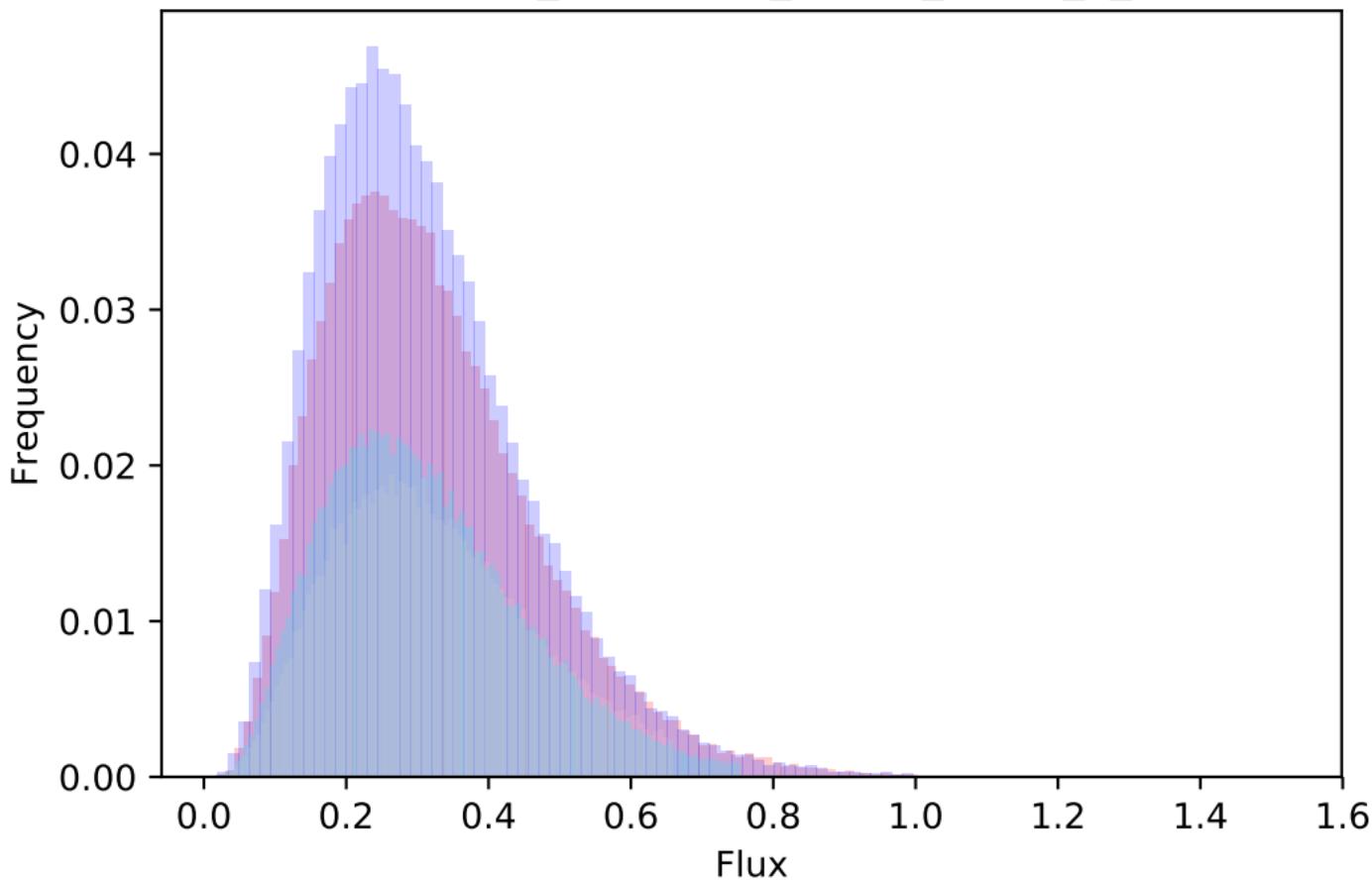
202:P_DASH_AICAR_DASH_P_h --> Pu_DASH_AICAR_DASH_P_h



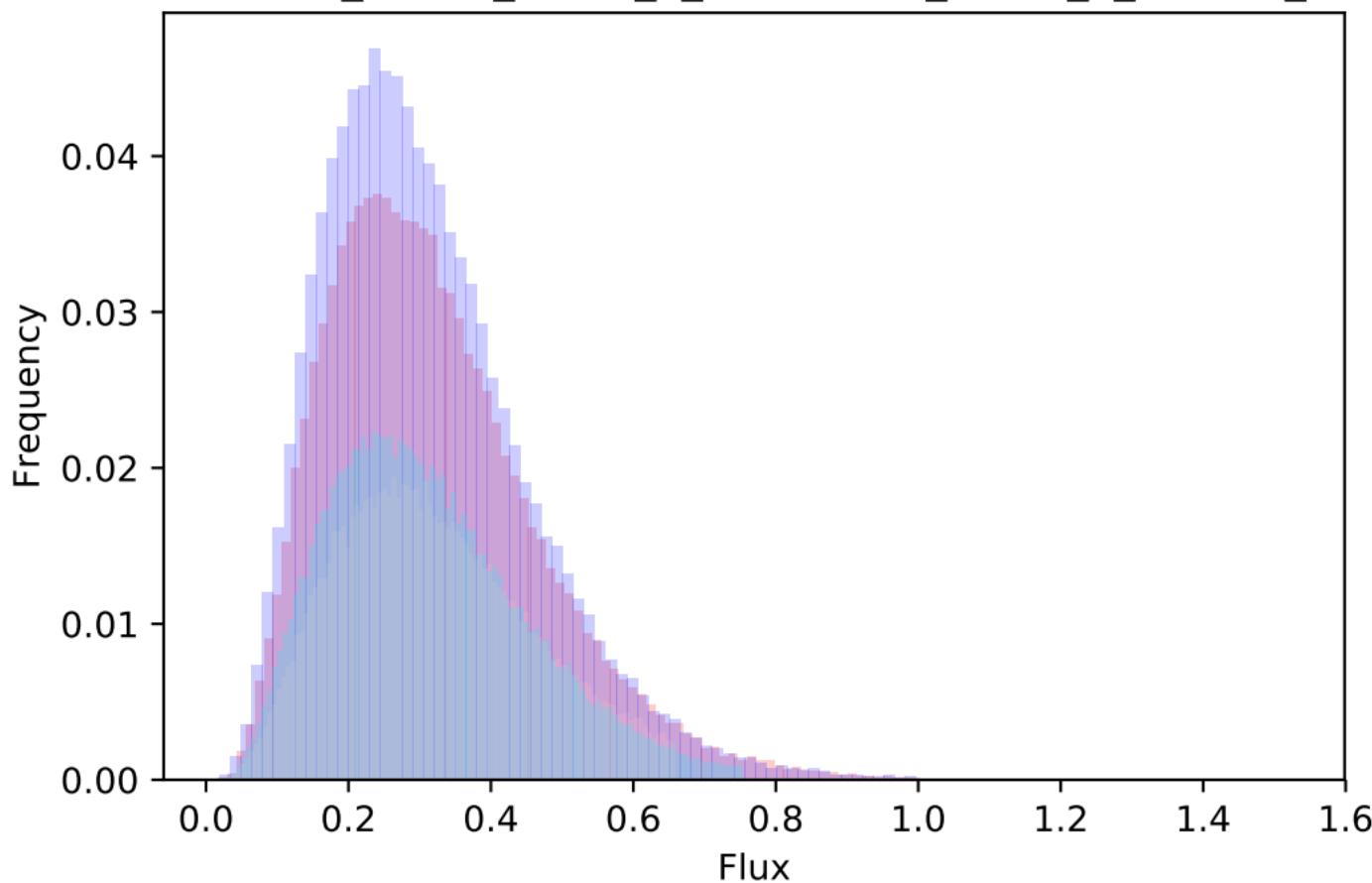
203:Gln_h + Pu_DASH_AICAR_DASH_P_h --> AICAR_h + EIGP_h + Glu_h

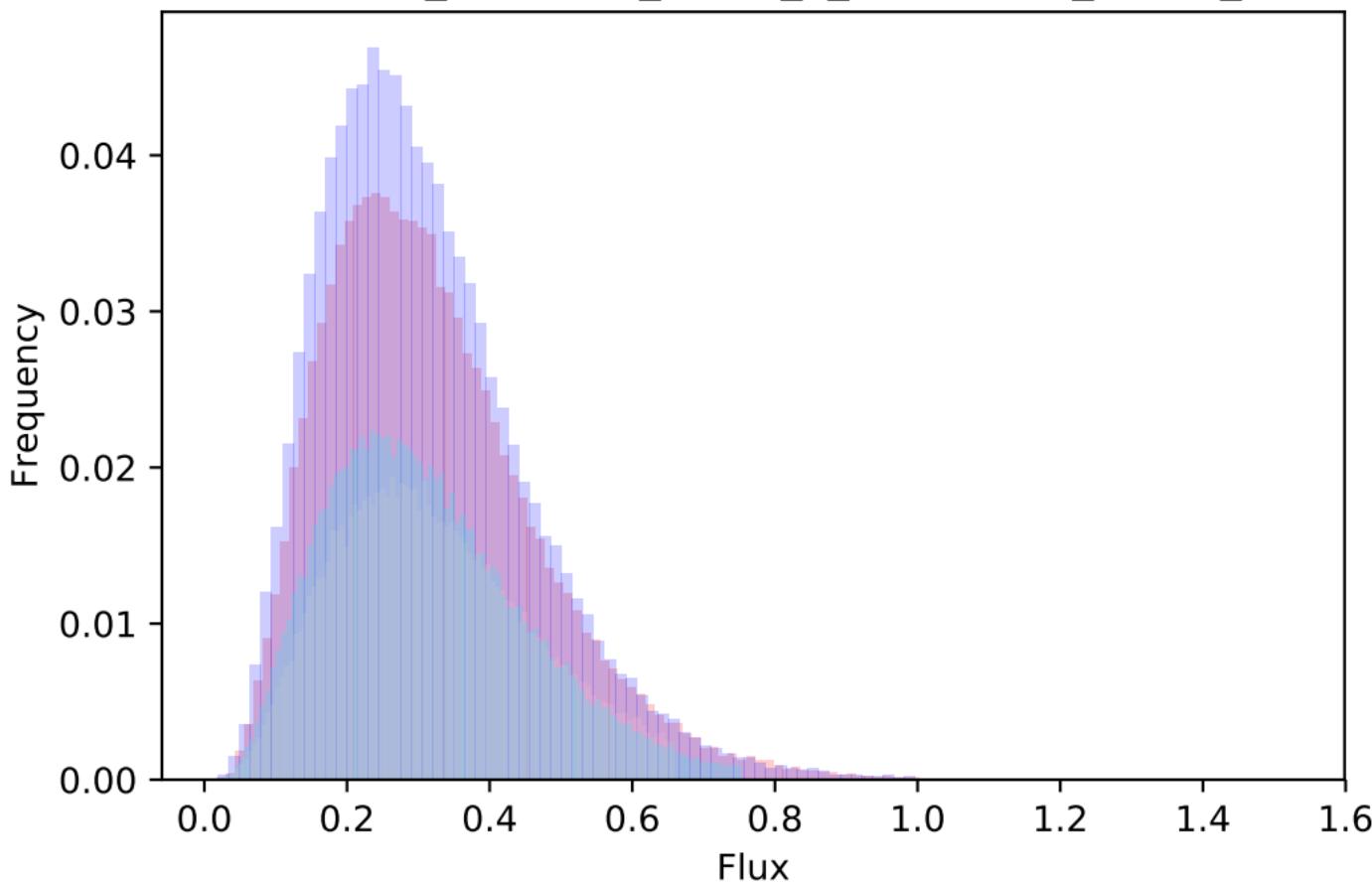


204:EIGP_h --> H2O_h + IA_DASH_P_h

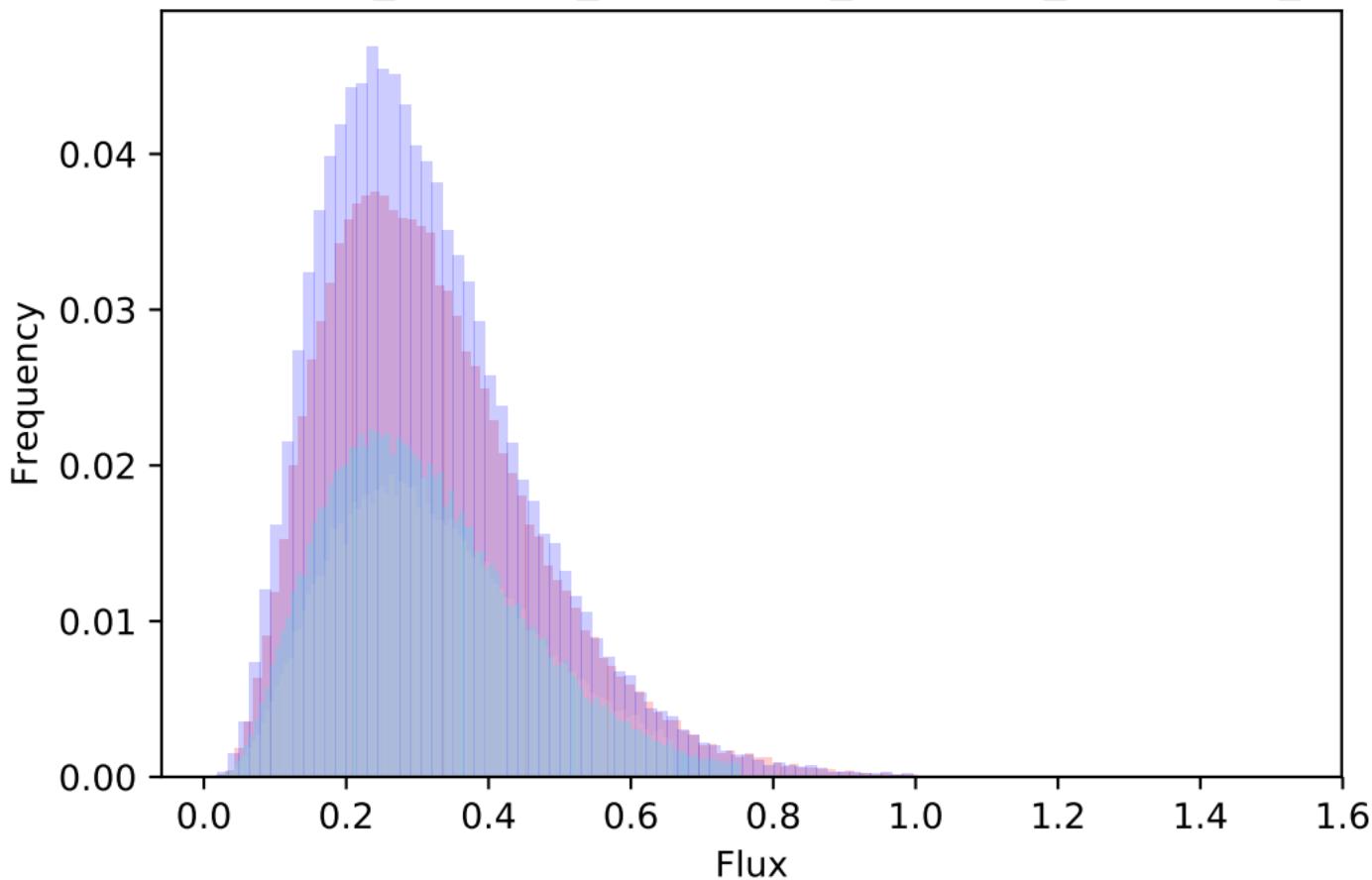


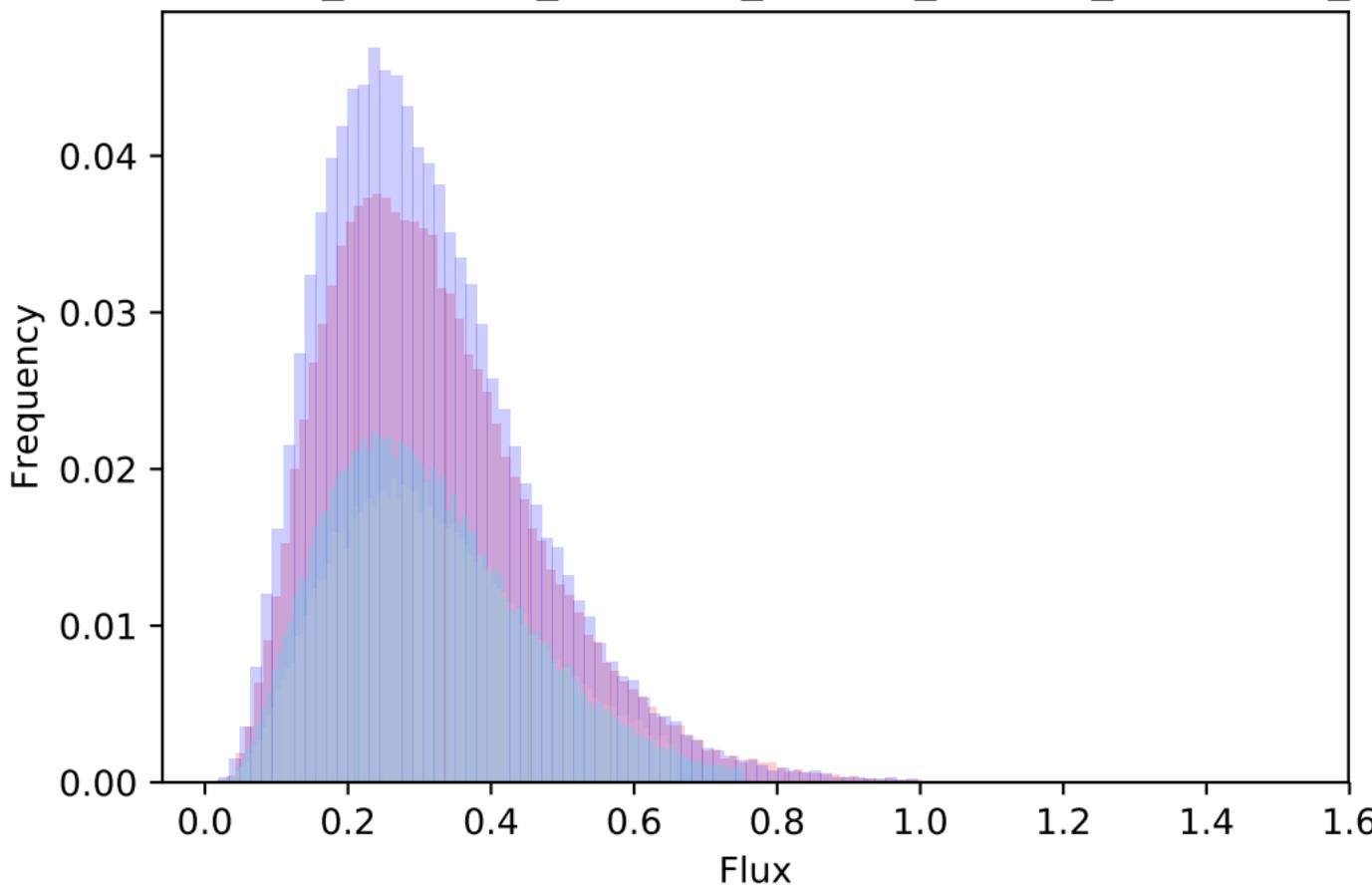
205:Glu_h + IA_DASH_P_h --> Hisol_DASH_P_h + KG_h



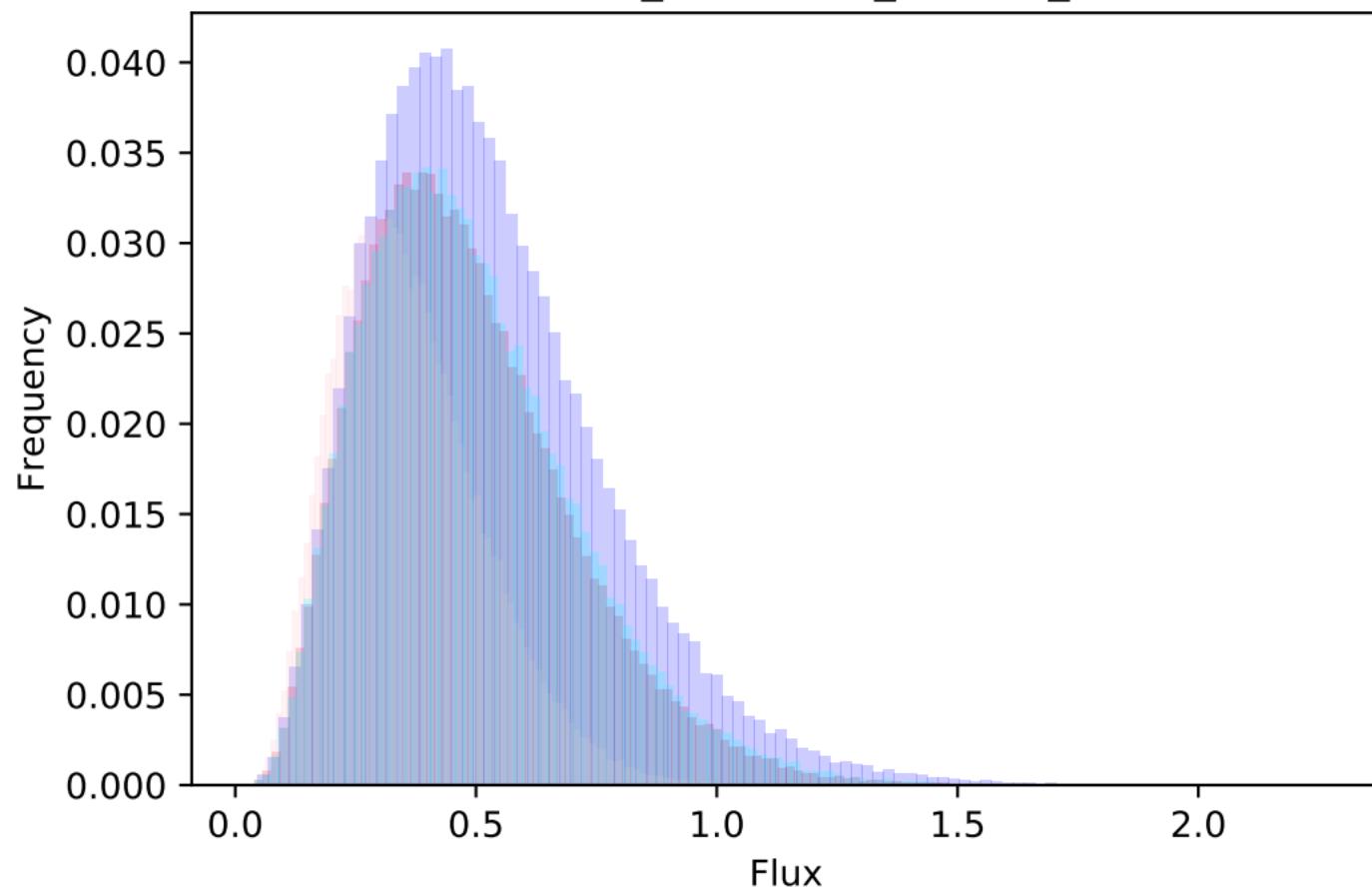


207:Hisol_h + NAD_h --> 2.0 H_h + Hisal_h + NADH_h

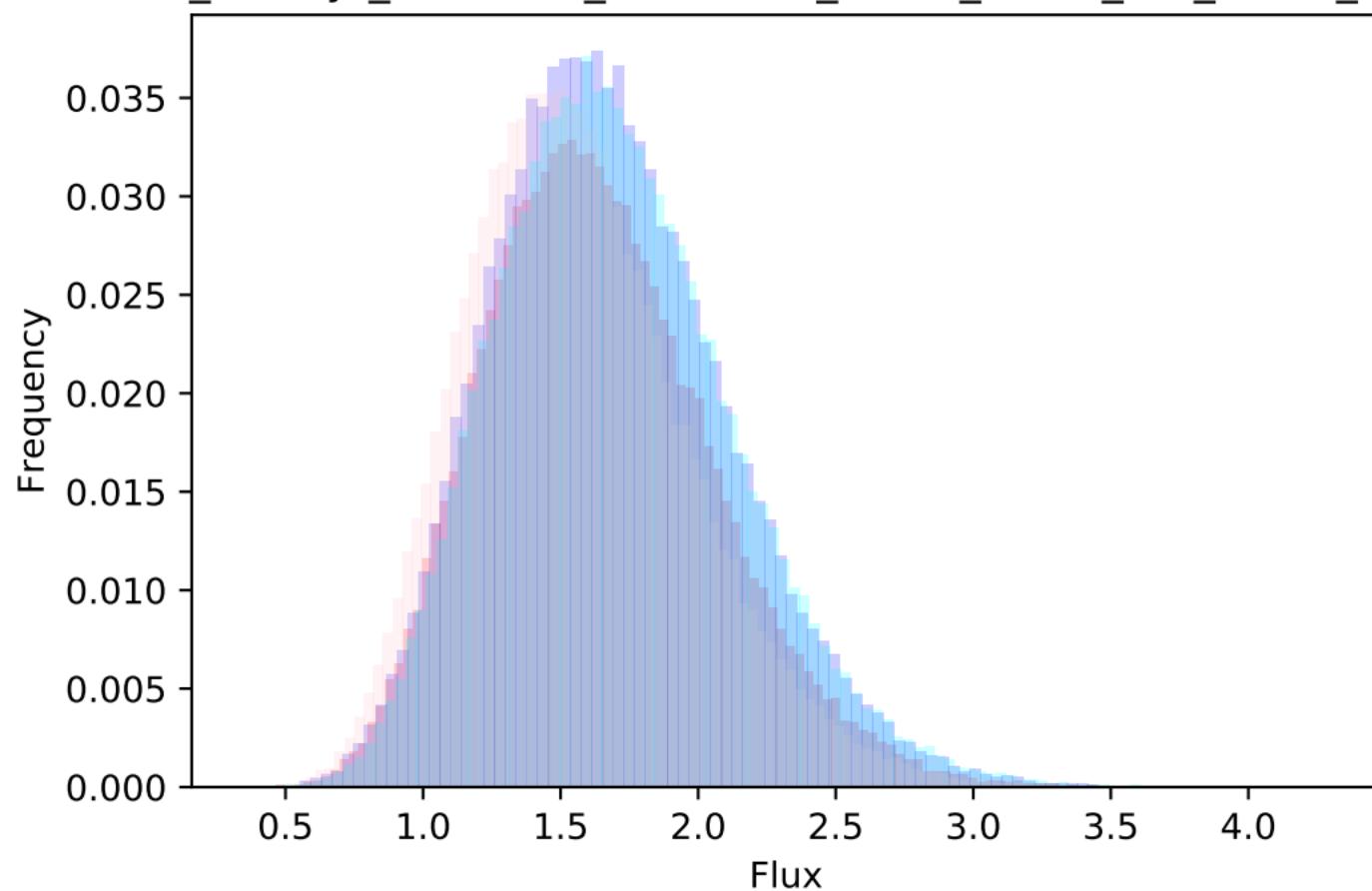




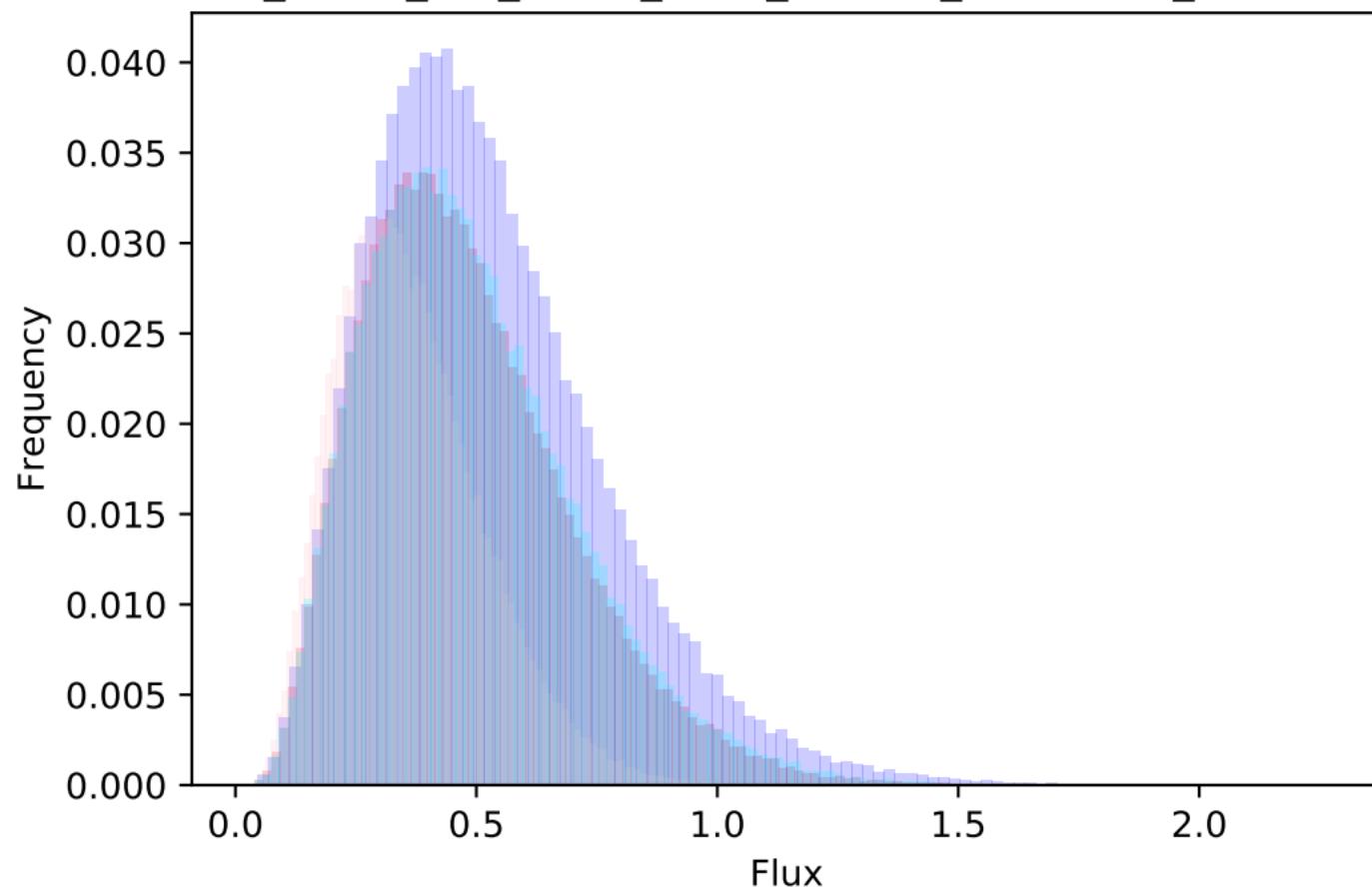
209:Thr_h --> NH4_h + OB_h



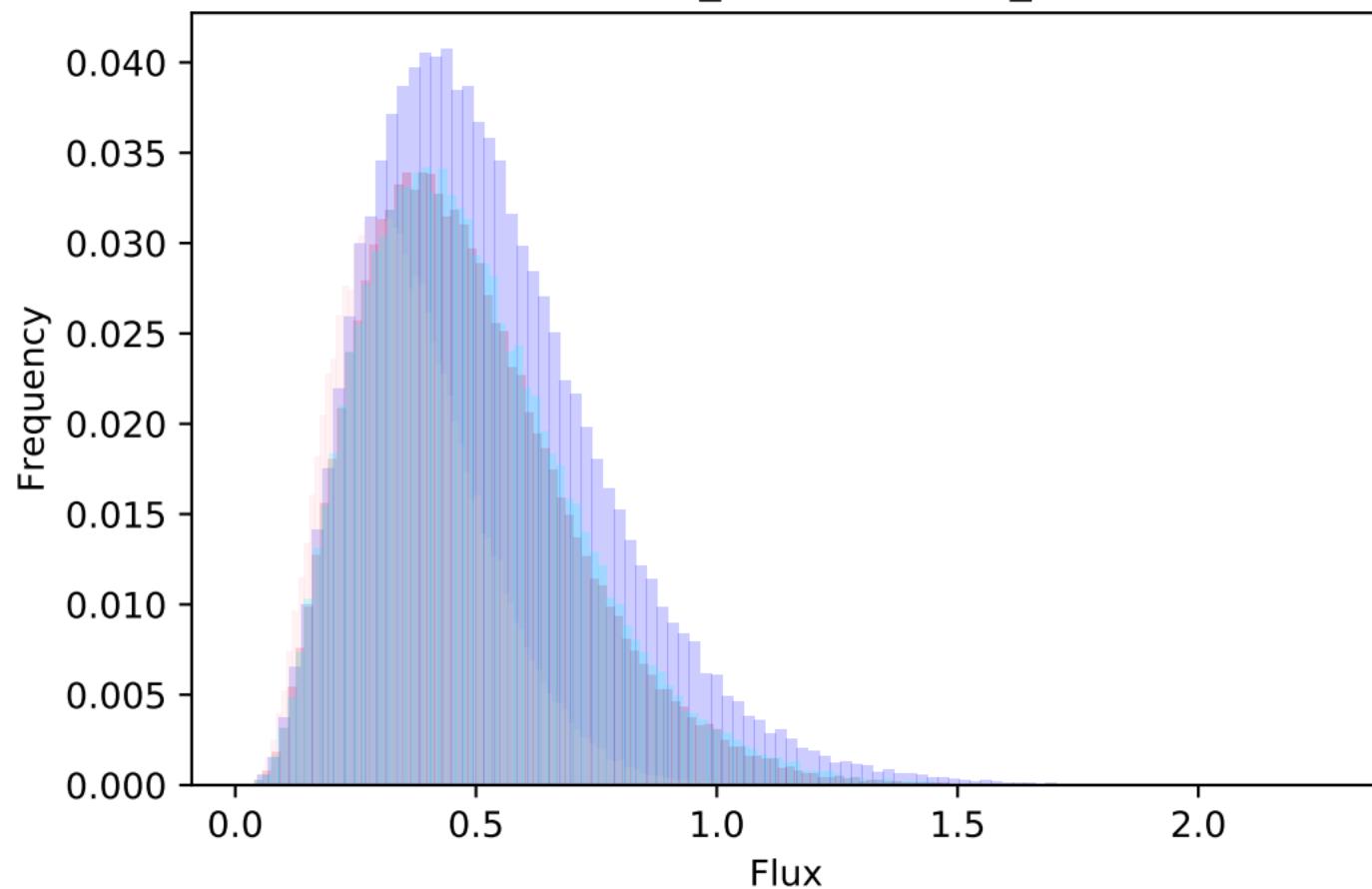
210:H_h + Pyr_h + ThPP_h --> CO2_h + H_DASH_Eth_DASH_ThPP_h



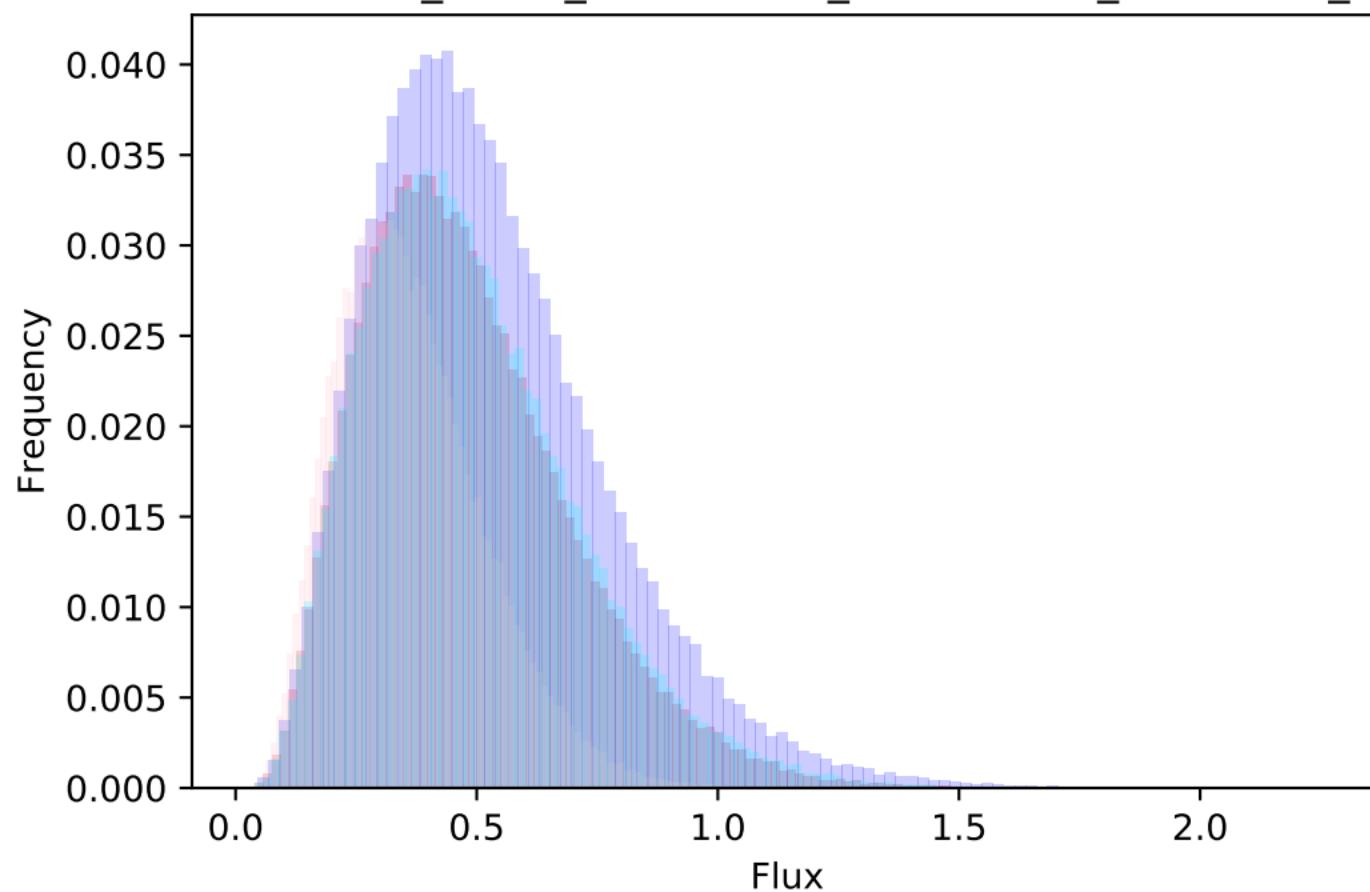
211:H_DASH_Eth_DASH_ThPP_h + OB_h --> AHB_h + ThPP_h



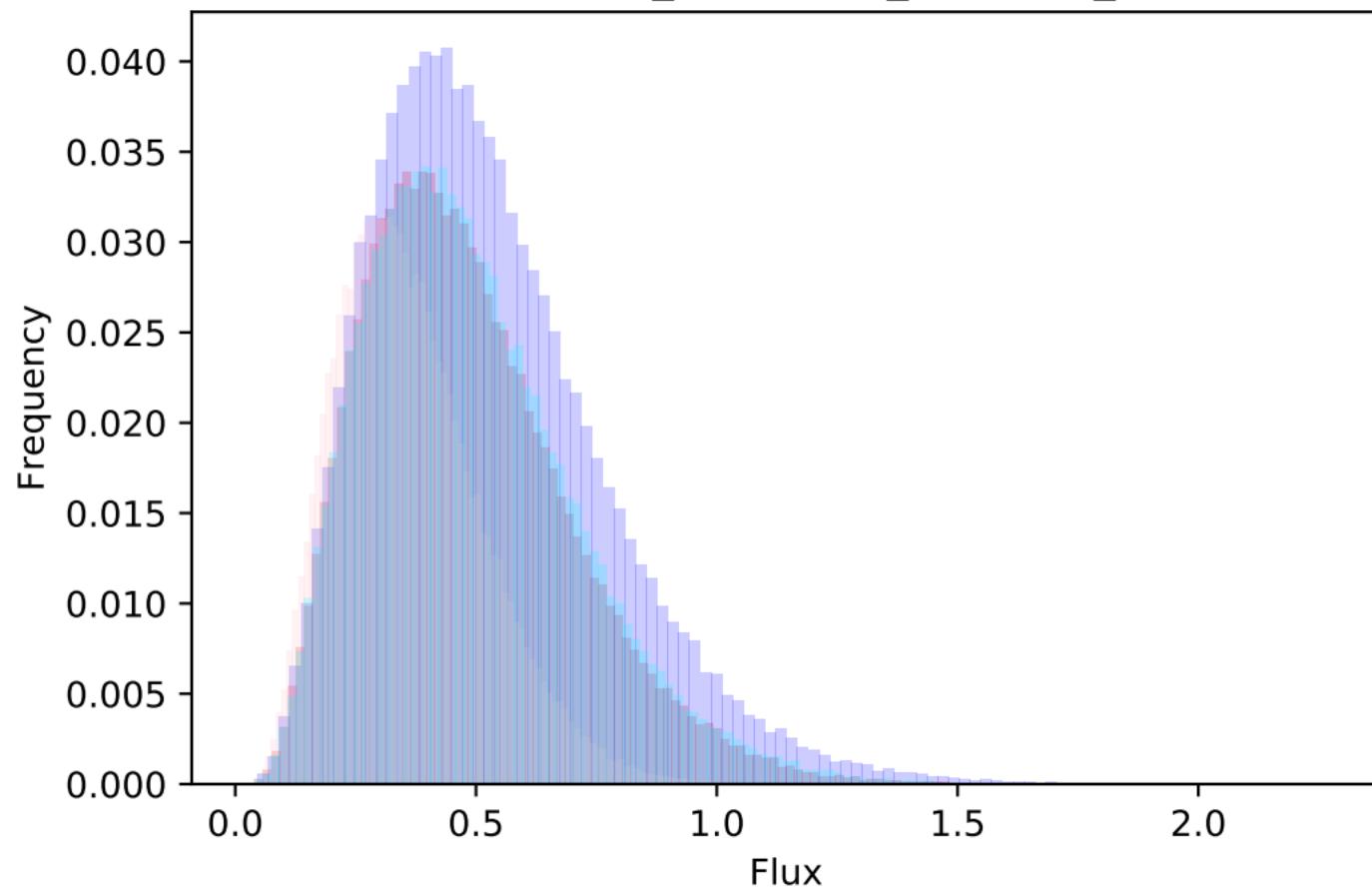
212:AHB_h <=> HMOP_h



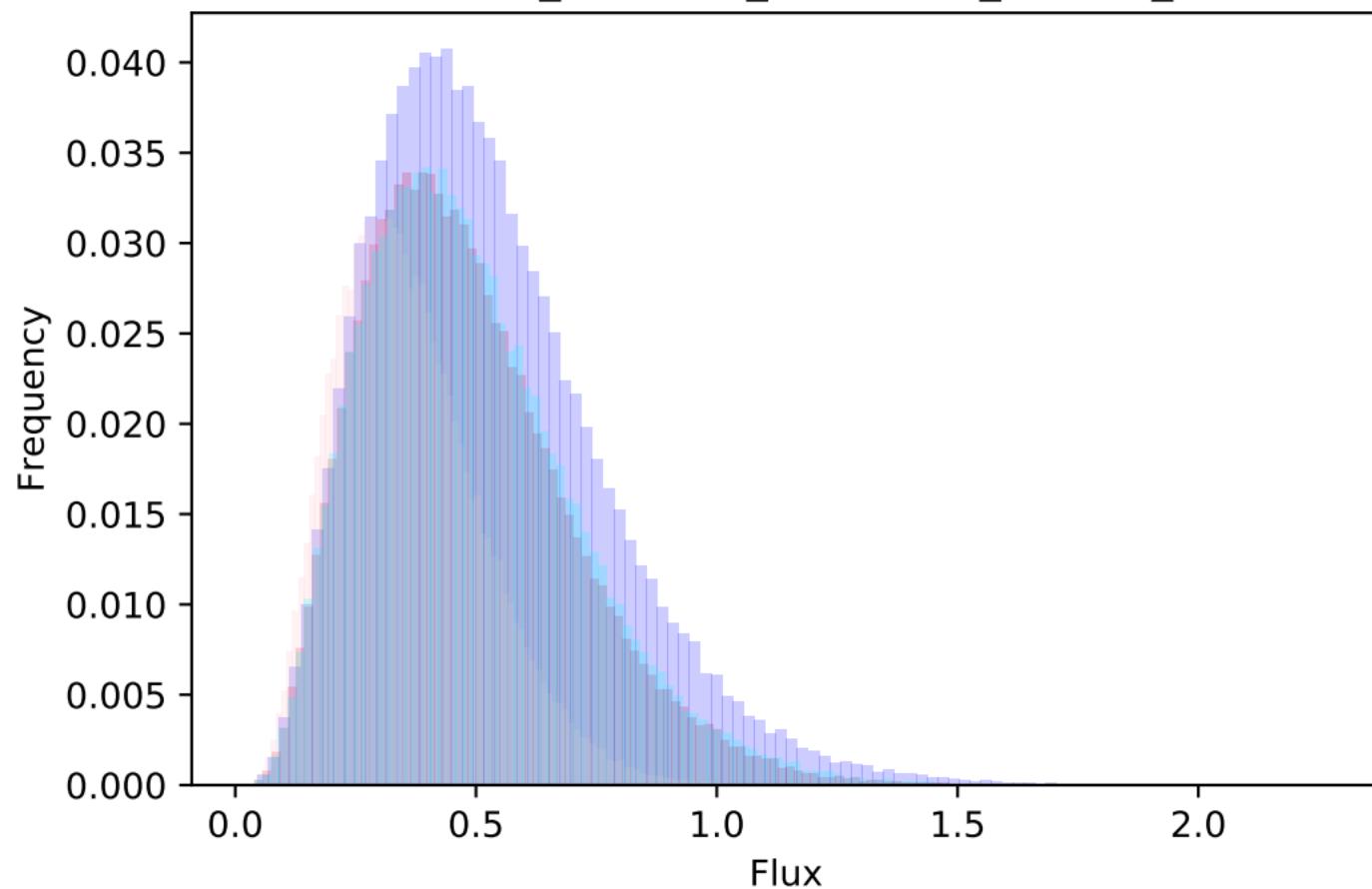
213:HMOP_h + H_h + NADPH_h --> DHMP_h + NADP_h



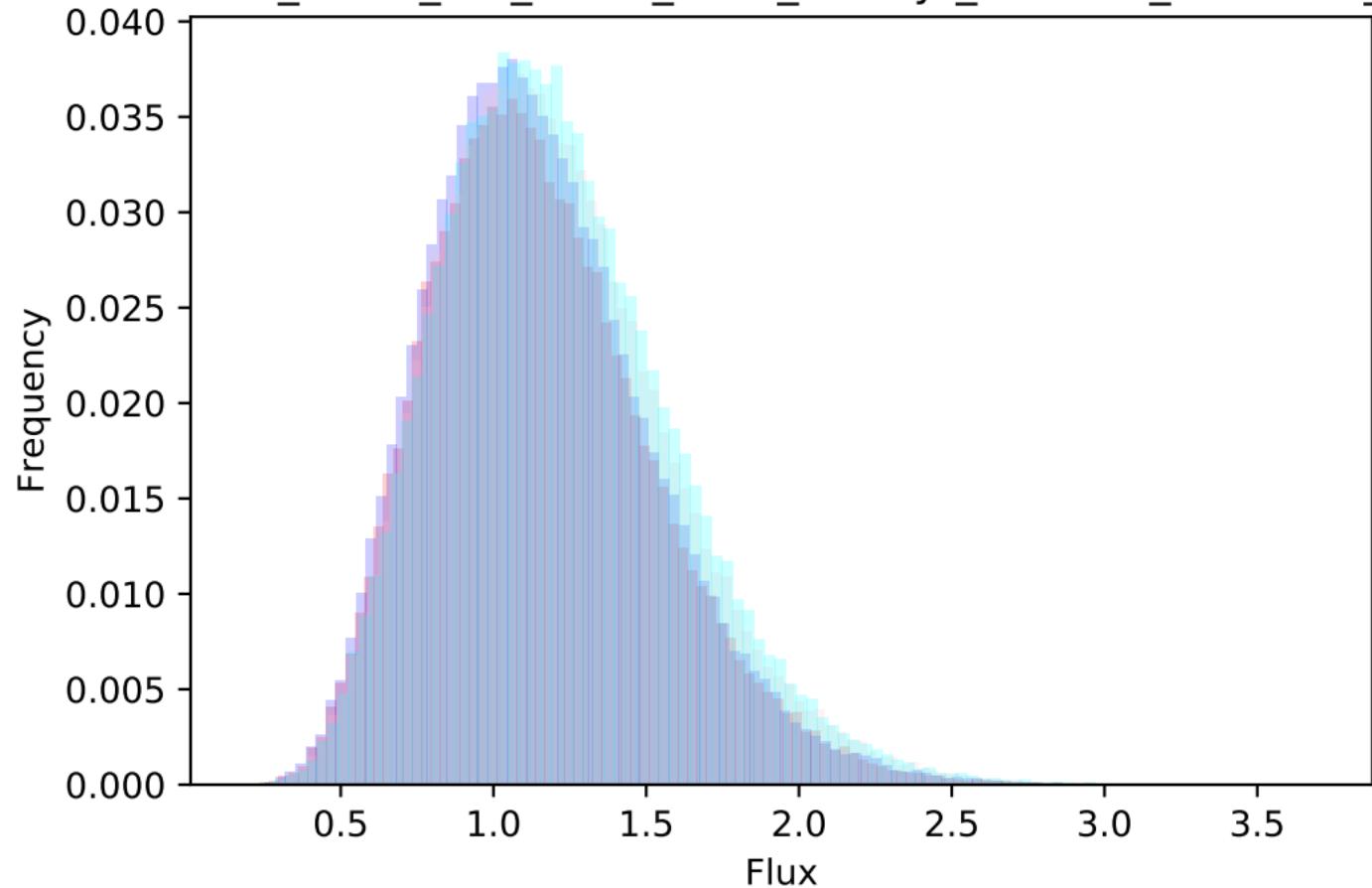
214:DHMP_h --> H₂O_h + MOP_h



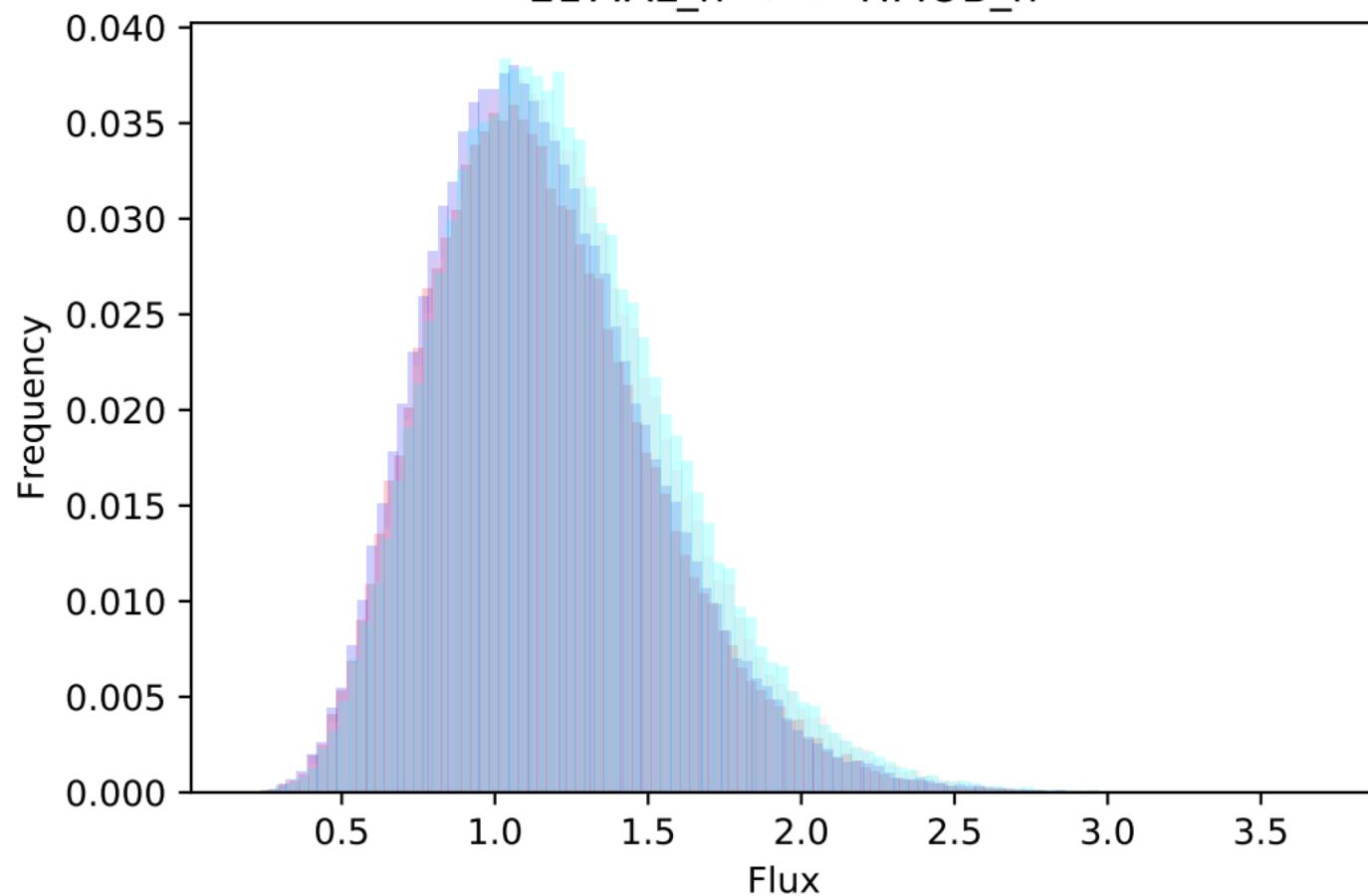
215:Glu_h + MOP_h <=> Ile_h + KG_h



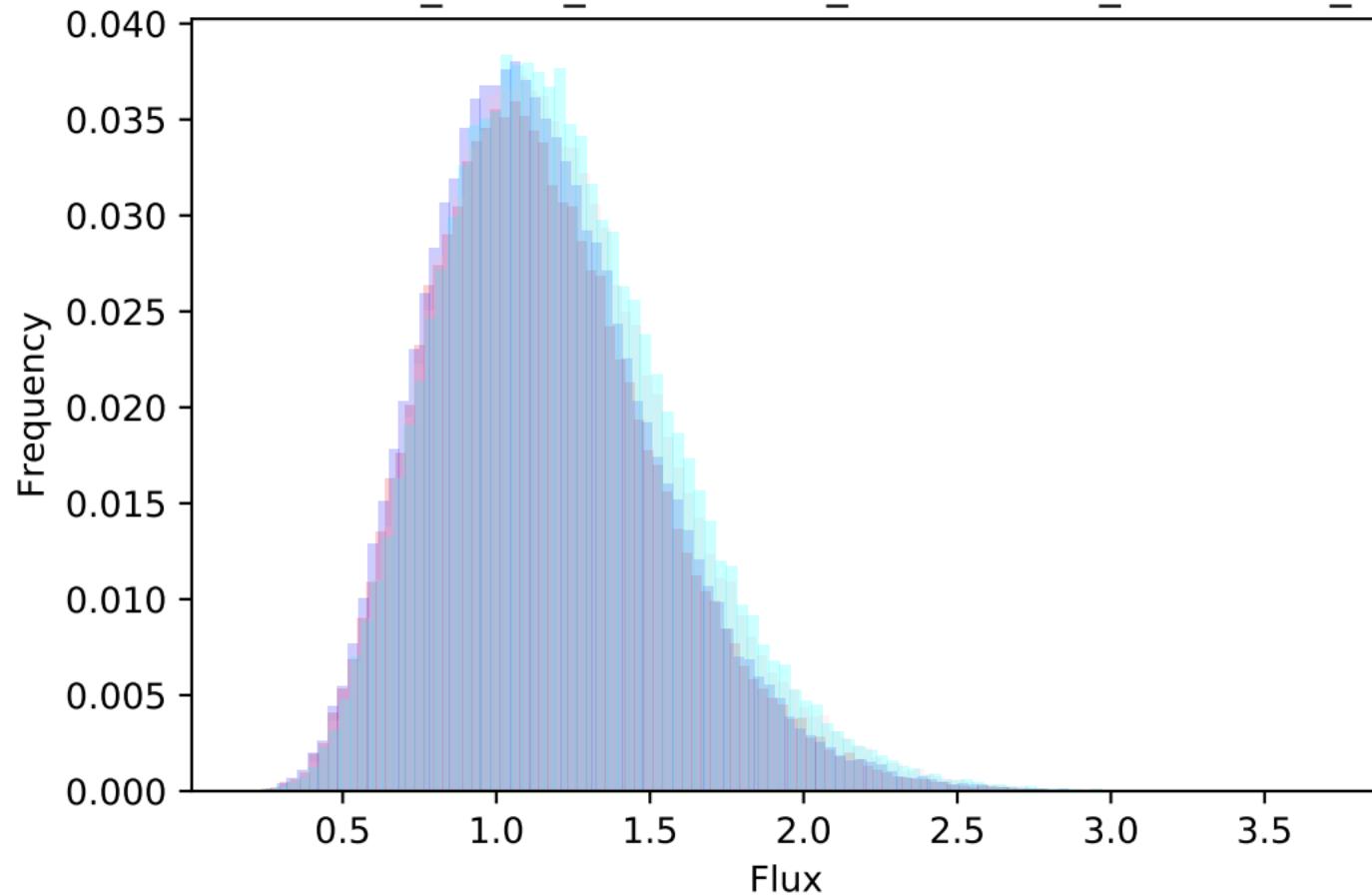
216:H_DASH_Eth_DASH_ThPP_h + Pyr_h --> AL_h + ThPP_h



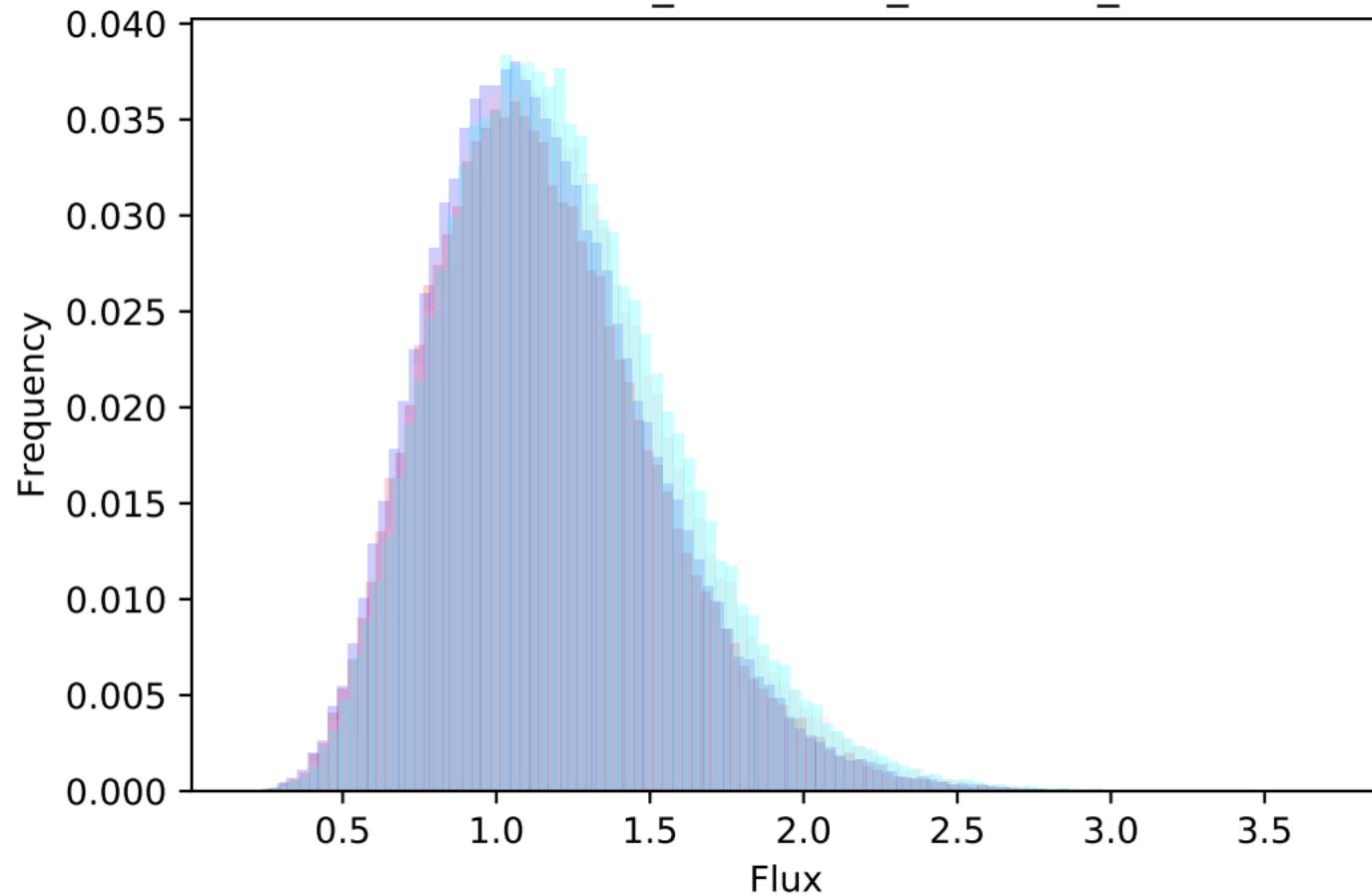
217:AL_h <=> HMOB_h



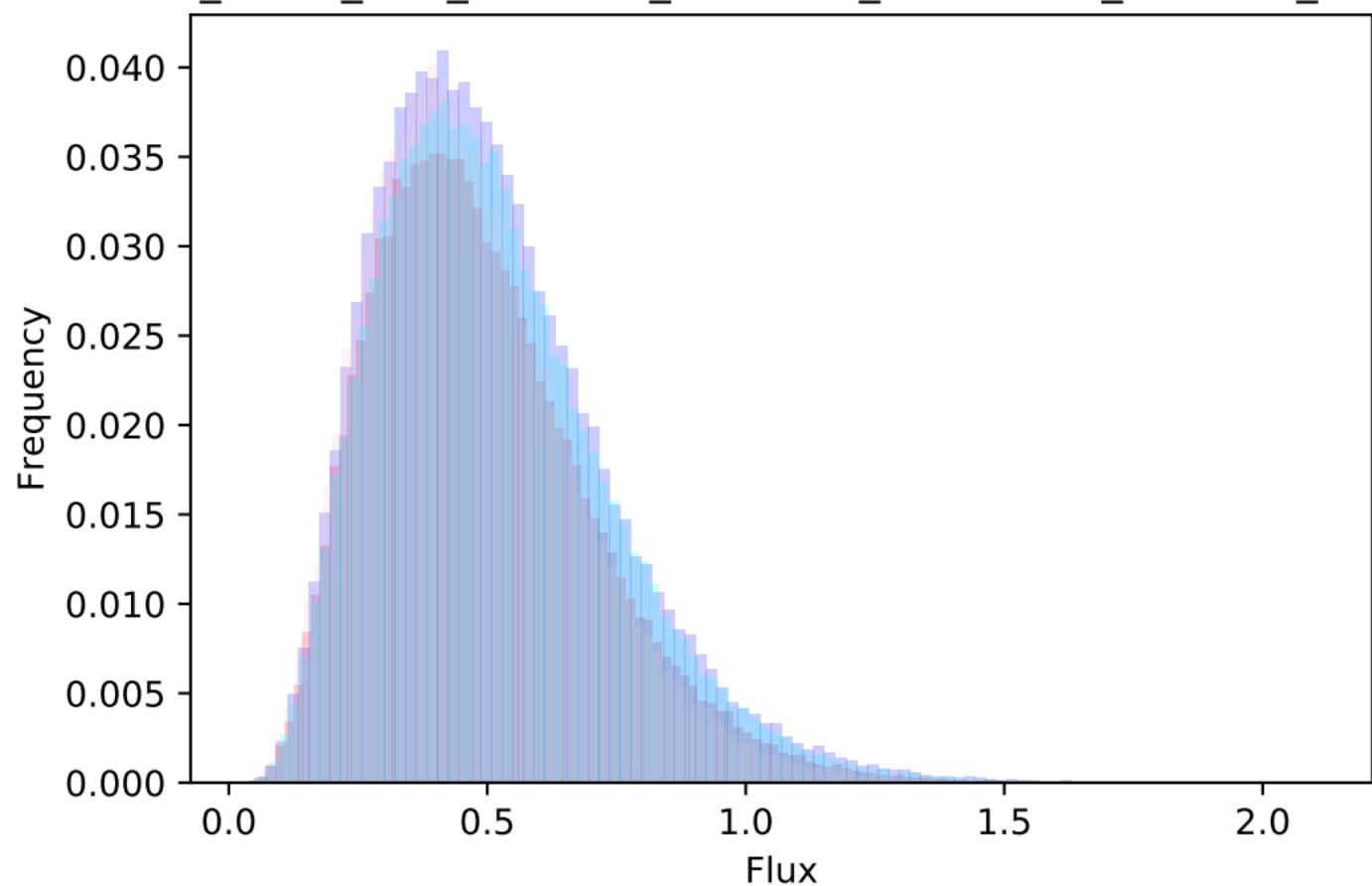
218:HMOB_h + H_h + NADPH_h --> DHMB_h + NADP_h



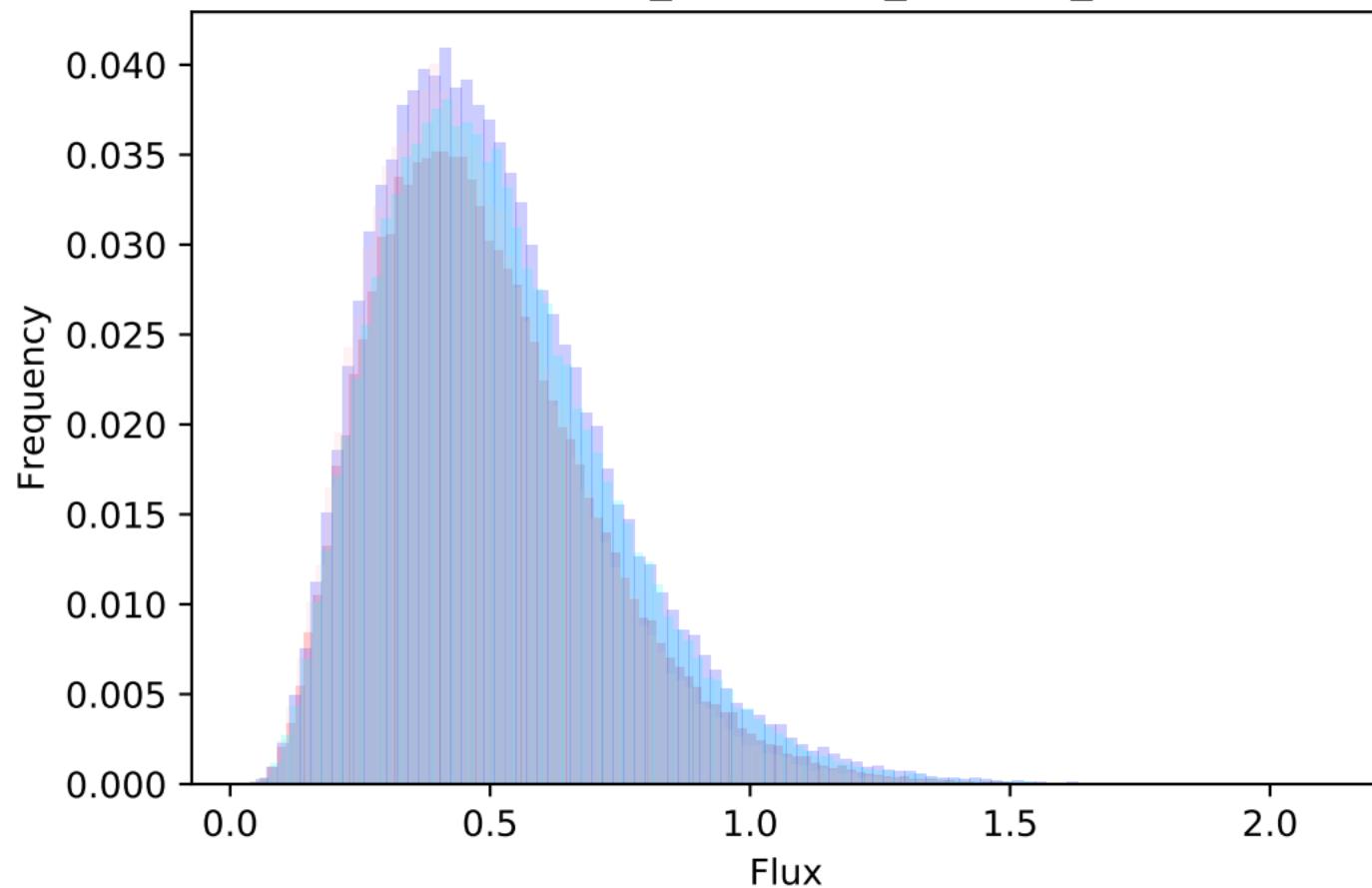
219:DHMB_h --> H2O_h + MOB_h

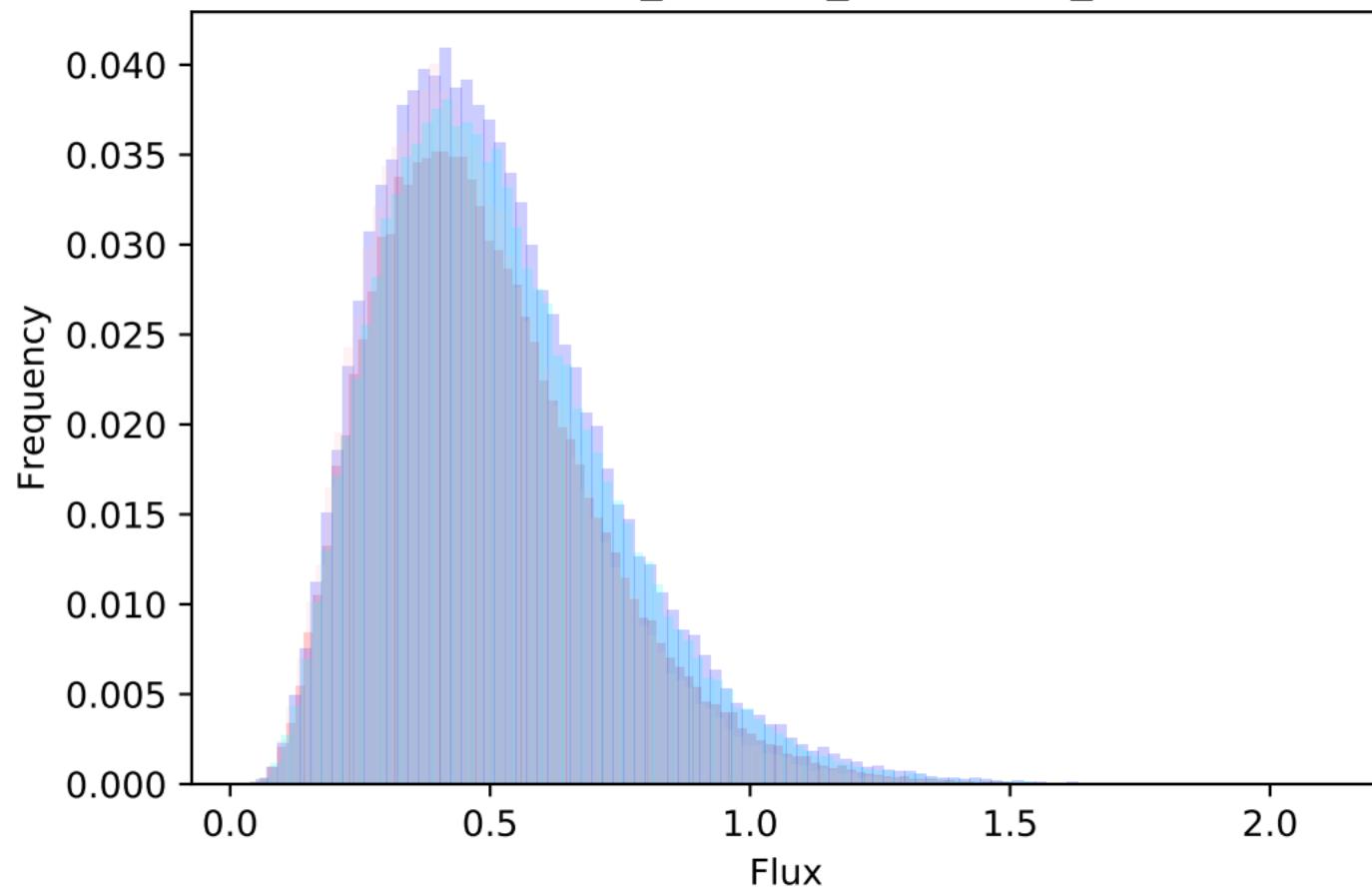


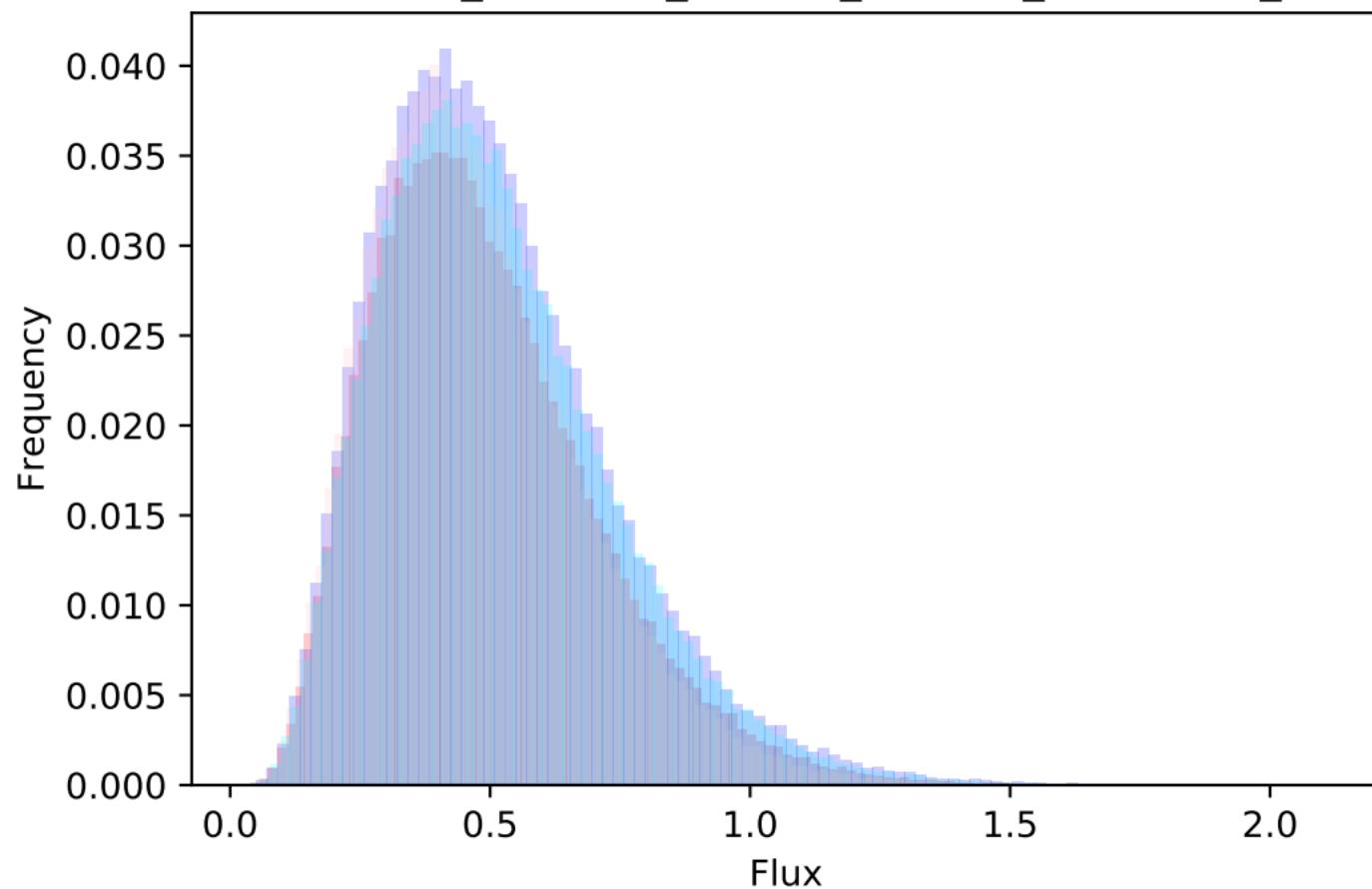
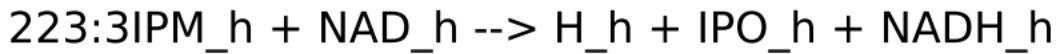
220:A_DASH_CoA_h + H2O_h + MOB_h --> 2IPM_h + CoA_h + H_h

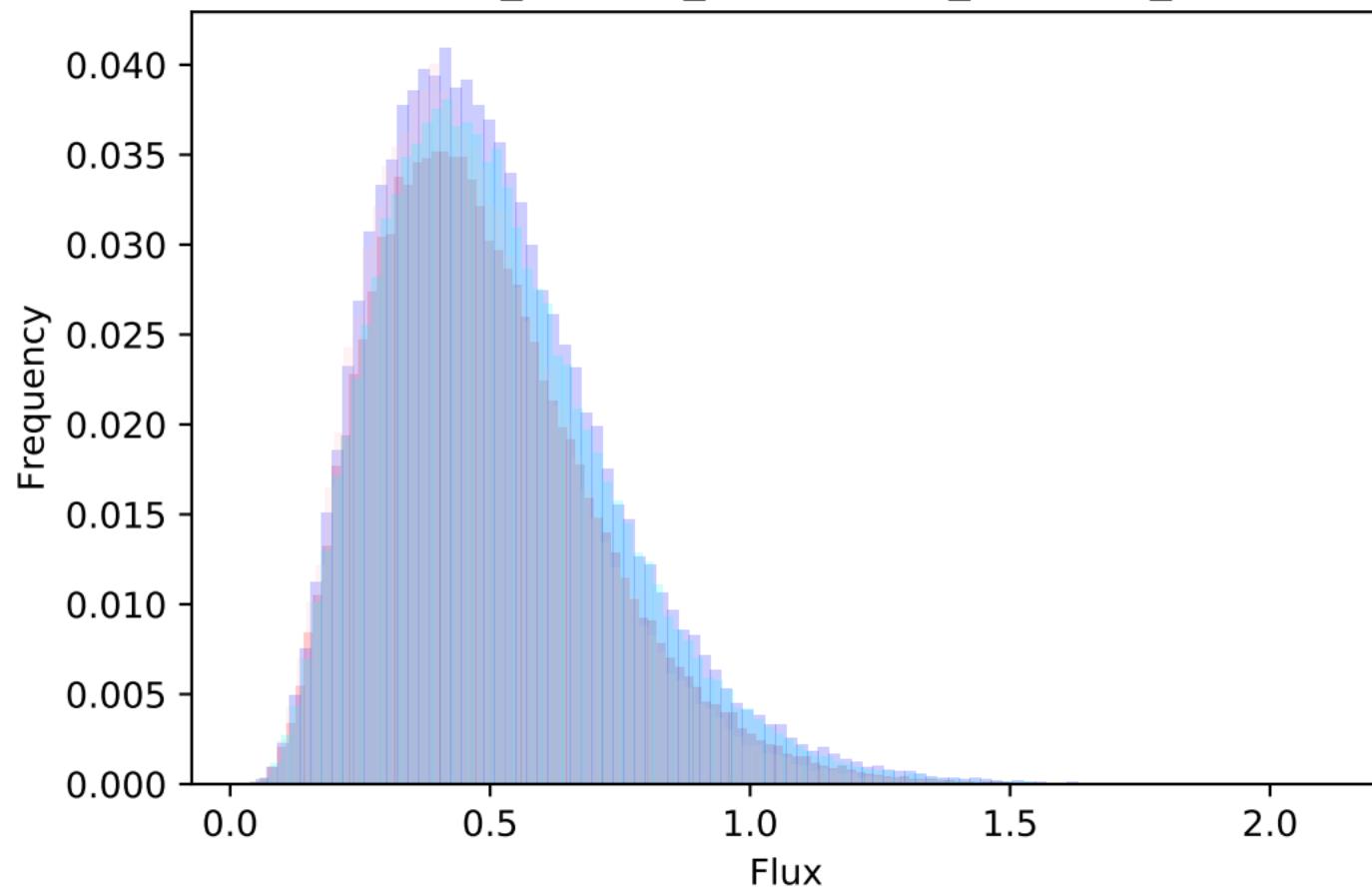
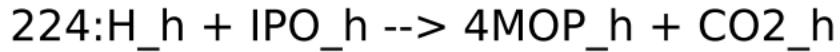


221:2IPM_h --> H2O_h + IPM_h

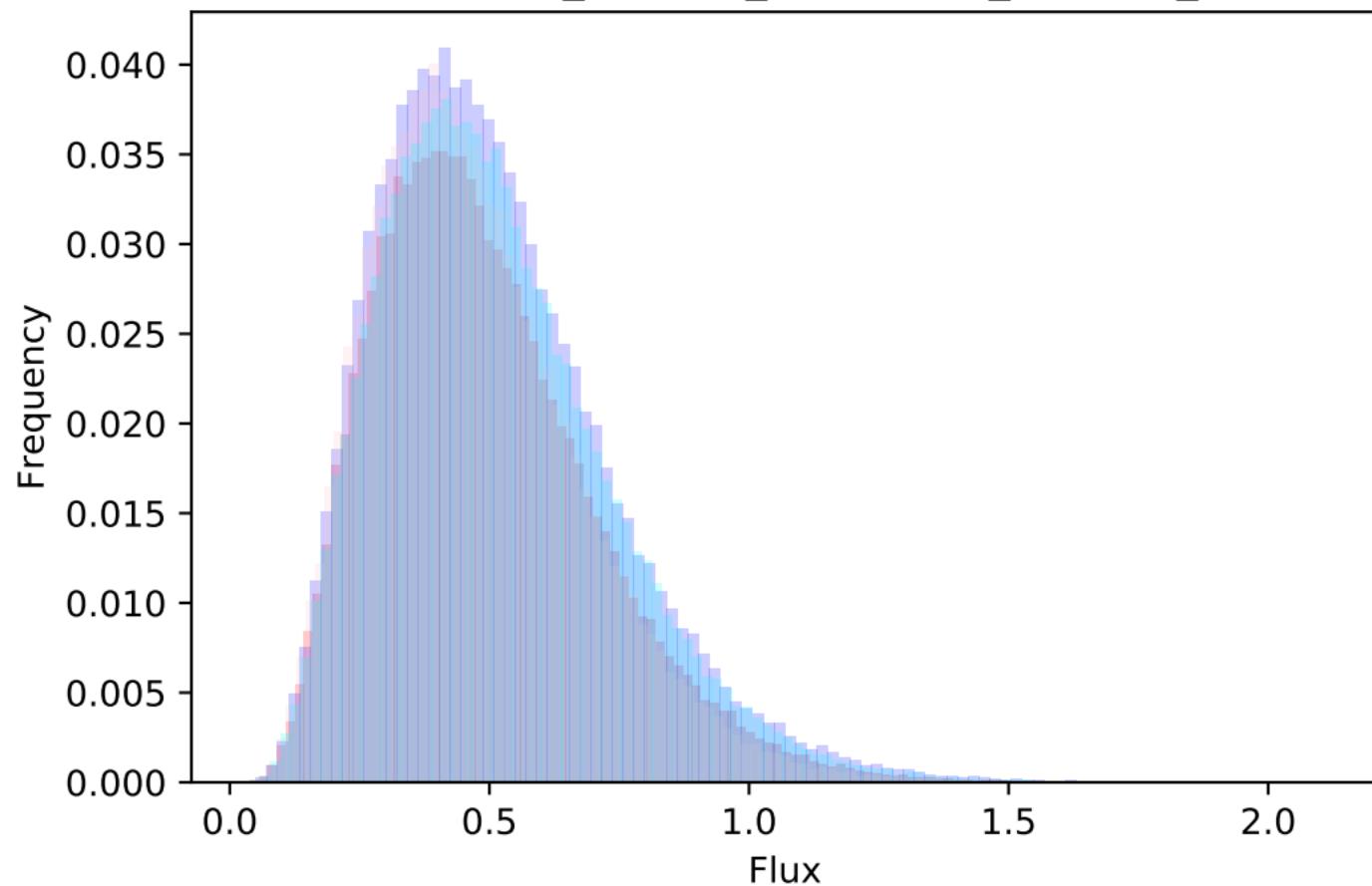


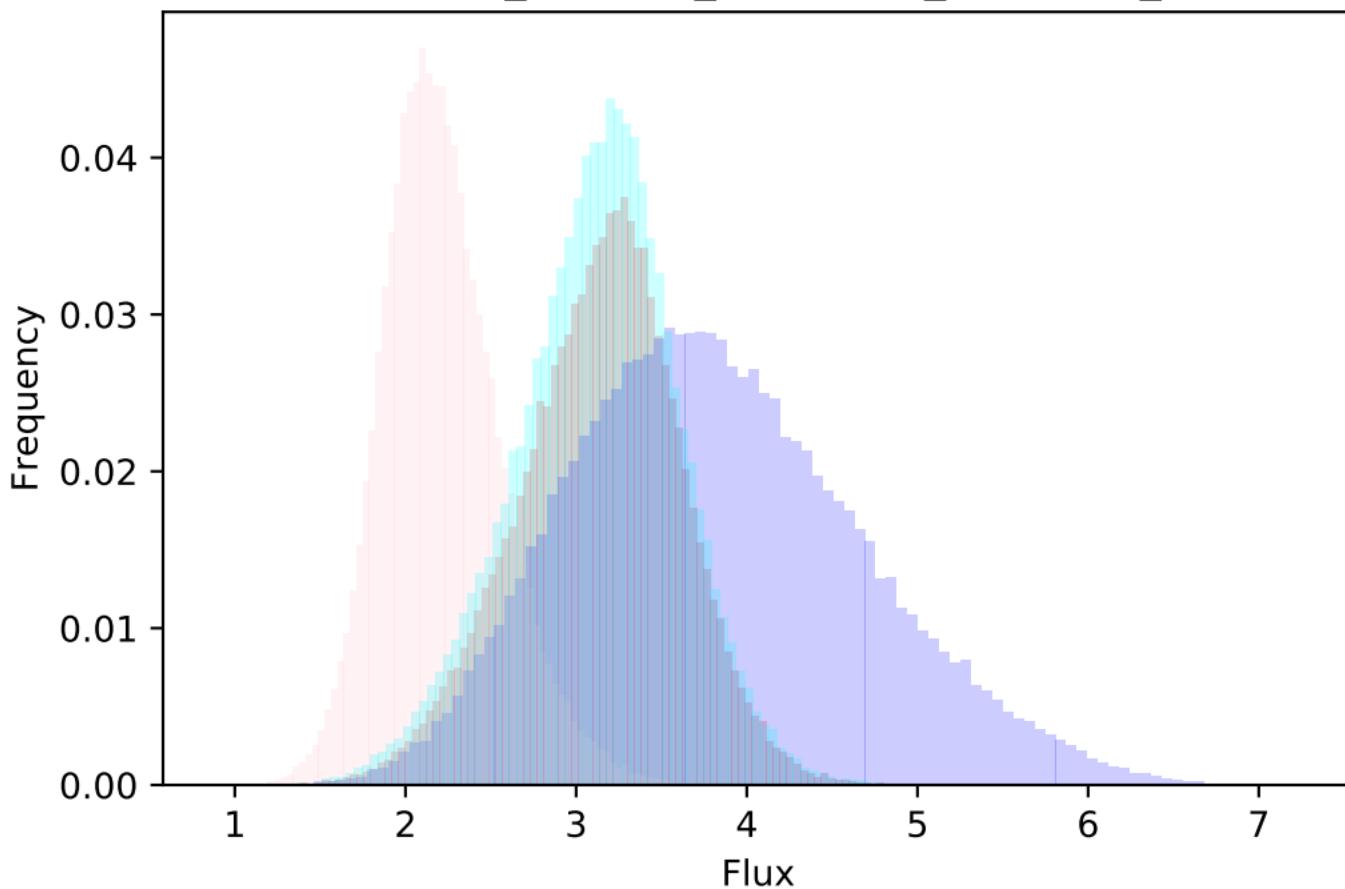
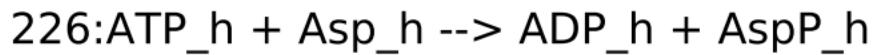


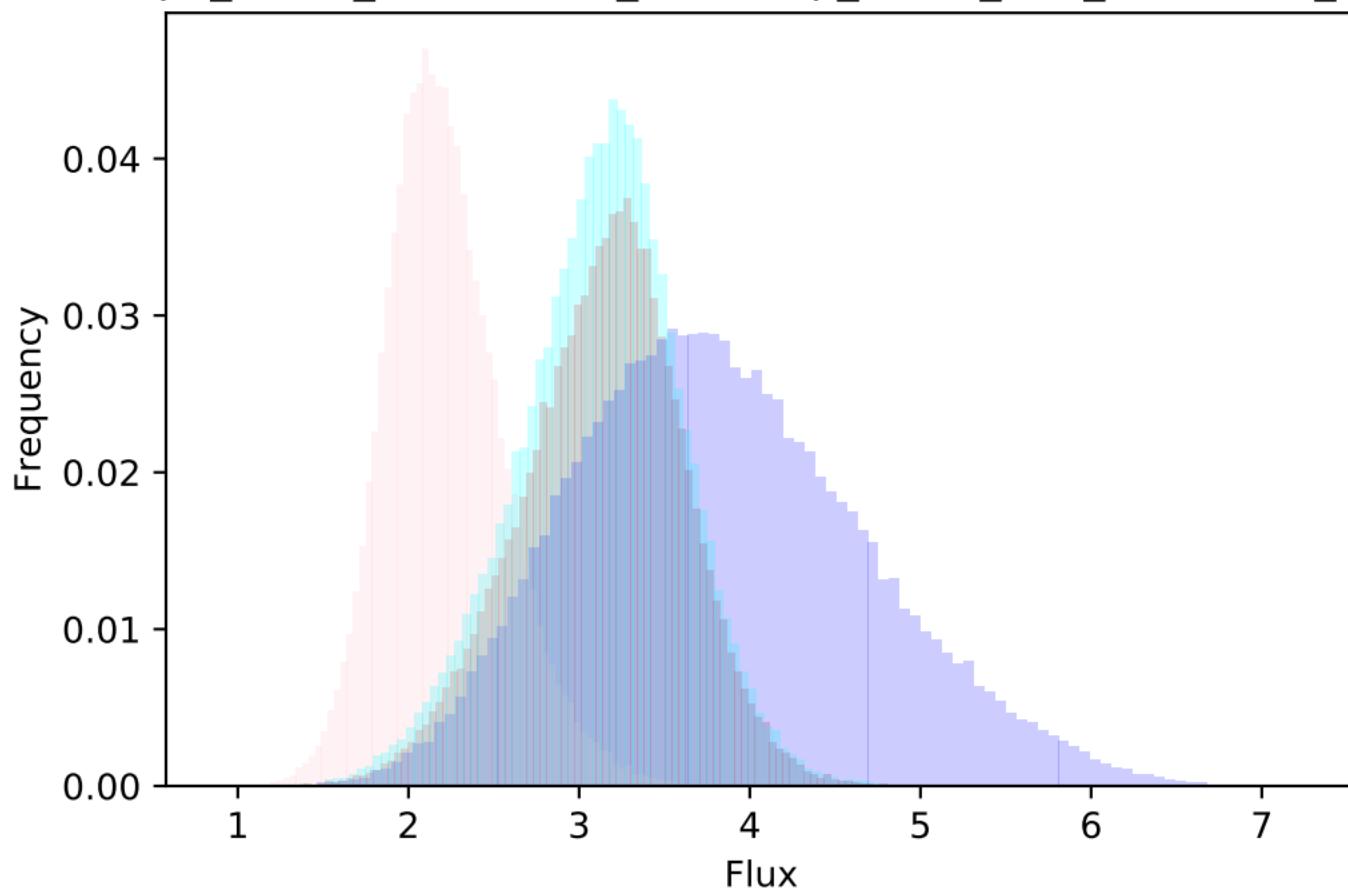


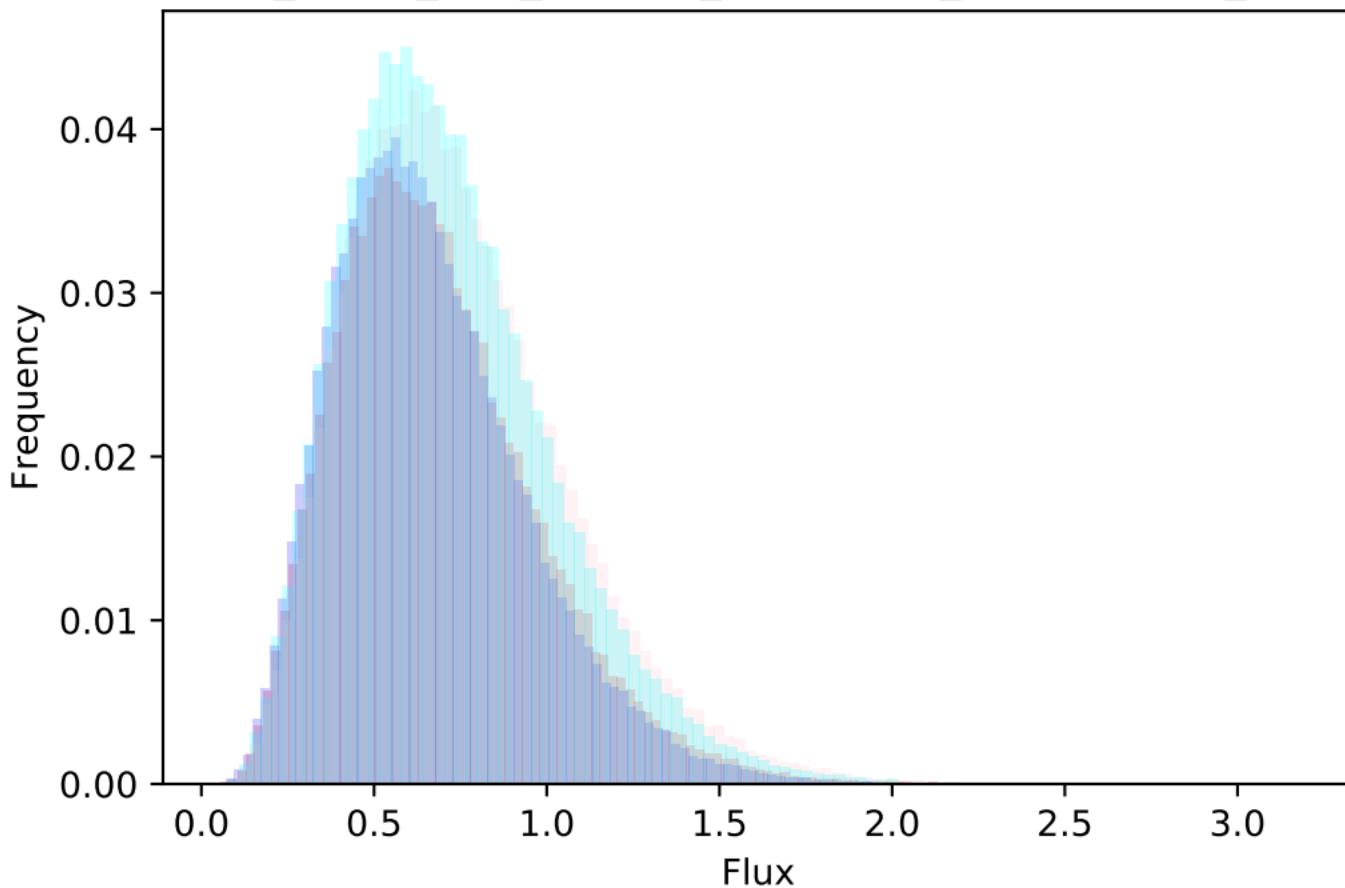
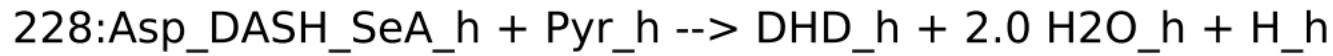


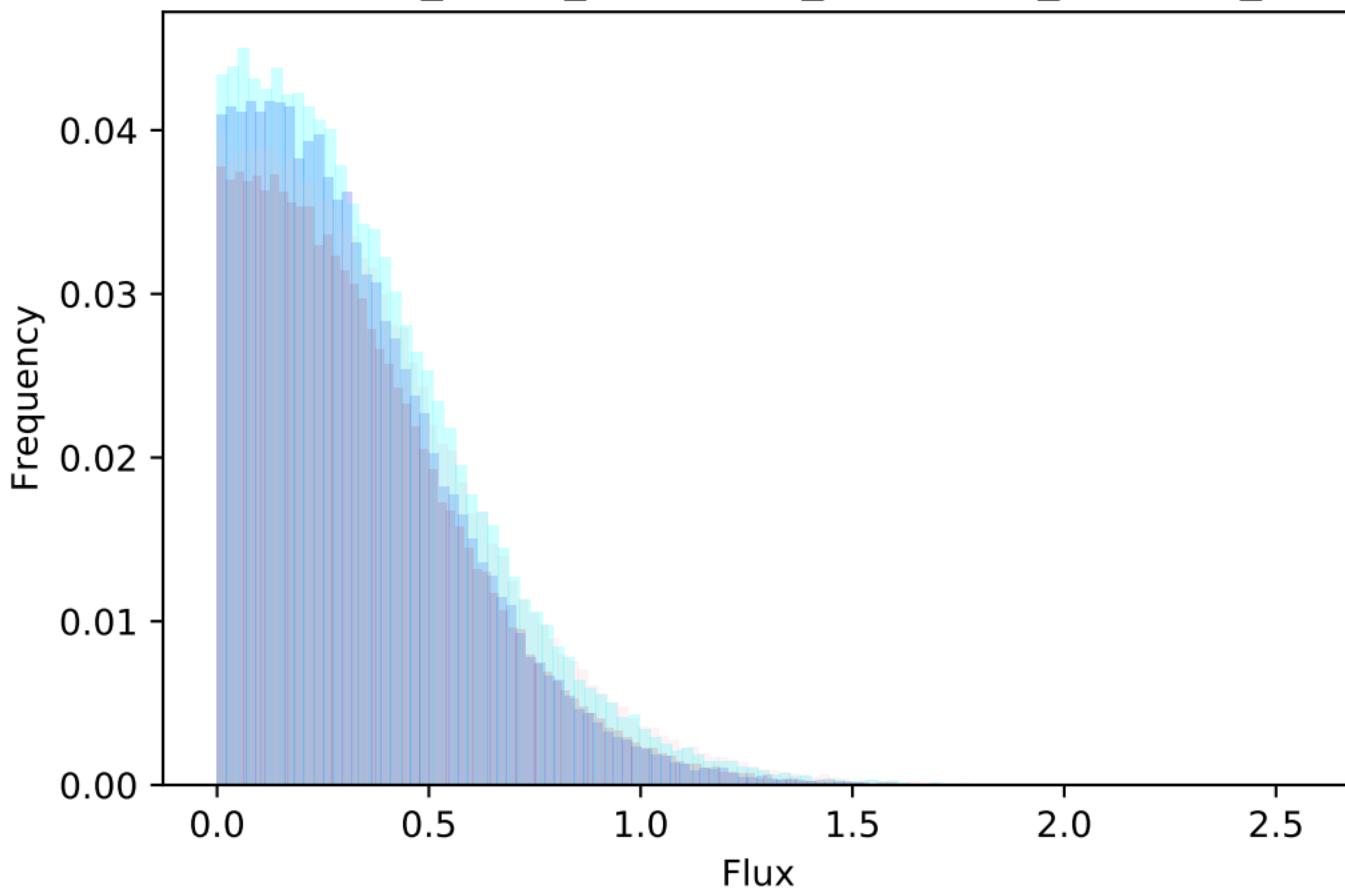
$225:4\text{MOP_h} + \text{Glu_h} \rightleftharpoons \text{KG_h} + \text{Leu_h}$



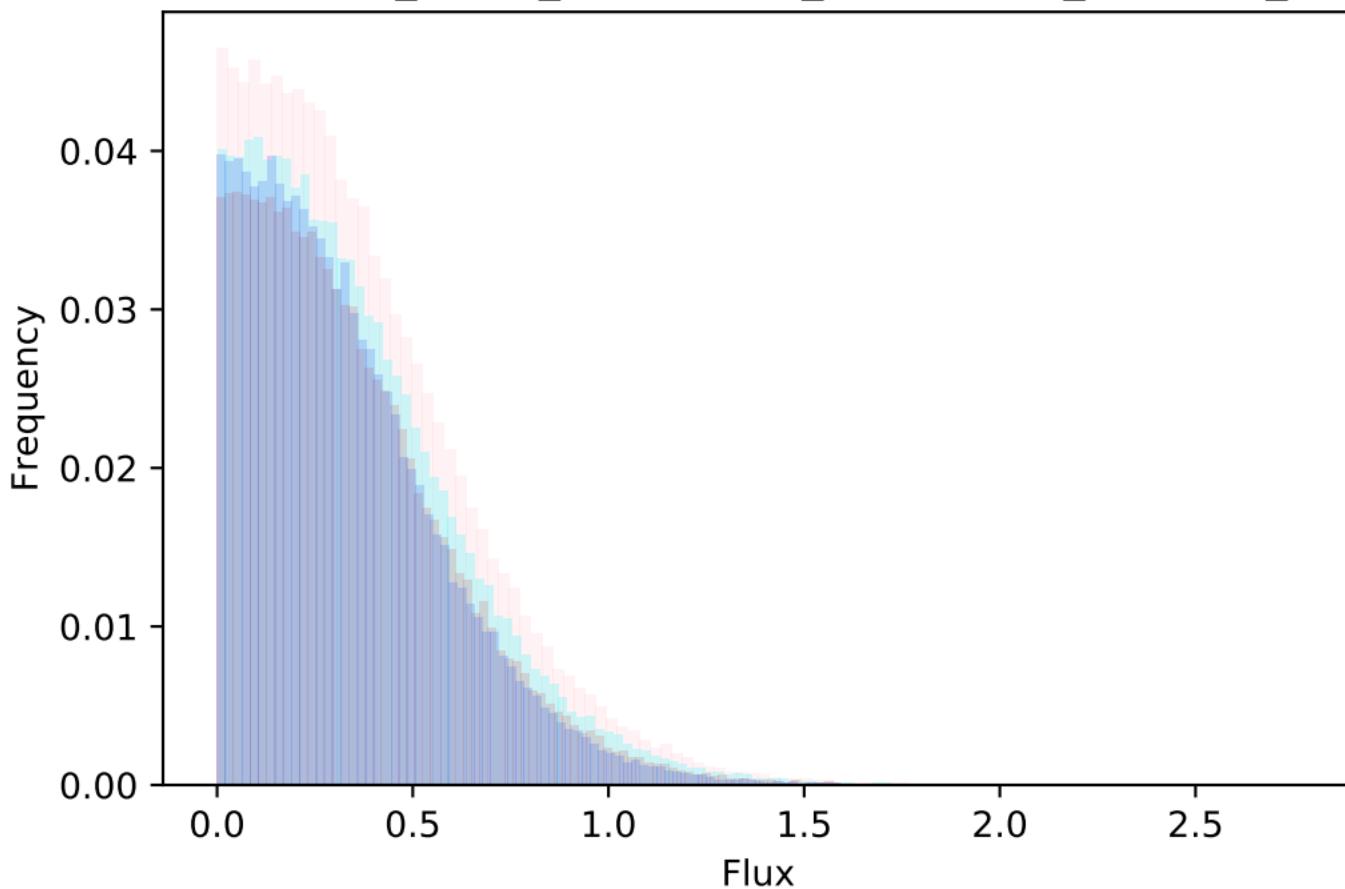




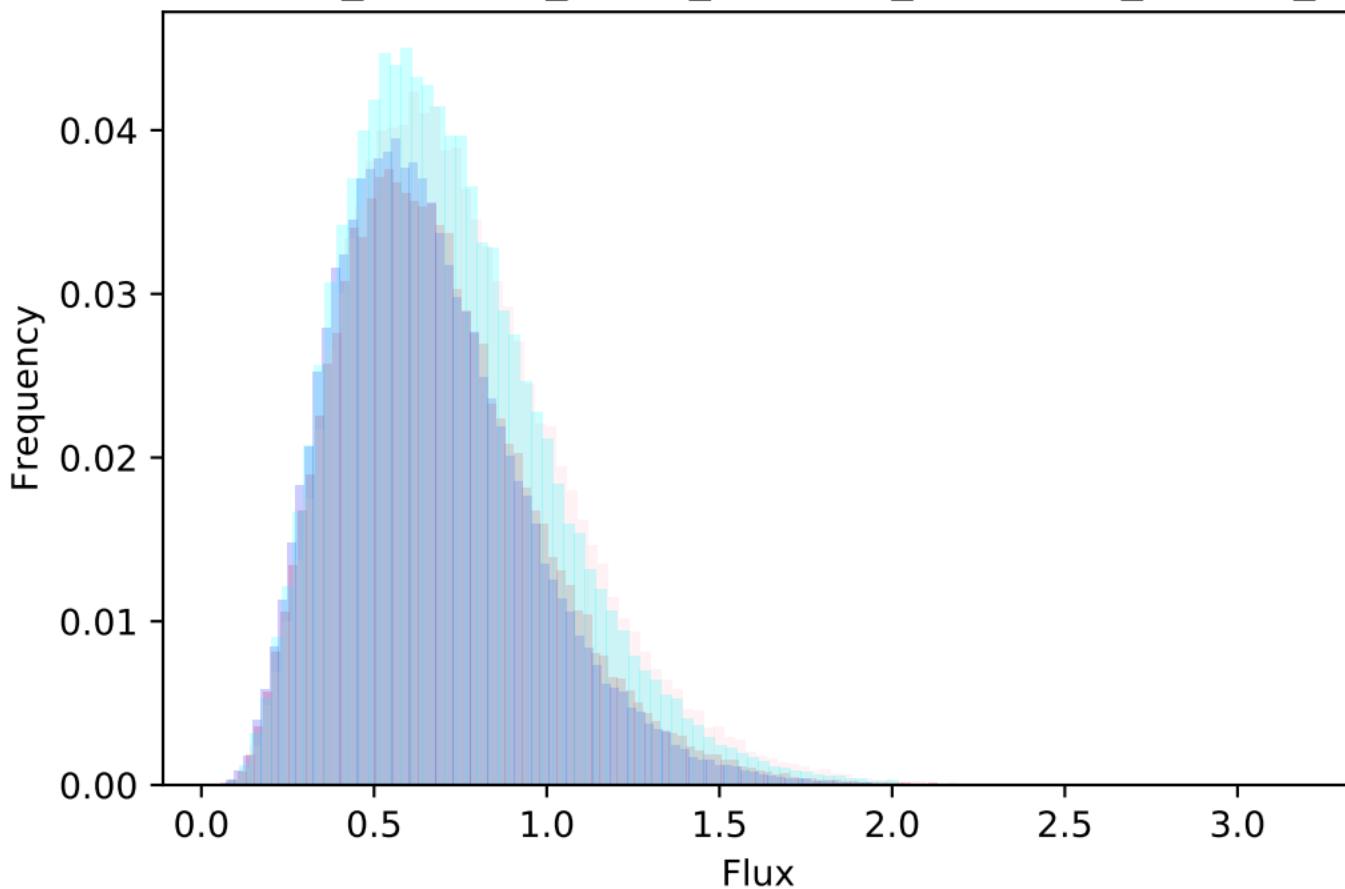




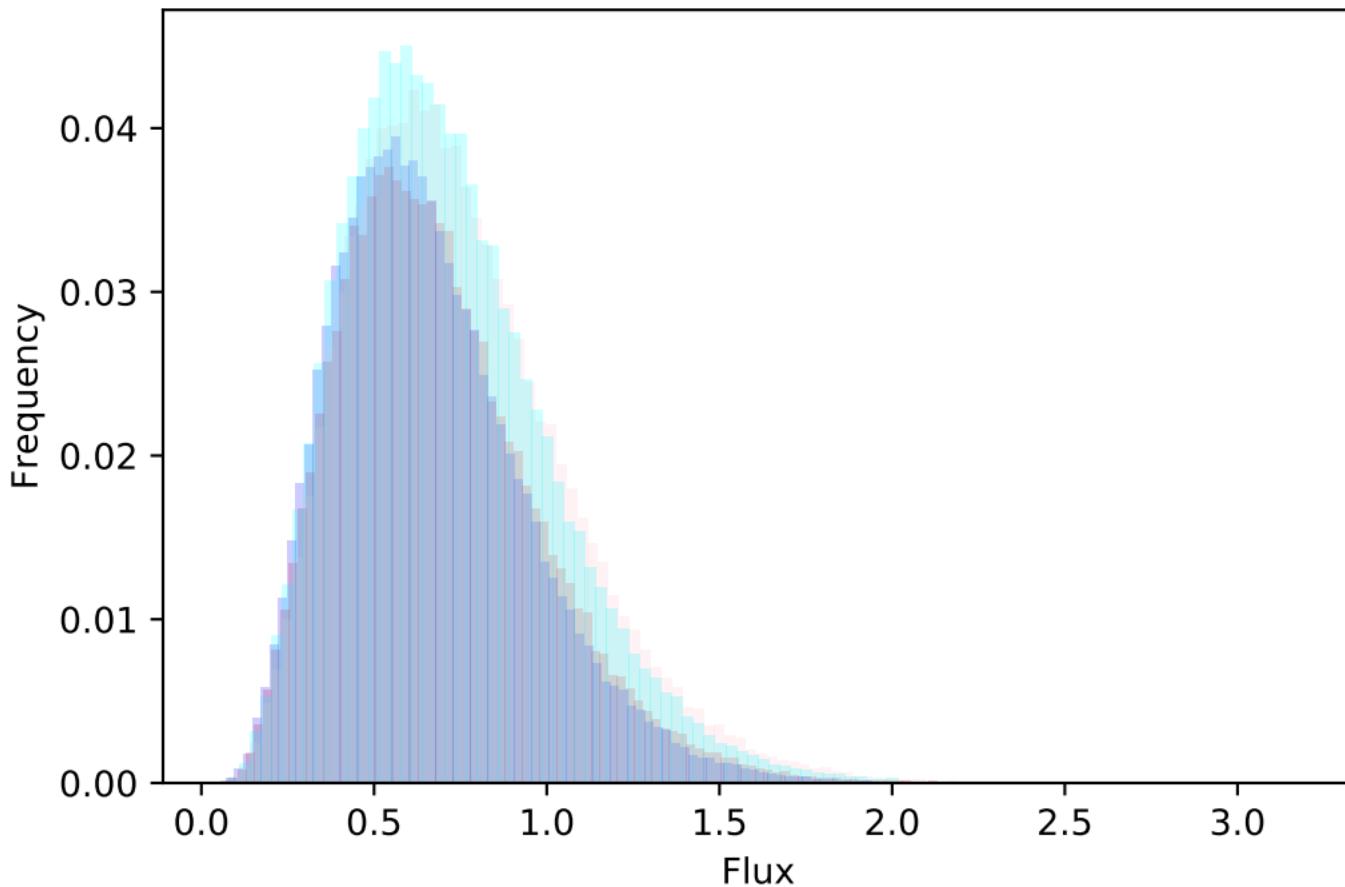
230:DHD_h + H_h + NADPH_h --> NADP_h + THD_h

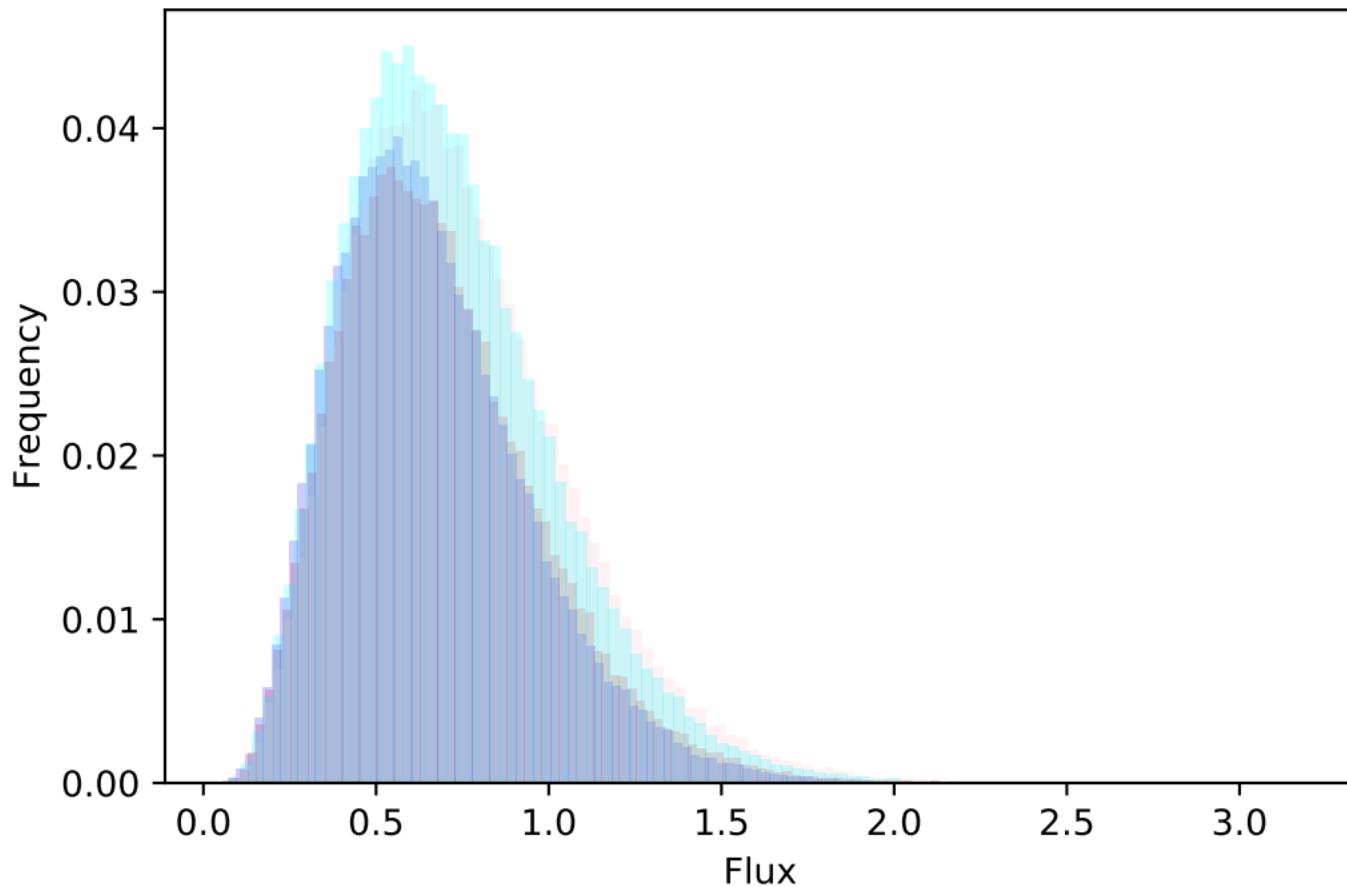
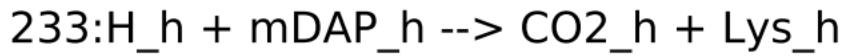


231:Glu_h + H2O_h + H_h + THD_h --> DAP_h + KG_h

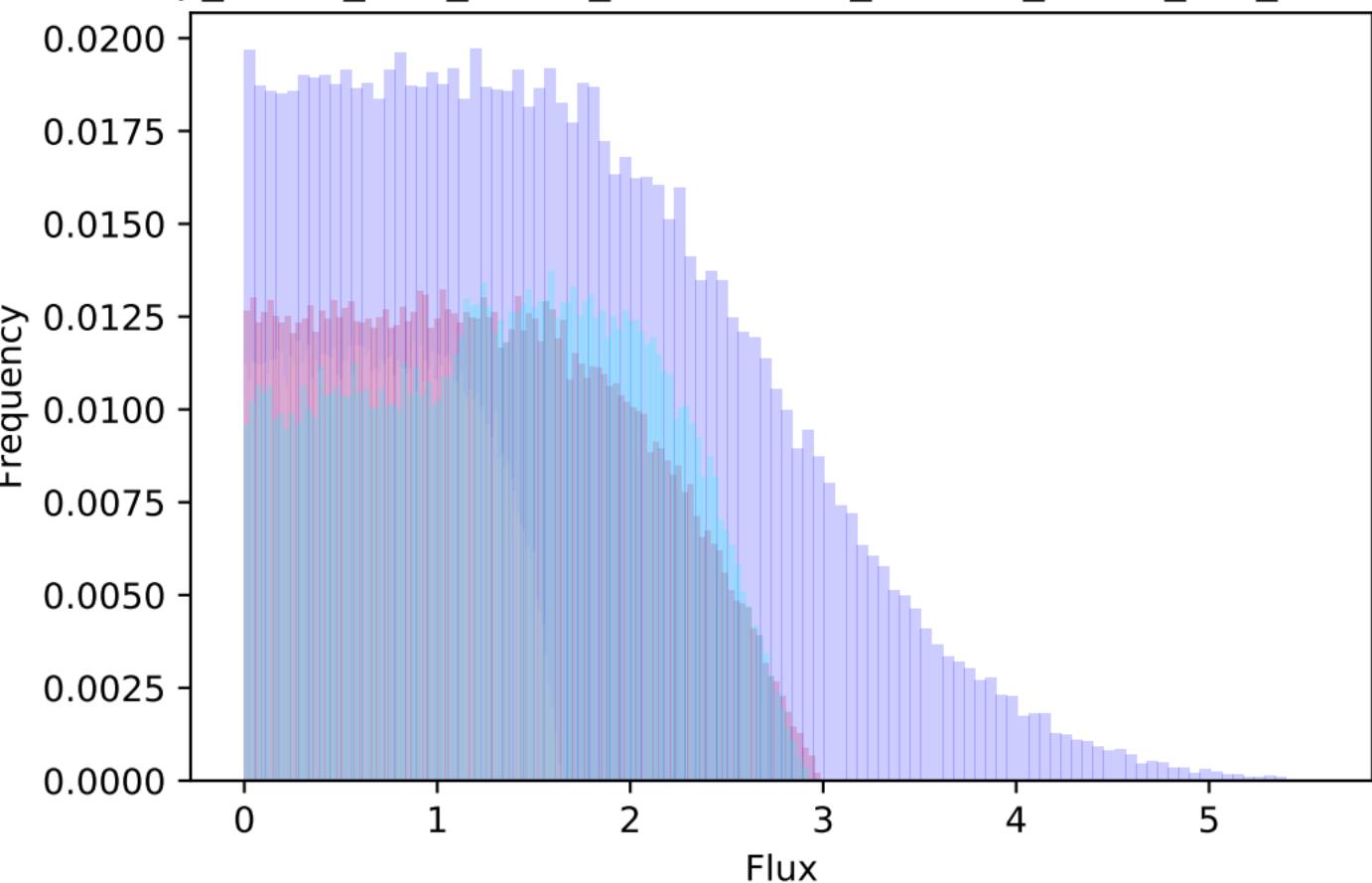


232:DAP_h --> mDAP_h

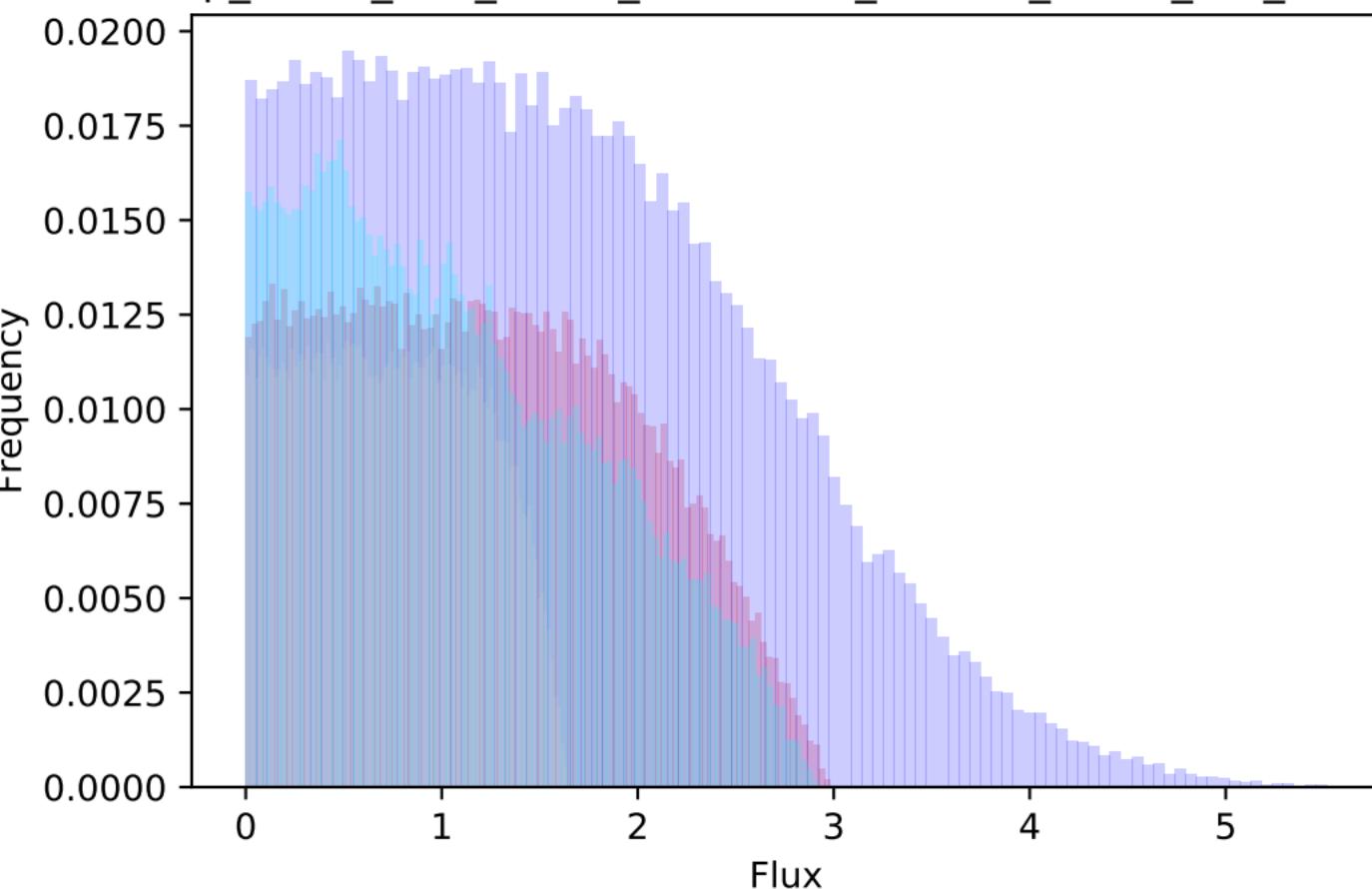


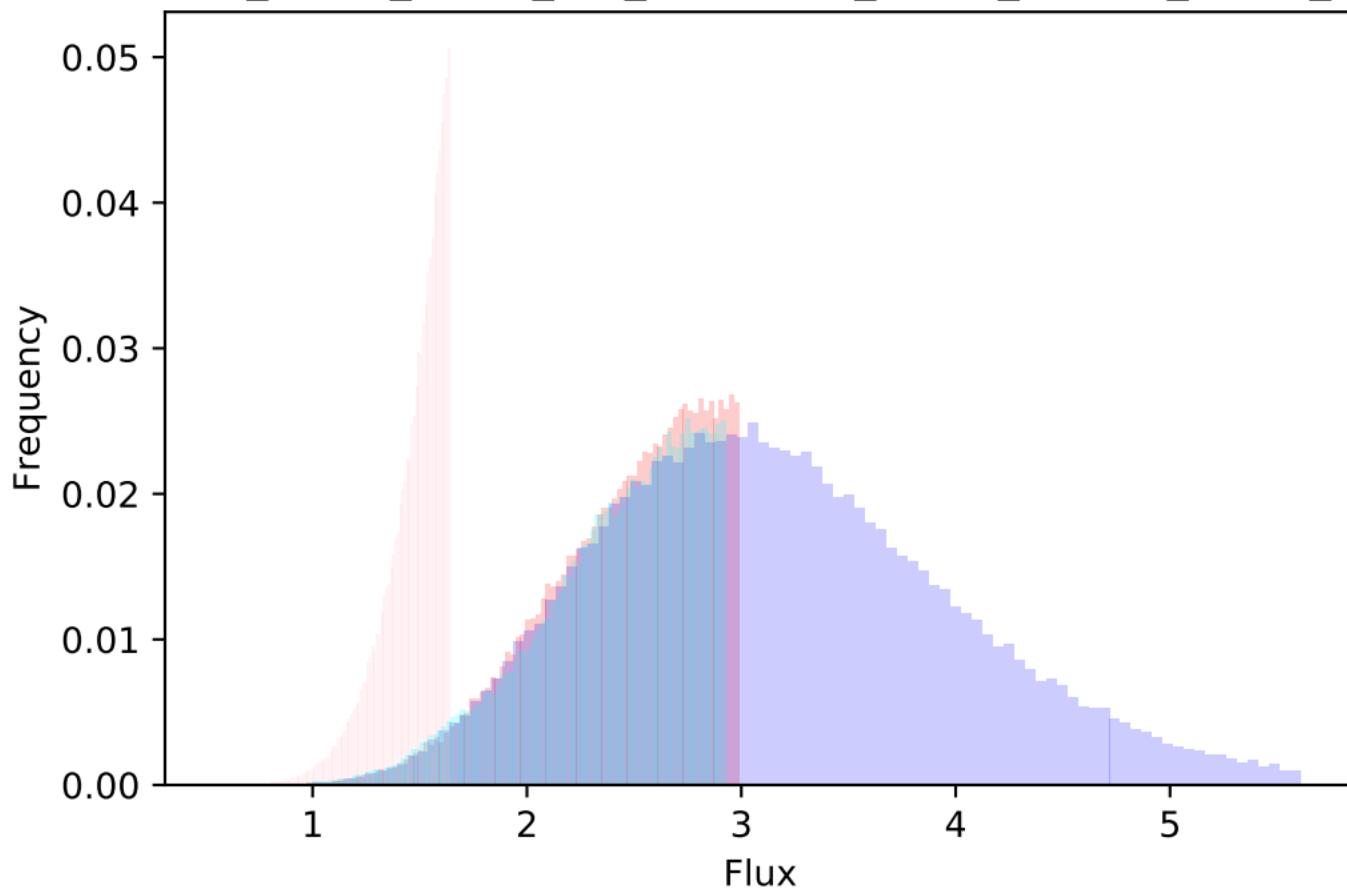


234:Asp_DASH_SeA_h + H_h + NADPH_h --> H_DASH_Ser_h + NADP_h

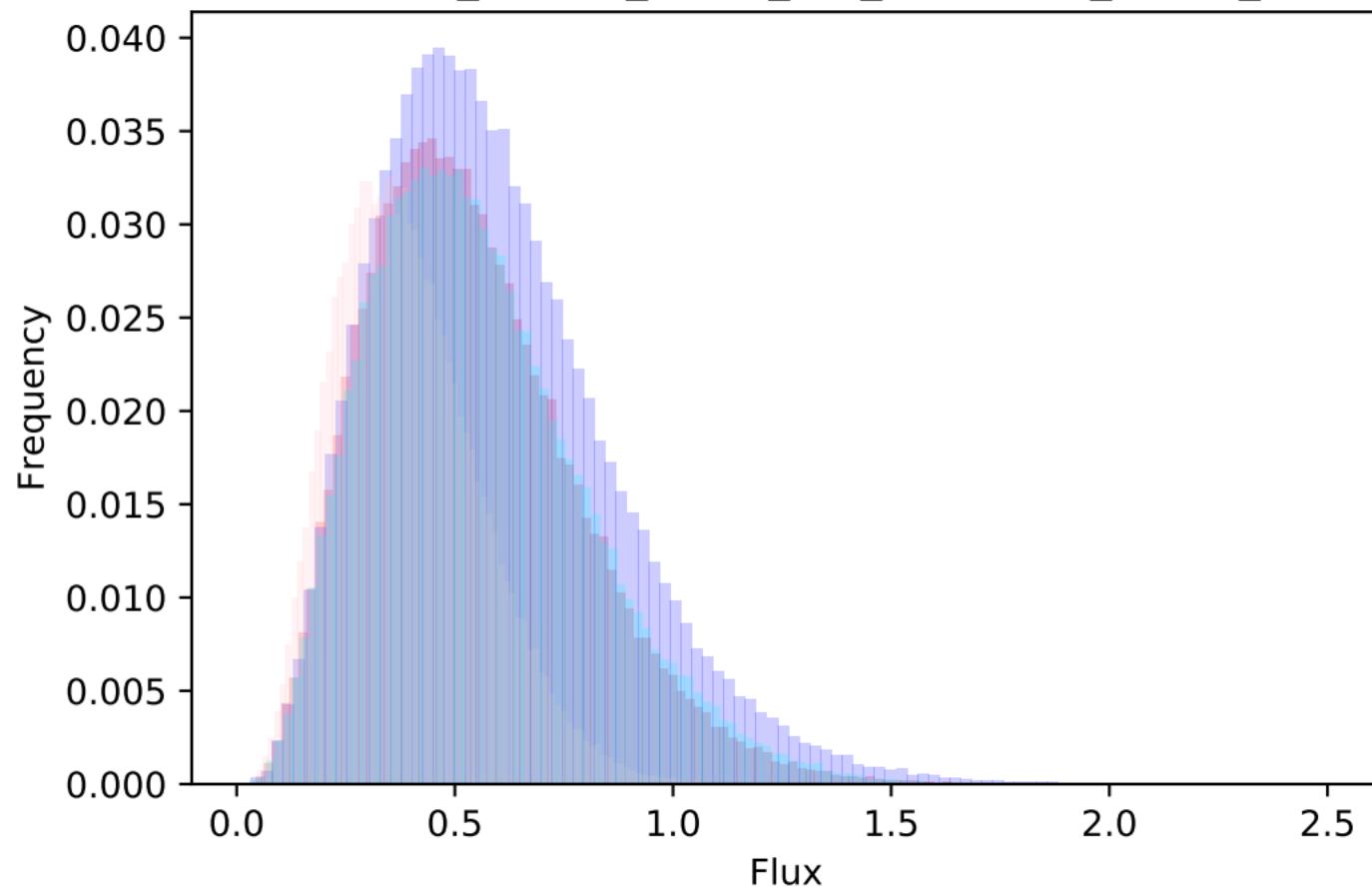


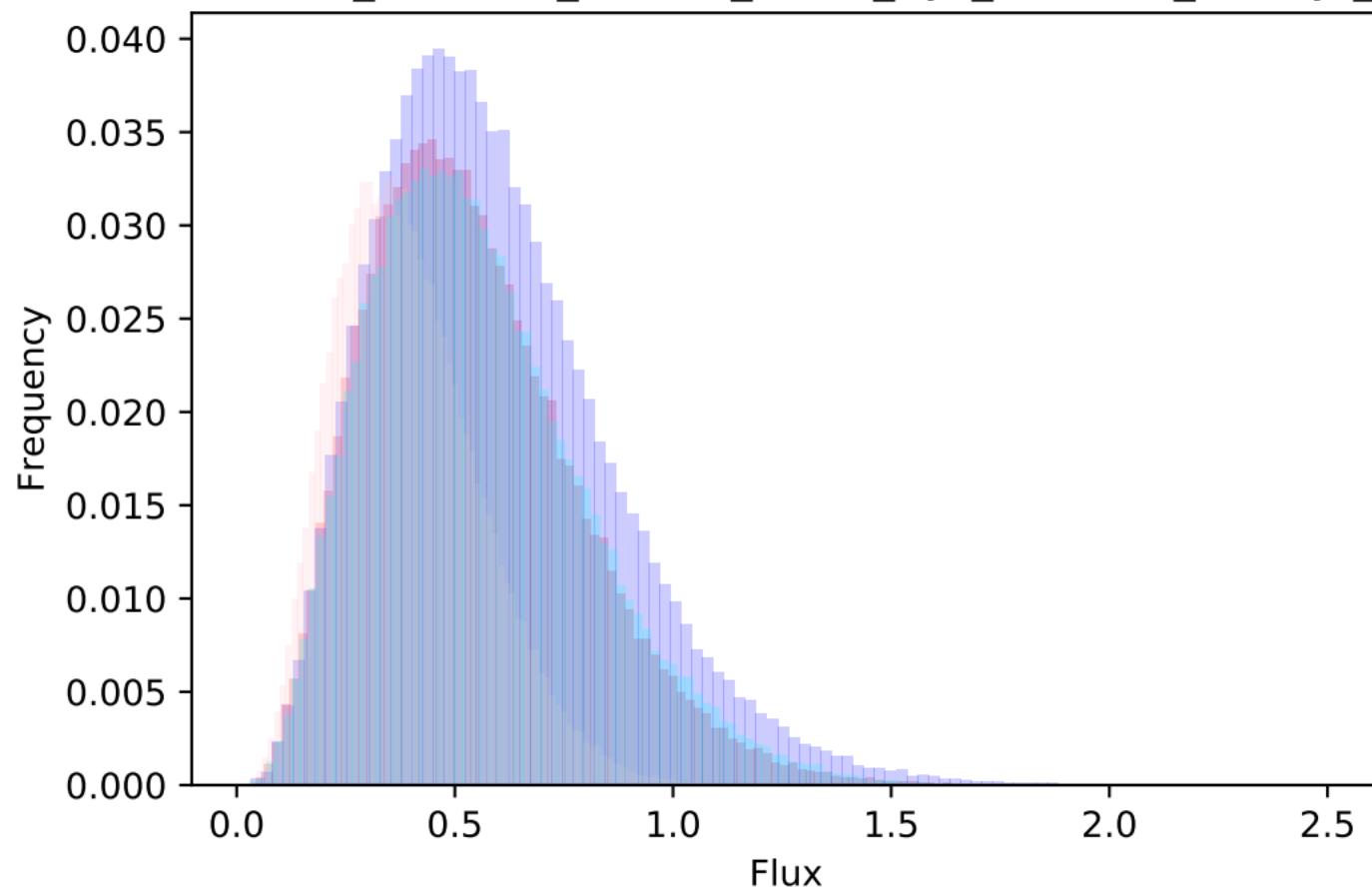
235:Asp_DASH_SeA_h + H_h + NADH_h --> H_DASH_Ser_h + NAD_h



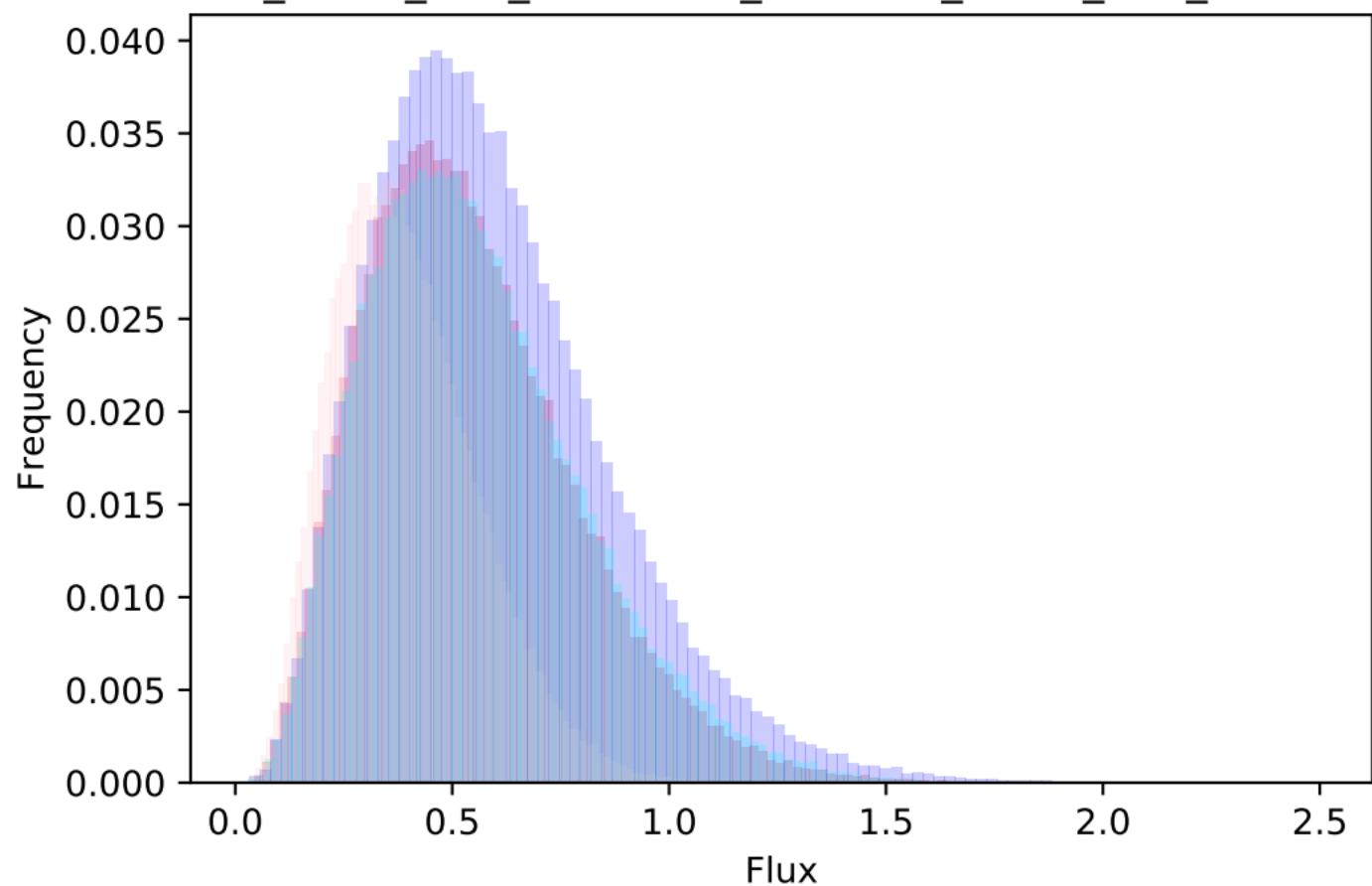


237:Cys_h + PH_DASH_Ser_h --> CTH_h + Pi_h

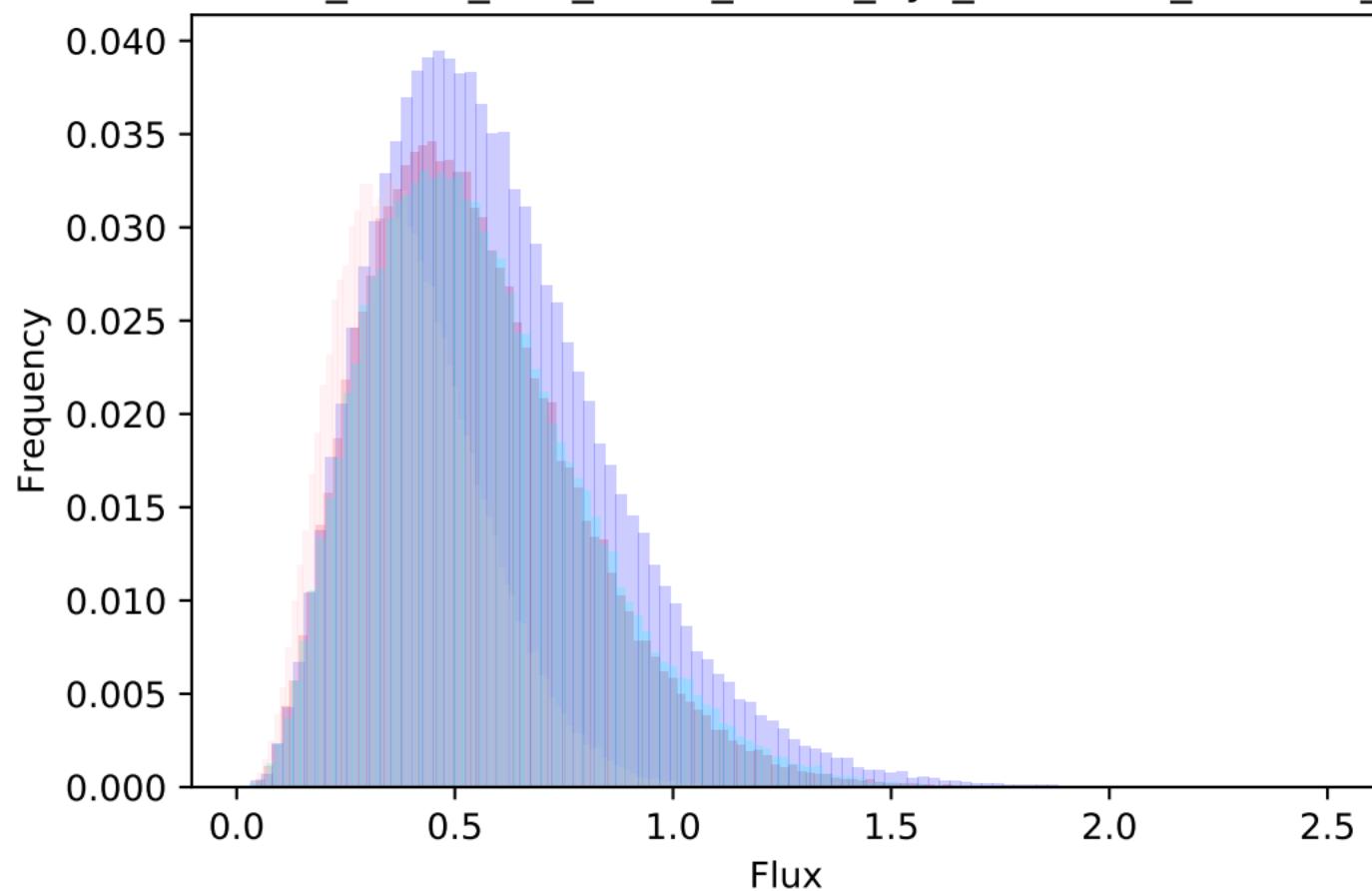


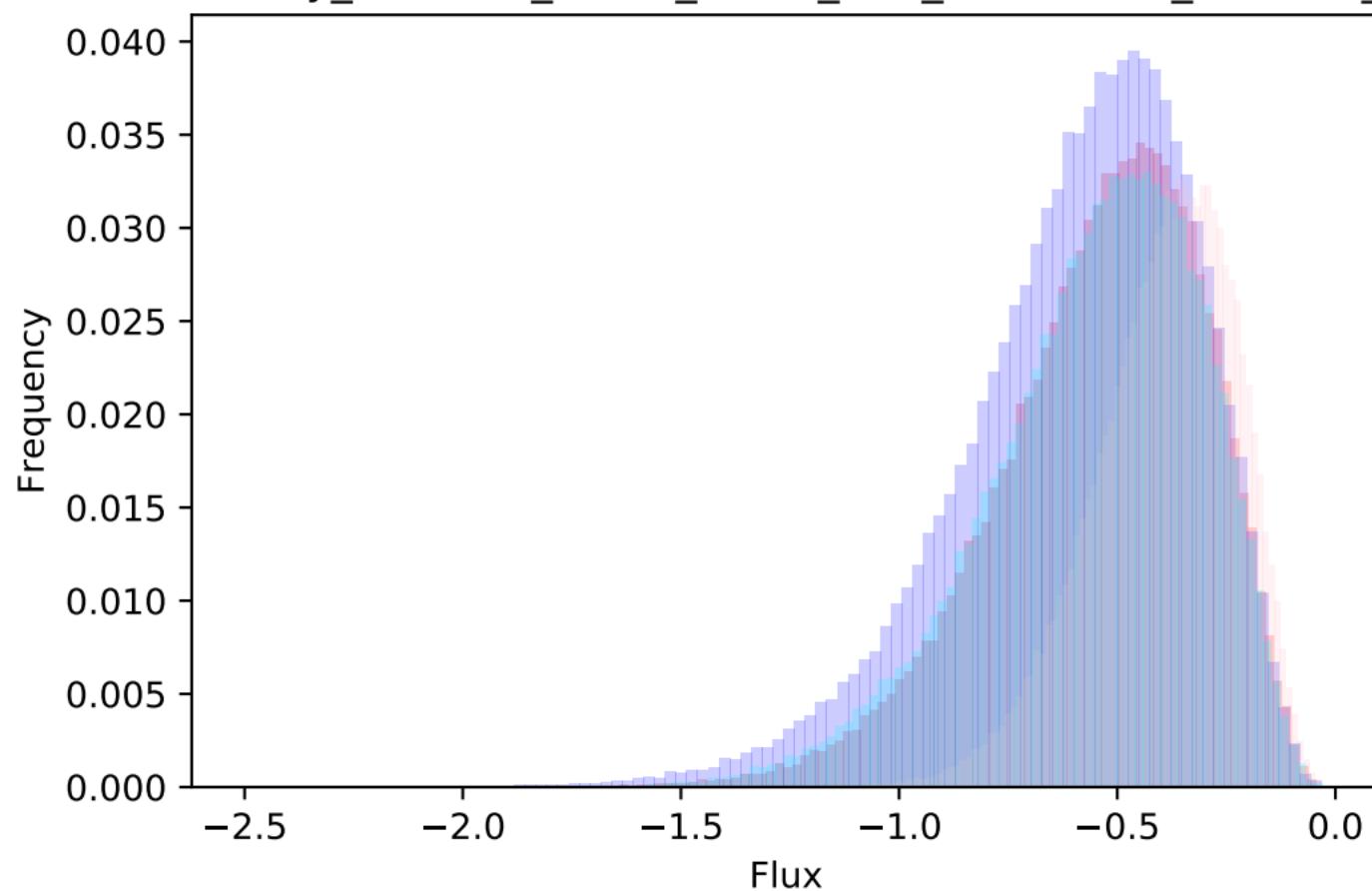


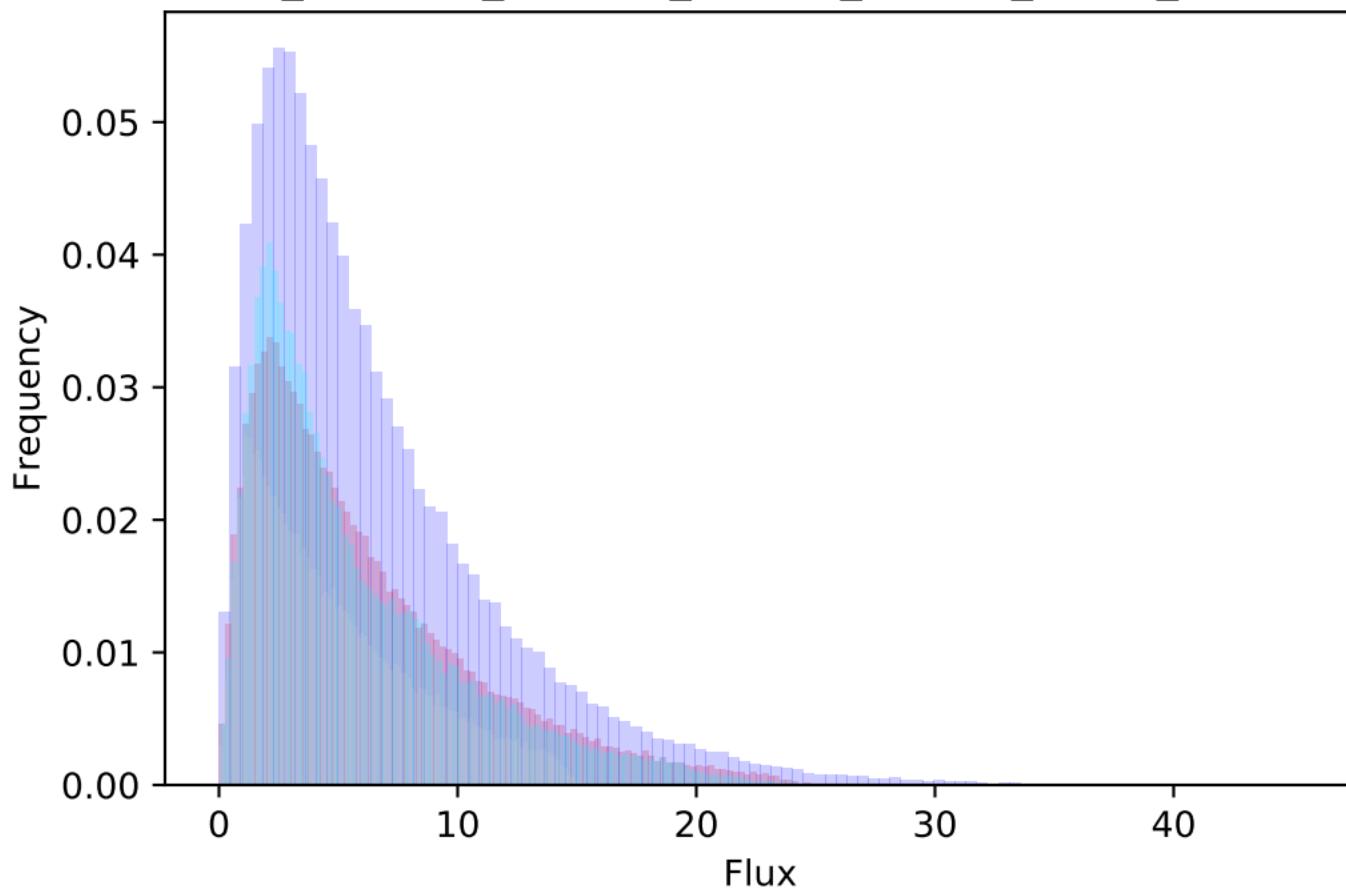
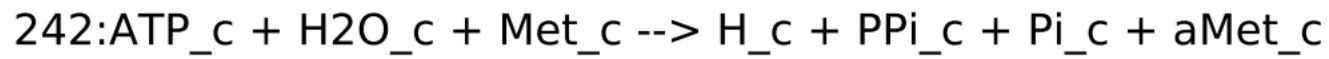
239:M_DASH_ THF_c + NADH_c --> 5M_DASH_ THF_c + NAD_c



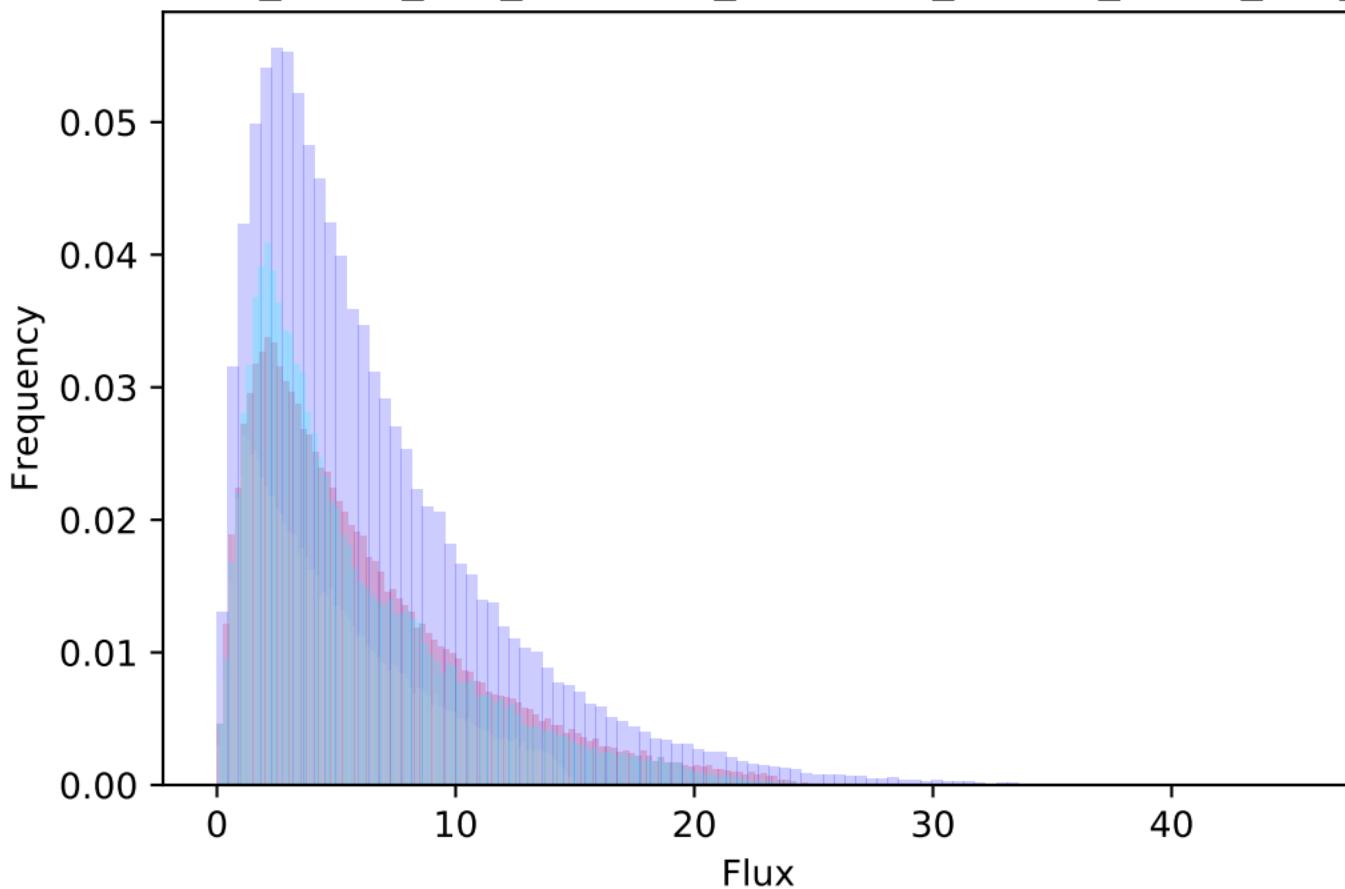
240:5M_DASH_ THF_c + H_DASH_Cys_c --> Met_c + THF_c

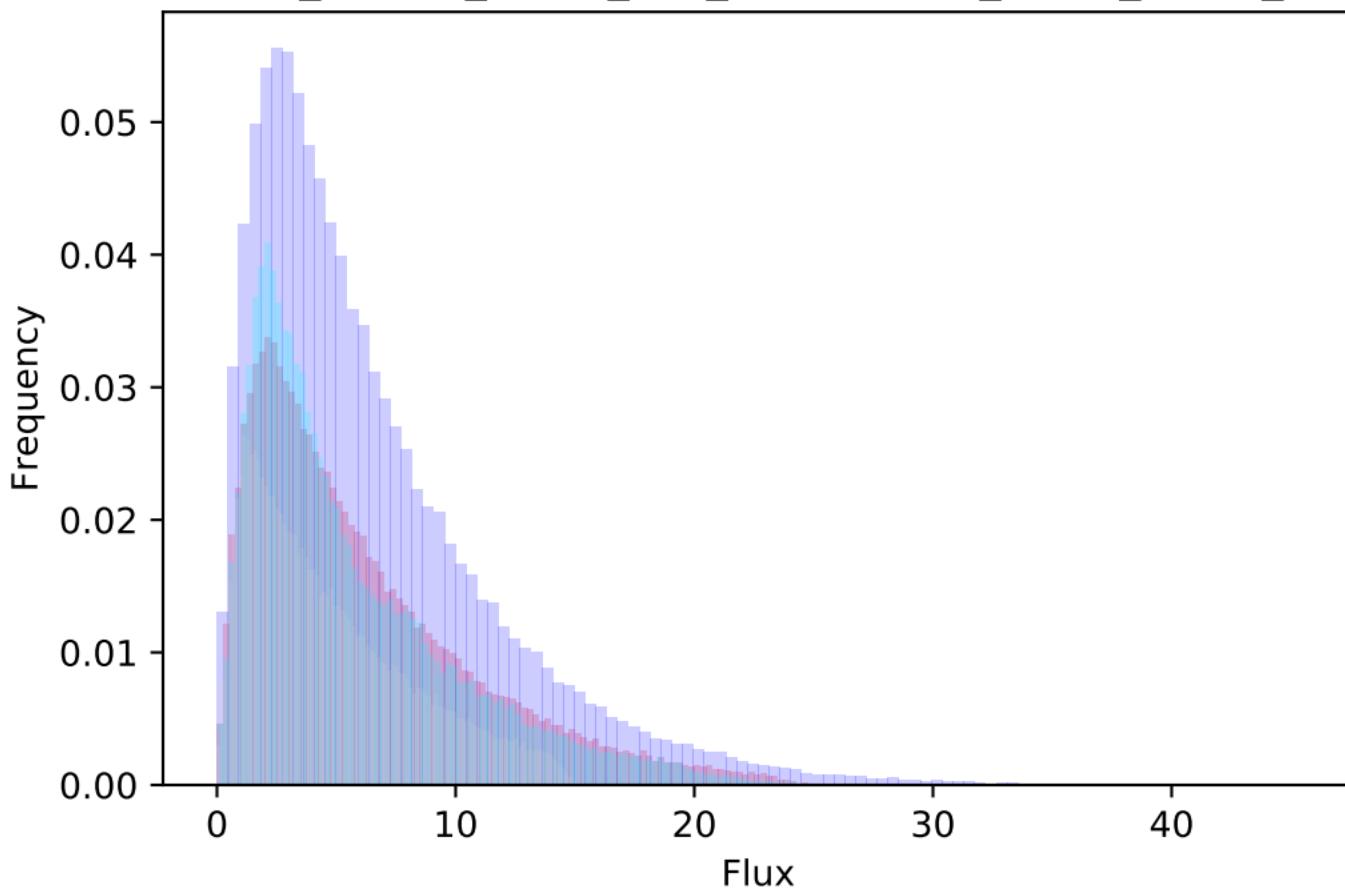
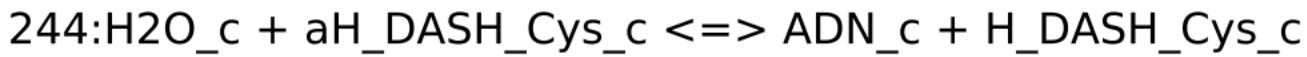




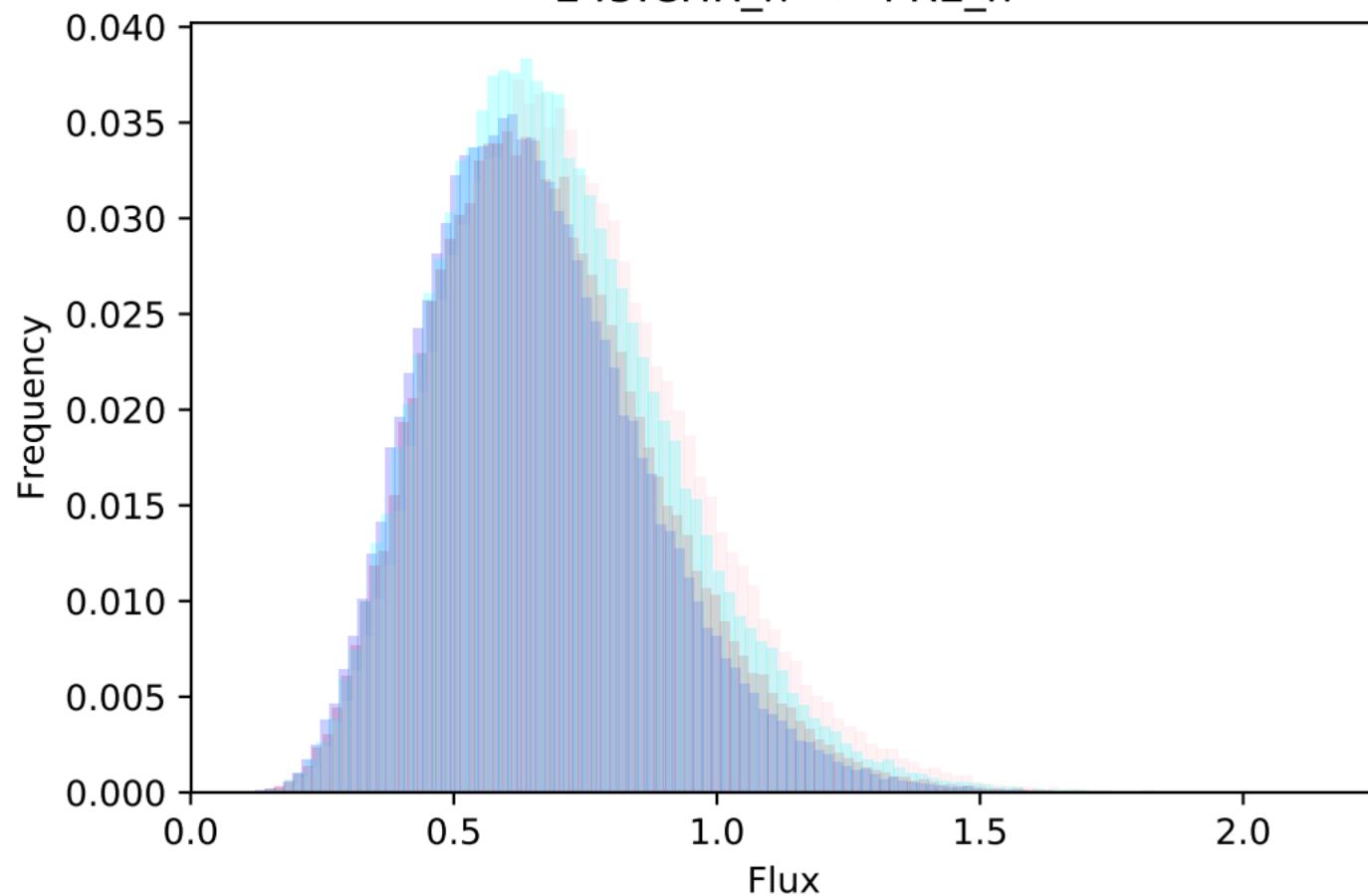


243:H_DASH_Cys_c + aMet_c --> Met_c + aH_DASH_Cys_c

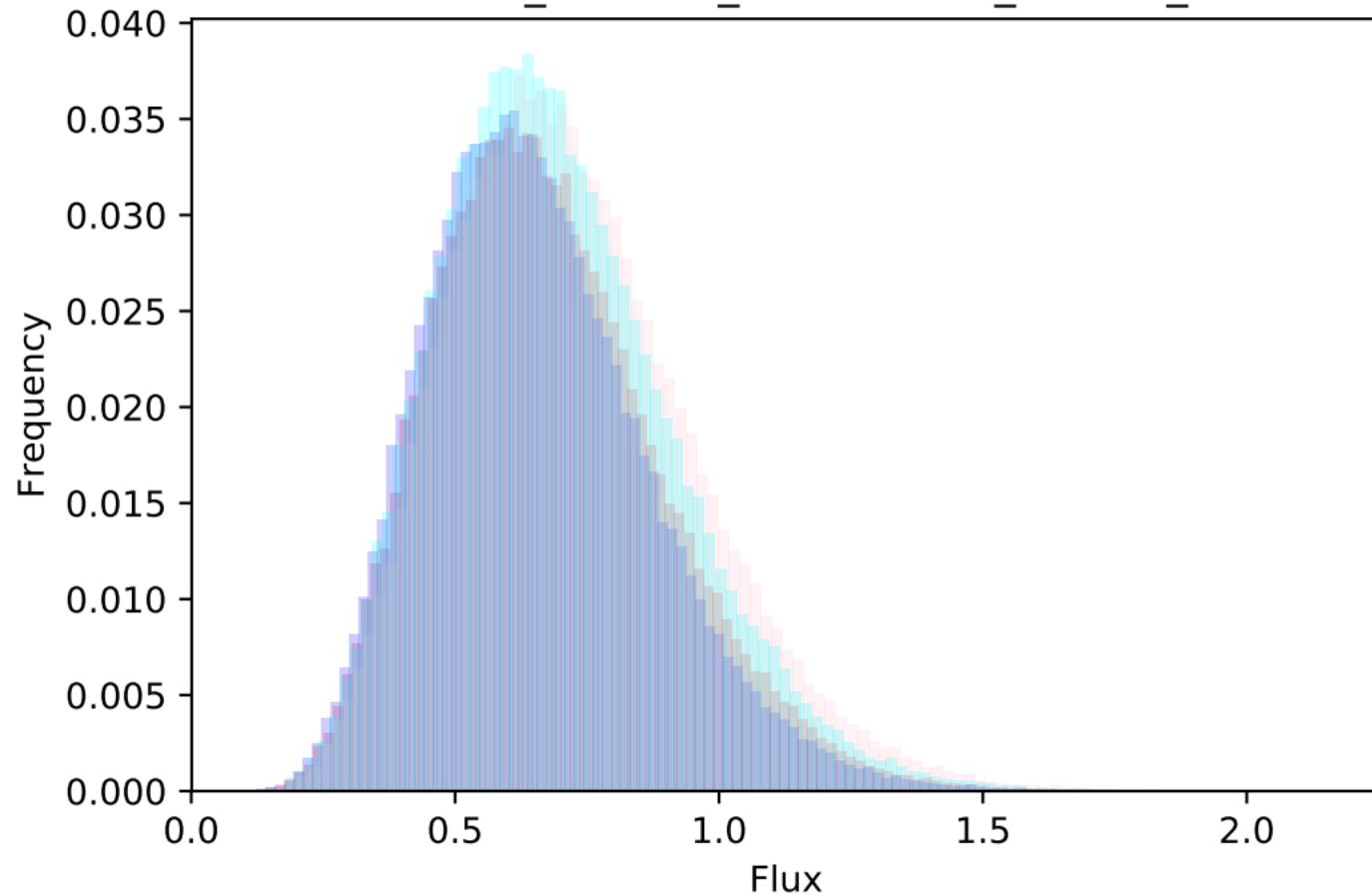




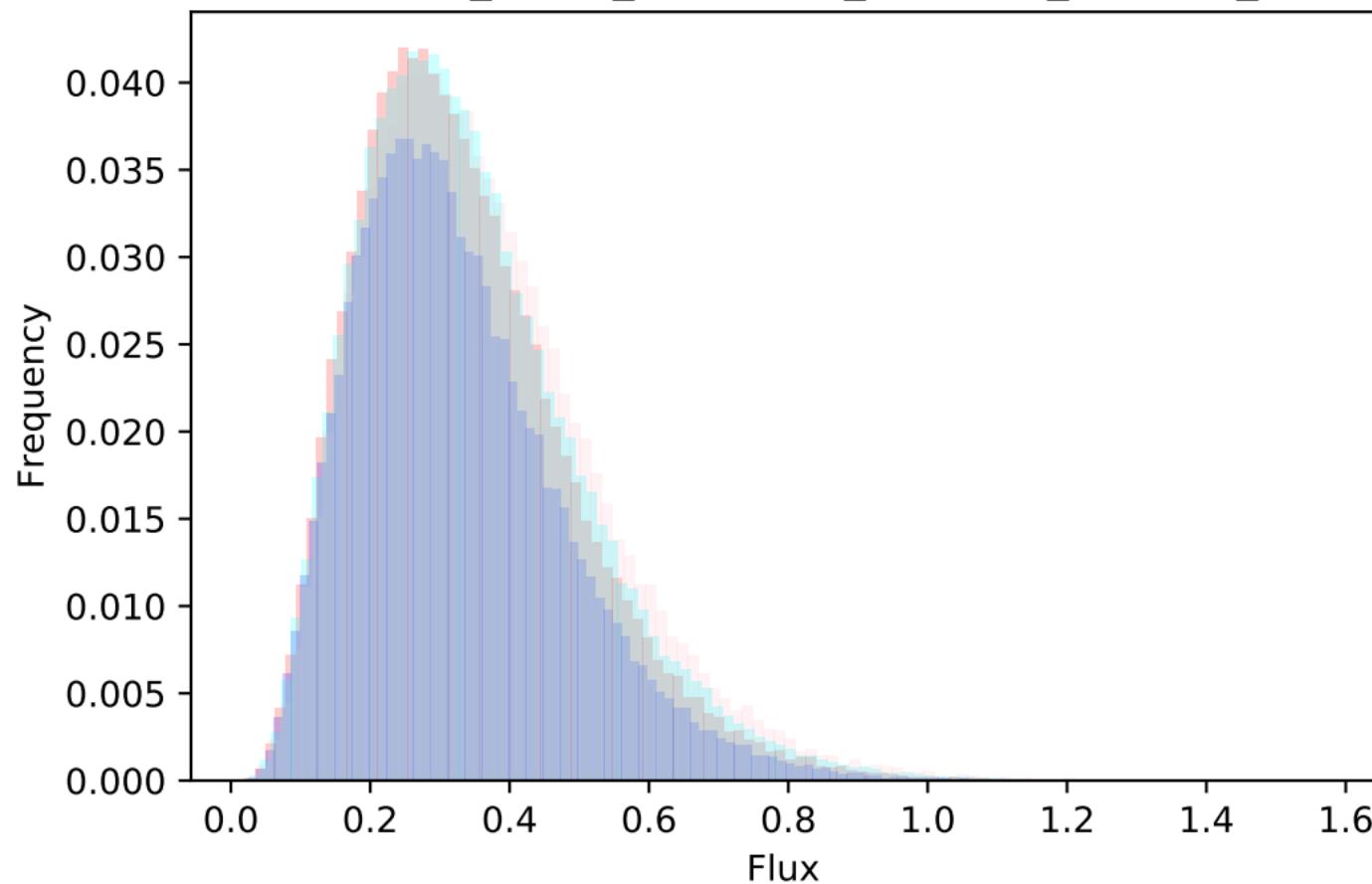
245:CHR_h --> PRE_h



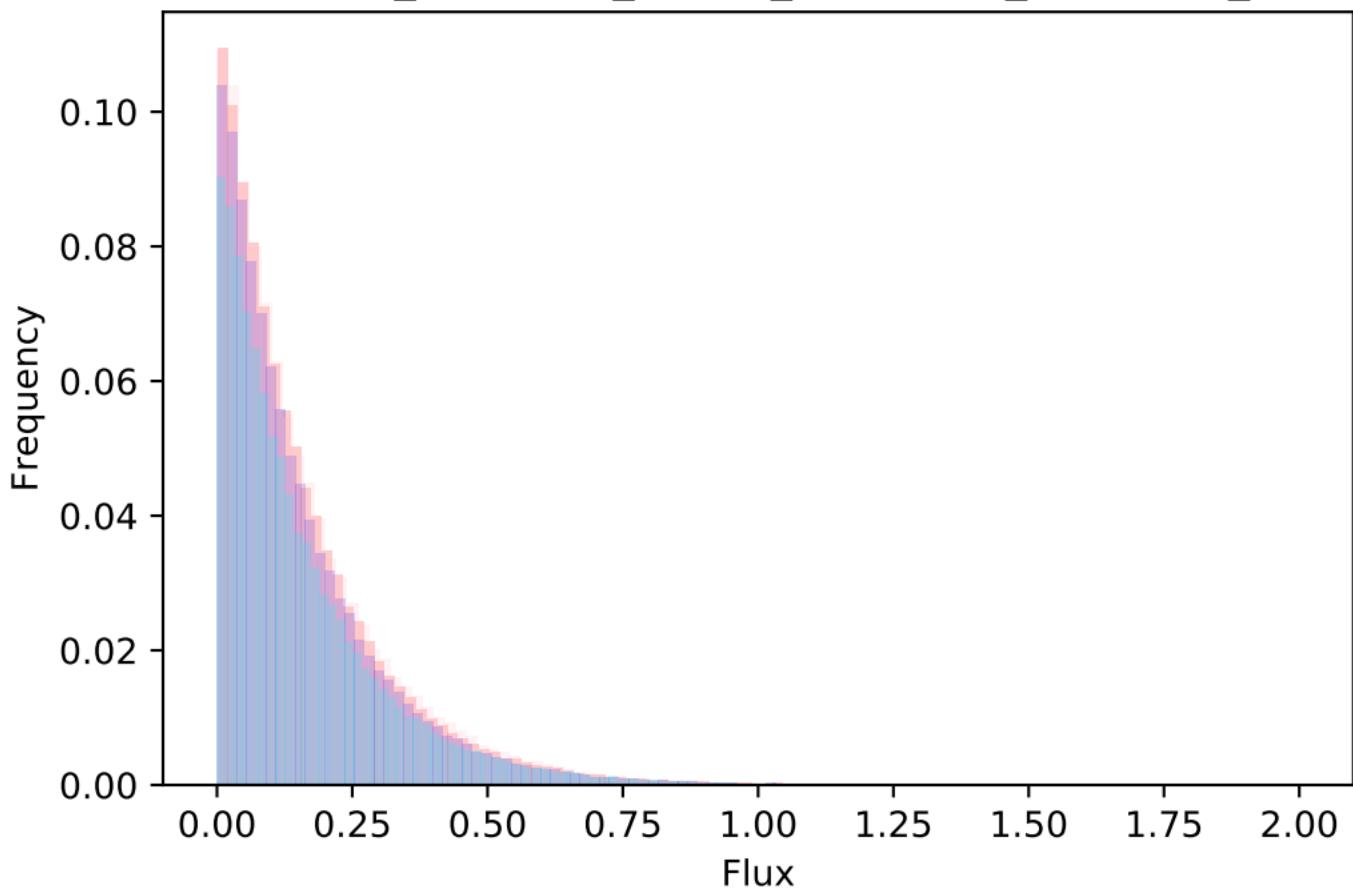
246:Glu_h + PRE_h <=> AGN_h + KG_h



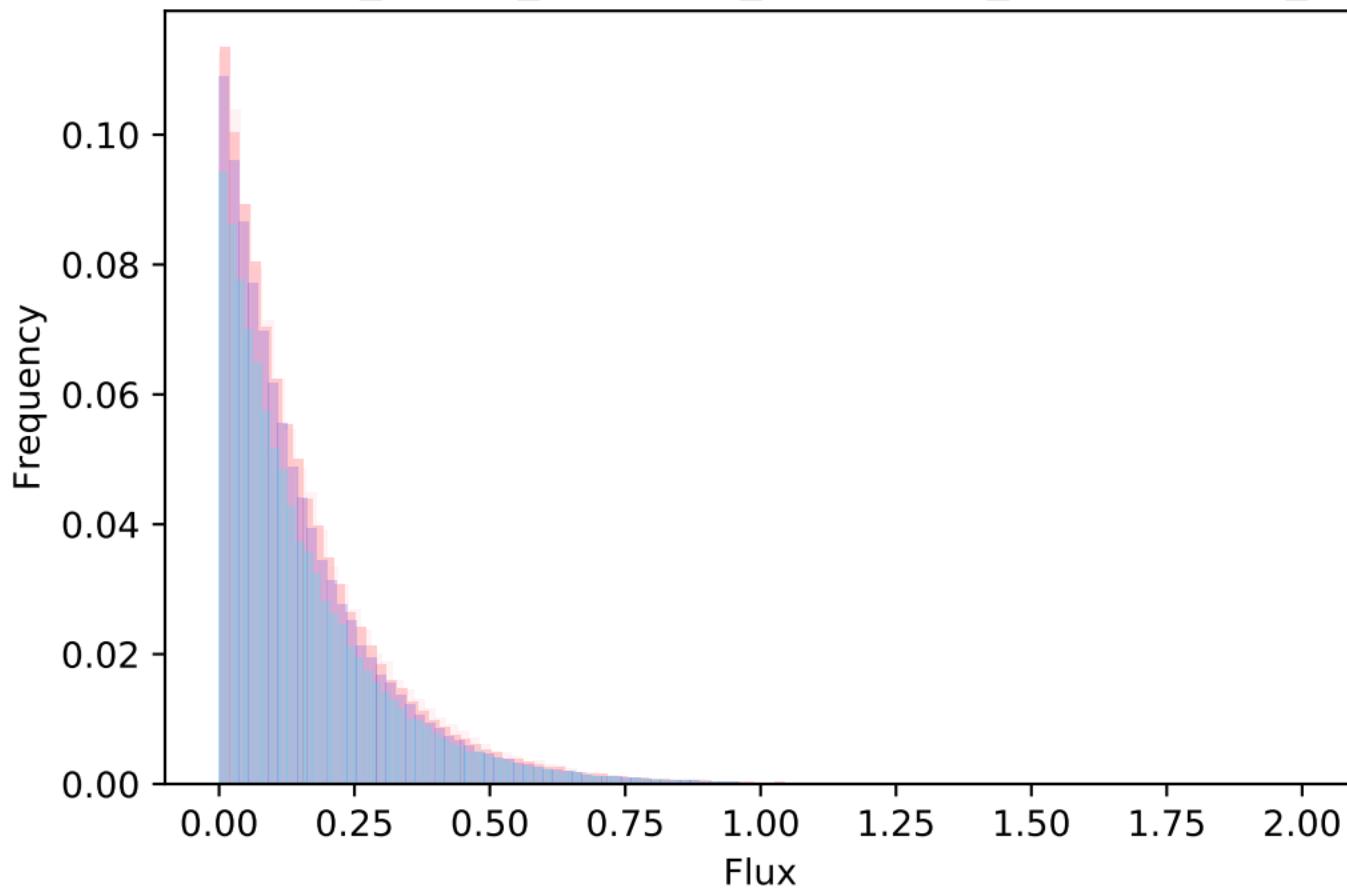
247:AGN_h + H_h --> CO2_h + H2O_h + Phe_h



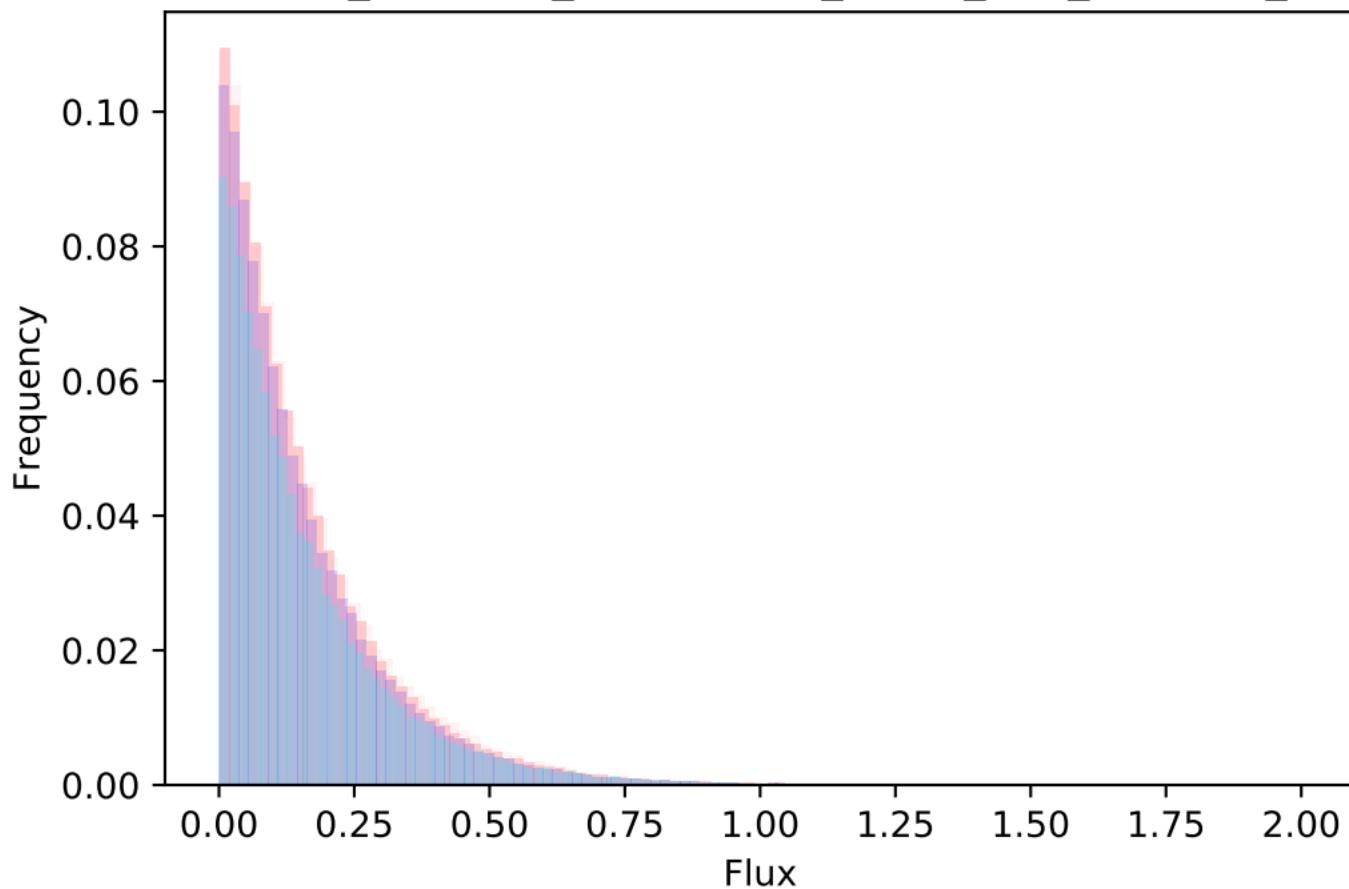
248:Arg_m + H2O_m + H_m --> Orn_m + urea_m



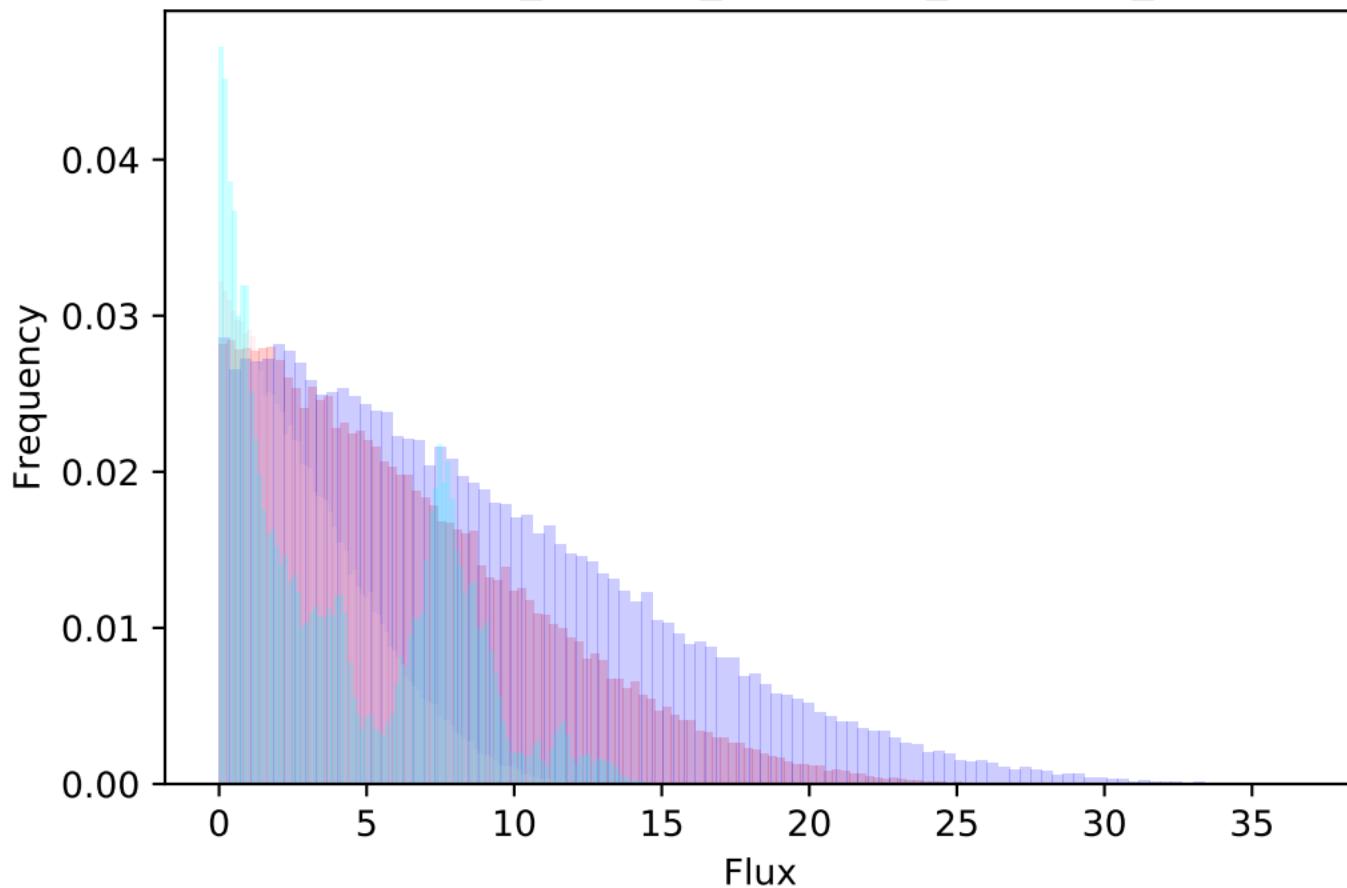
249:H2O_m + H_m + urea_m --> CO2_m + 2.0 NH4_m

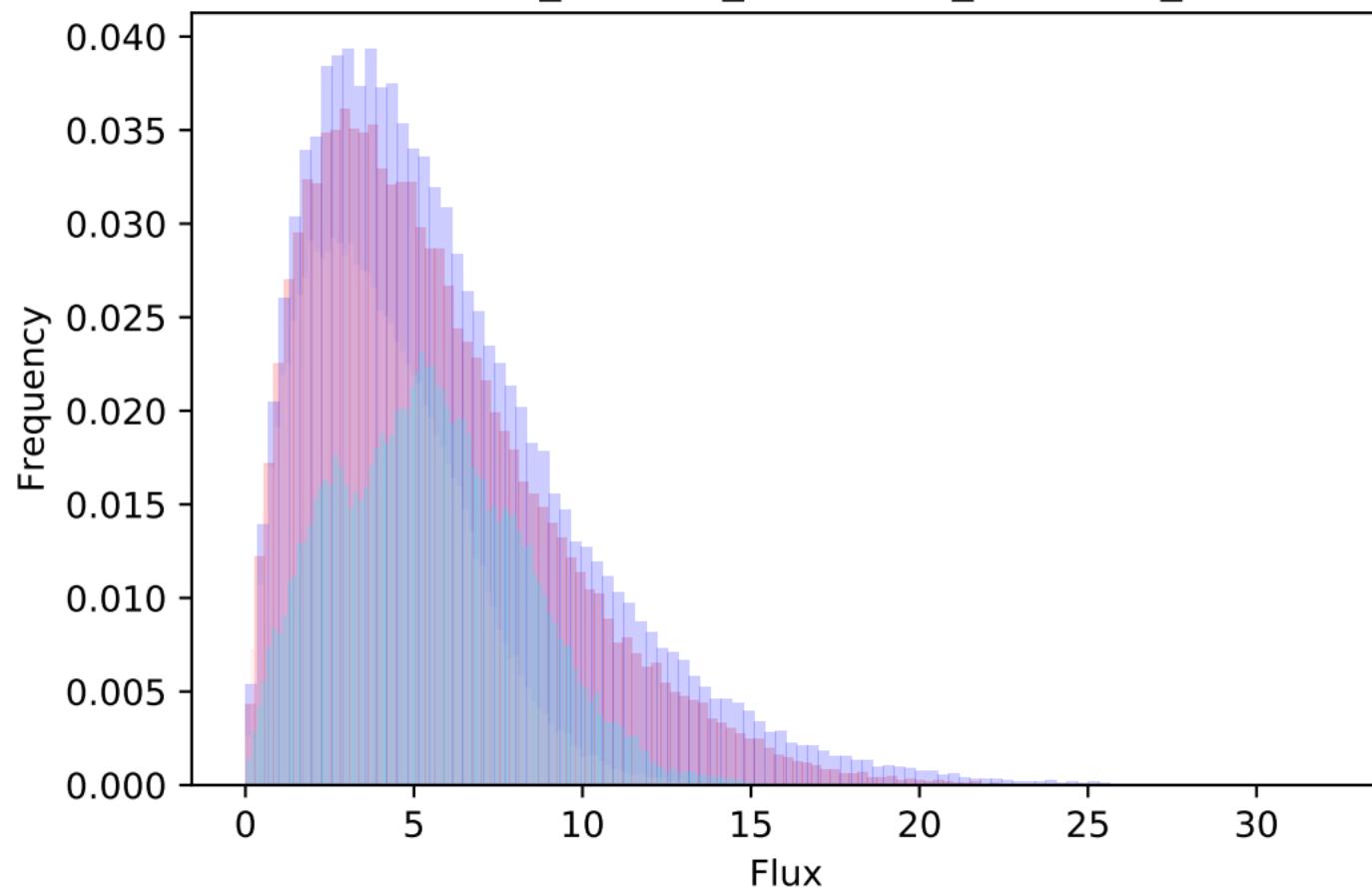
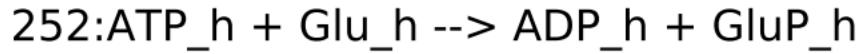


250:KG_m + Orn_m <=> Glu_DASH_SeA_m + Glu_m

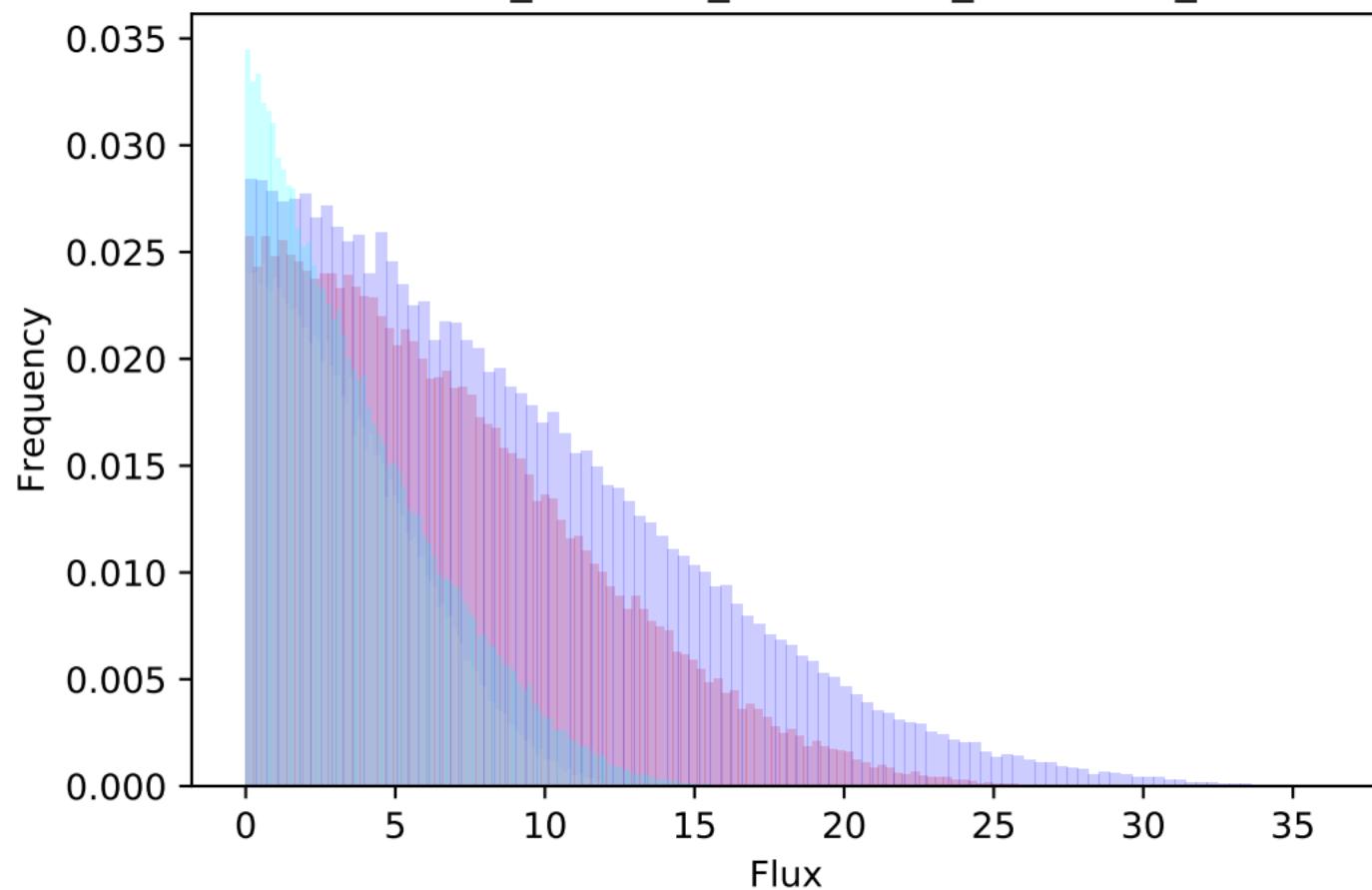


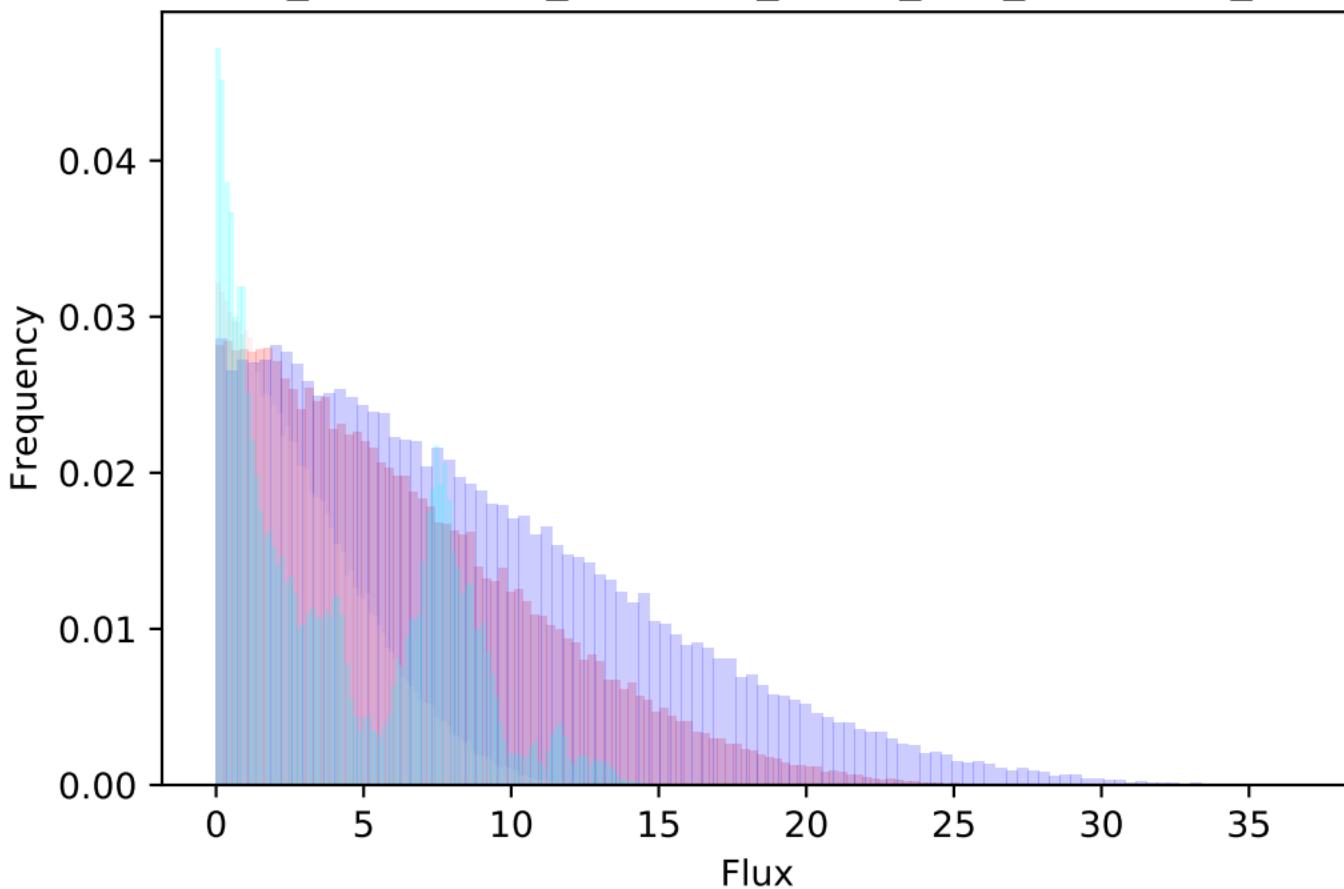
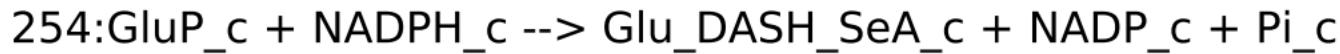
251:ATP_c + Glu_c --> ADP_c + GluP_c



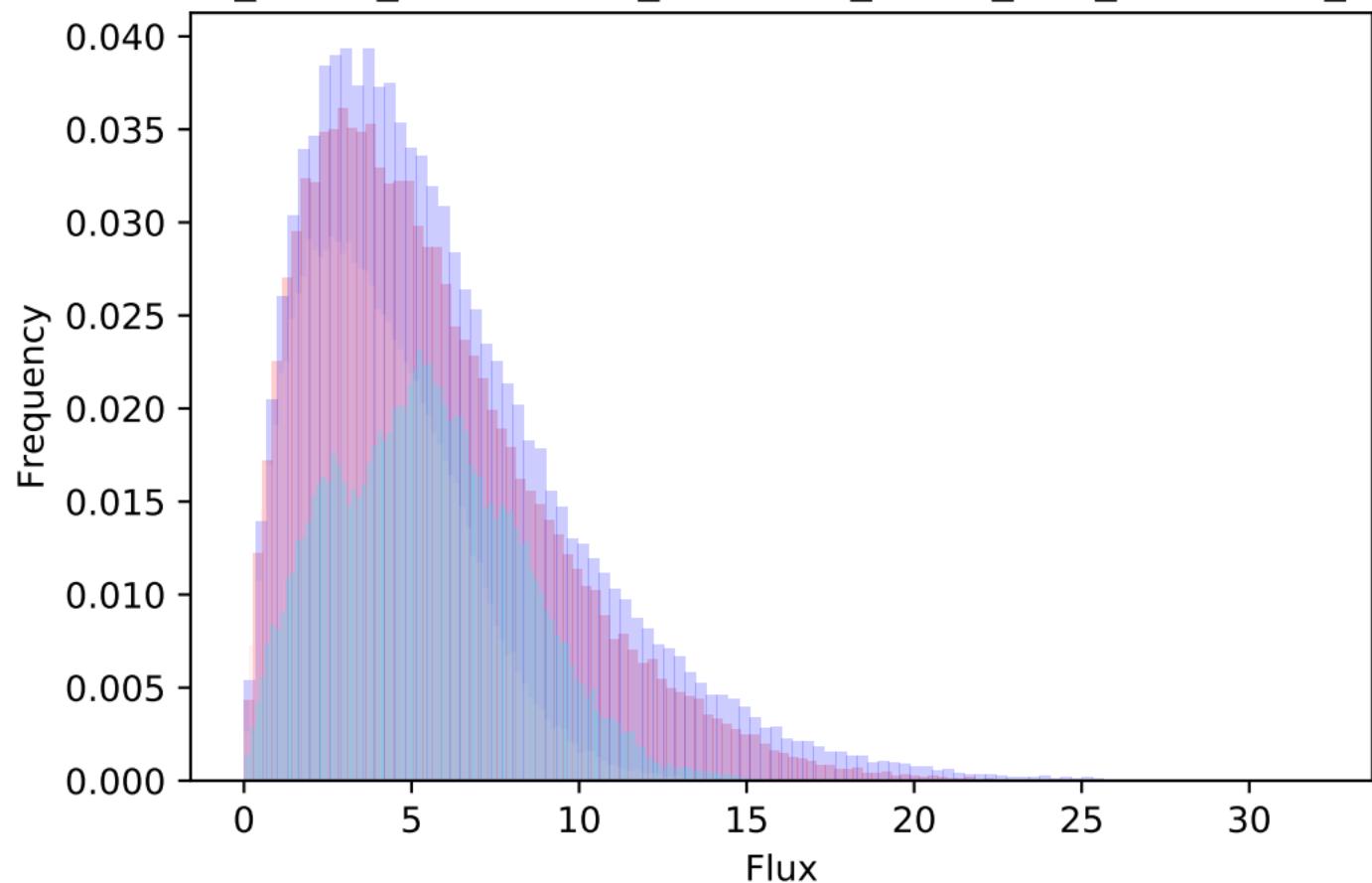


253:ATP_m + Glu_m --> ADP_m + GluP_m

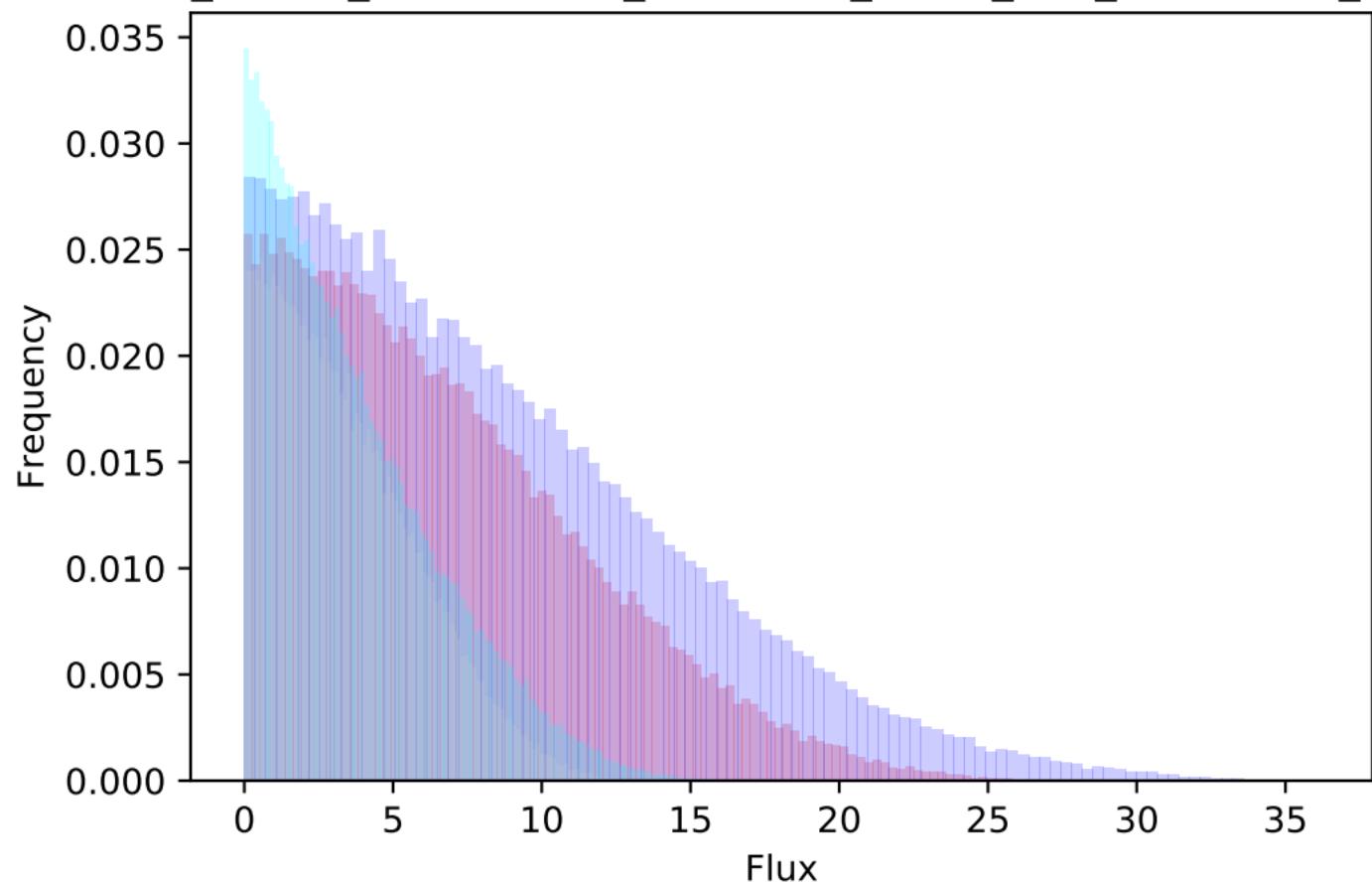




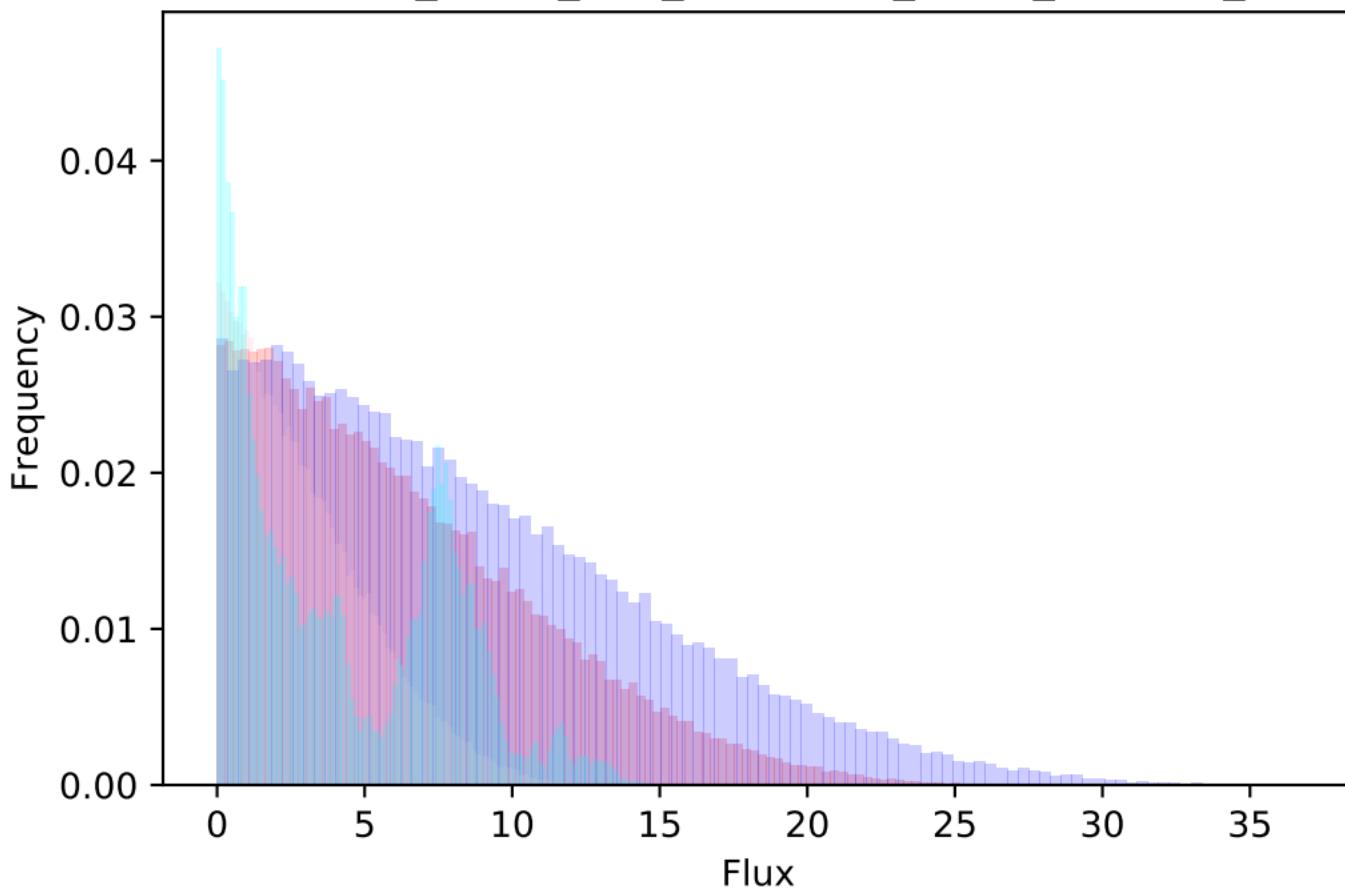
255:GluP_h + H_h + NADPH_h --> Glu_DASH_SeA_h + NADP_h + Pi_h



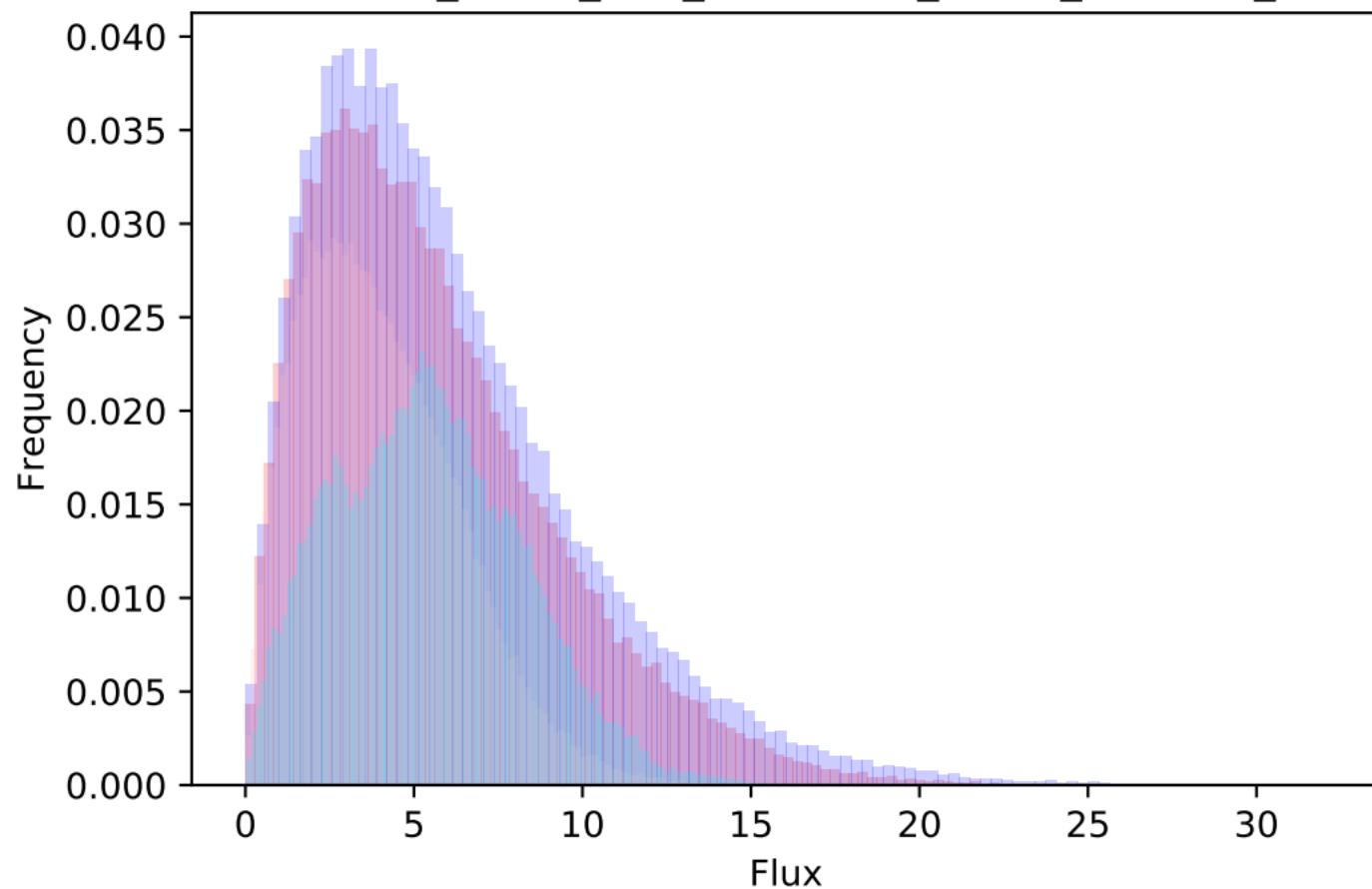
256:GluP_m + H_m + NADPH_m --> Glu_DASH_SeA_m + NADP_m + Pi_



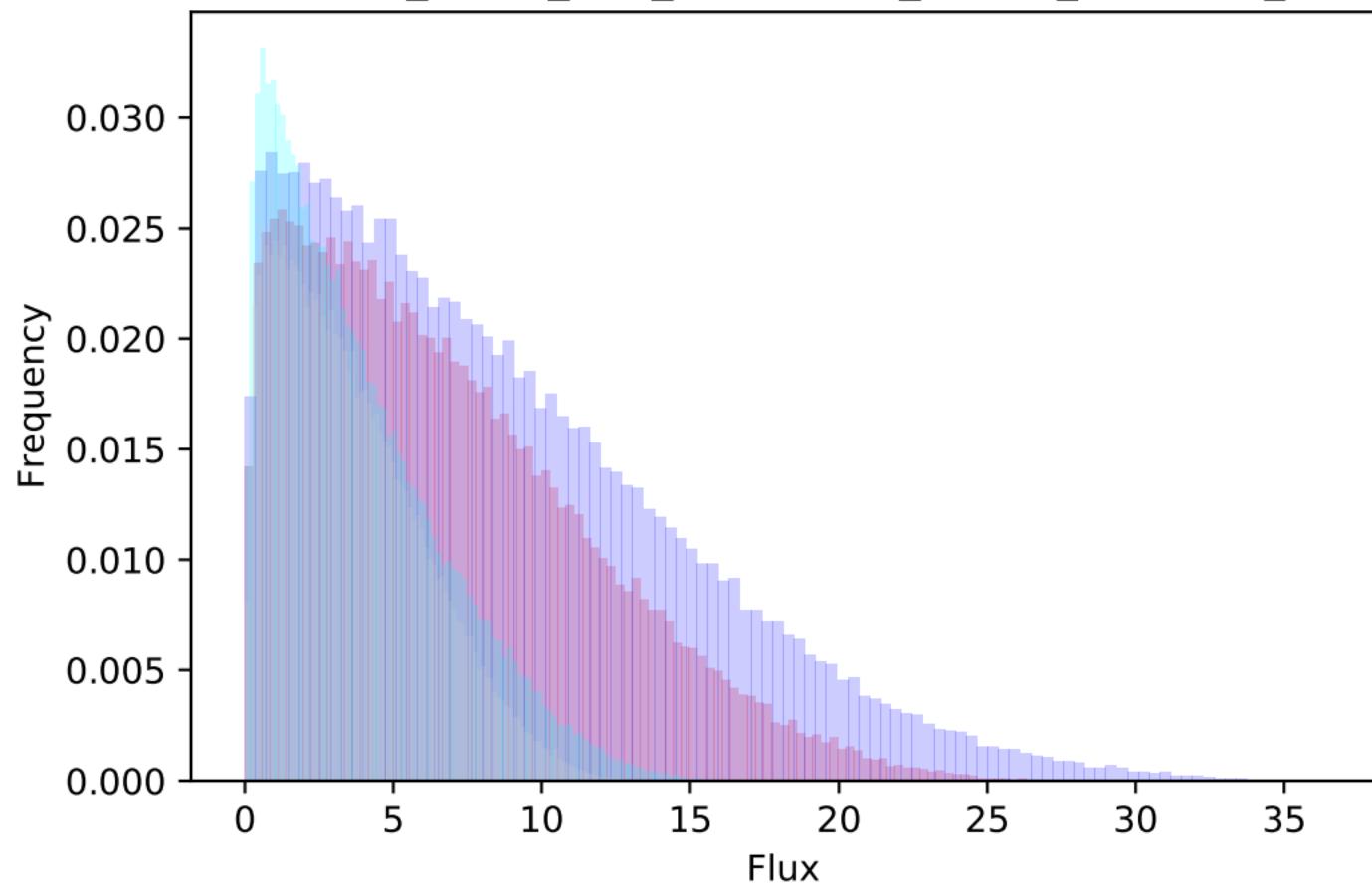
257:Glu_DASH_SeA_c --> H2O_c + H_c + P5C_c



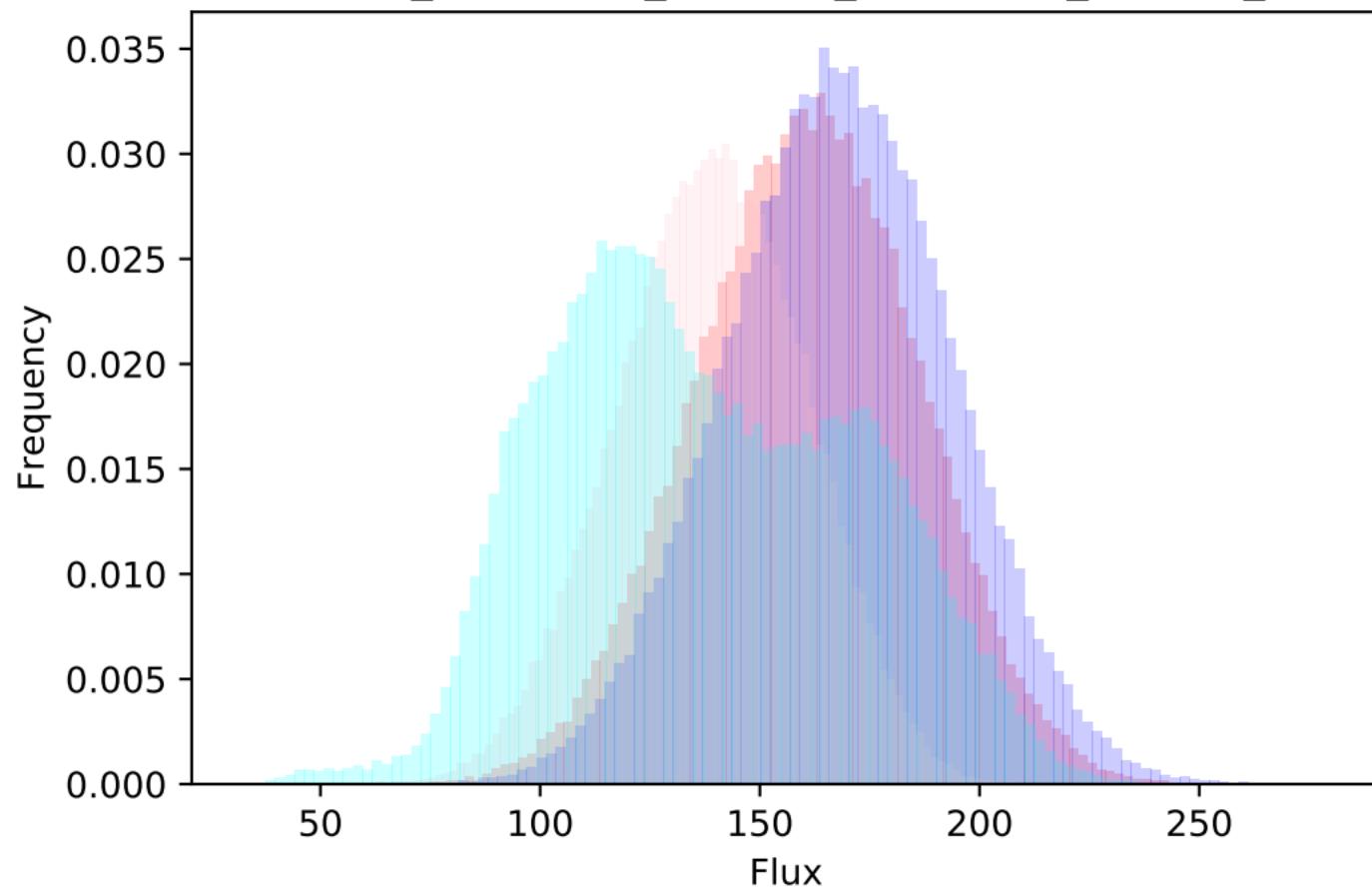
258:Glu_DASH_SeA_h --> H2O_h + H_h + P5C_h



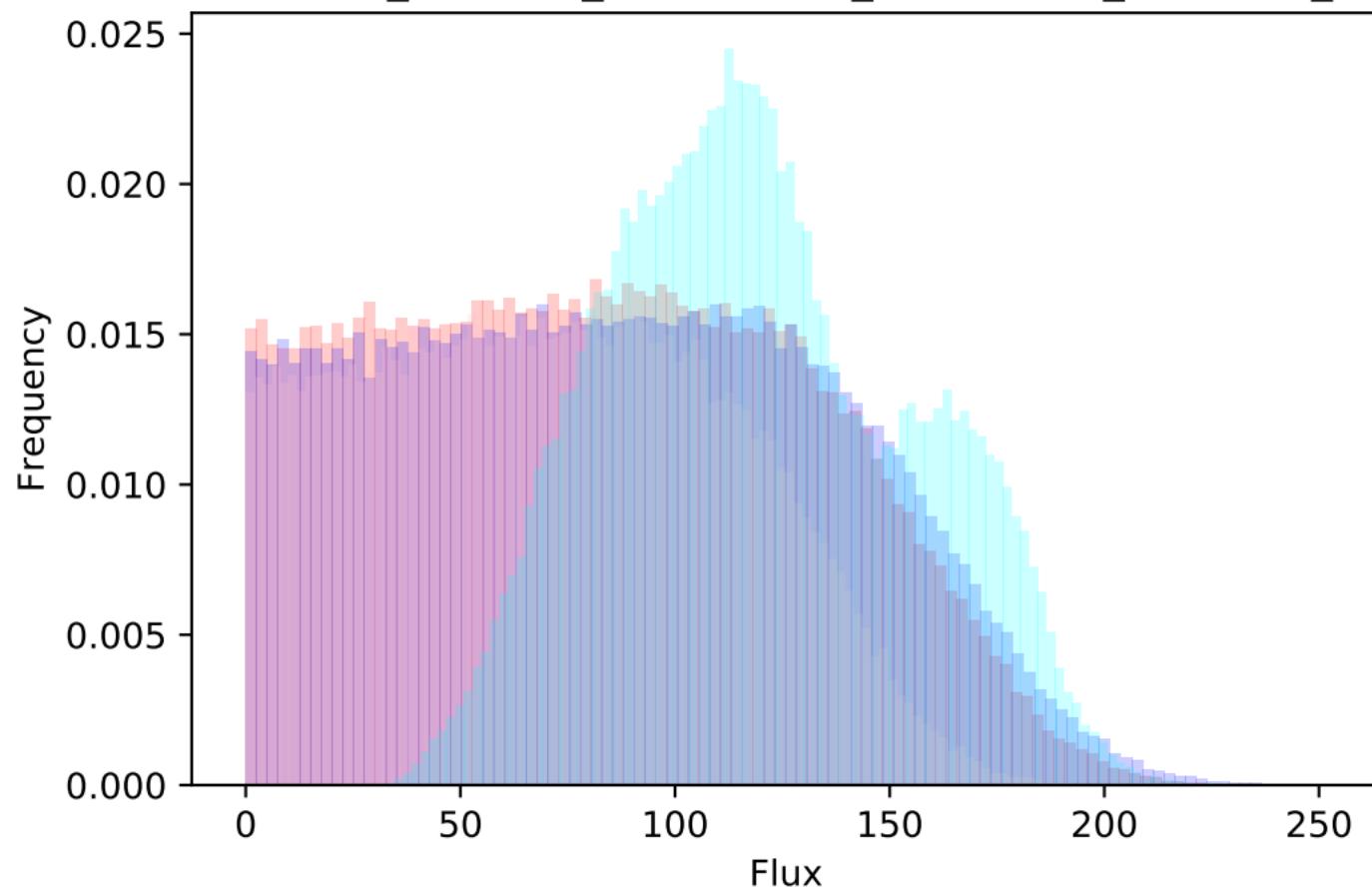
259:Glu_DASH_SeA_m --> H2O_m + H_m + P5C_m



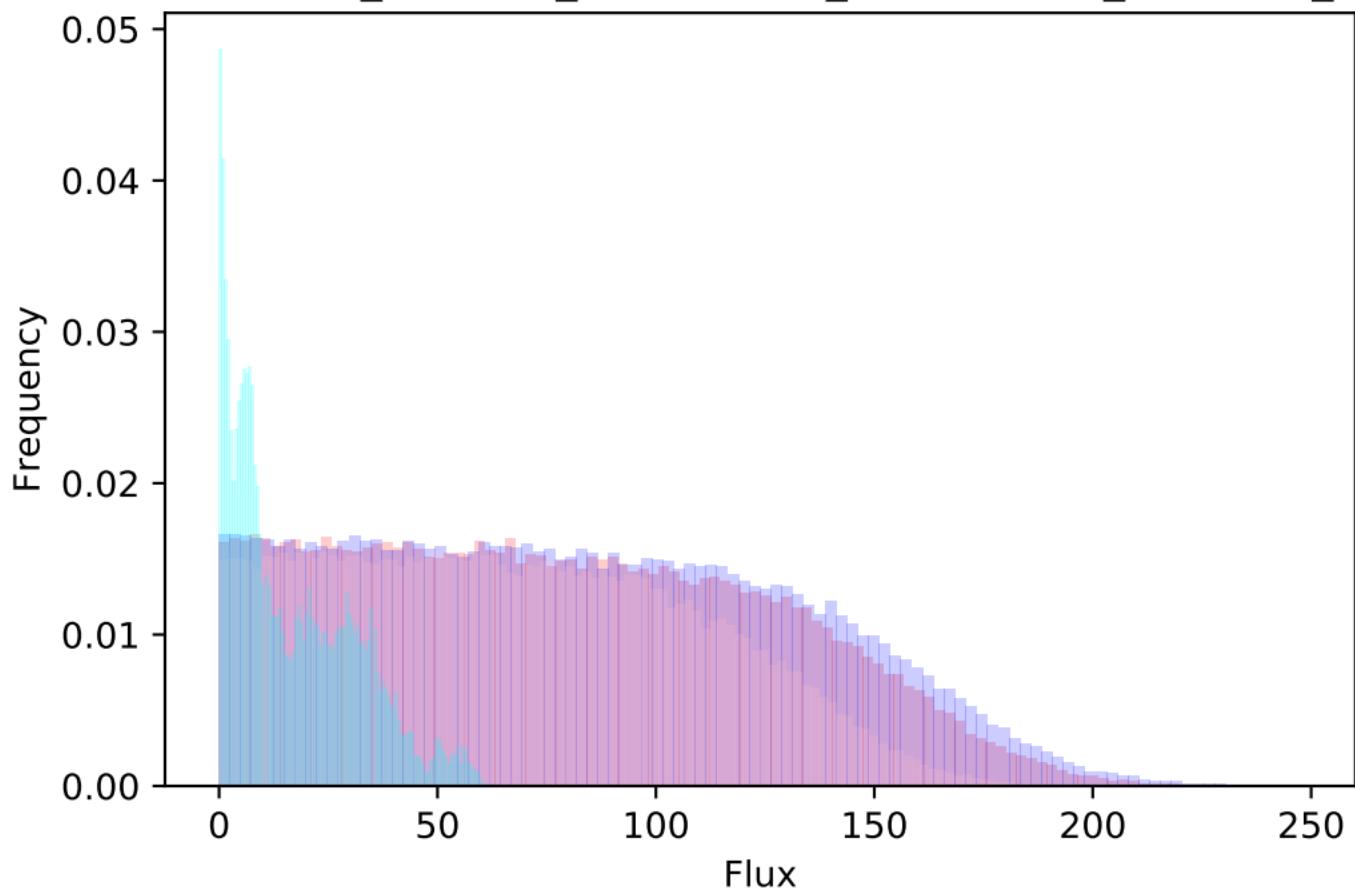
$260:\text{H}_c + \text{NADH}_c + \text{P5C}_c \rightarrow \text{NAD}_c + \text{Pro}_c$

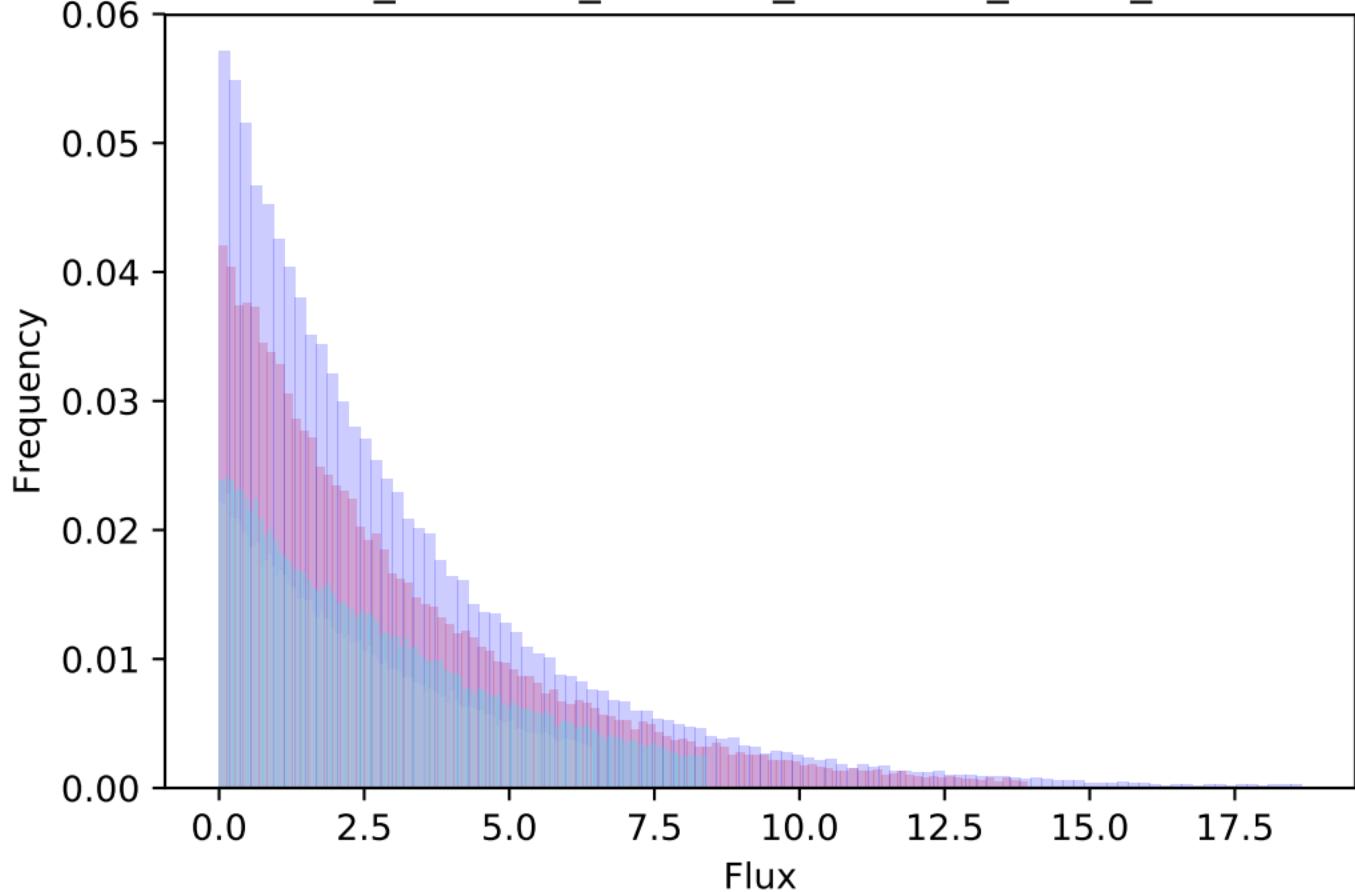


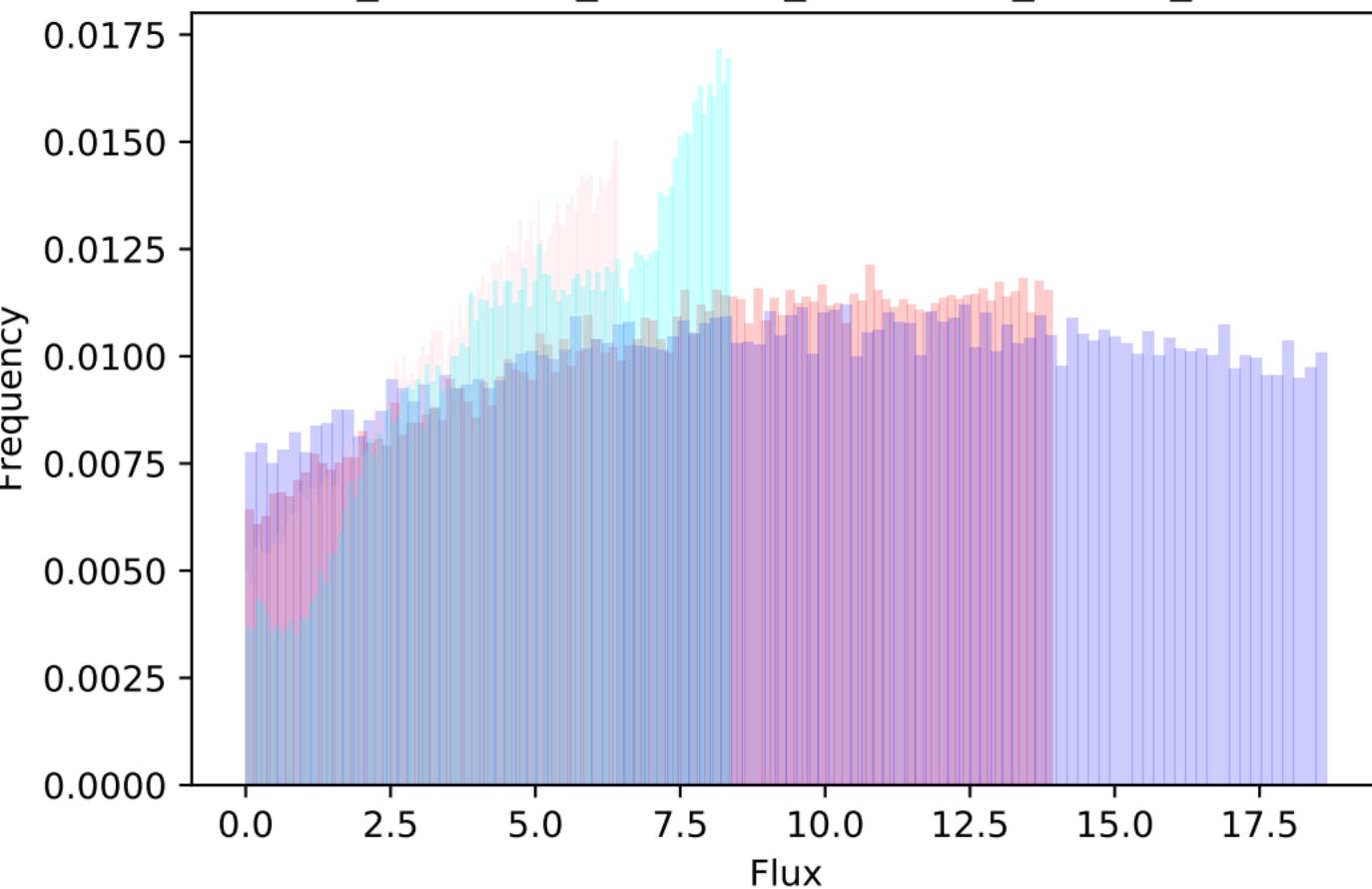
$261:\text{NAD_m} + \text{Pro_m} \rightarrow 2.0 \text{ H_m} + \text{NADH_m} + \text{P5C_m}$

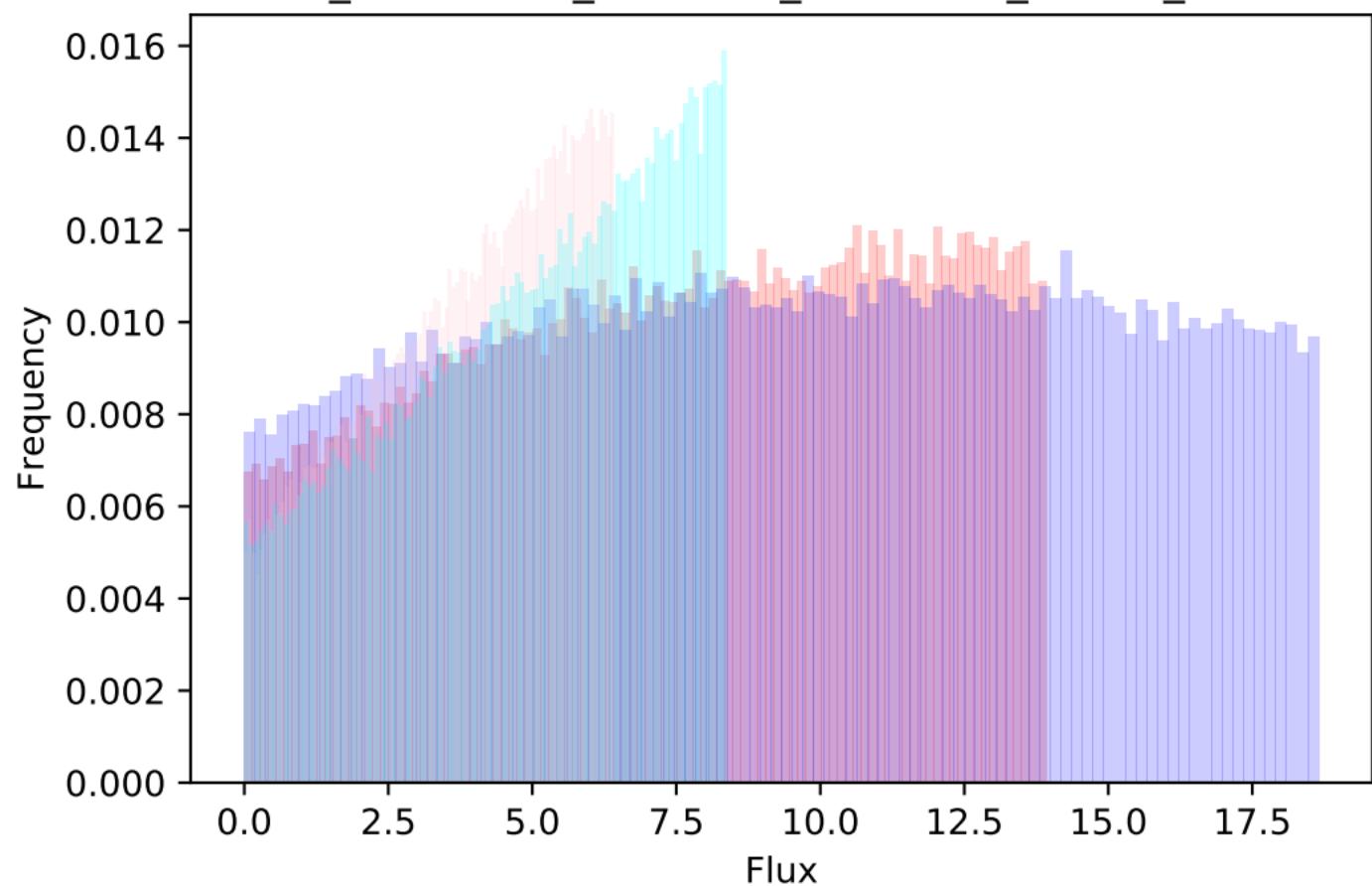


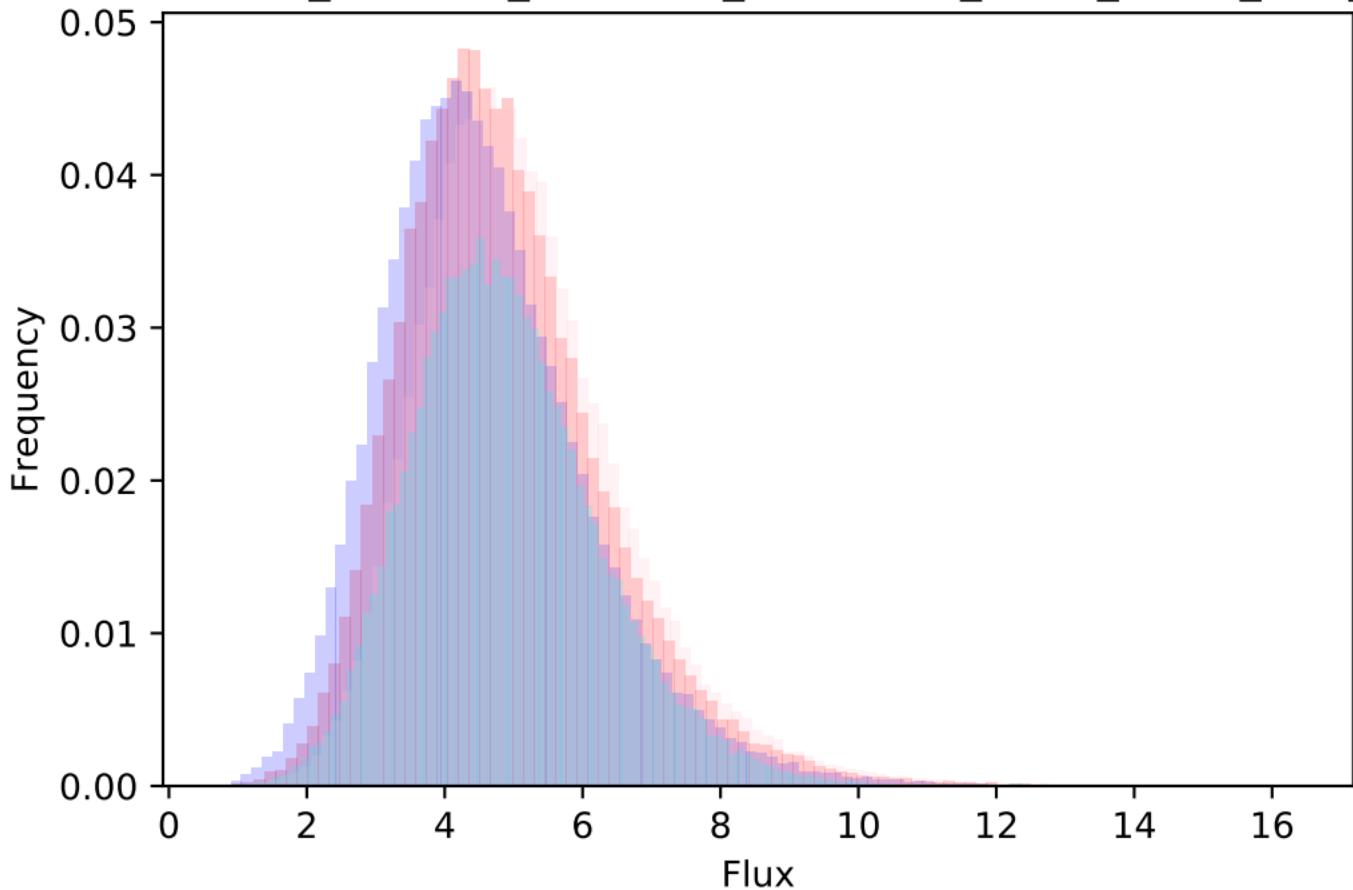
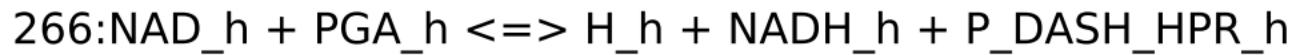
262:NADP_m + Pro_m --> 2.0 H_m + NADPH_m + P5C_m



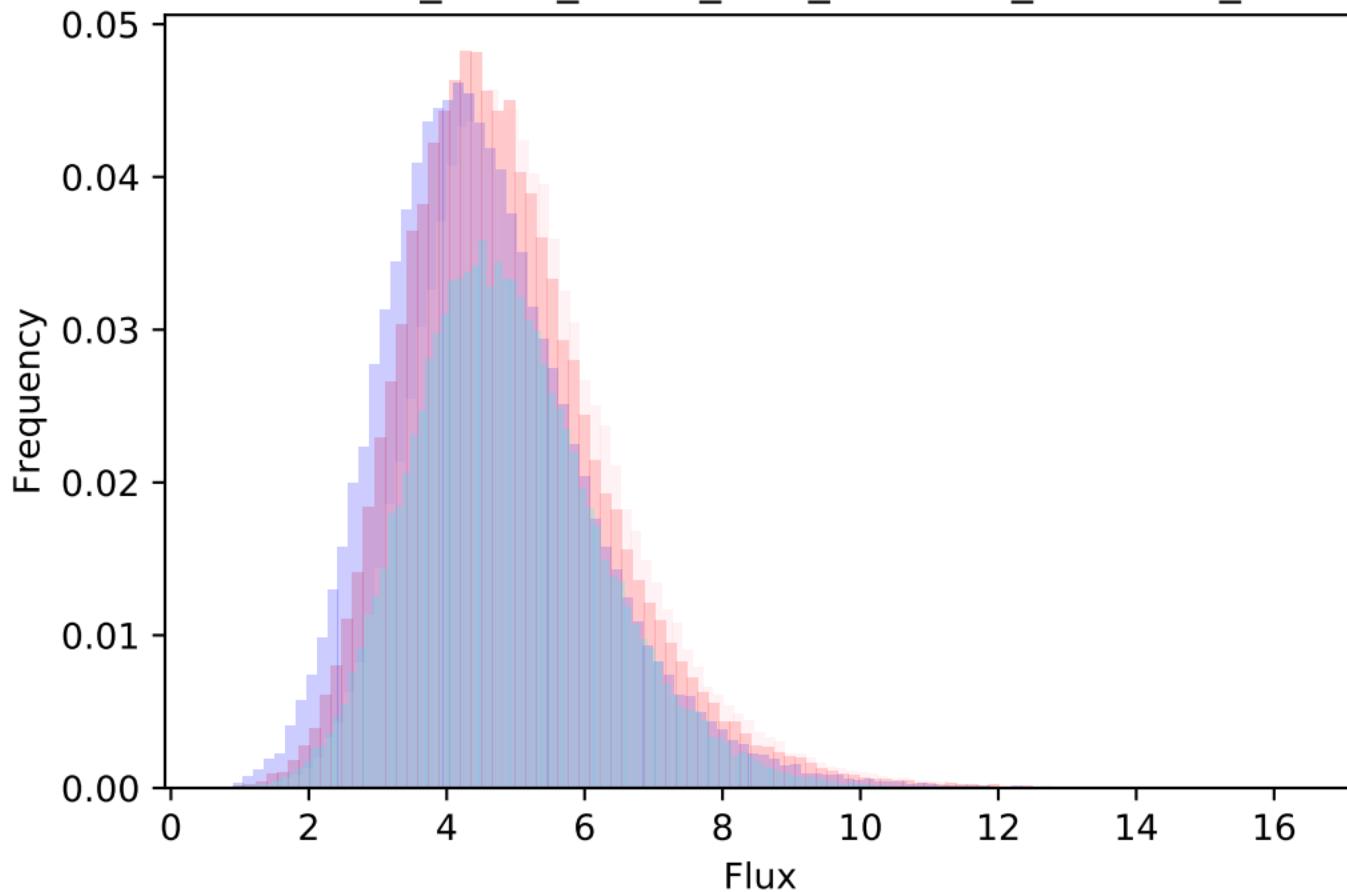


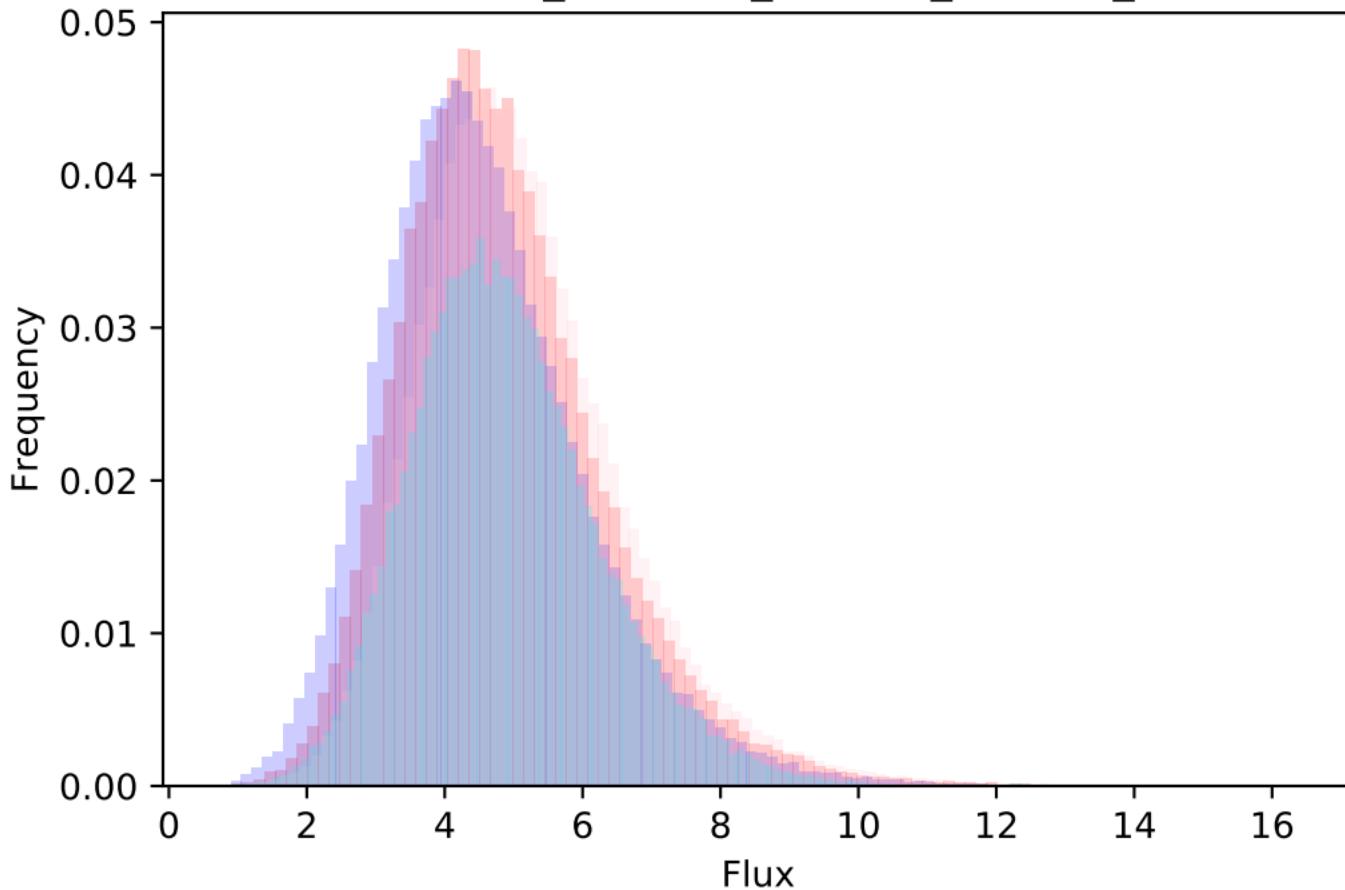




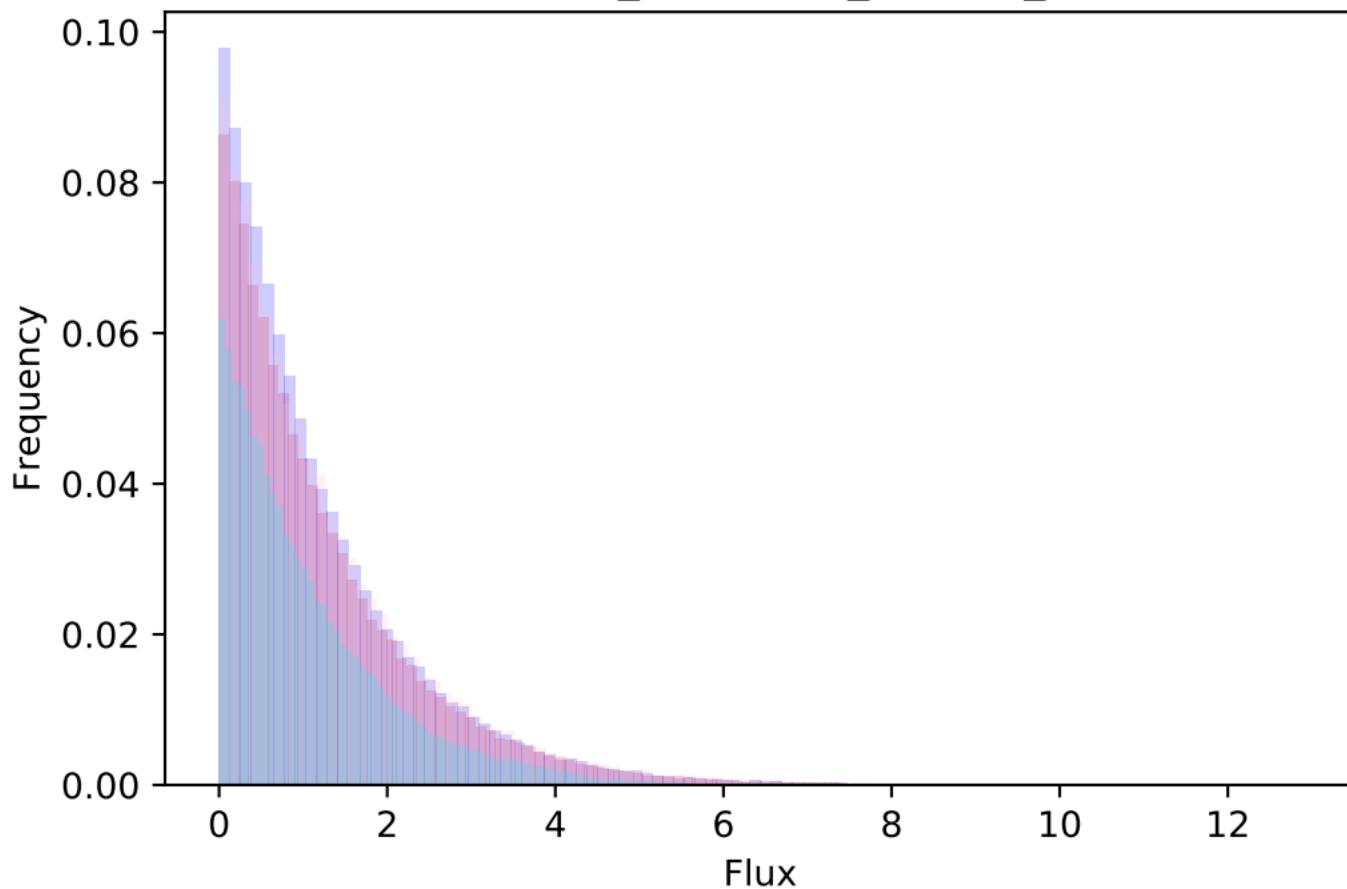


267:Glu_h + P_DASH_HPR_h --> KG_h + PSer_h

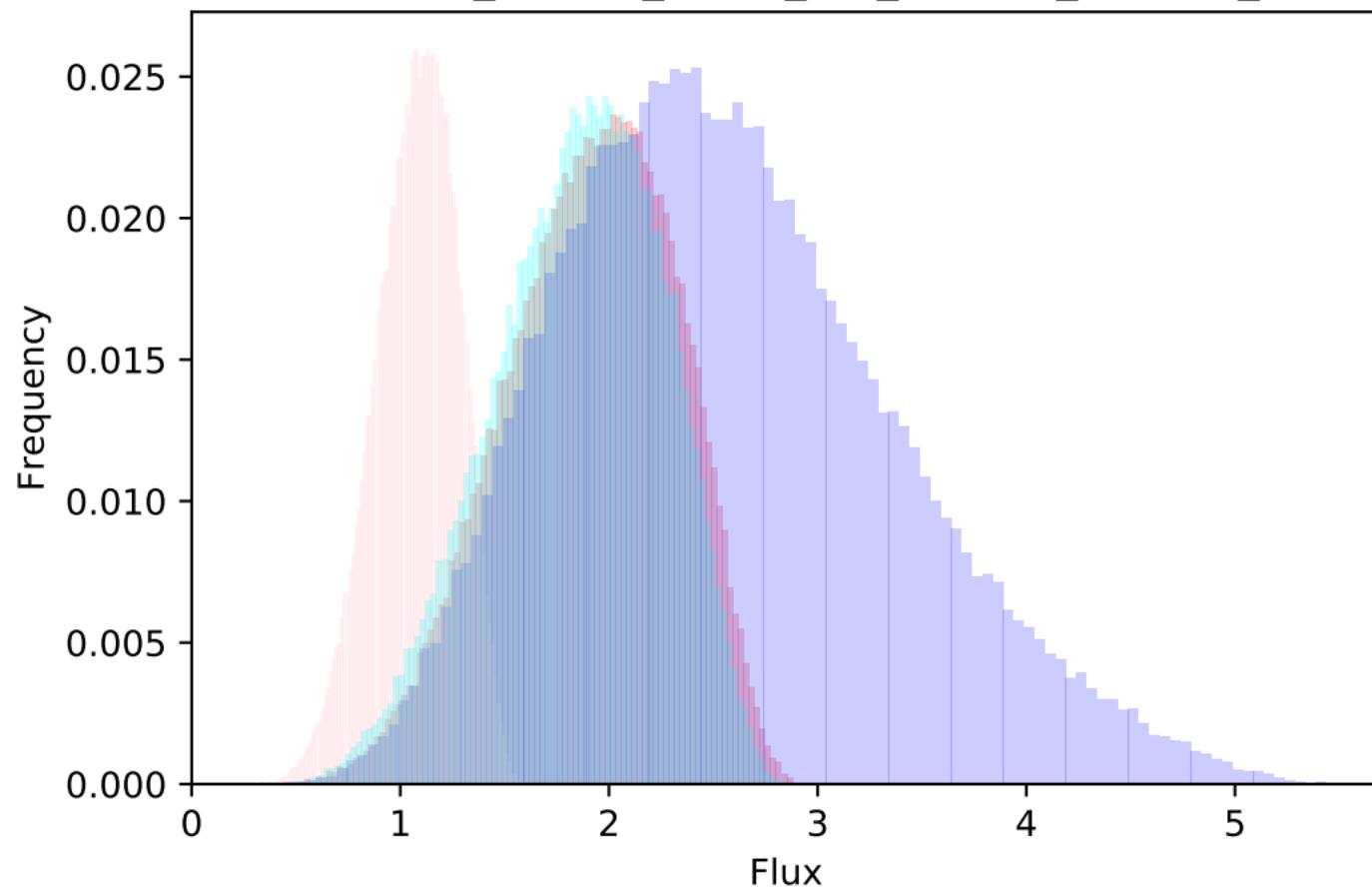




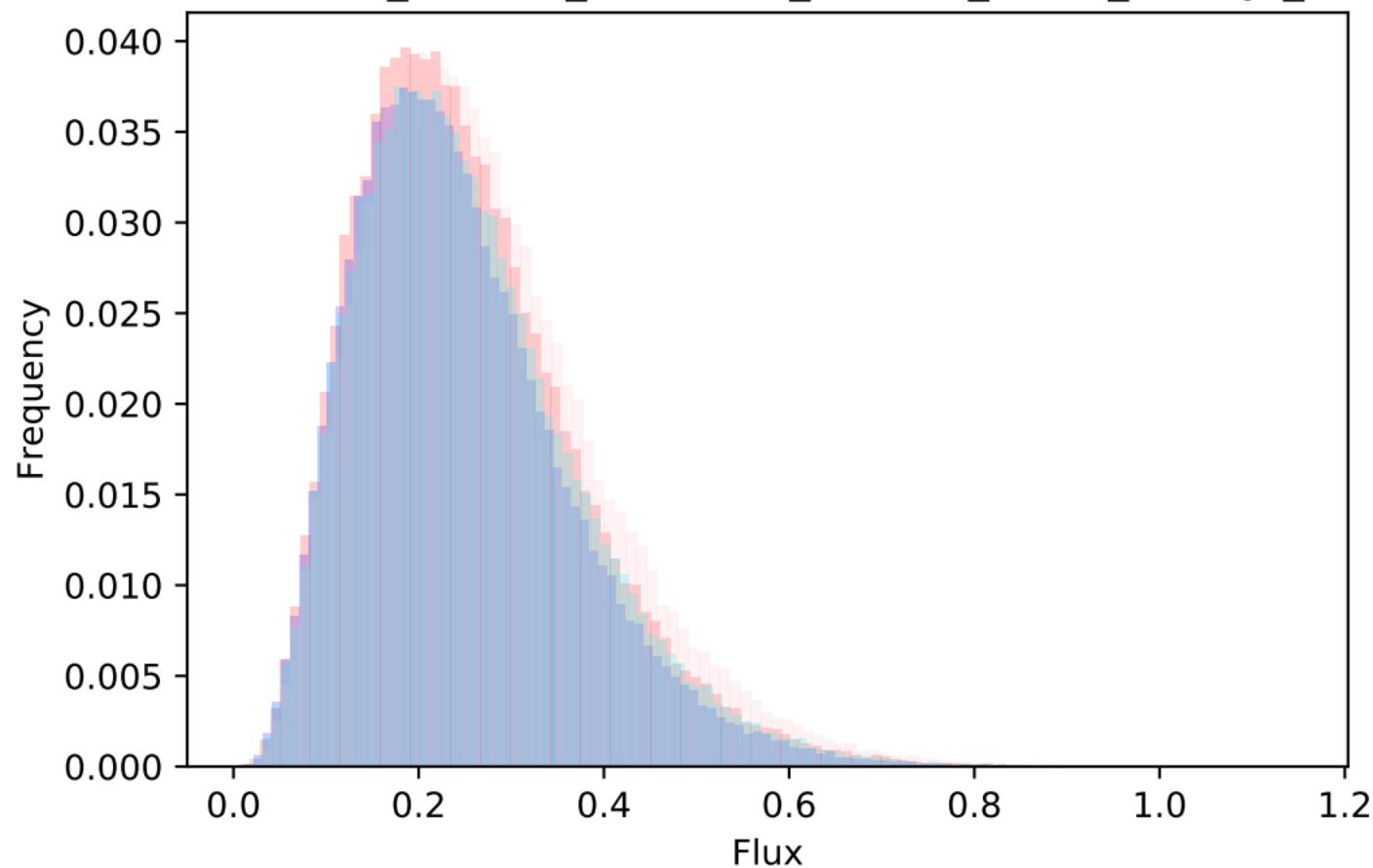
269:Ser_c --> NH4_c + Pyr_c



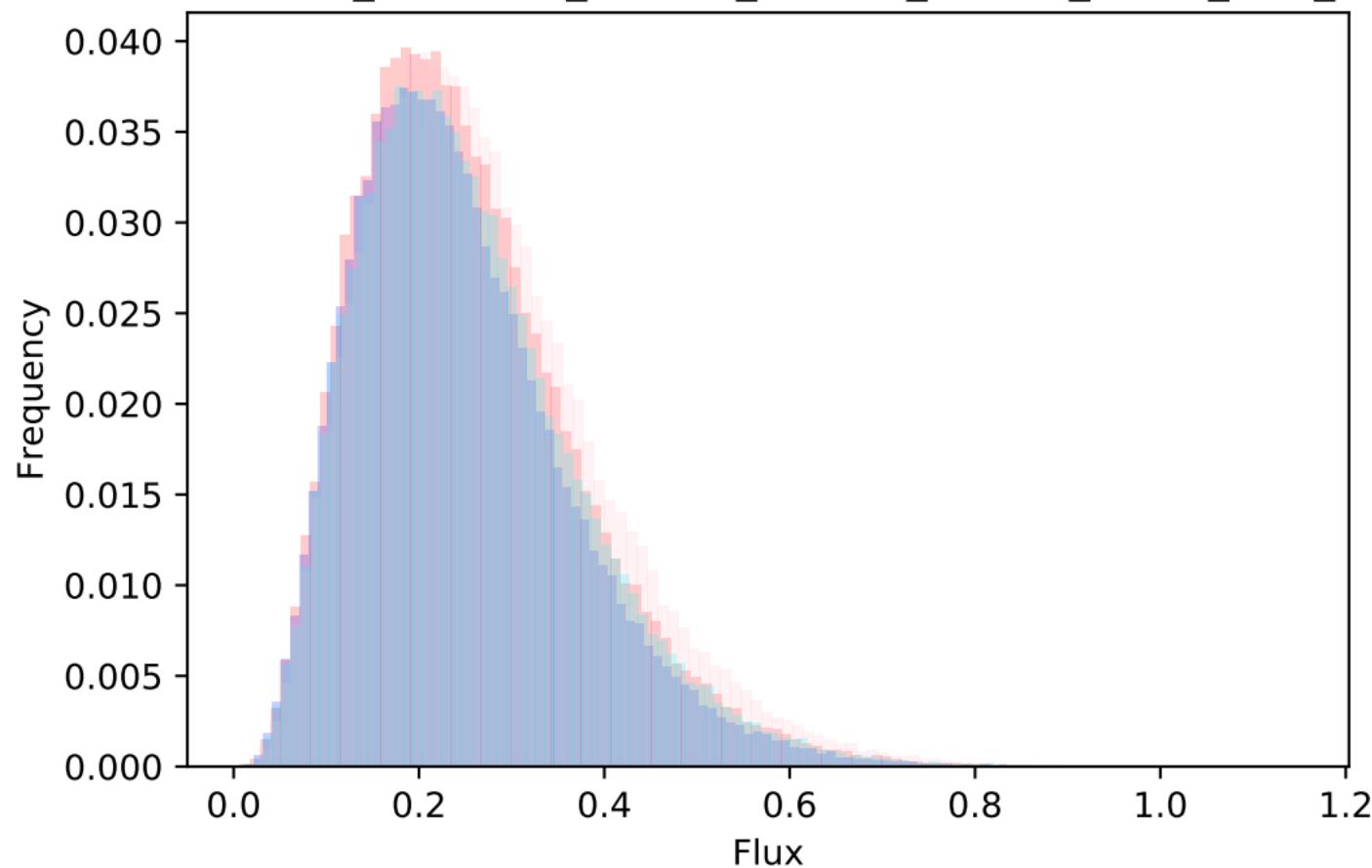
270:H2O_h + PH_DASH_Ser_h --> Pi_h + Thr_h



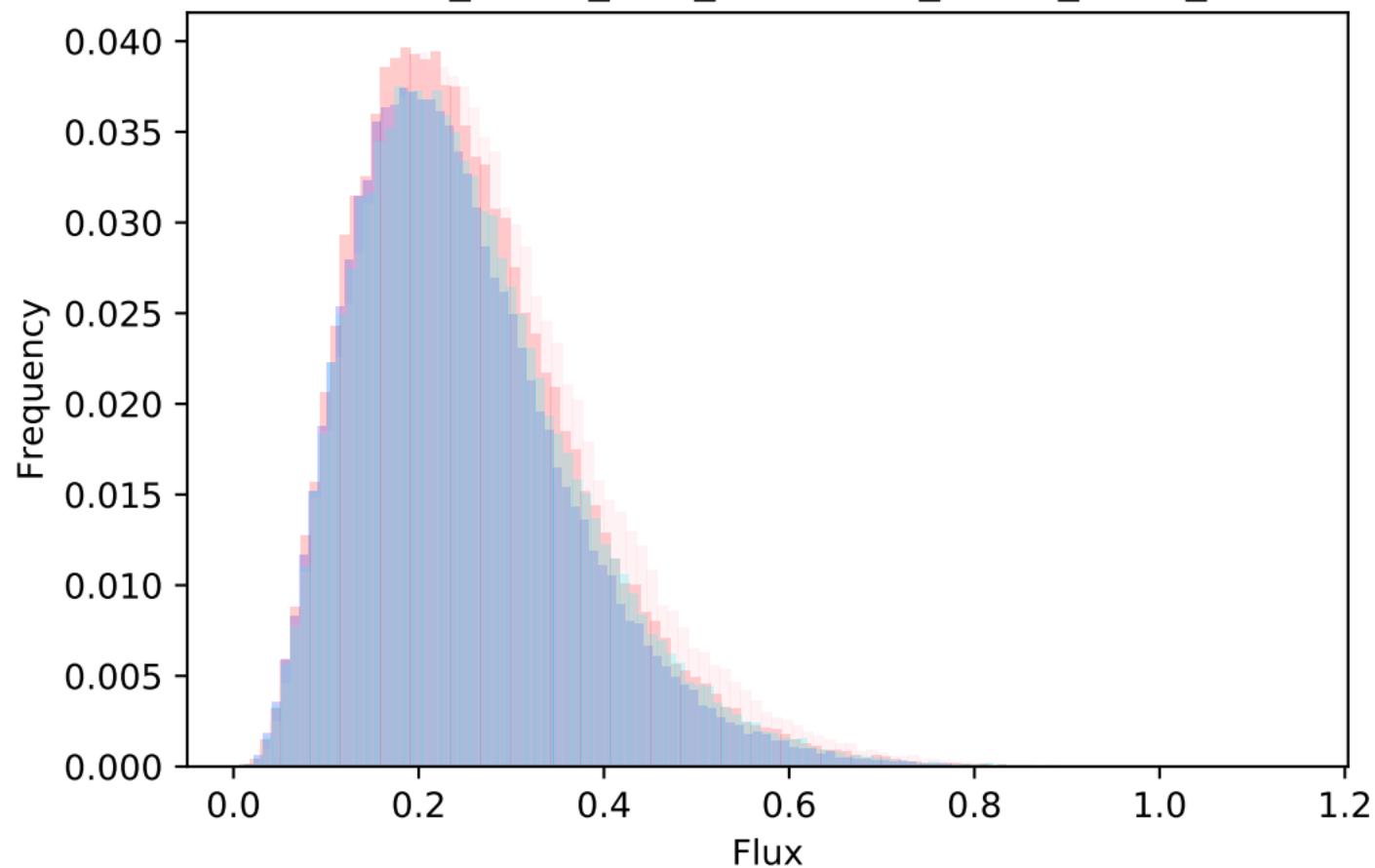
271:CHR_h + Gln_h --> ANT_h + Glu_h + H_h + Pyr_h



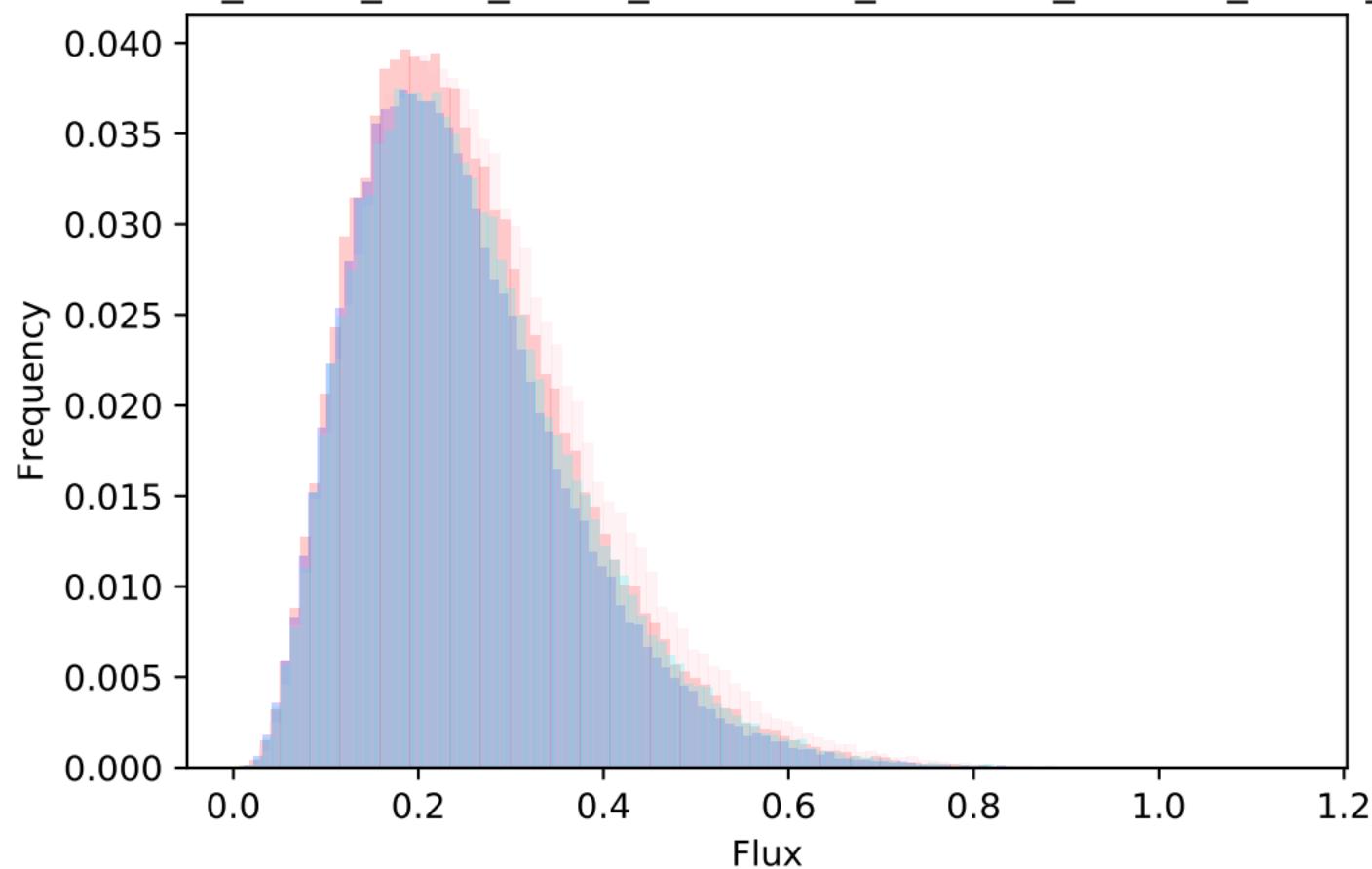
$272:\text{ANT_h} + \text{PRPP_h} \rightarrow \text{H_h} + \text{PPi_h} + \text{PR_DASH_ANT_h}$



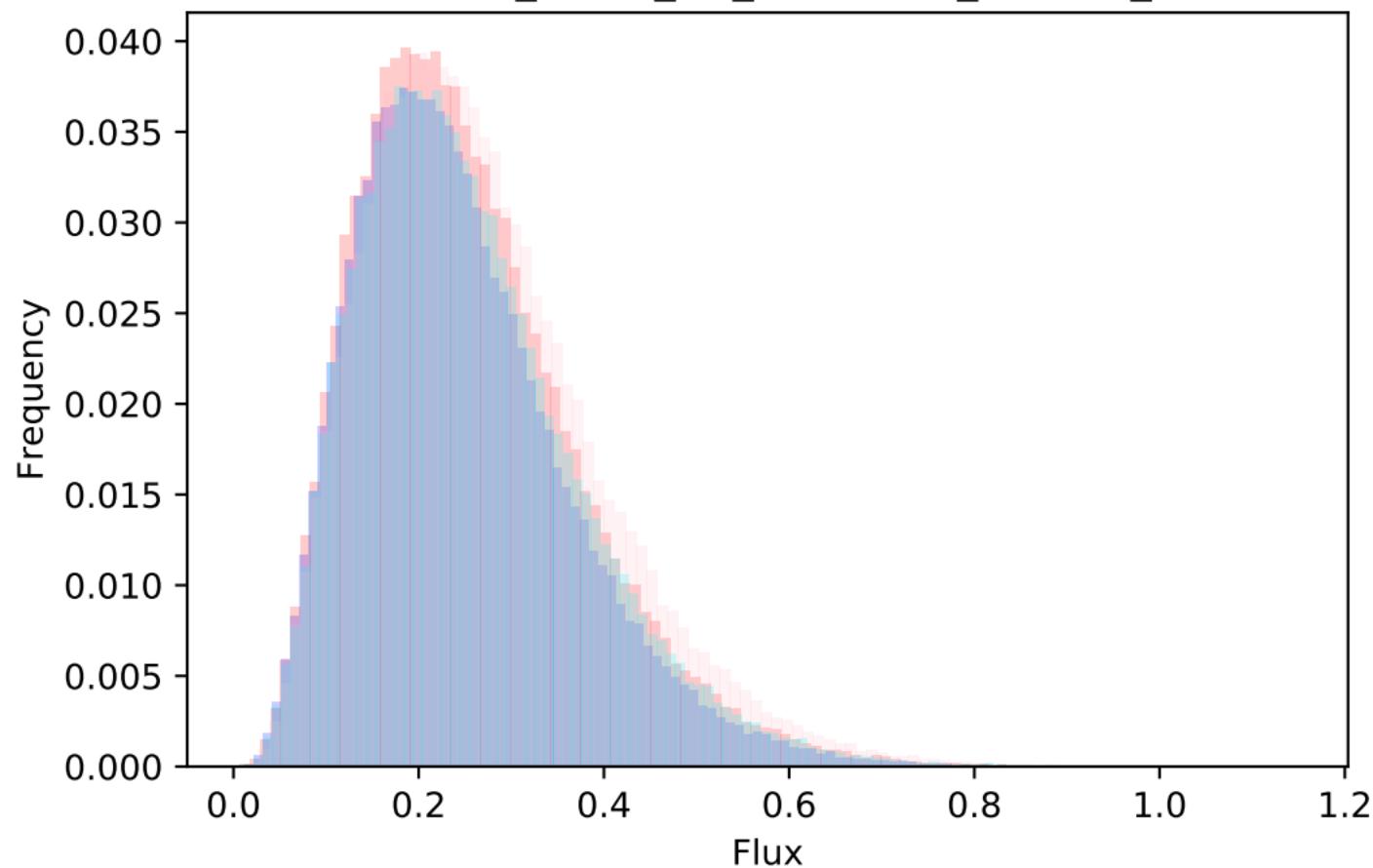
273:PR_DASH_ANT_h --> CPD_DASH_Ru5P_h



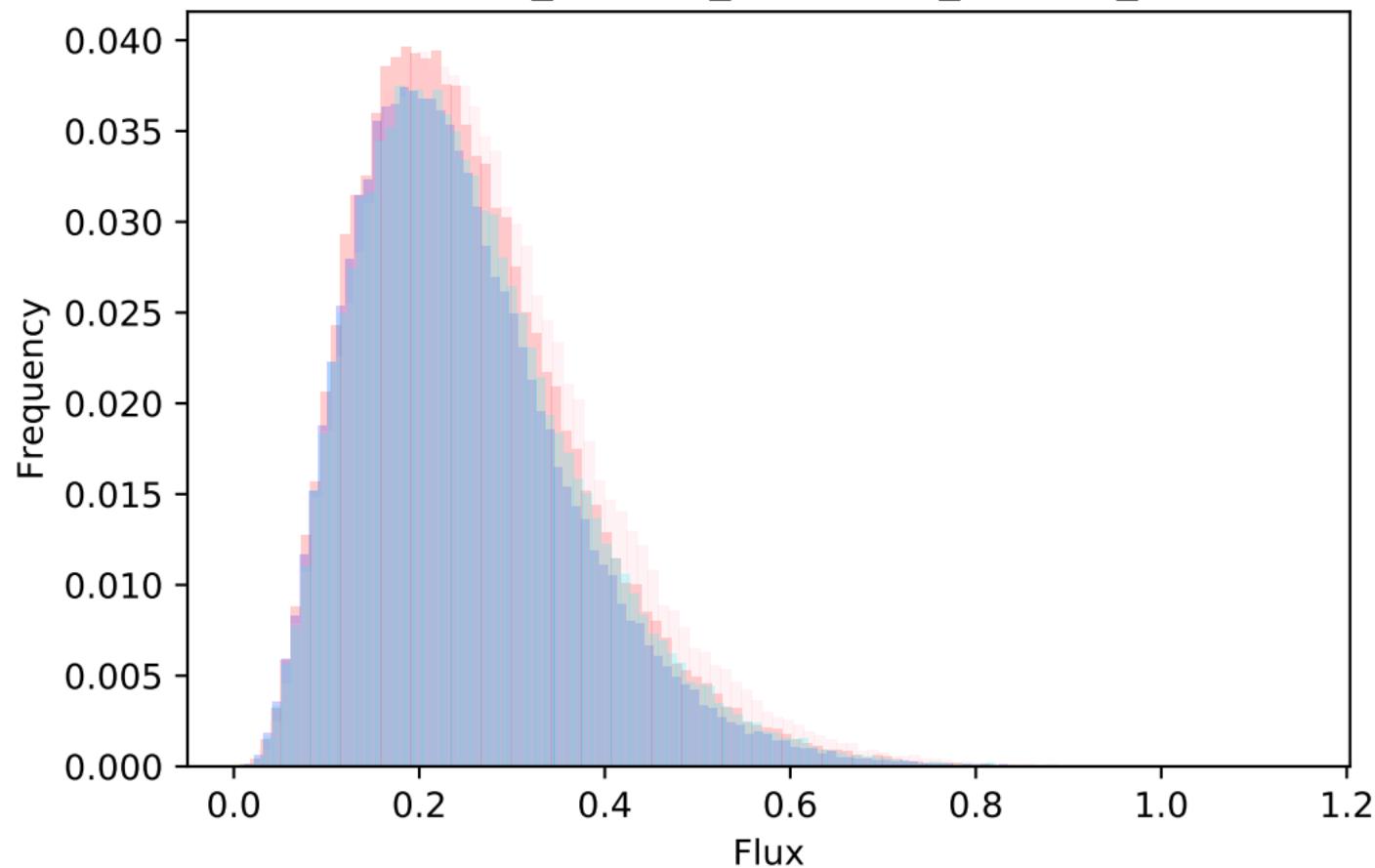
274:CPD_DASH_Ru5P_h + H_h --> CO2_h + H2O_h + Ind_DASH_GP_h



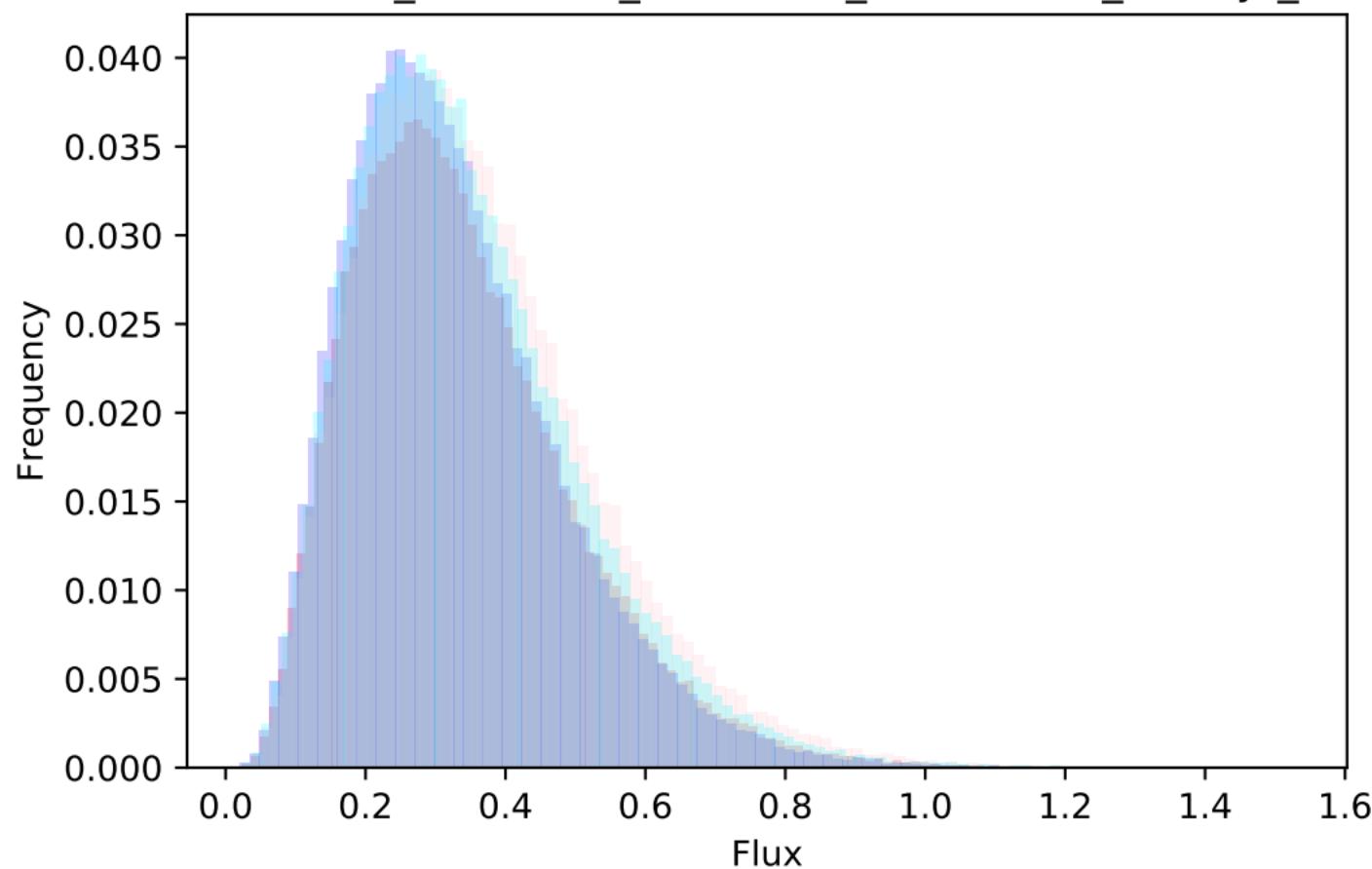
275:Ind_DASH_GP_h --> GAP_h + Ind_h



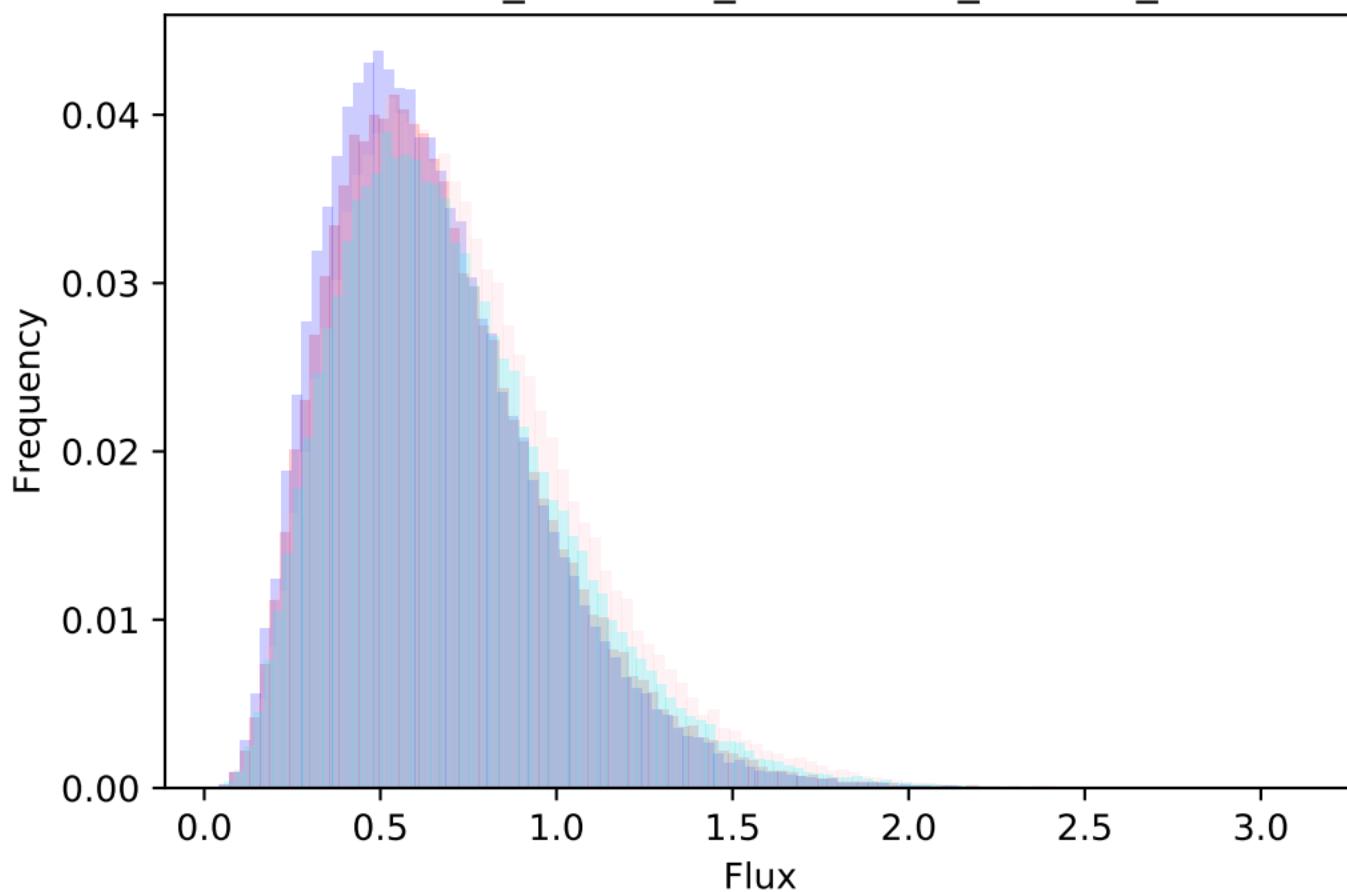
276:Ind_h + Ser_h --> H2O_h + Trp_h

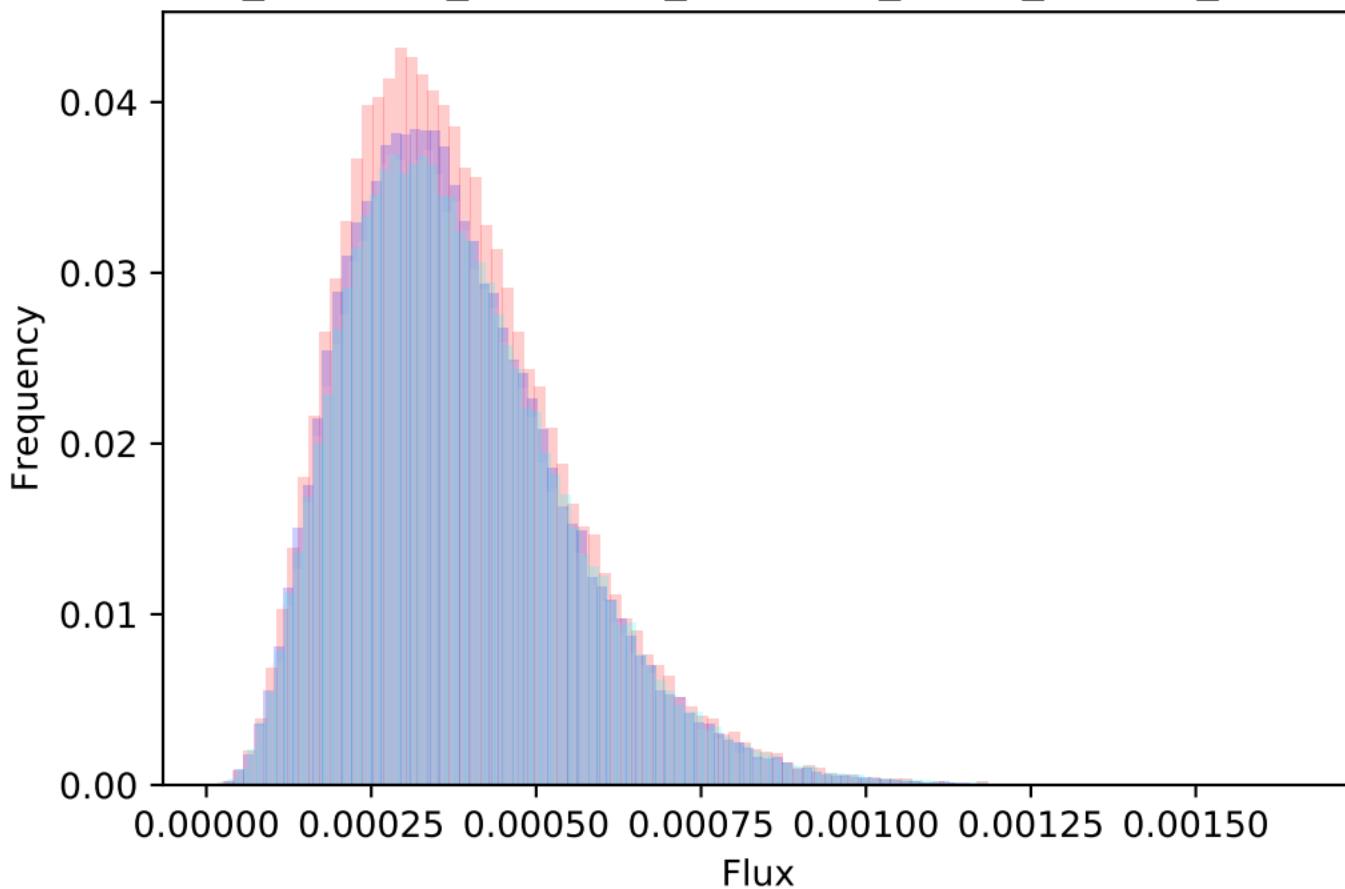
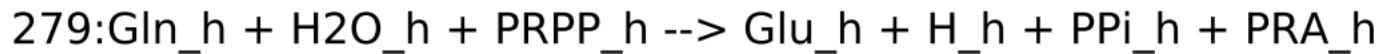


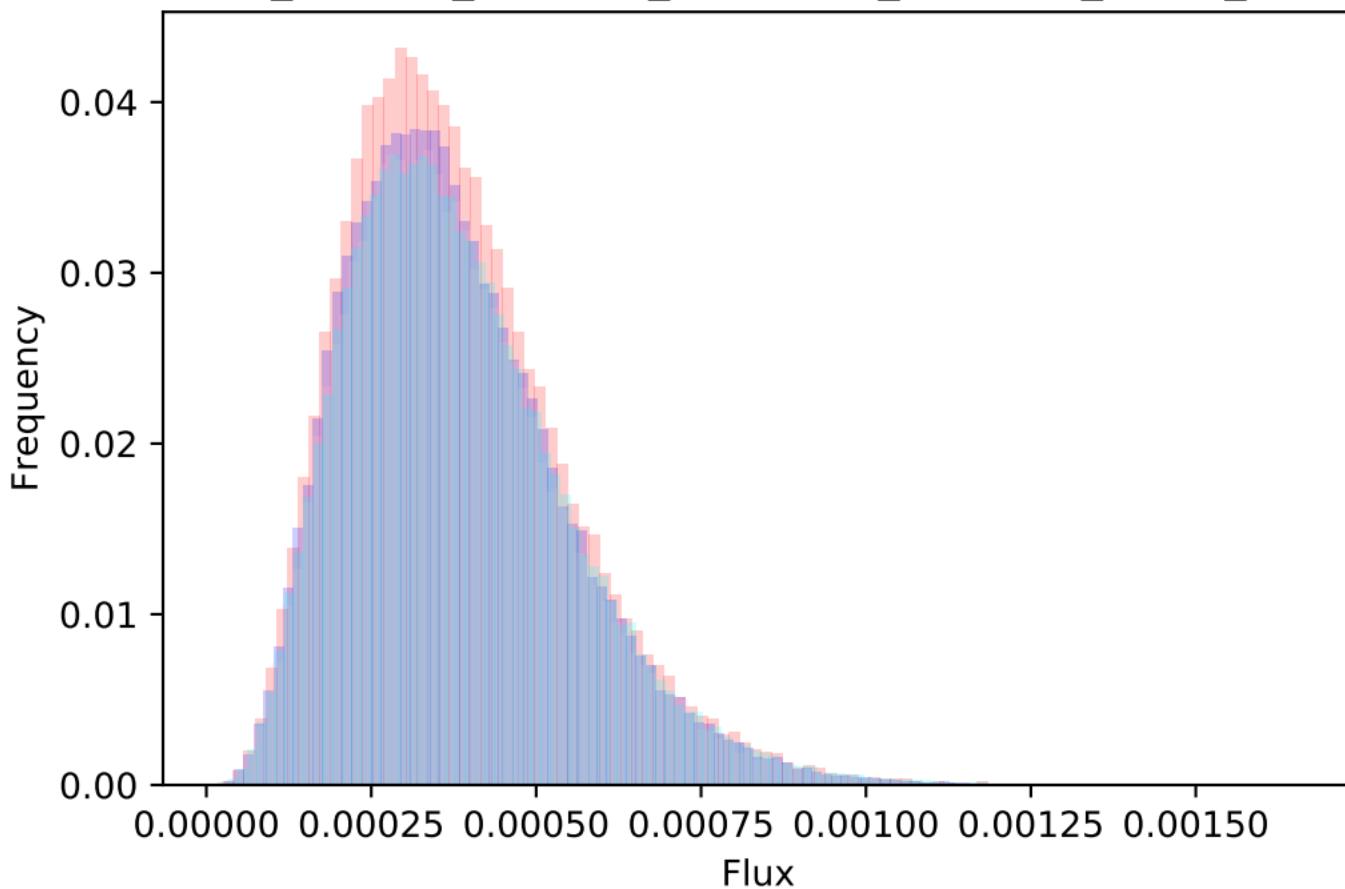
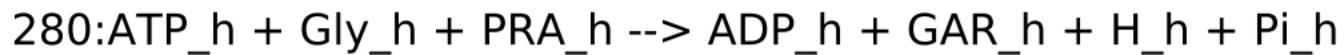
277:AGN_h + NADP_h --> CO2_h + NADPH_h + Tyr_h



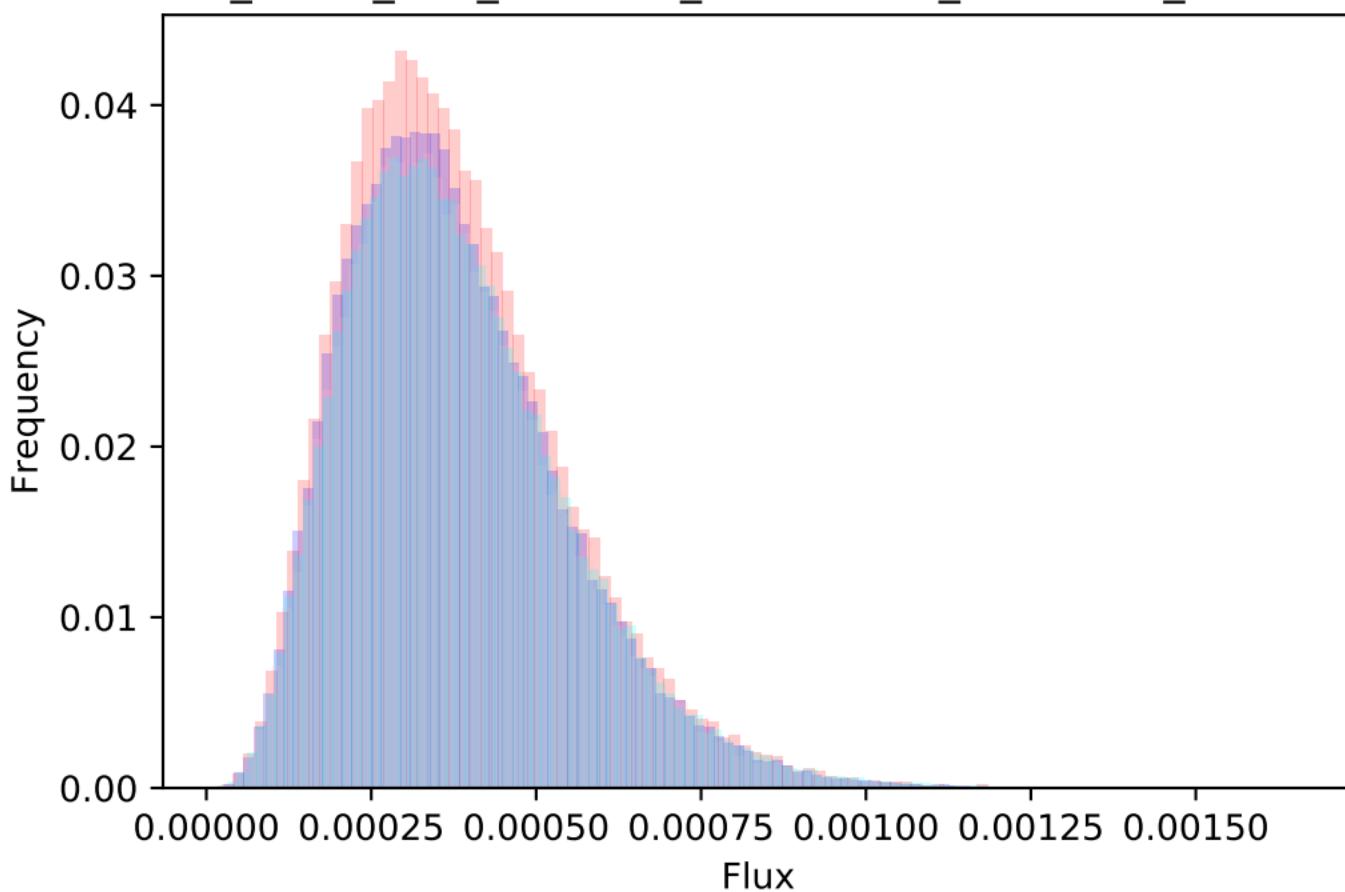
278:Glu_h + MOB_h <=> KG_h + Val_h

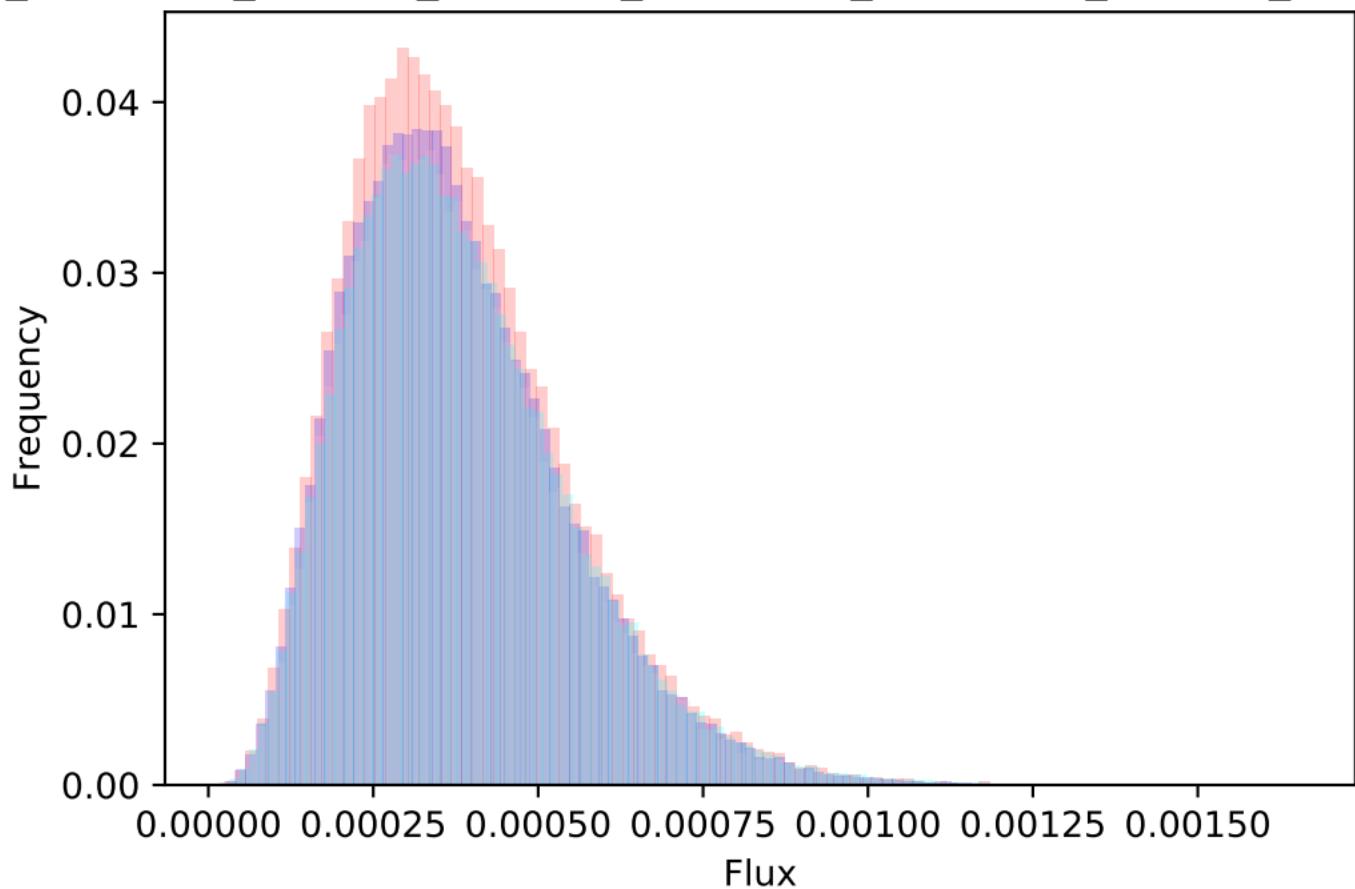
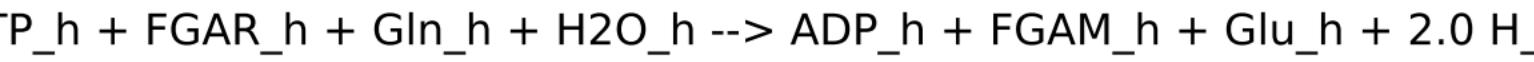




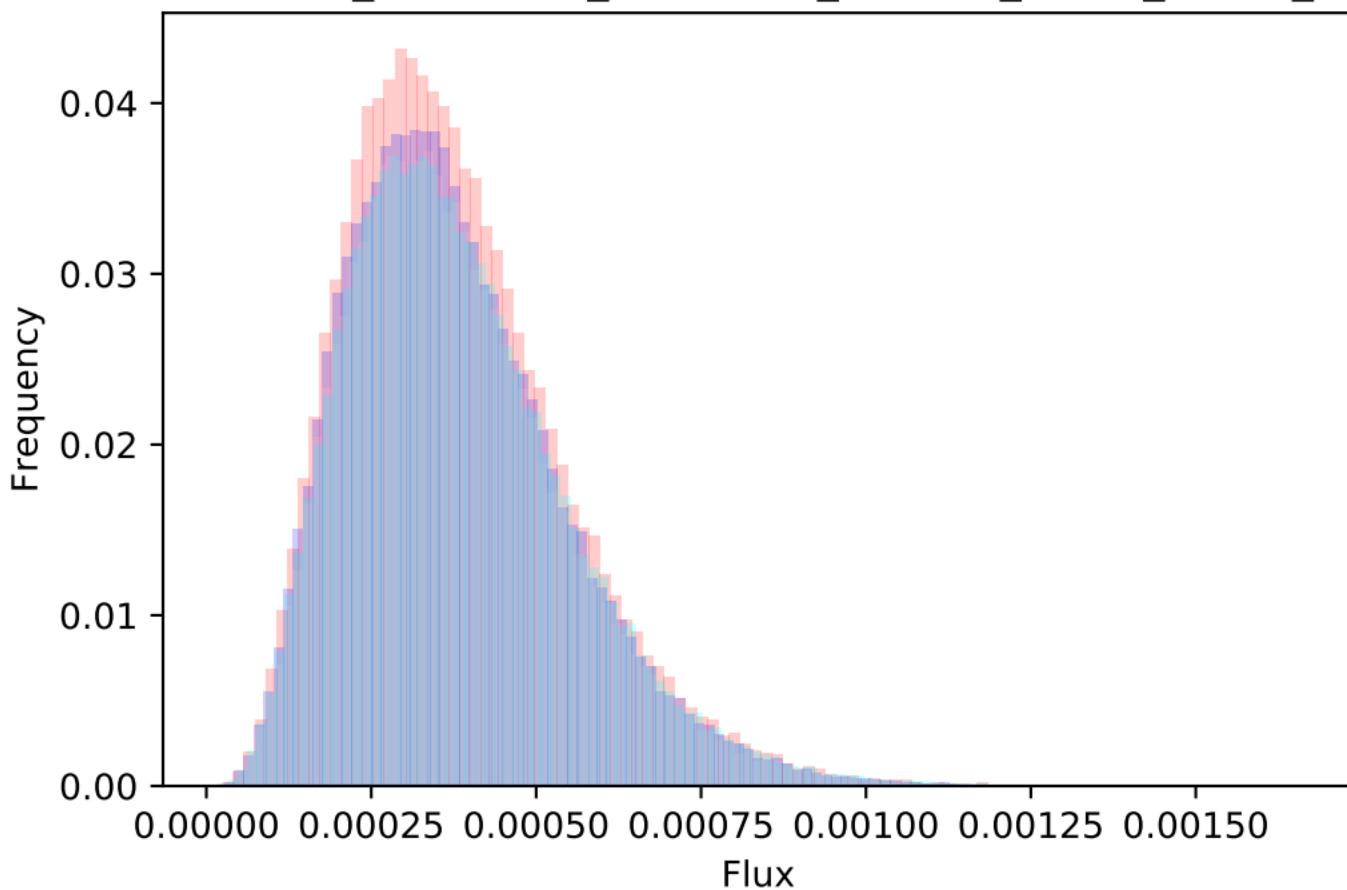


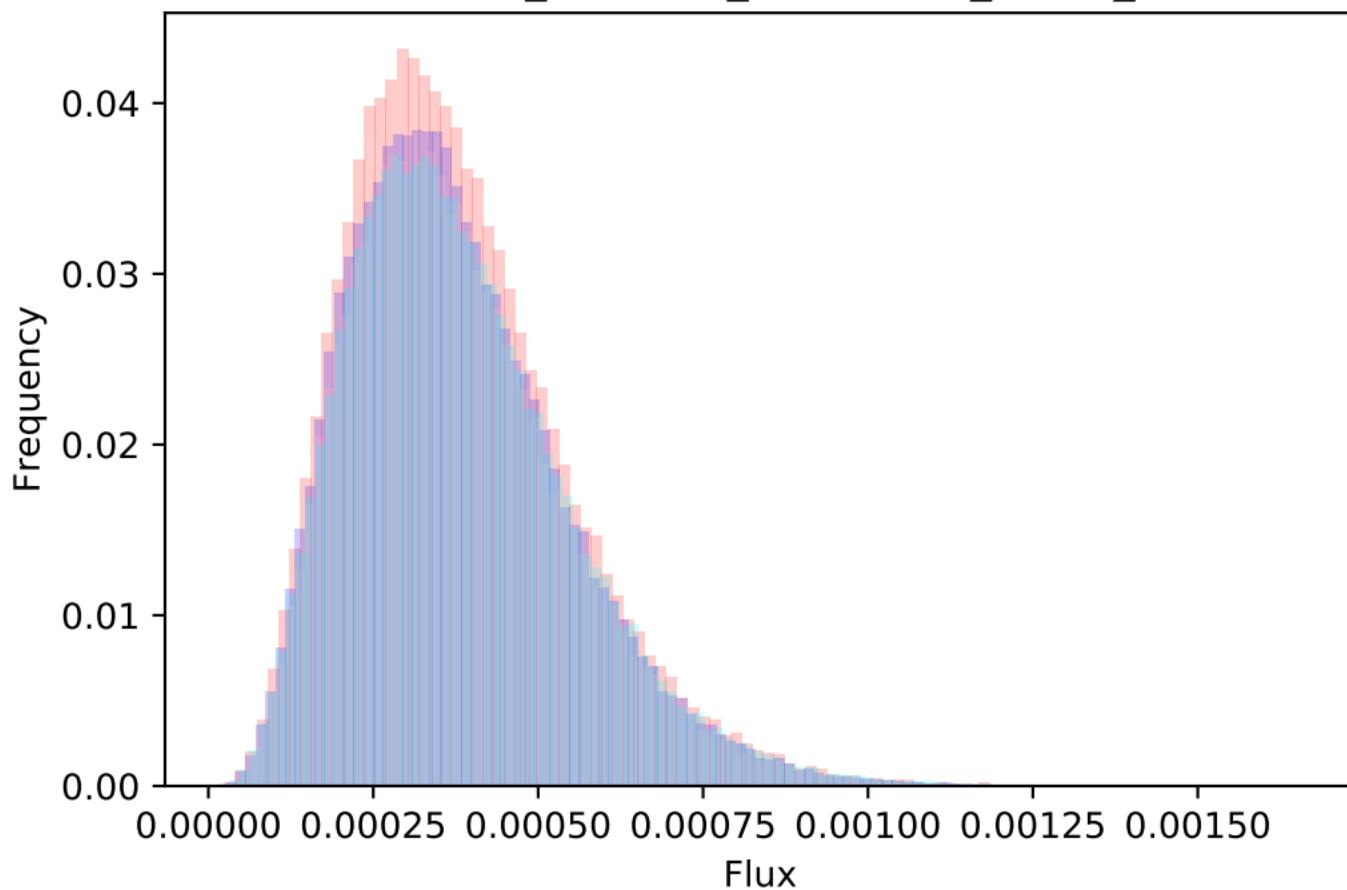
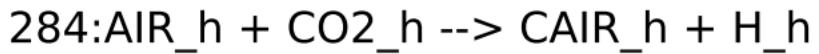
281:F_DASH_THF_h + GAR_h --> FGAR_h + 2.0 H_h + THF_h

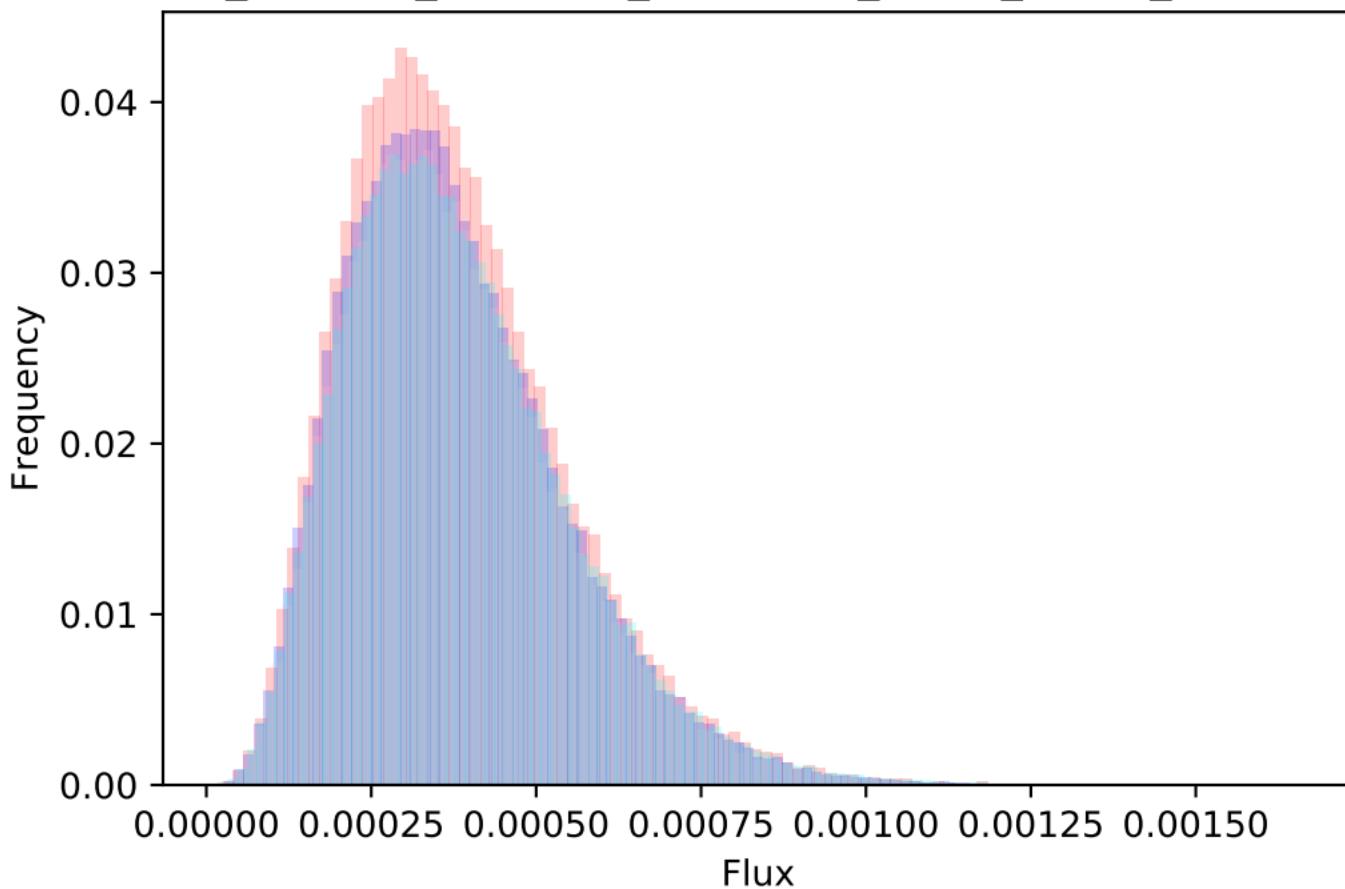
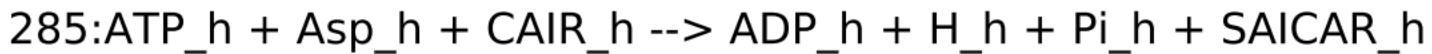




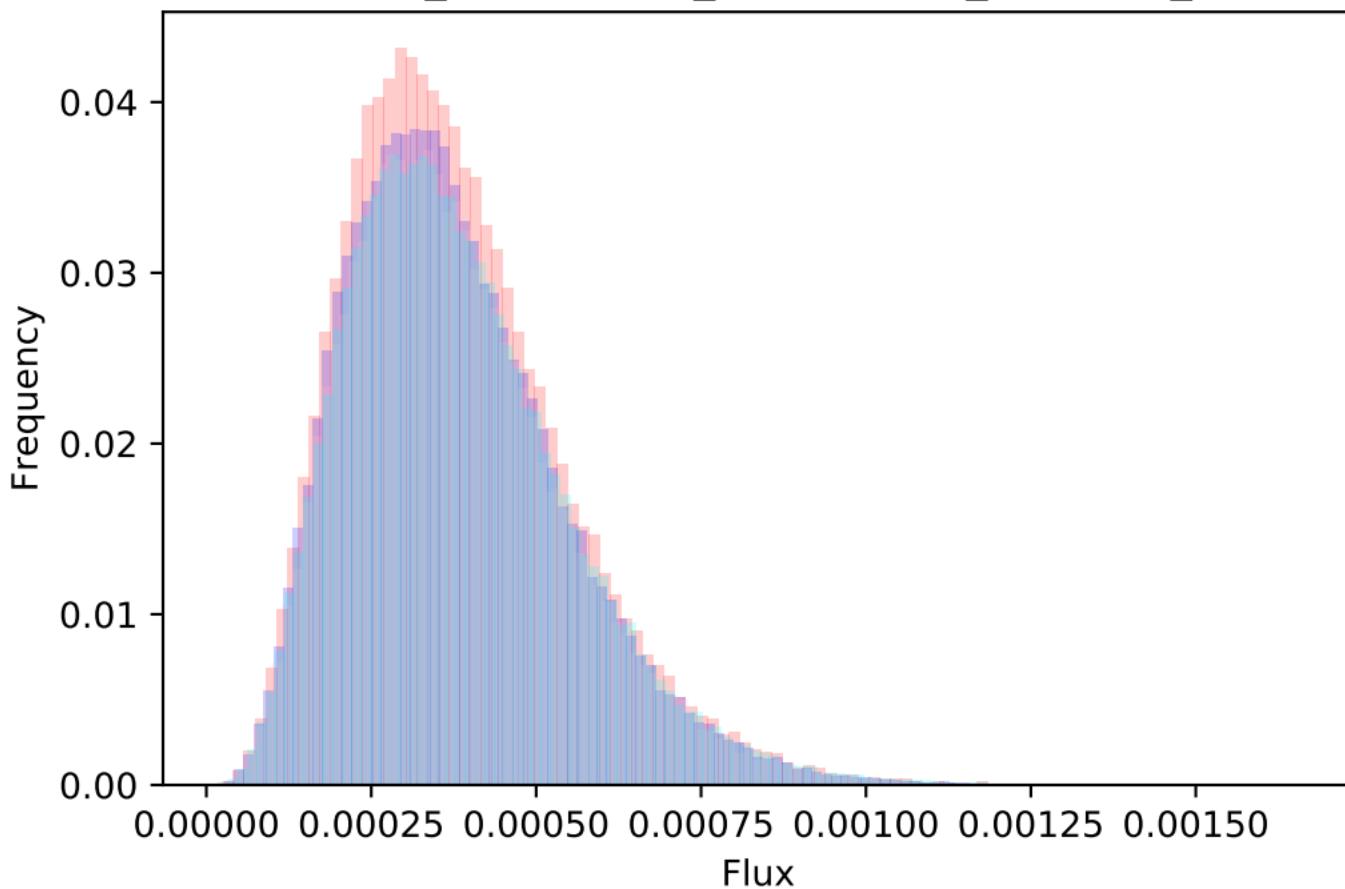
283:ATP_h + FGAM_h --> ADP_h + AIR_h + H_h + Pi_h

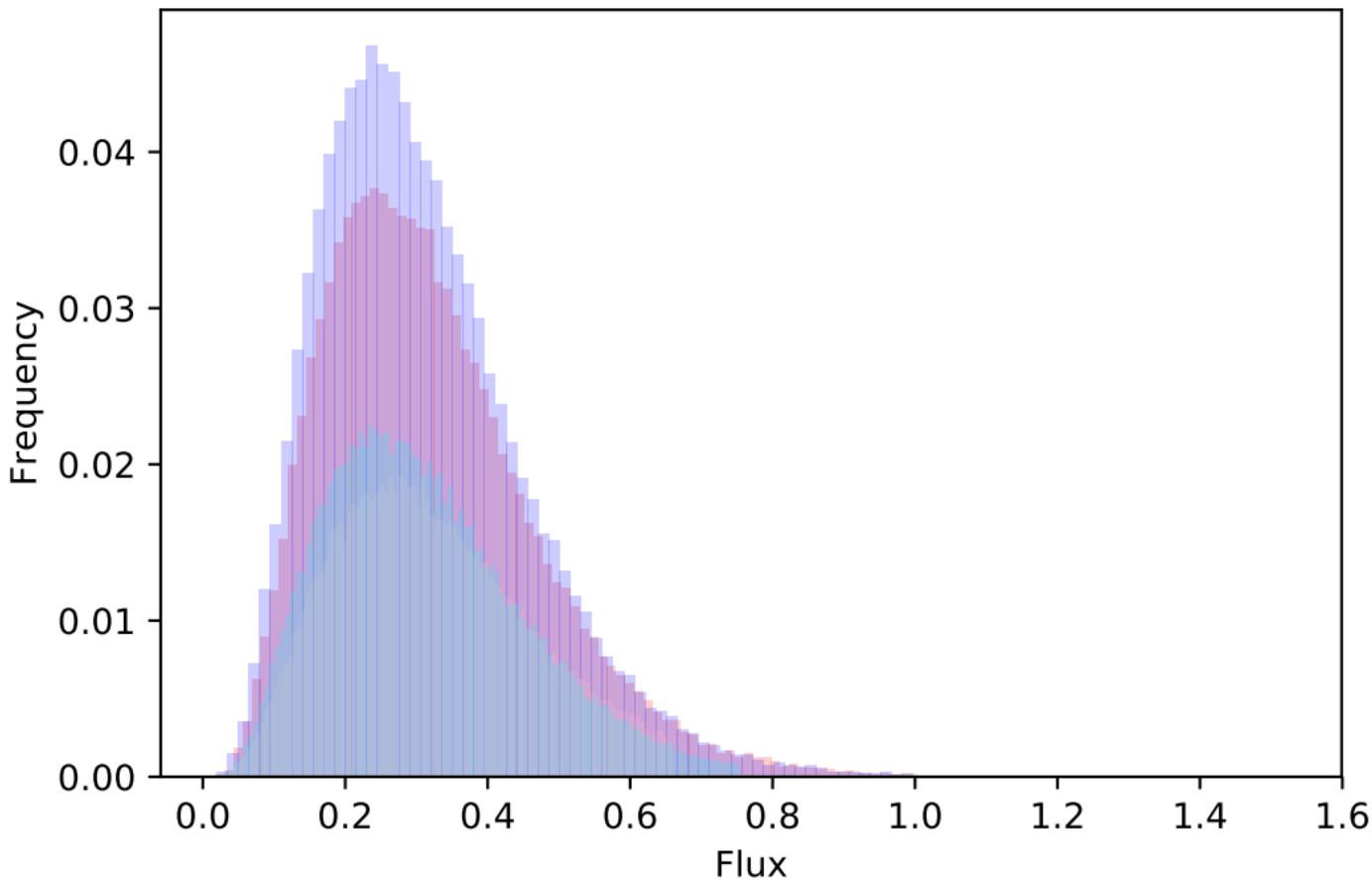
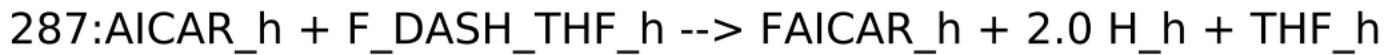




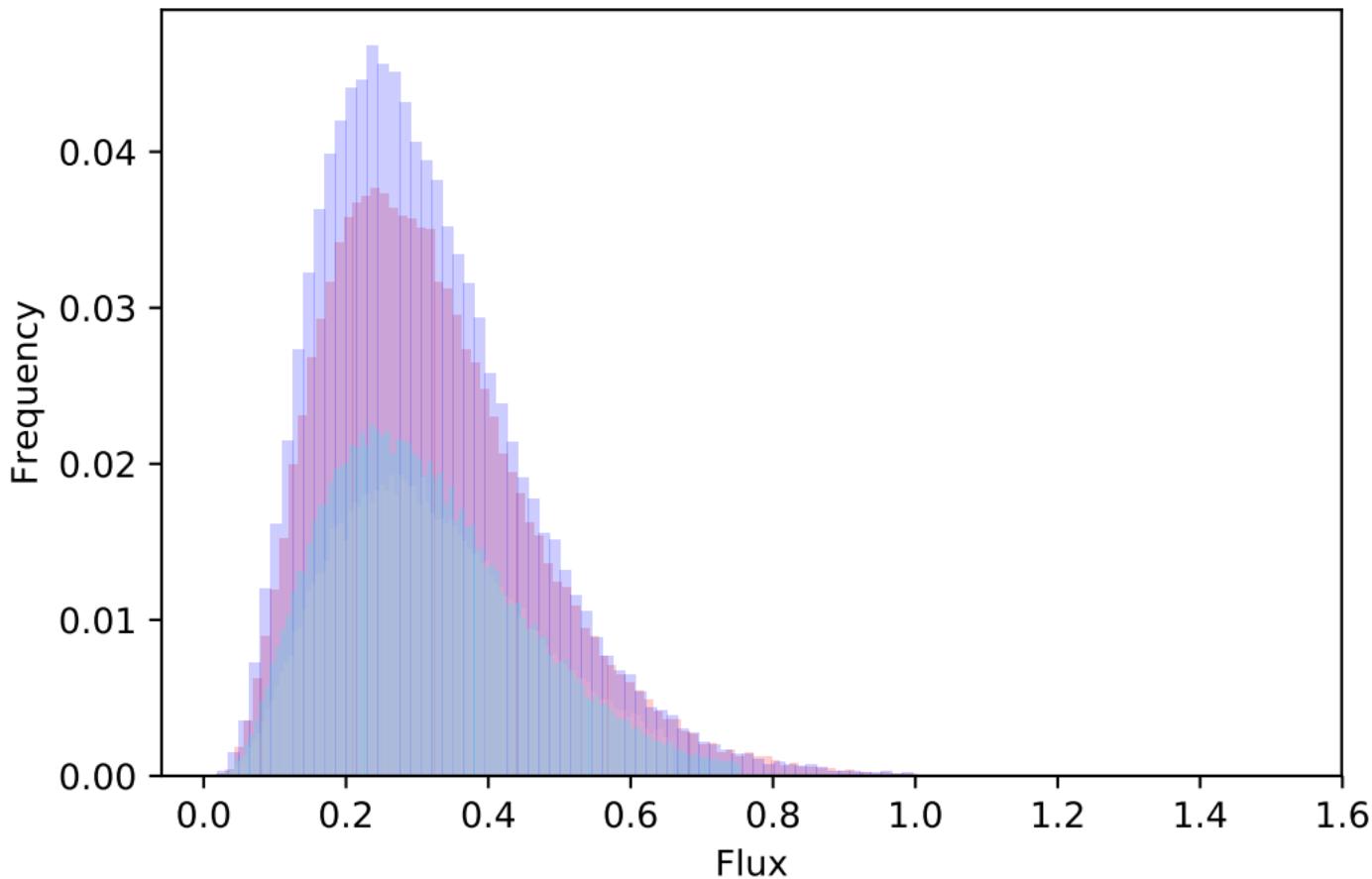


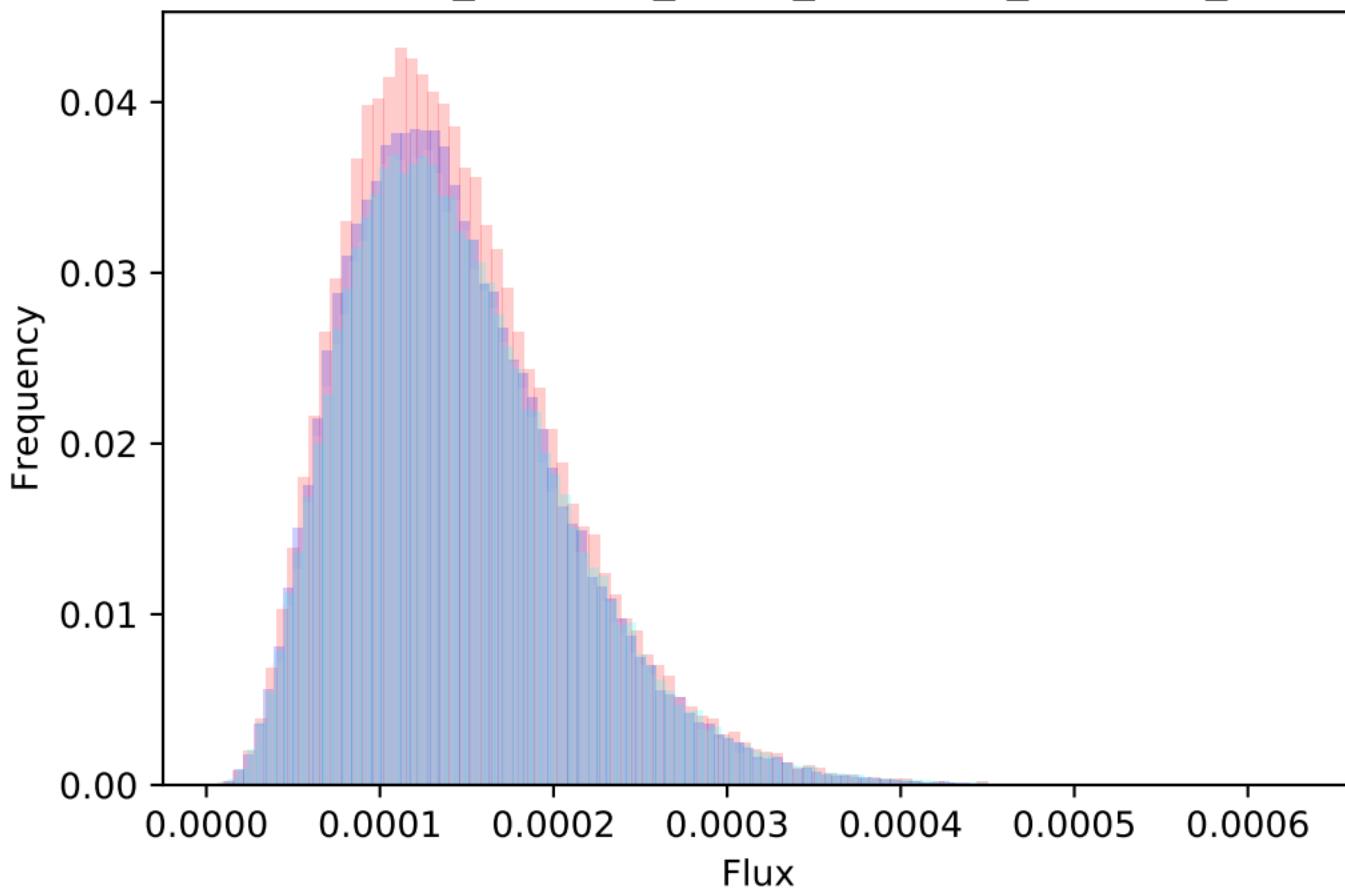
286:H_h + SAICAR_h --> AICAR_h + Fum_h

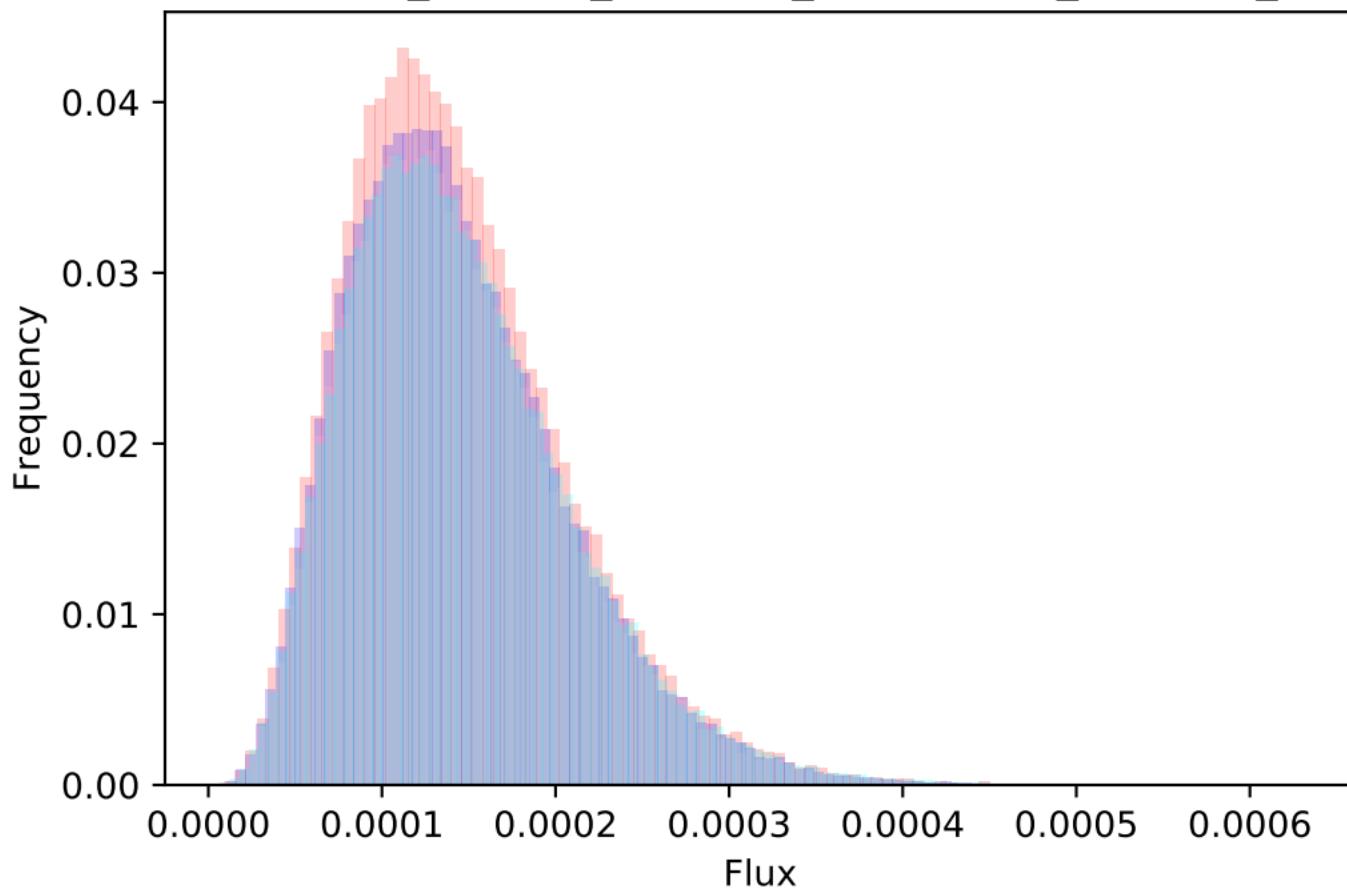




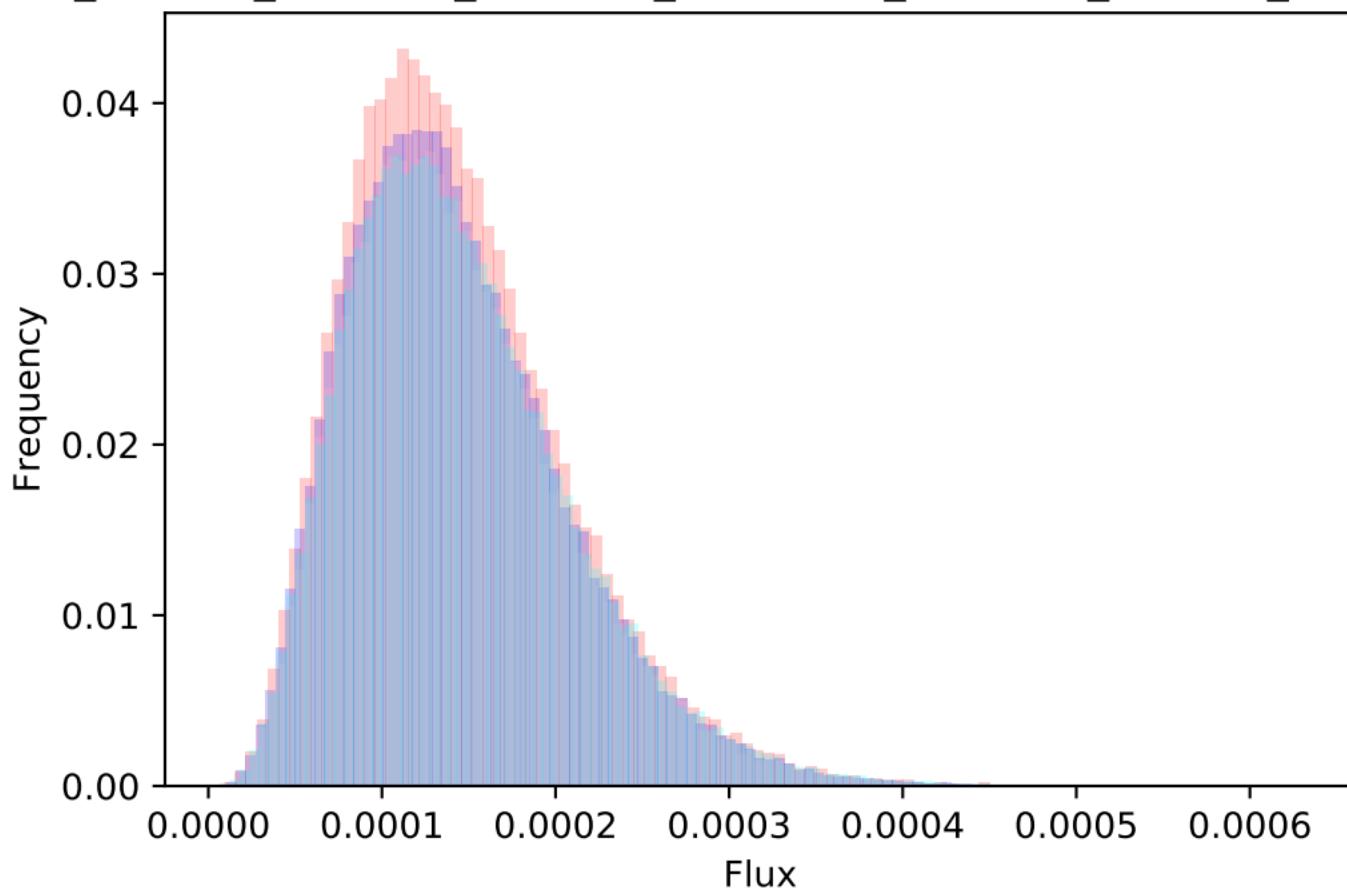
288:FAICAR_h --> H2O_h + IMP_h

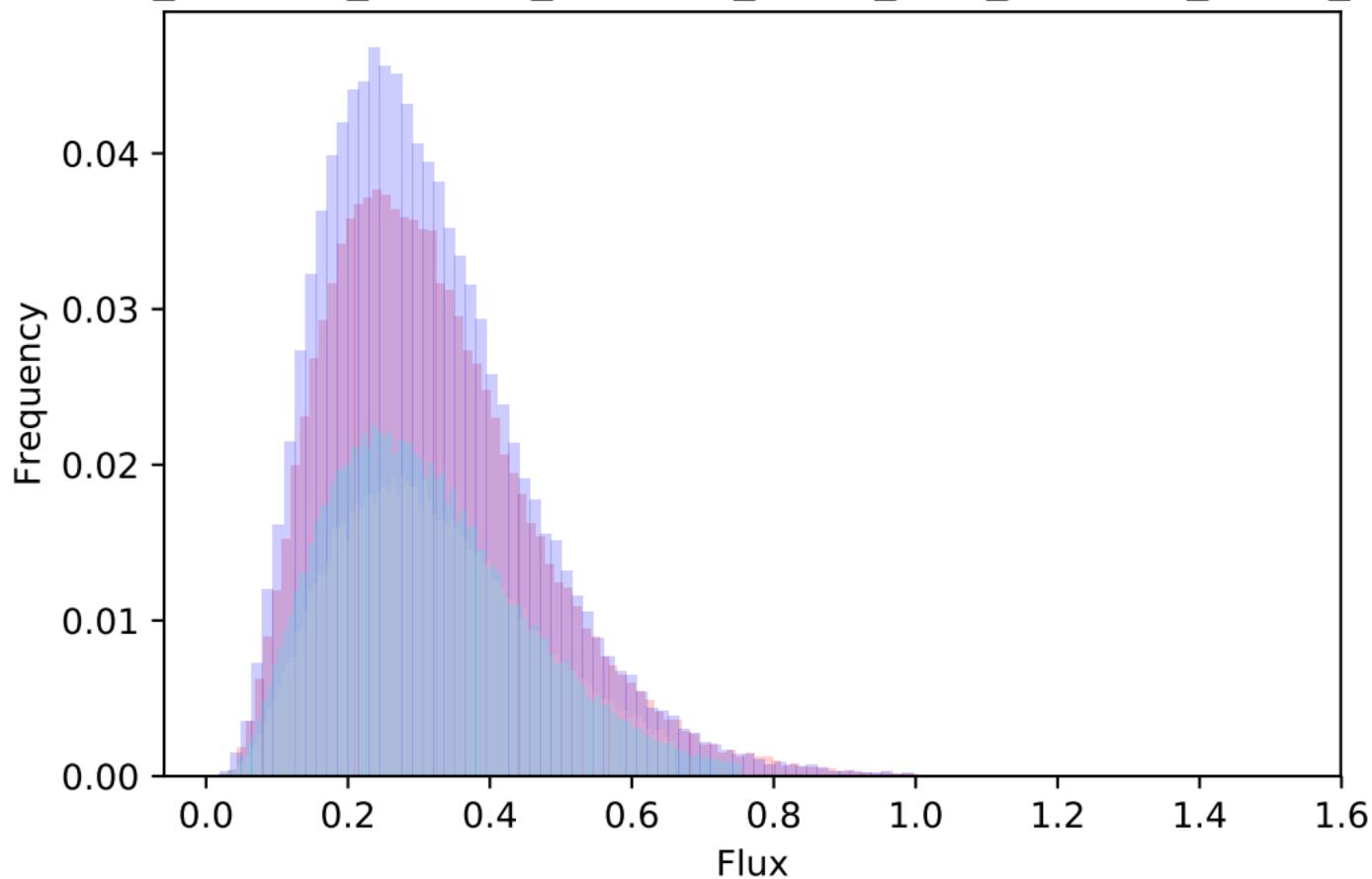




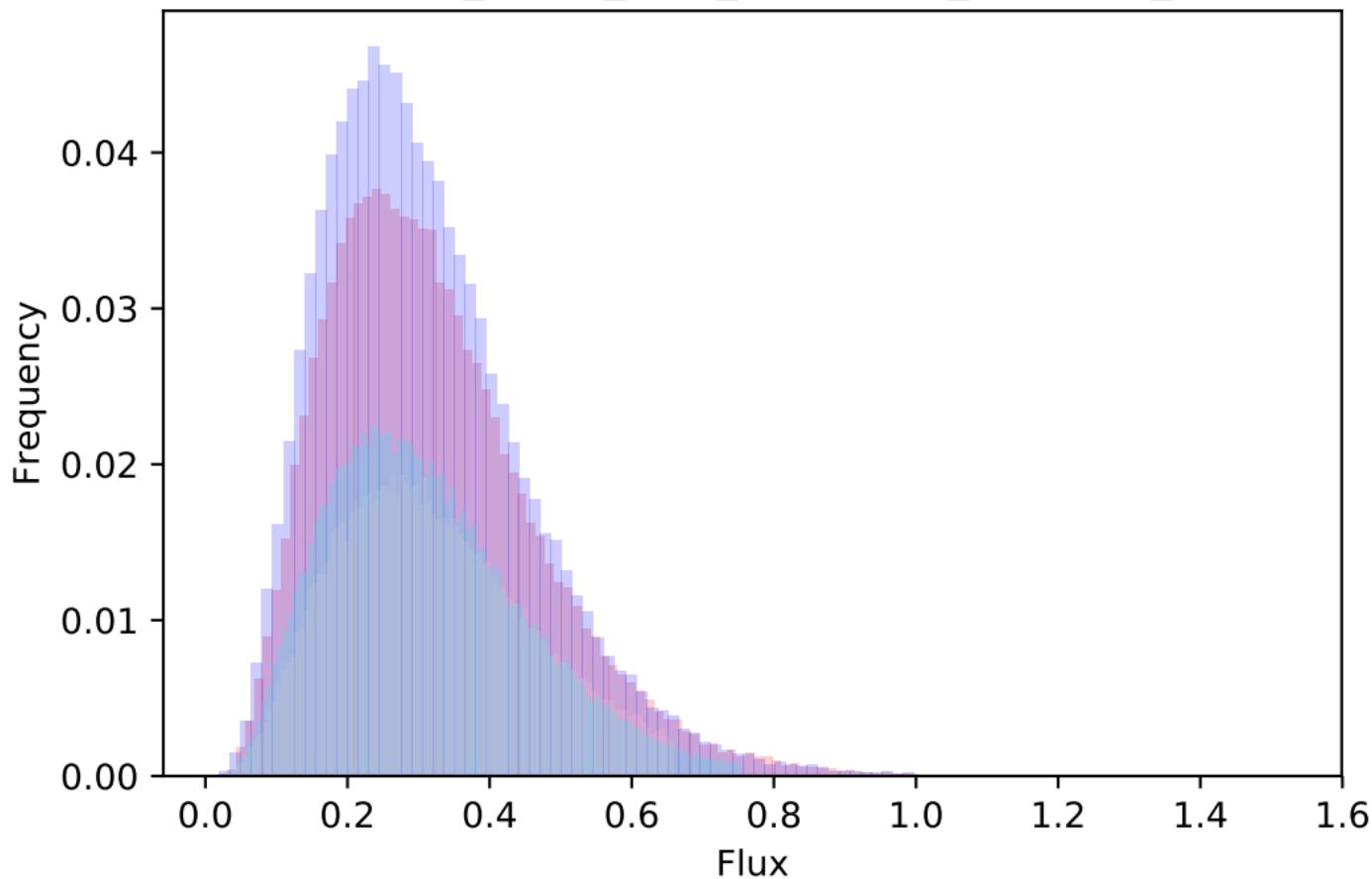


::ATP_c + Gln_c + H2O_c + XMP_c --> AMP_c + GMP_c + Glu_c + H_c +

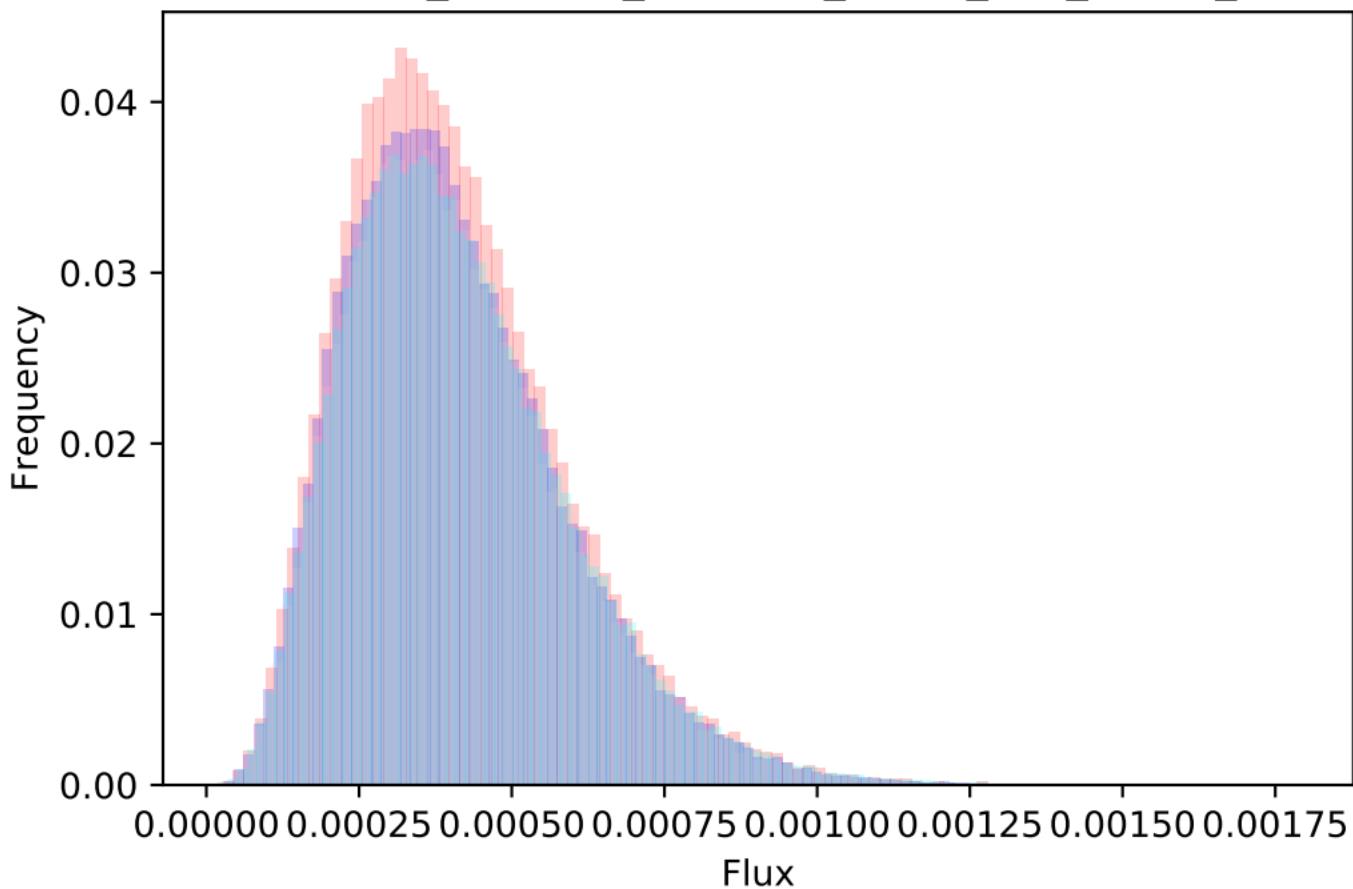




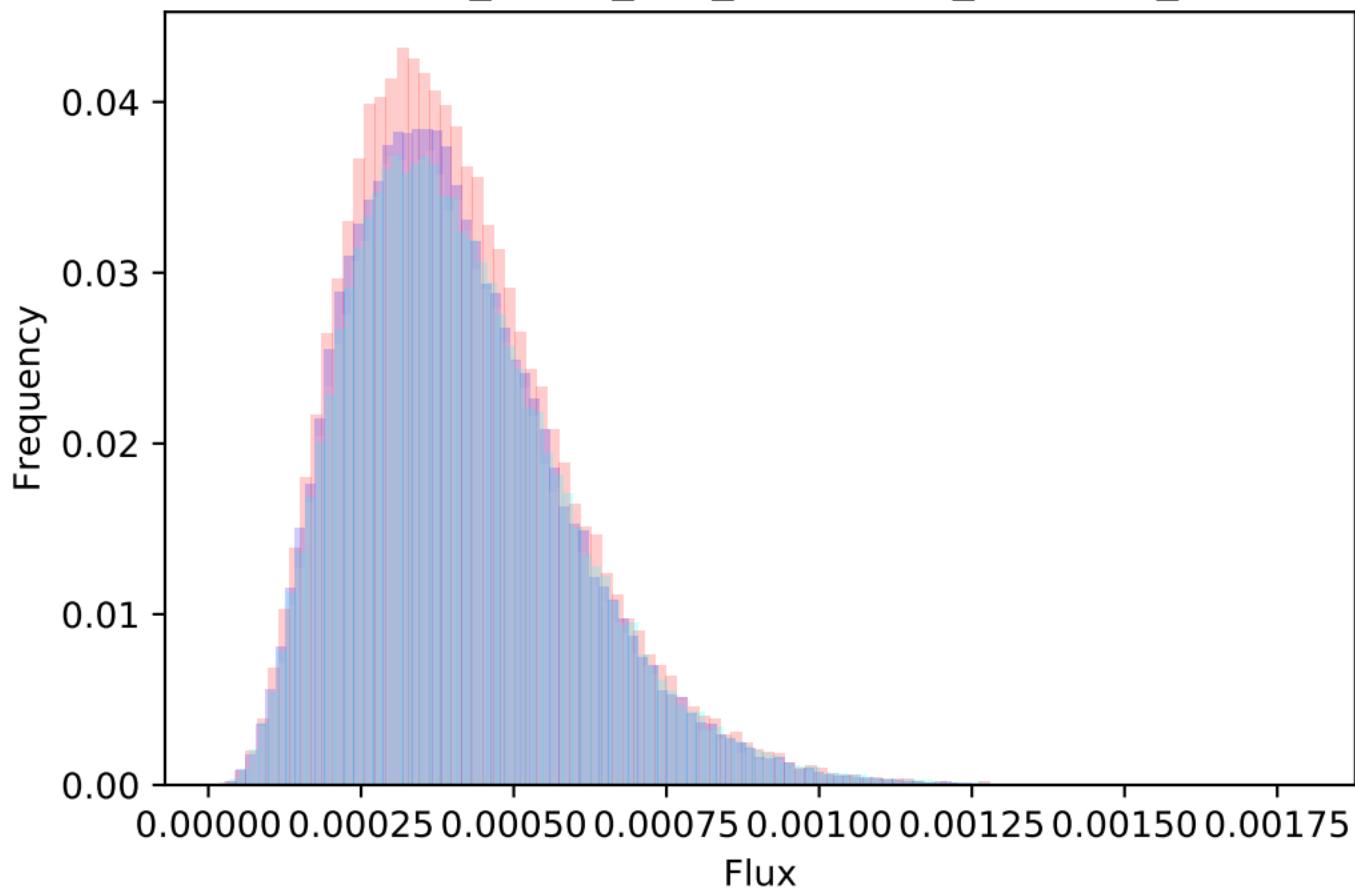
293:DC_DASH_AMP_h --> AMP_h + Fum_h

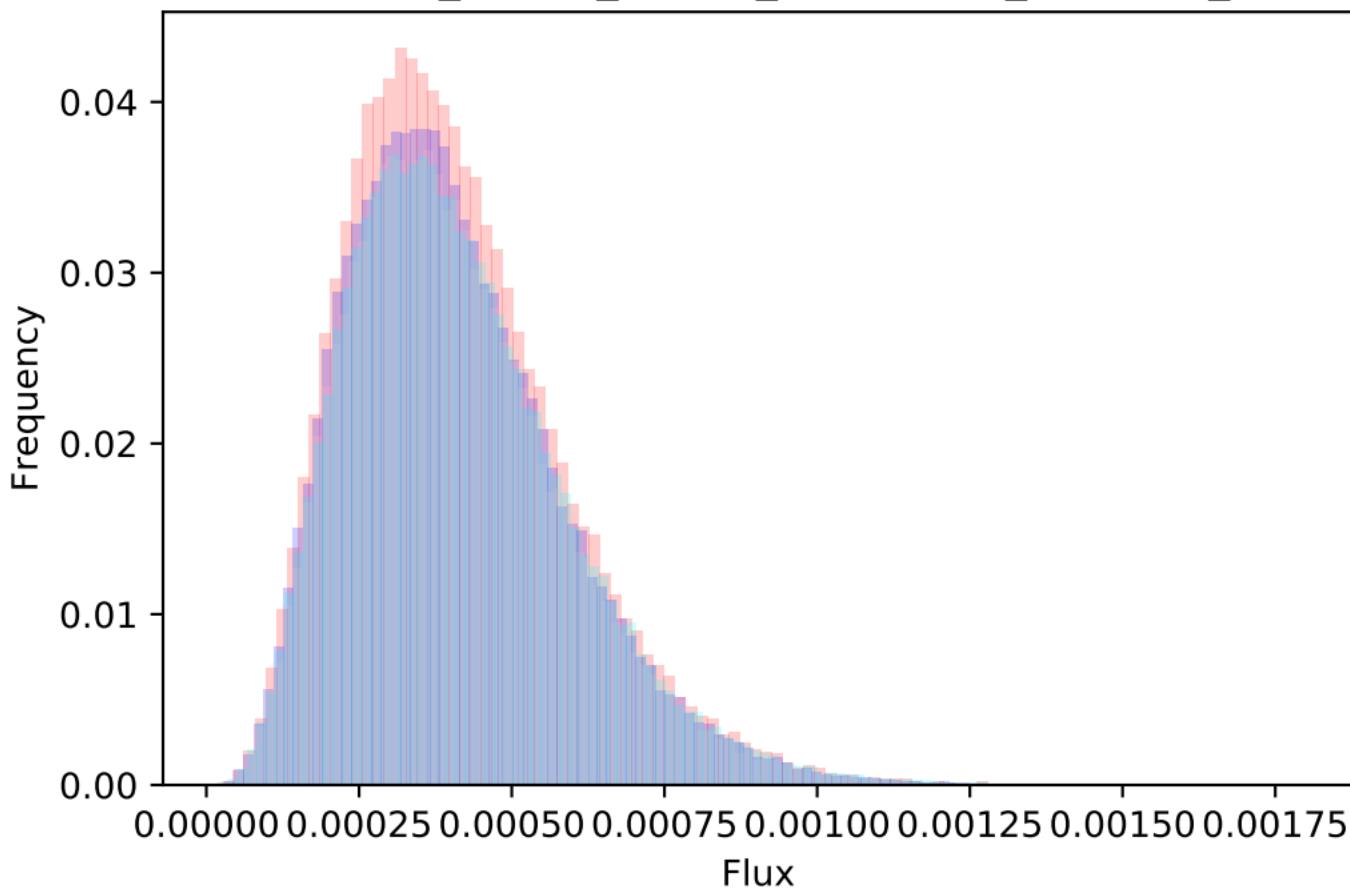


294:Asp_h + CBP_h --> CB_DASH_Asp_h + Pi_h

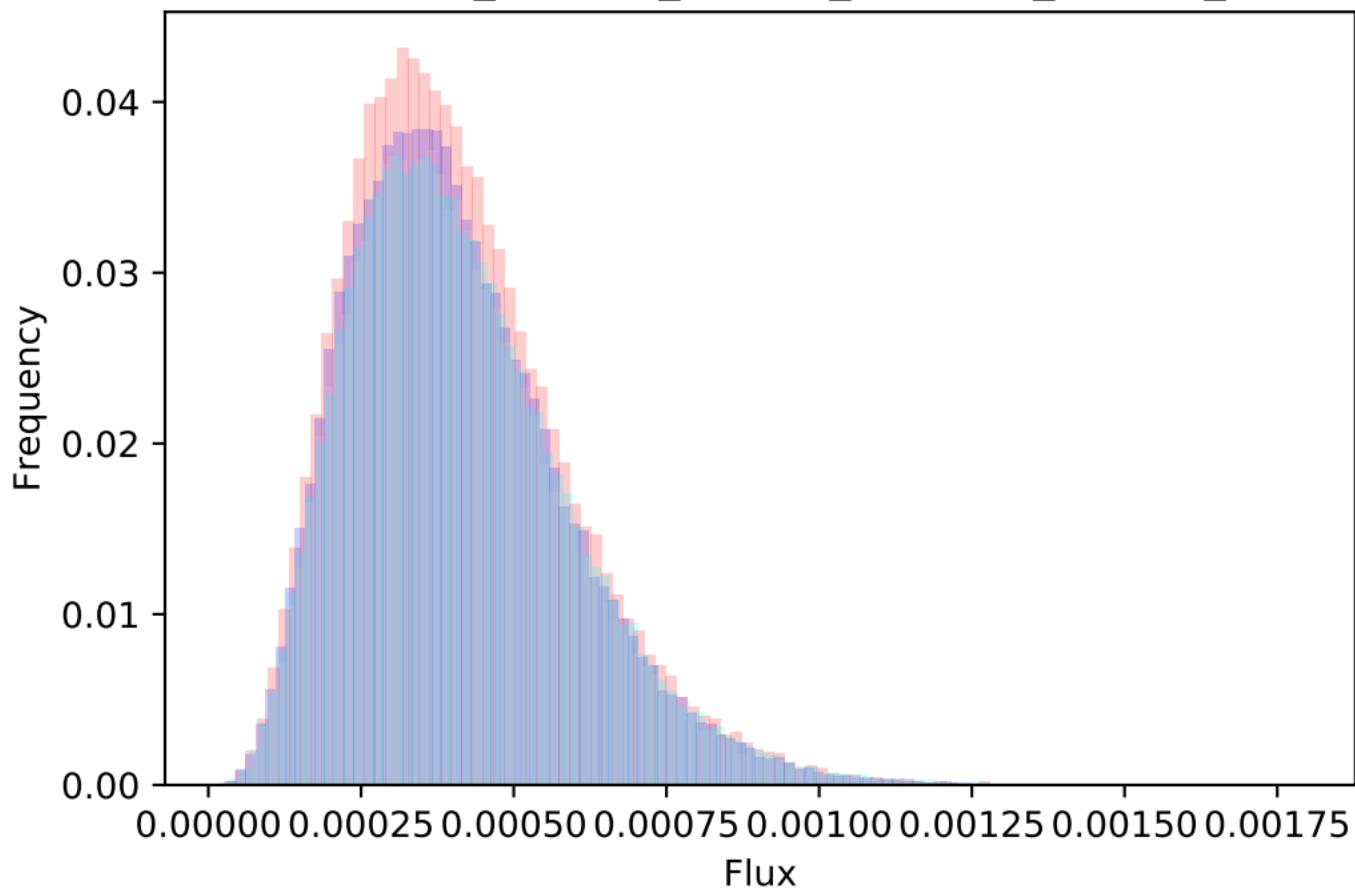


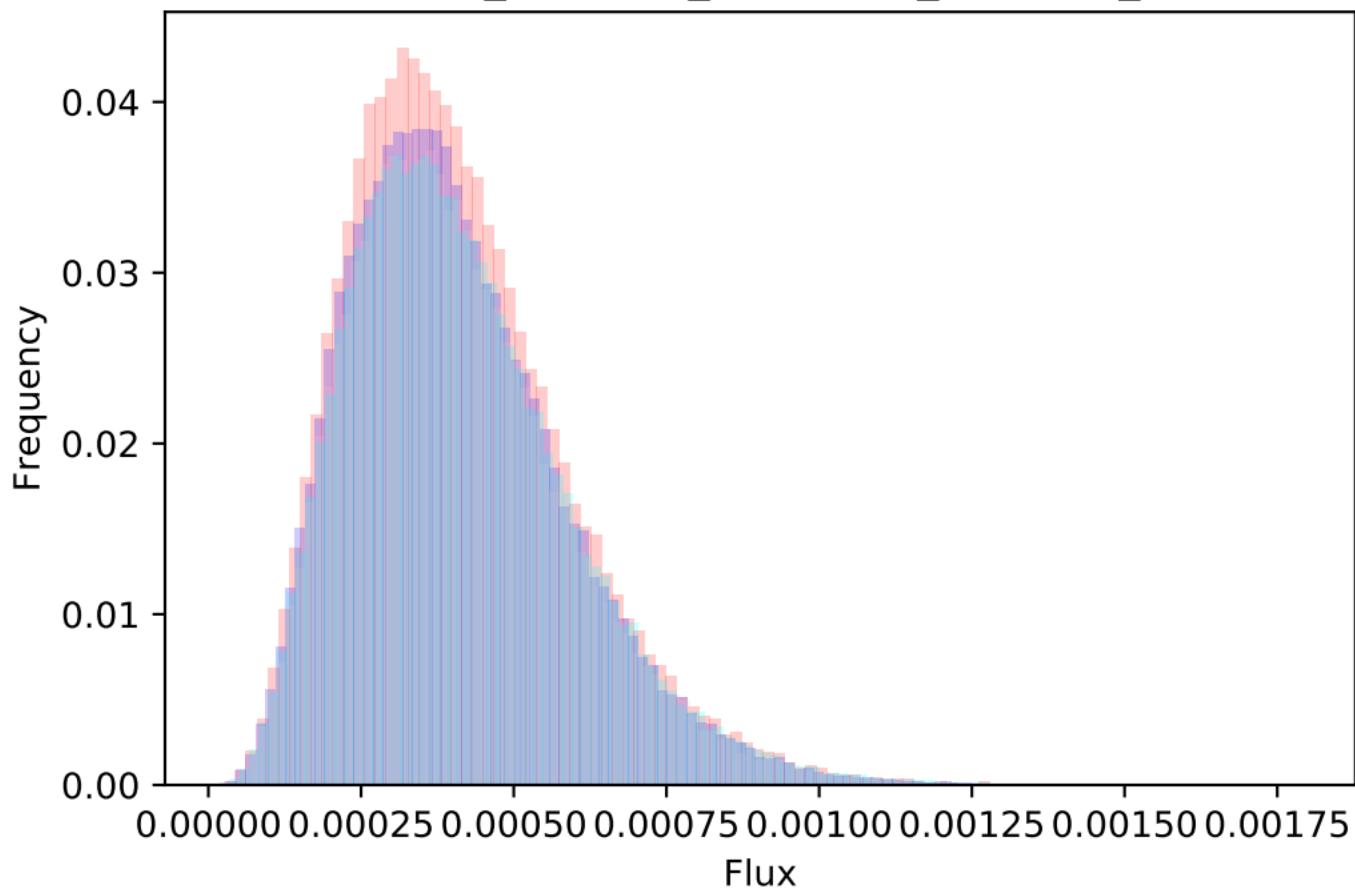
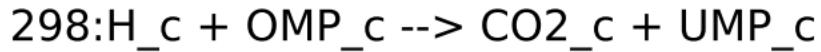
295:CB_DASH_Asp_h --> DHO_h + H2O_h

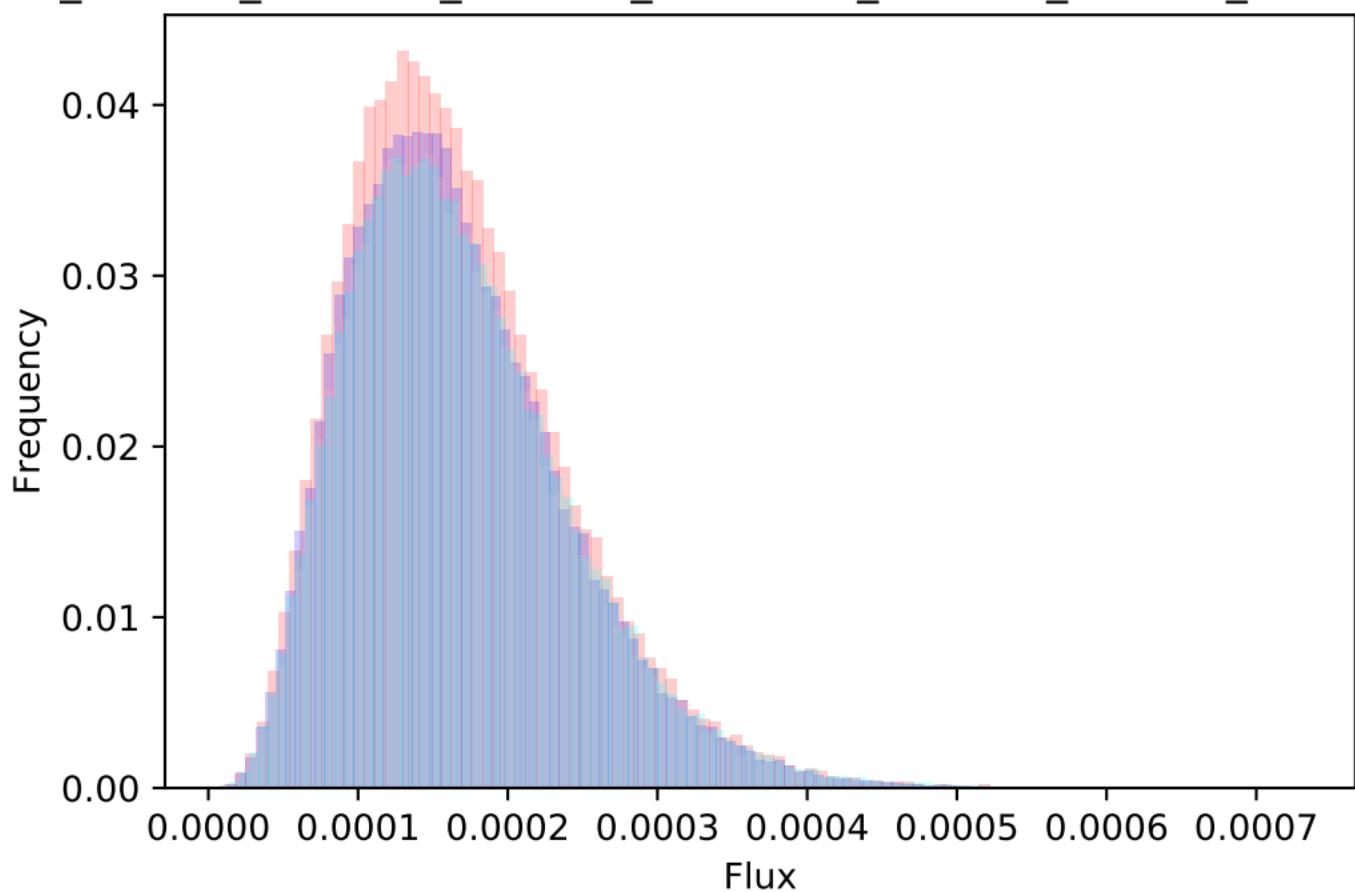
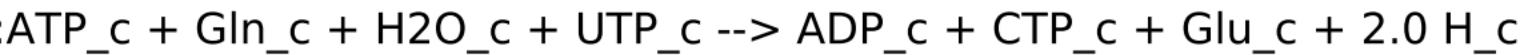




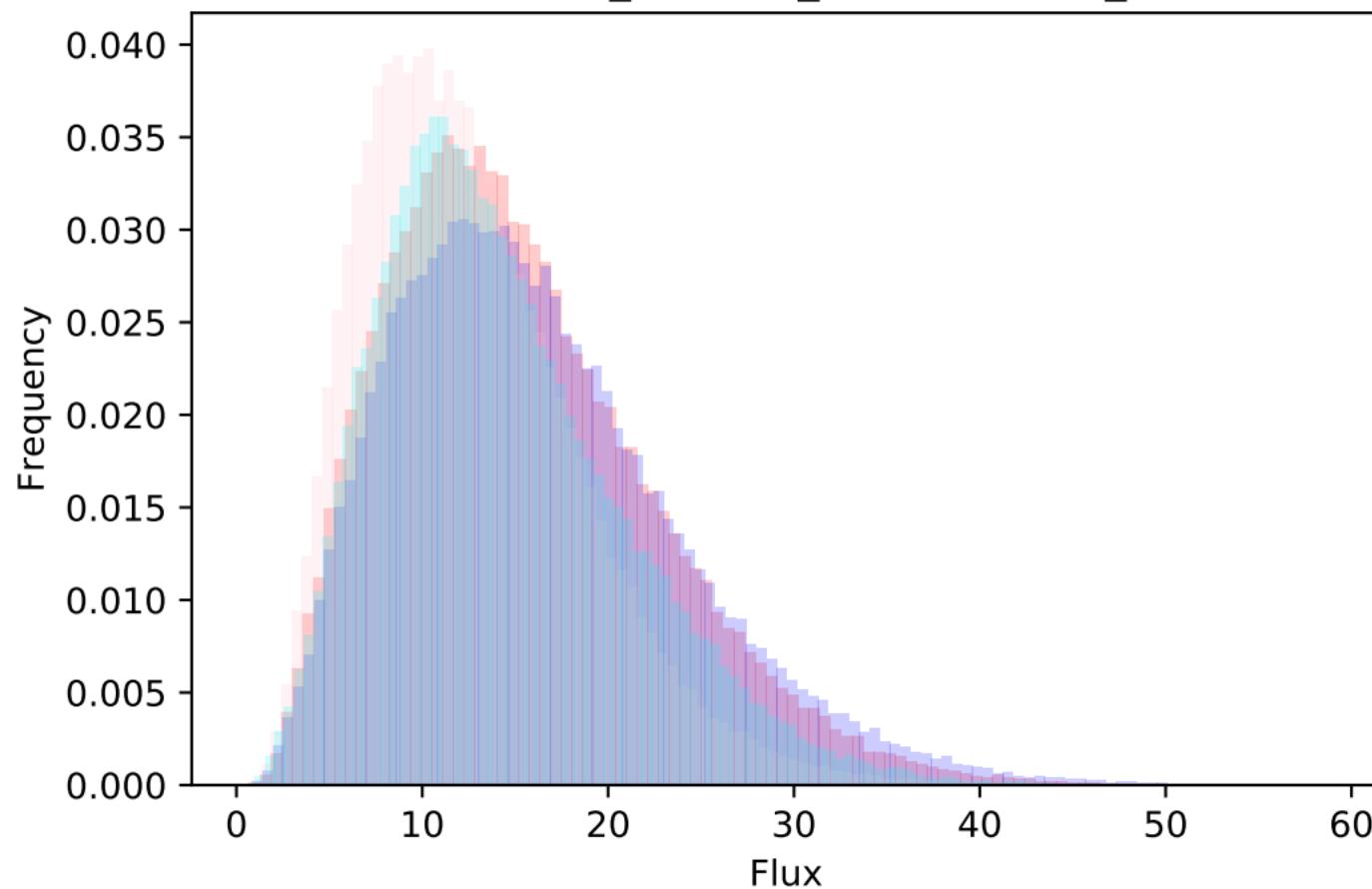
297:PRPP_c + orO_c --> H_c + OMP_c + PPi_c

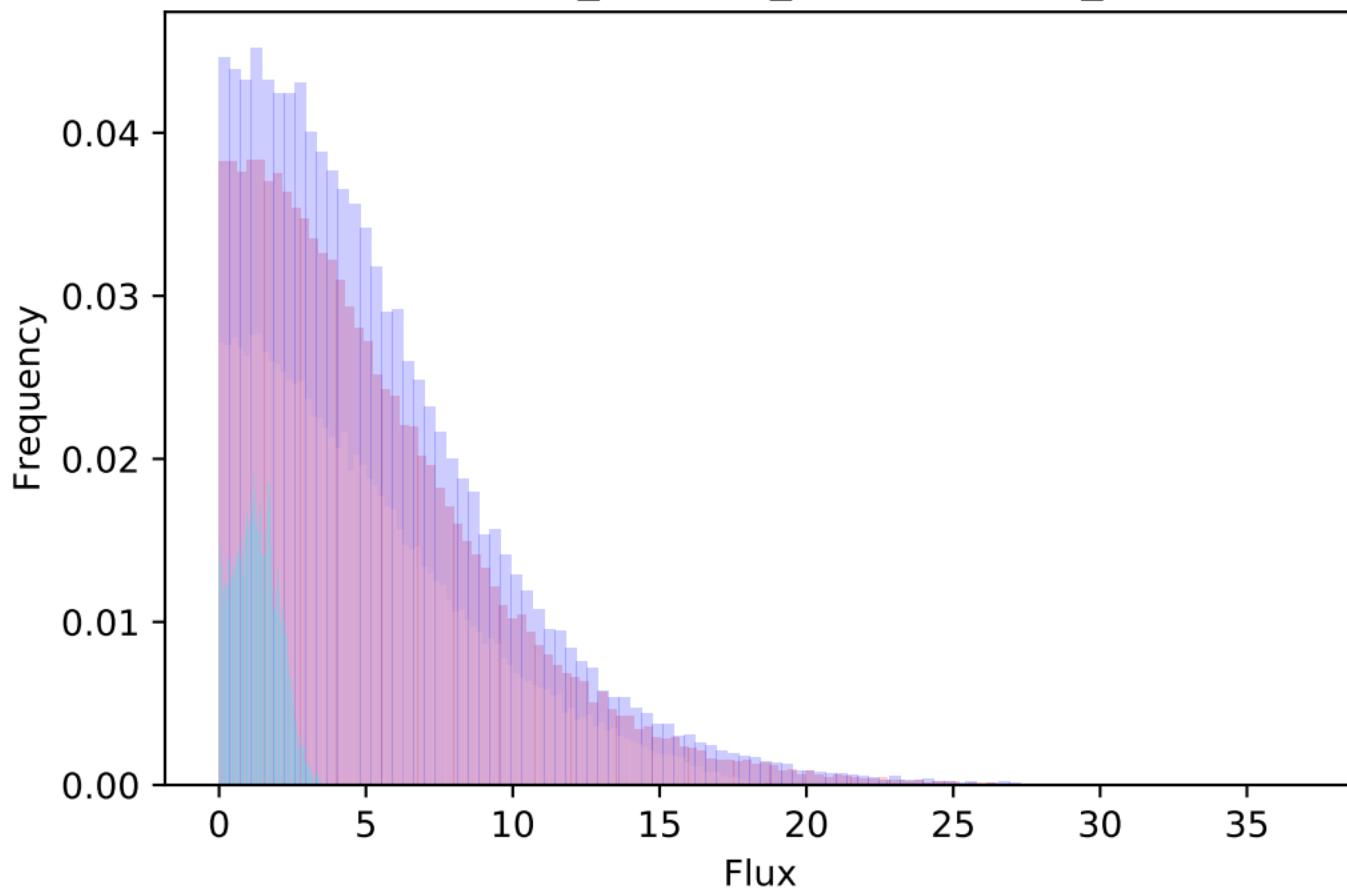


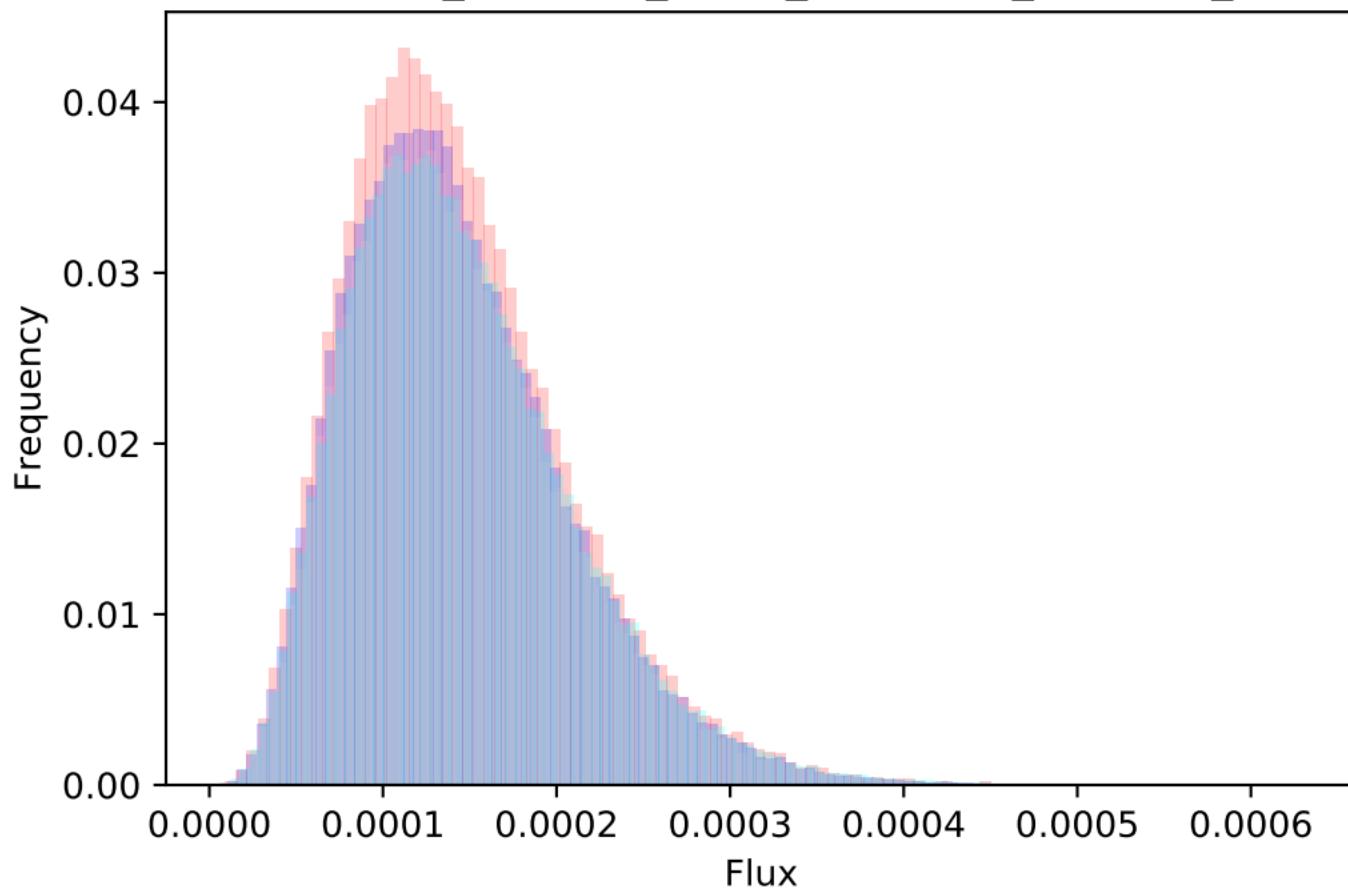
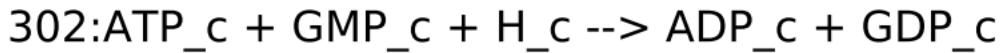


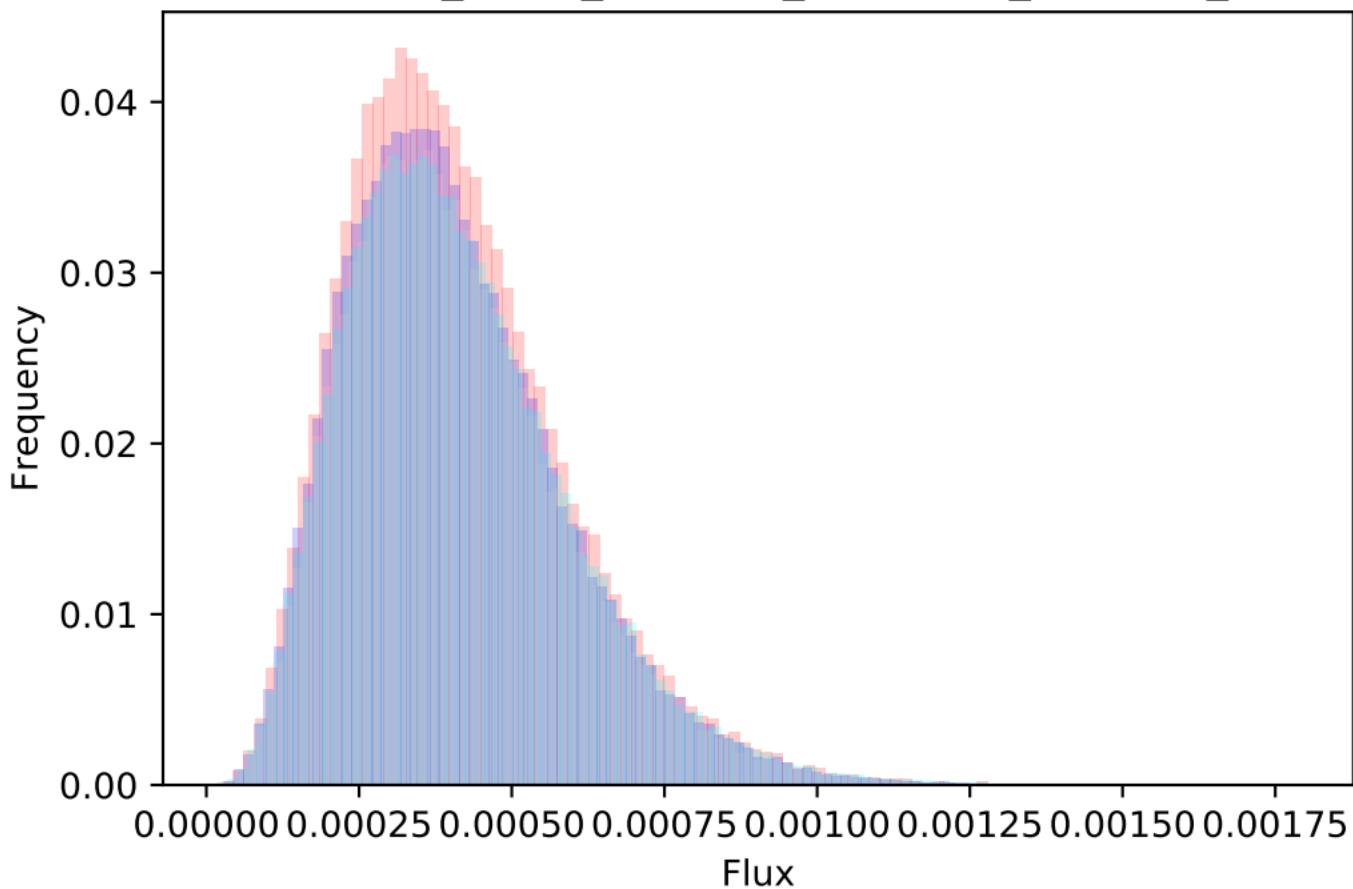


$300:\text{AMP_c} + \text{ATP_c} \rightarrow 2.0 \text{ ADP_c}$

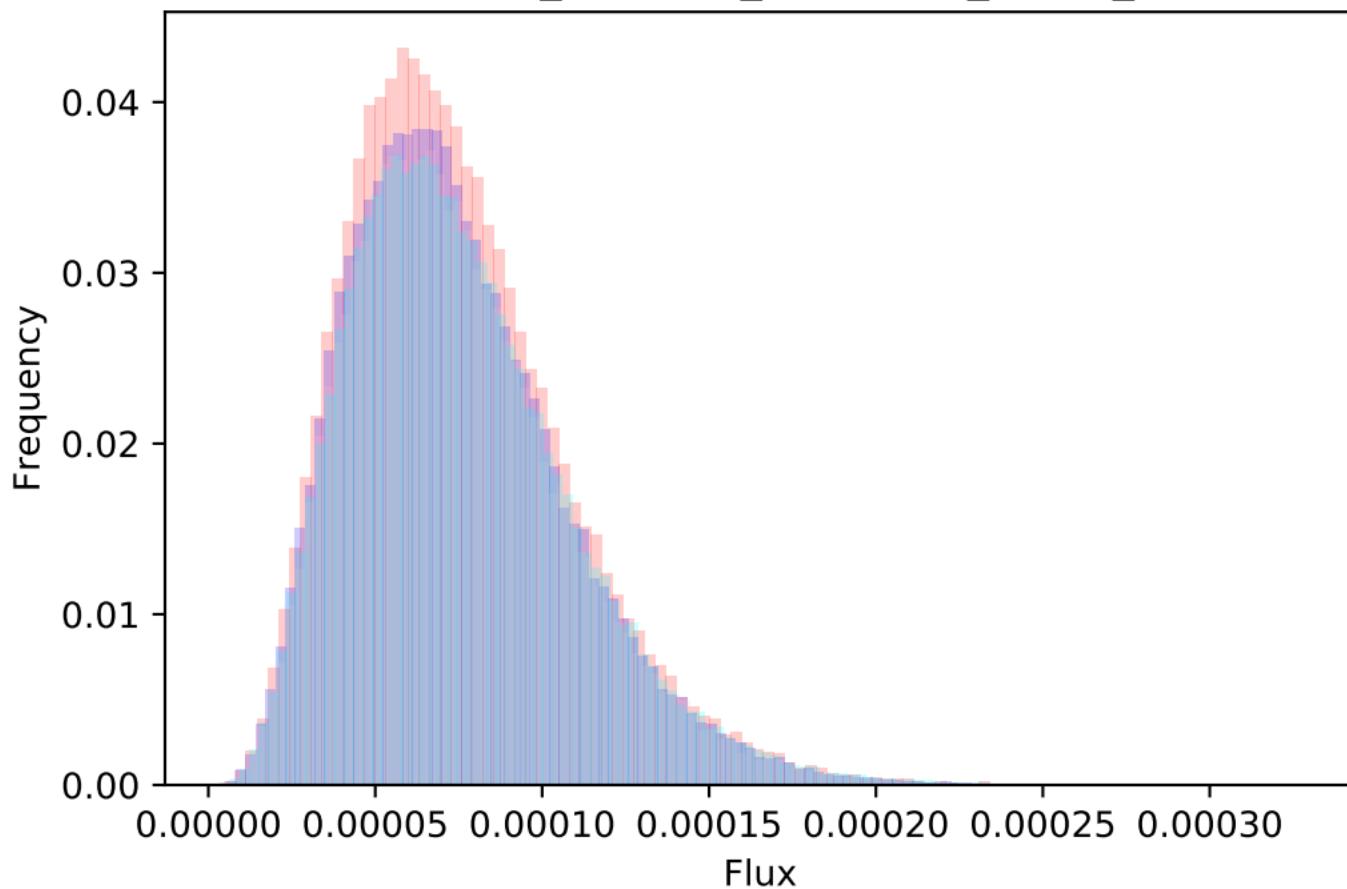


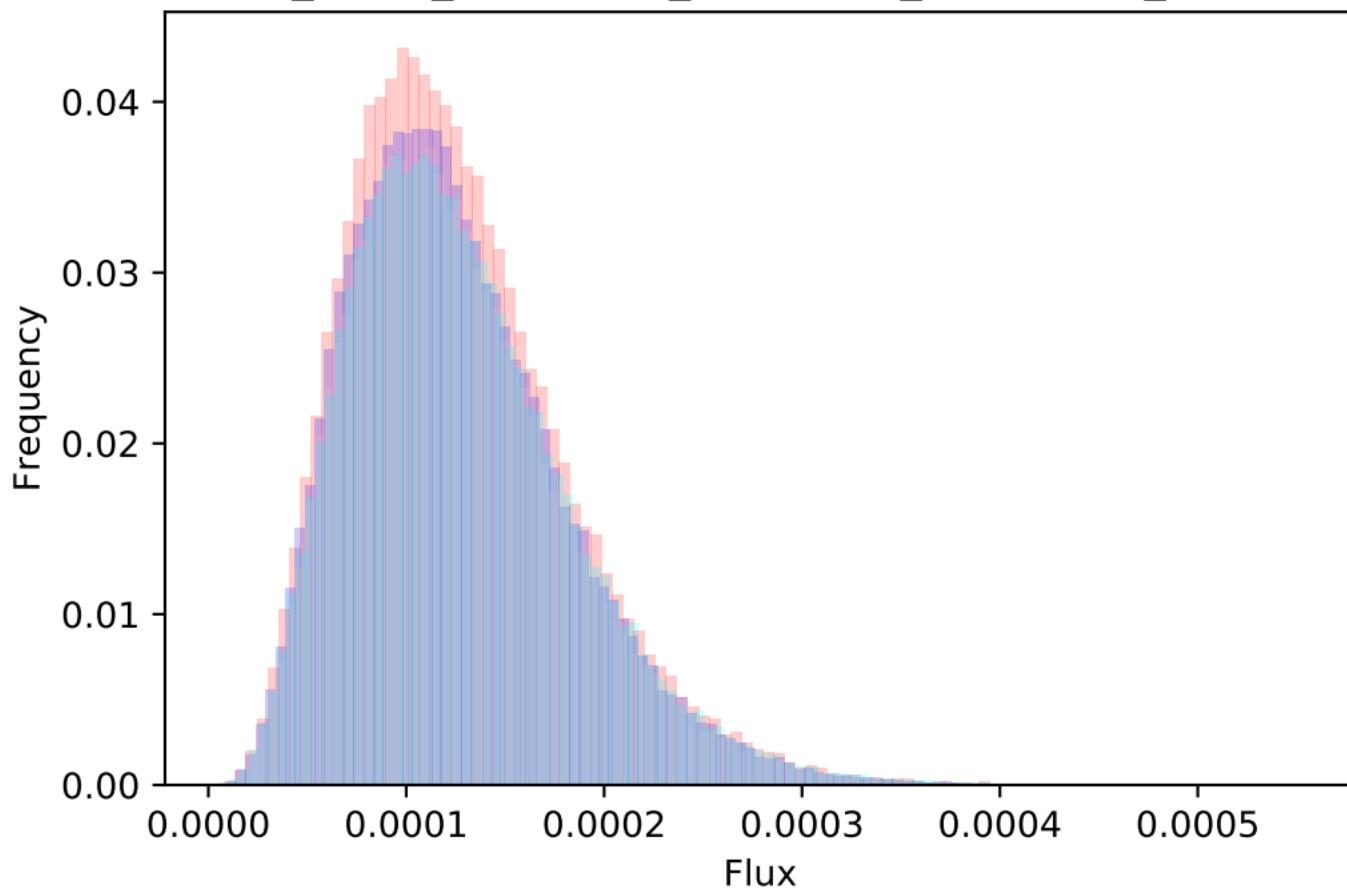
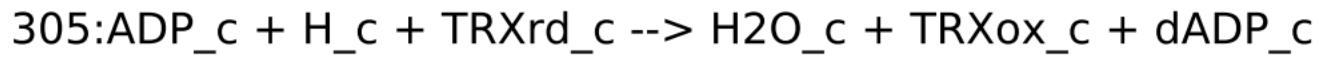


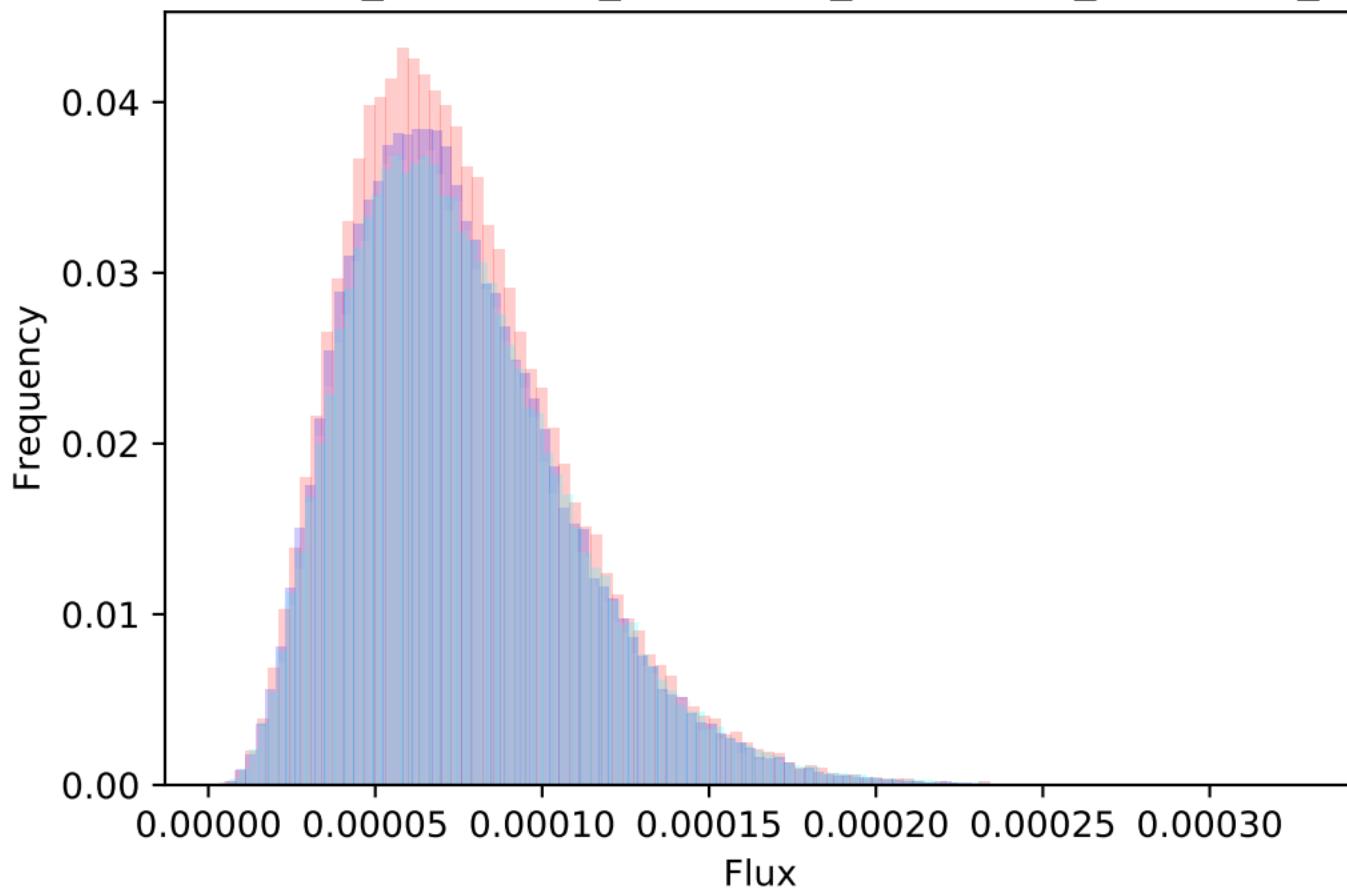
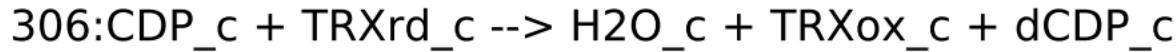




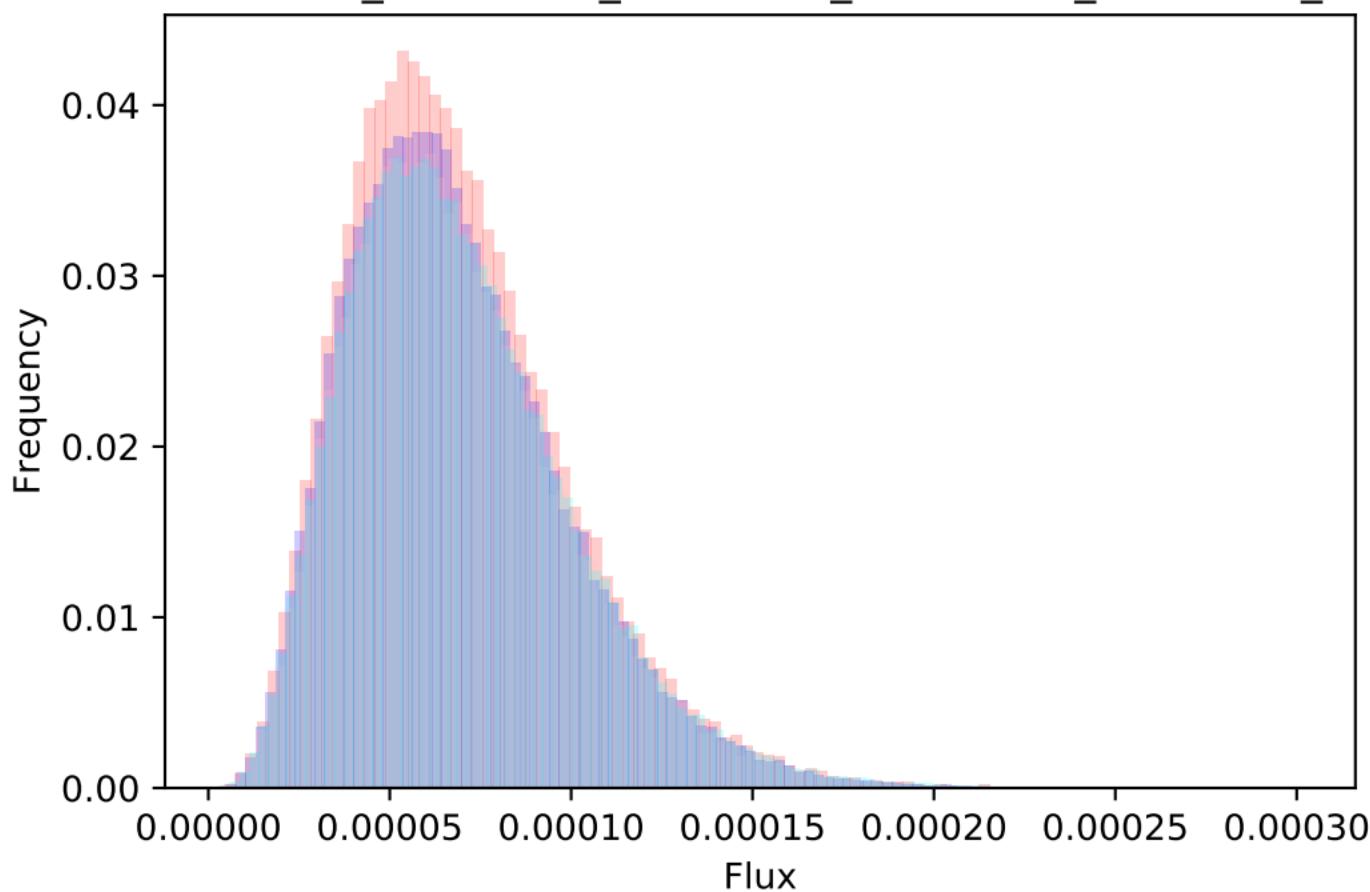
304:CTP_c + H2O_c --> CDP_c + Pi_c

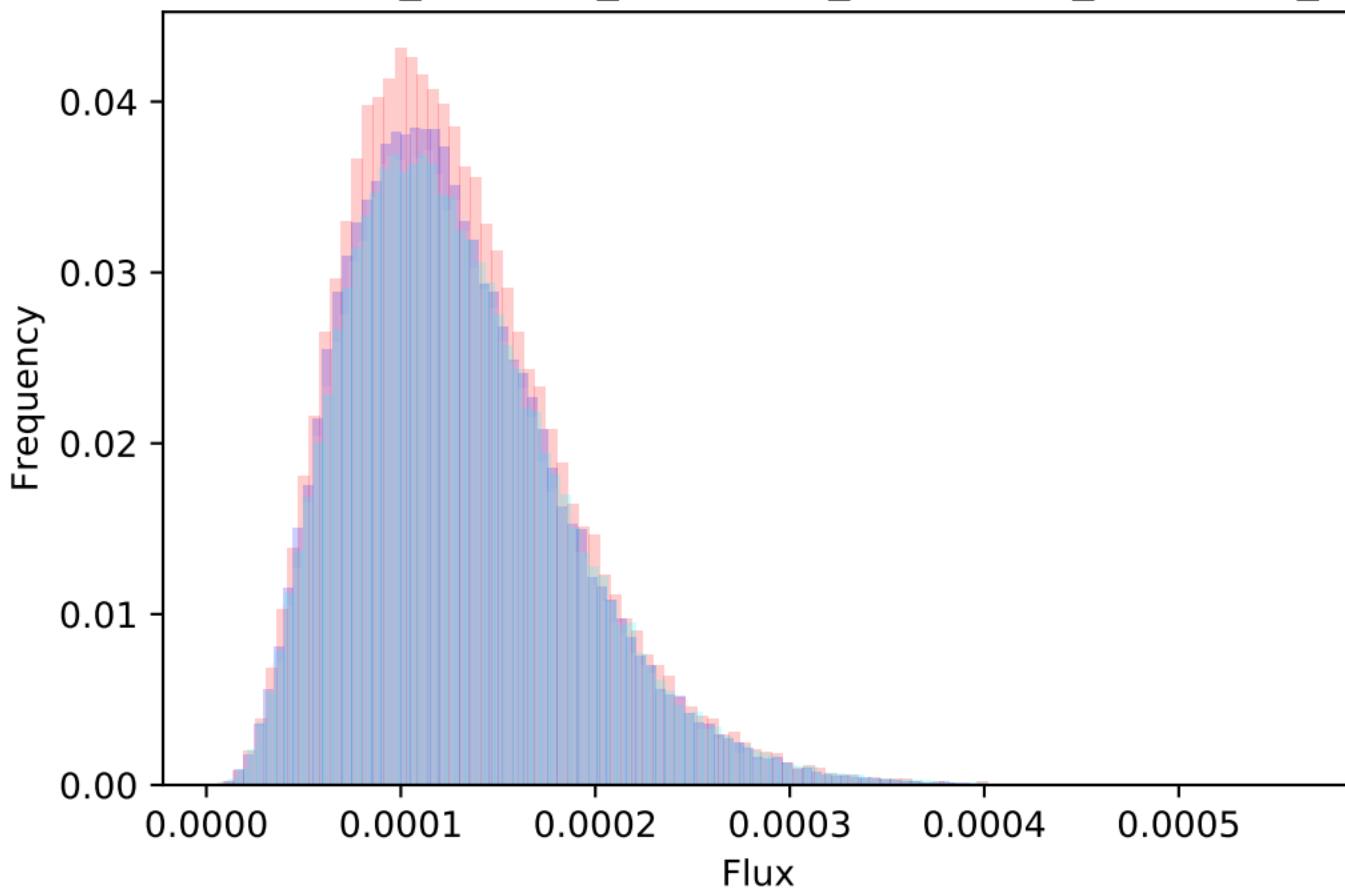
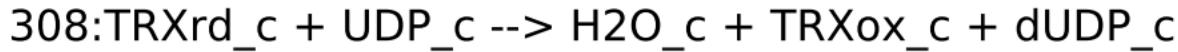


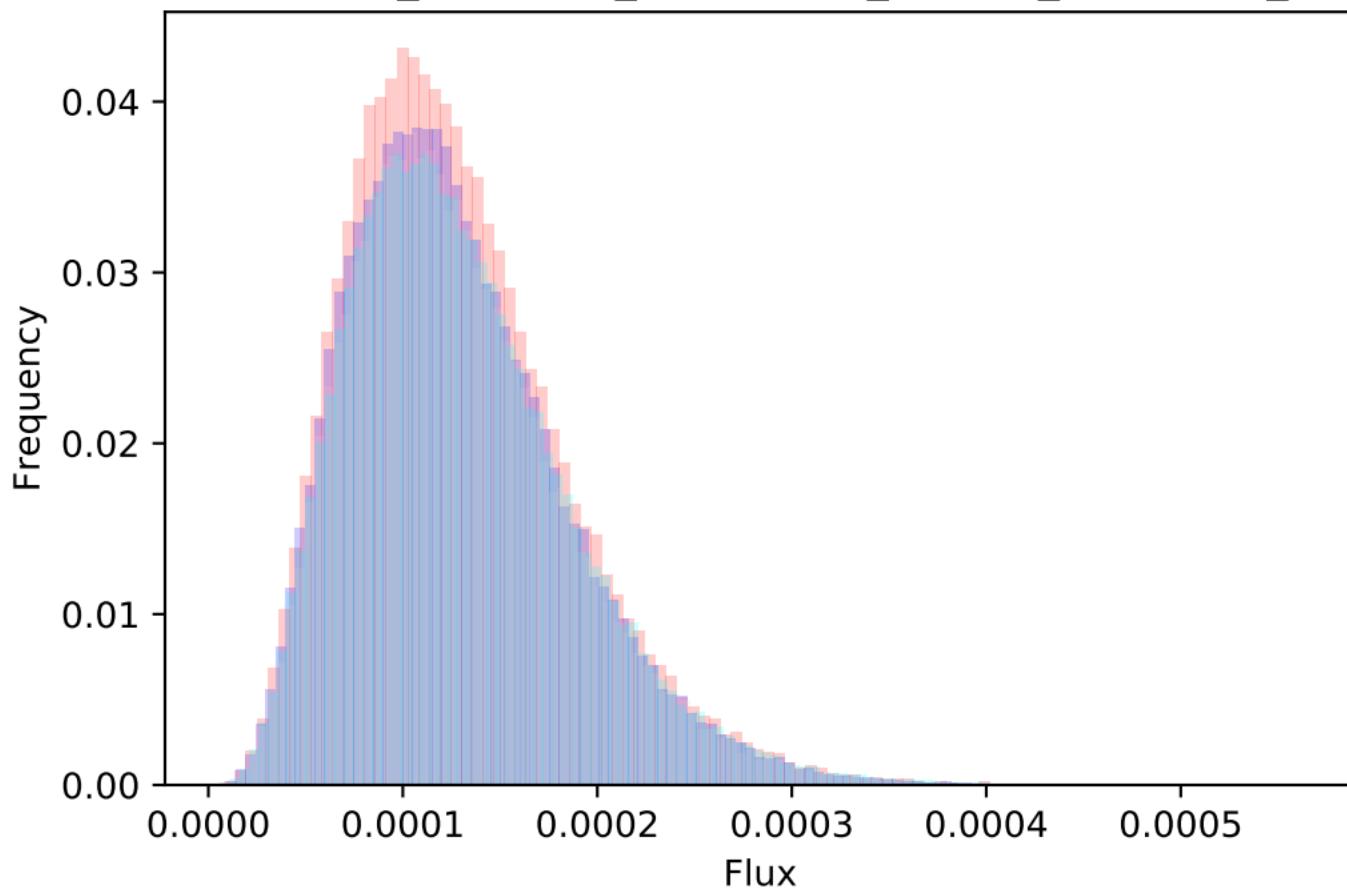
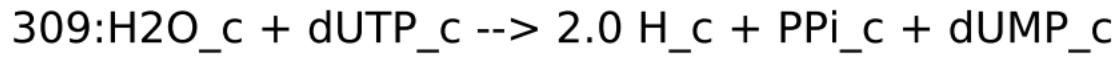




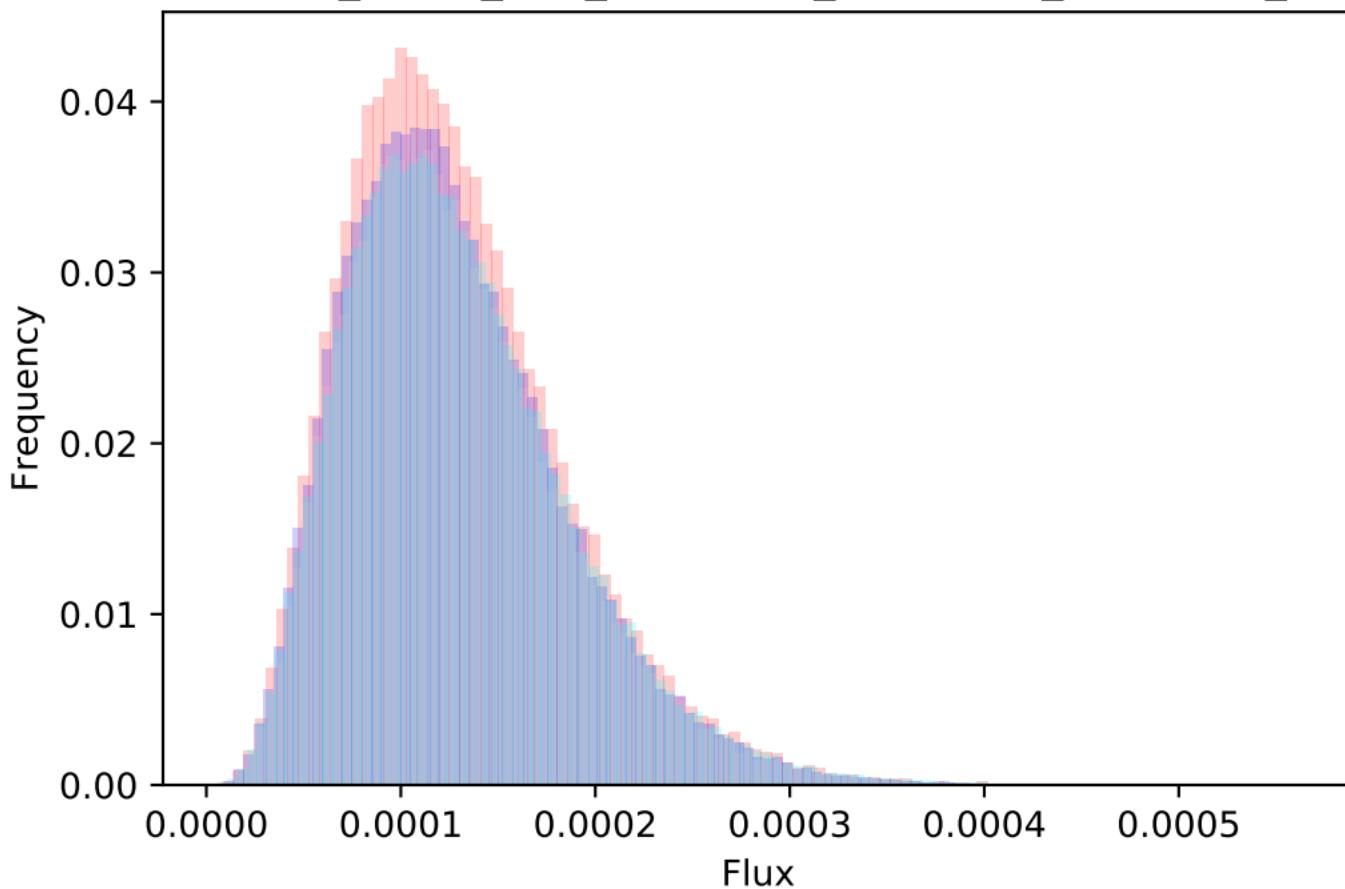
307:GDP_c + TRXrd_c --> H2O_c + TRXox_c + dGDP_c

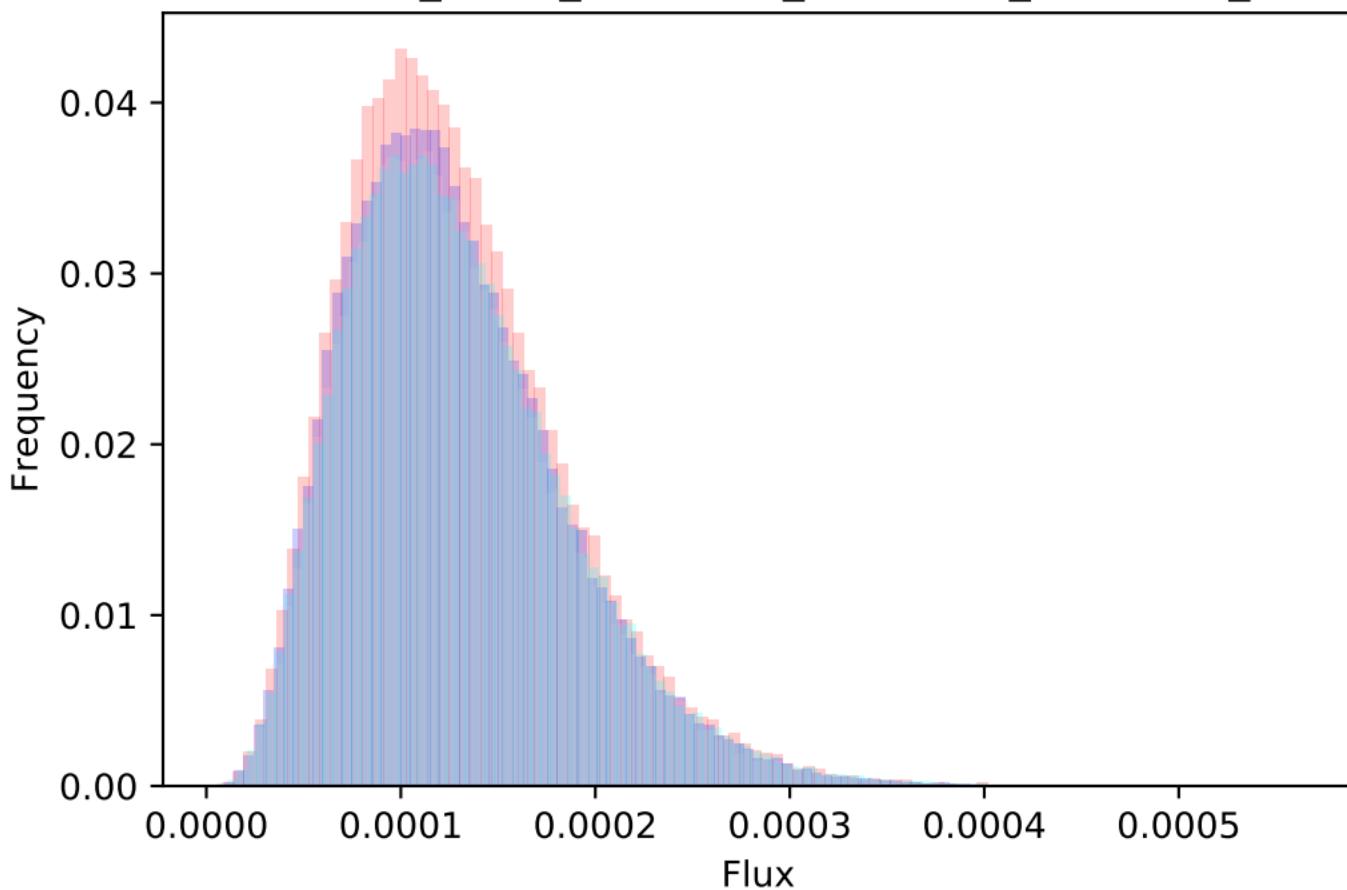


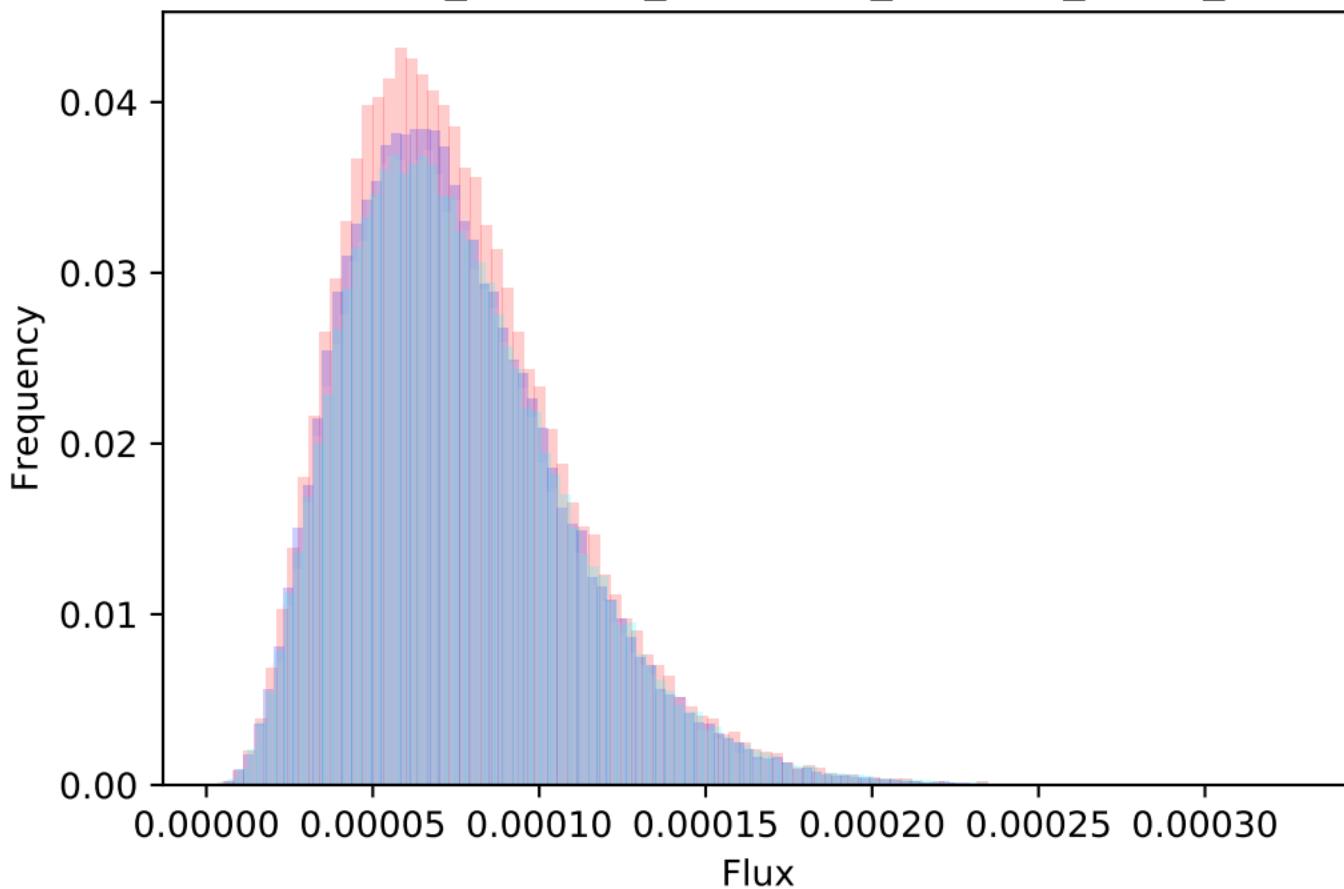
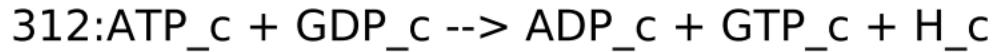


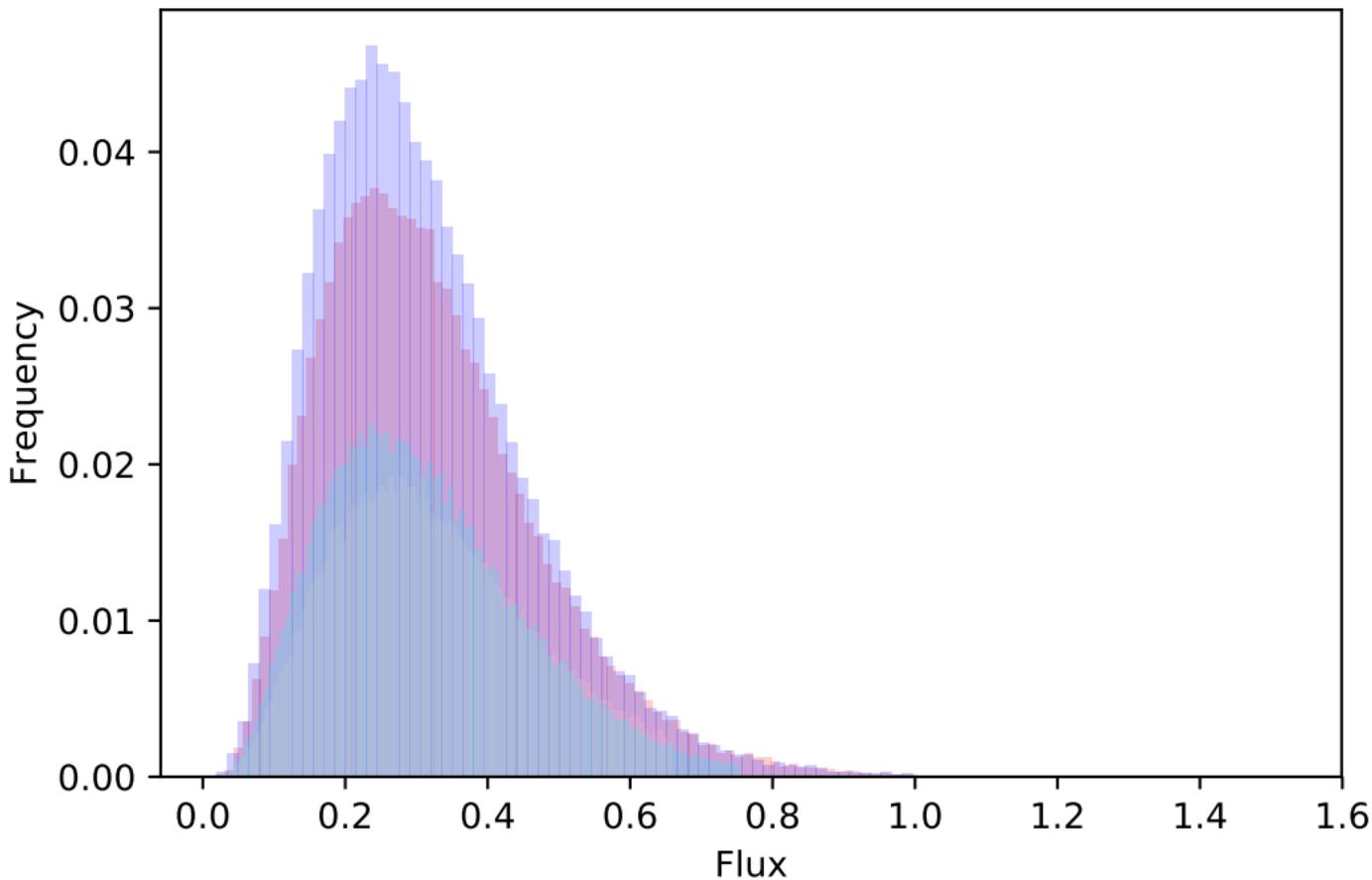
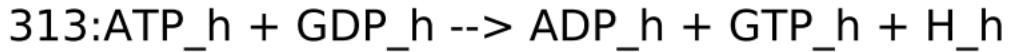


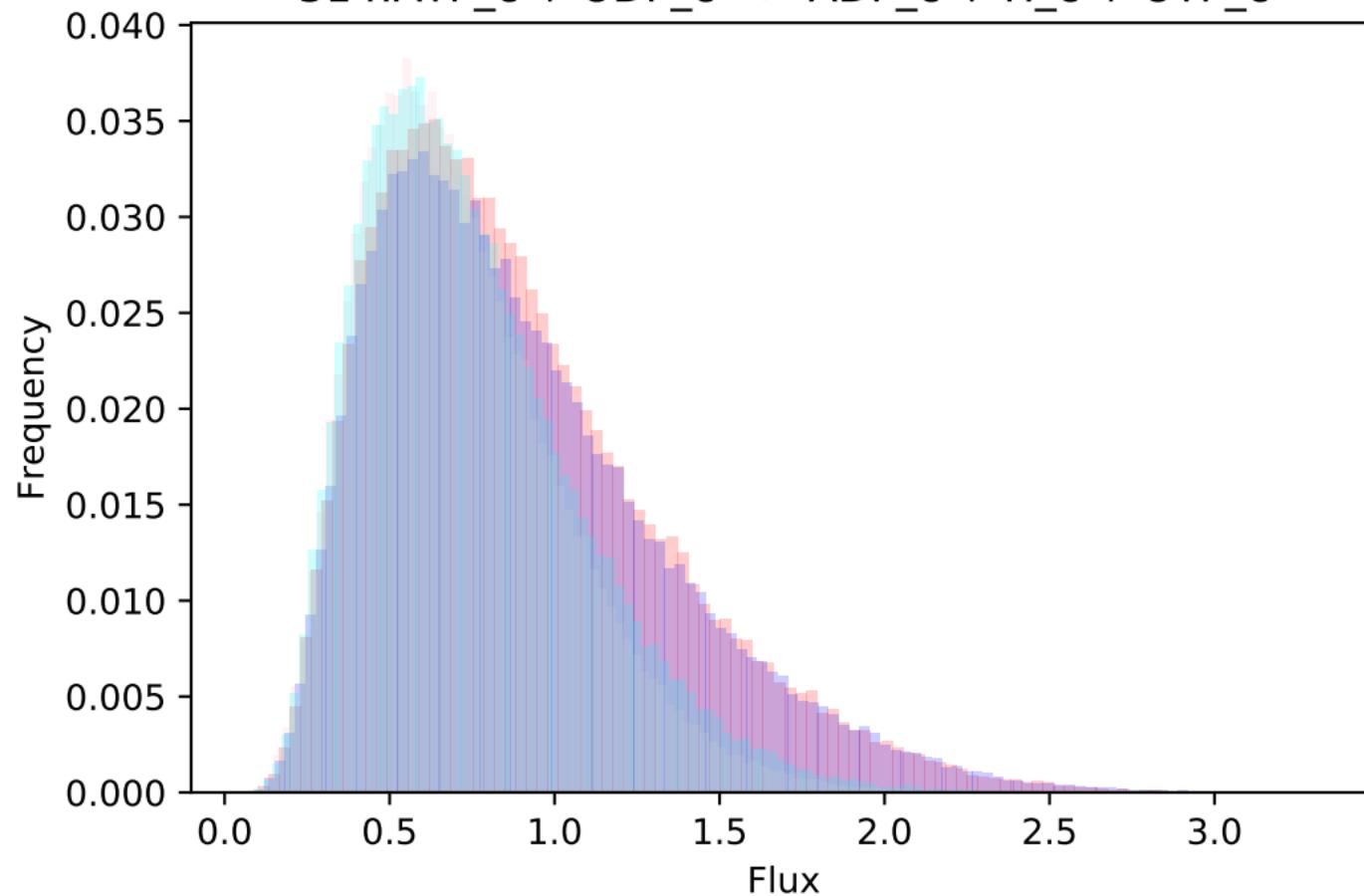
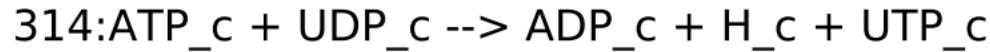
310:M_DASH_ THF_c + dUMP_c --> DHF_c + dTMP_c



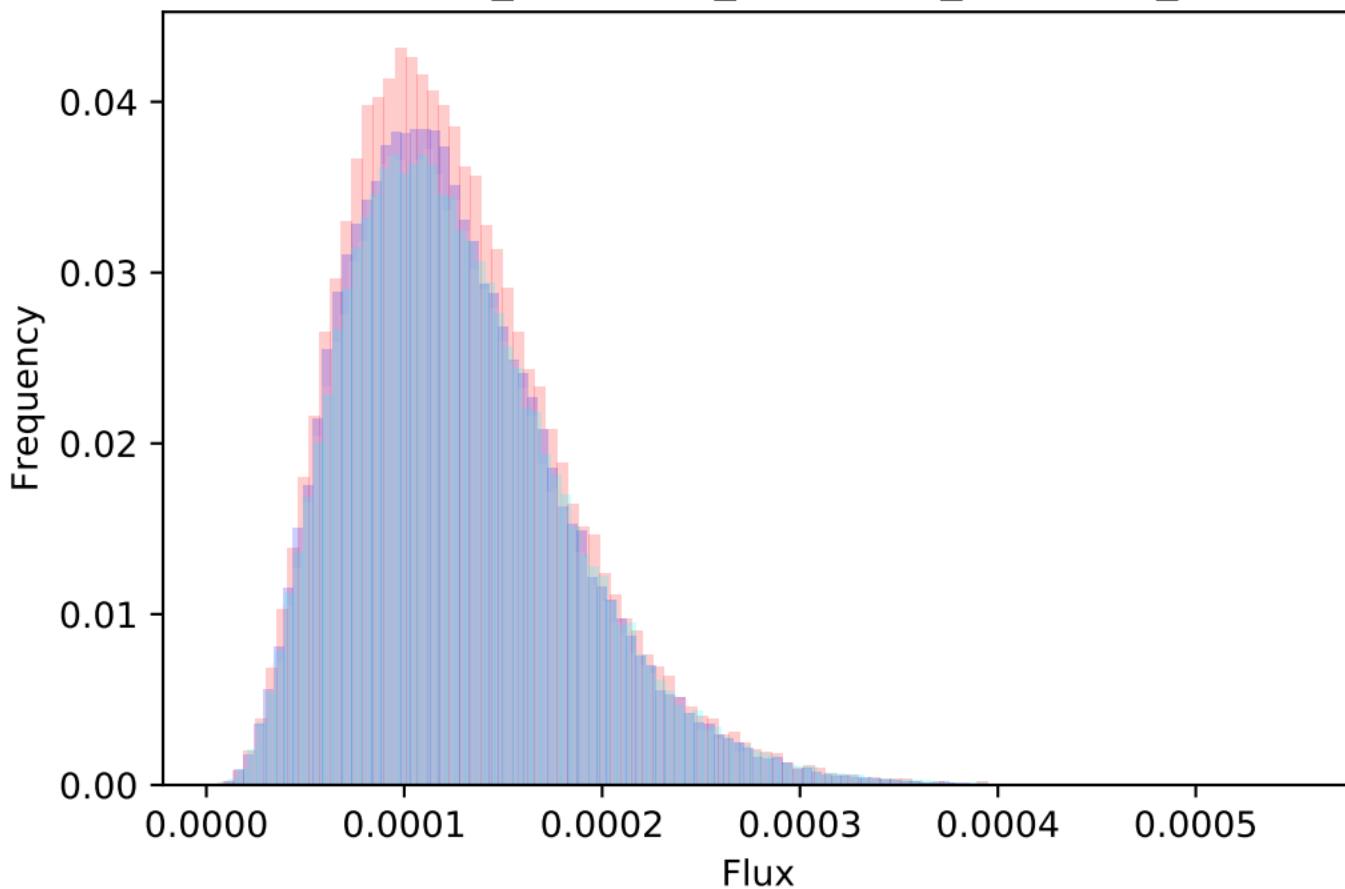


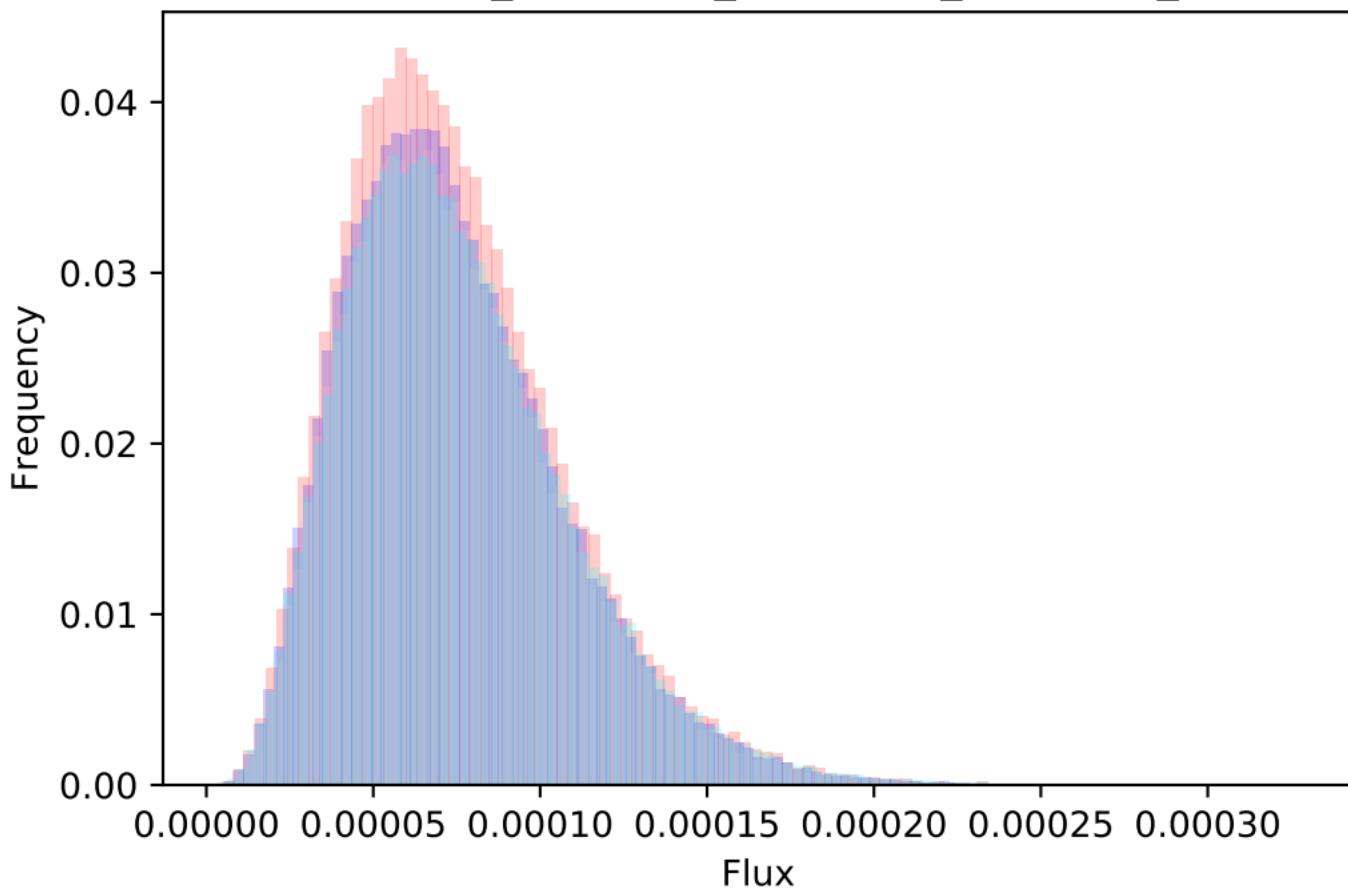
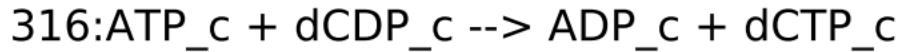




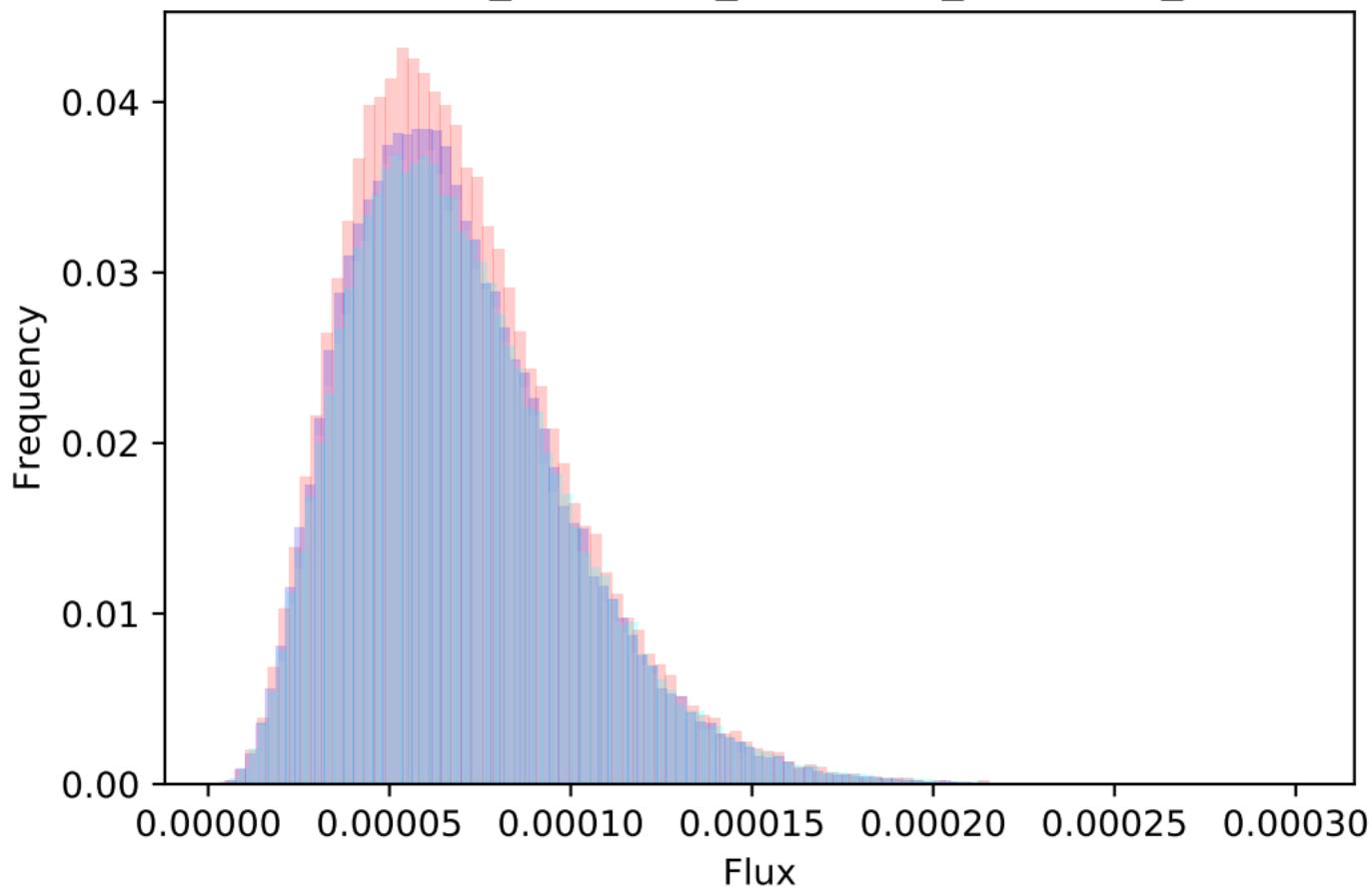


315:ATP_c + dADP_c --> ADP_c + dATP_c

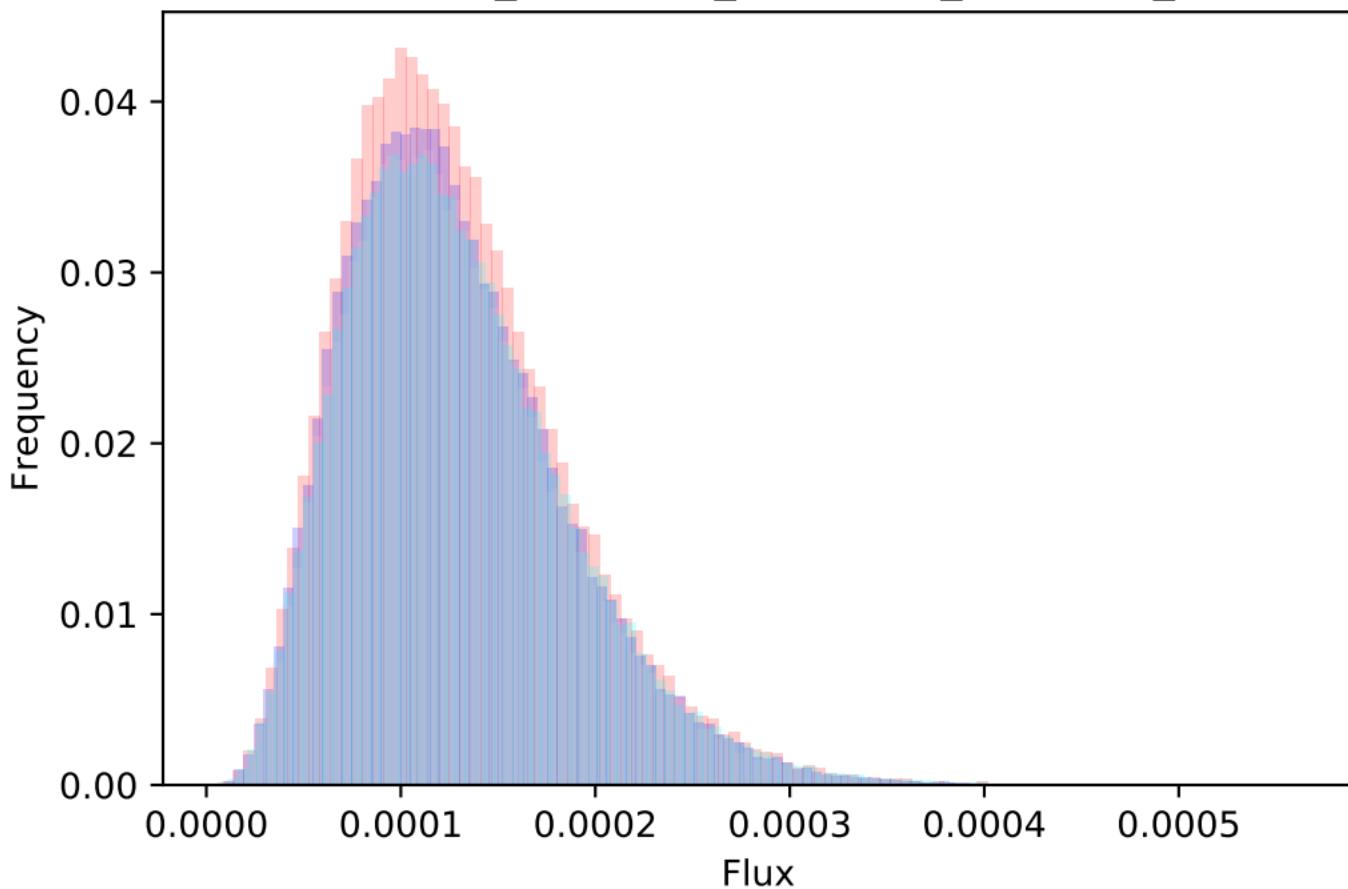




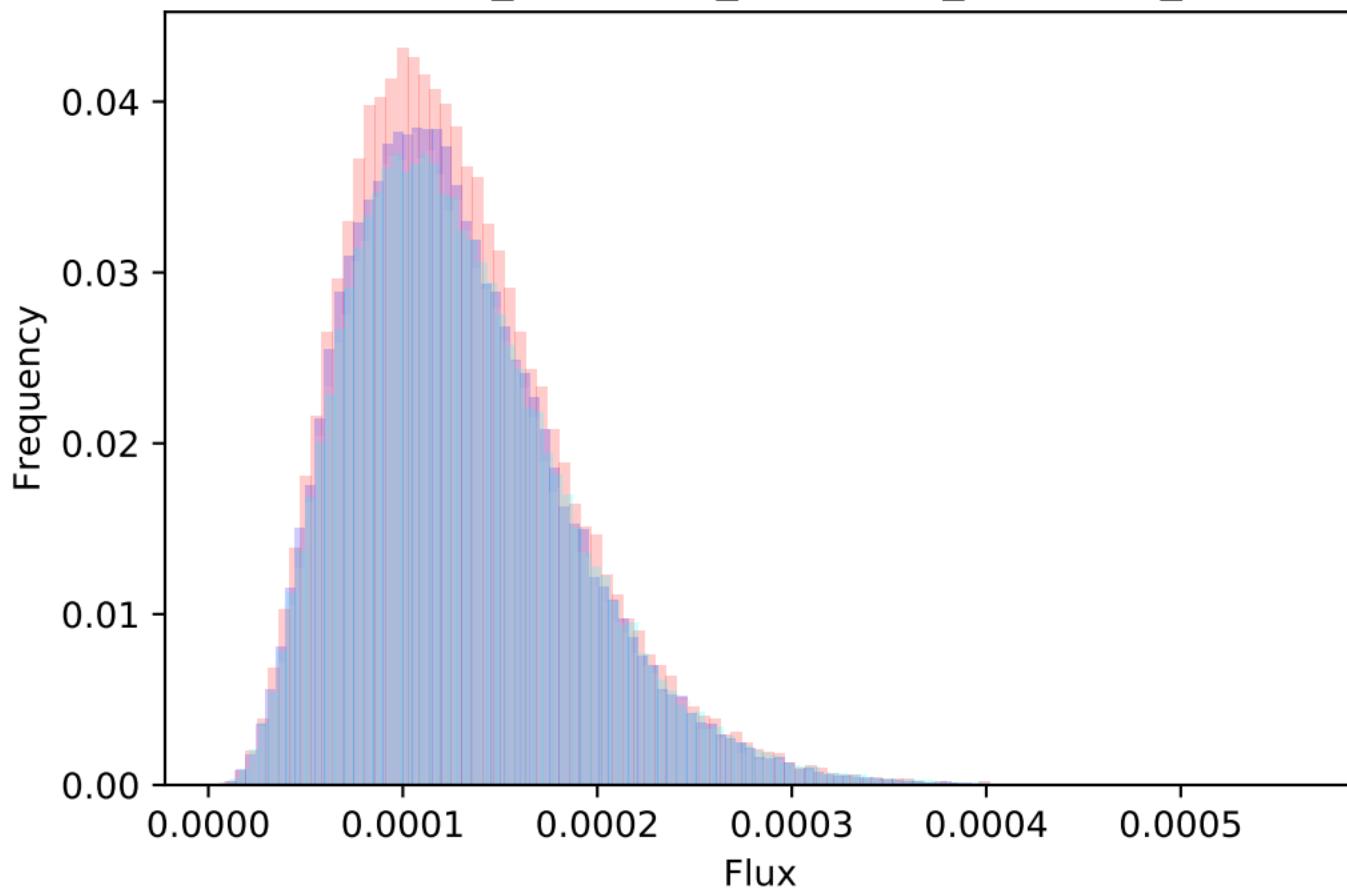
317:ATP_c + dGDP_c --> ADP_c + dGTP_c



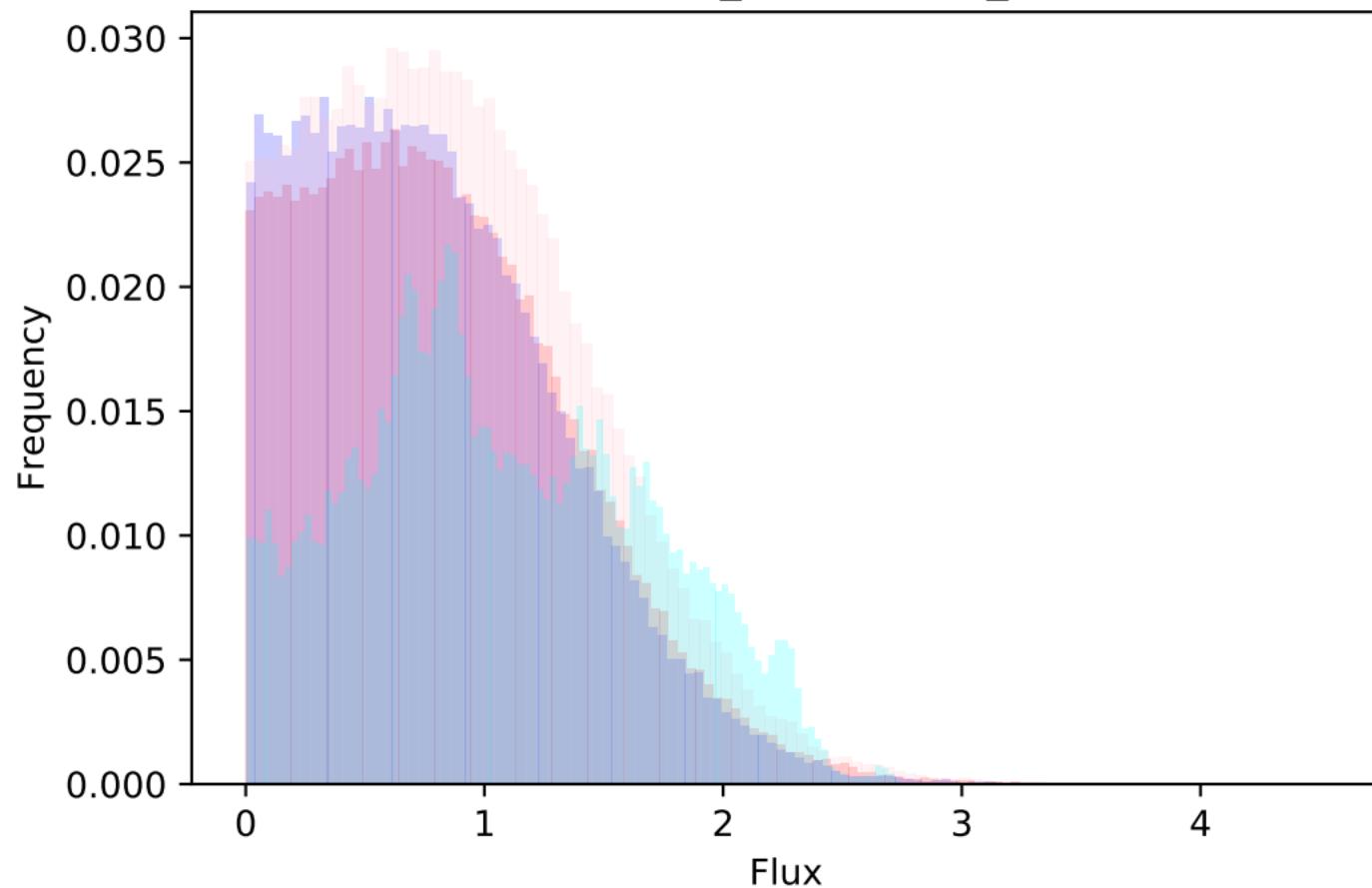
318:ATP_c + dTDP_c --> ADP_c + dTTP_c



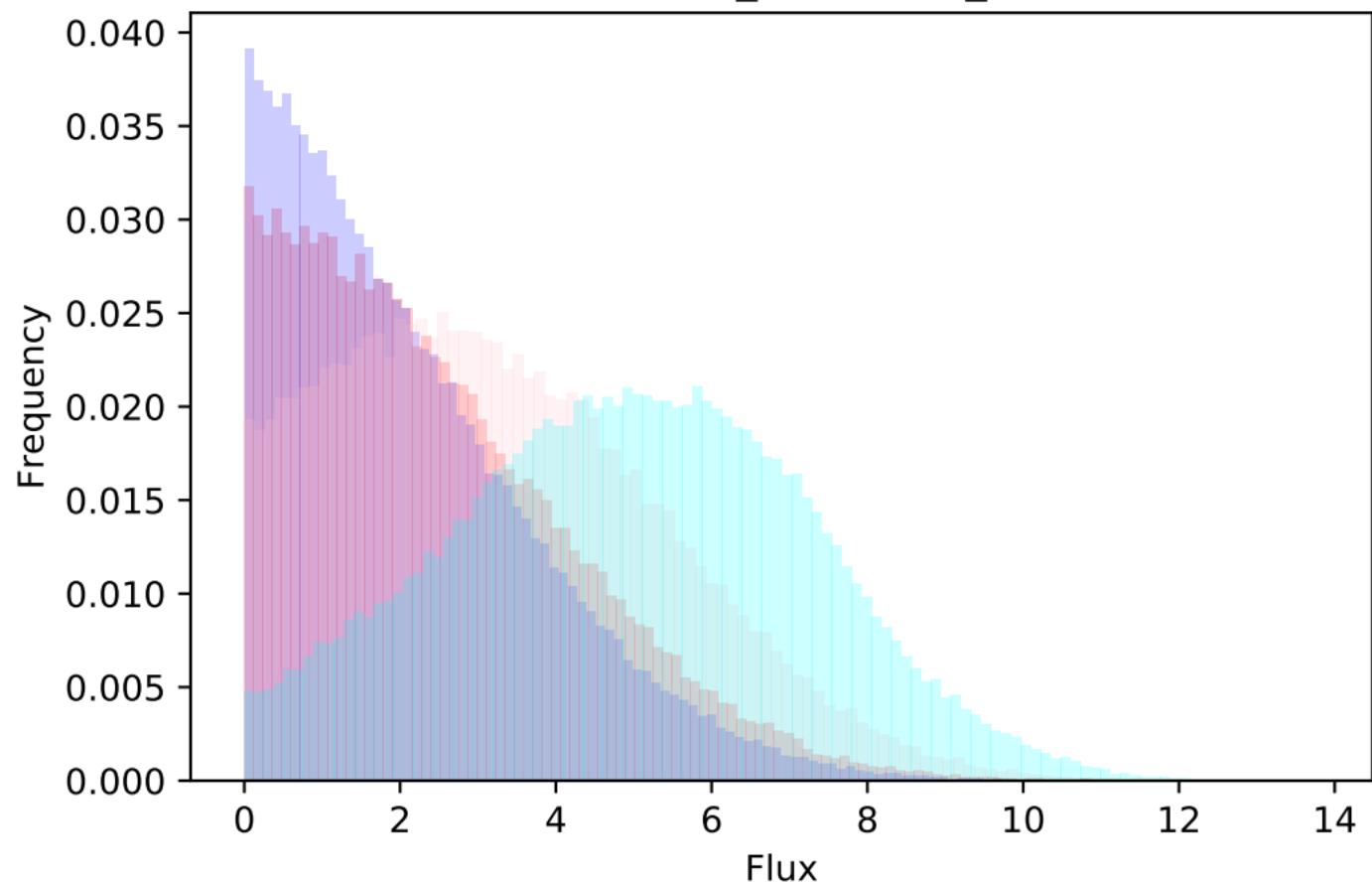
319:ATP_c + dUDP_c --> ADP_c + dUTP_c



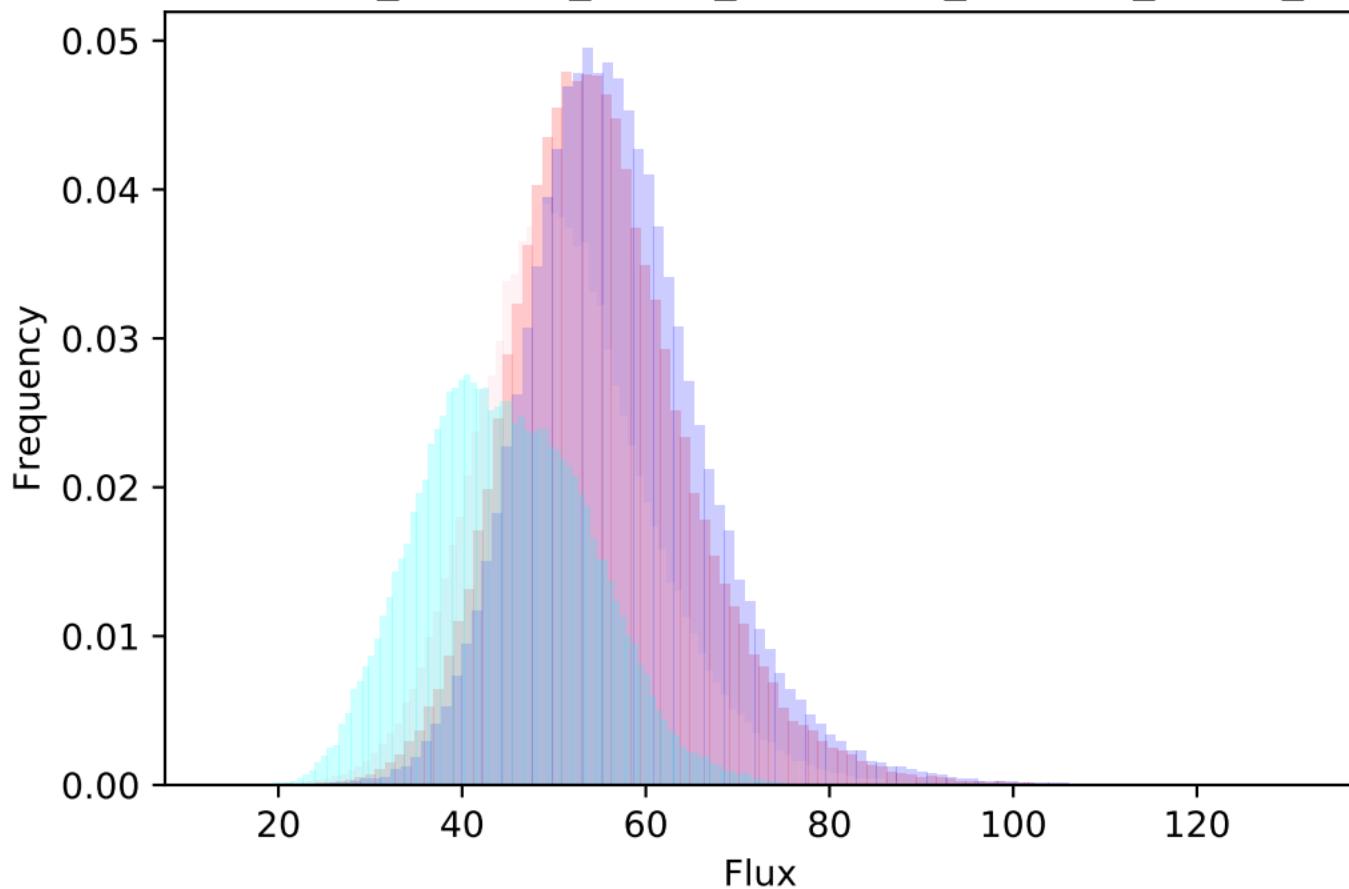
320:SO4_c <=> SO4_h



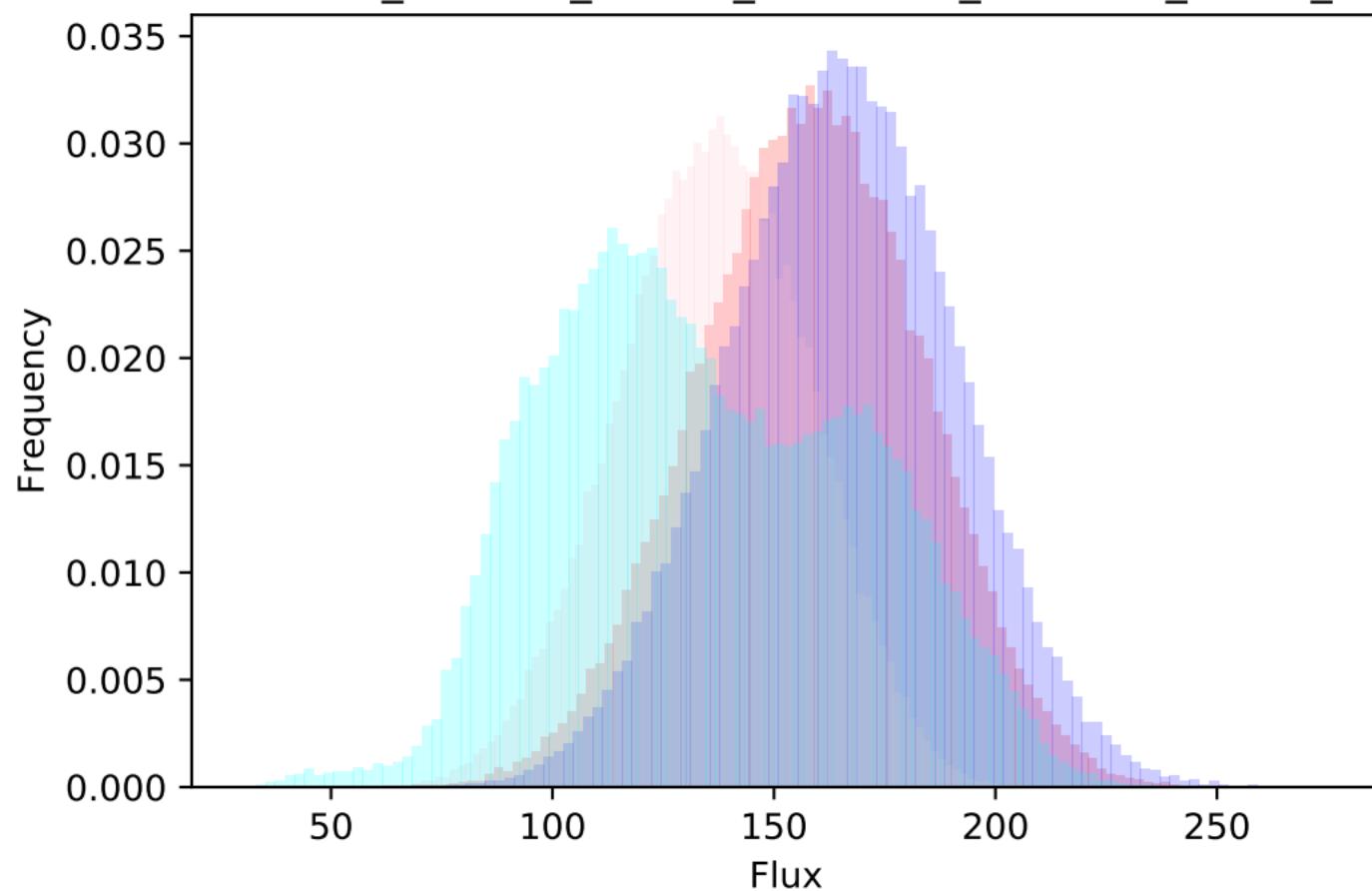
321:NO2_c --> NO2_h



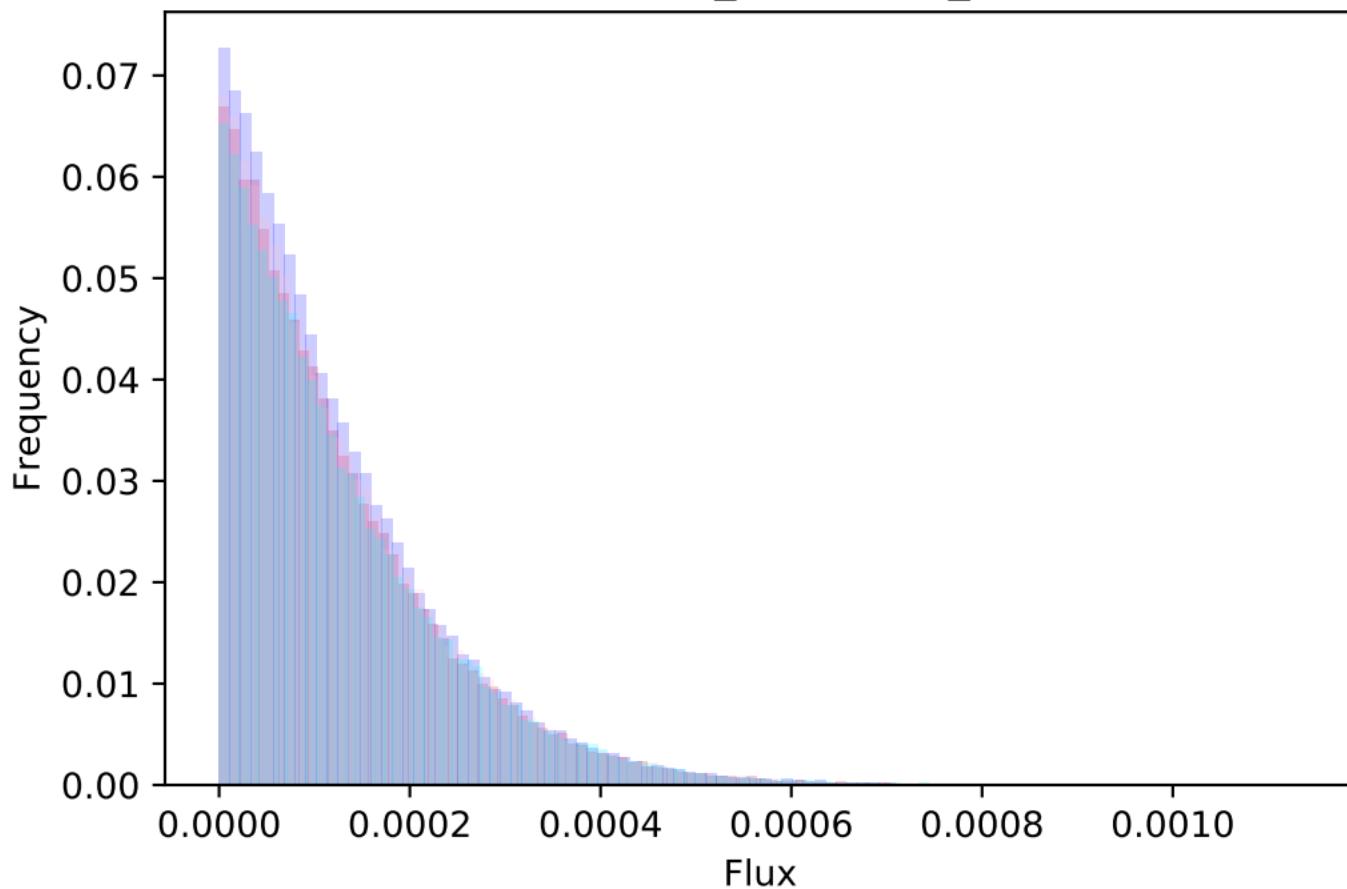
322:ADP_h + ATP_c + Pi_h --> ADP_c + ATP_h + Pi_c



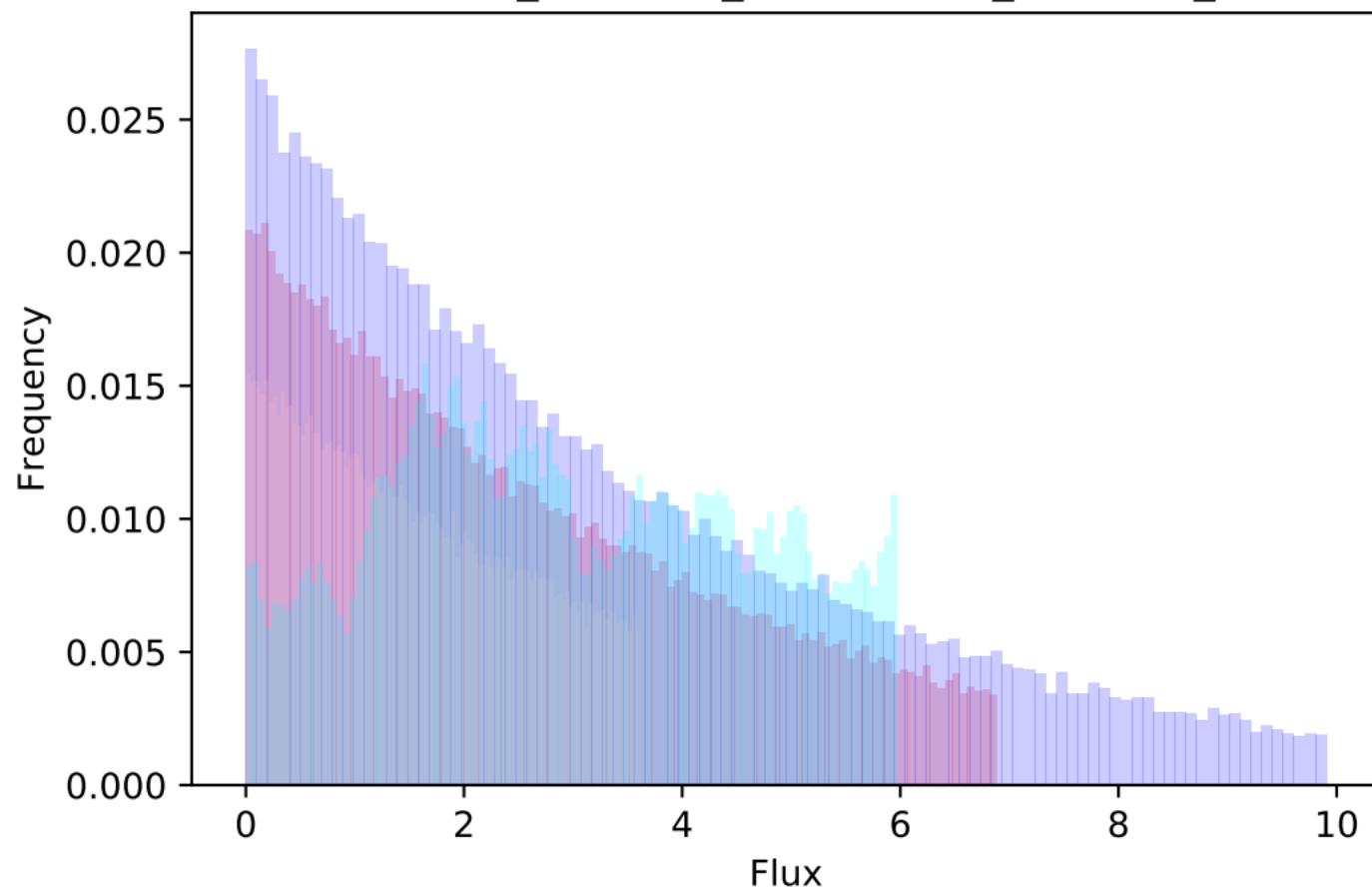
323:ADP_c + ATP_m + Pi_c --> ADP_m + ATP_c + Pi_m



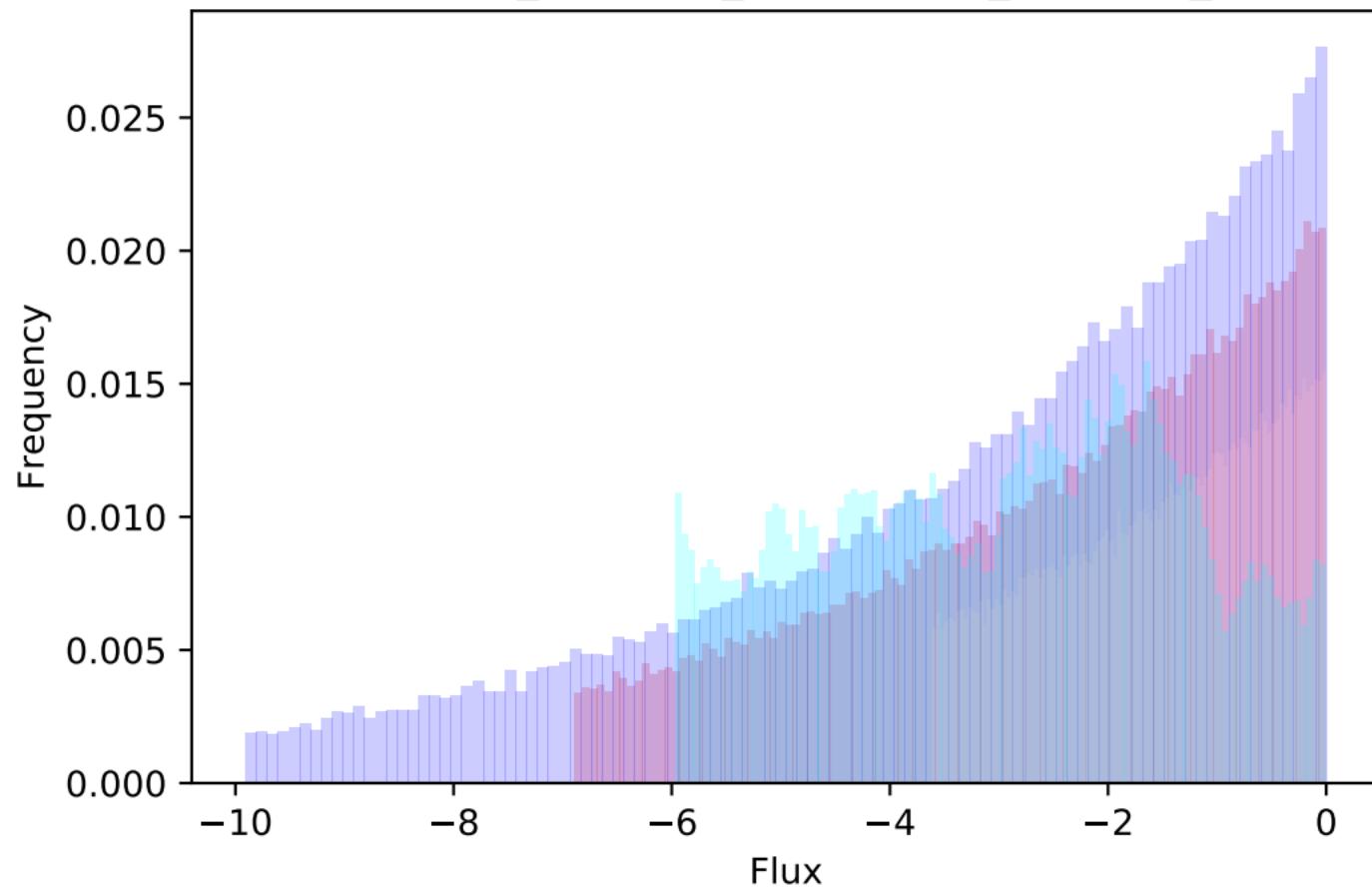
324:AMP_h --> AMP_c



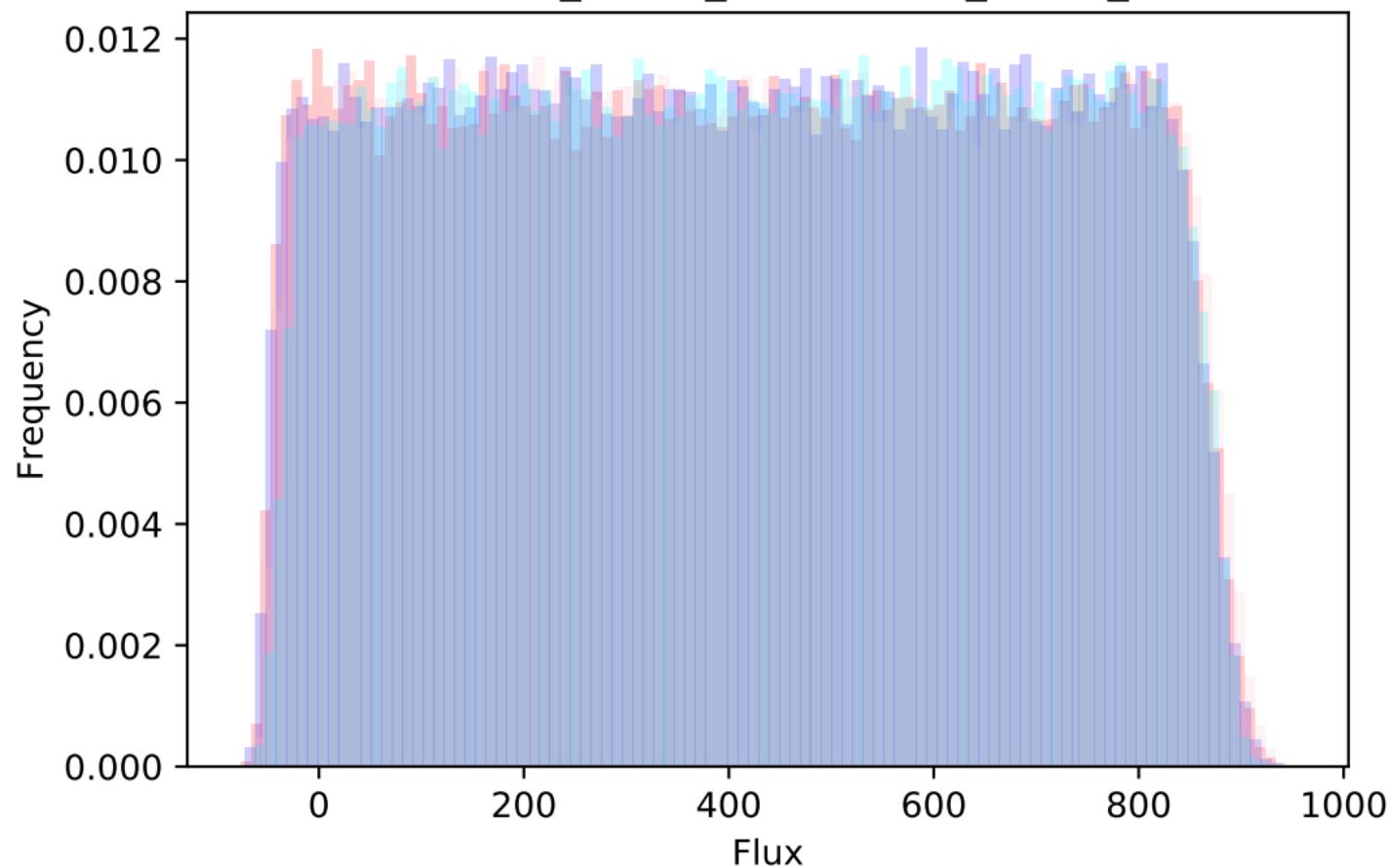
327:AMP_h + NAD_c <=> AMP_c + NAD_h



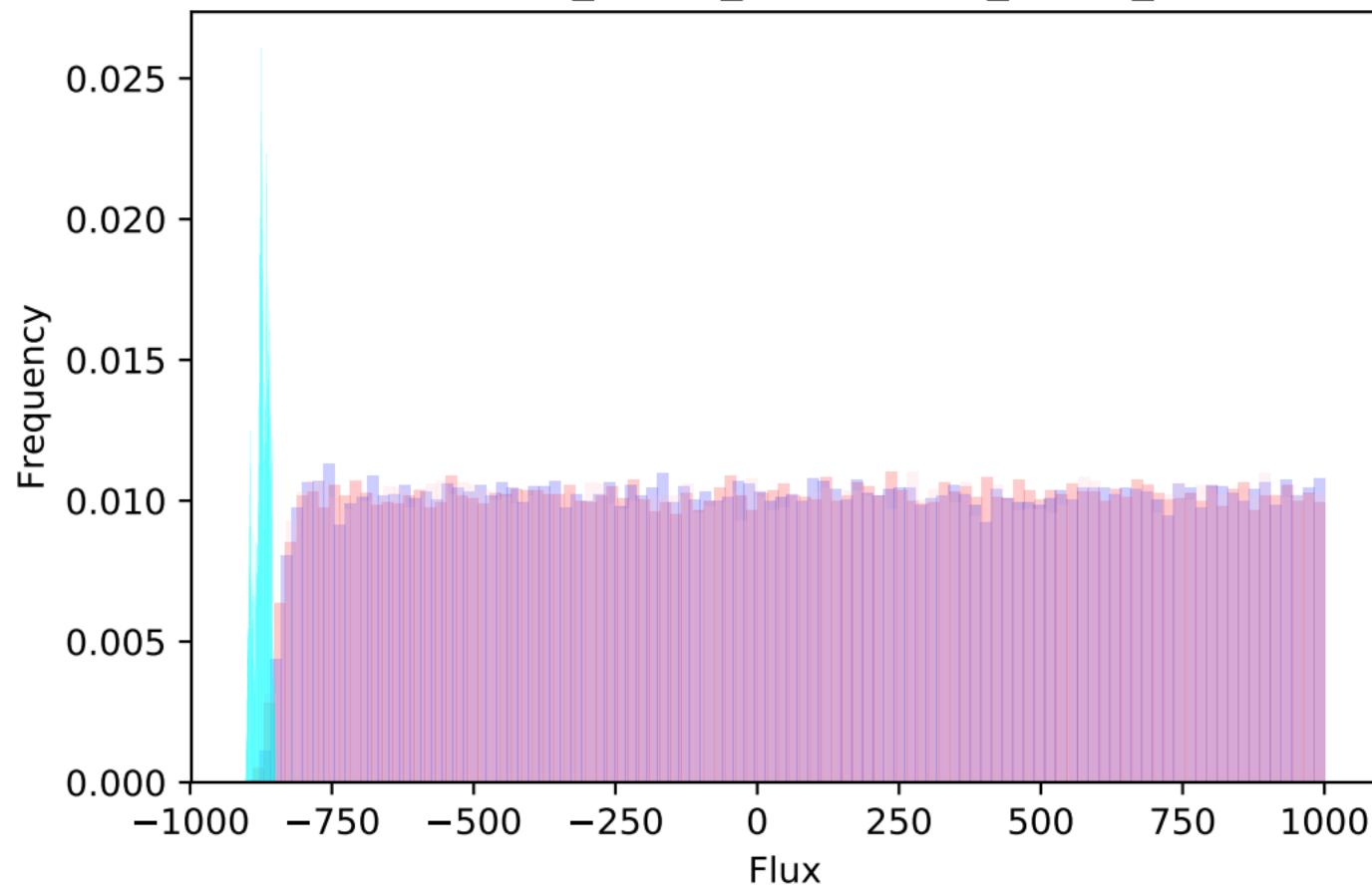
328:ADP_h + NAD_c <=> ADP_c + NAD_h



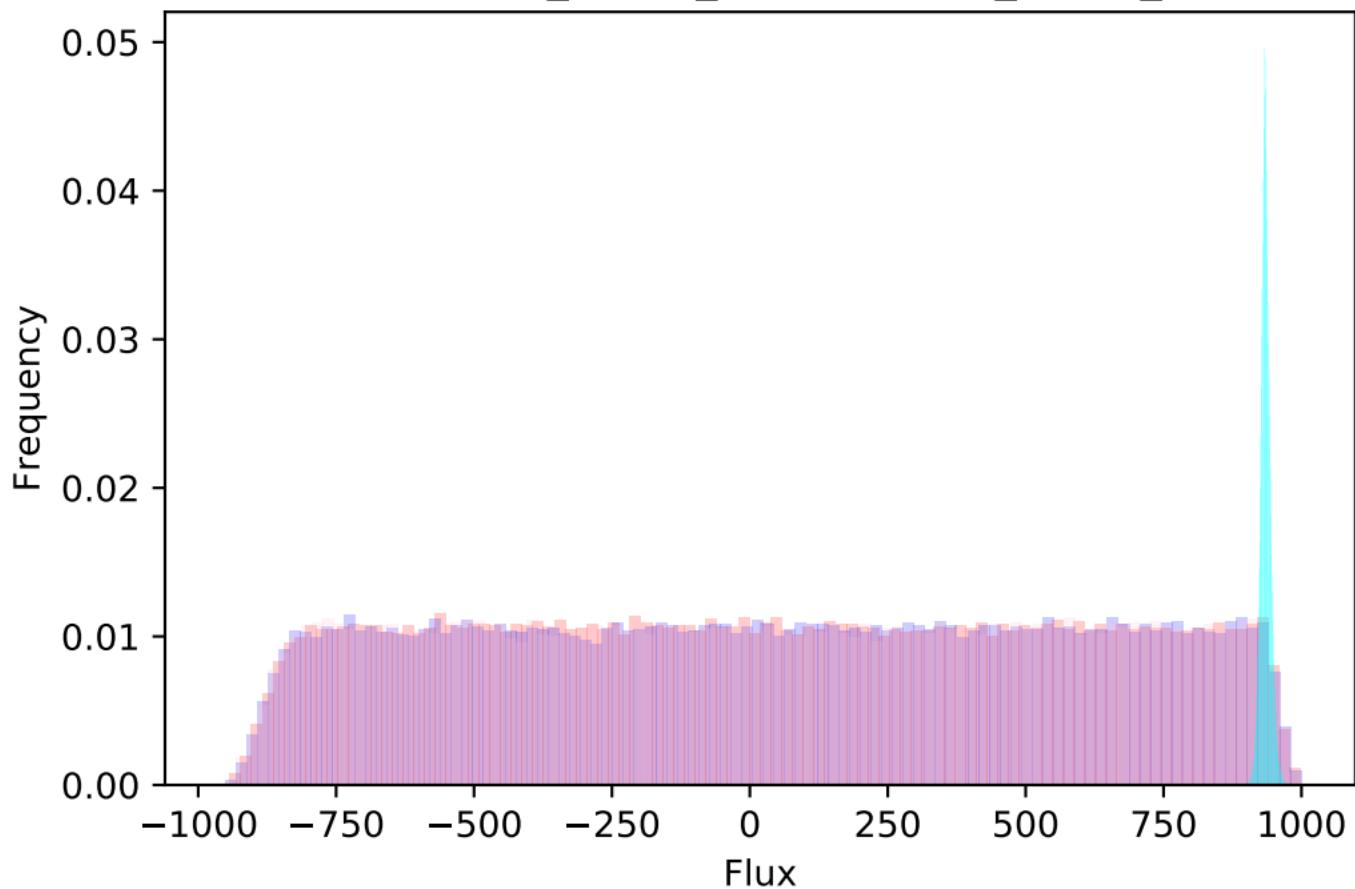
329:PGA_h + Pi_c <=> PGA_c + Pi_h



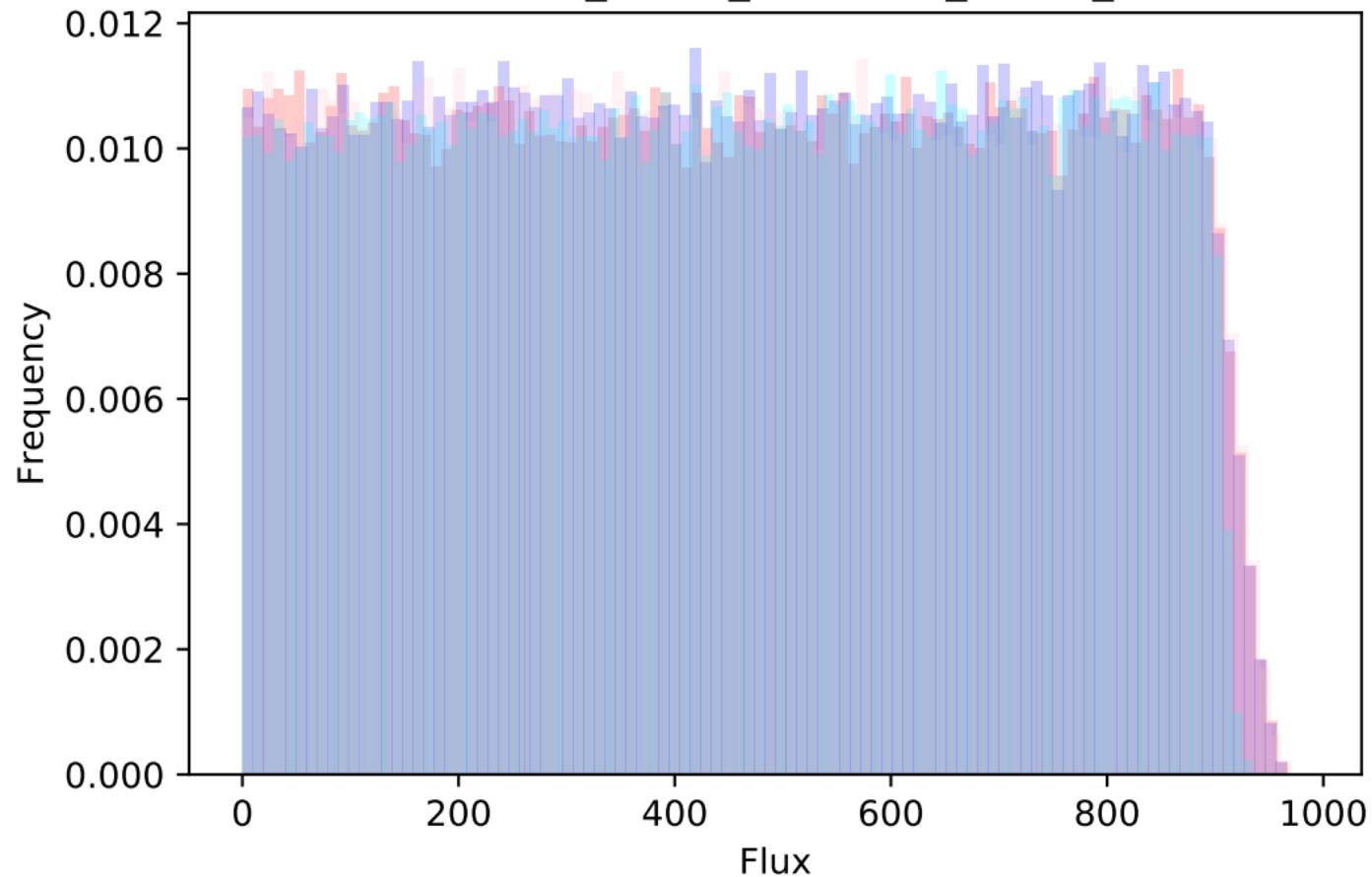
$330:\text{GAP_h} + \text{Pi_c} <=> \text{GAP_c} + \text{Pi_h}$



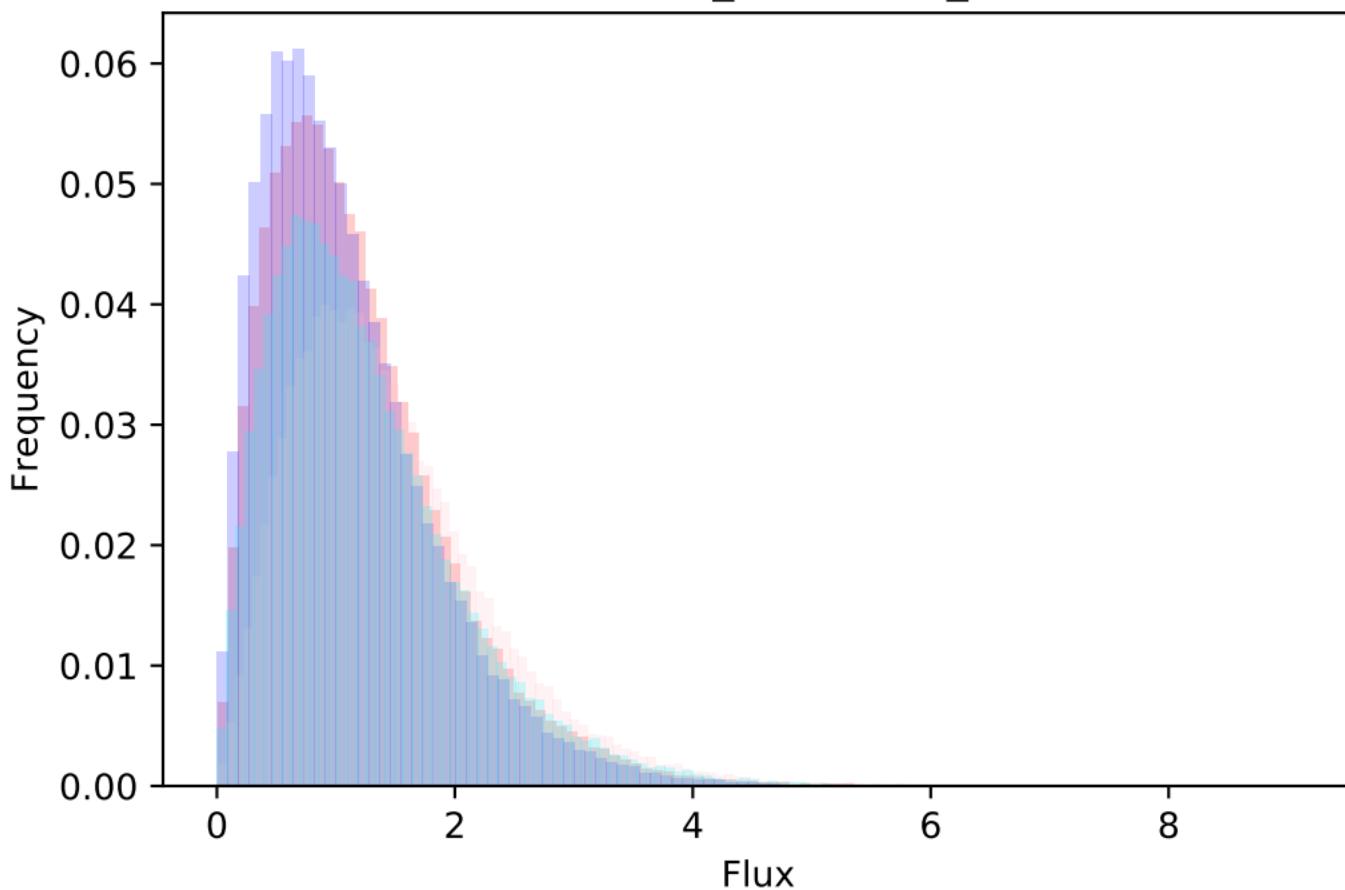
331:DHAP_h + Pi_c <=> DHAP_c + Pi_h



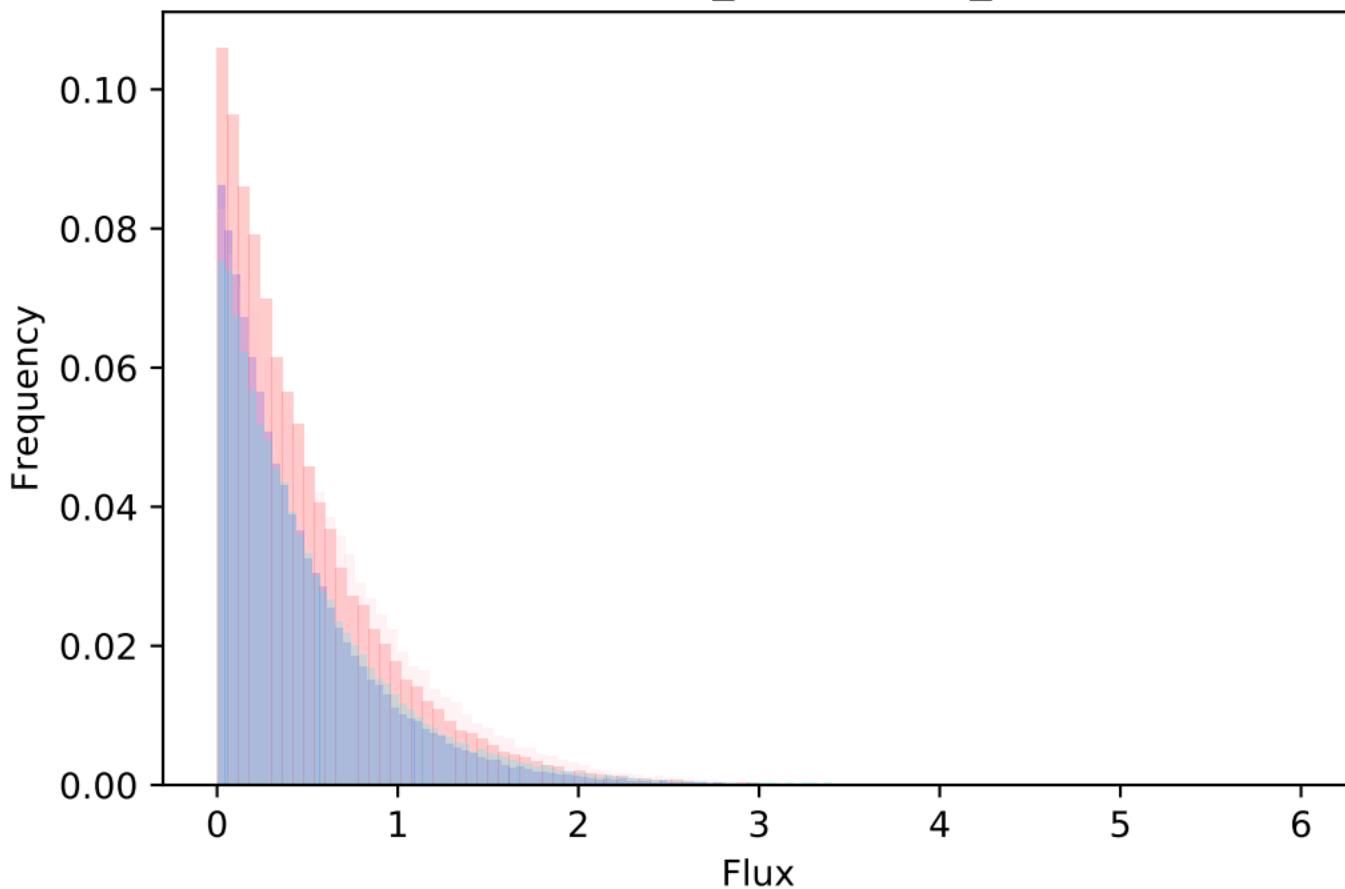
332:PEP_c + Pi_h --> PEP_h + Pi_c

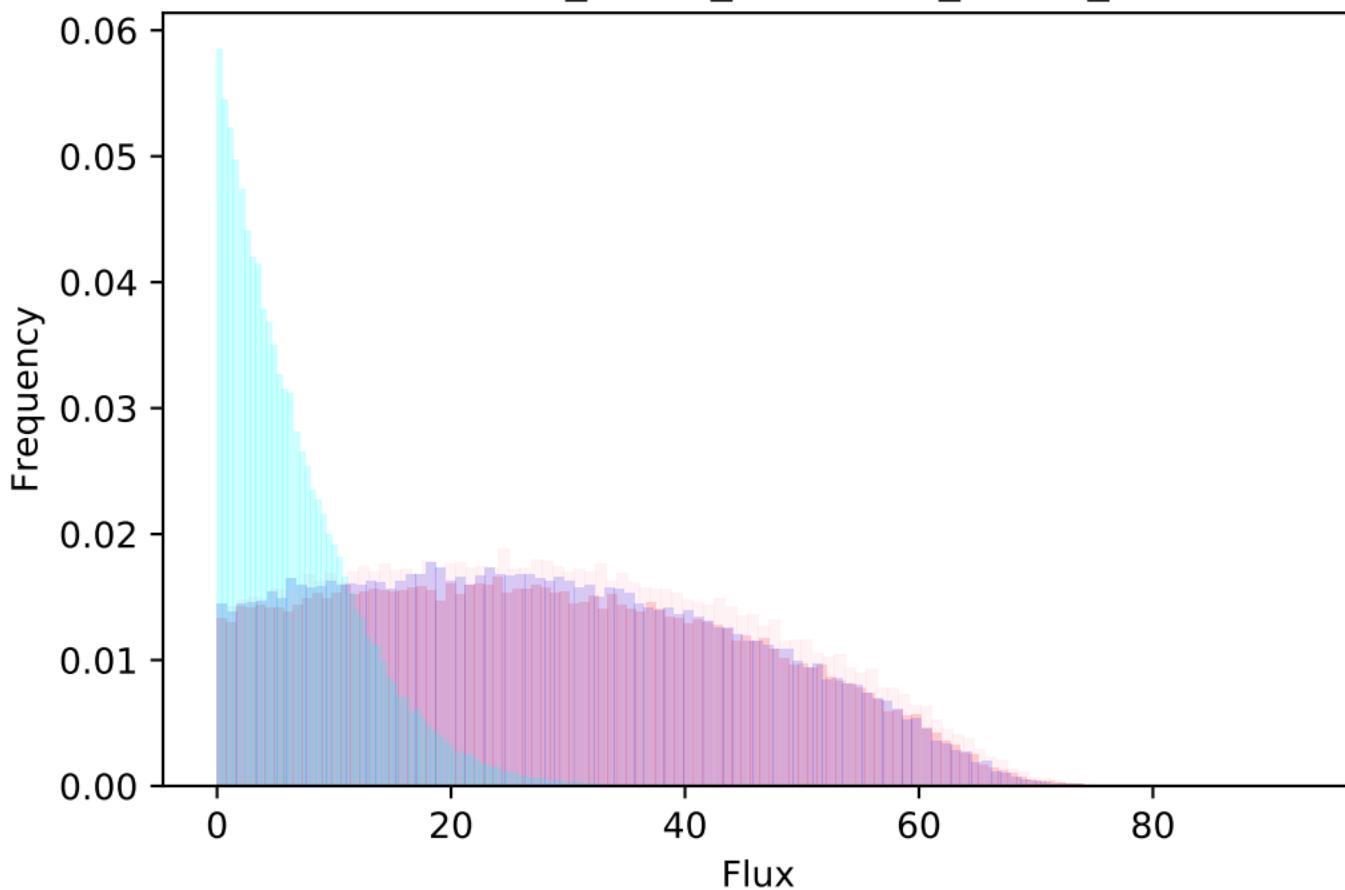
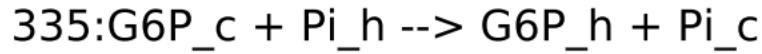


333:GCA_h --> GCA_c

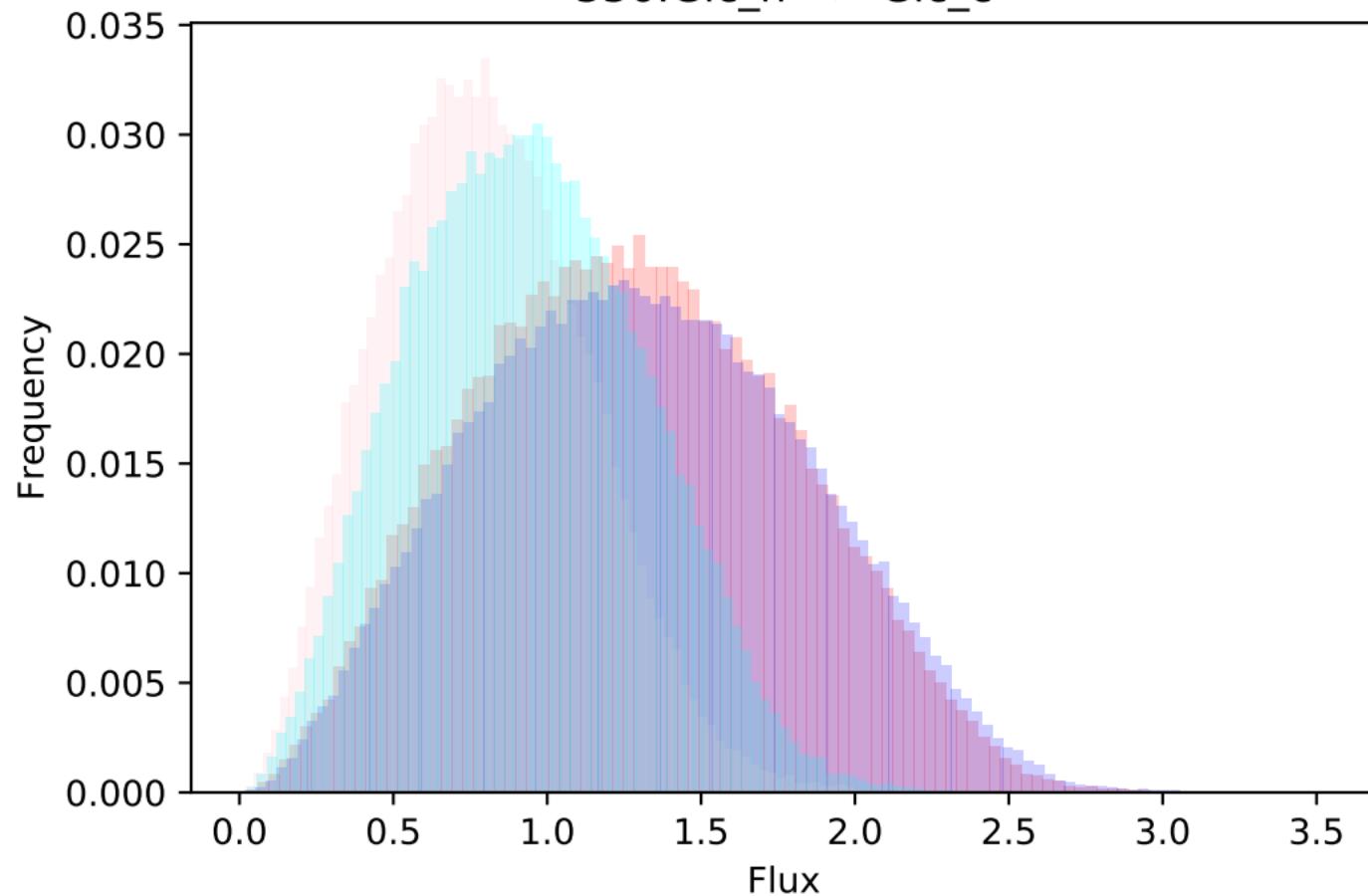


334:GCEA_c --> GCEA_h

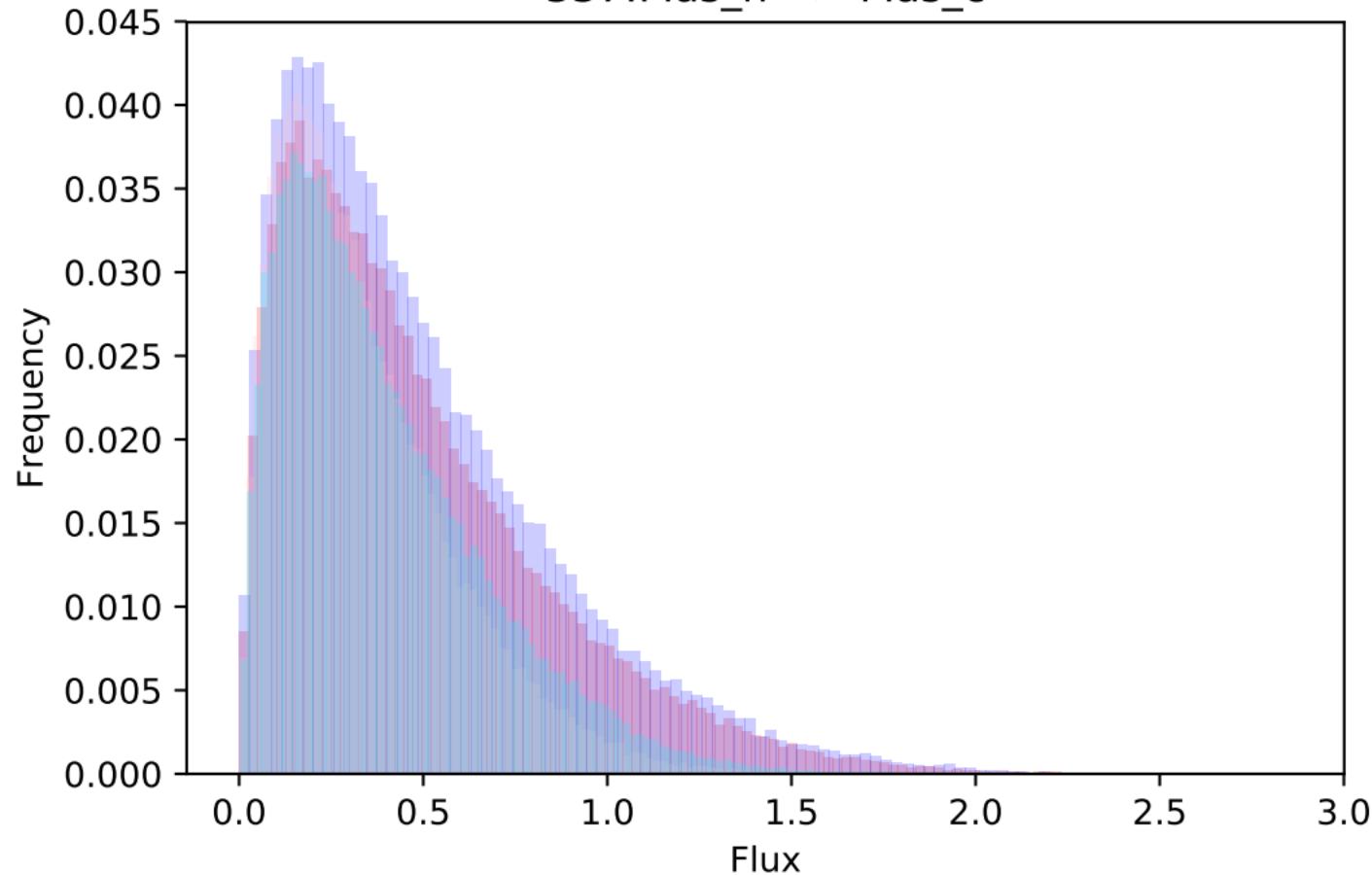




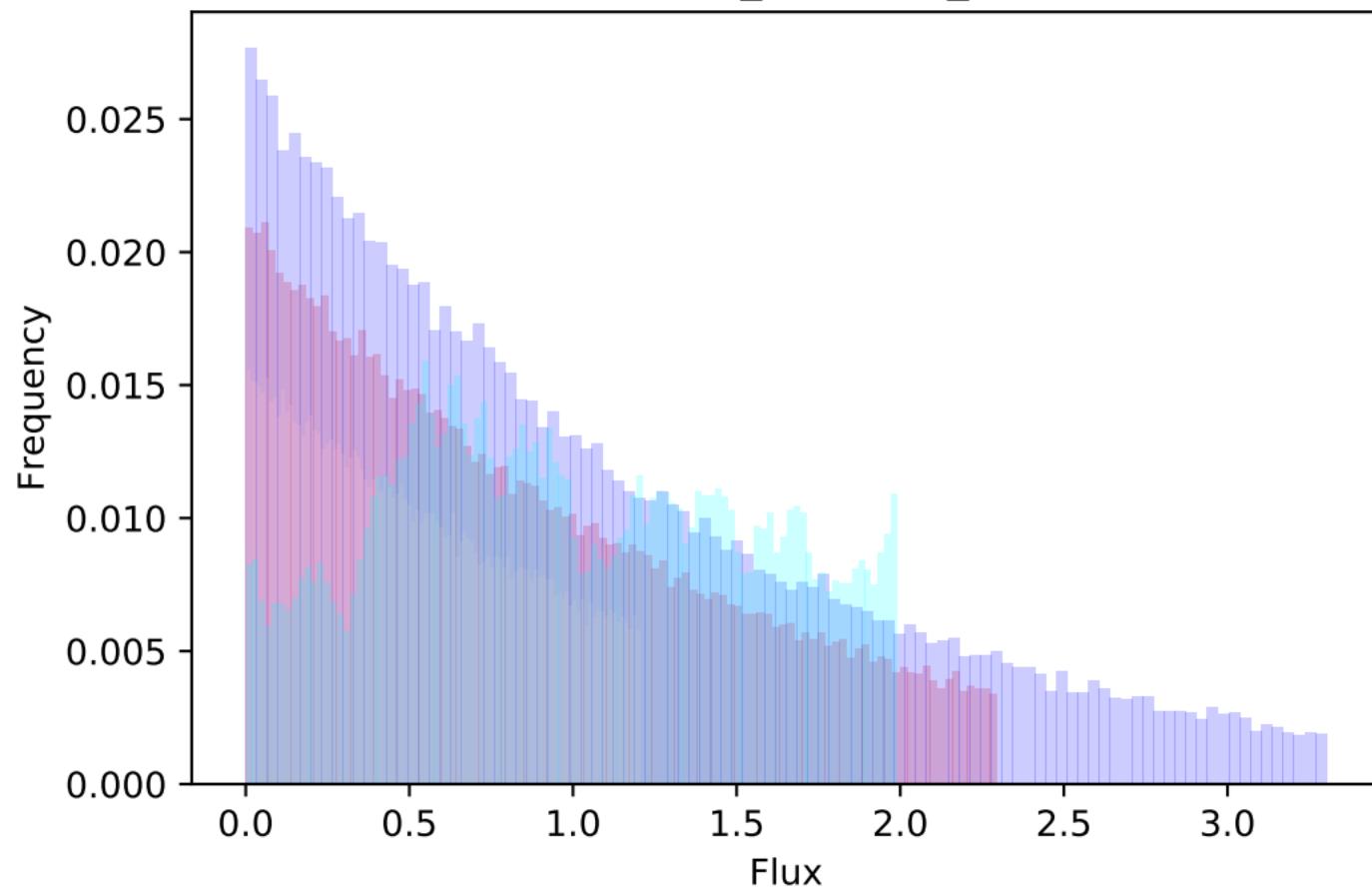
336:Glc_h --> Glc_c



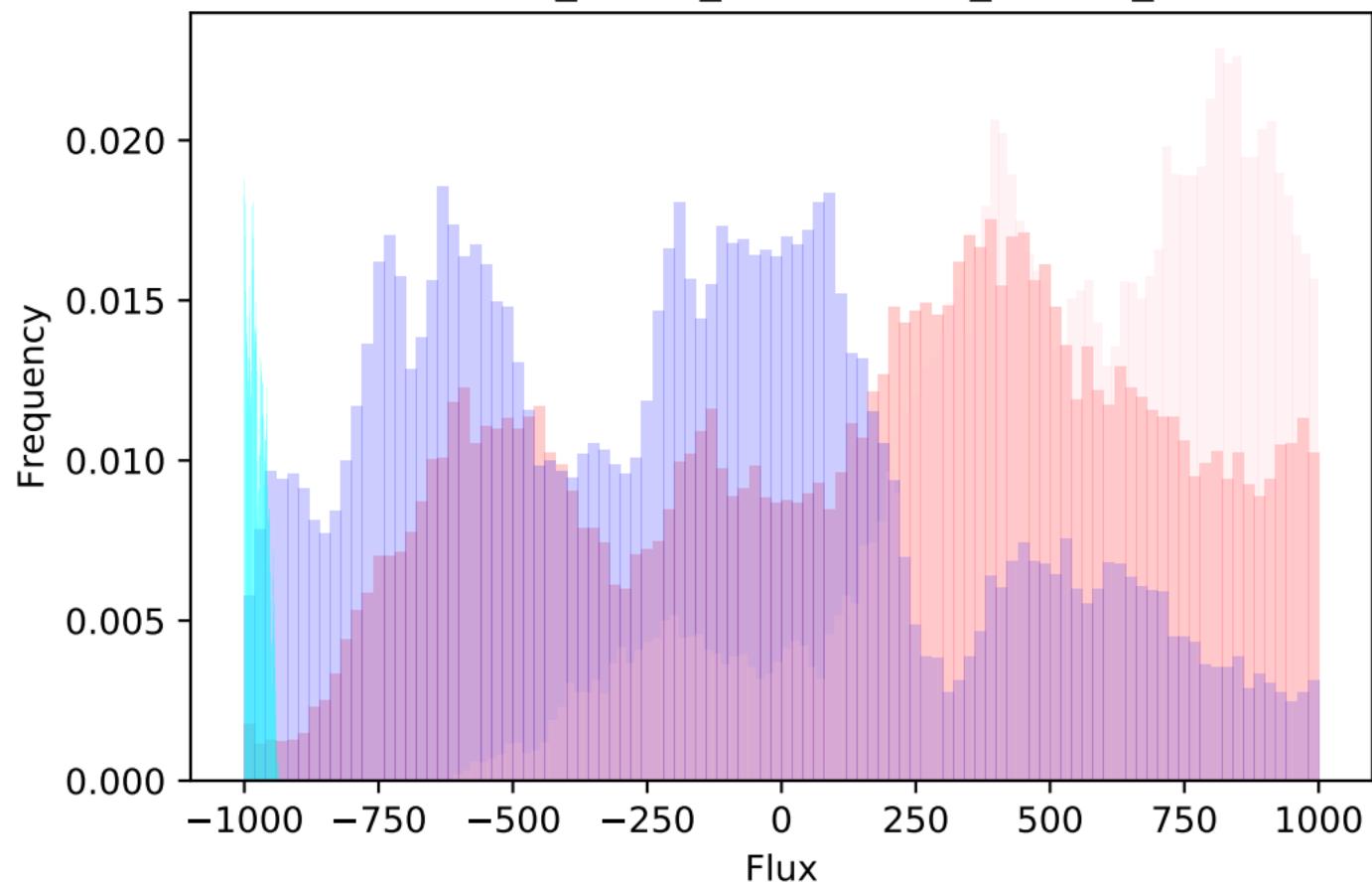
337:Mas_h --> Mas_c



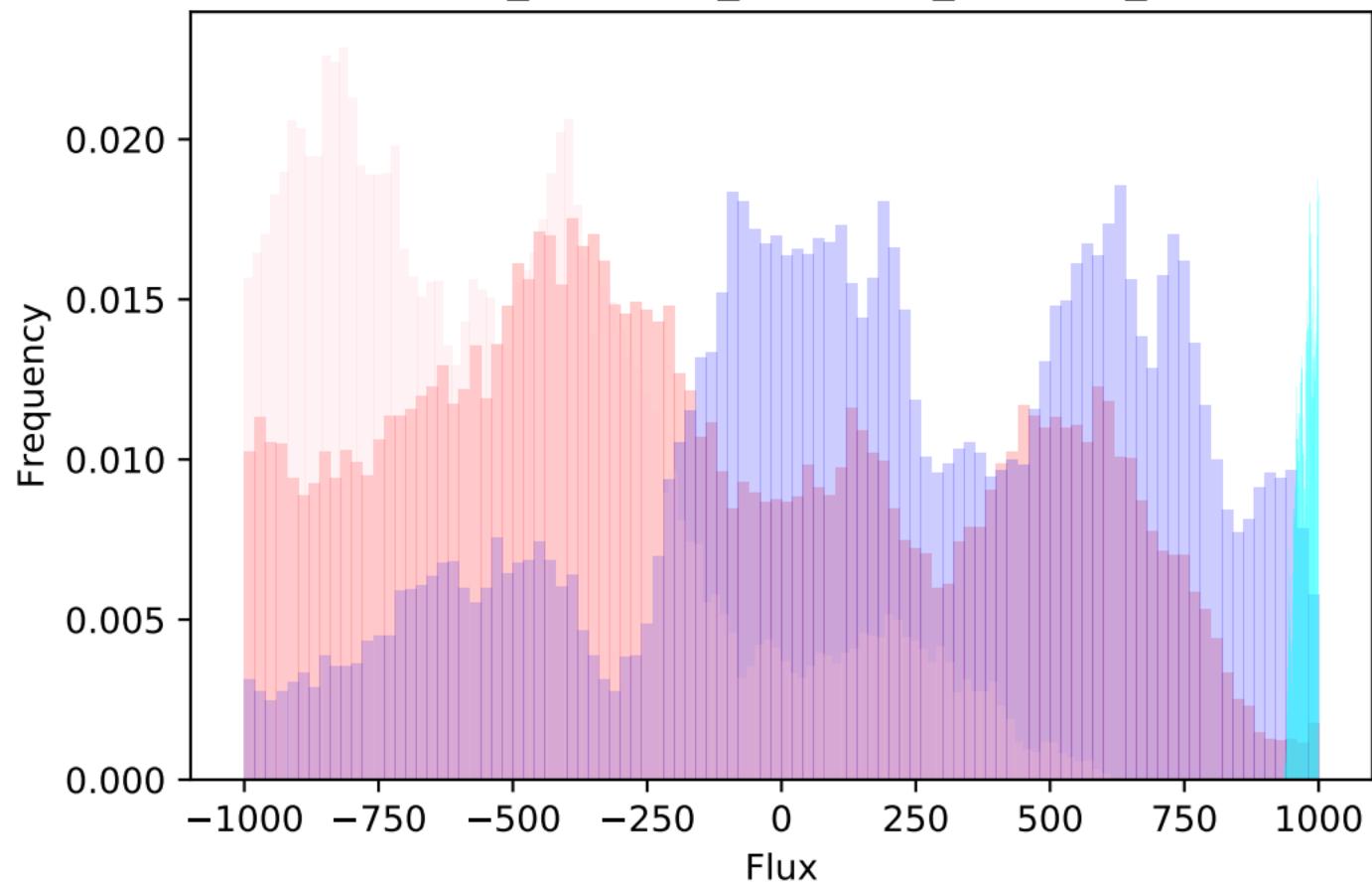
338:Rib_c --> Rib_h



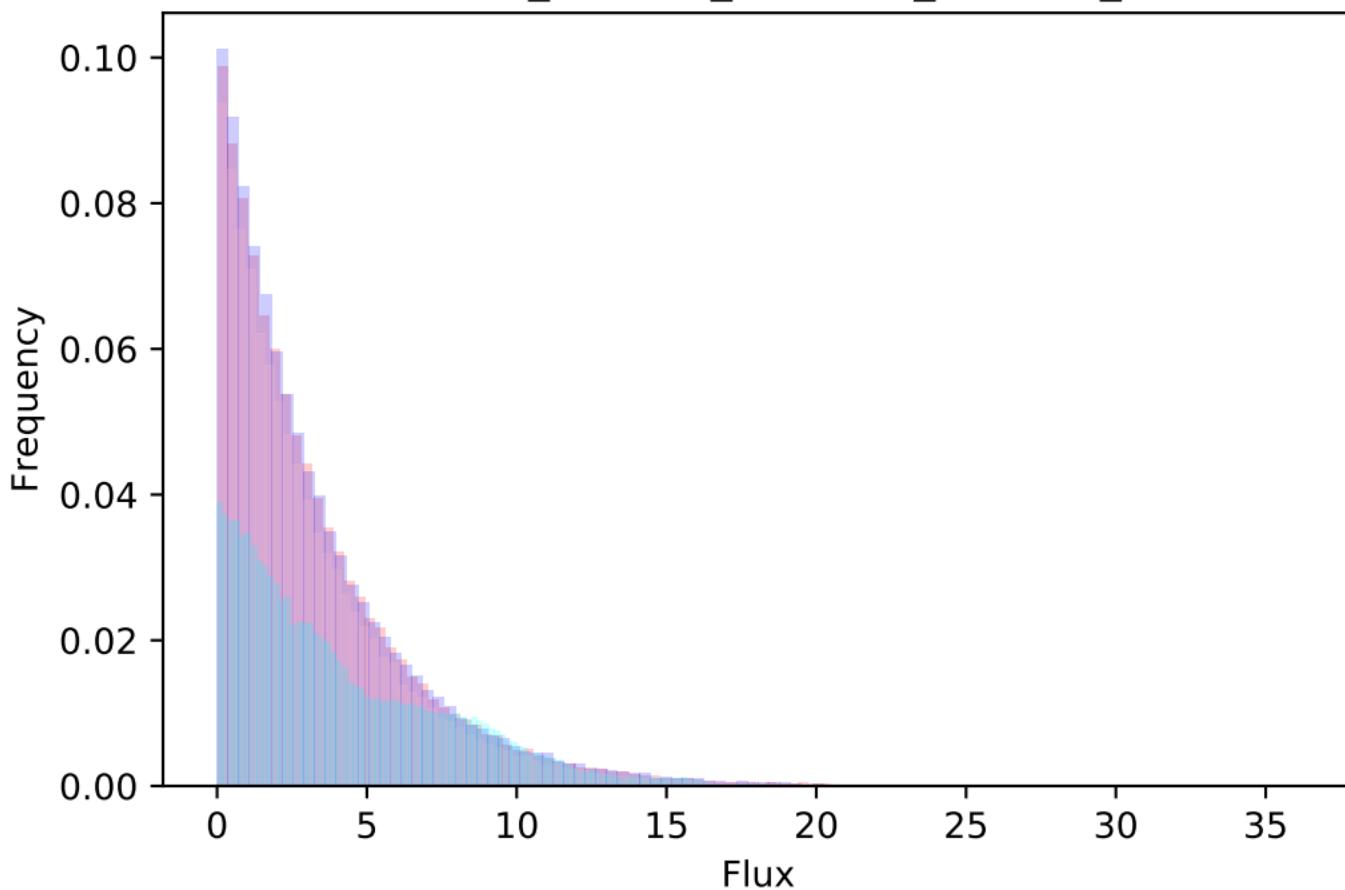
339:Mal_c + Pi_m \rightleftharpoons Mal_m + Pi_c



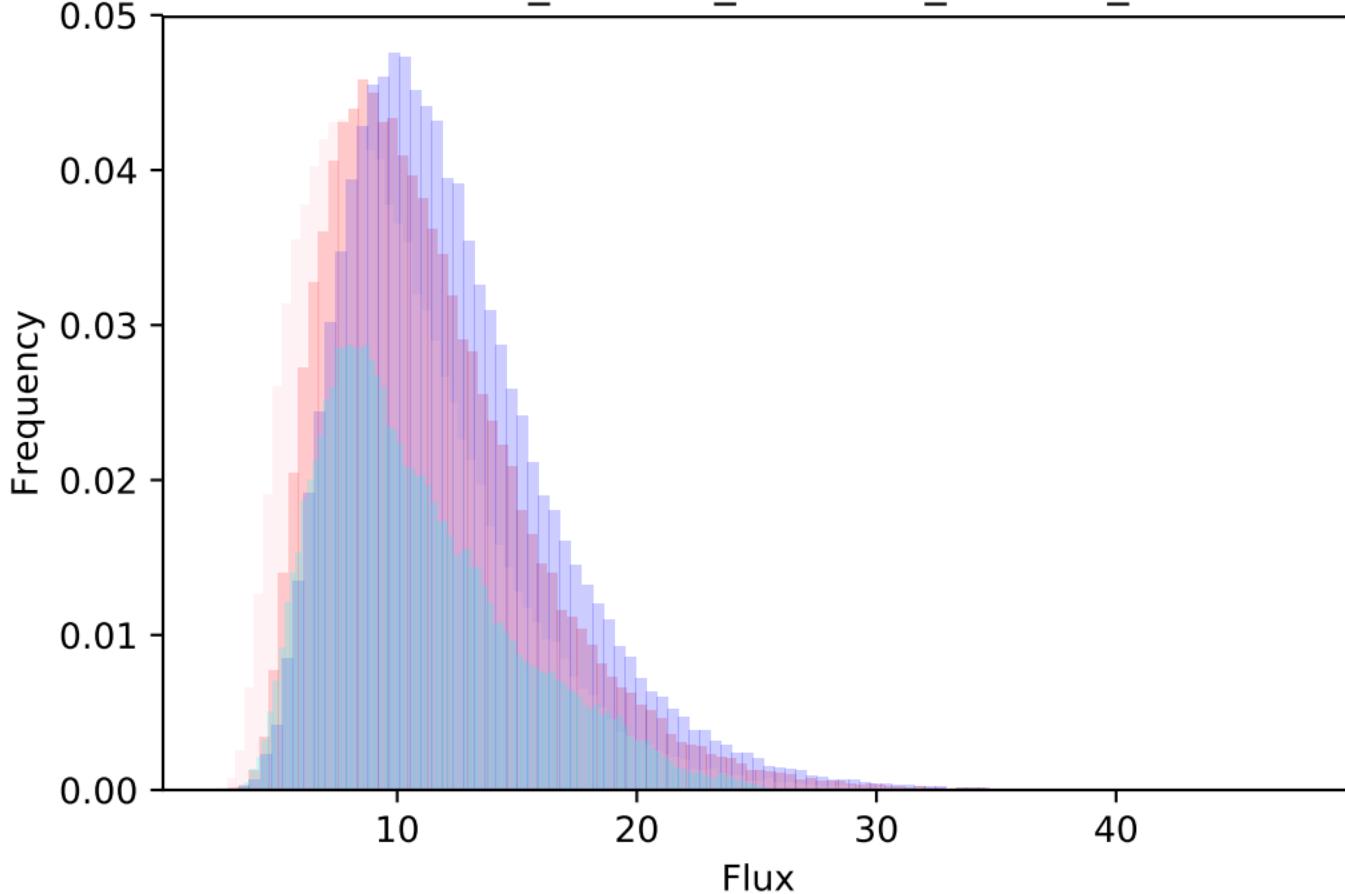
340: $\text{Pi}_m + \text{SCA}_c \rightleftharpoons \text{Pi}_c + \text{SCA}_m$



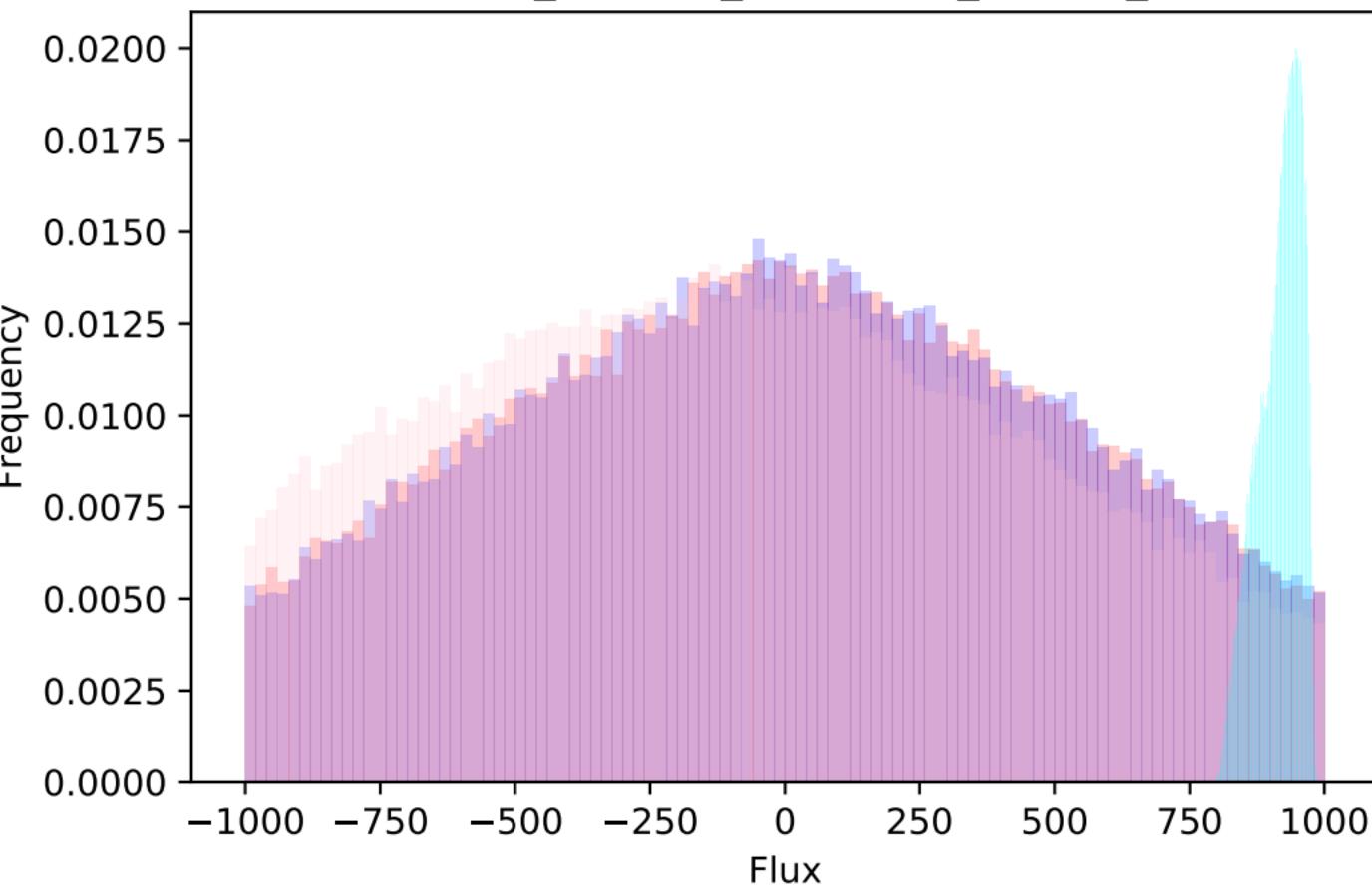
341:KG_c + Mal_h --> KG_h + Mal_c



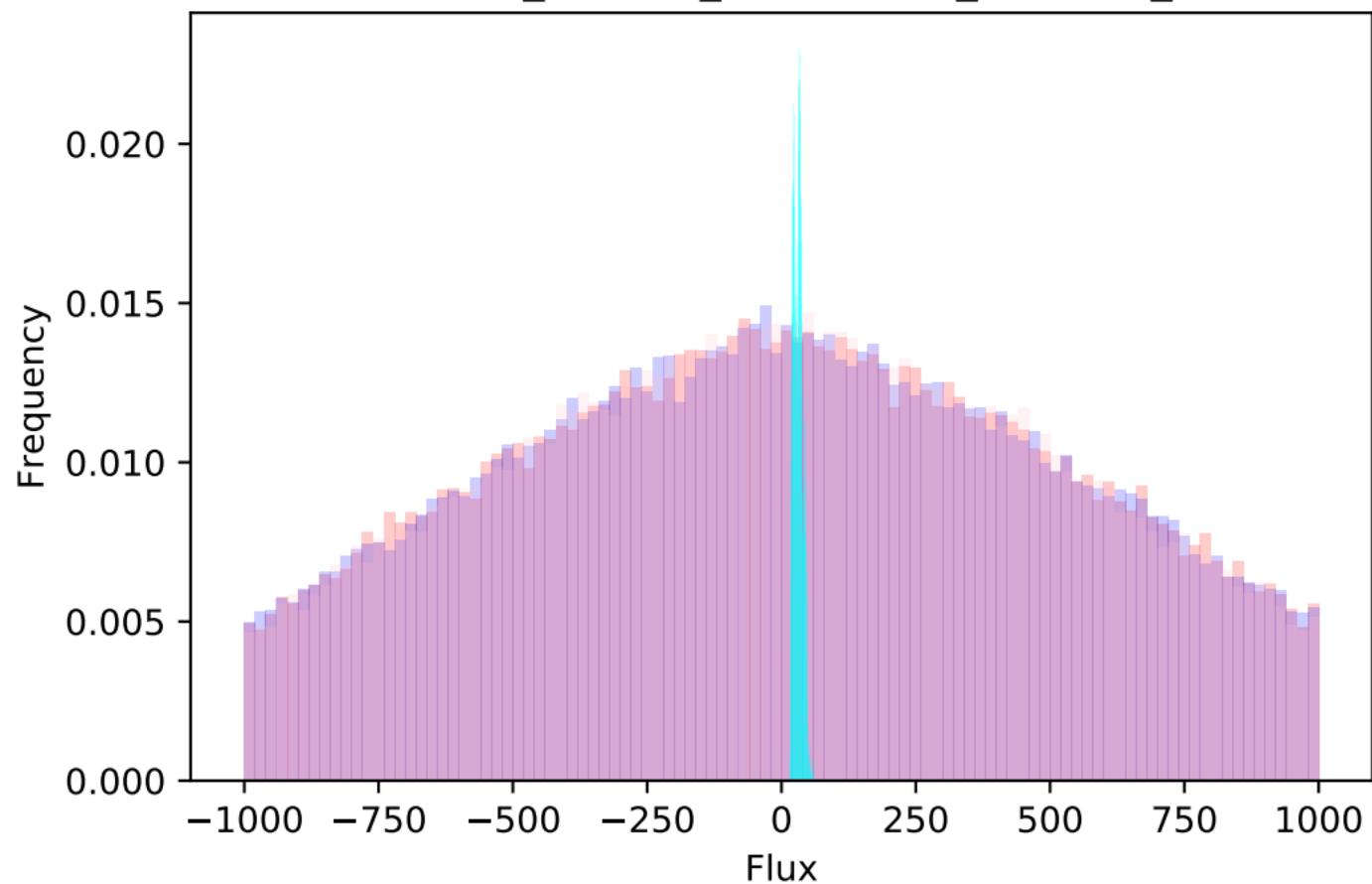
342:Glu_h + Mal_c \rightarrow Glu_c + Mal_h



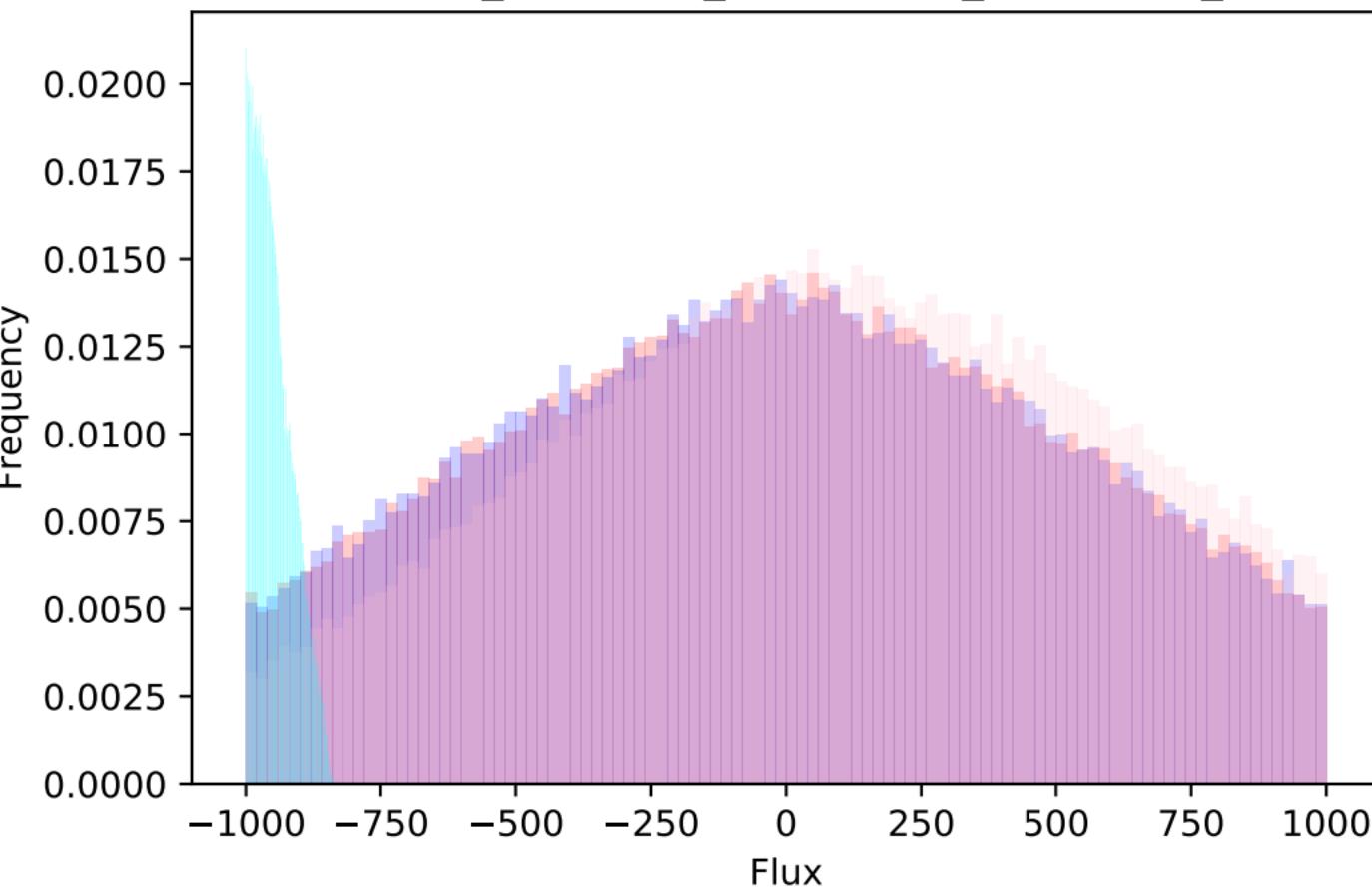
343:Cit_m + KG_c <=> Cit_c + KG_m



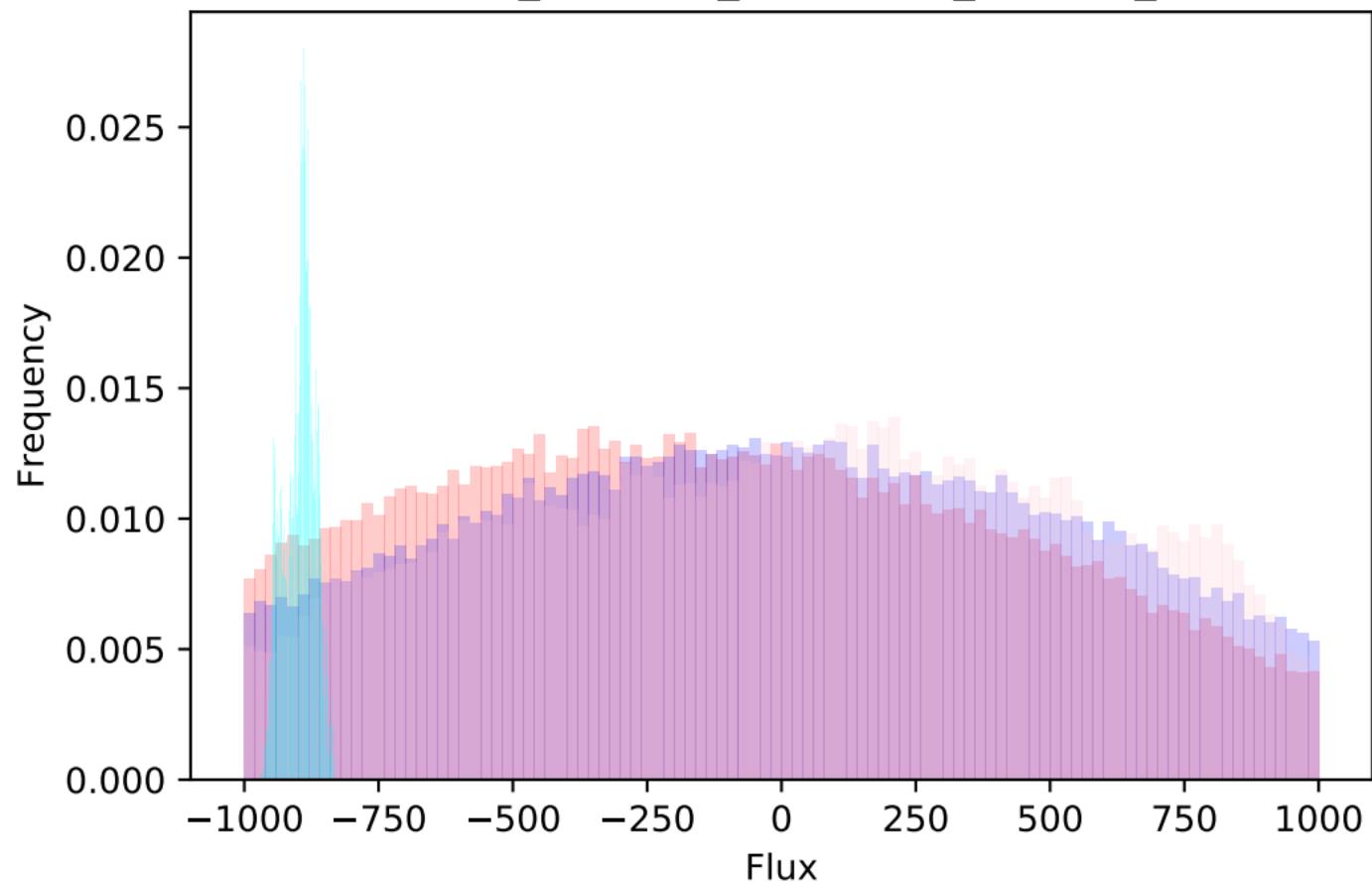
344:KG_c + iCit_m <=> KG_m + iCit_c



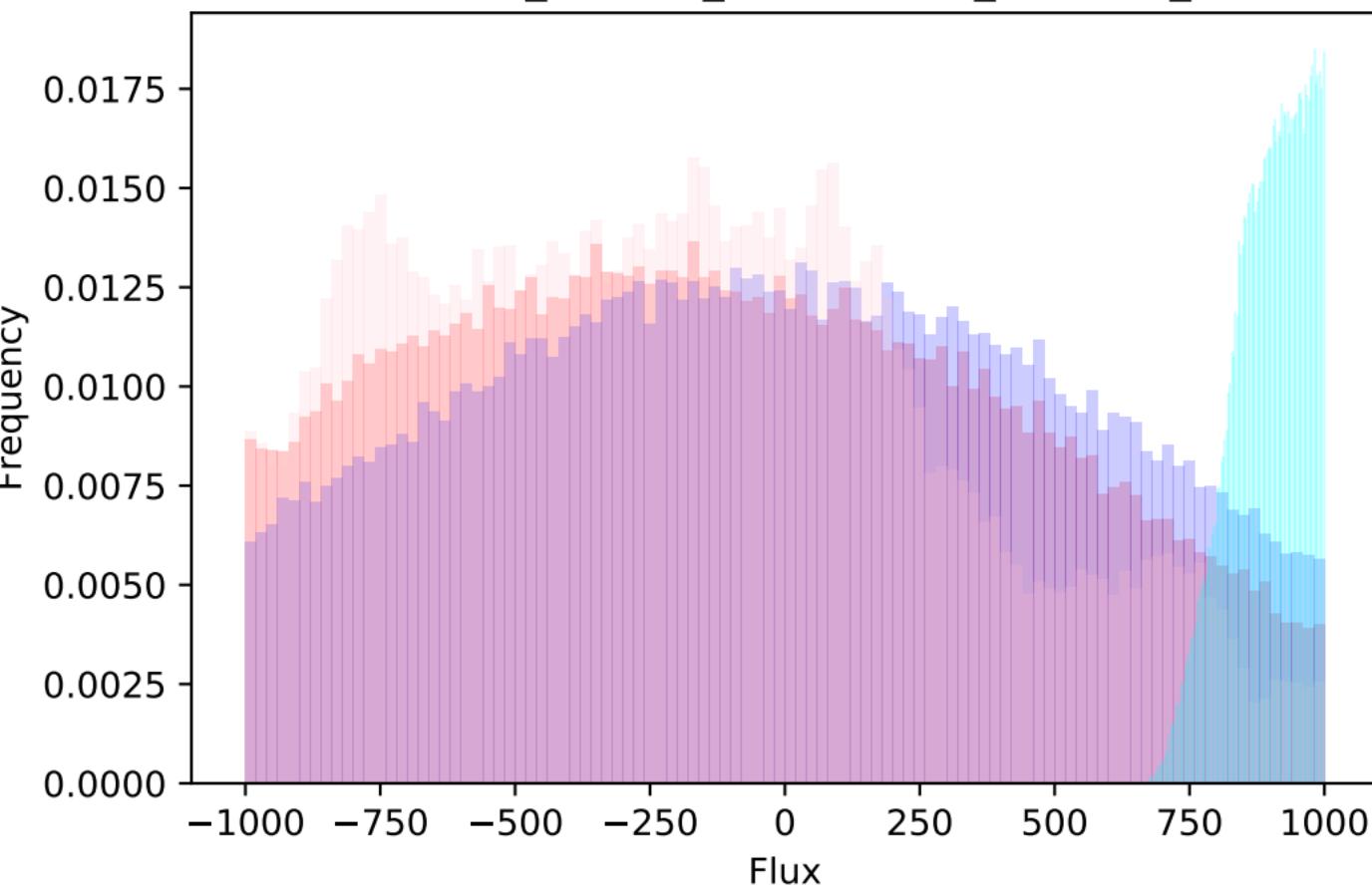
345:KG_c + cACN_m <=> KG_m + cACN_c



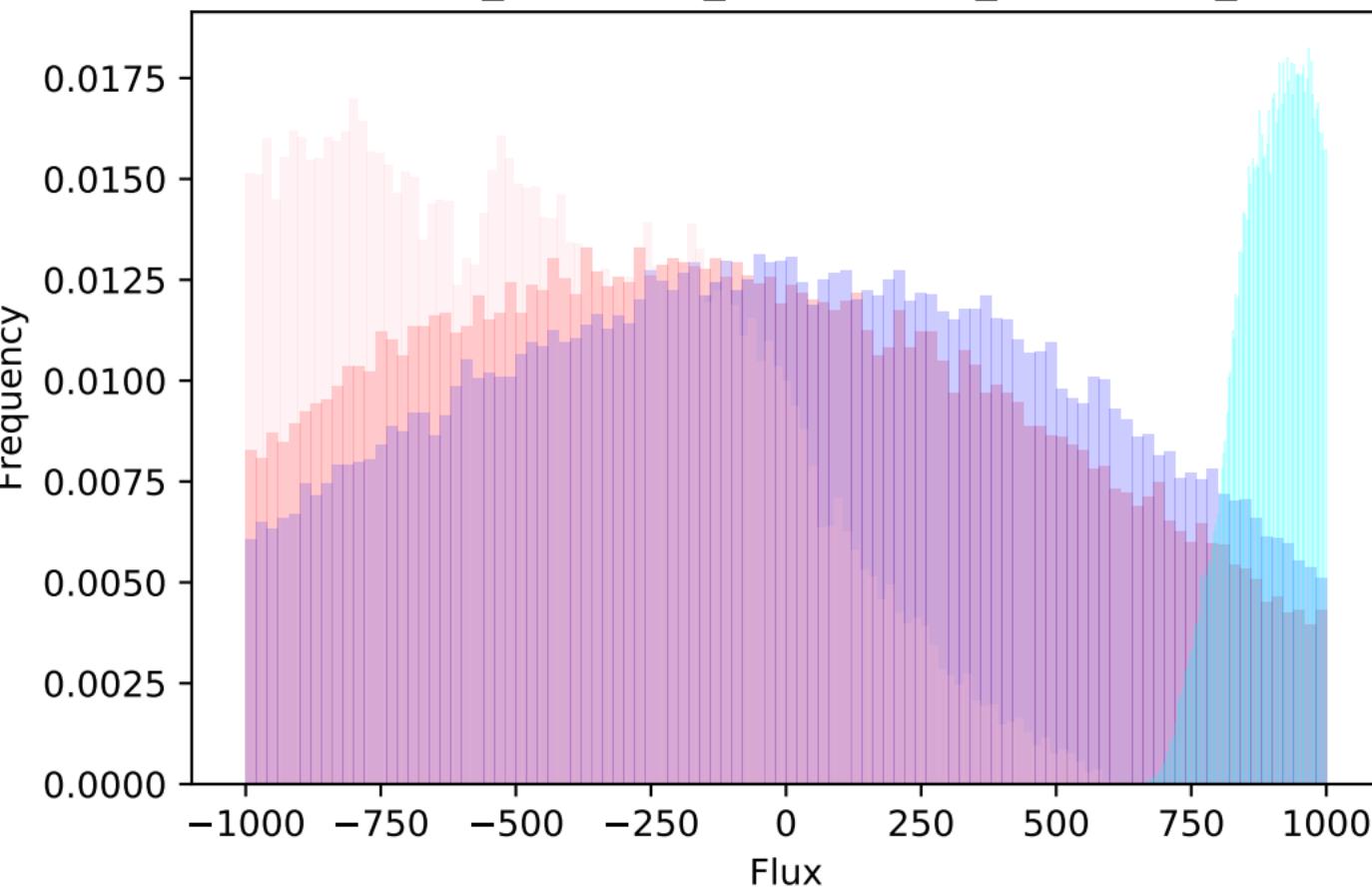
346:Cit_m + Mal_c <=> Cit_c + Mal_m



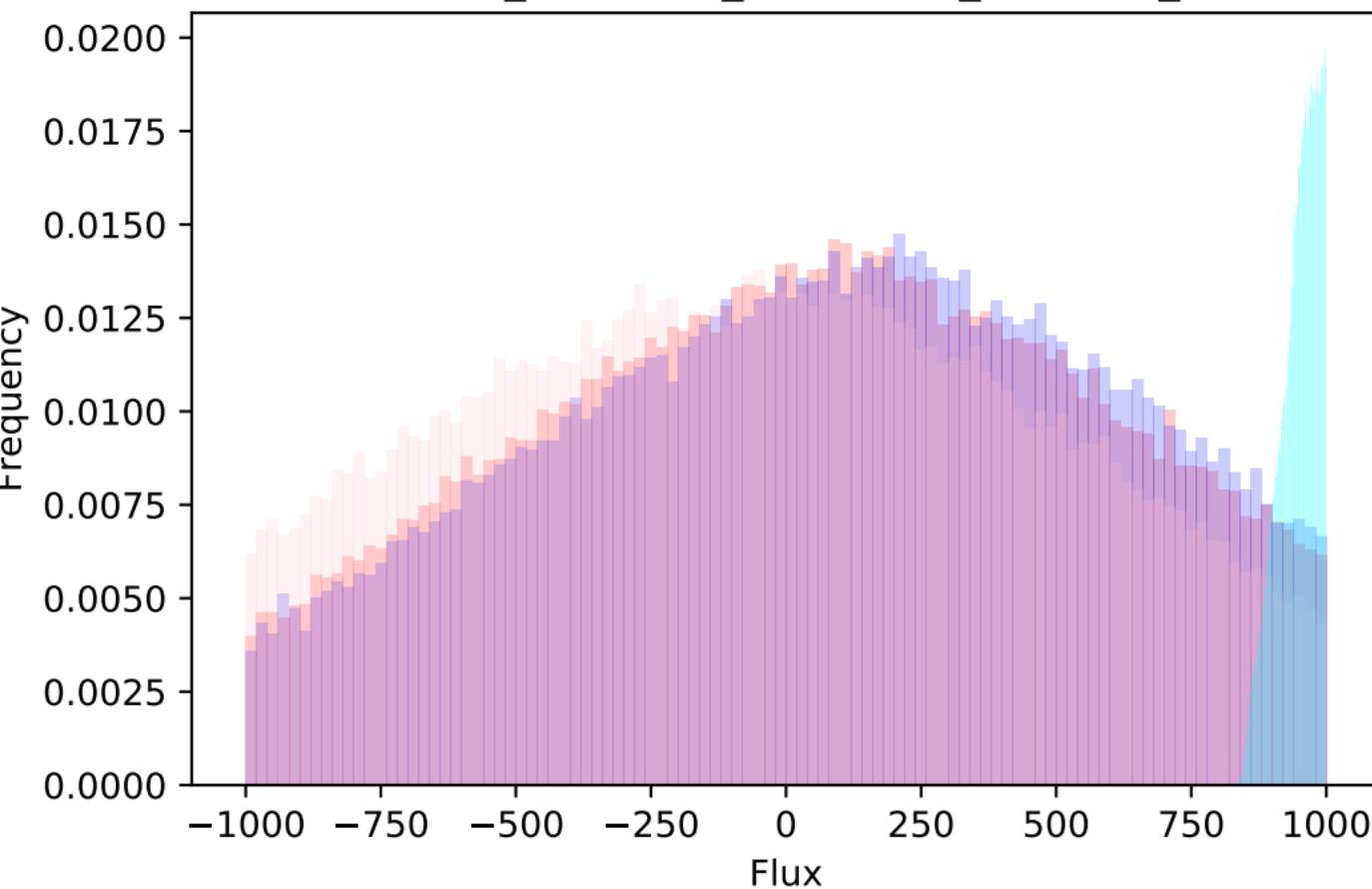
347:Mal_c + iCit_m <=> Mal_m + iCit_c



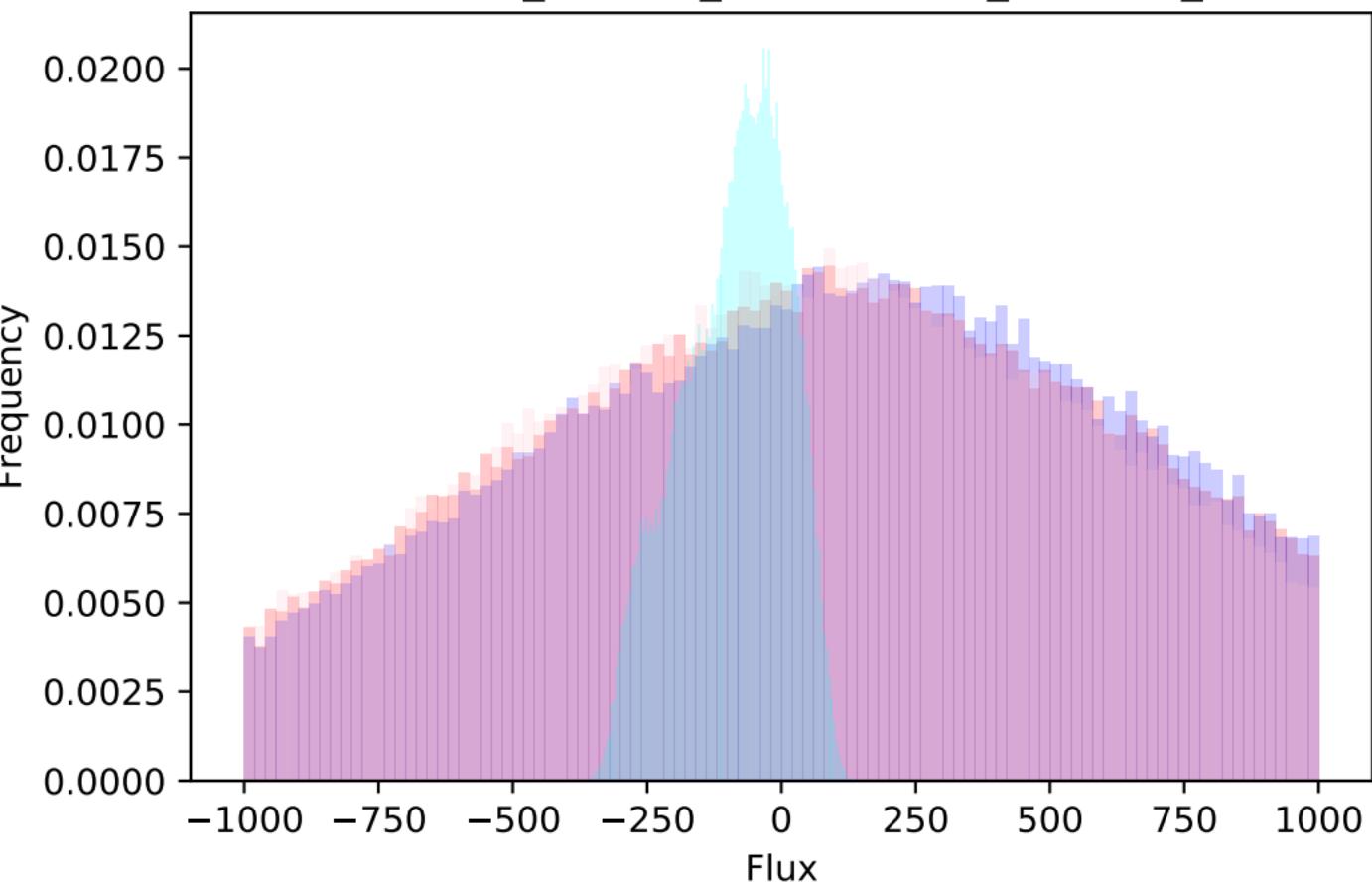
348:Mal_c + cACN_m <=> Mal_m + cACN_c



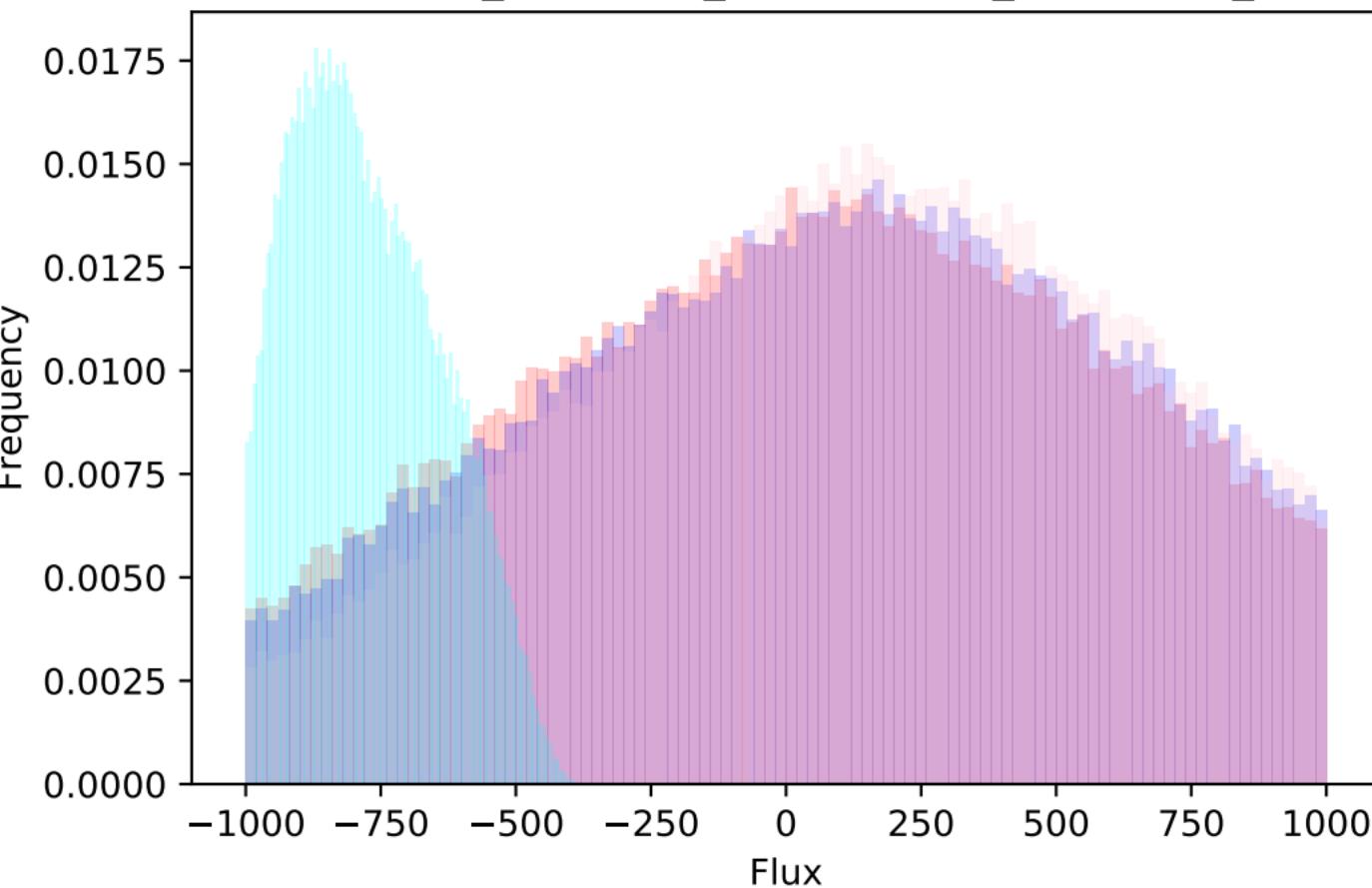
349:Cit_m + OAA_c <=> Cit_c + OAA_m



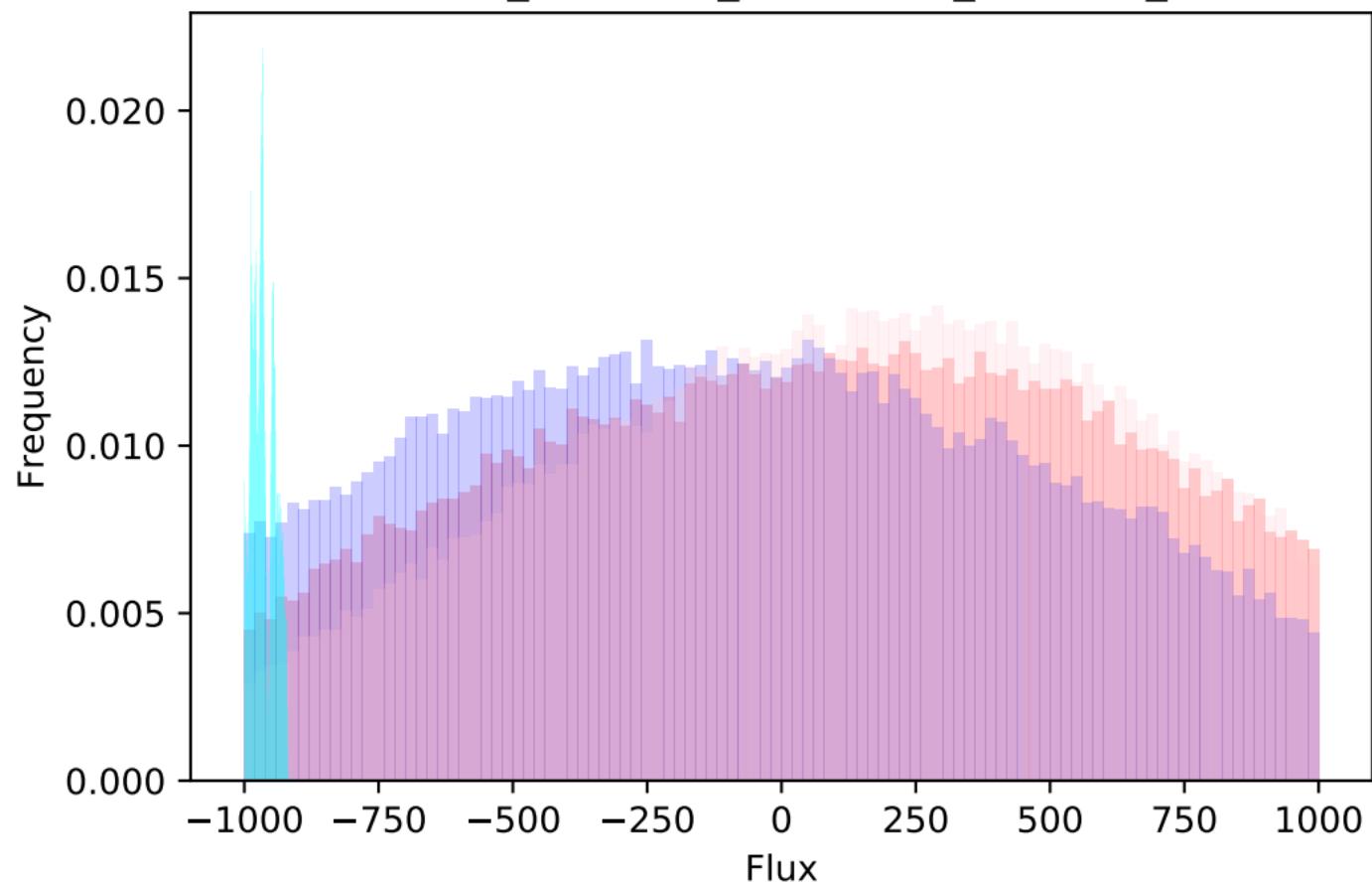
$350:\text{OAA_c} + \text{iCit_m} \rightleftharpoons \text{OAA_m} + \text{iCit_c}$



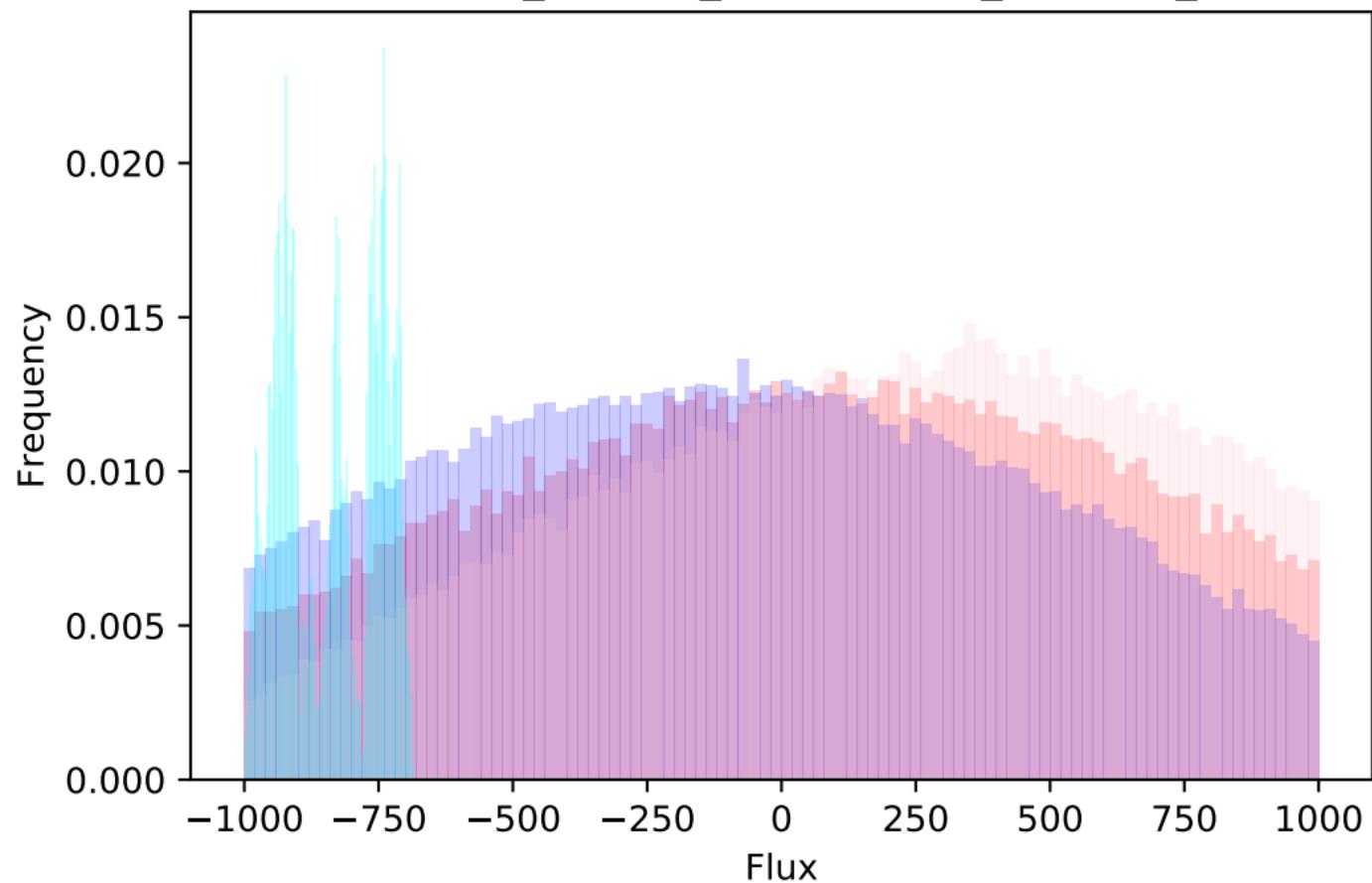
$351:\text{OAA_c} + \text{cACN_m} \rightleftharpoons \text{OAA_m} + \text{cACN_c}$



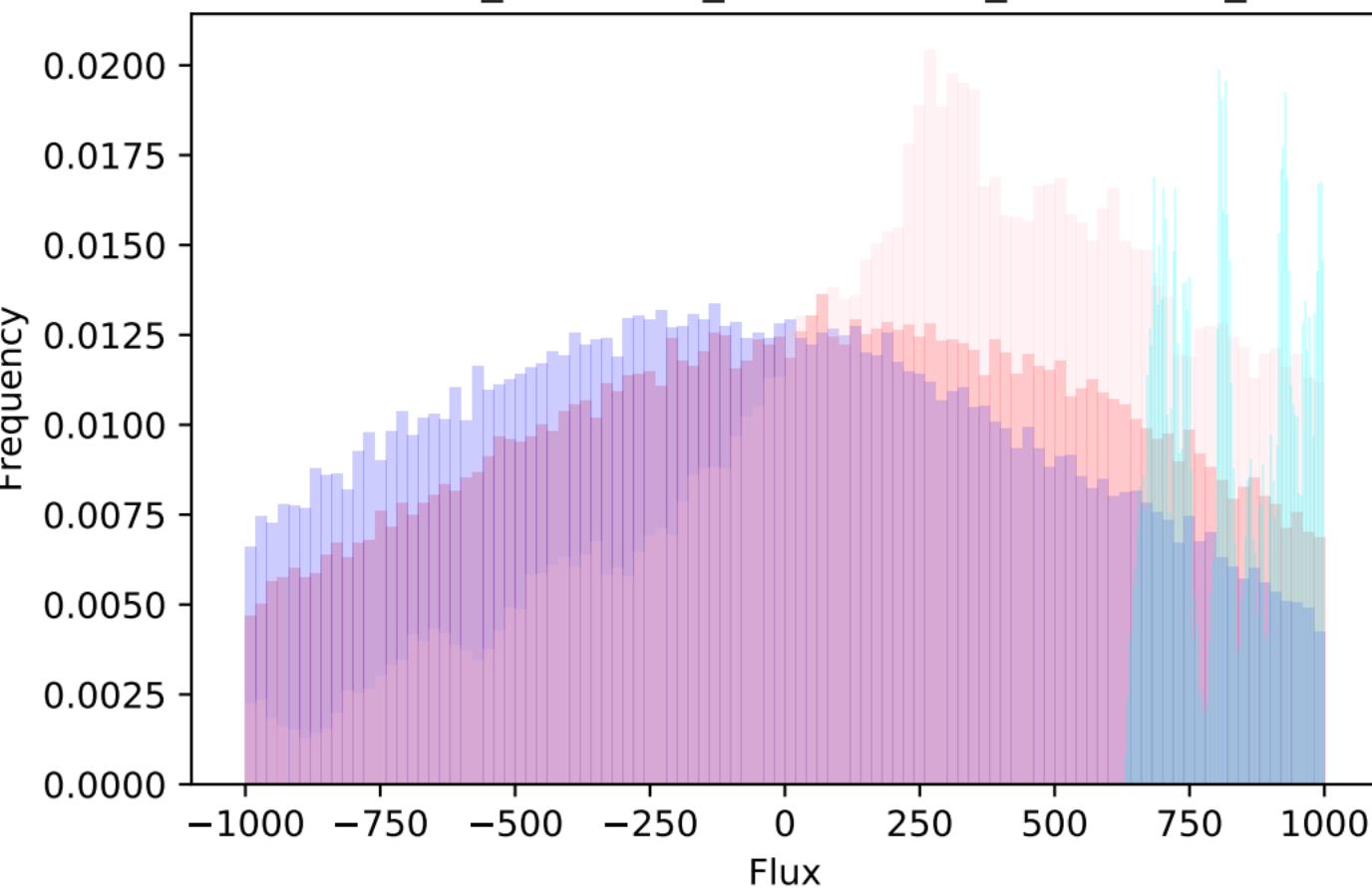
352:Cit_m + SCA_c <=> Cit_c + SCA_m



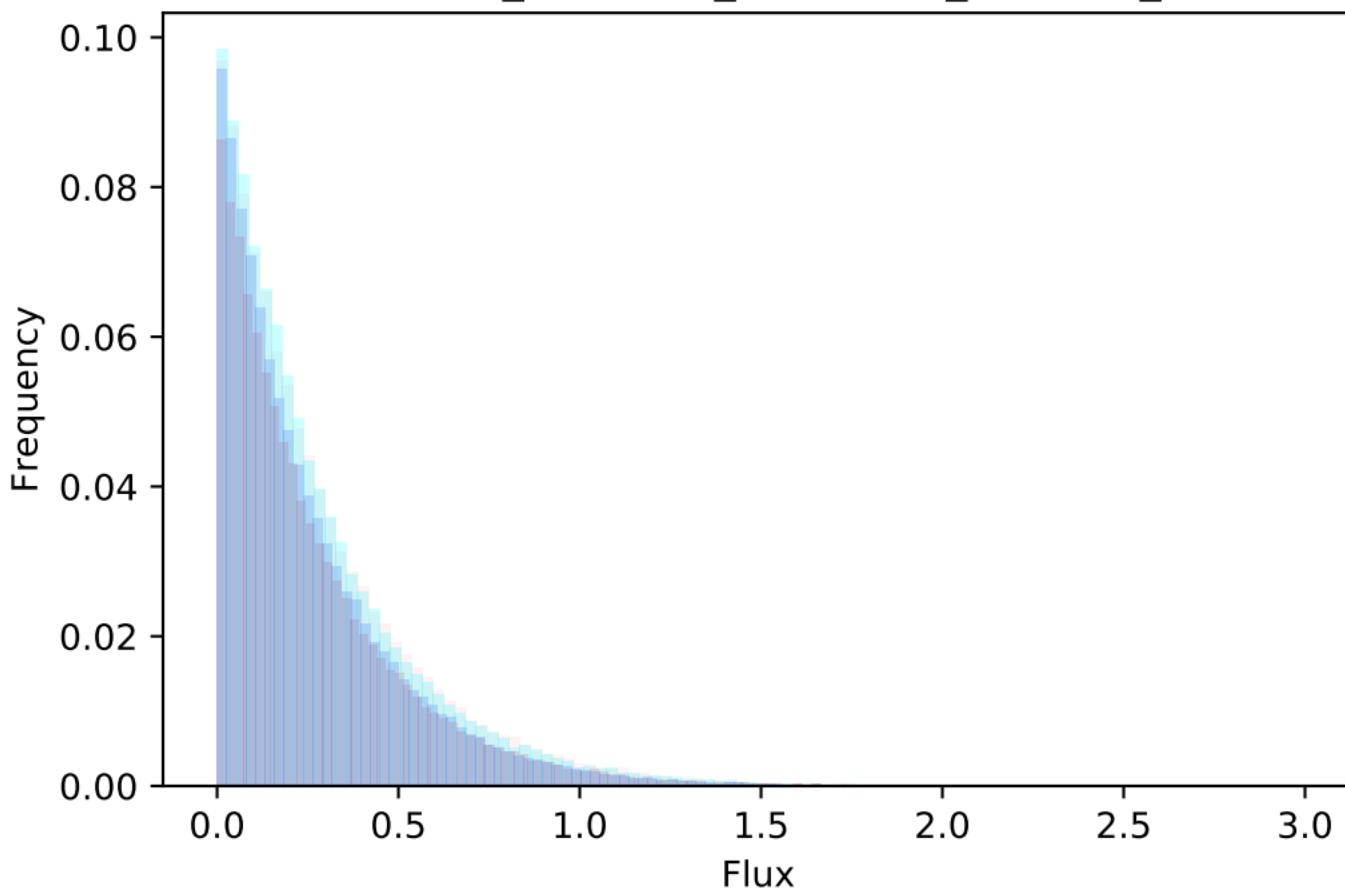
$353:\text{SCA_c} + \text{iCit_m} \rightleftharpoons \text{SCA_m} + \text{iCit_c}$



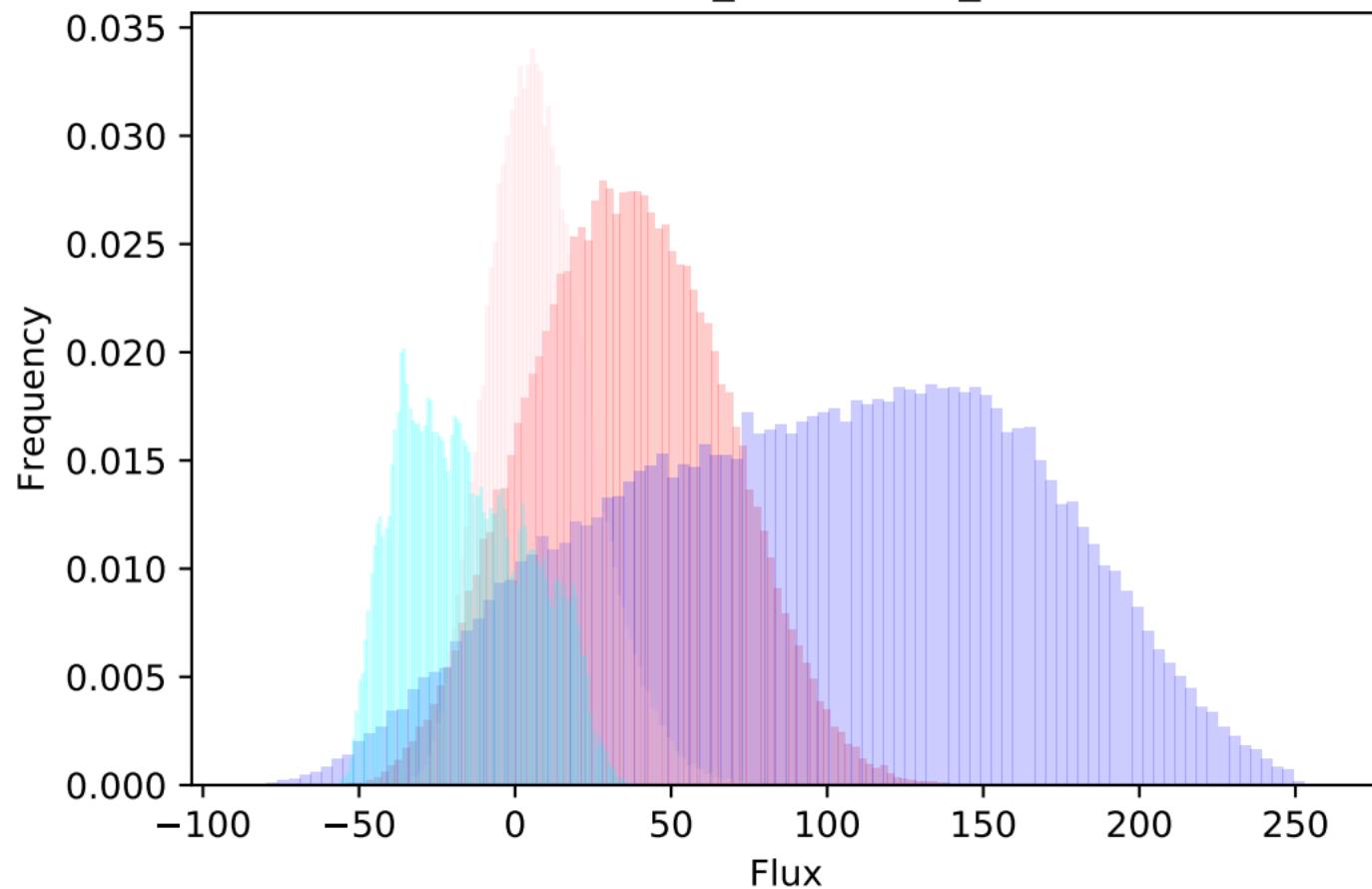
354:SCA_c + cACN_m <=> SCA_m + cACN_c



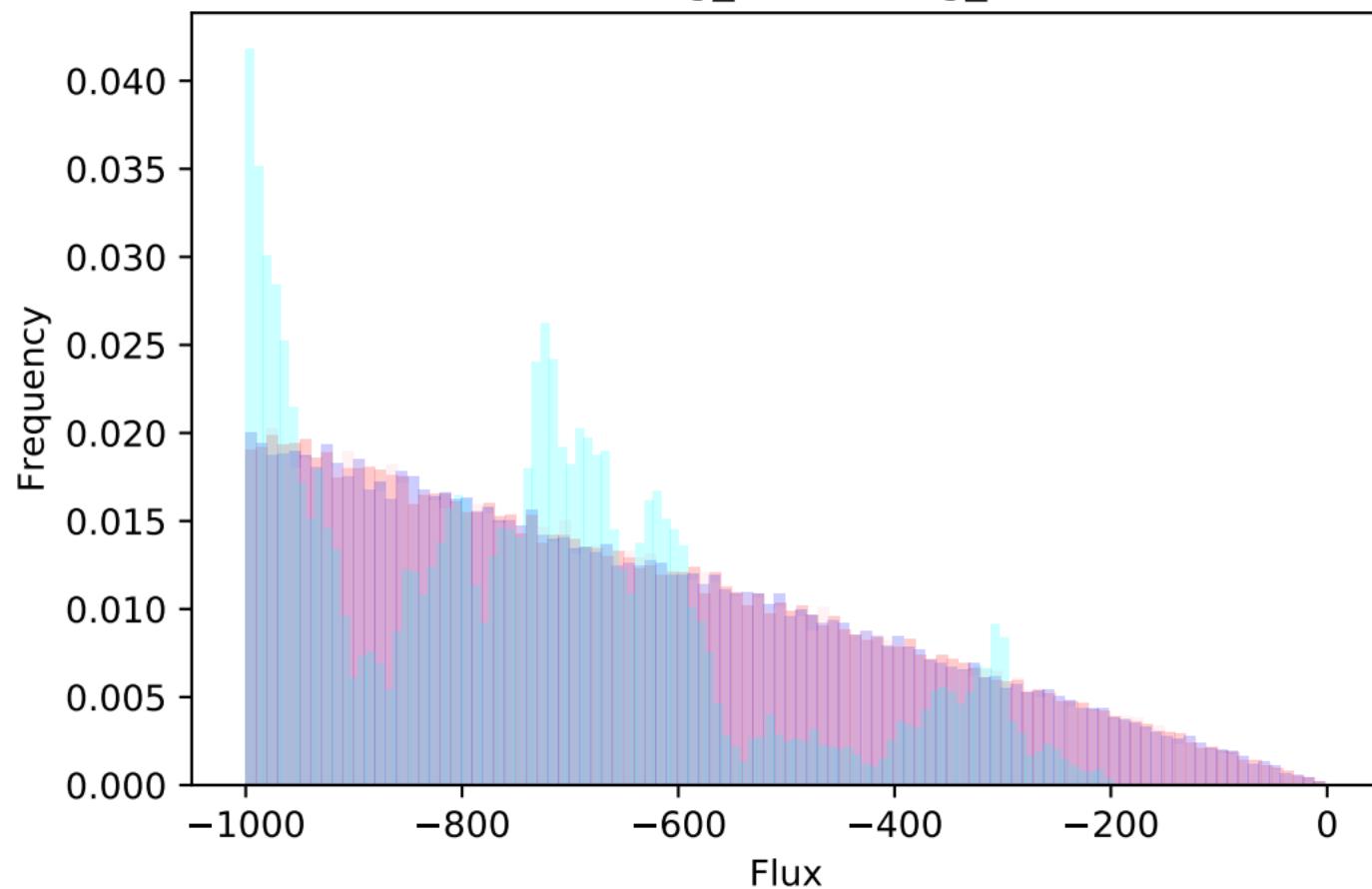
355:Fum_m + SCA_c --> Fum_c + SCA_m



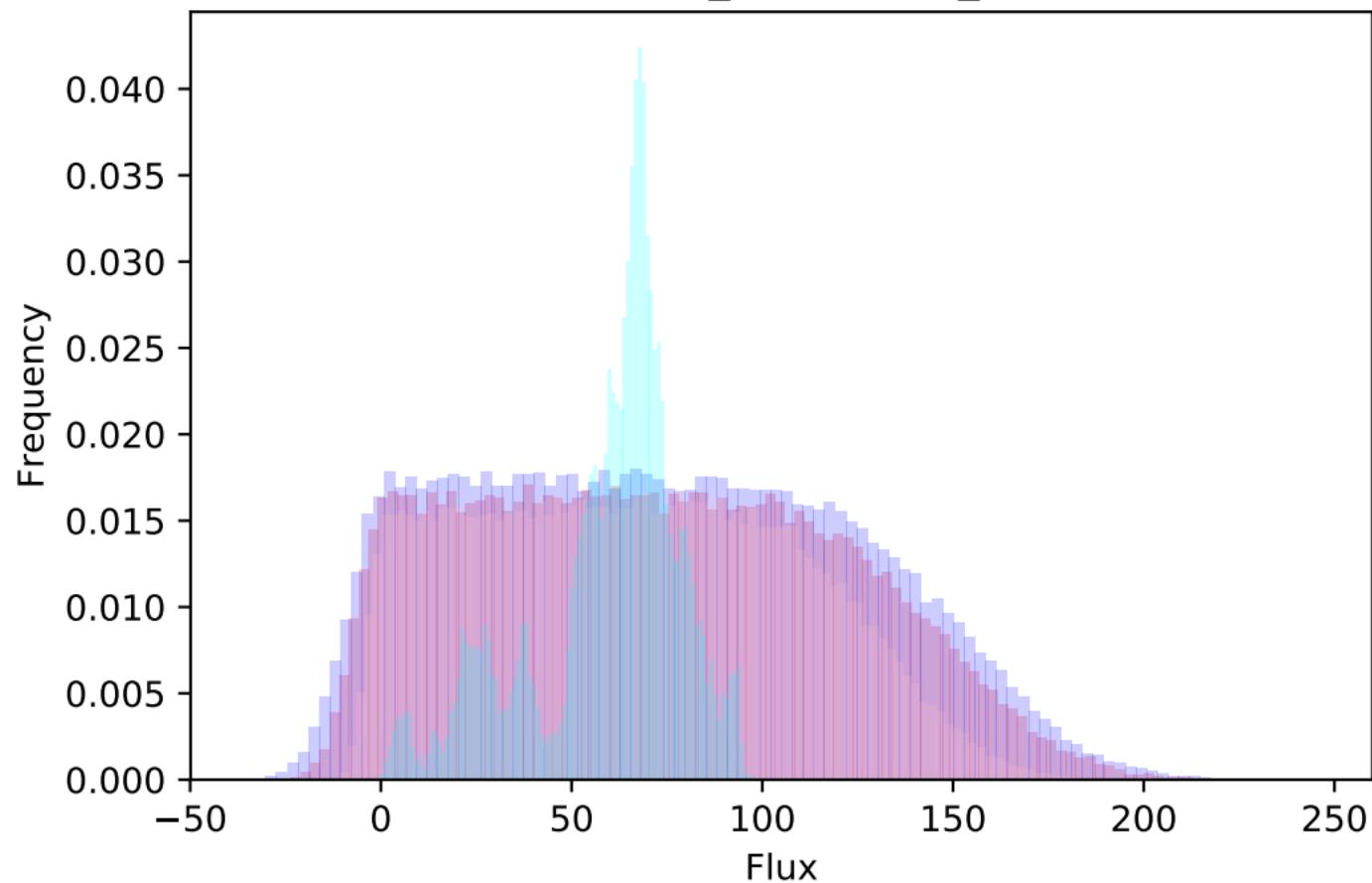
356:Ala_c <=> Ala_m



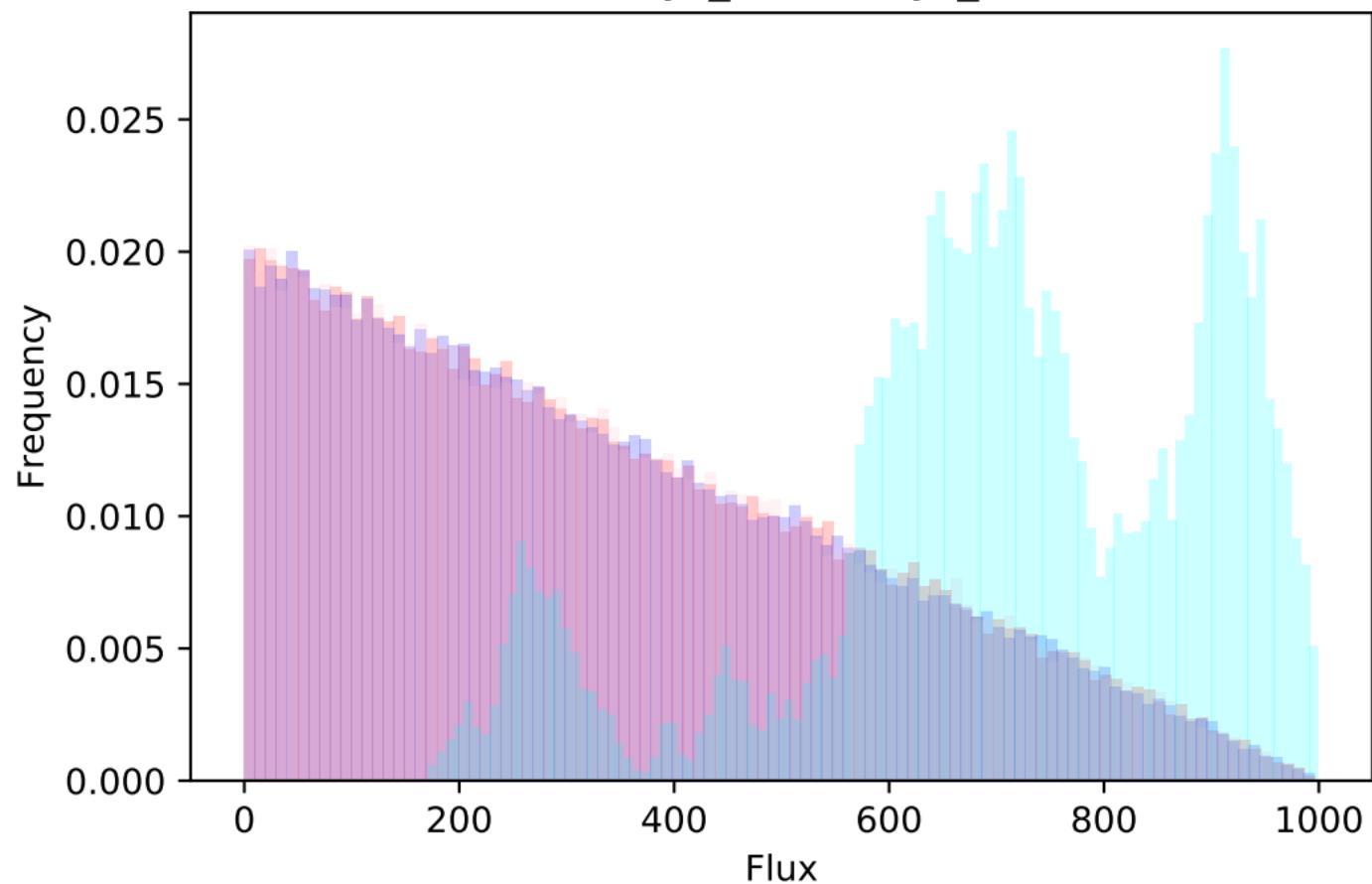
357:Arg_c <=> Arg_m



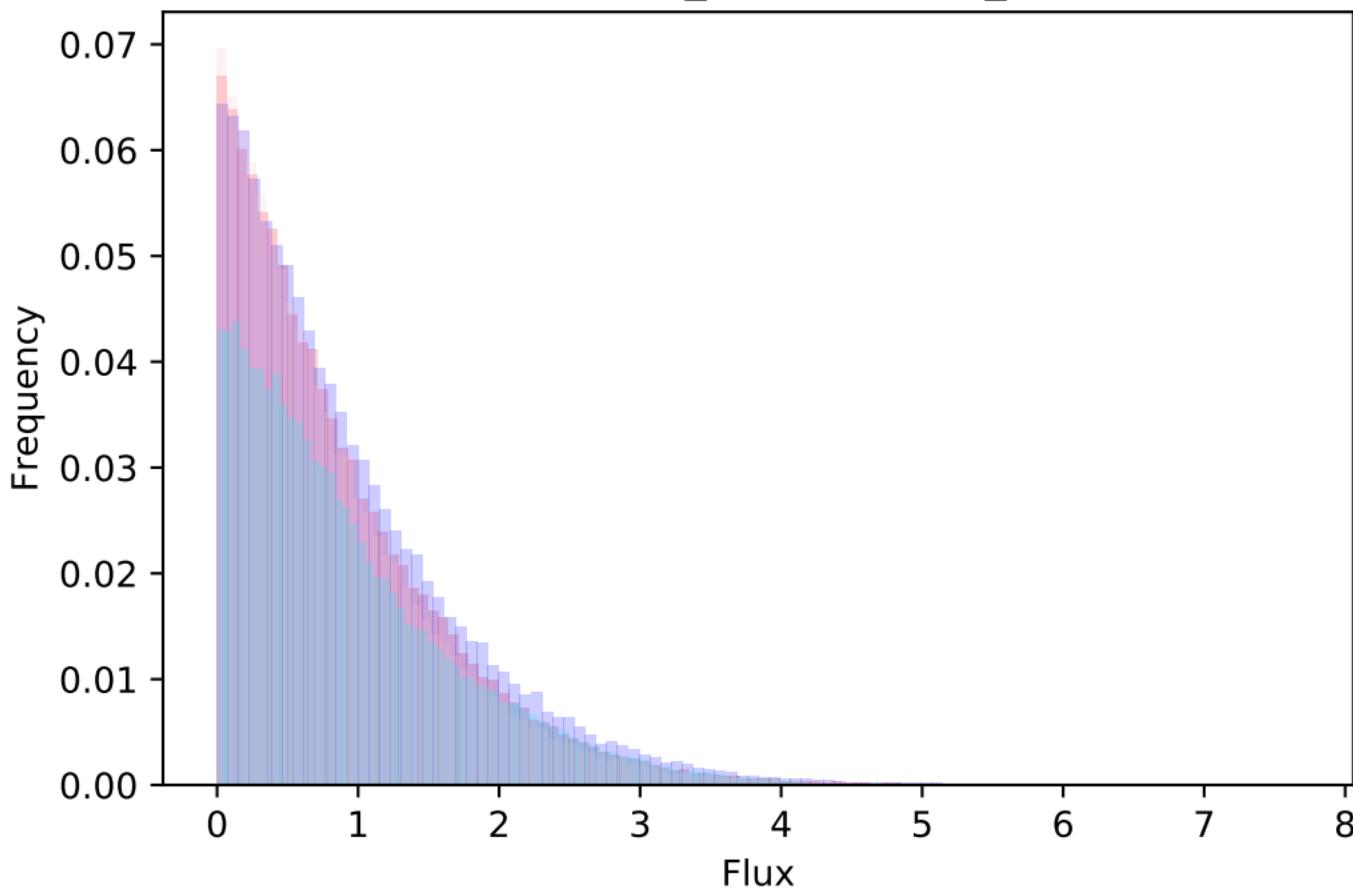
358:Glu_c <=> Glu_m



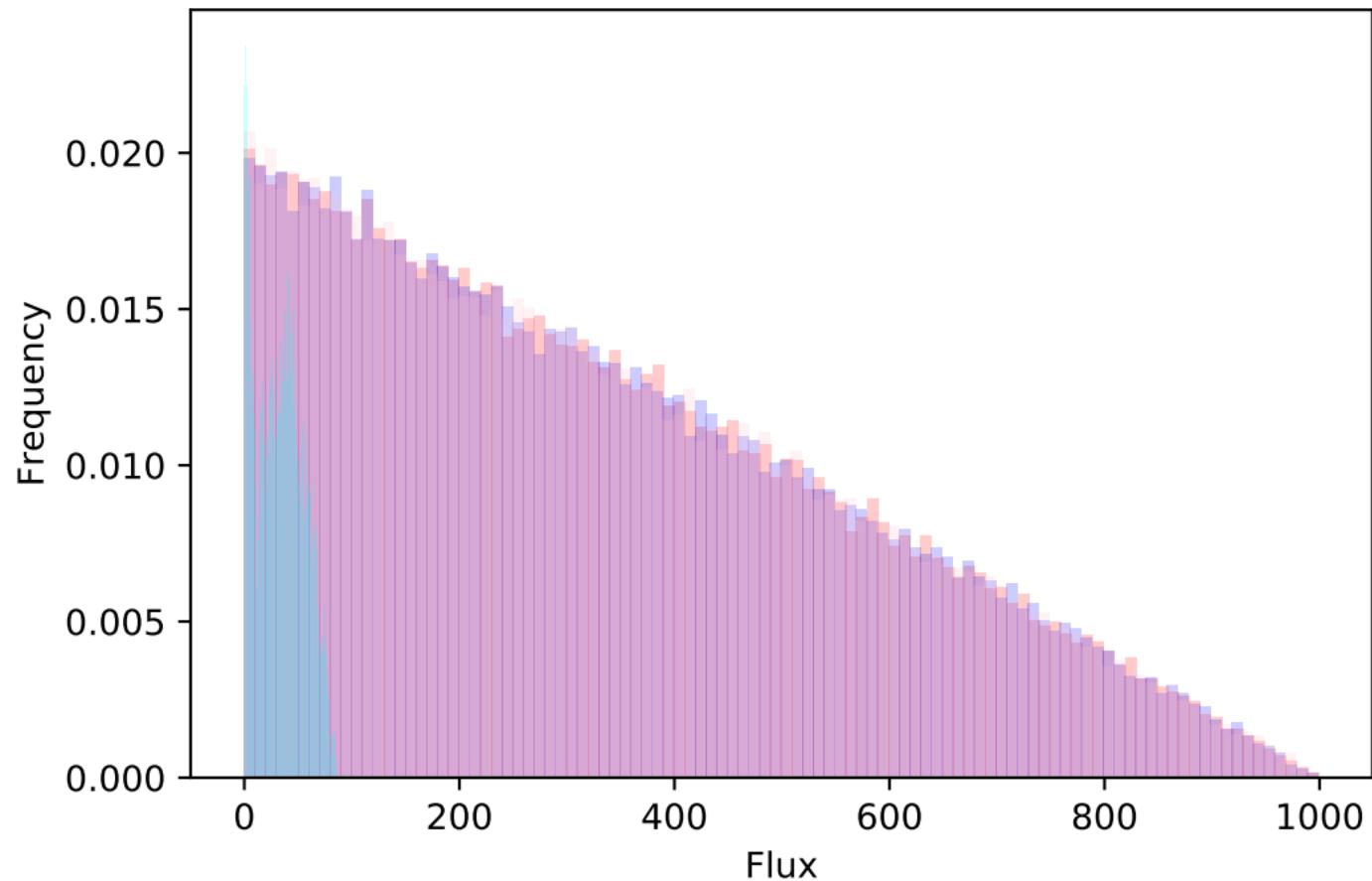
359:Lys_c <=> Lys_m



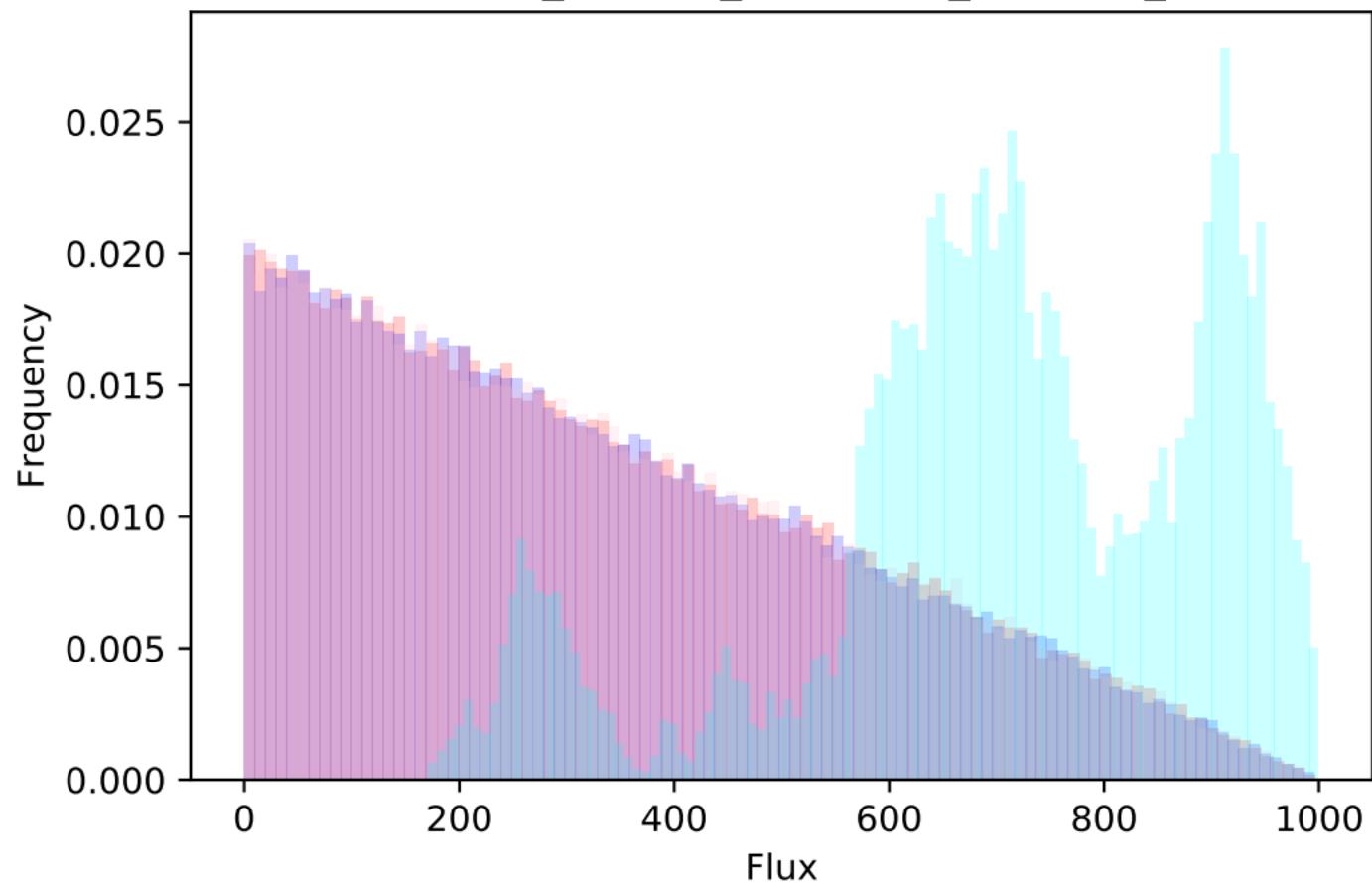
360:GABA_c <=> GABA_m



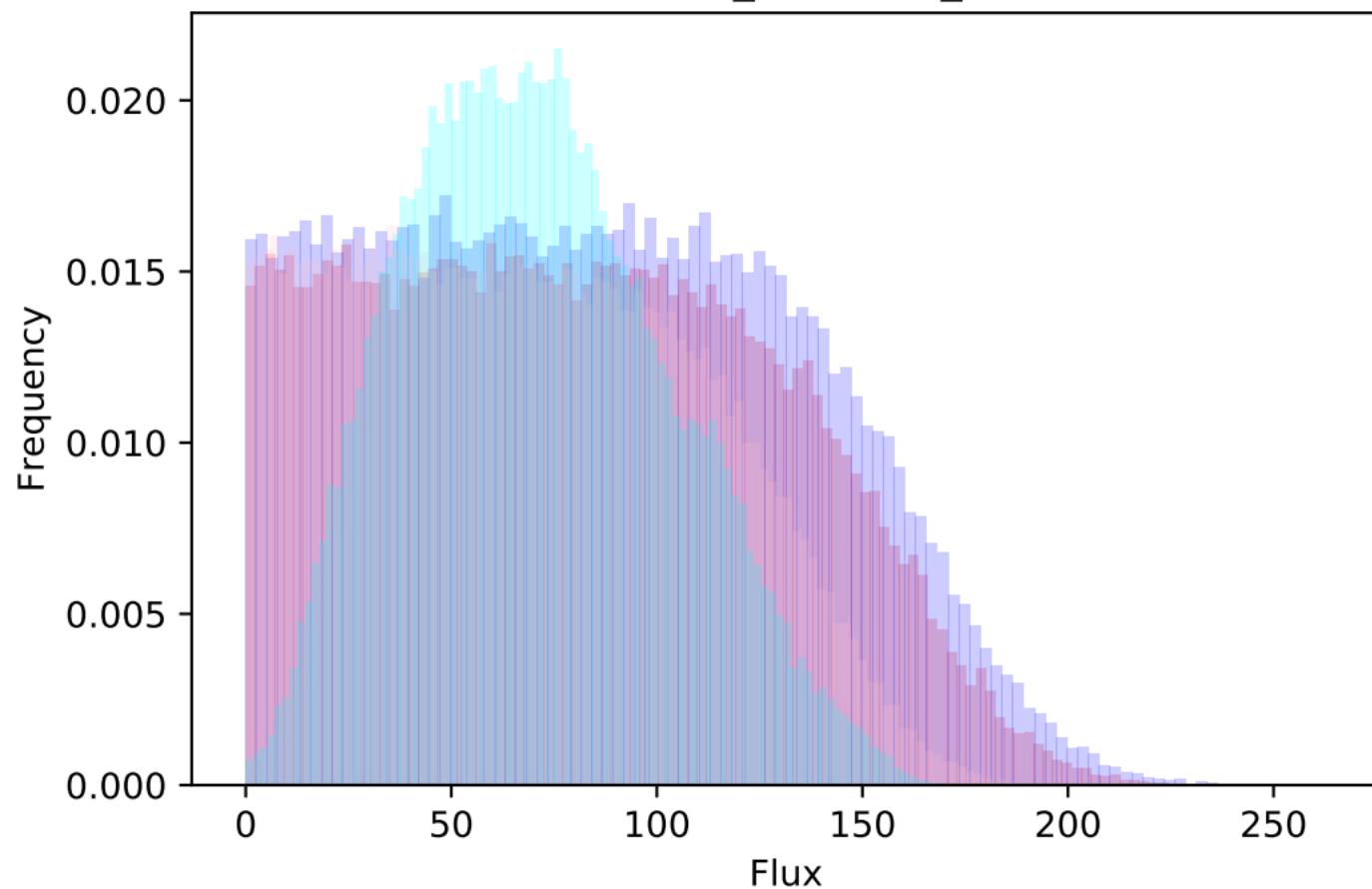
$361:\text{Arg_c} + \text{His_m} \rightarrow \text{Arg_m} + \text{His_c}$



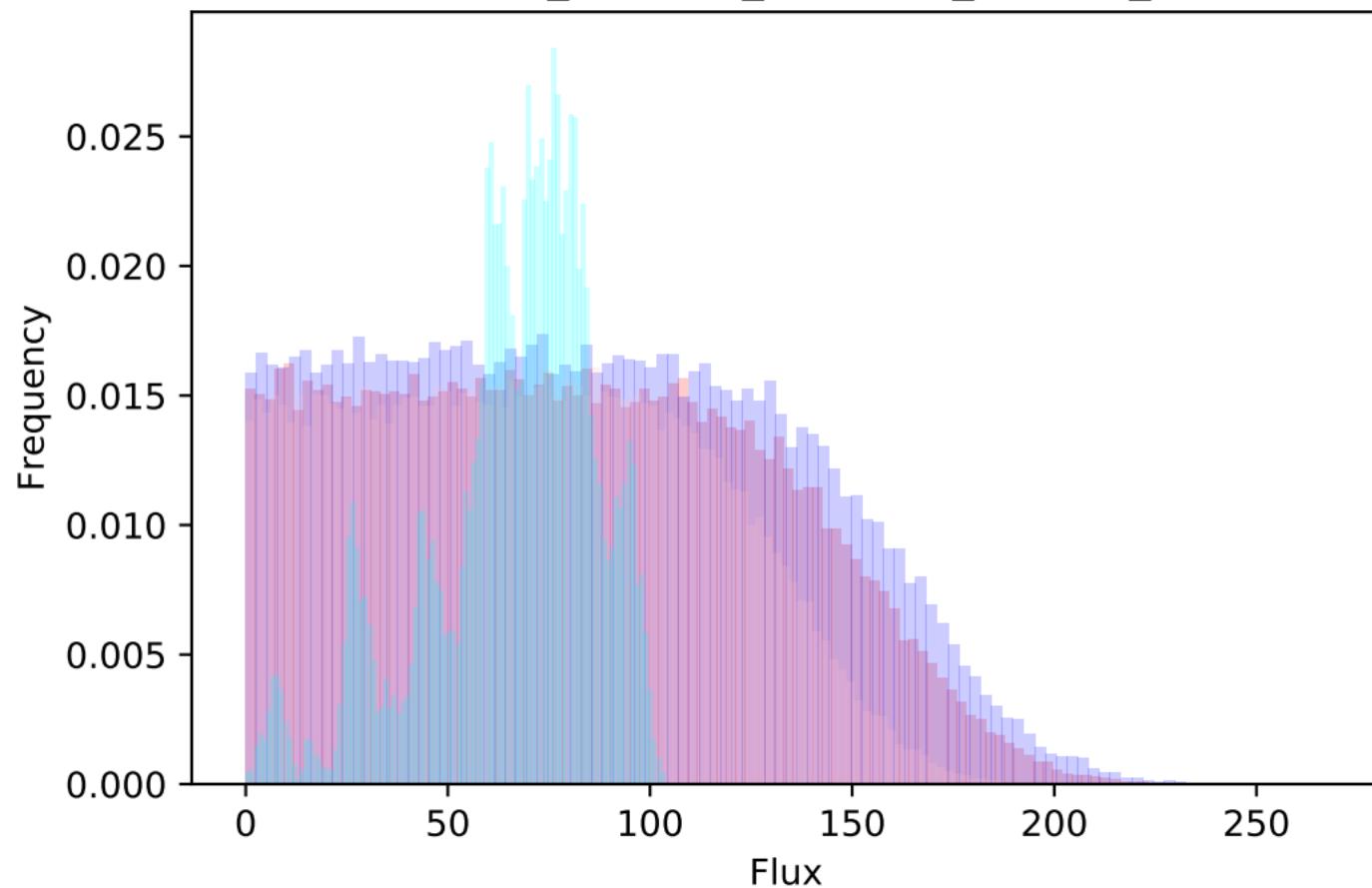
$362:\text{Arg_c} + \text{Lys_m} \rightarrow \text{Arg_m} + \text{Lys_c}$



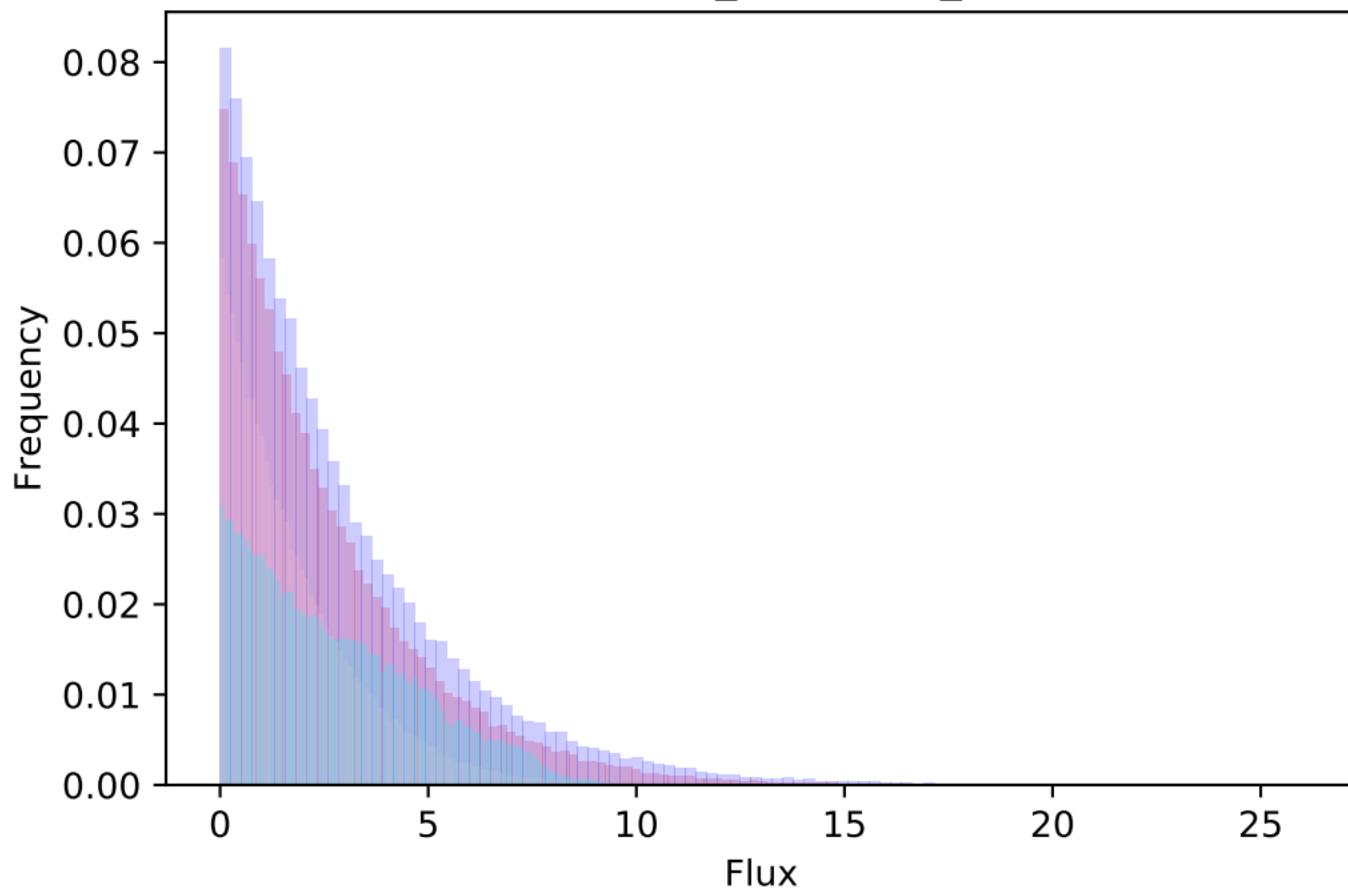
363:Pro_c --> Pro_m



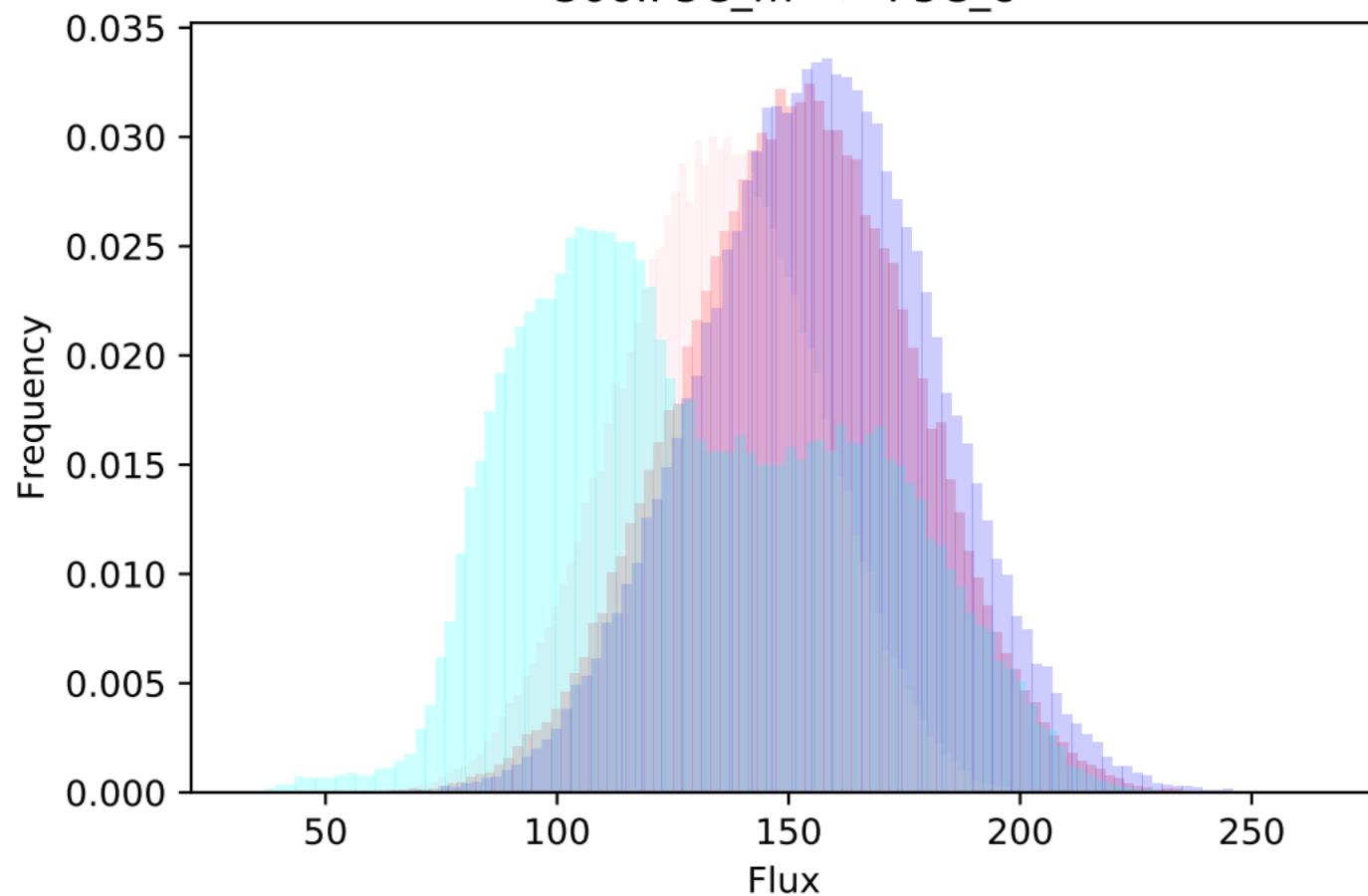
364:Glu_m + Pro_c --> Glu_c + Pro_m



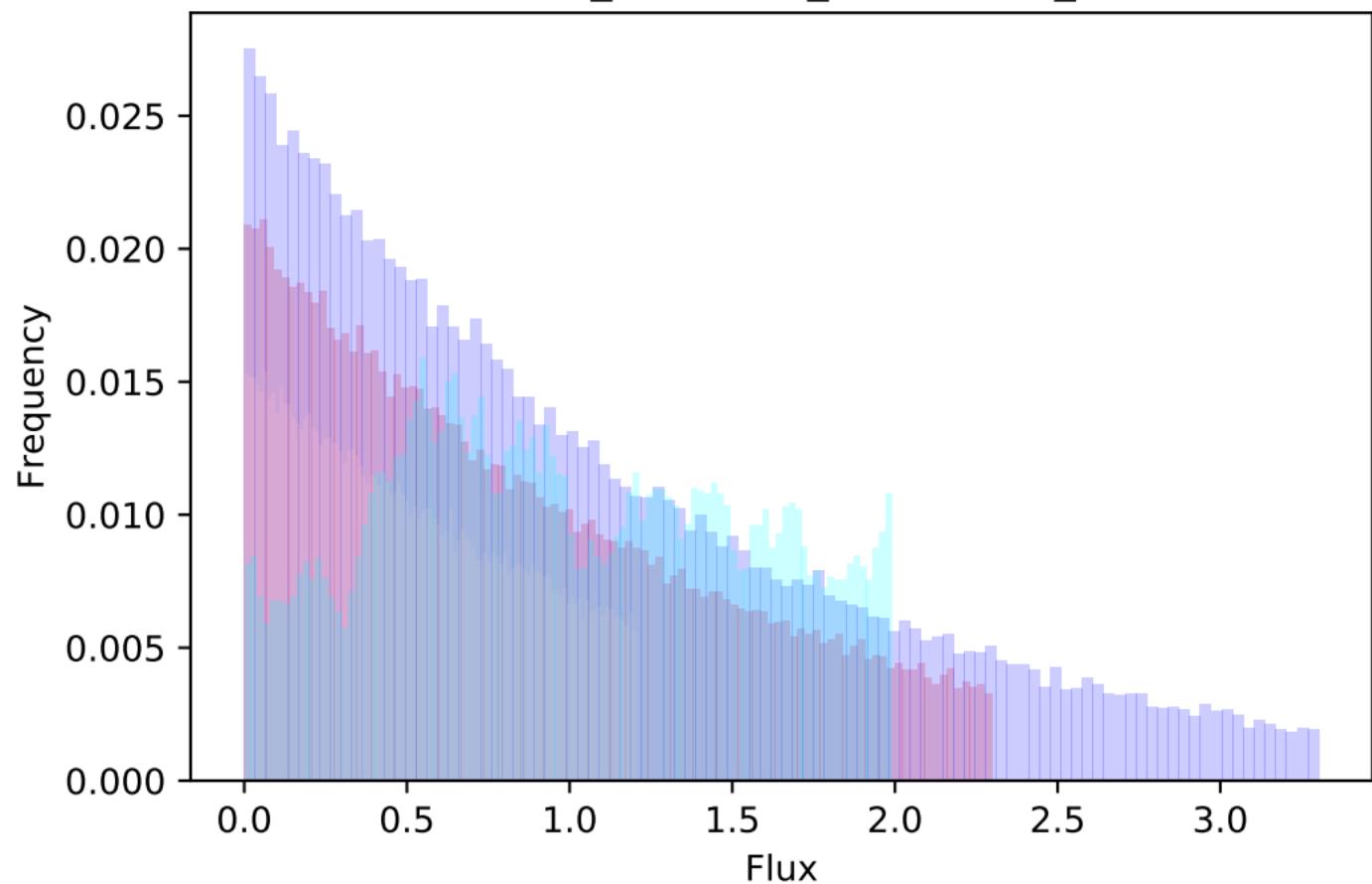
365:P5C_h --> P5C_c



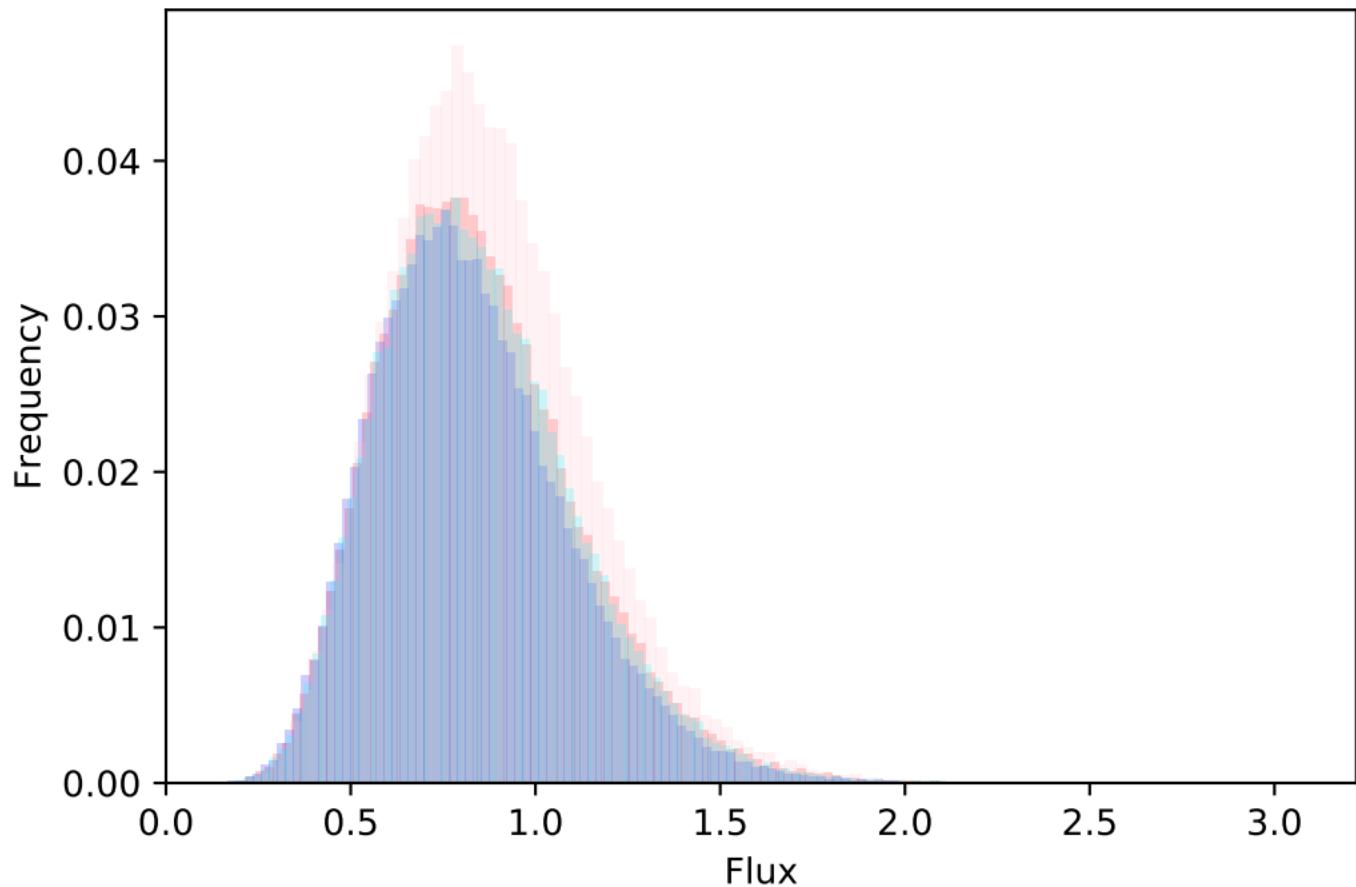
366:P5C_m --> P5C_c



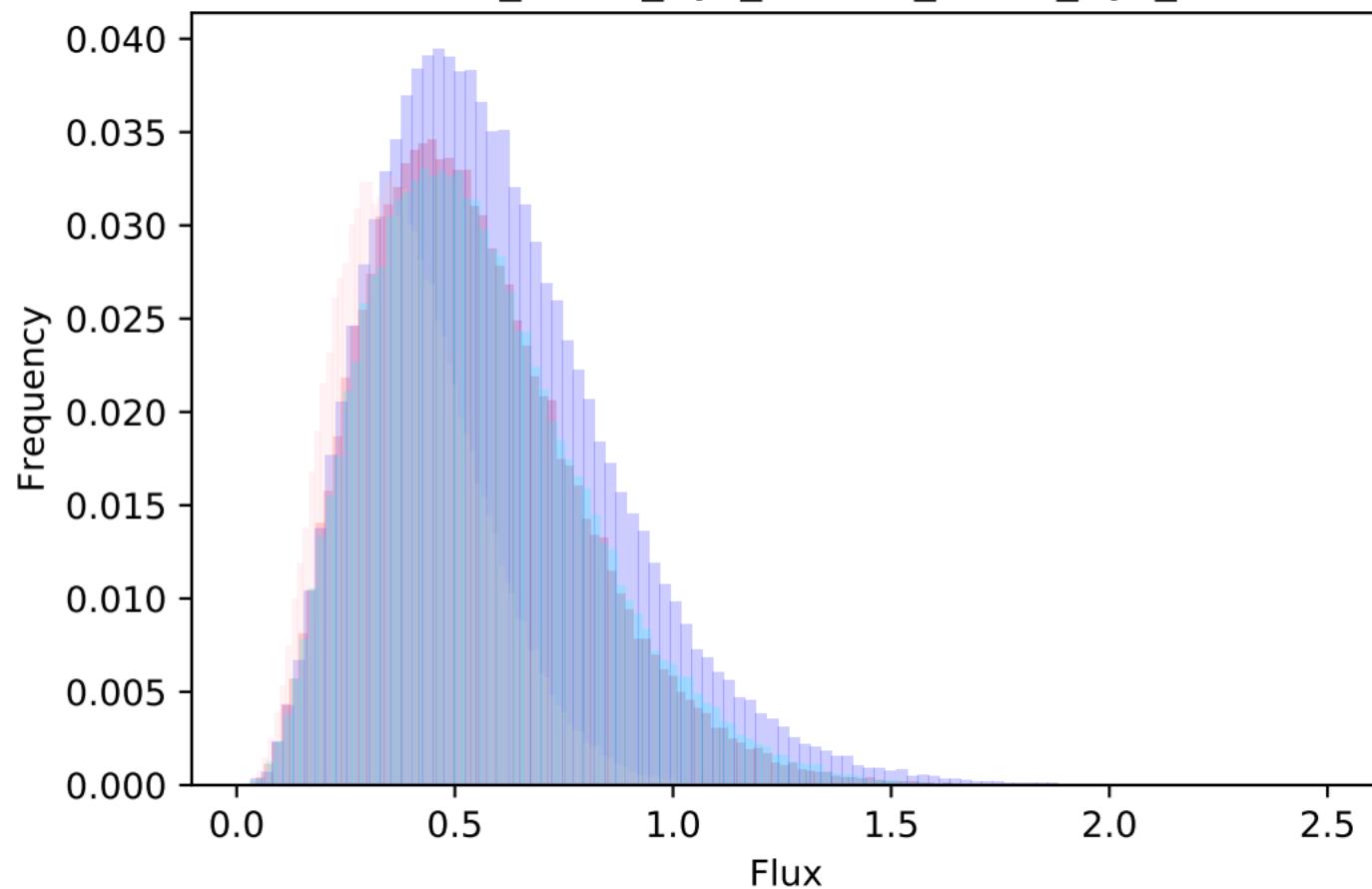
367:H_h + PRPP_h --> PRPP_c



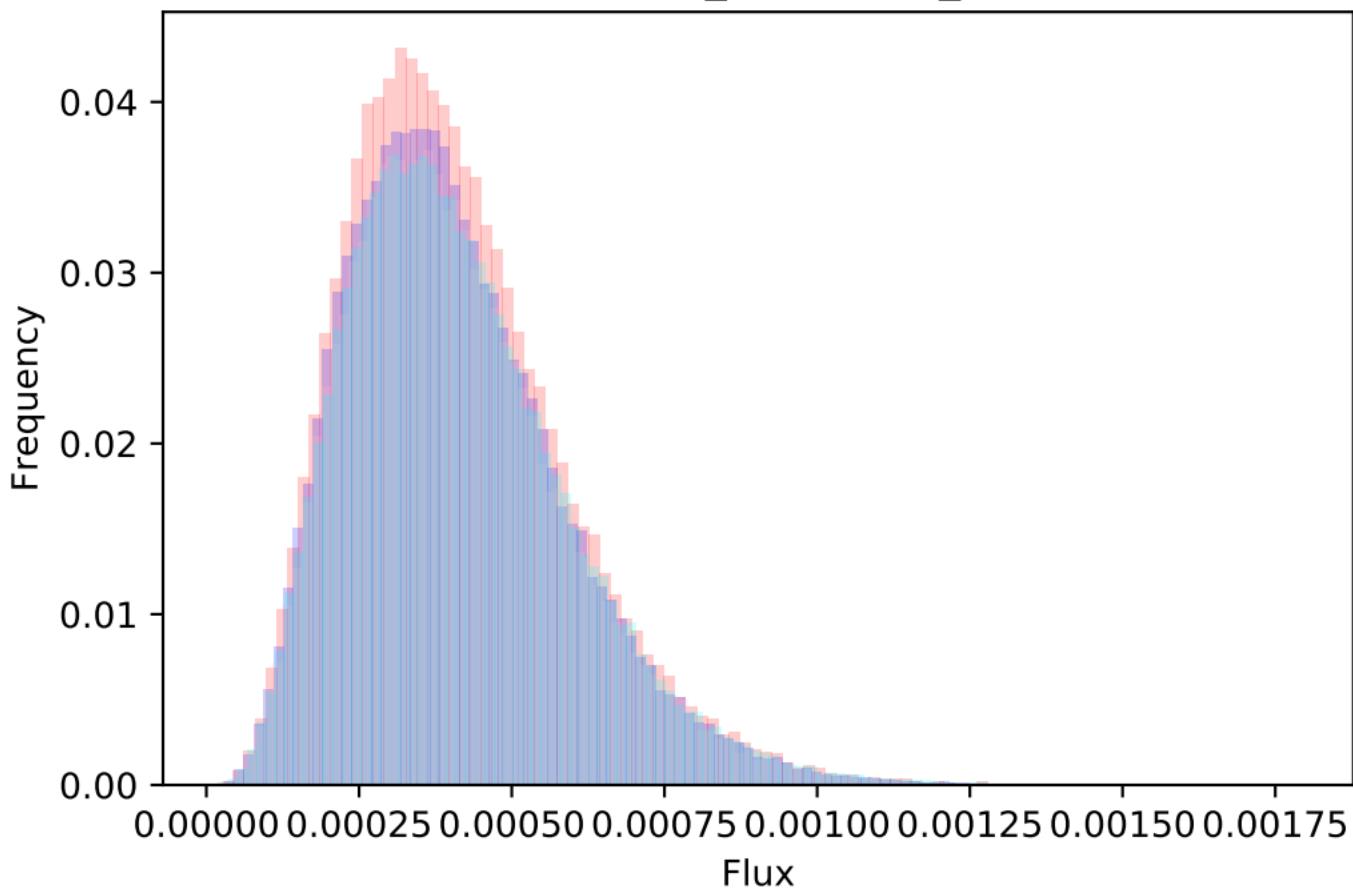
368:Fum_h --> Fum_c



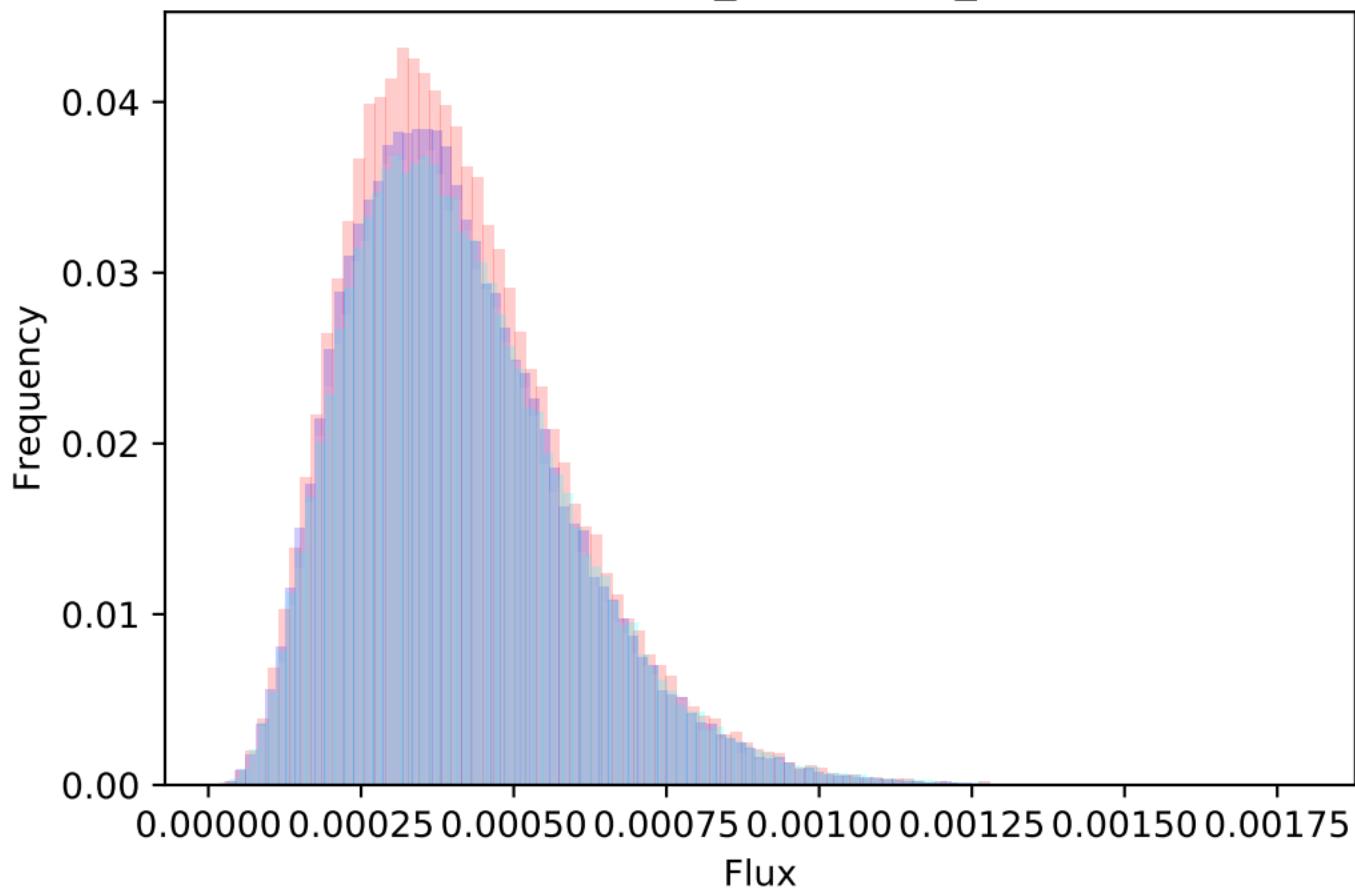
369:H_DASH_Cys_h --> H_DASH_Cys_c



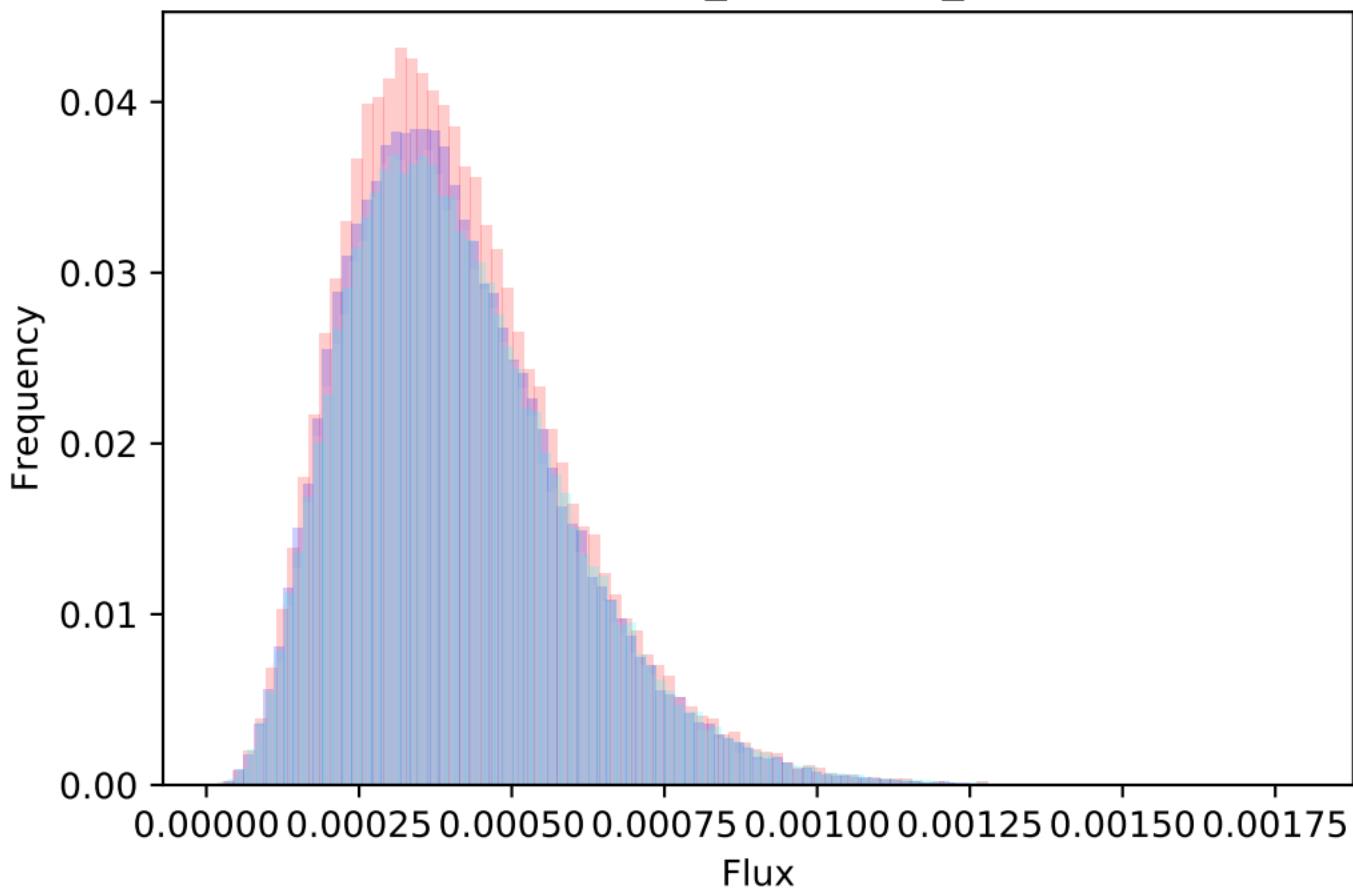
370:orO_m --> orO_c



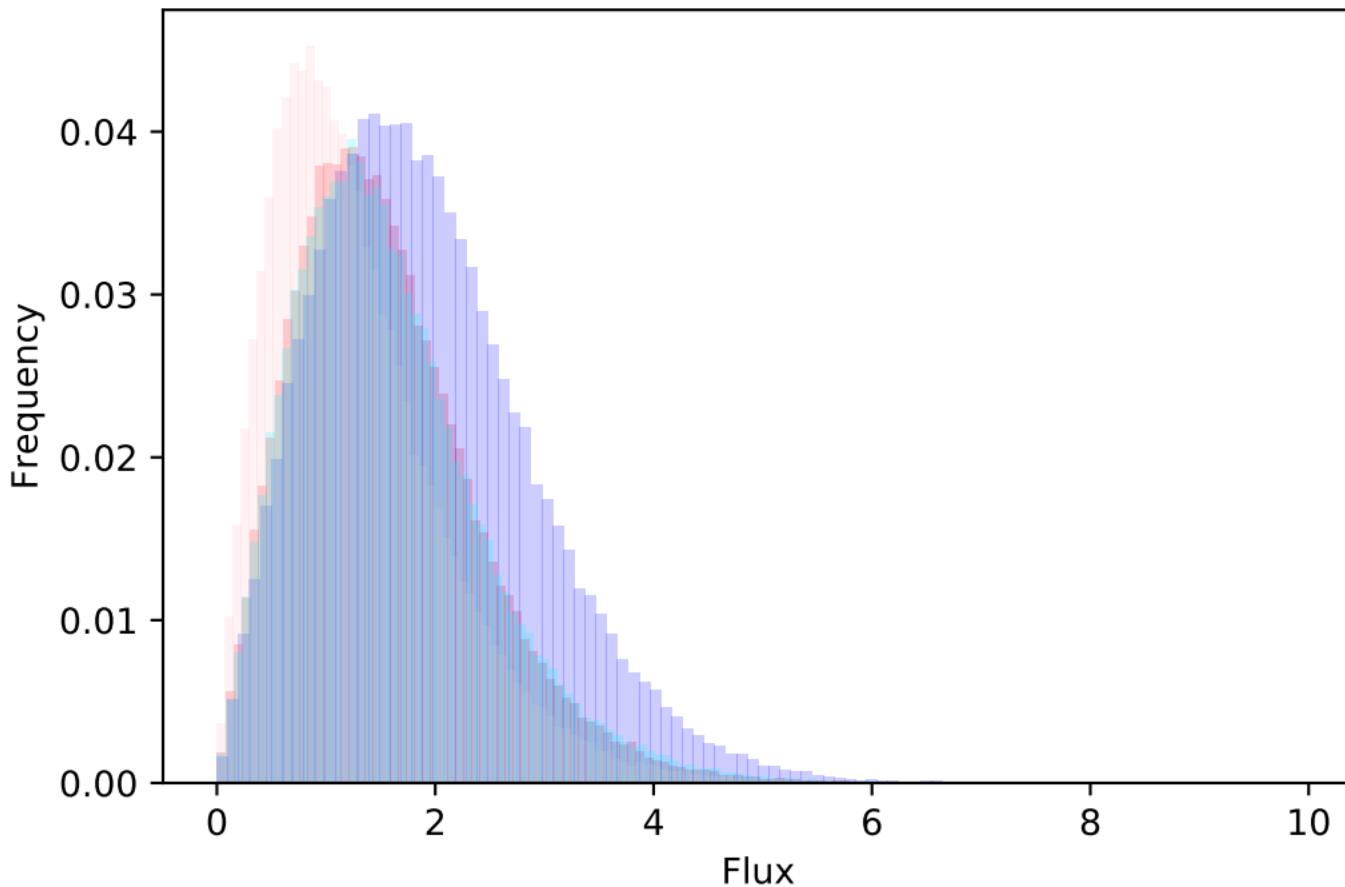
371:DHO_h --> DHO_c



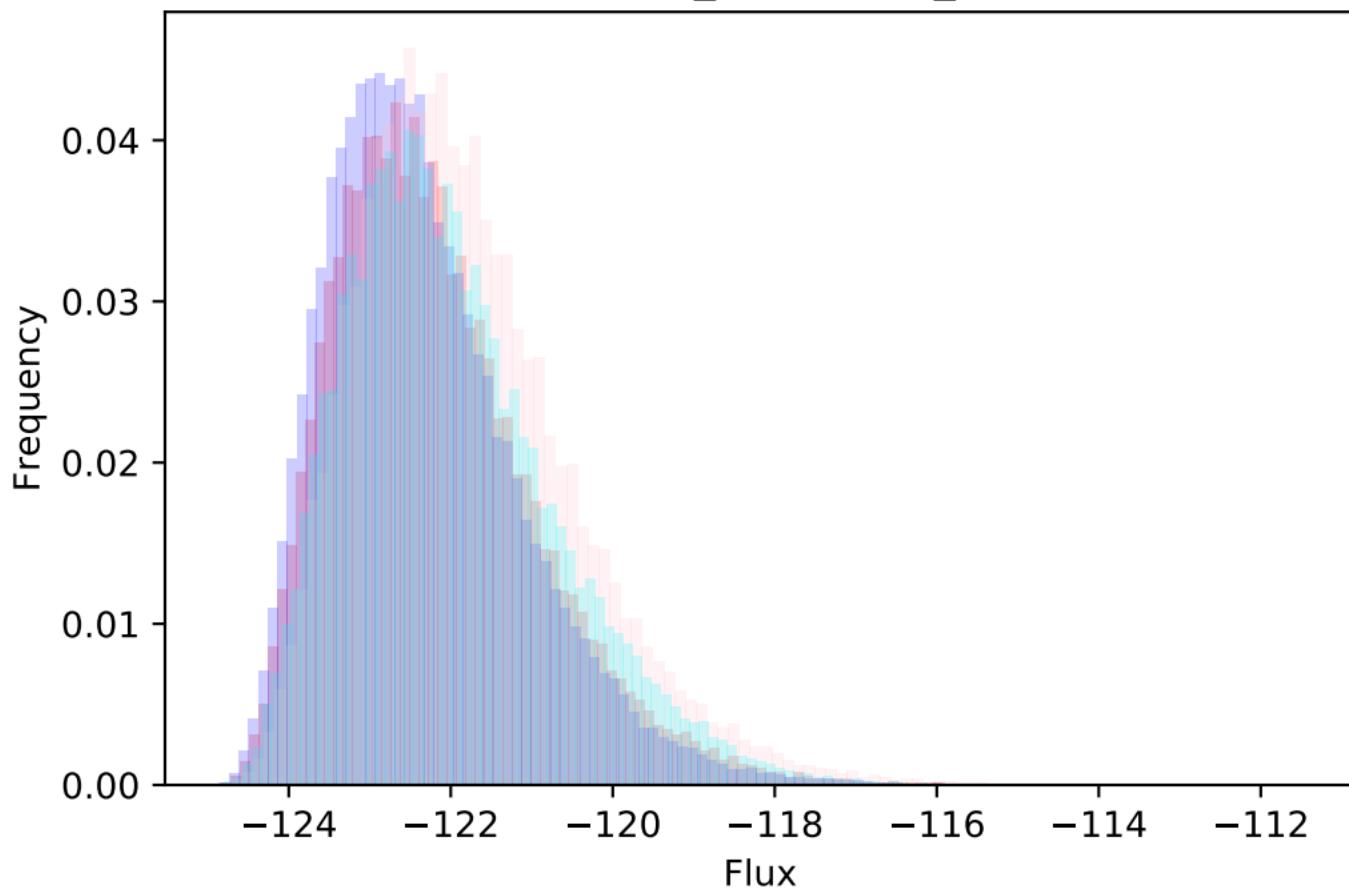
372:DHO_c --> DHO_m



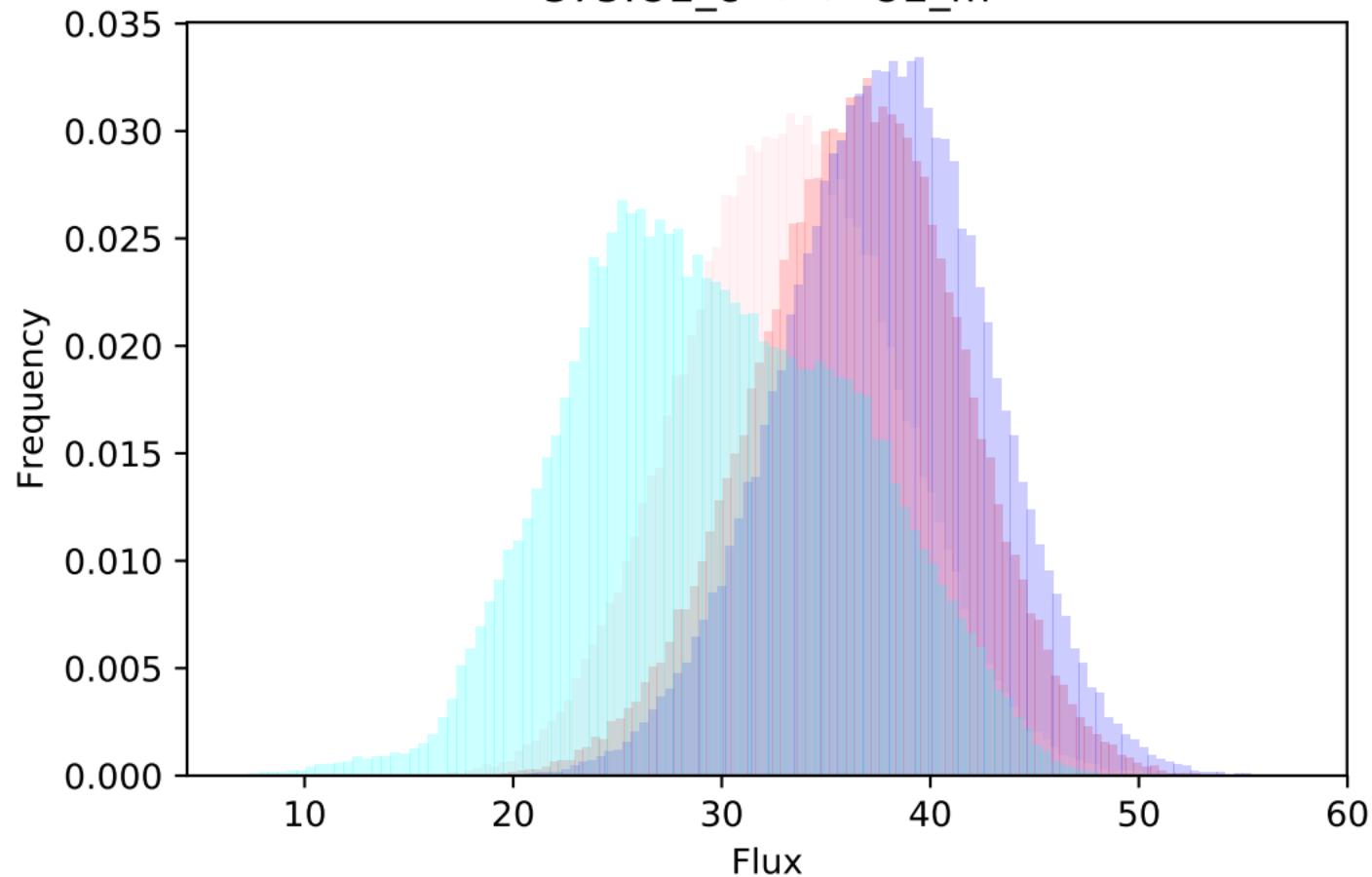
373:Gly_c + Ser_m --> Gly_m + Ser_c



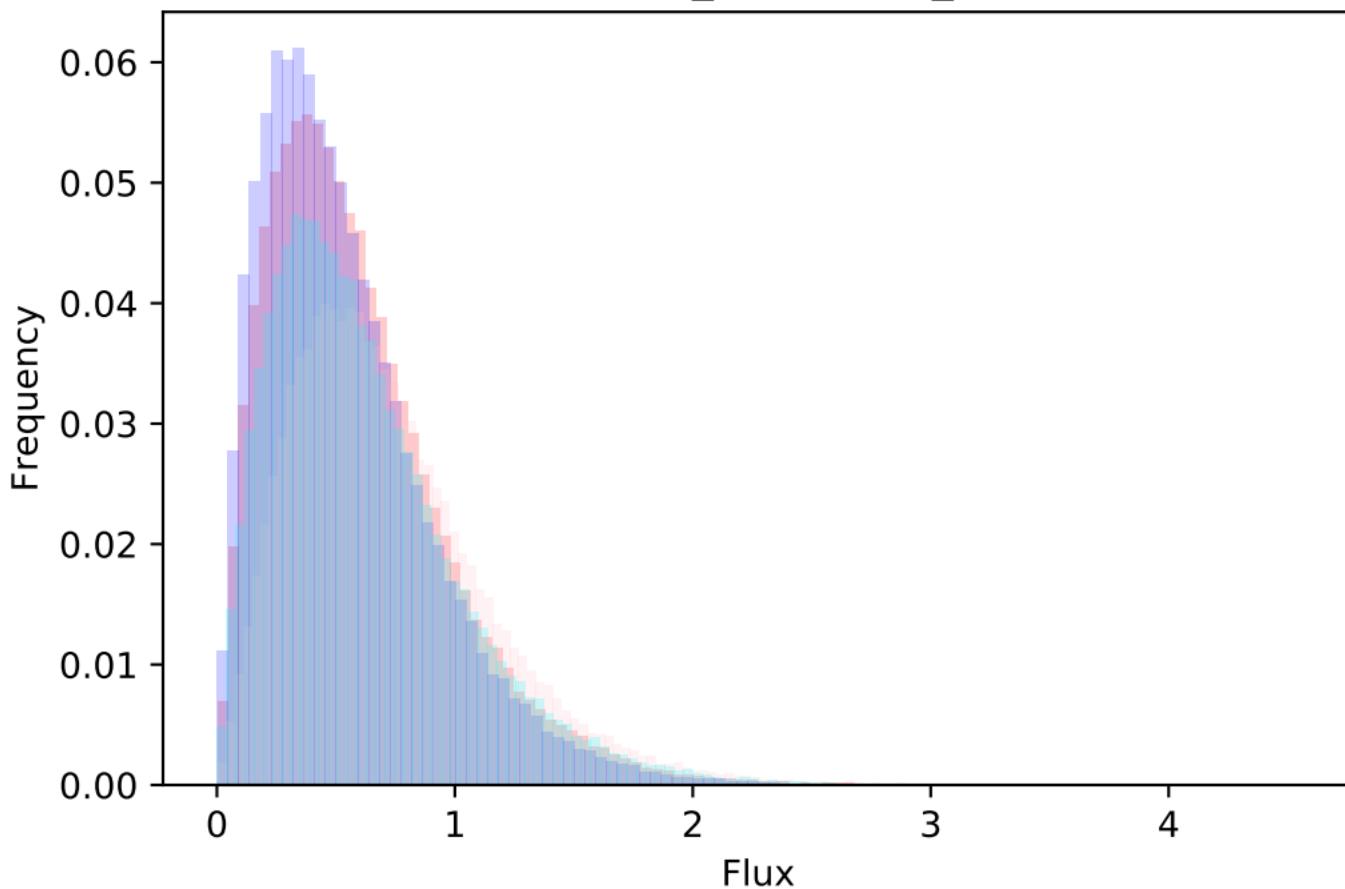
374:O2_c <=> O2_h



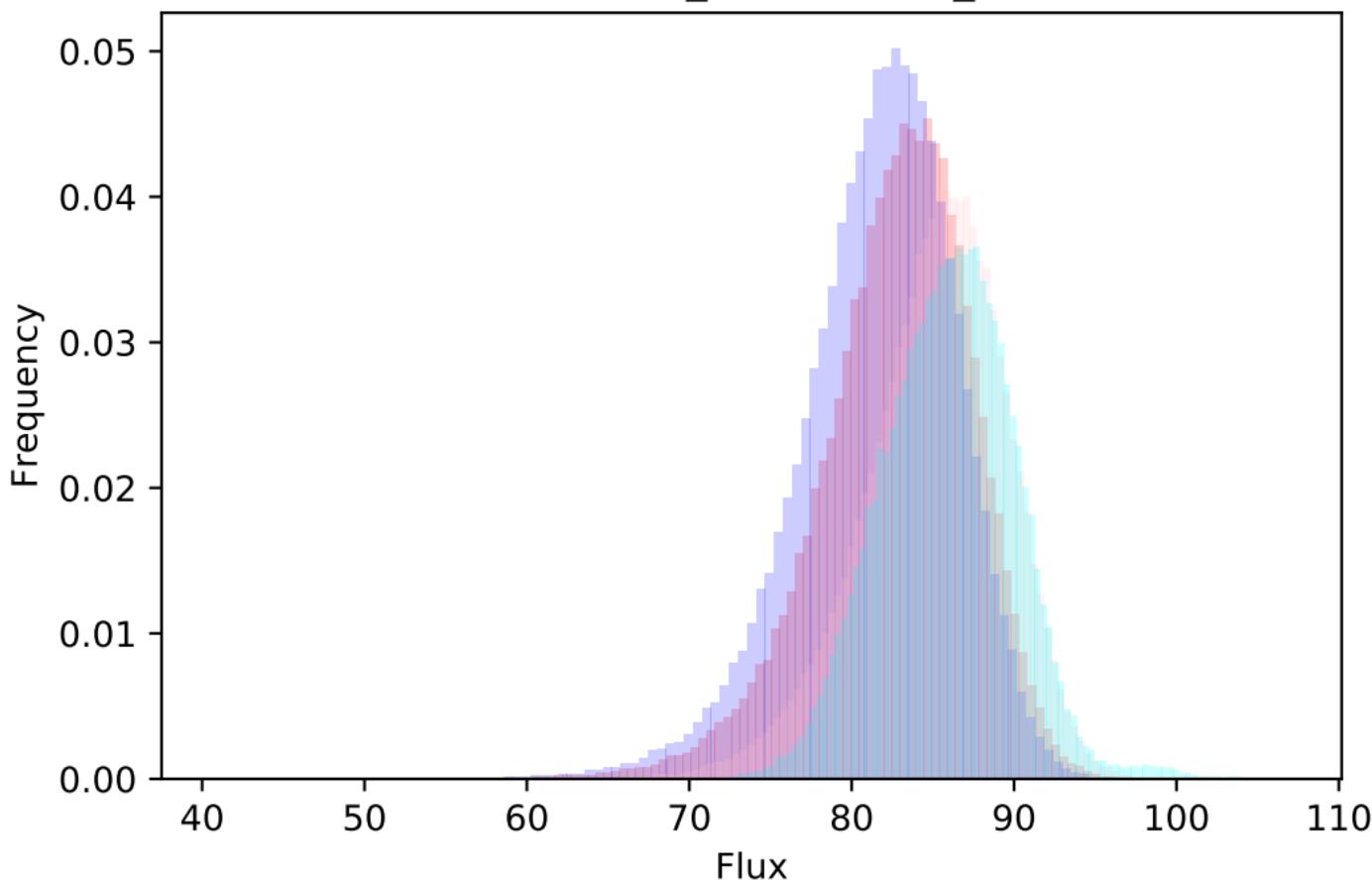
375:O2_c <=> O2_m



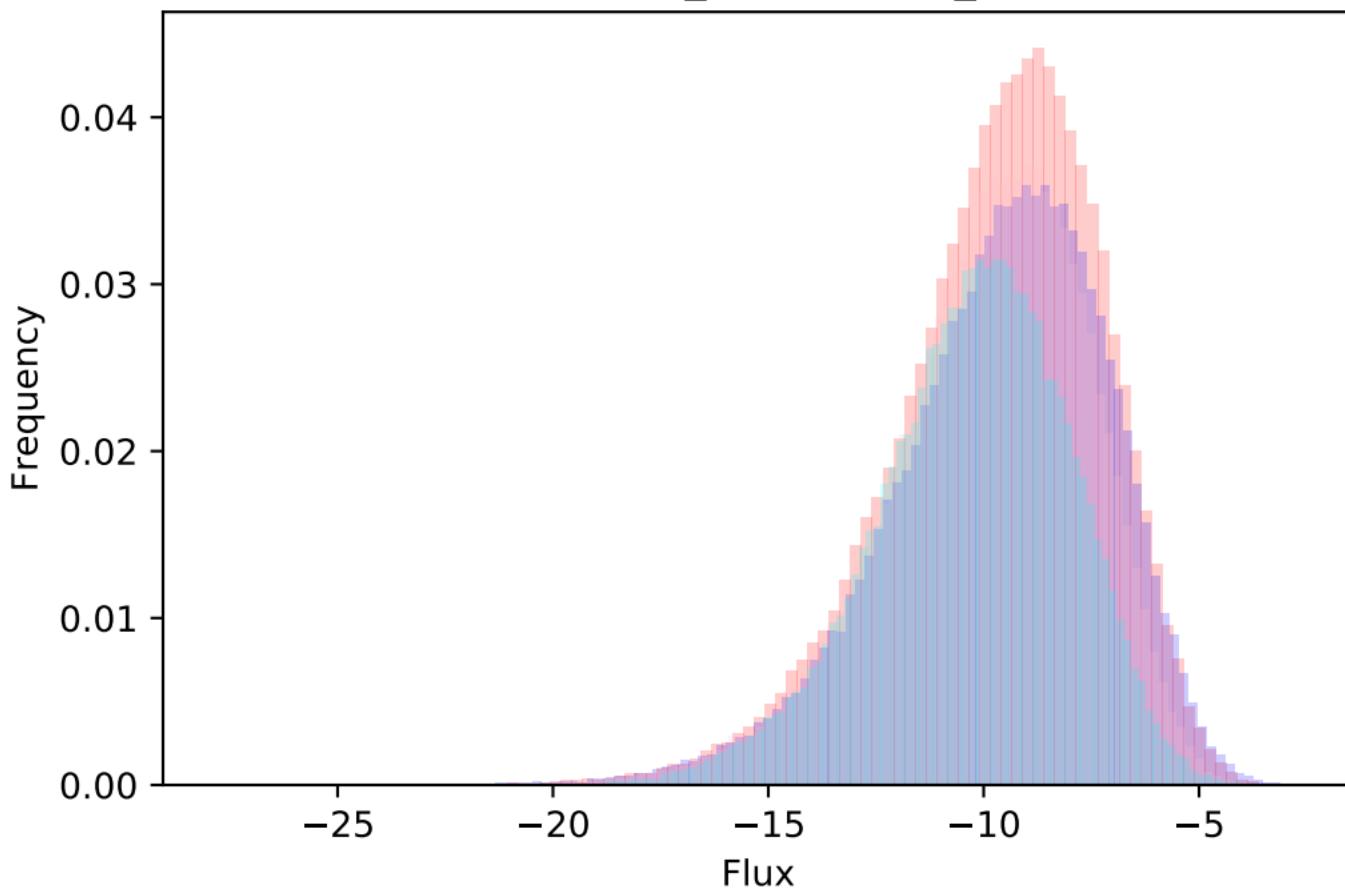
376:O2_c <=> O2_p



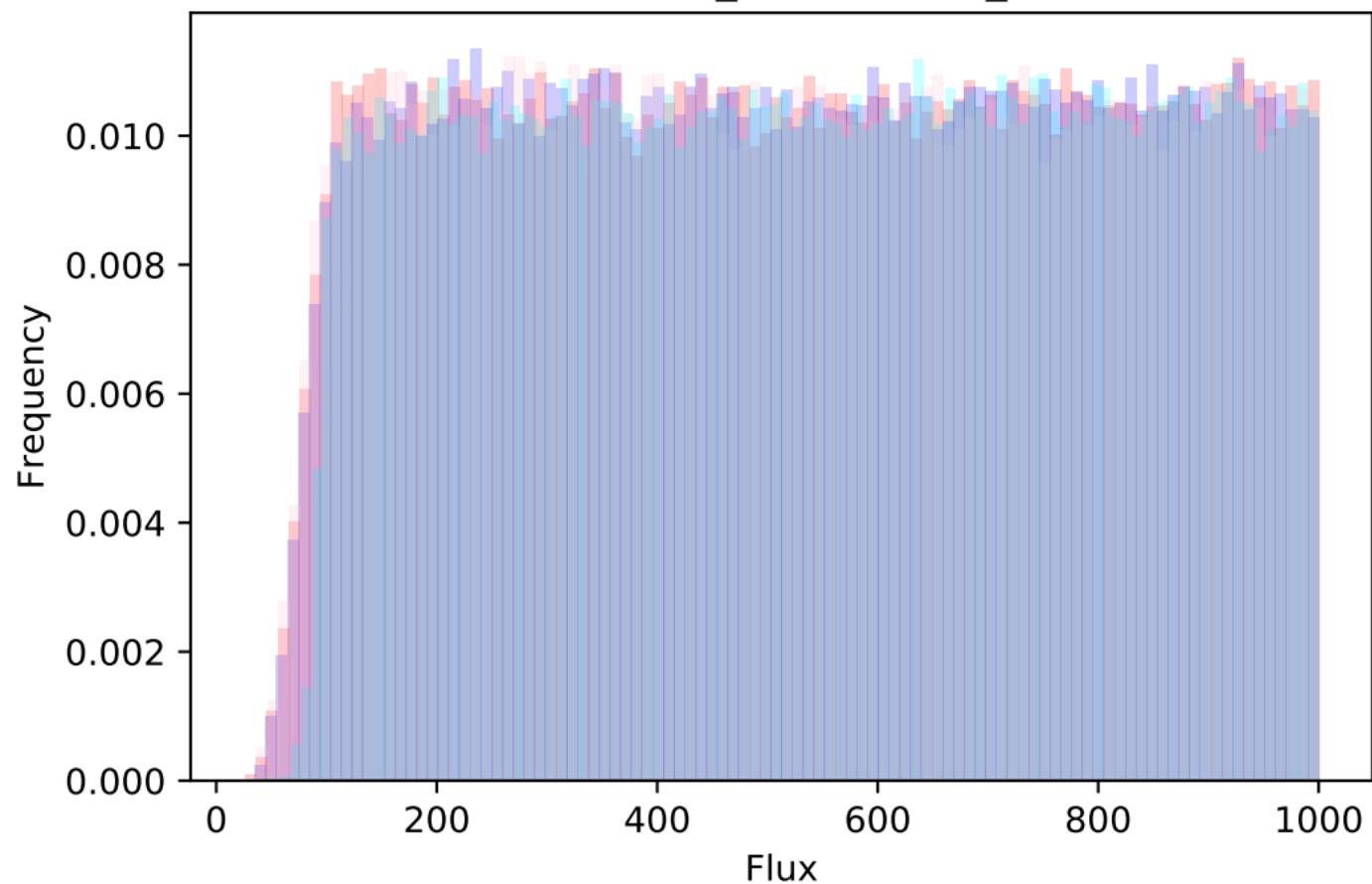
377:CO2_c <=> CO2_h



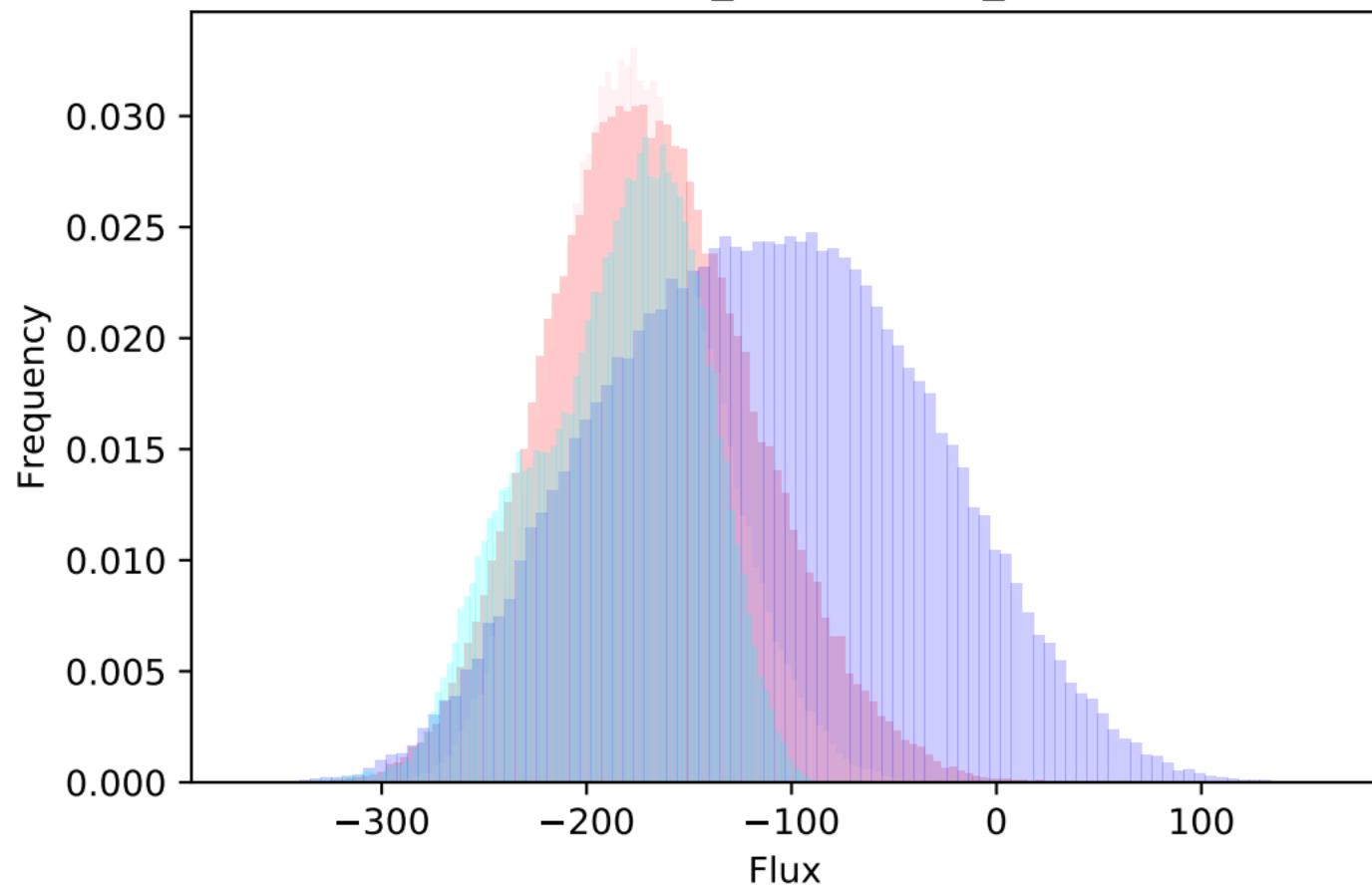
378:CO2_c <=> CO2_m



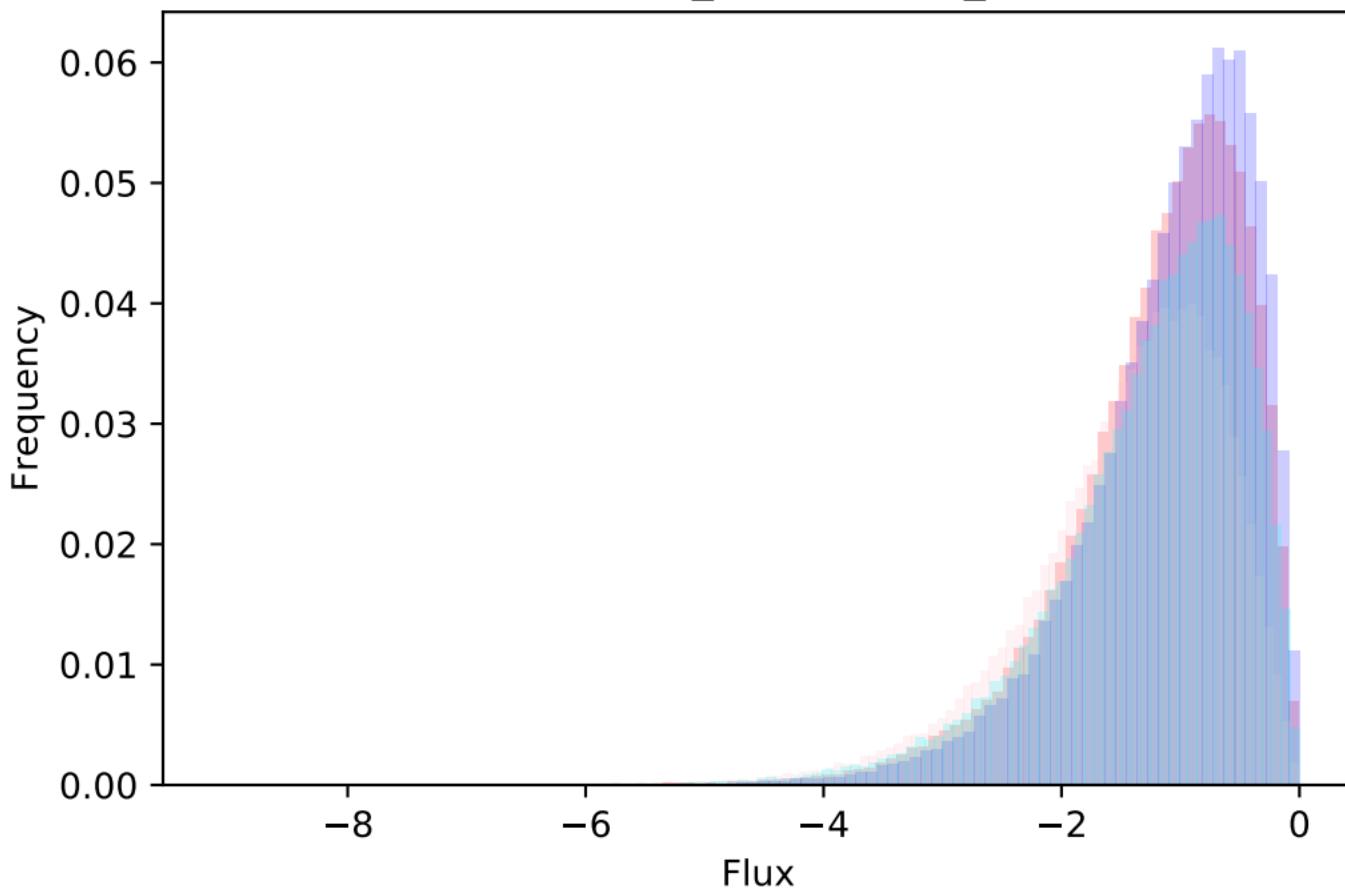
379:H2O_c <=> H2O_h



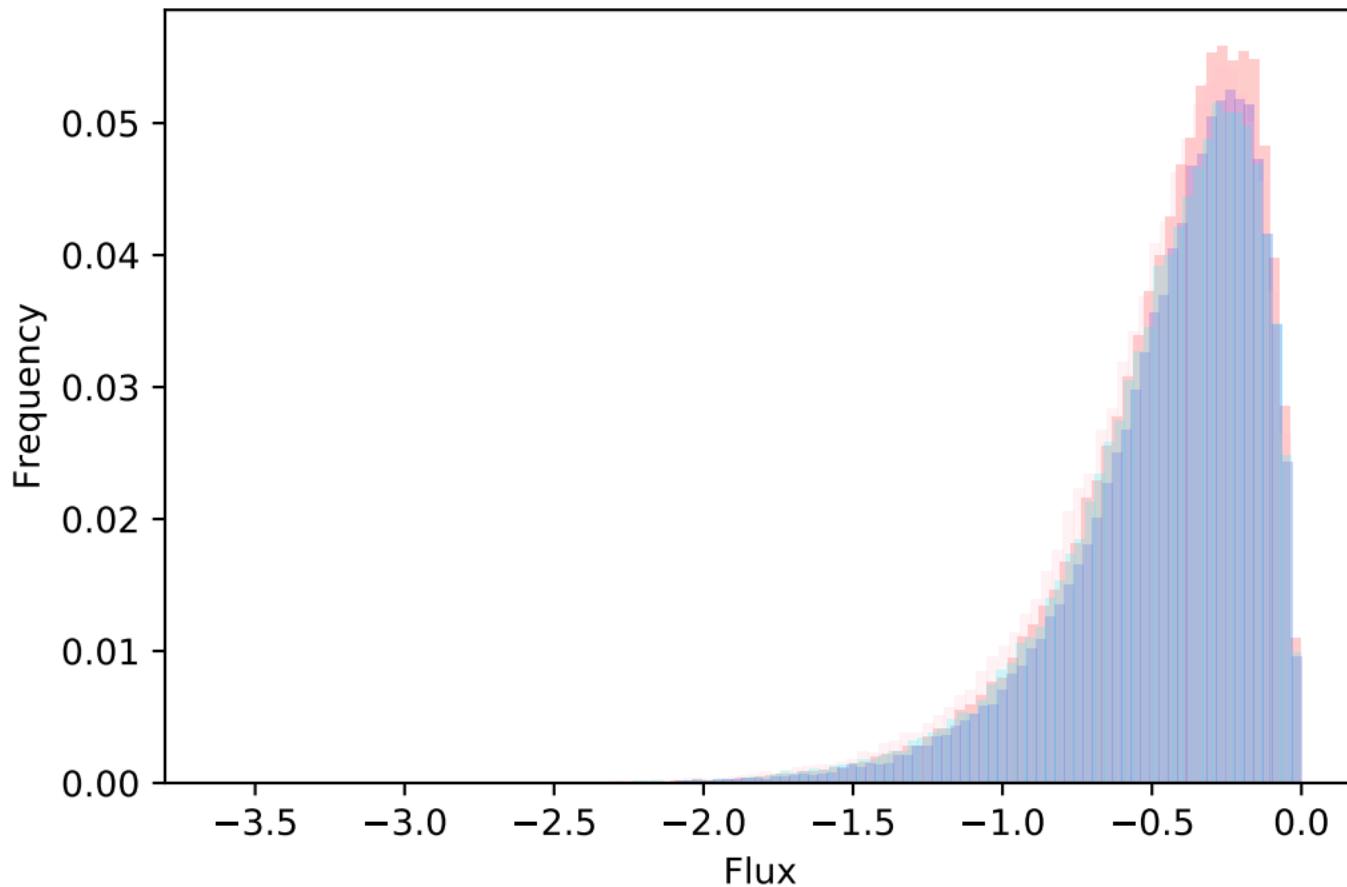
380:H2O_c <=> H2O_m



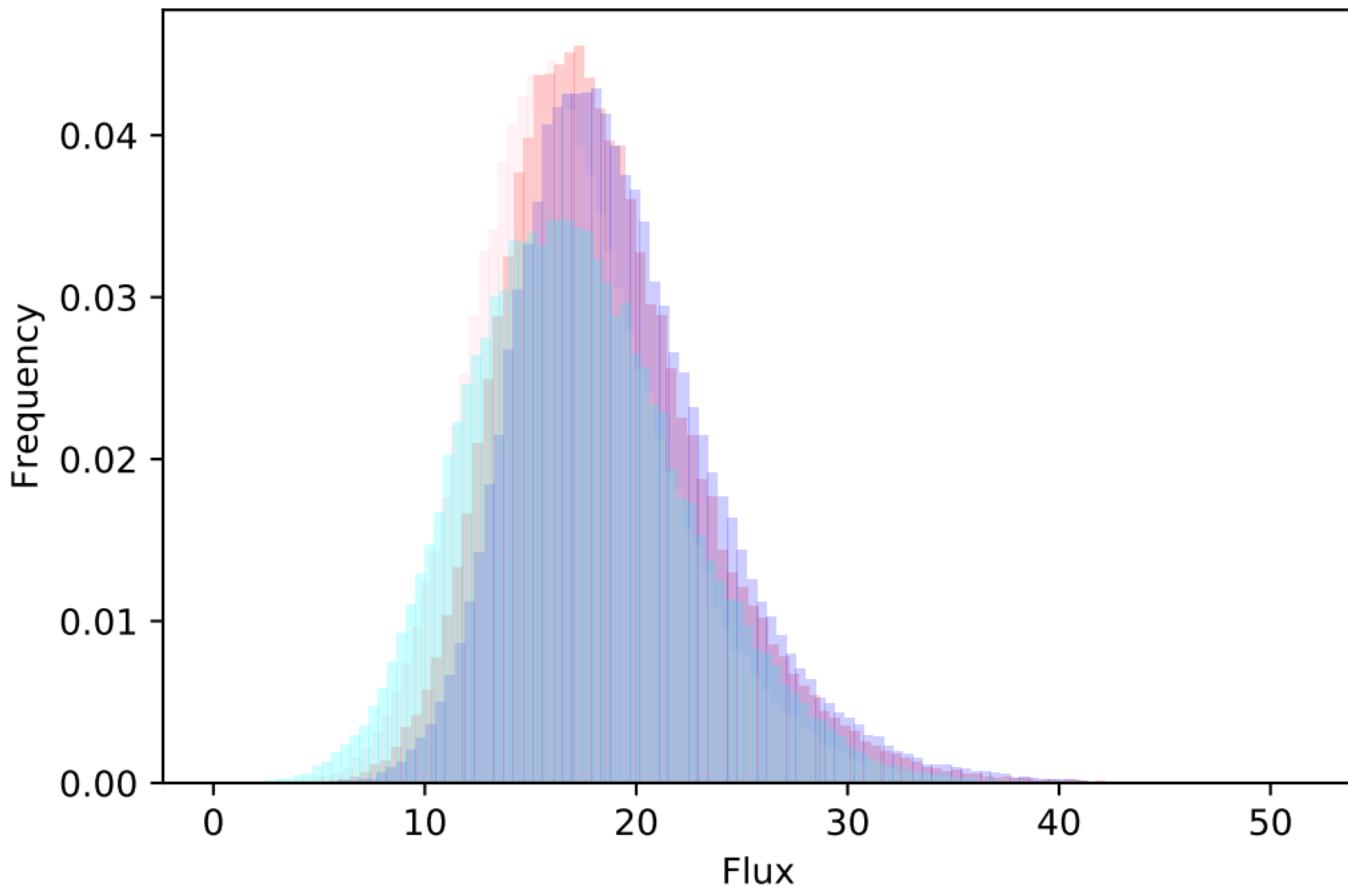
381:H2O_c <=> H2O_p



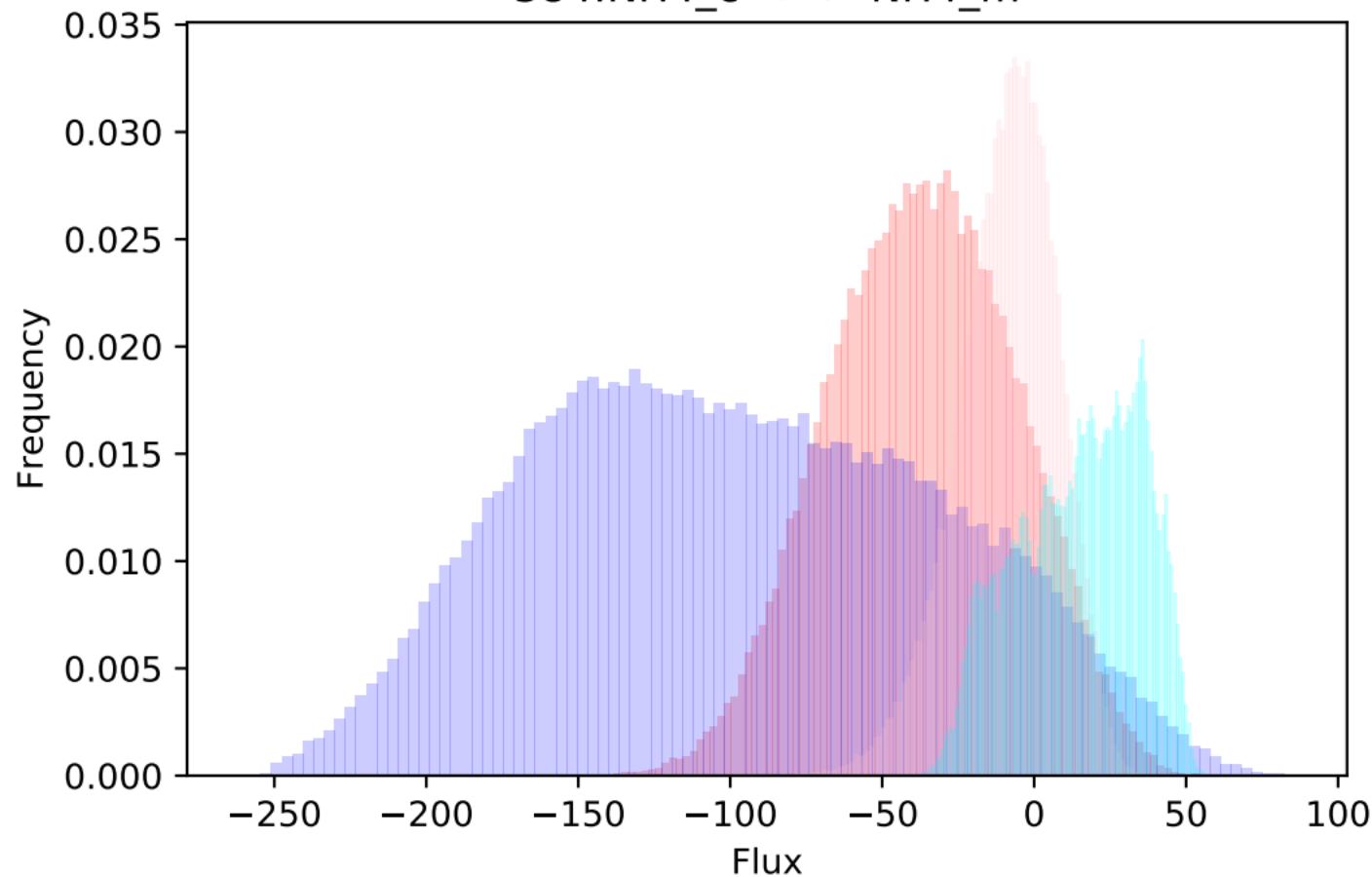
382:H_c <=> H_p



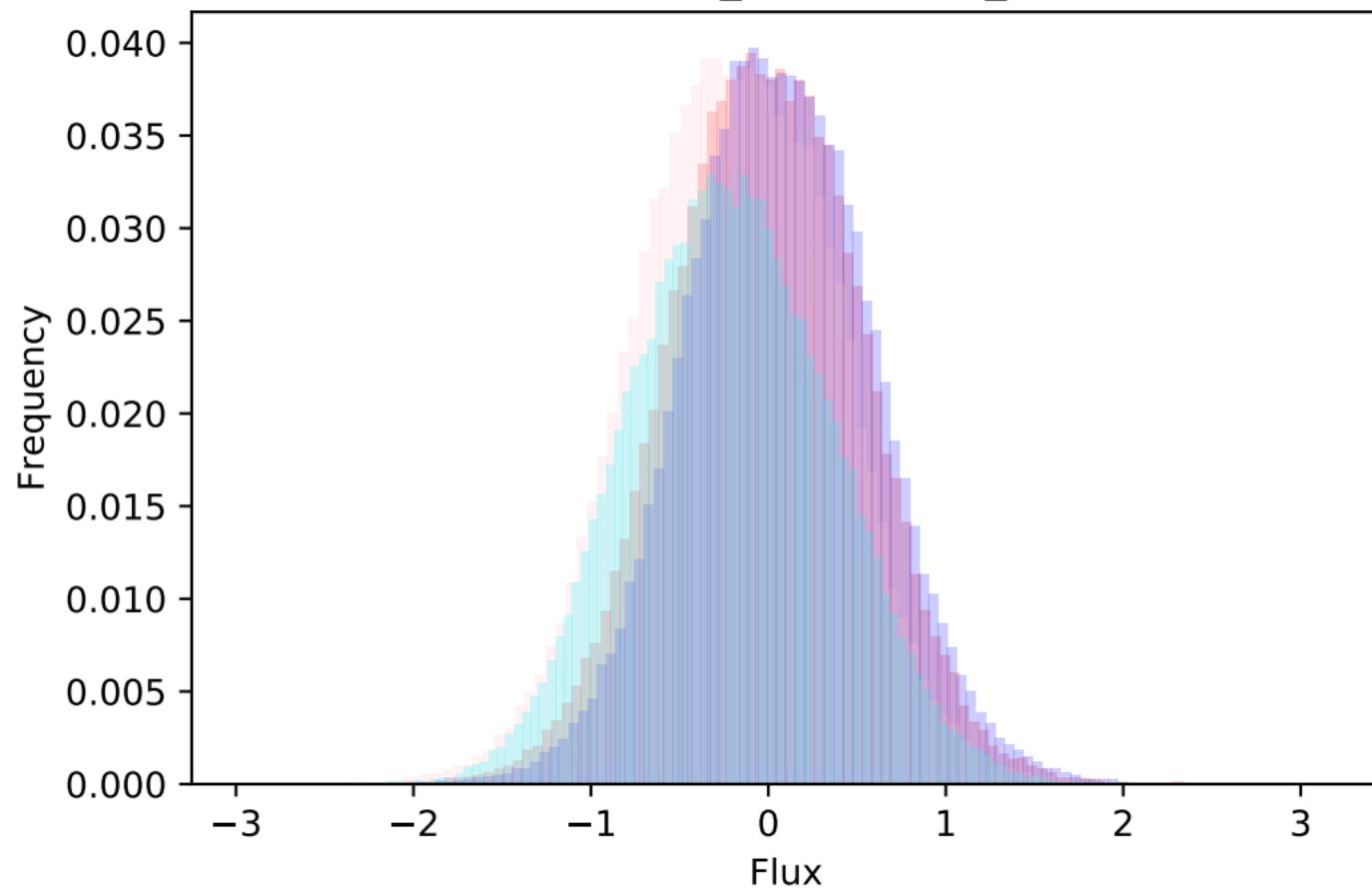
383:NH4_c <=> NH4_h



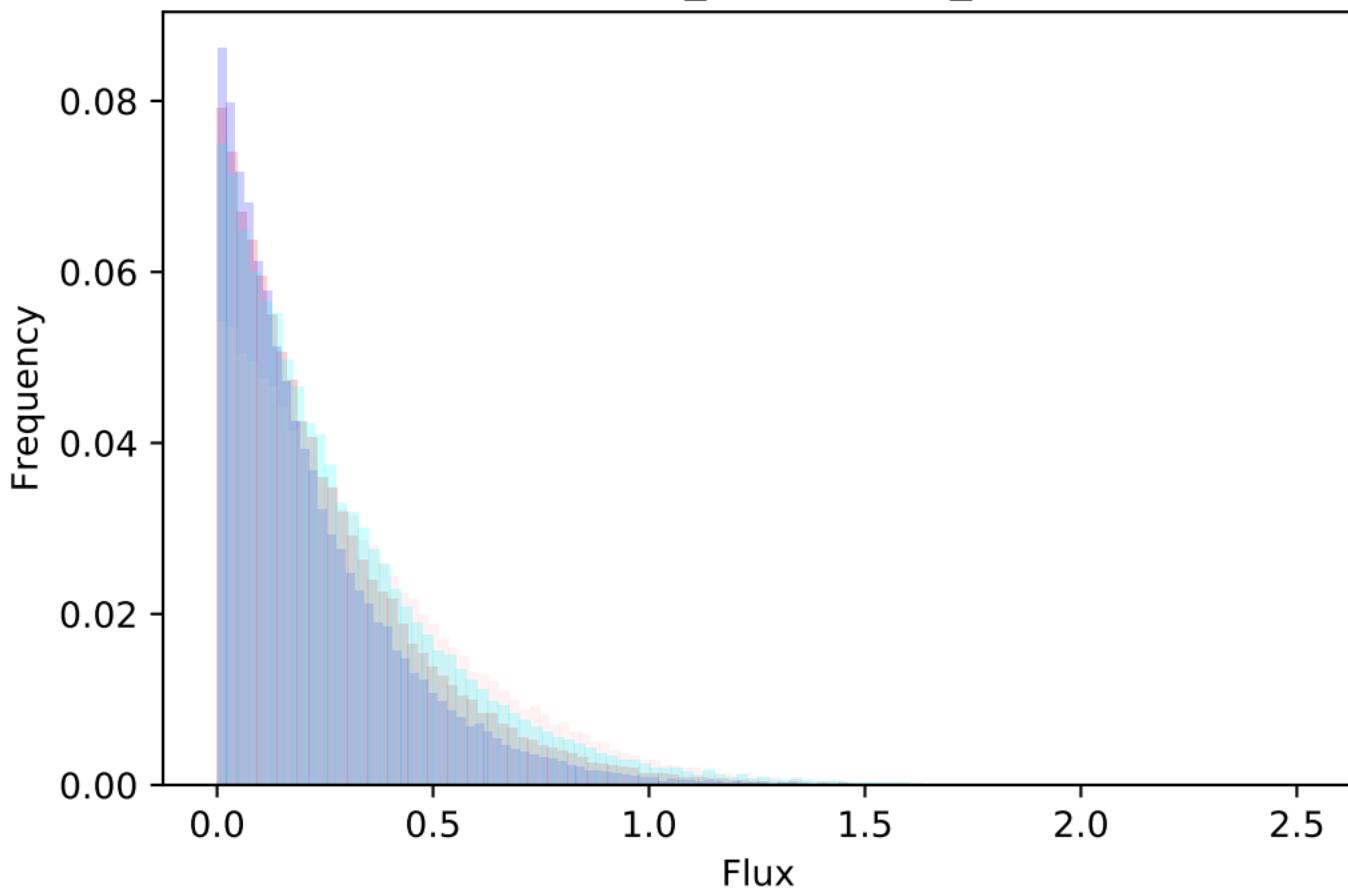
384:NH4_c <=> NH4_m



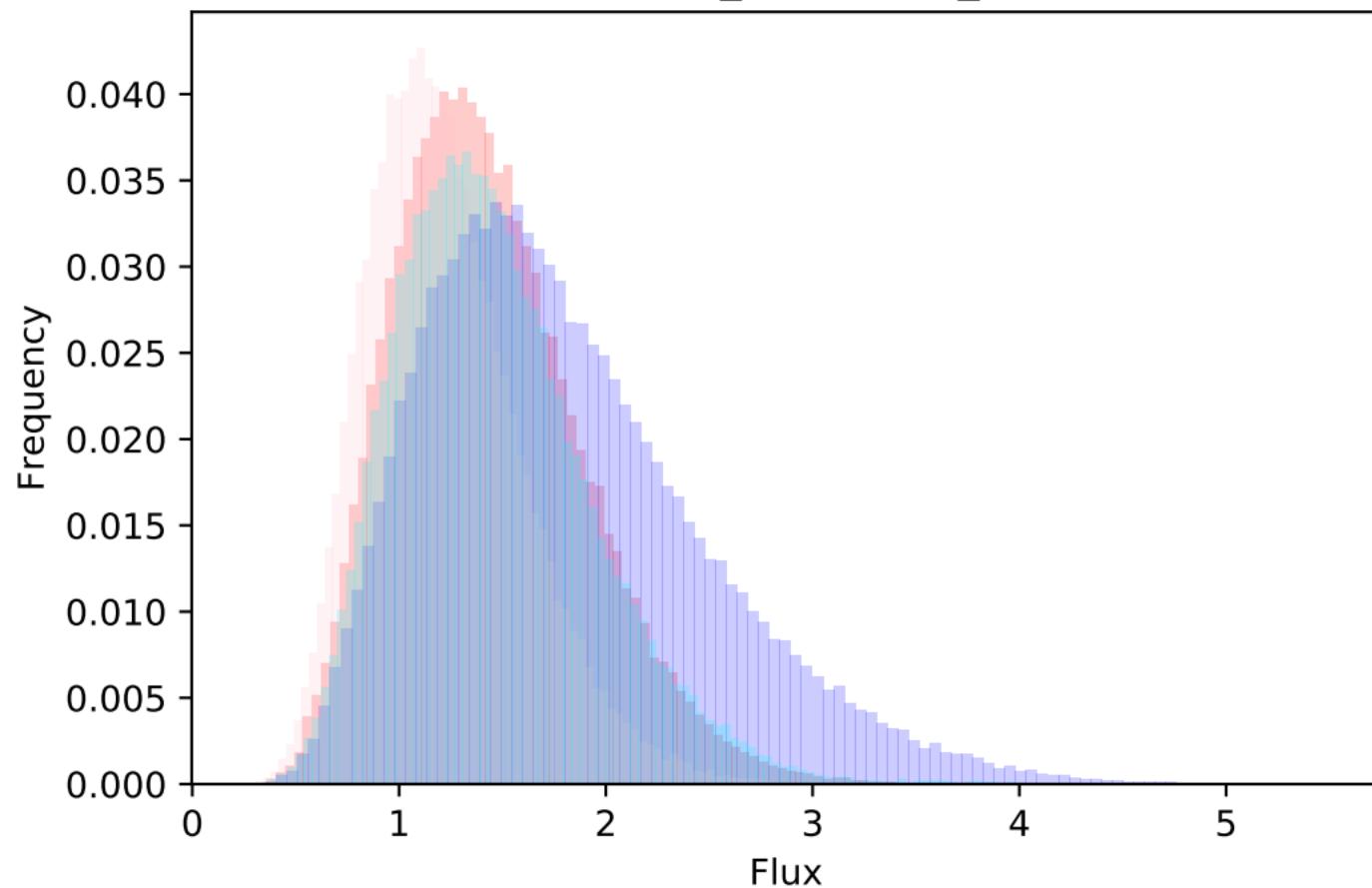
385:H2S_c <=> H2S_h



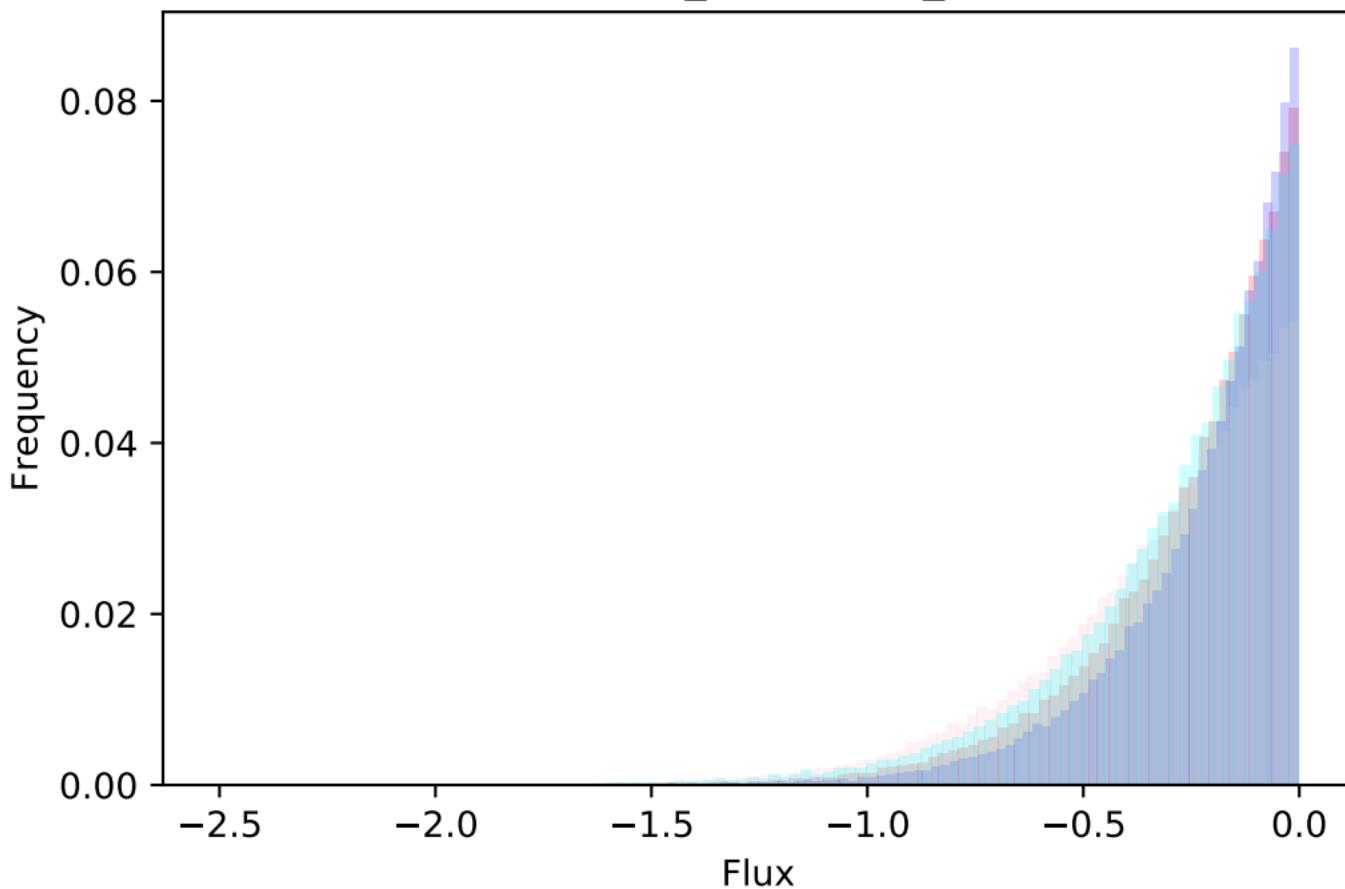
386:H2S_c <=> H2S_m



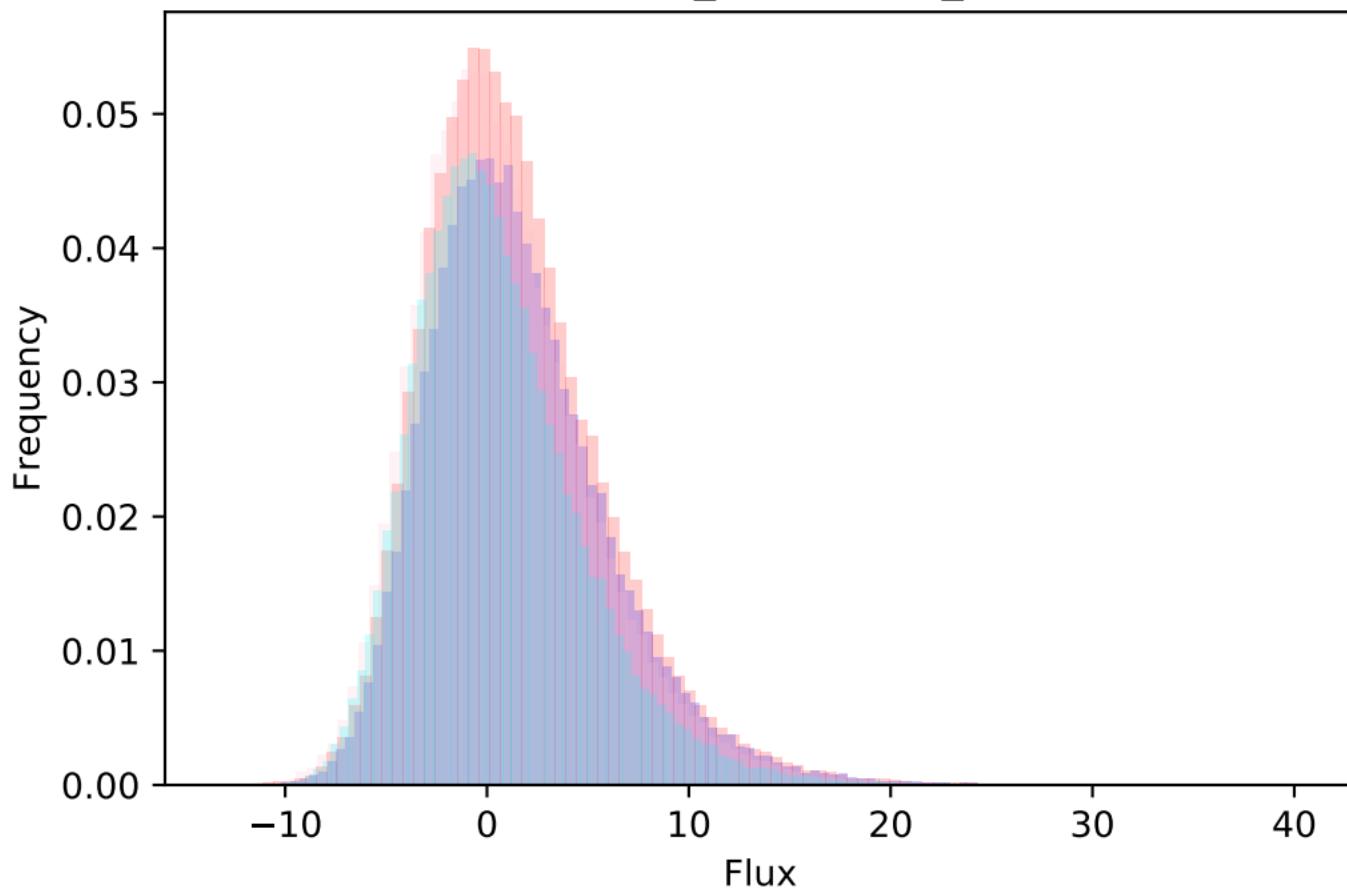
387:AC_c <=> AC_h



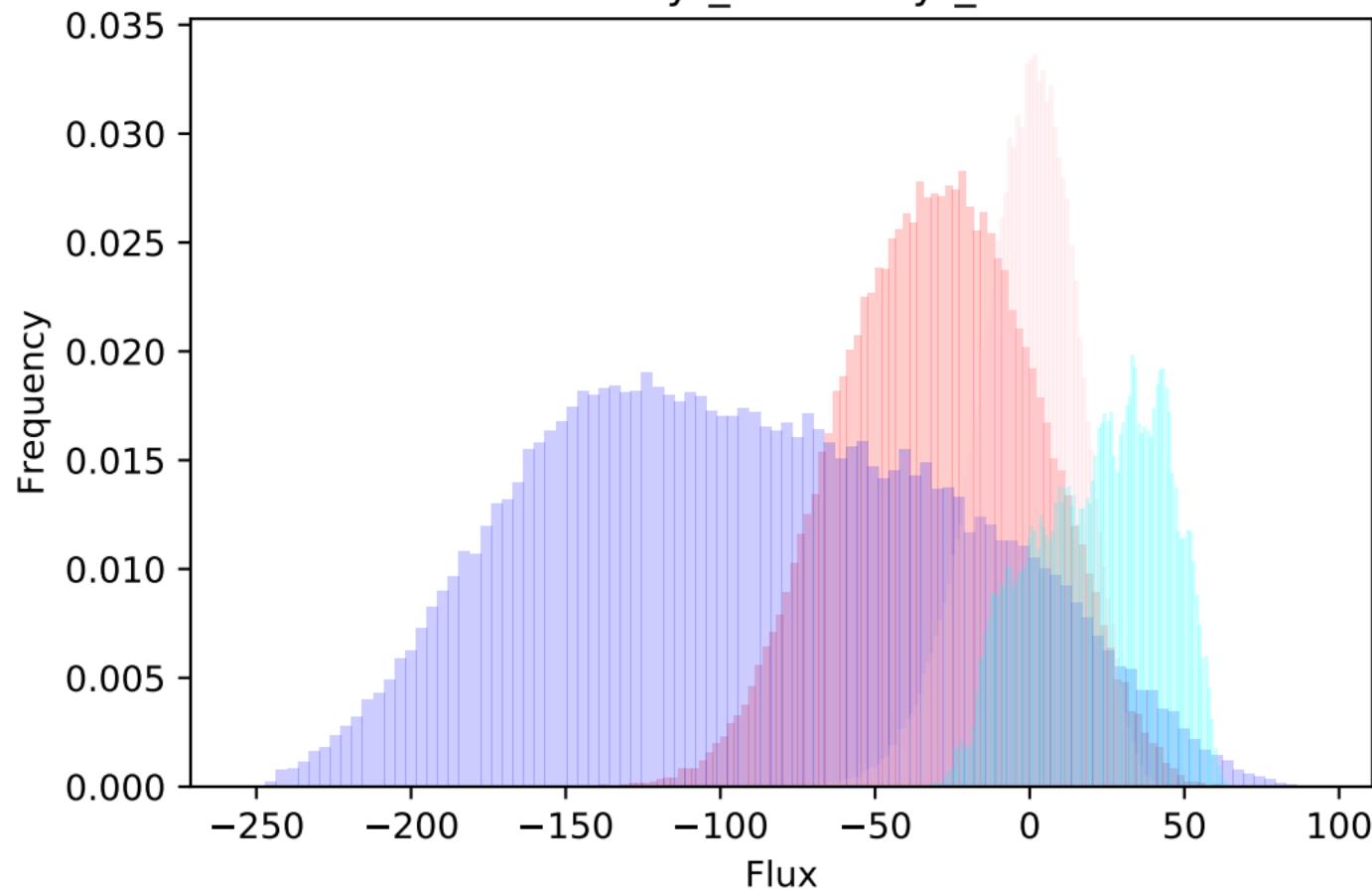
388:AC_c <=> AC_m



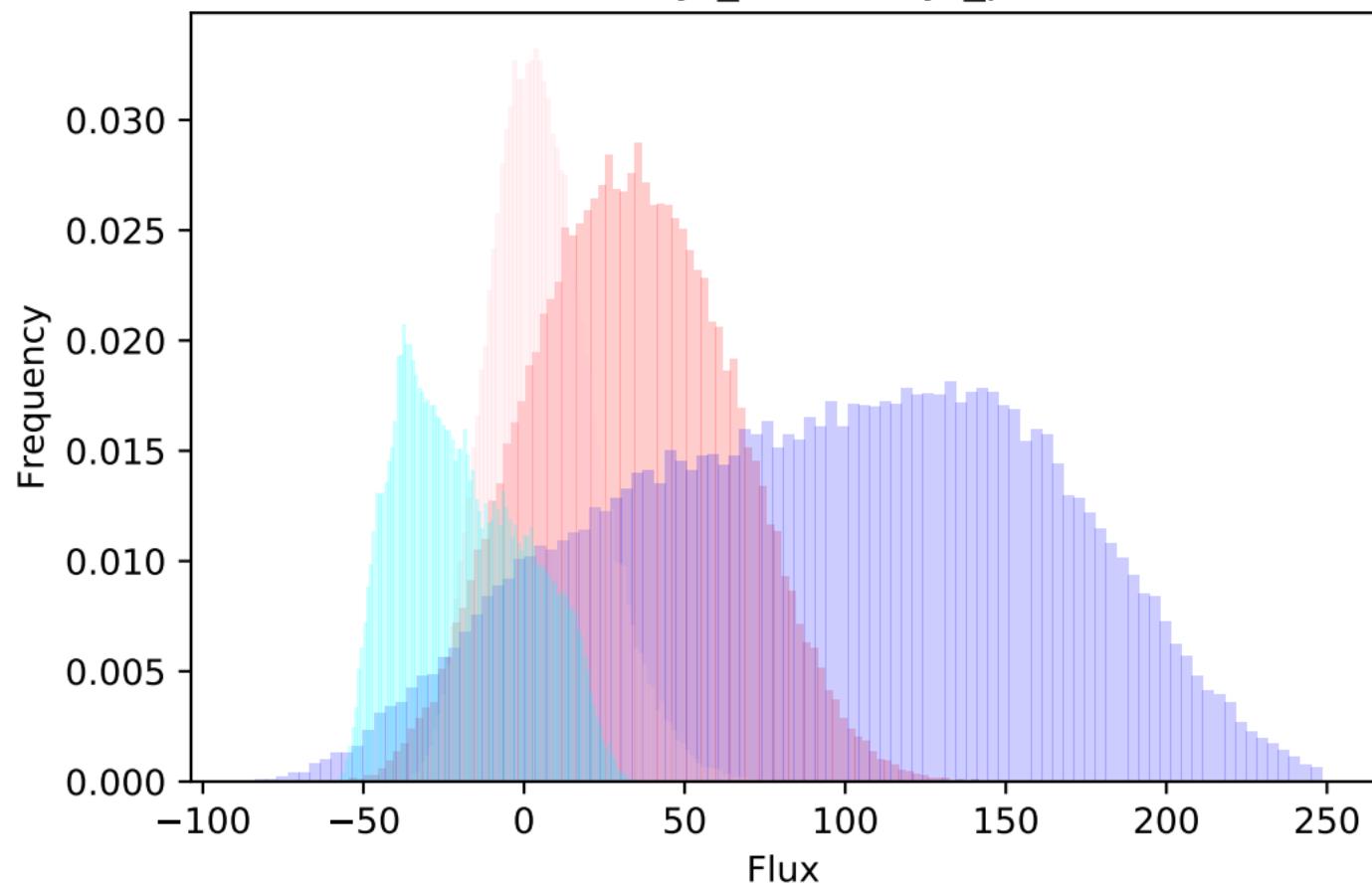
389:Pyr_c <=> Pyr_h



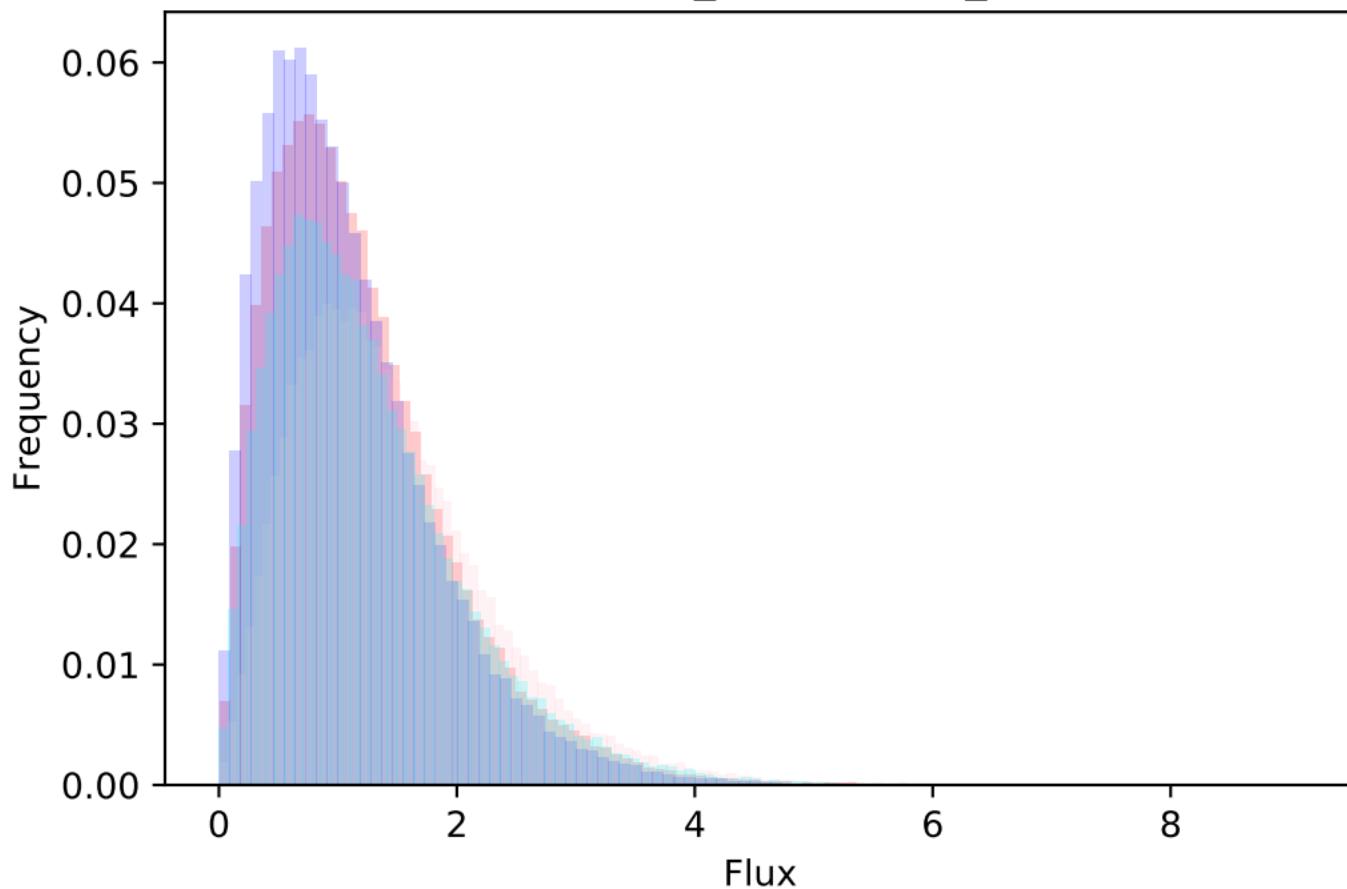
390:Pyr_c <=> Pyr_m



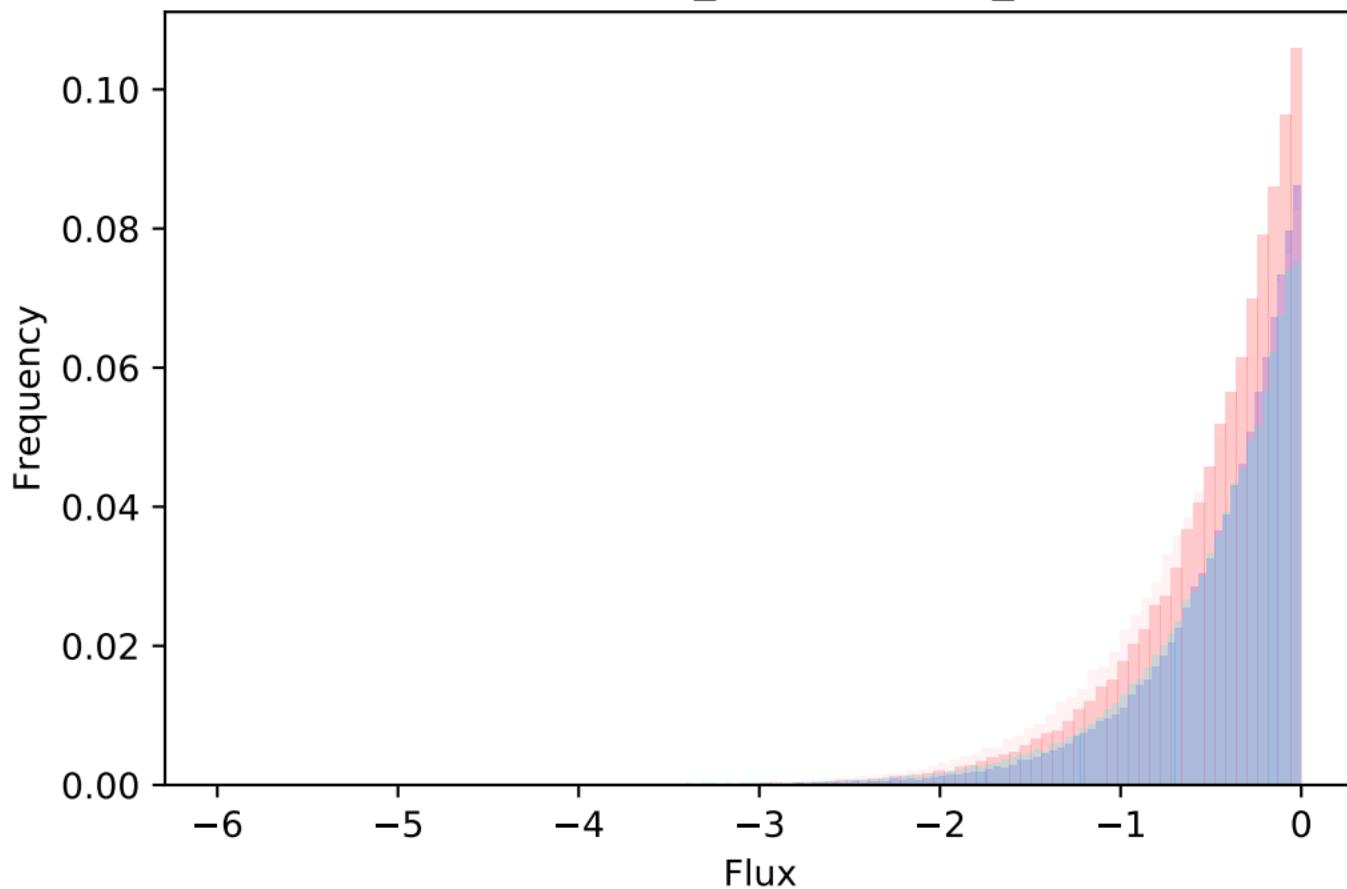
391:Pyr_c <=> Pyr_p



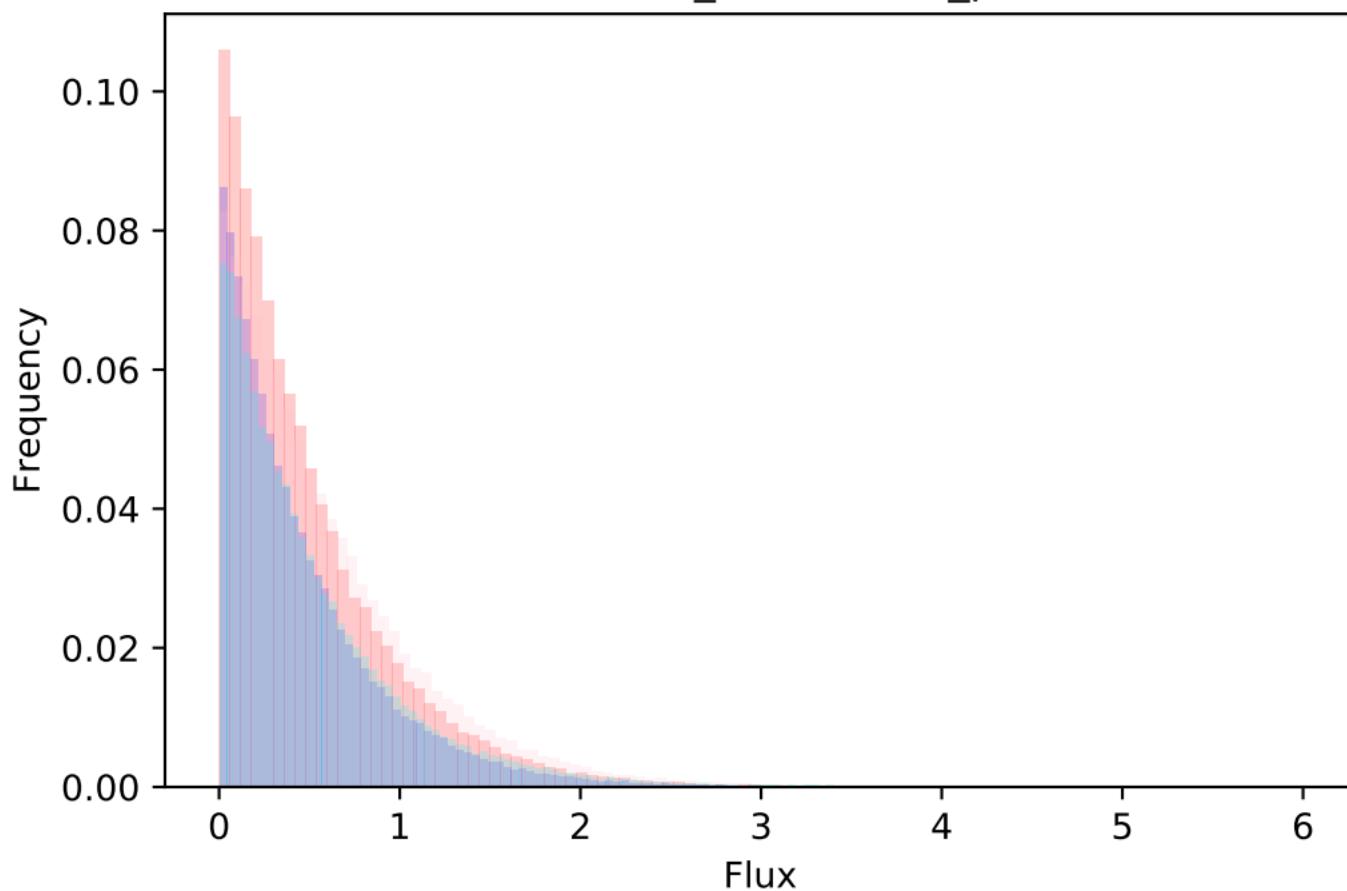
392:GCA_c <=> GCA_p



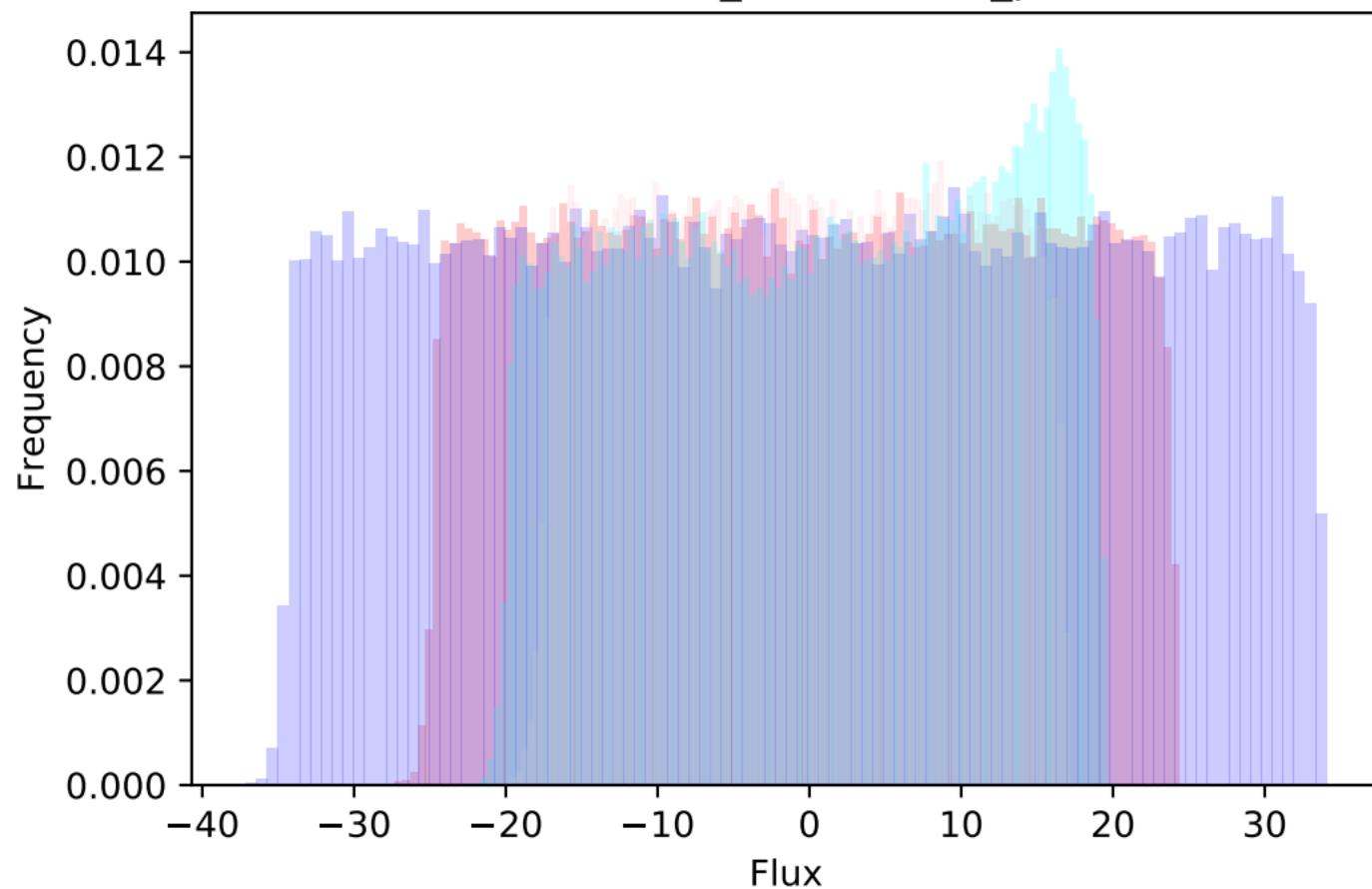
393:GCEA_c <=> GCEA_p



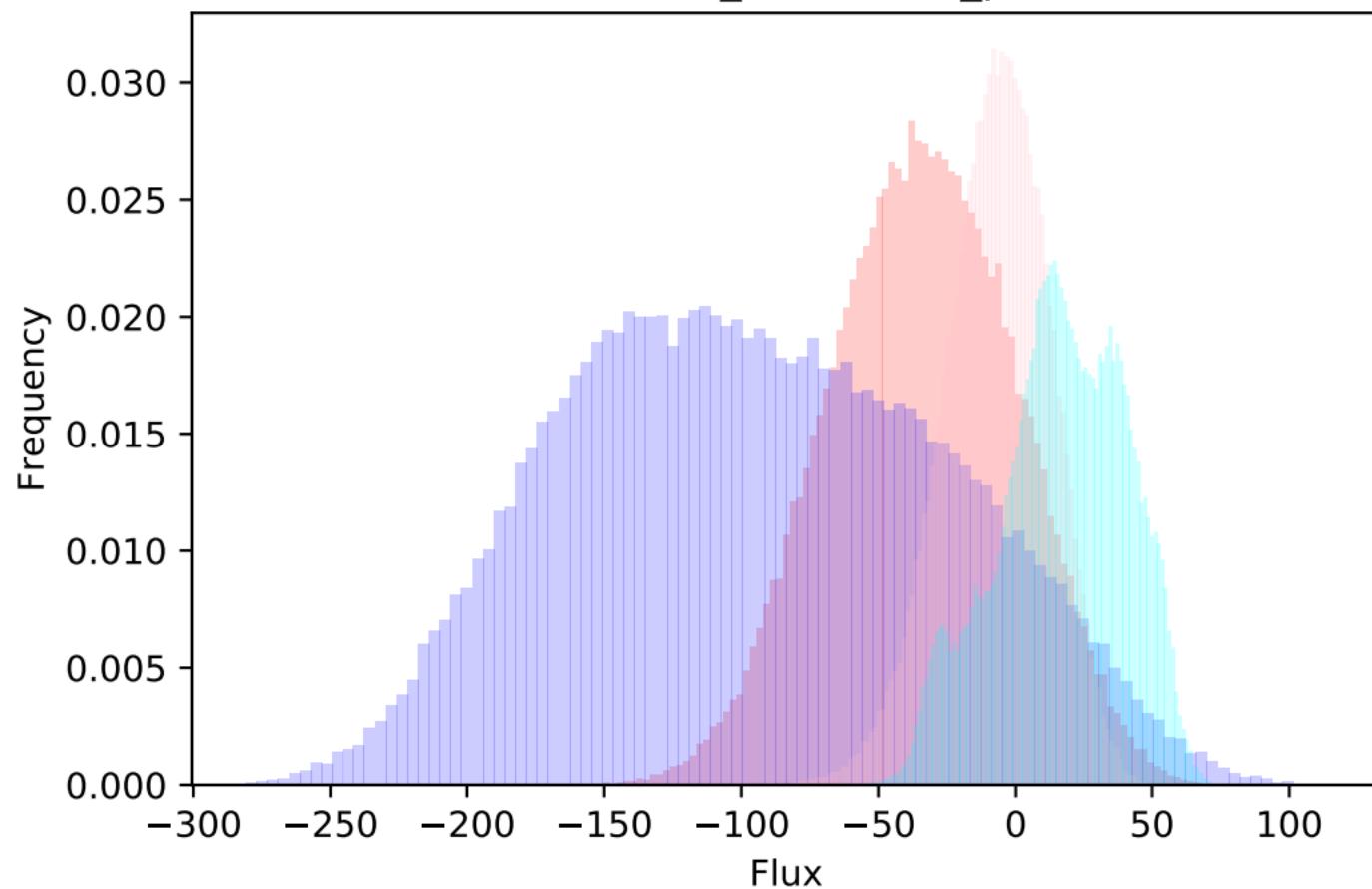
394:Mal_c <=> Mal_p



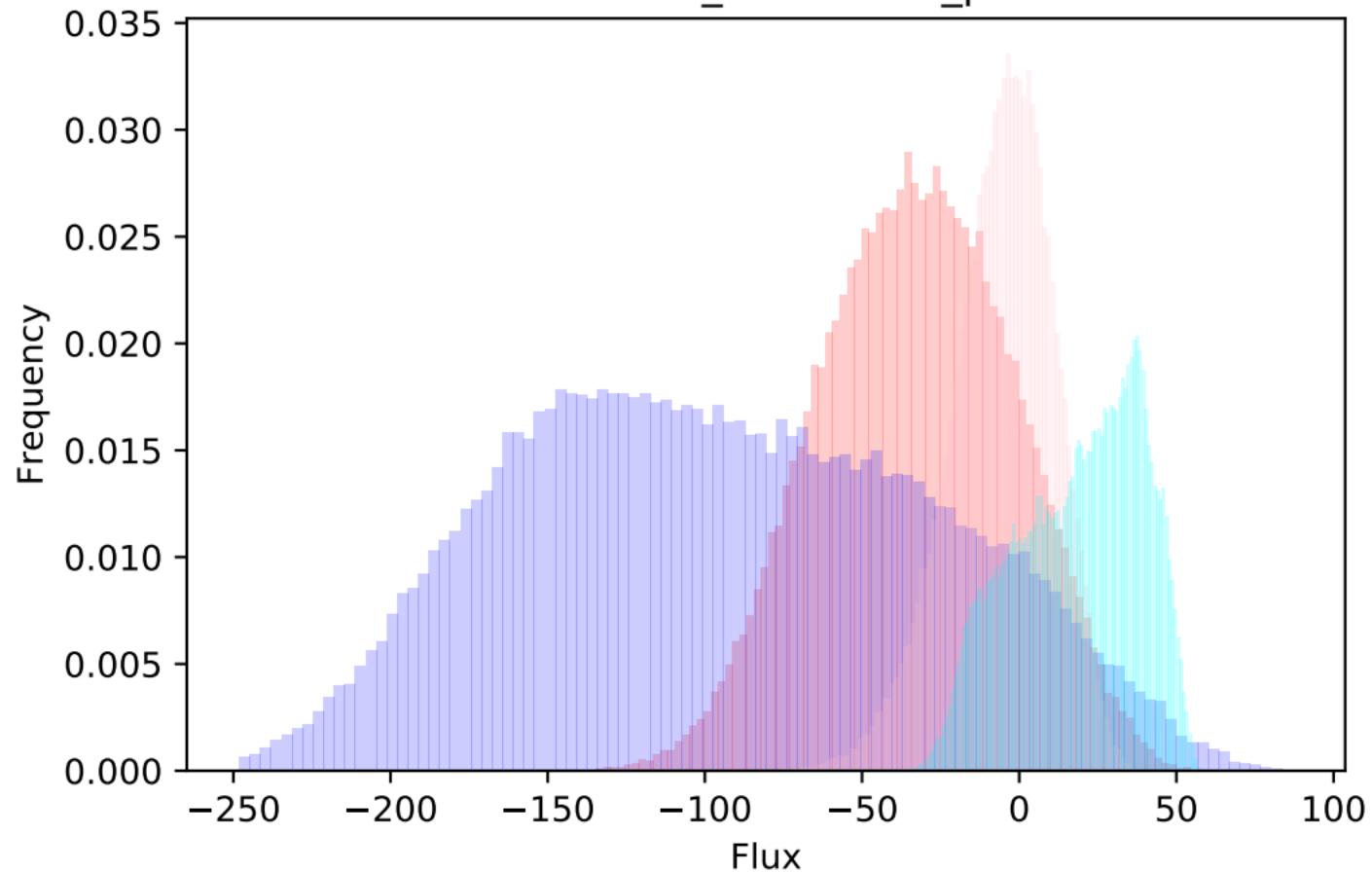
395:OAA_c <=> OAA_p



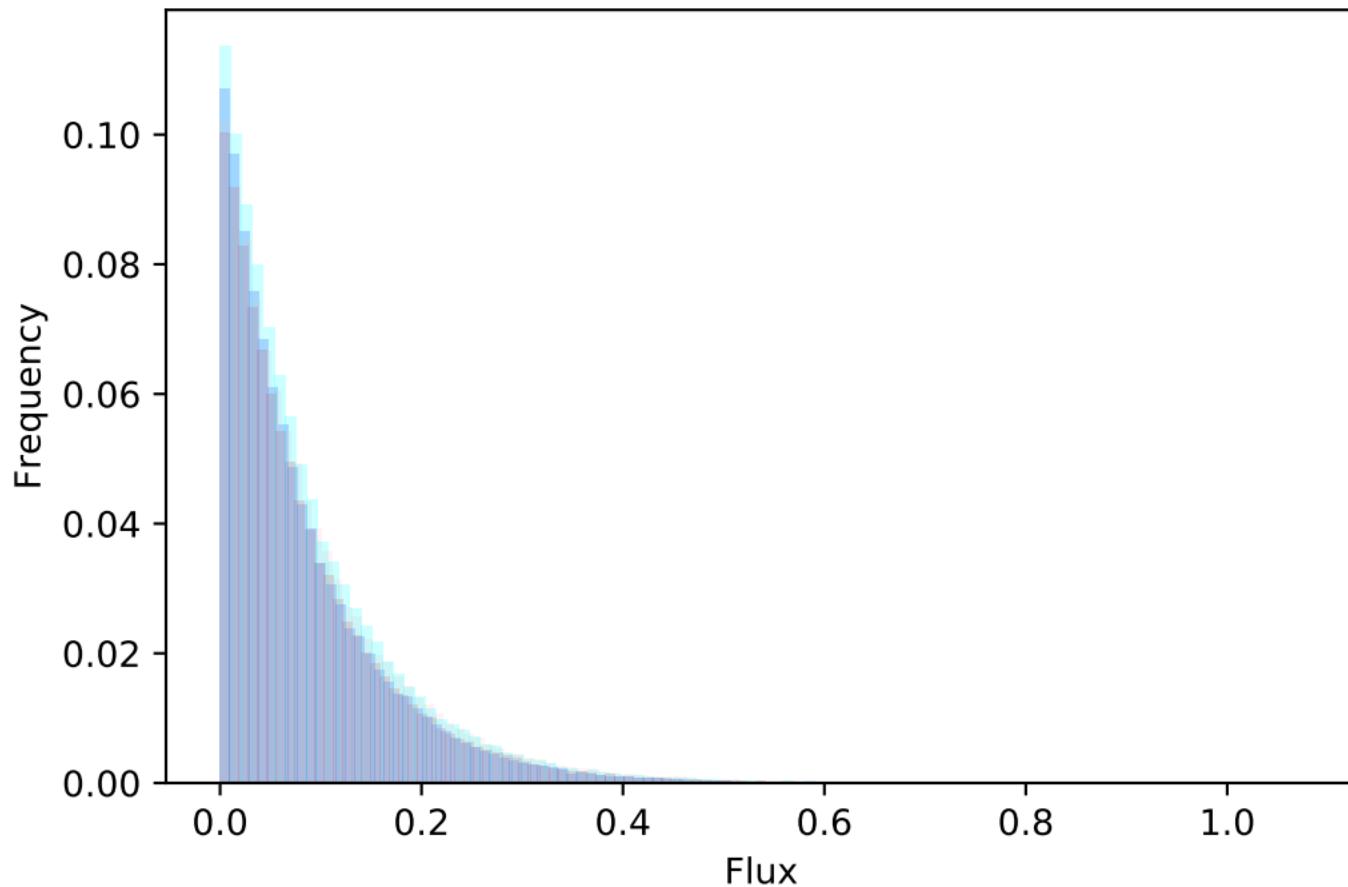
396:KG_c <=> KG_p



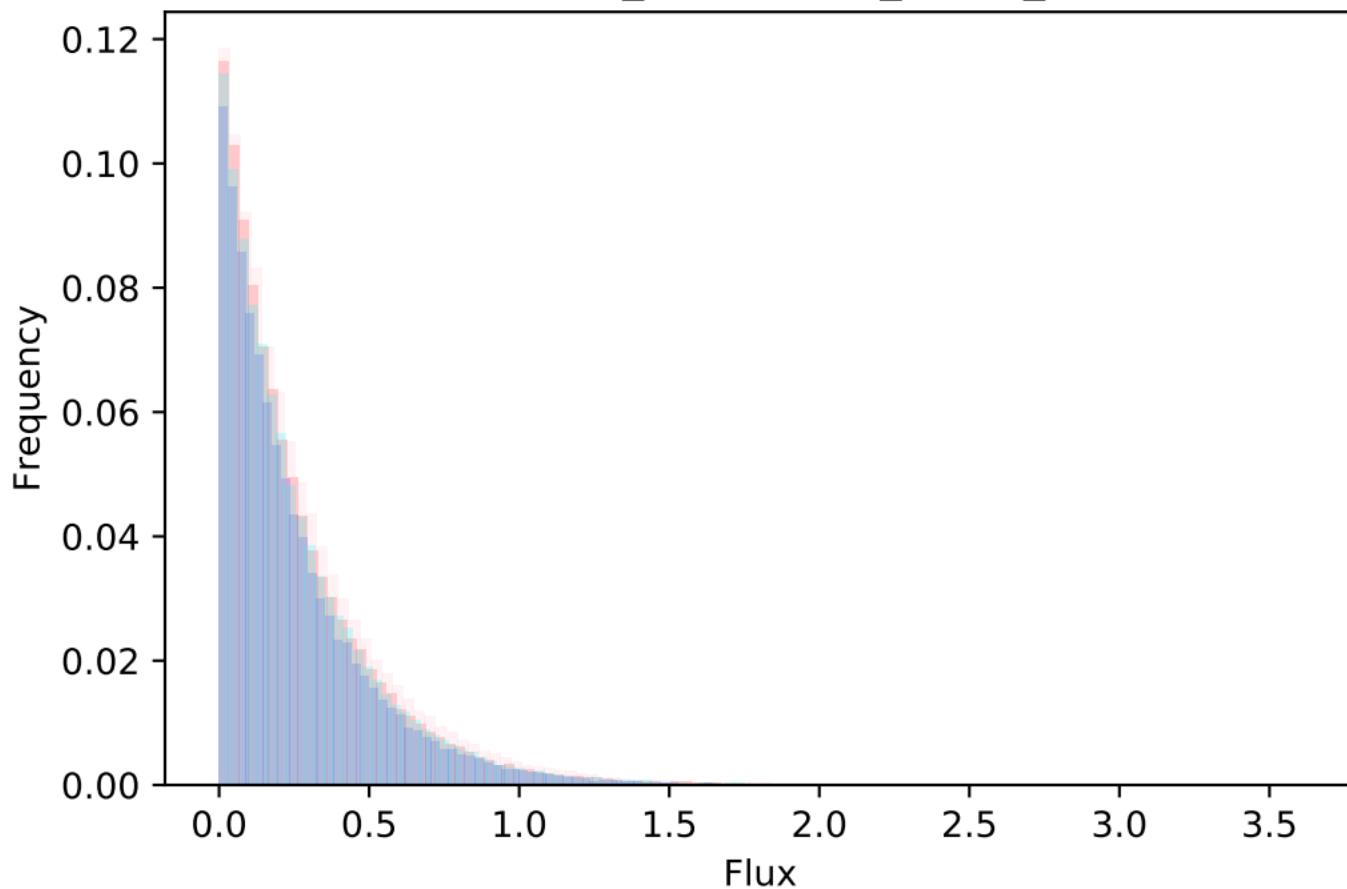
397:Ala_c <=> Ala_p



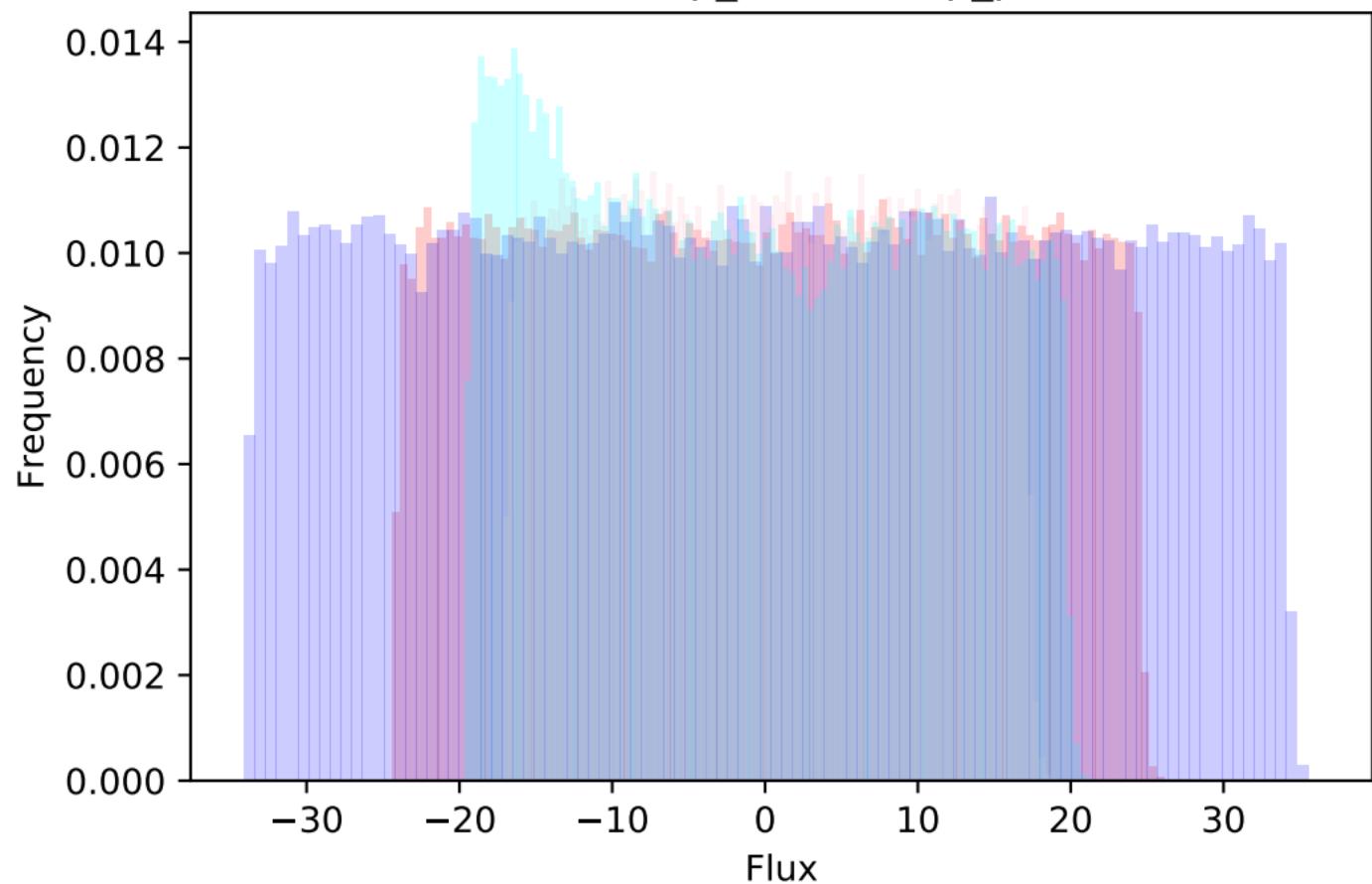
398:Arg_c <=> Arg_p



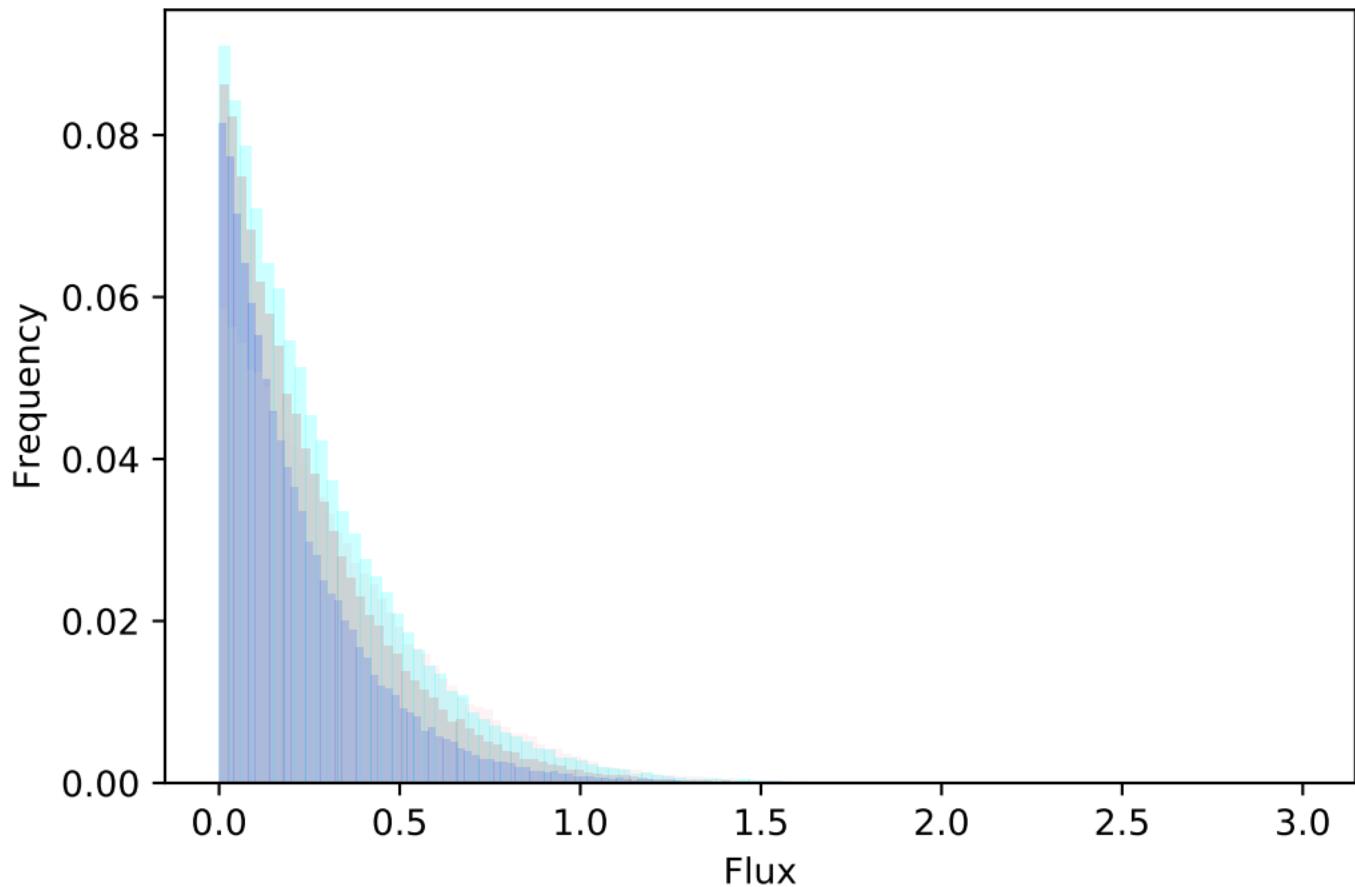
399:Asn_c <=> Asn_p + H_p



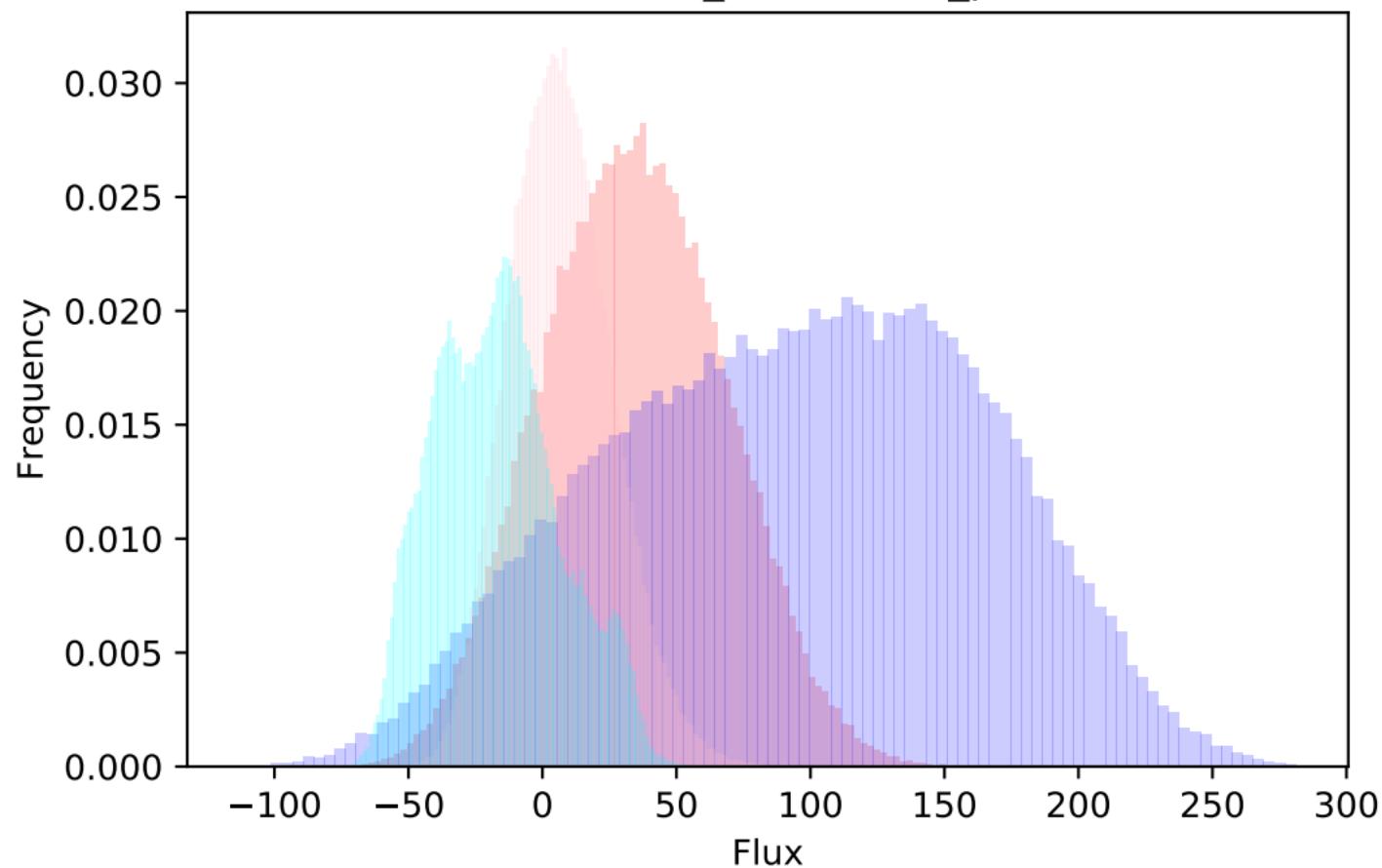
400:Asp_c <=> Asp_p



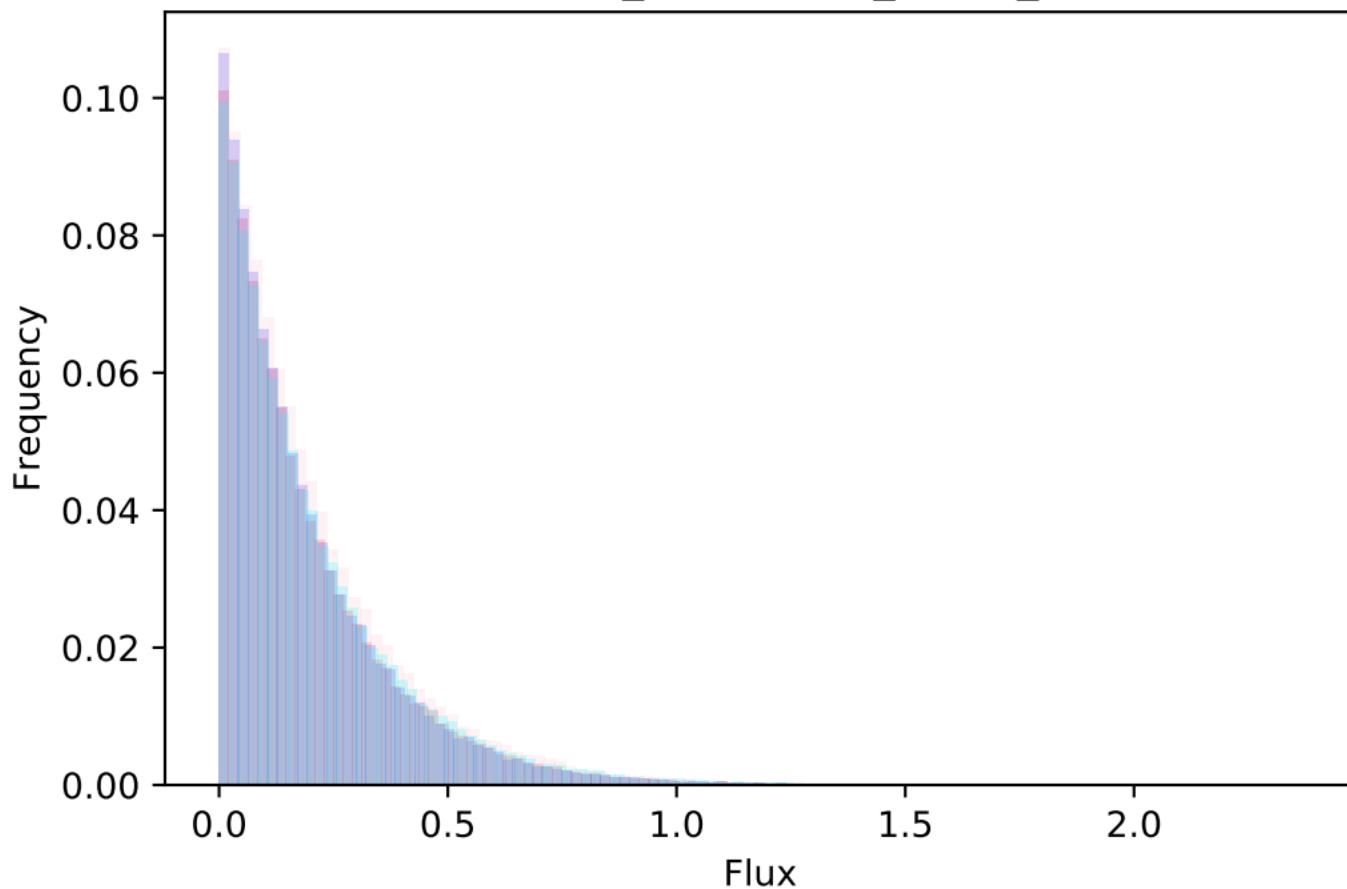
401:Cys_c <=> Cys_p



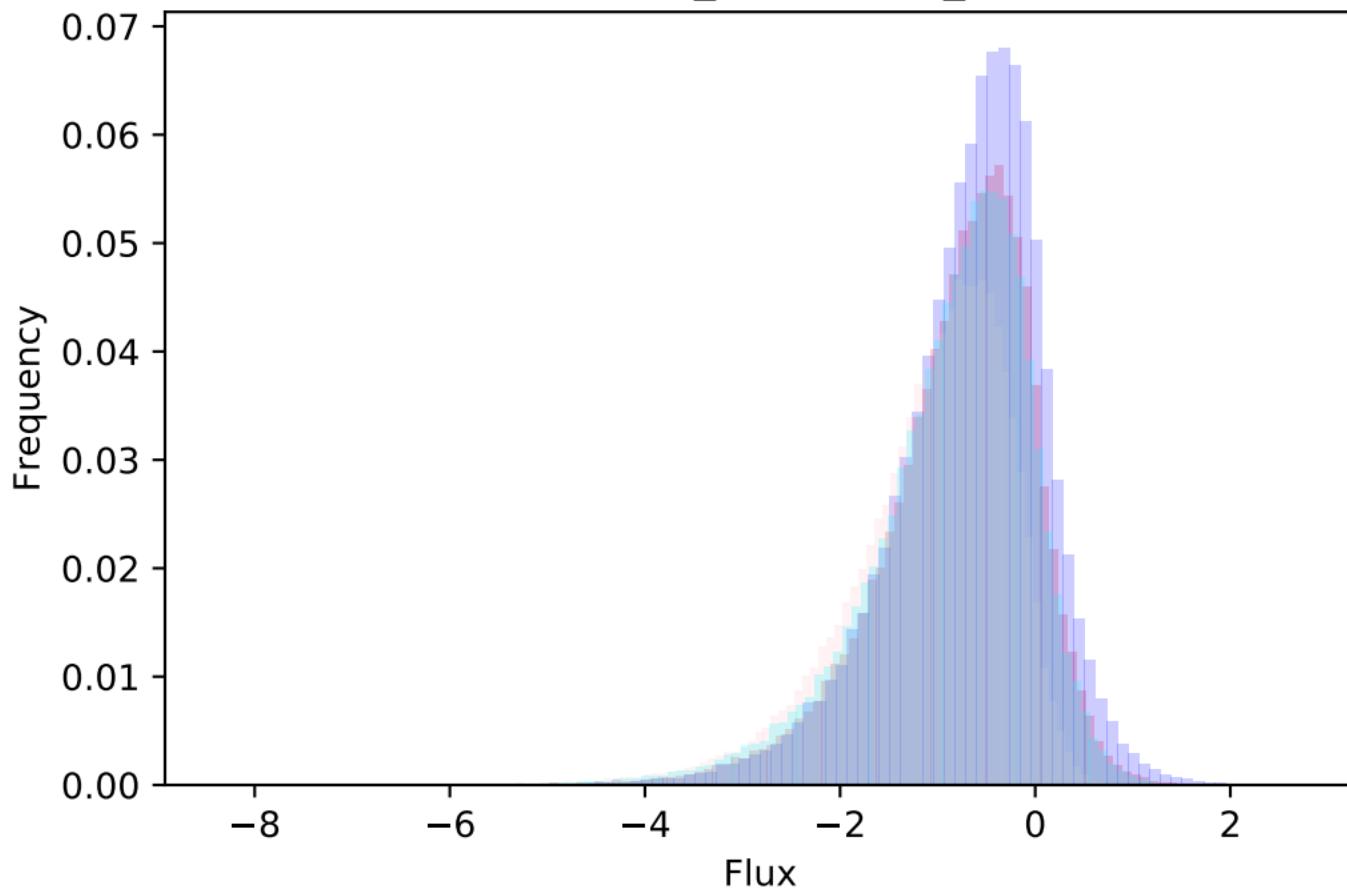
402:Glu_c <=> Glu_p



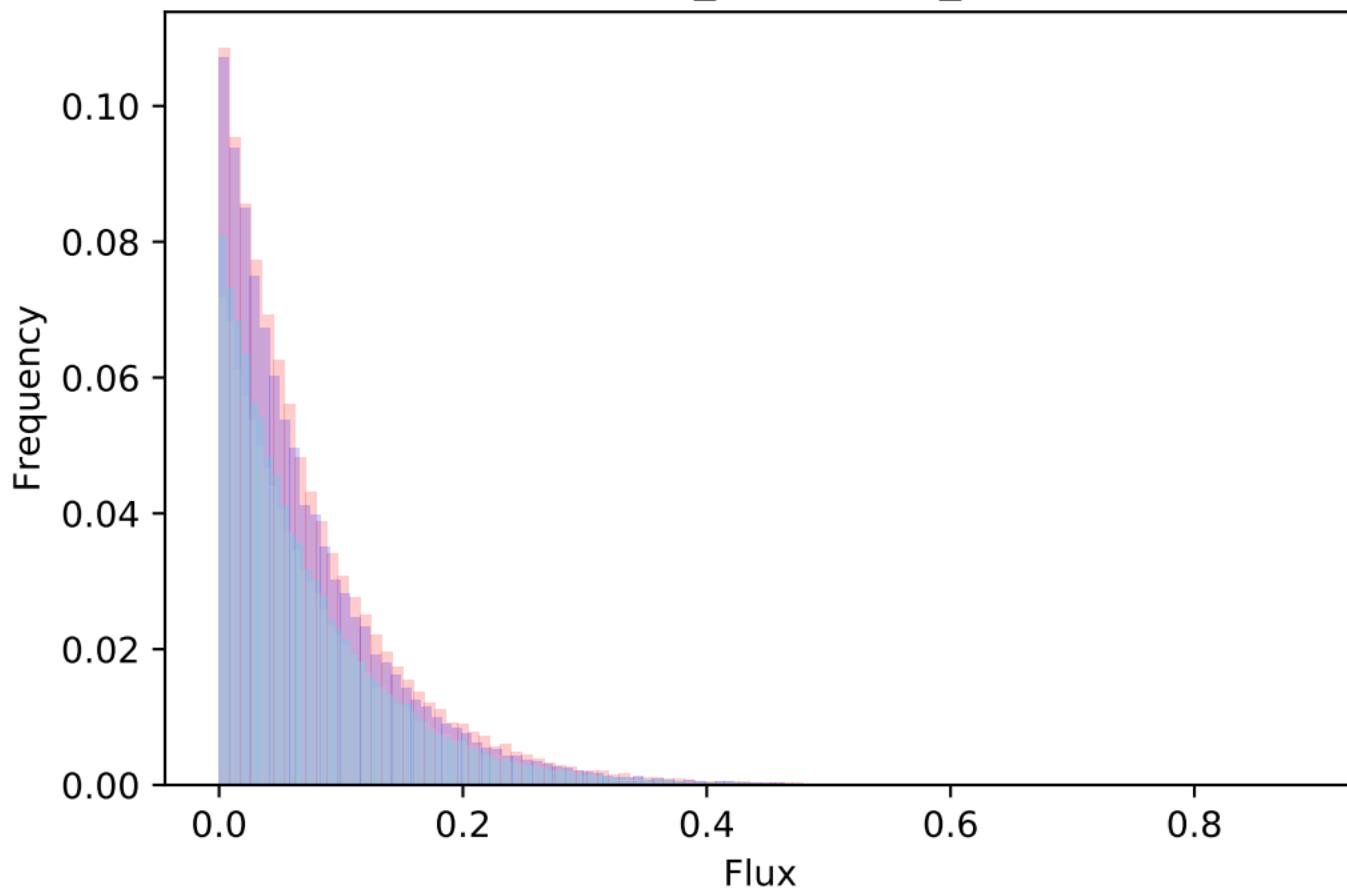
403:Gln_c <=> Gln_p + H_p



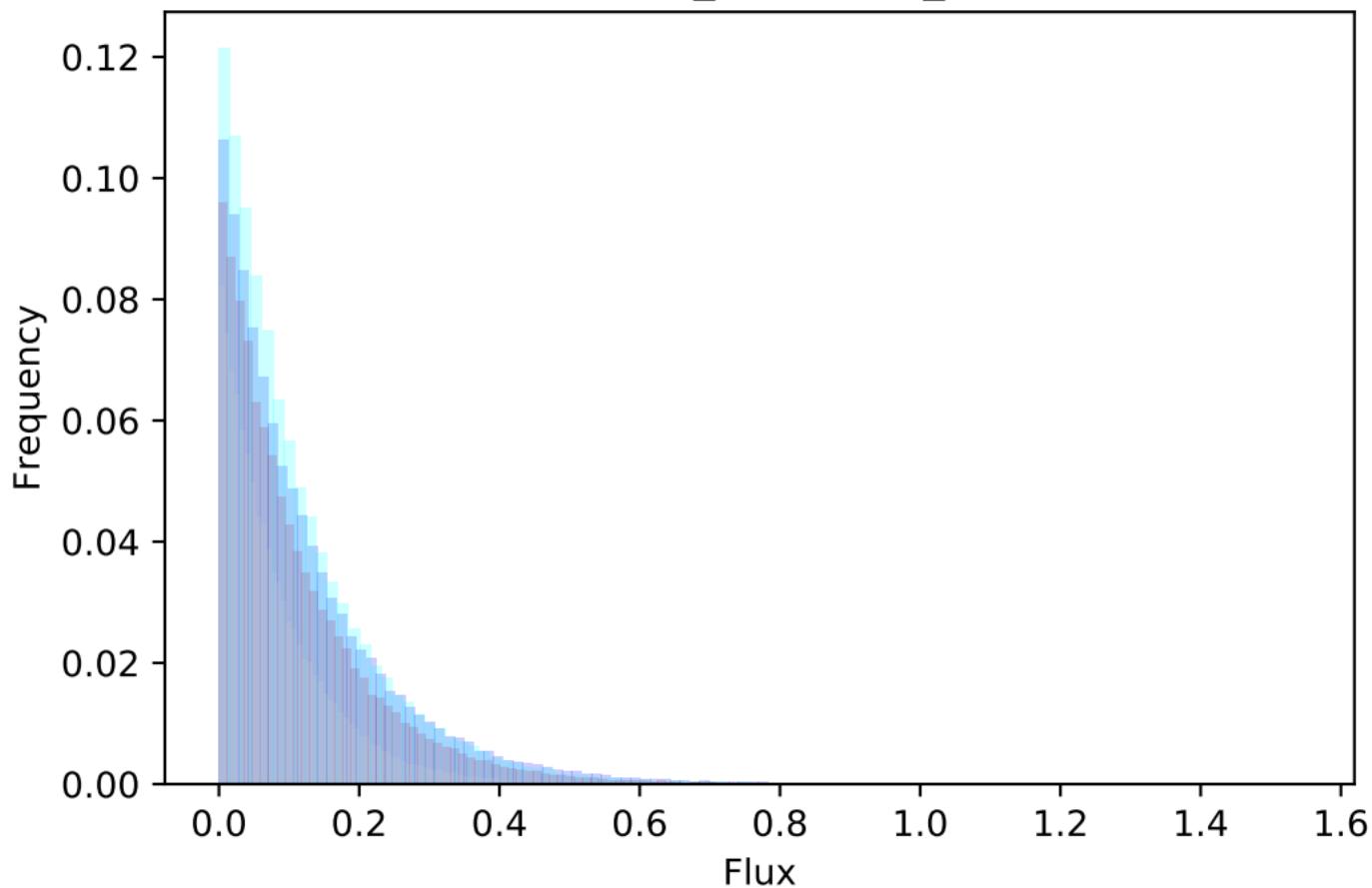
404:Gly_c <=> Gly_p



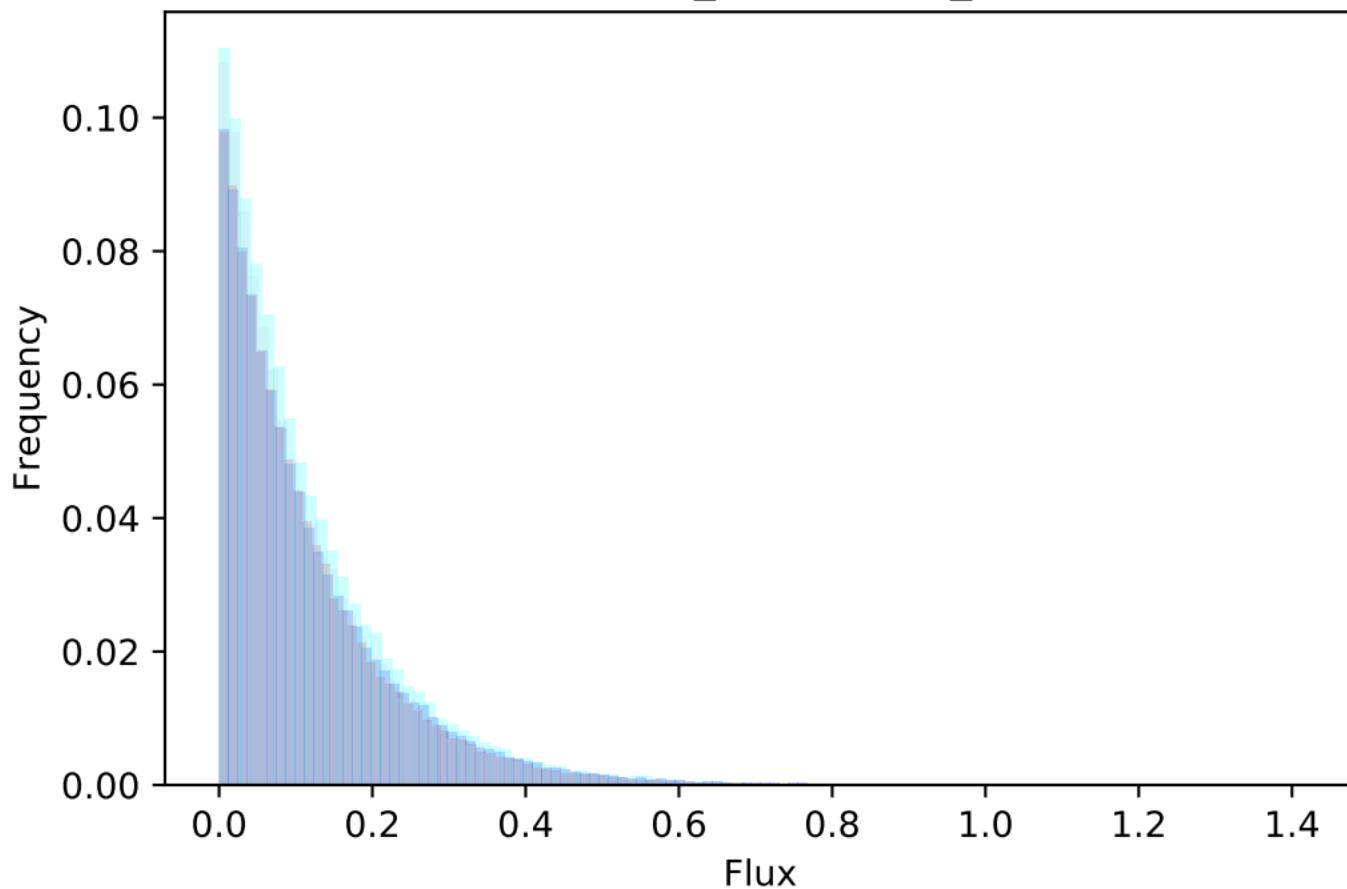
405:His_c <=> His_p



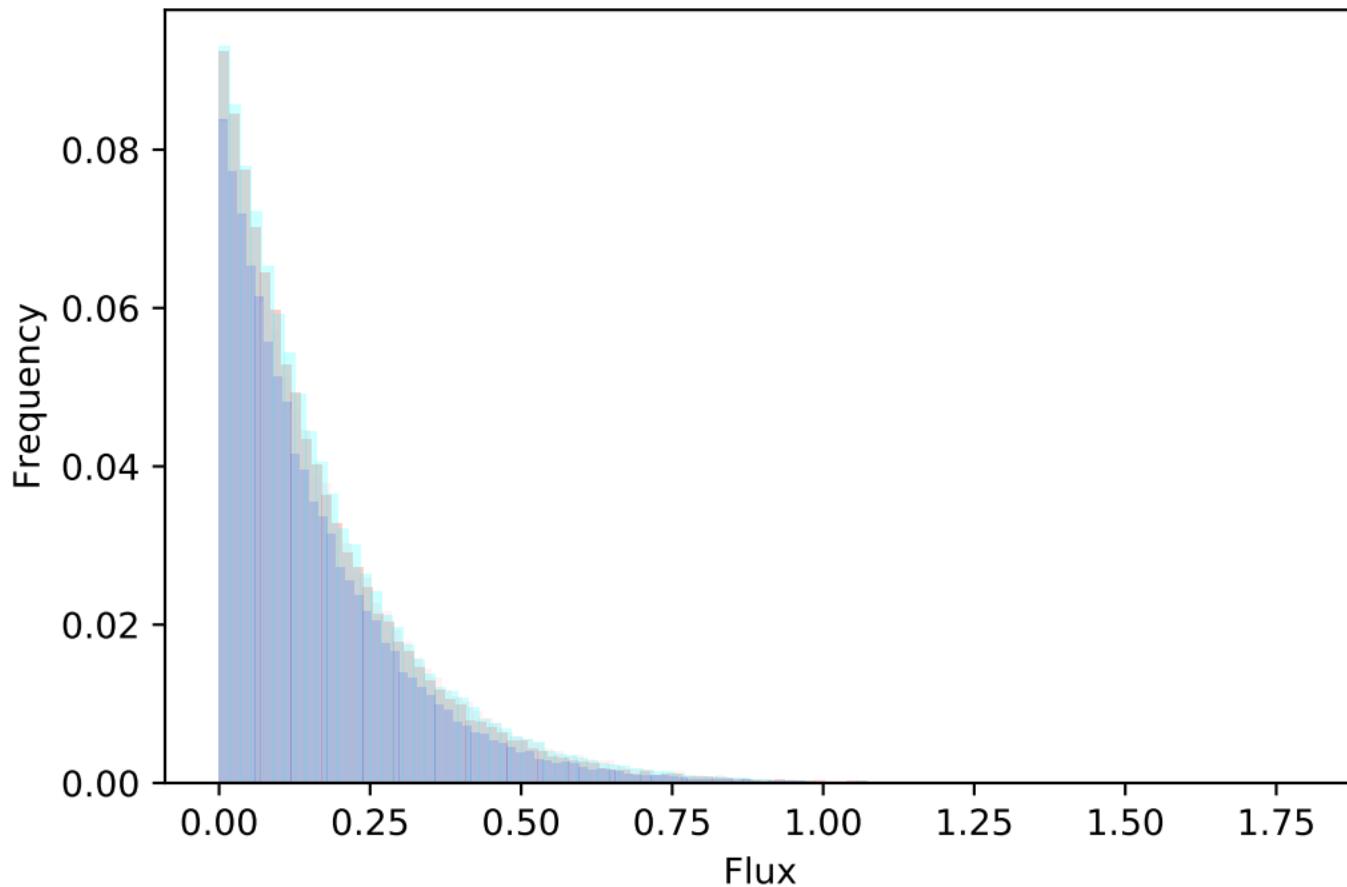
406:lle_c <=> lle_p



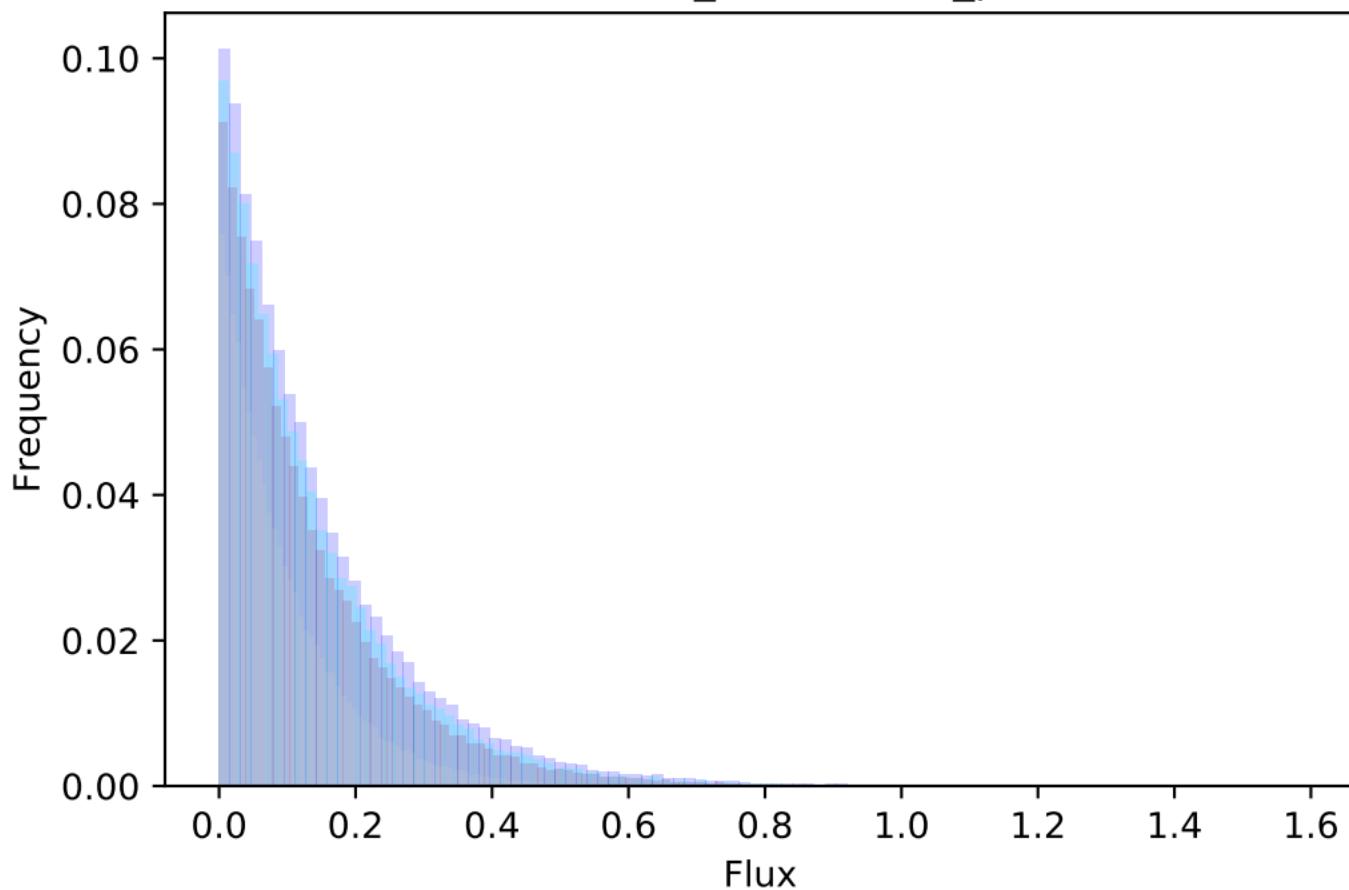
407:Leu_c <=> Leu_p



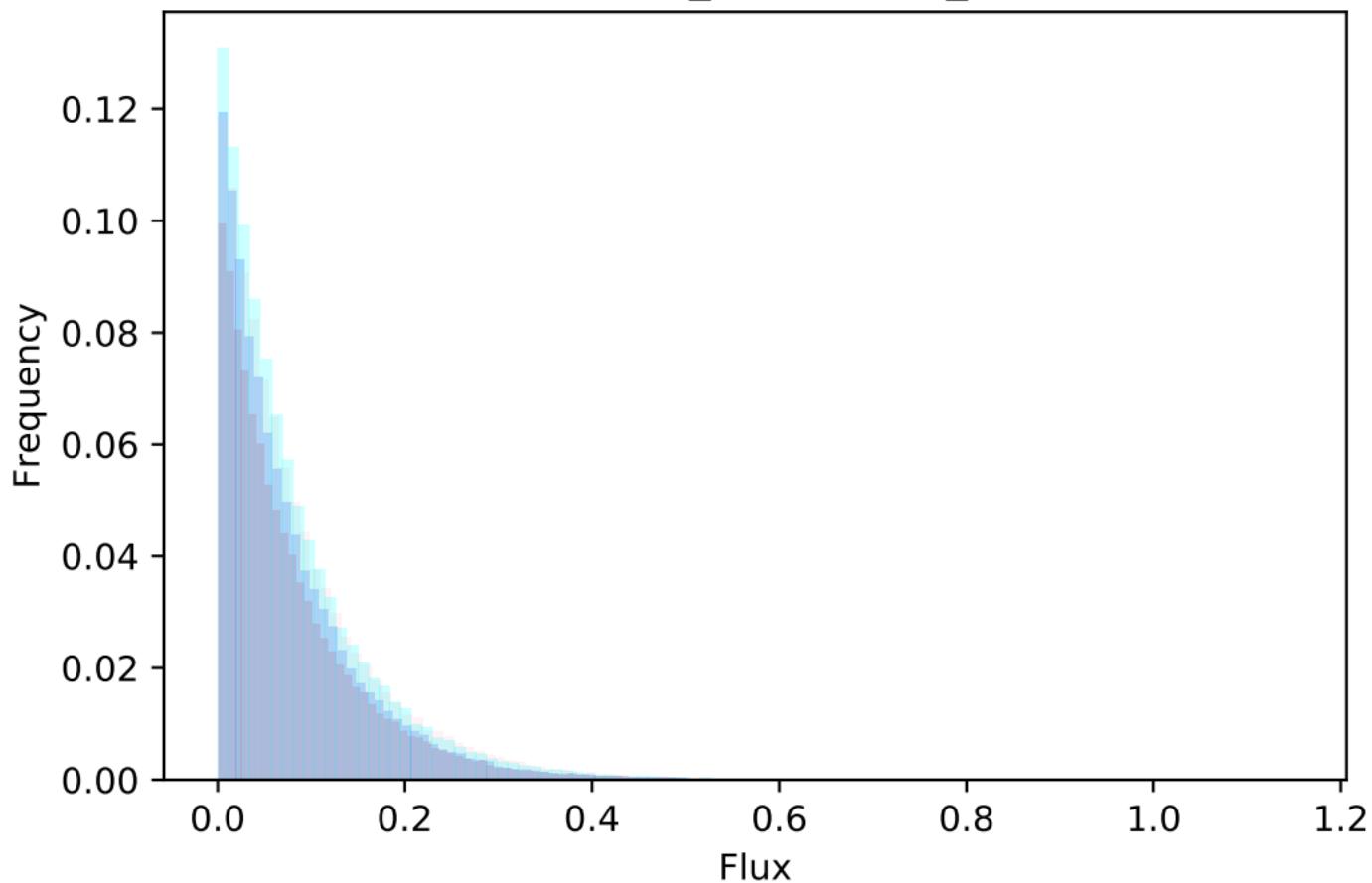
408:Lys_c <=> Lys_p



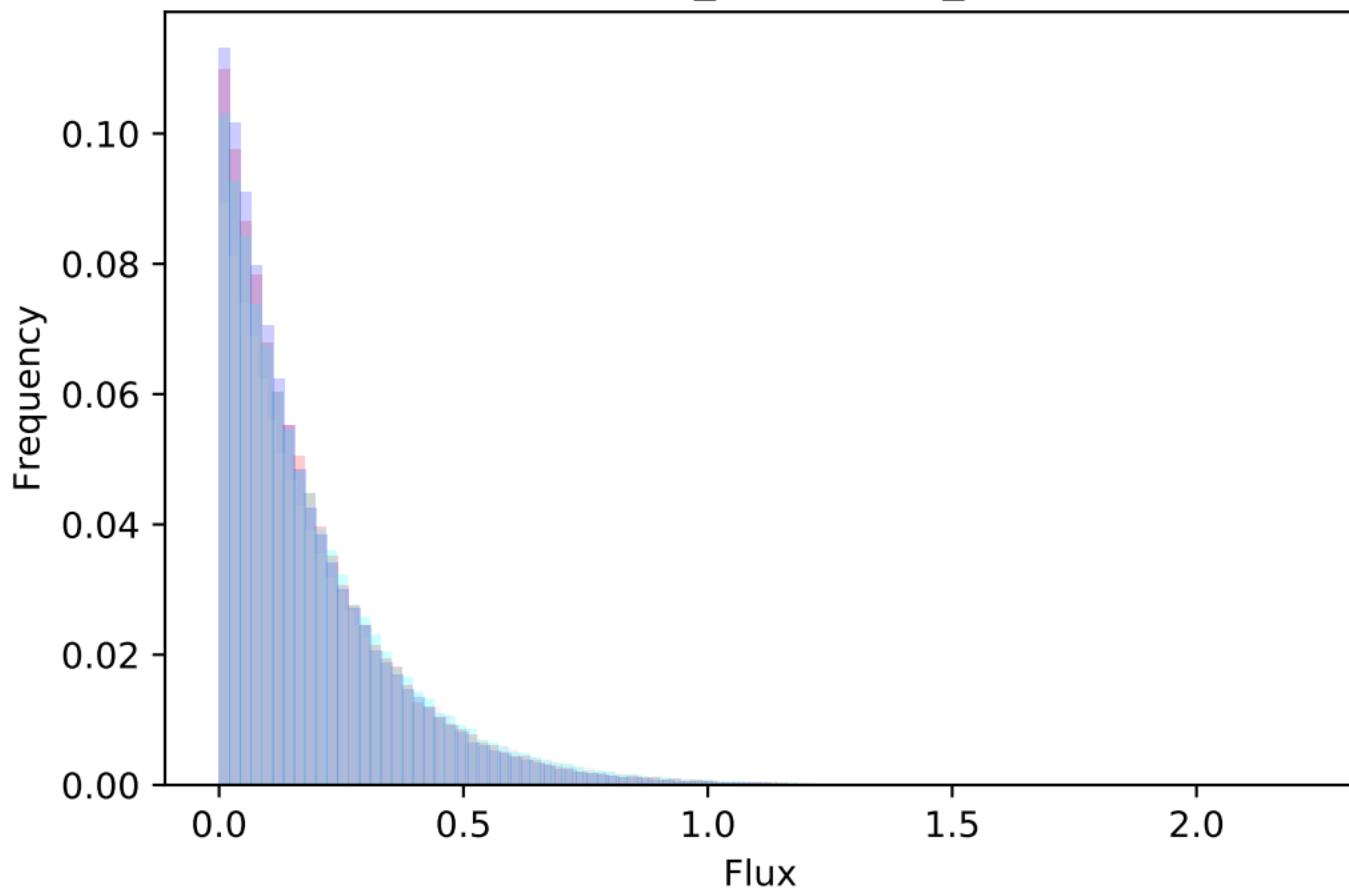
409:Met_c <=> Met_p



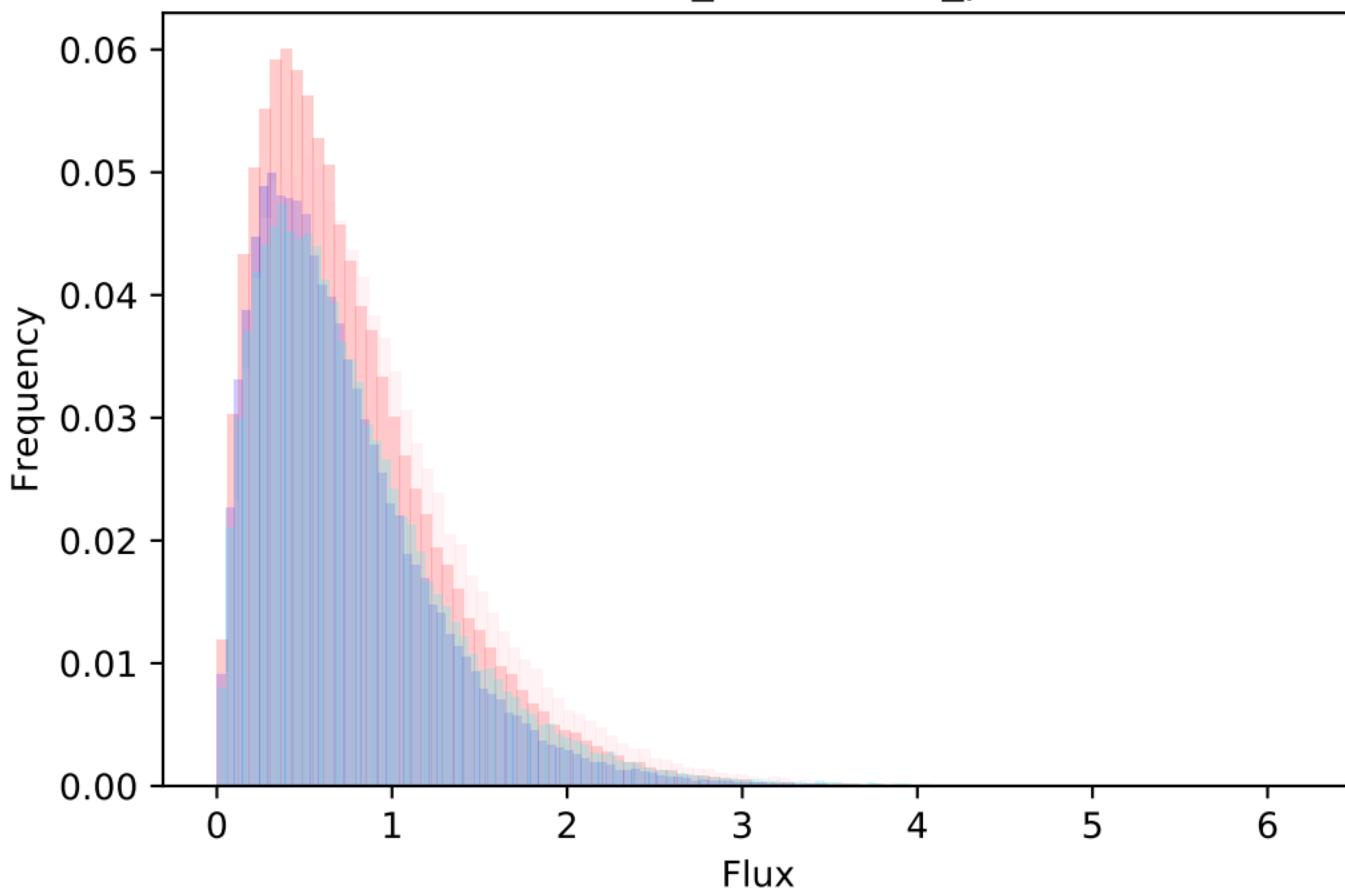
410:Phe_c <=> Phe_p



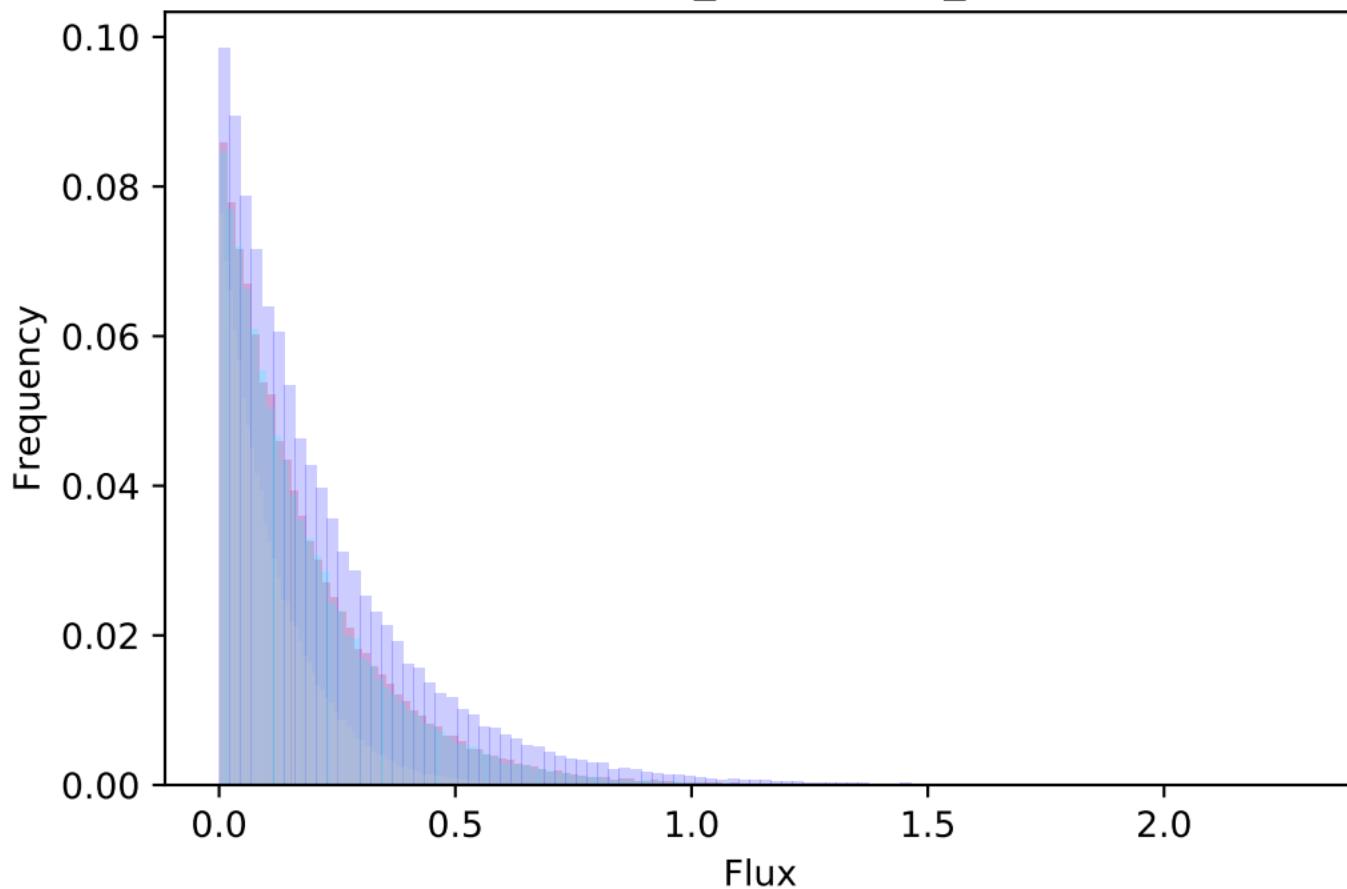
411:Pro_c <=> Pro_p



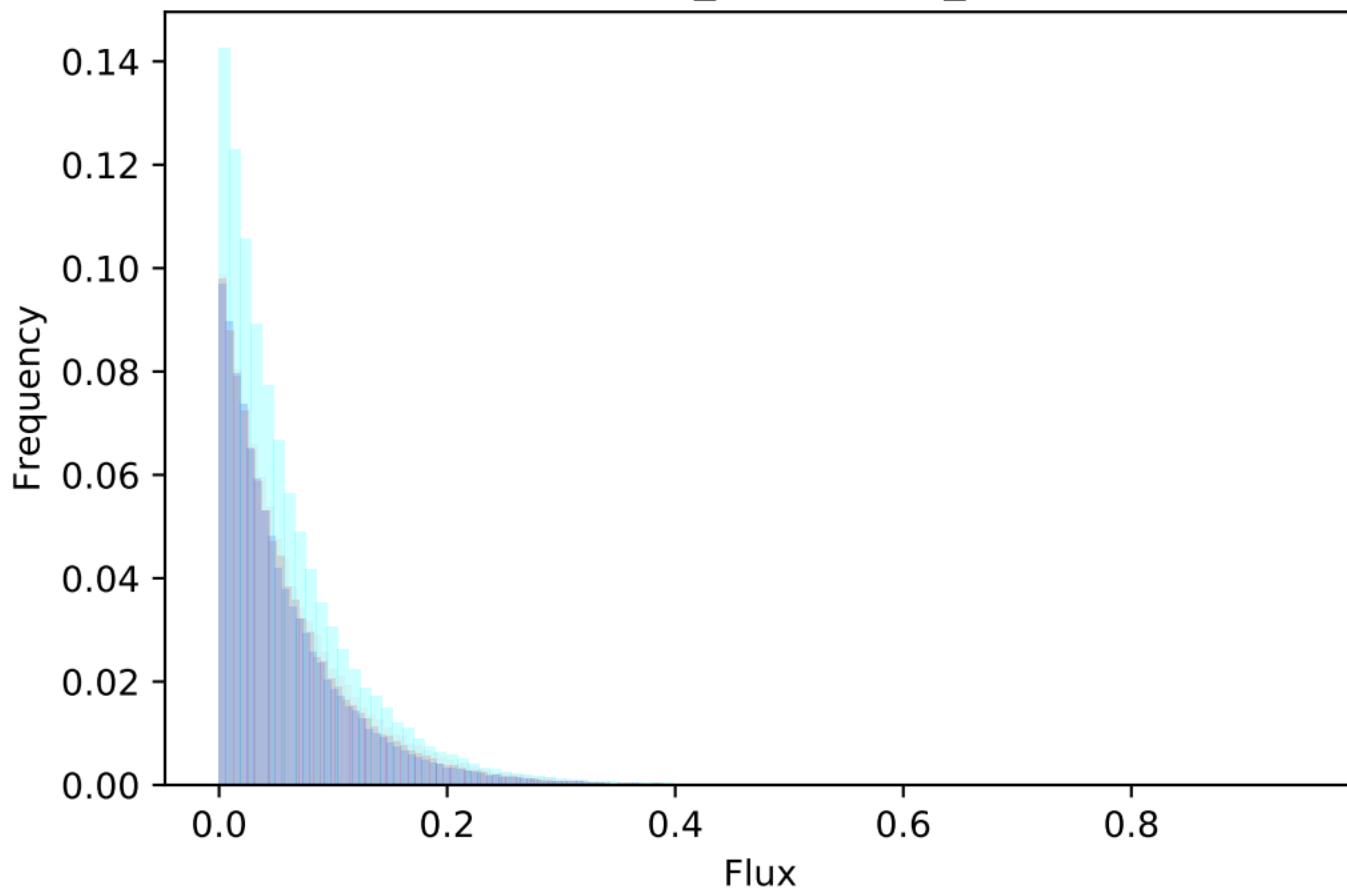
412:Ser_c <=> Ser_p



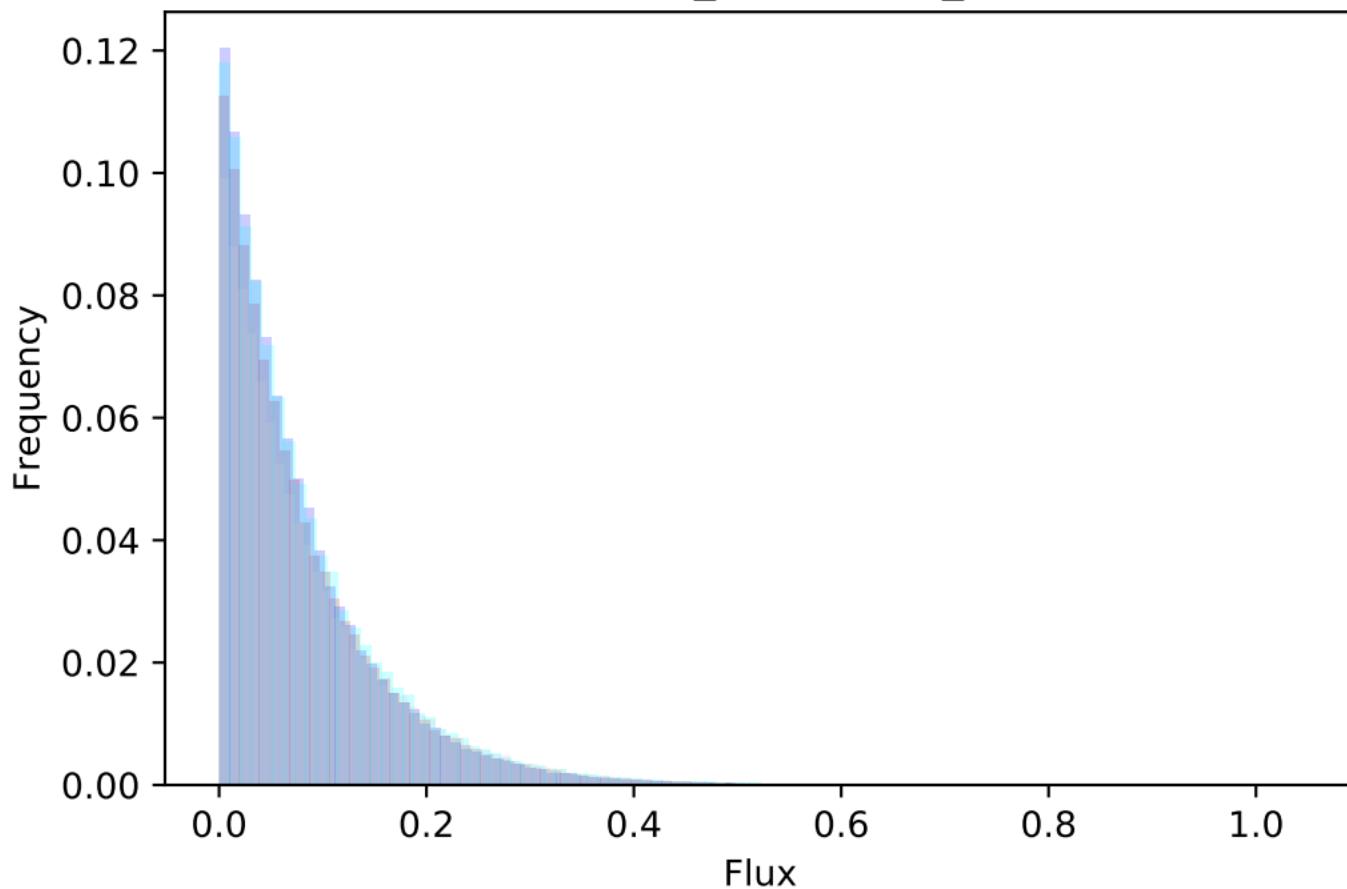
413:Thr_c <=> Thr_p



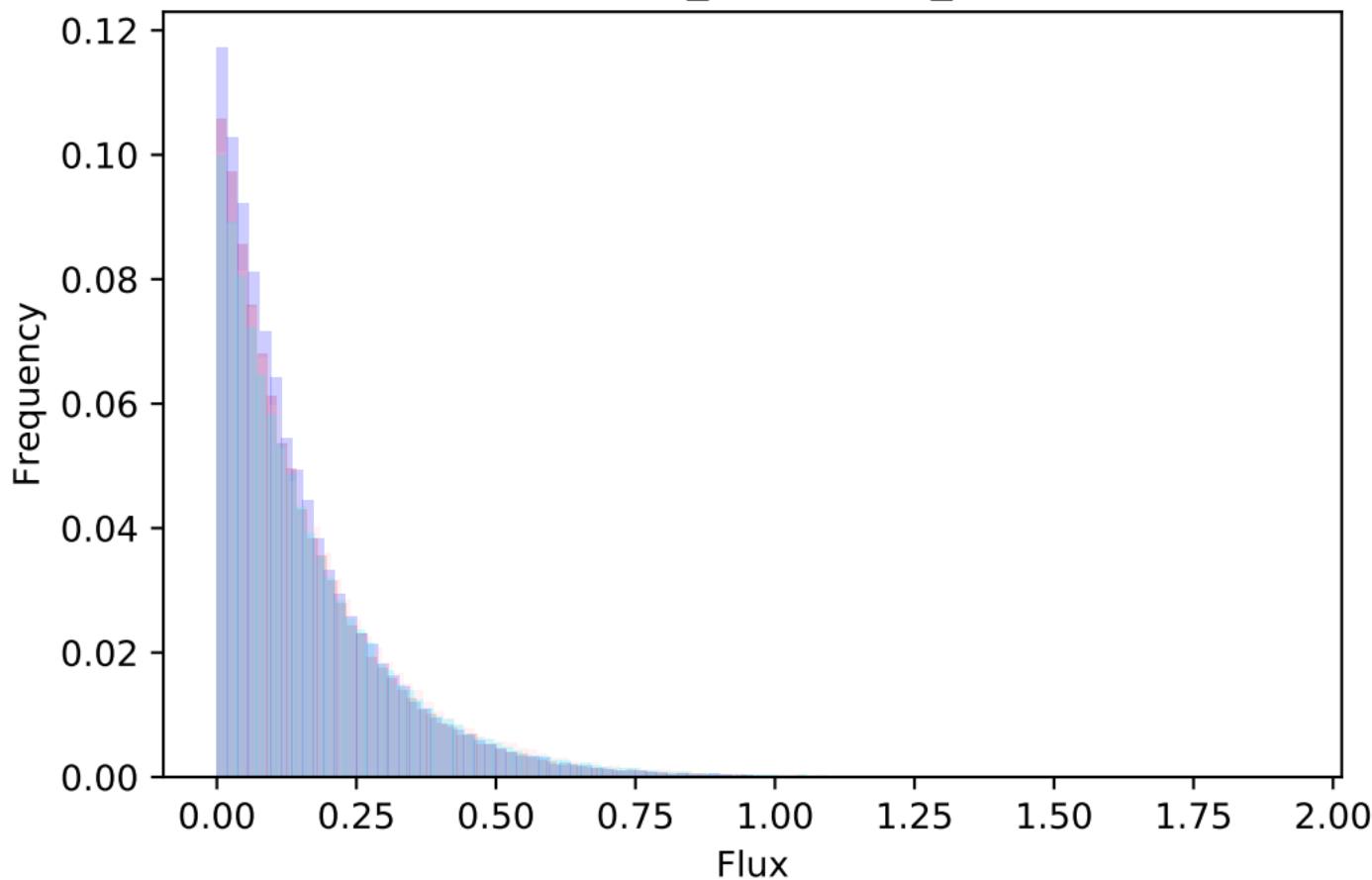
414:Trp_c <=> Trp_p



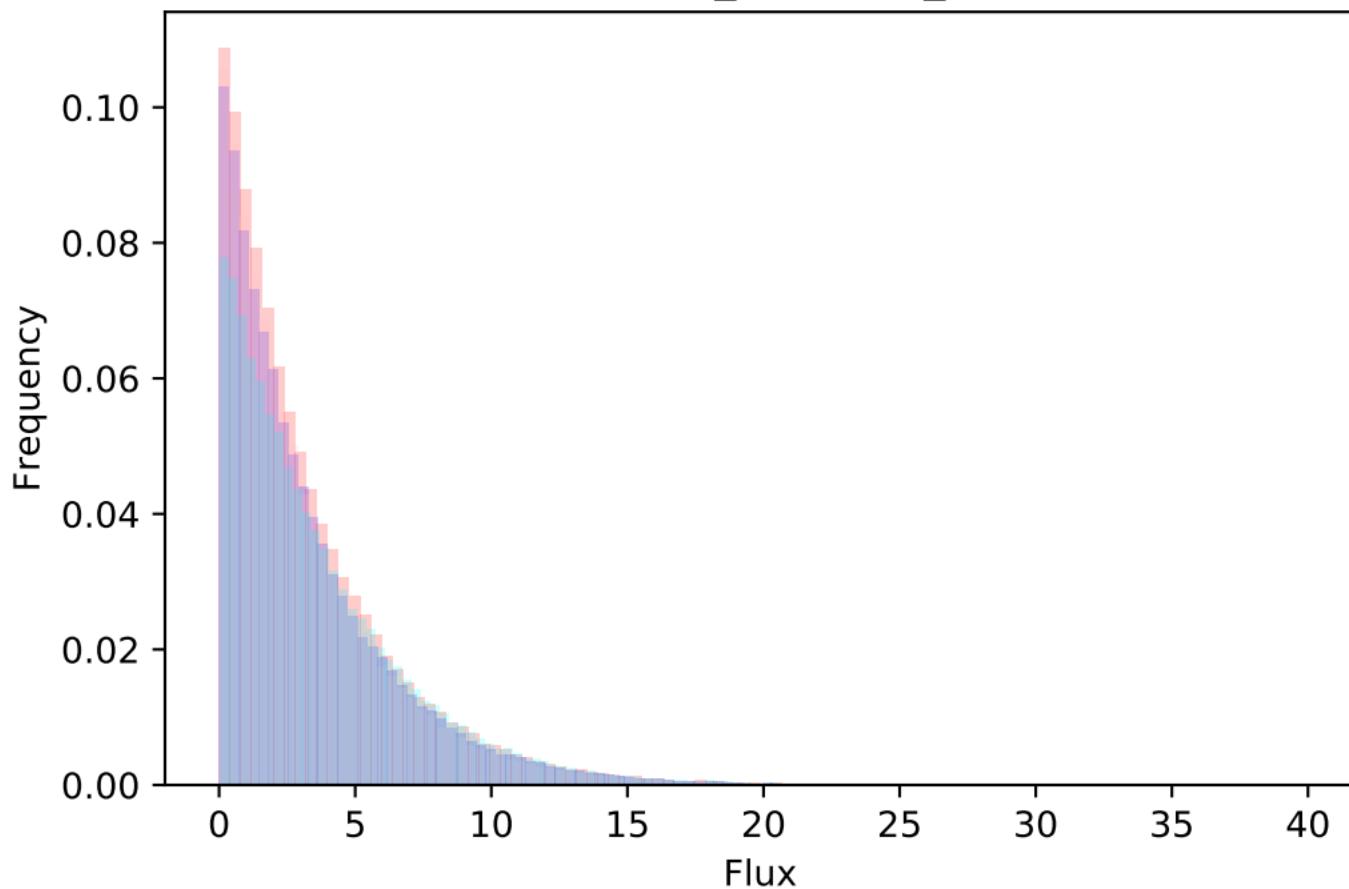
415:Tyr_c <=> Tyr_p



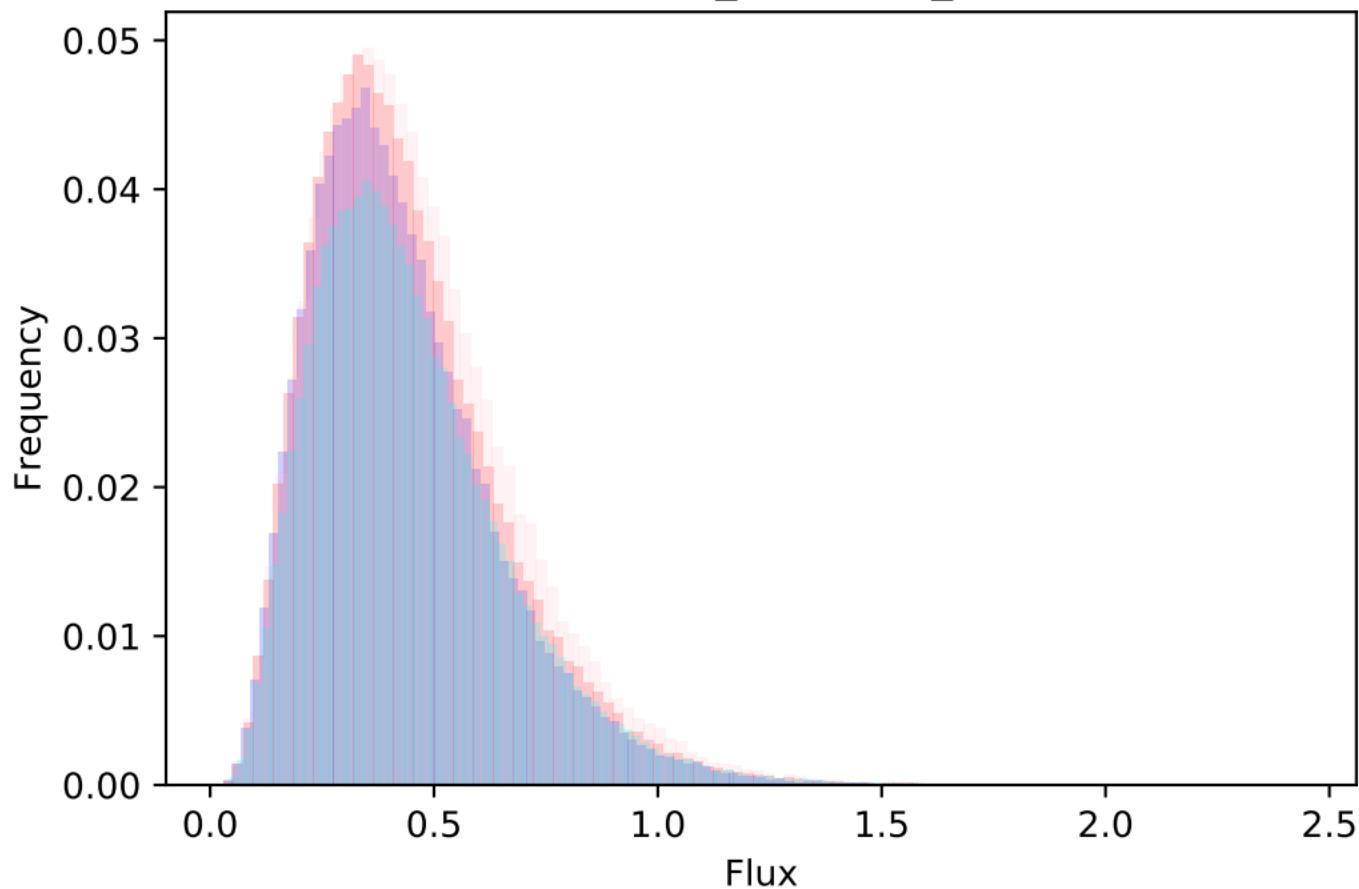
416:Val_c <=> Val_p



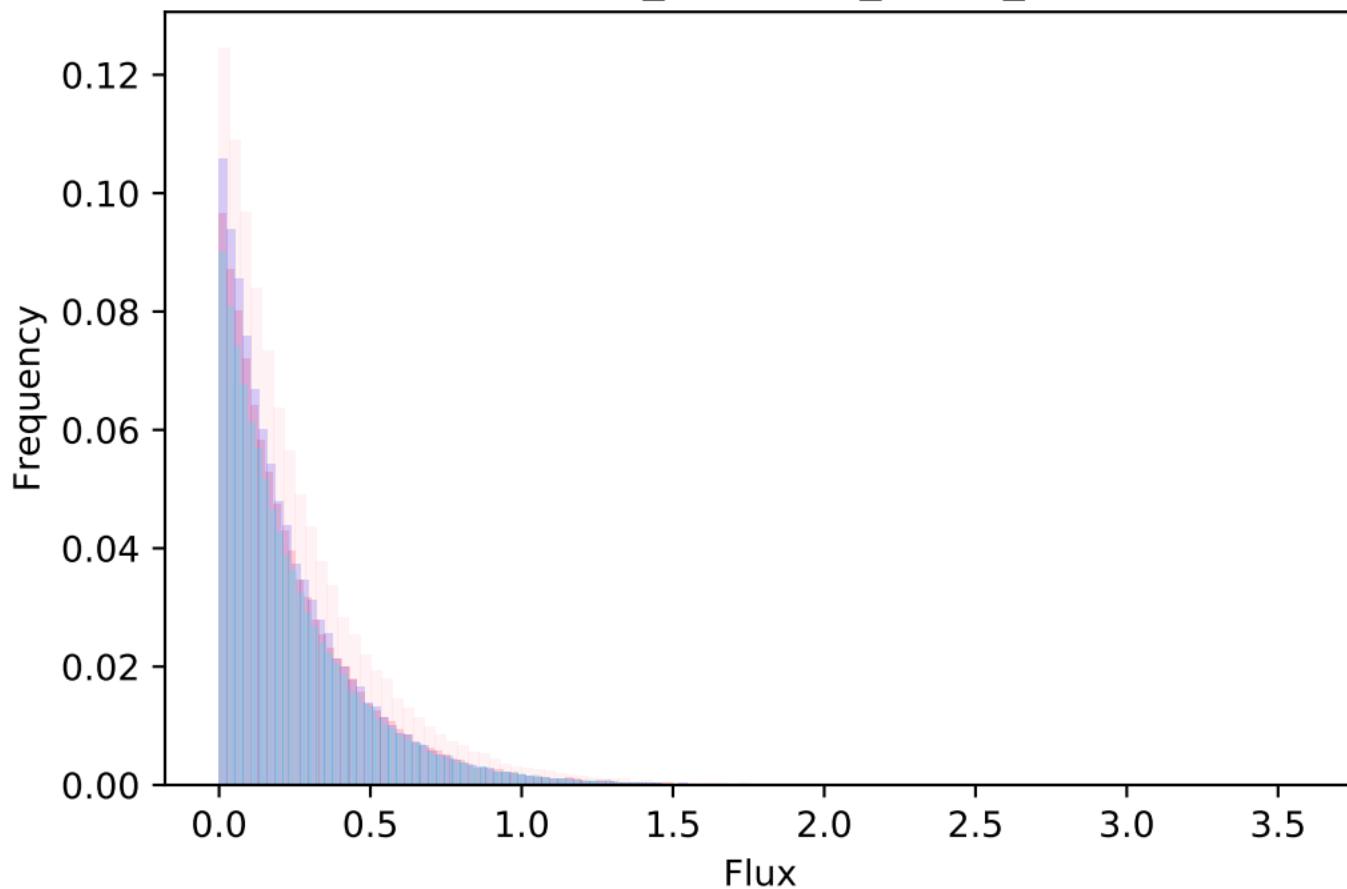
417:Ala_h --> Ala_c



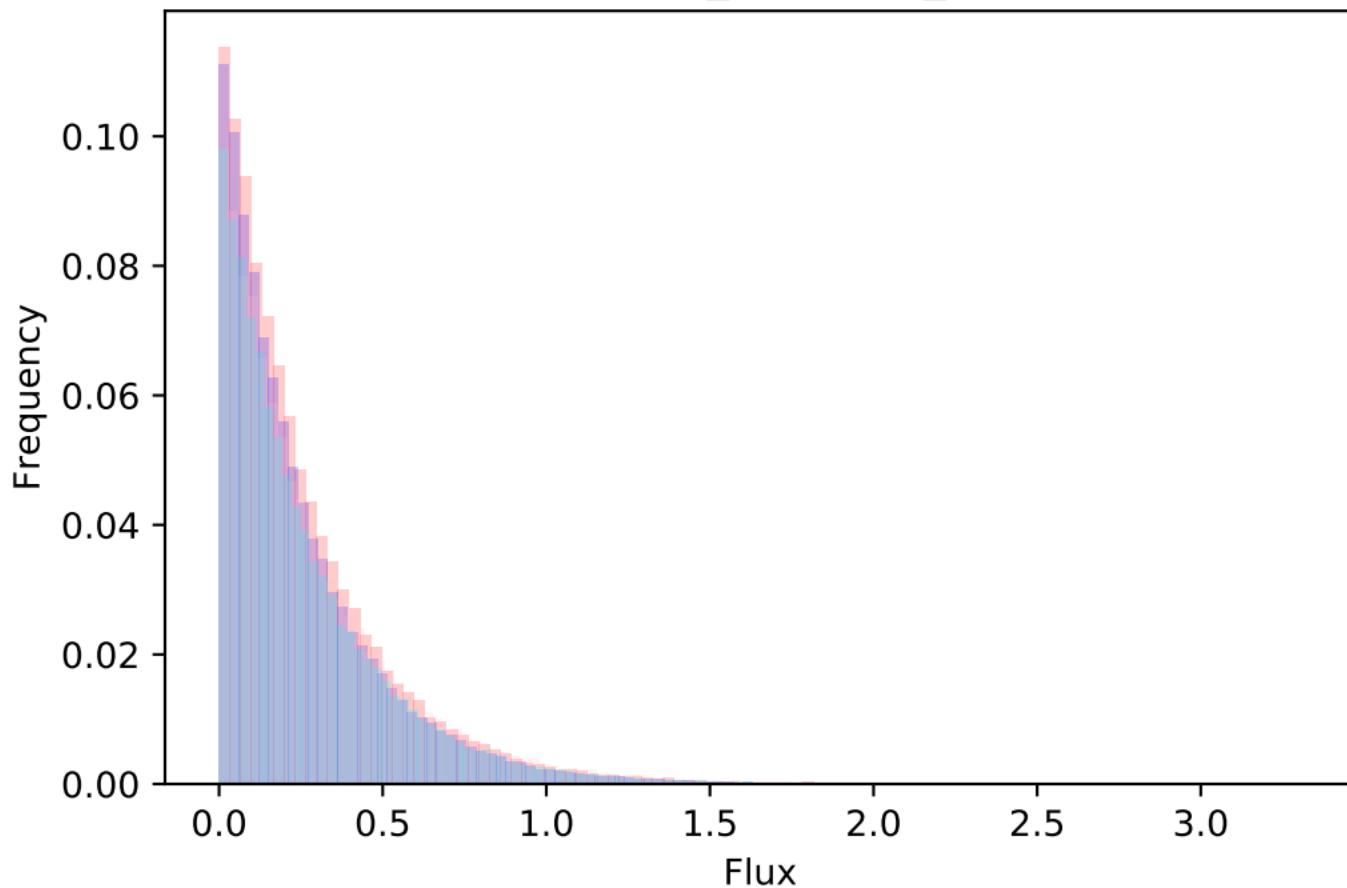
418:Arg_h --> Arg_c



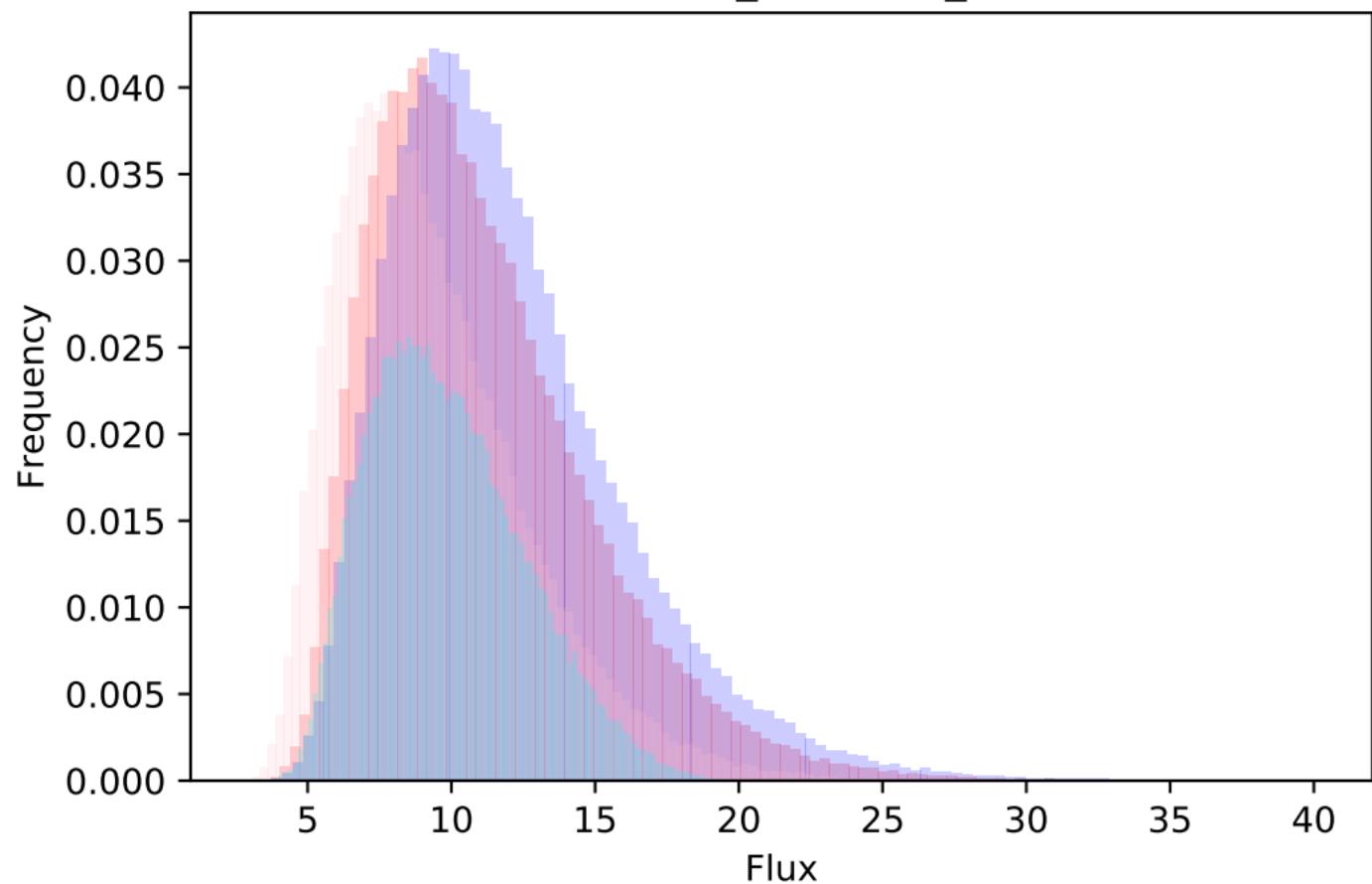
419:Asn_c --> Asn_h + H_h



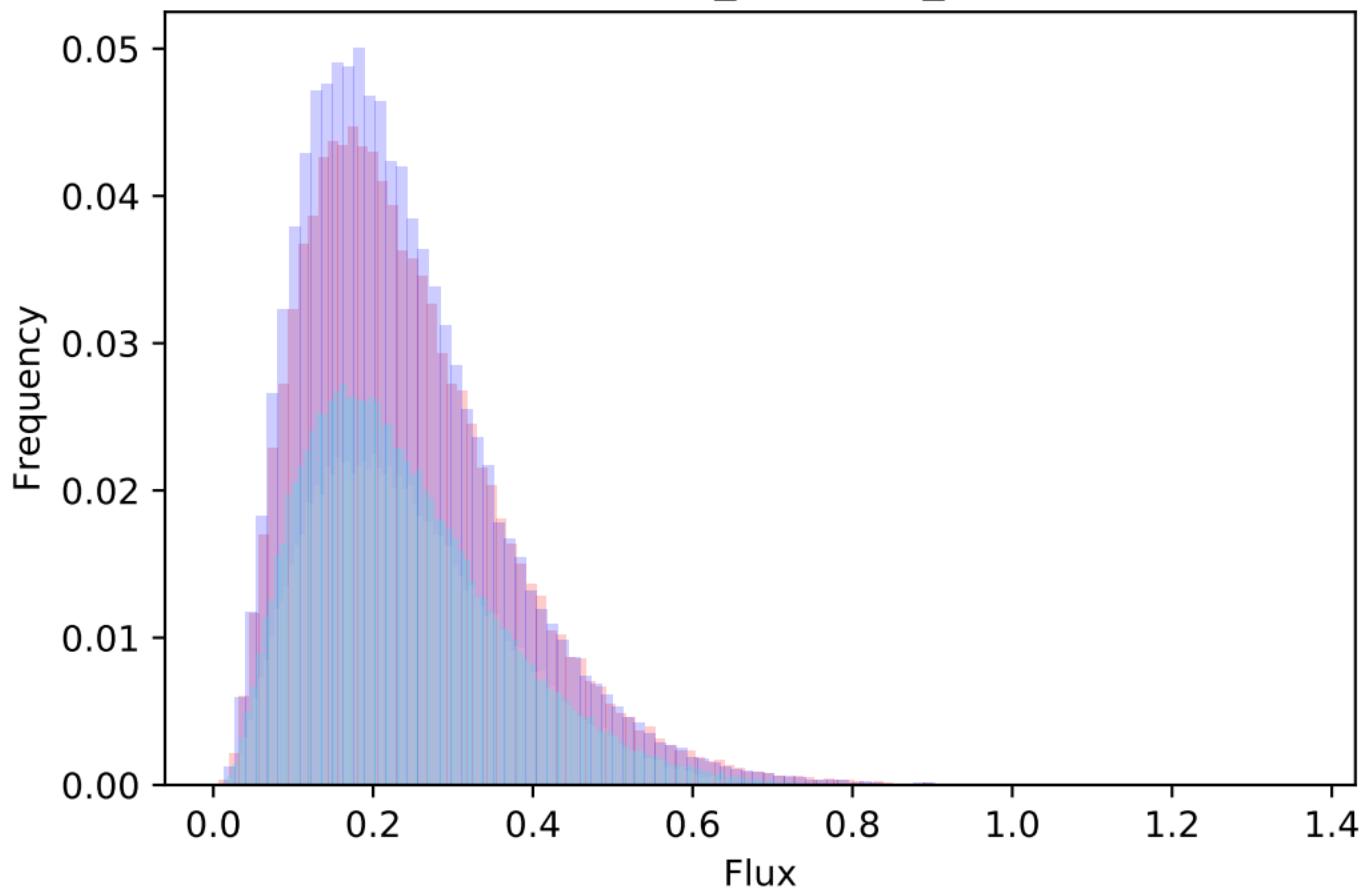
420:Asn_c --> Asn_m



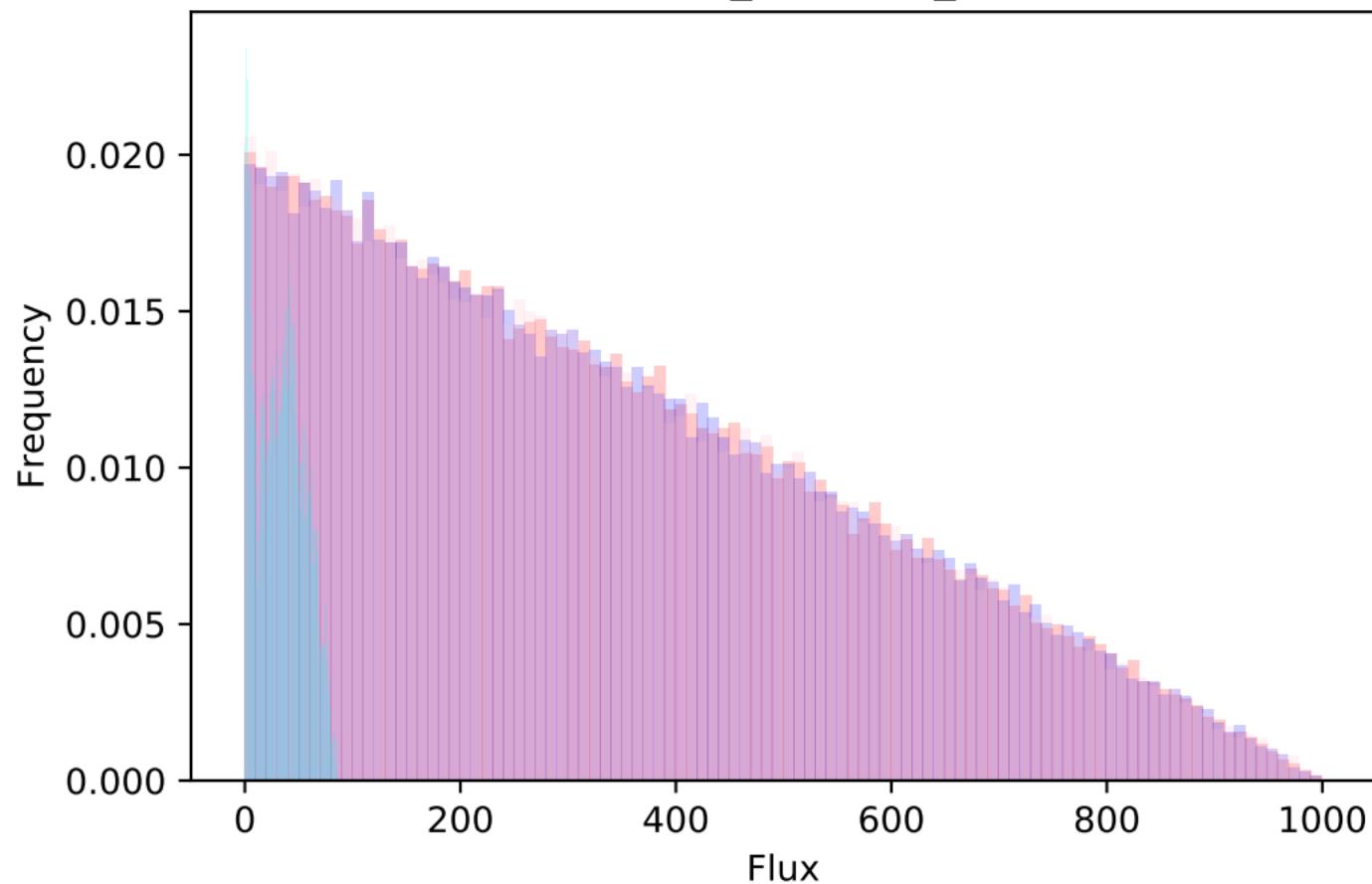
421:Glu_c --> Glu_h



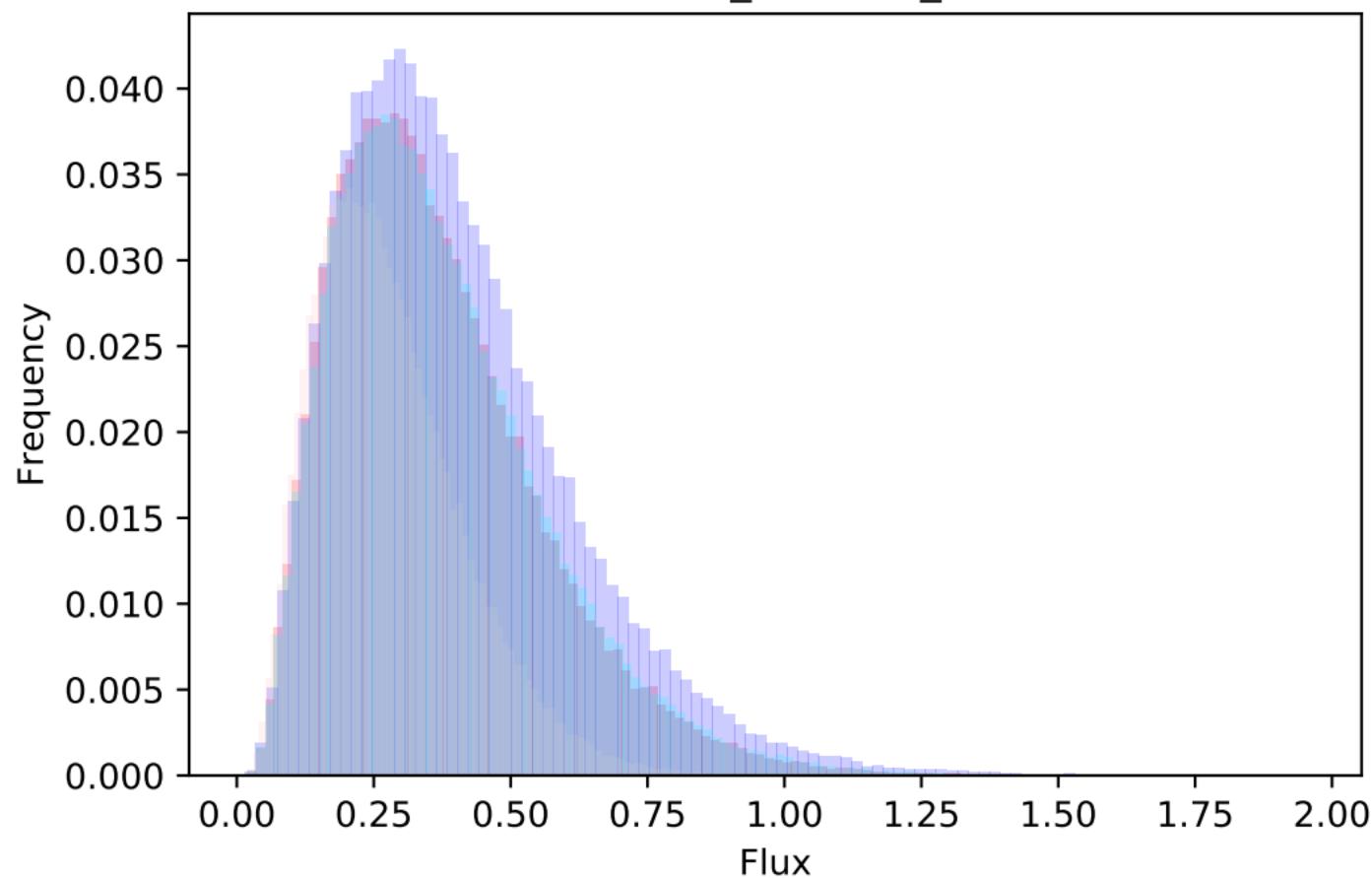
422:His_h --> His_c



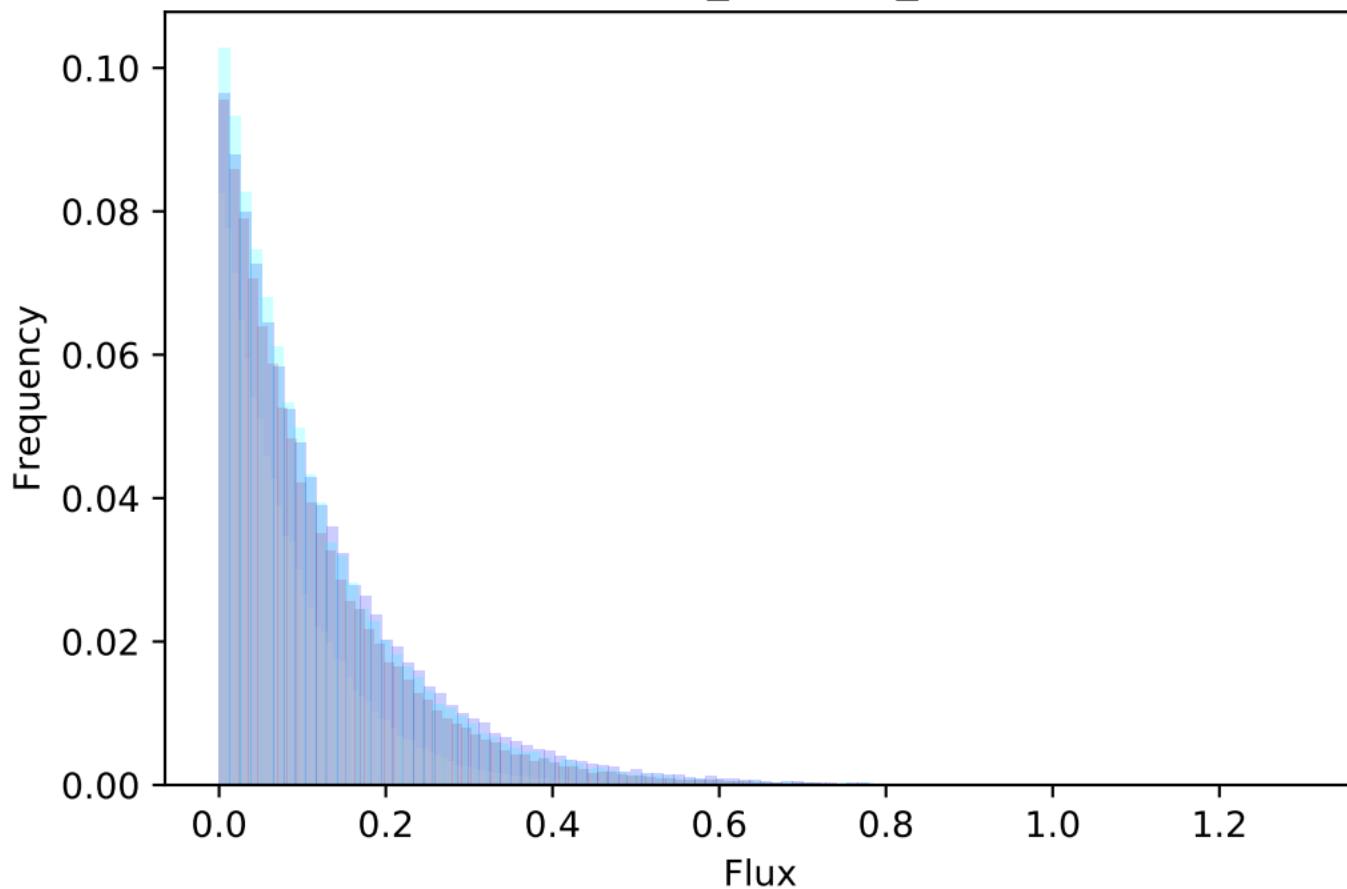
423:His_c --> His_m



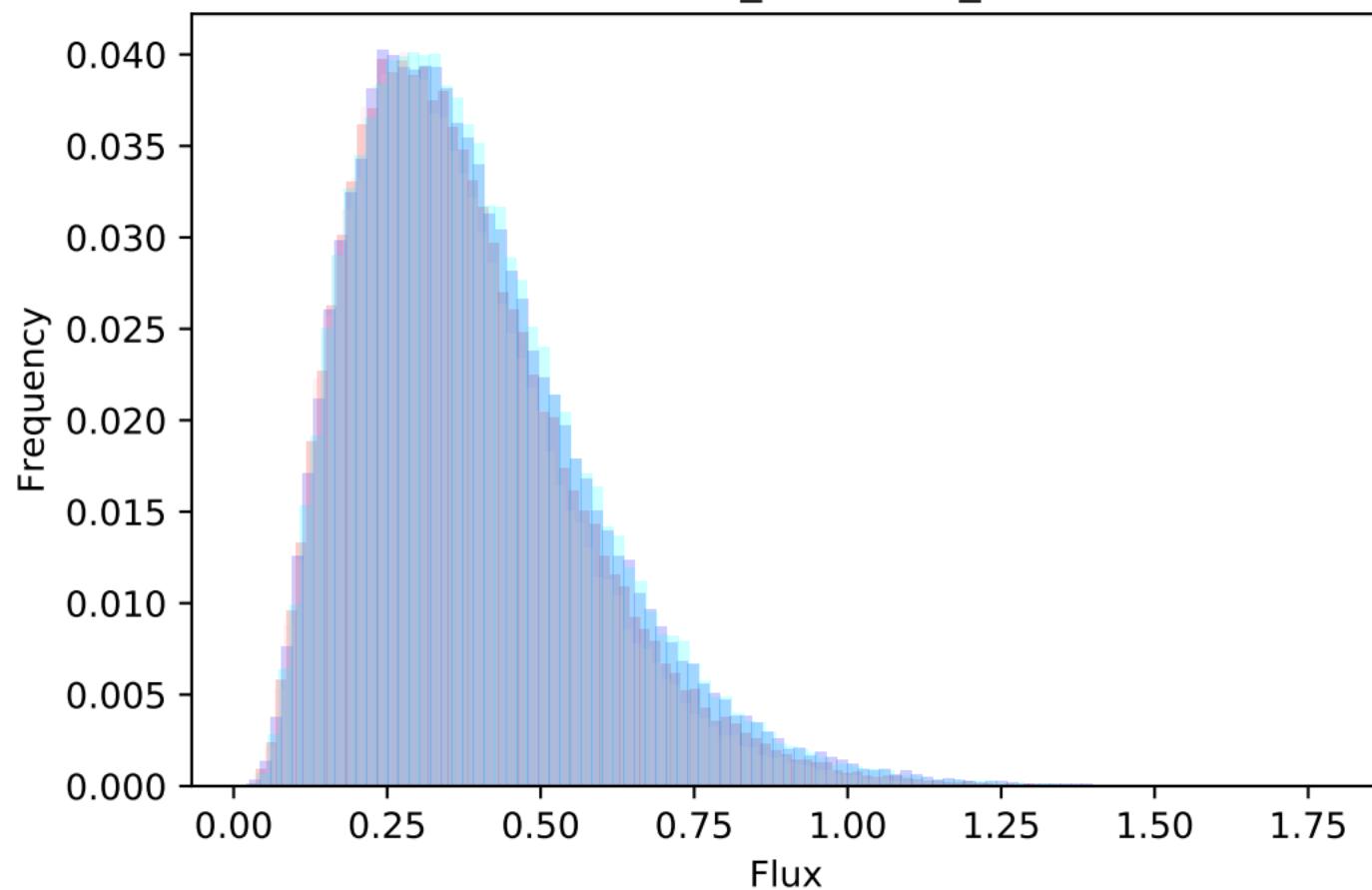
424:lle_h --> lle_c



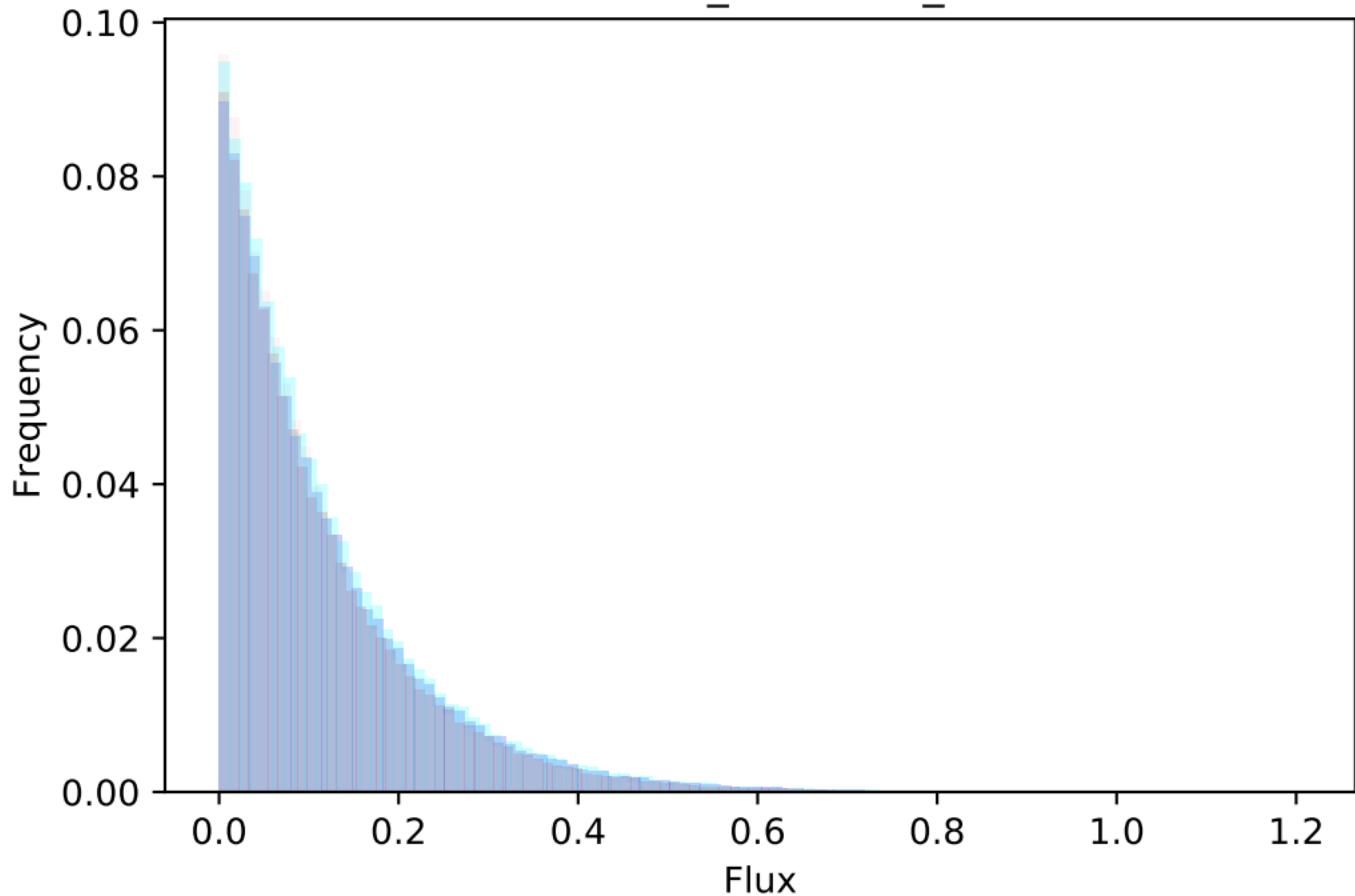
425:Ile_c --> Ile_m



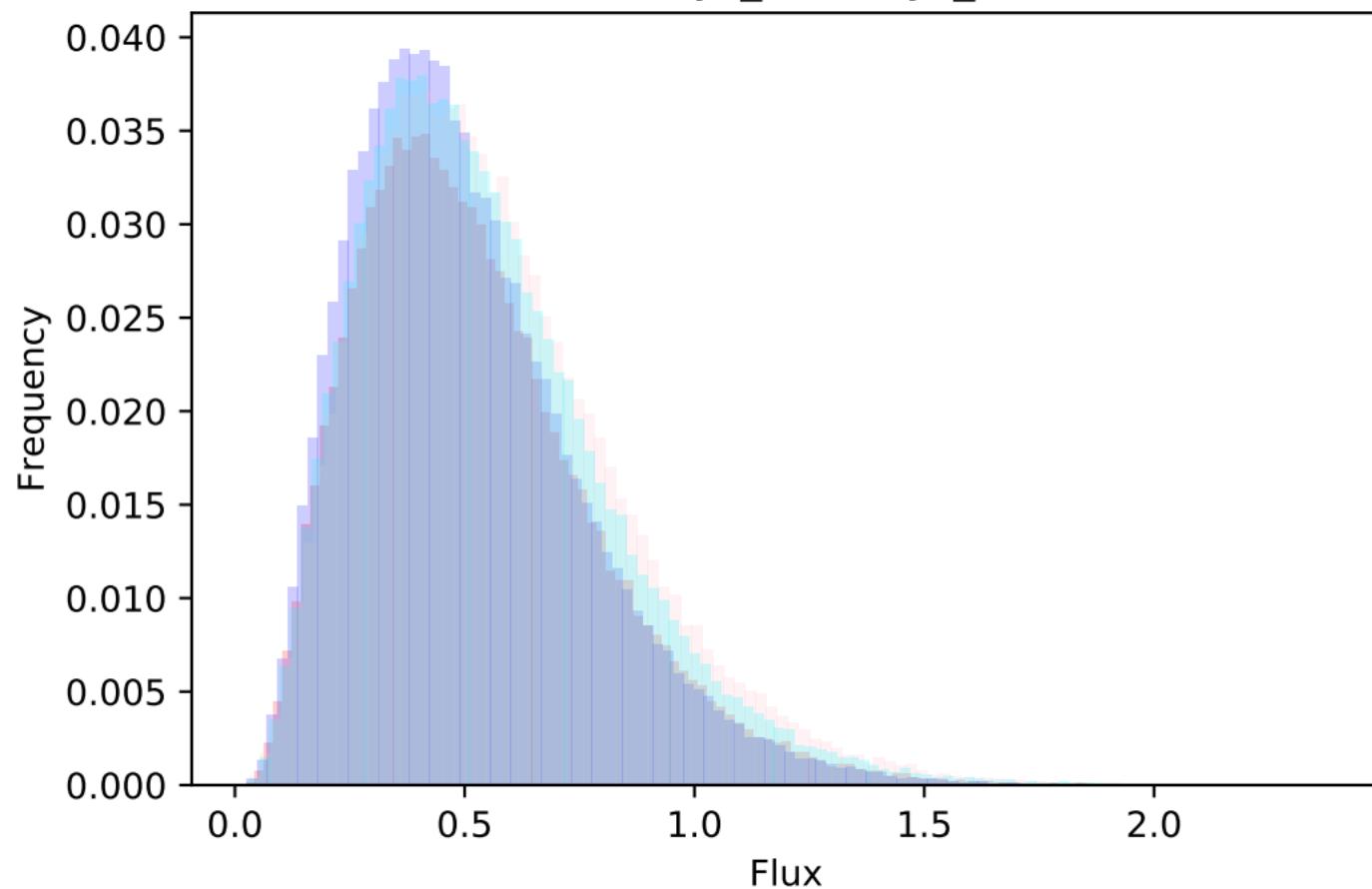
426:Leu_h --> Leu_c



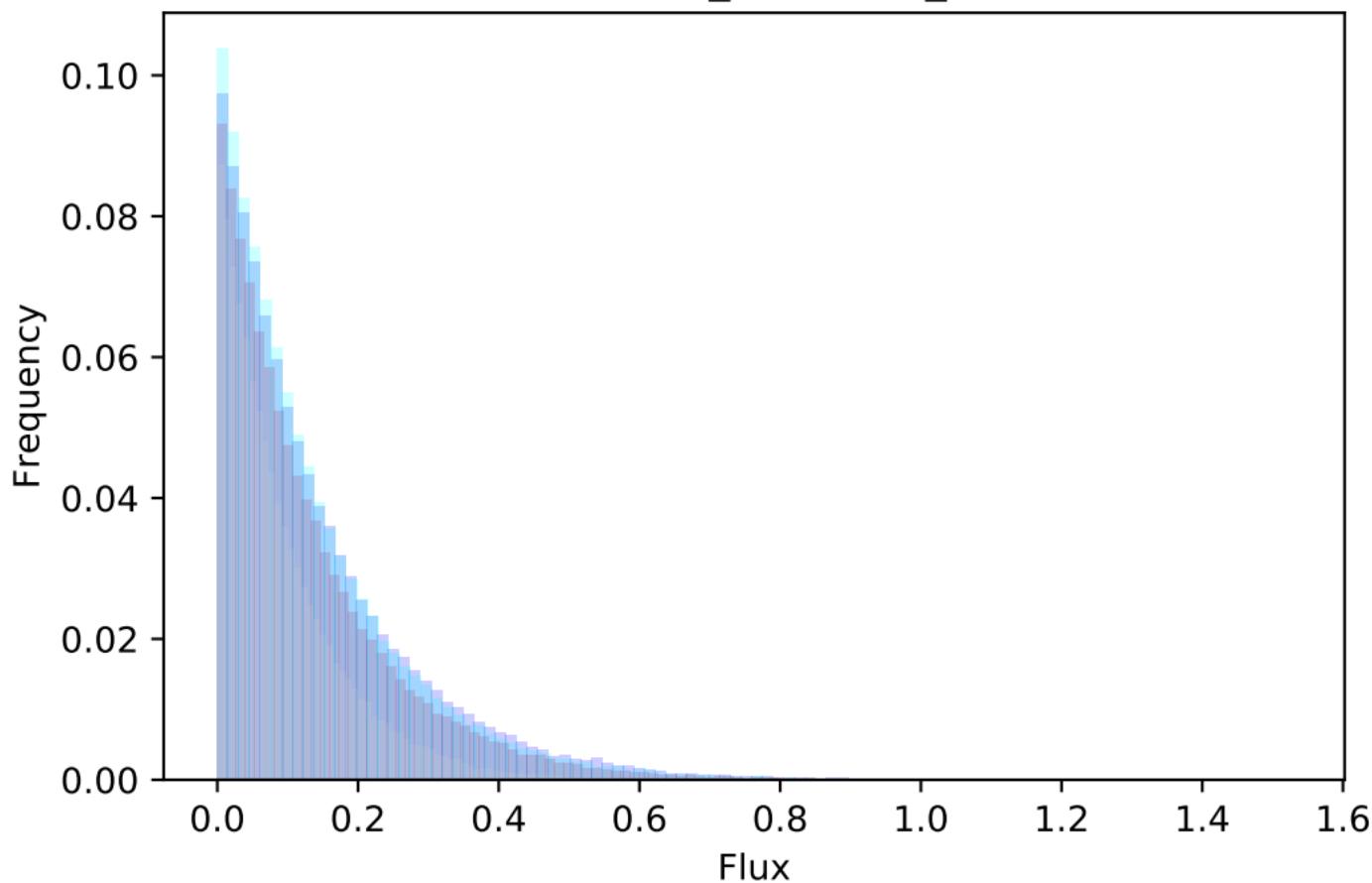
427:Leu_c --> Leu_m



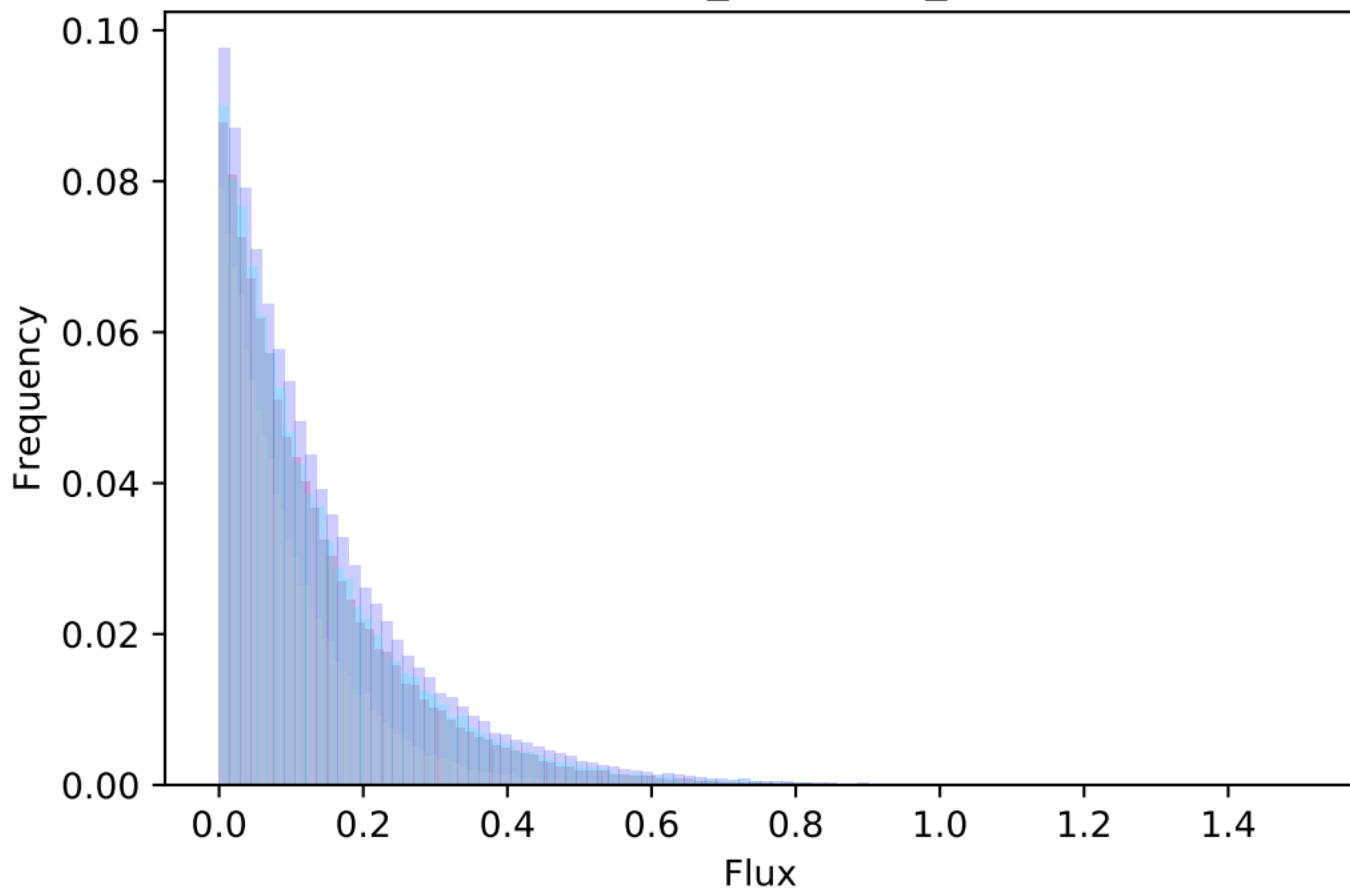
428:Lys_h --> Lys_c



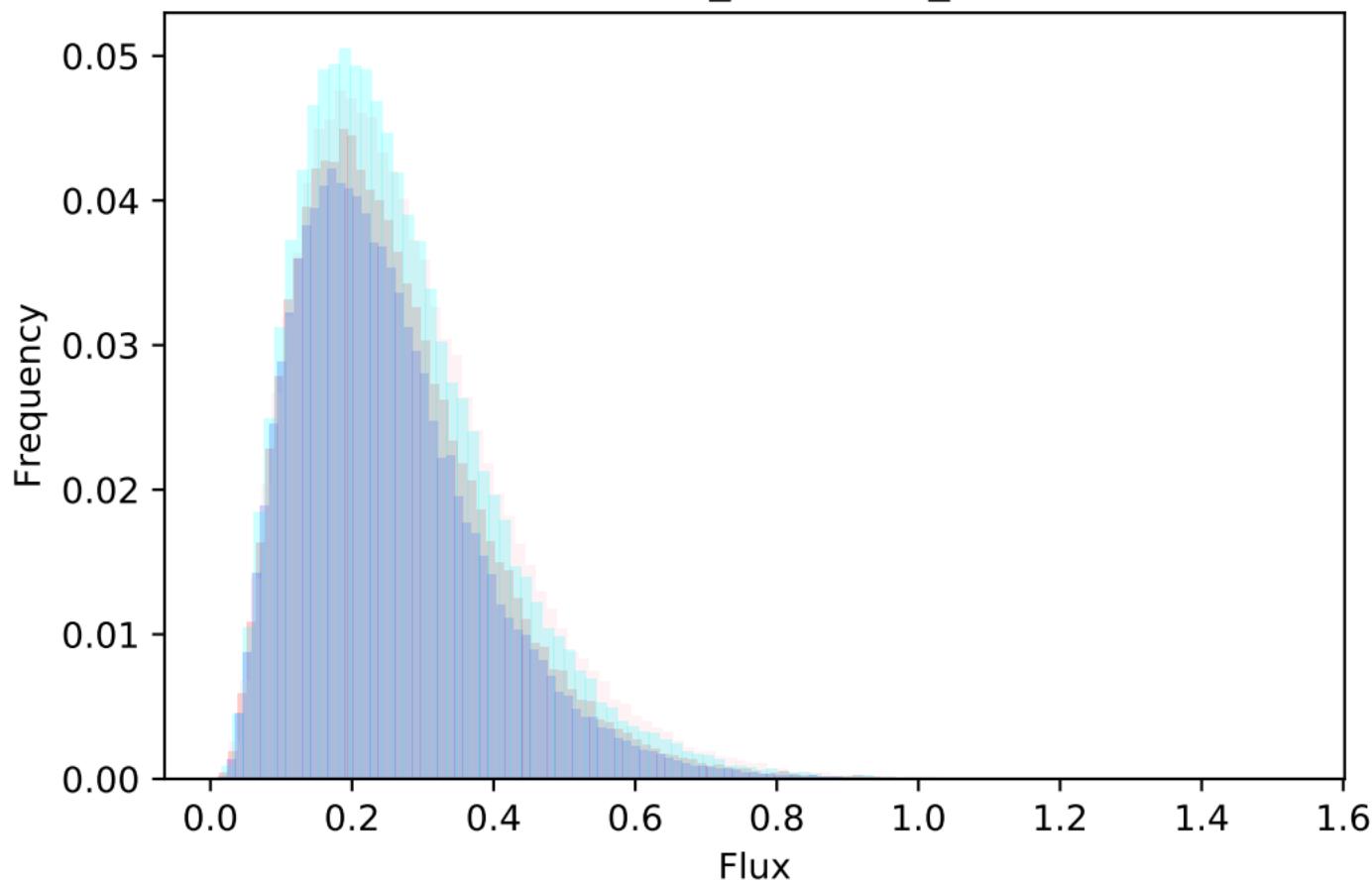
429:Met_c --> Met_h



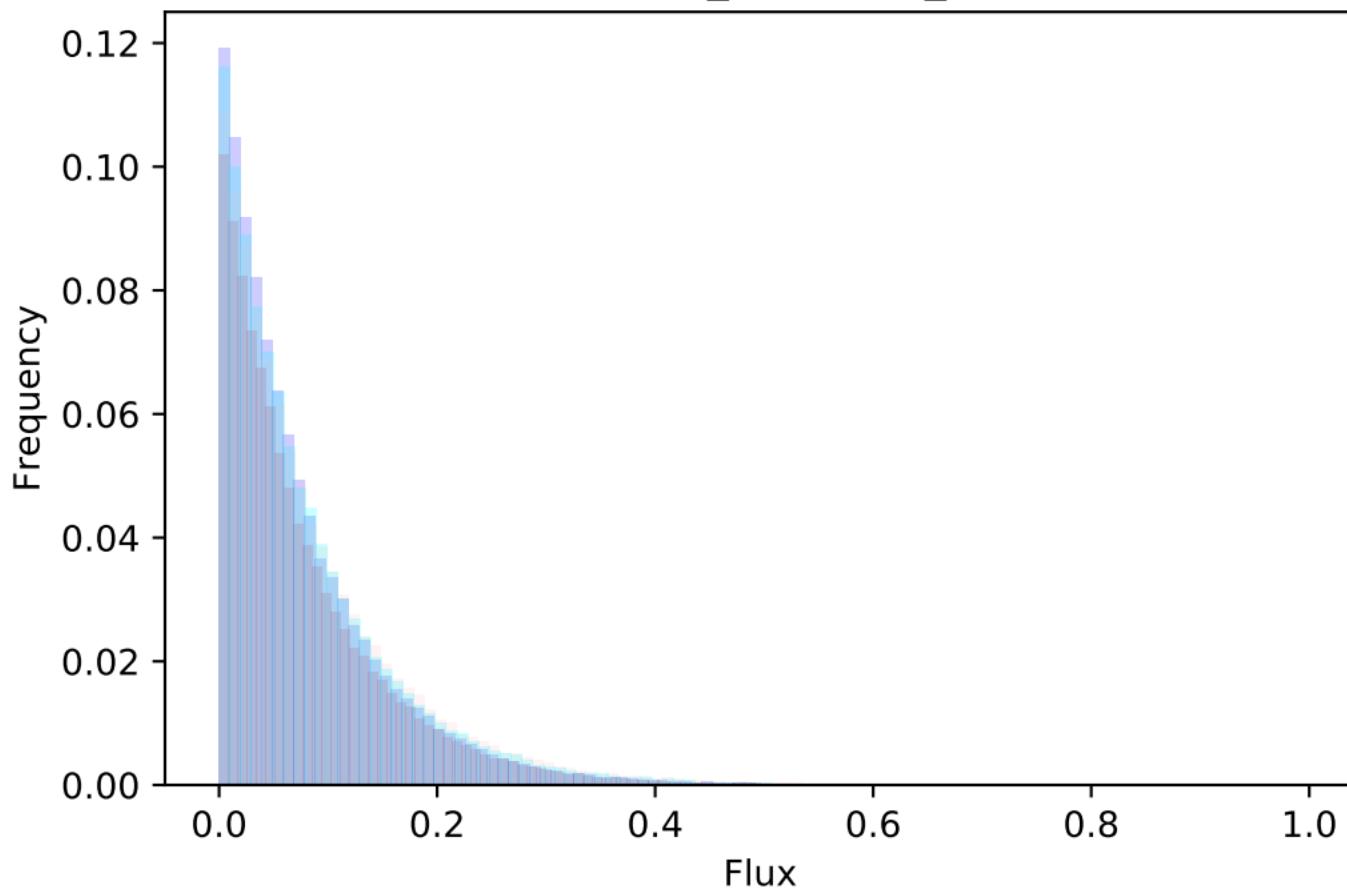
430:Met_c --> Met_m



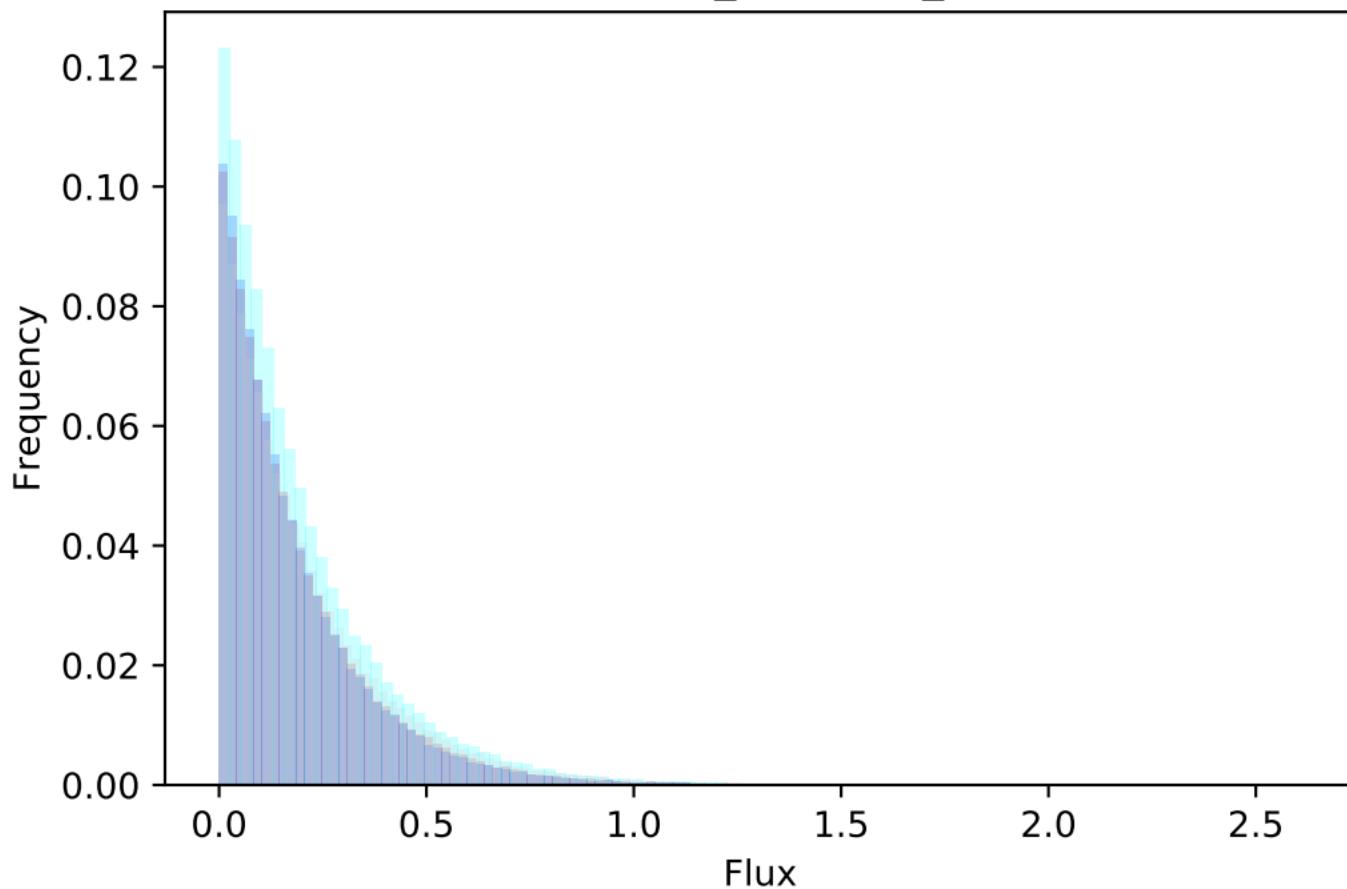
431:Phe_h --> Phe_c



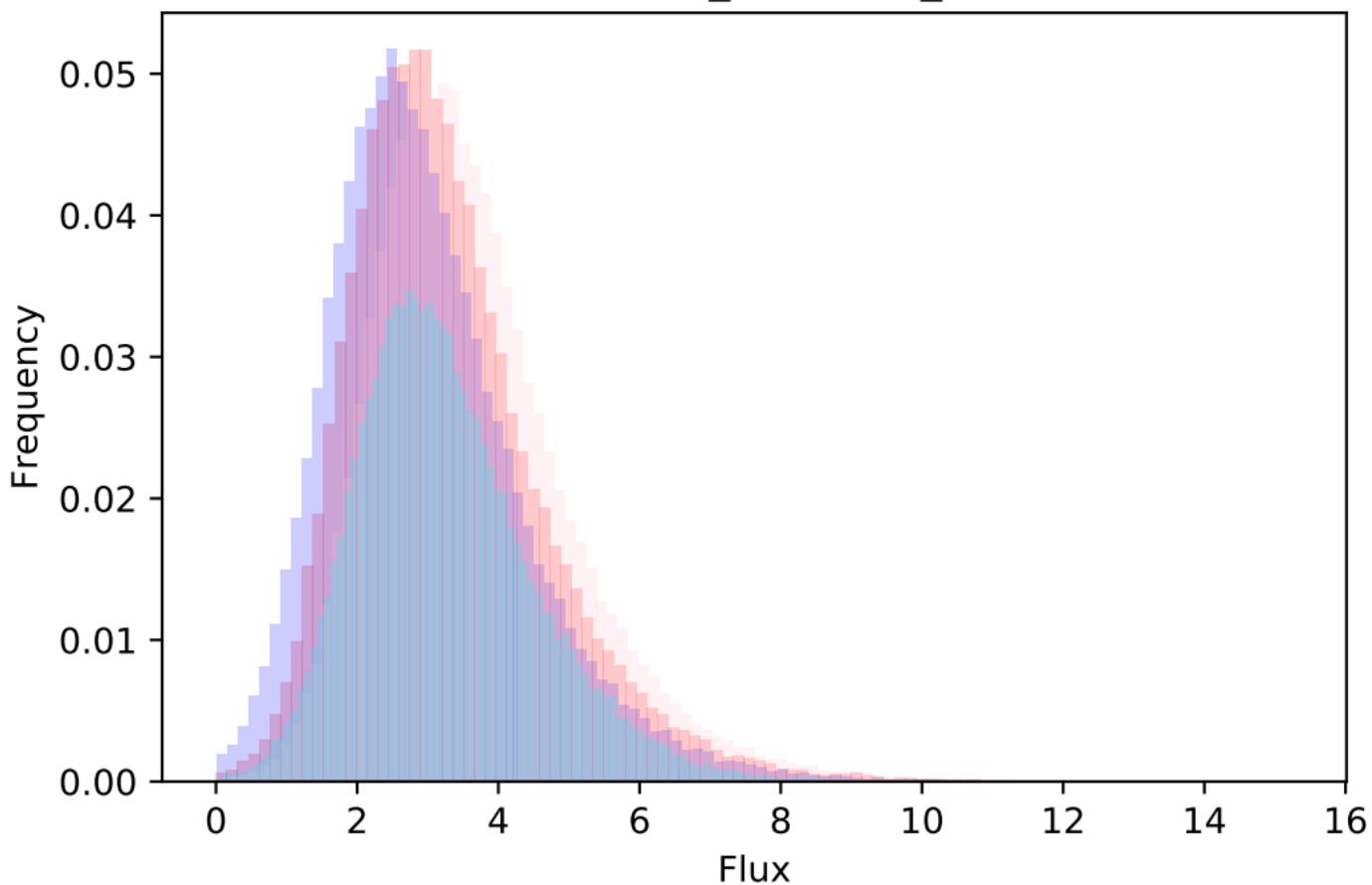
432:Phe_c --> Phe_m



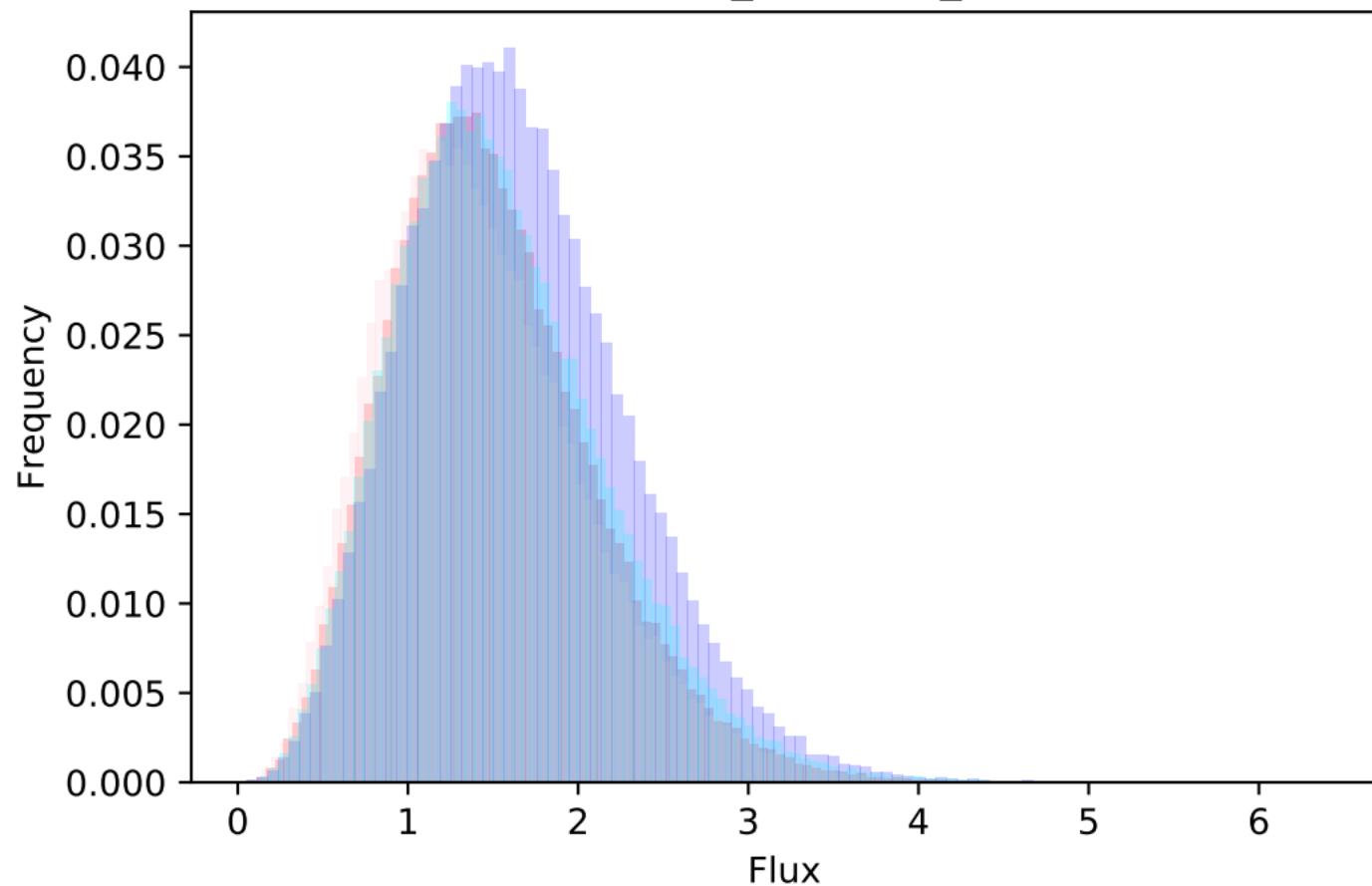
433:Pro_c --> Pro_h



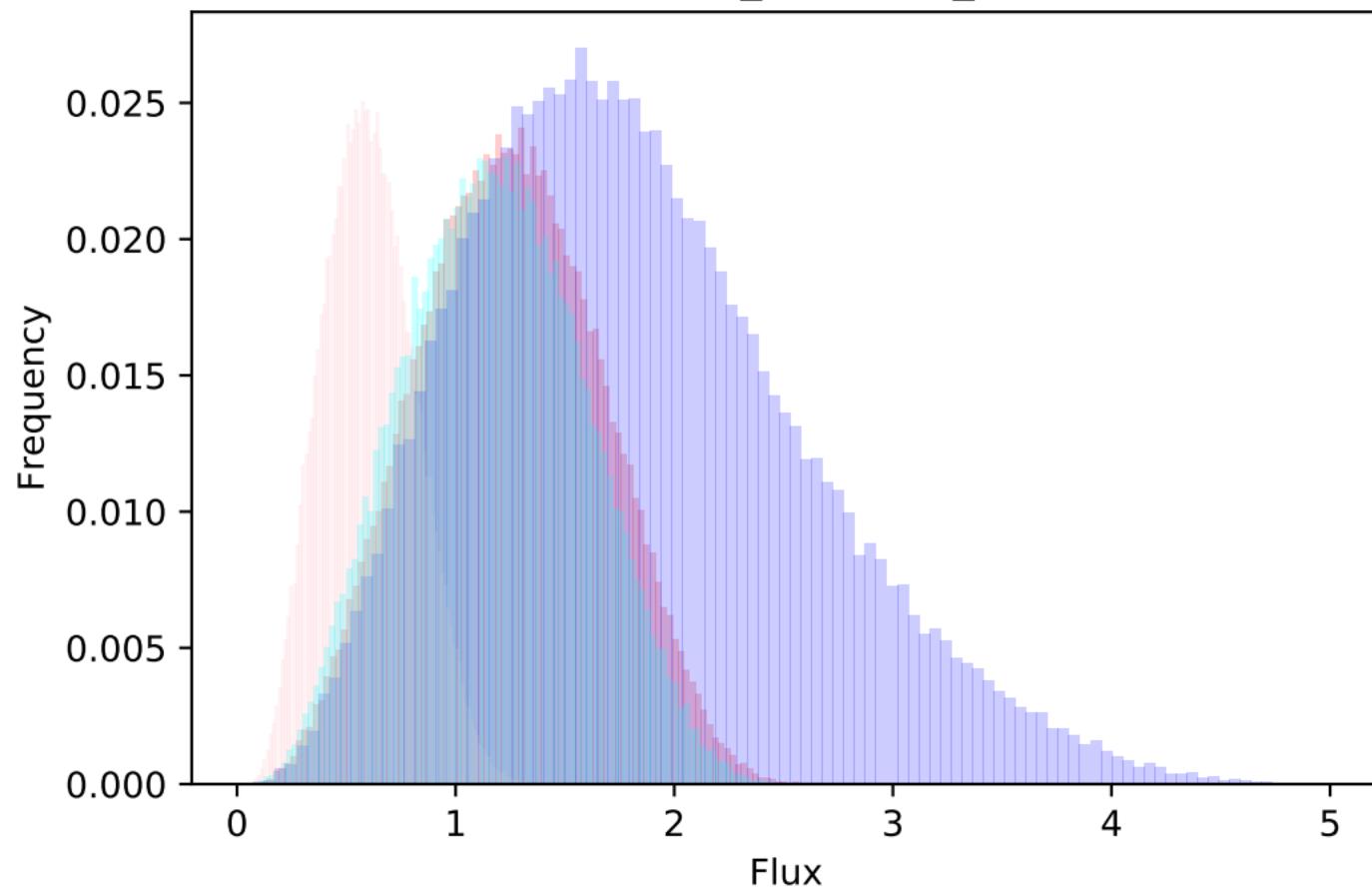
434:Ser_h --> Ser_c



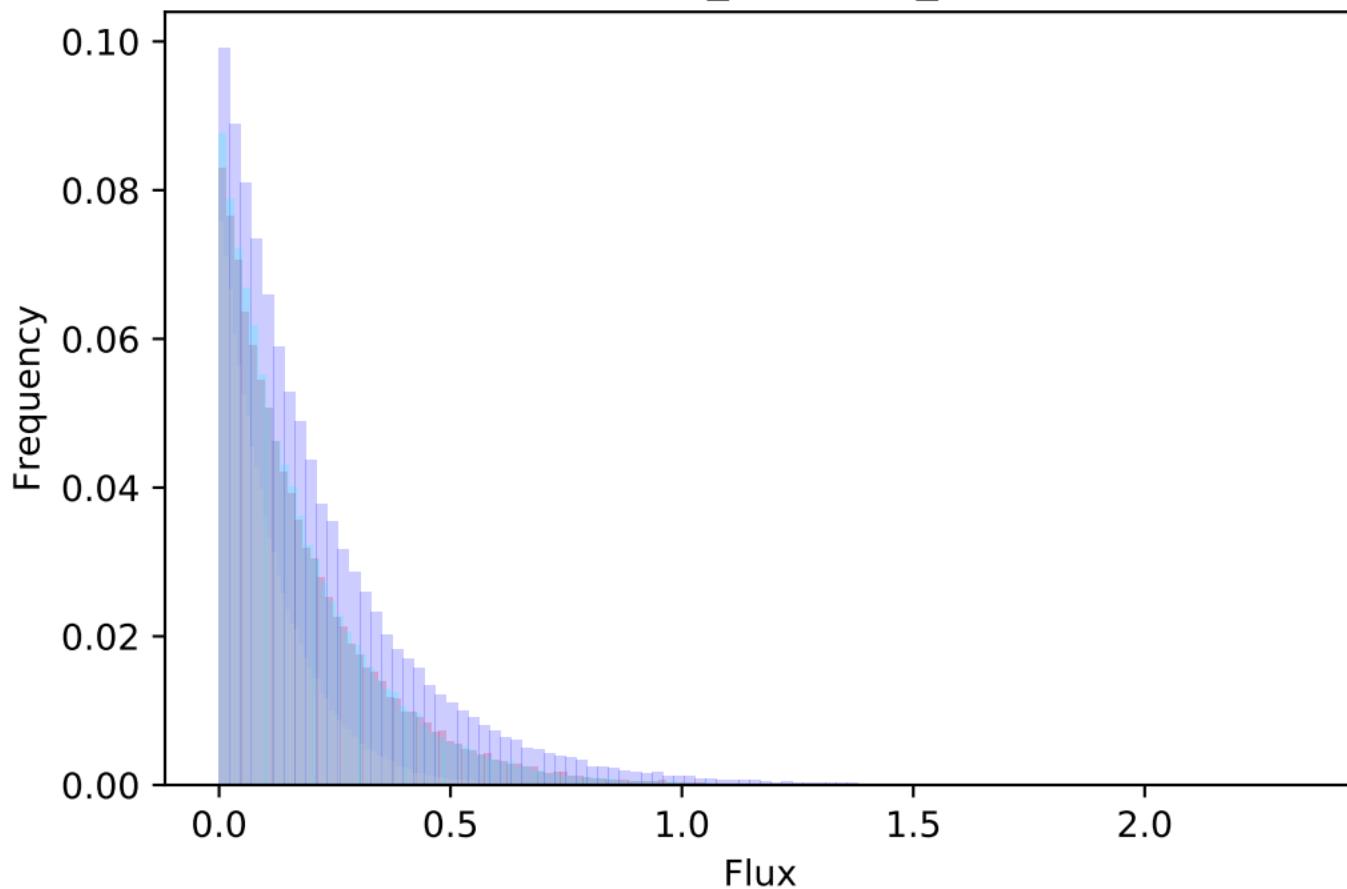
435:Ser_c --> Ser_m



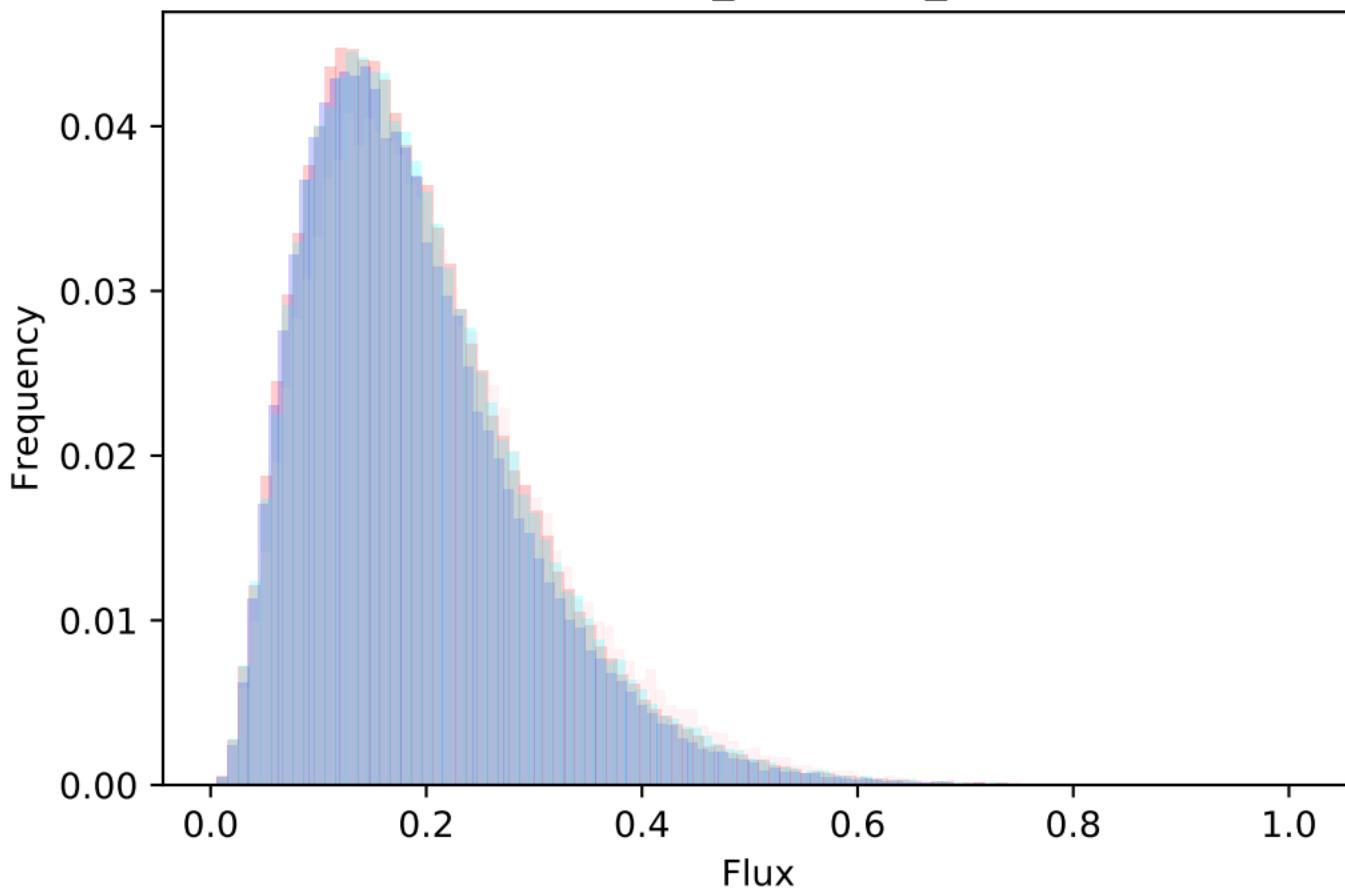
436:Thr_h --> Thr_c



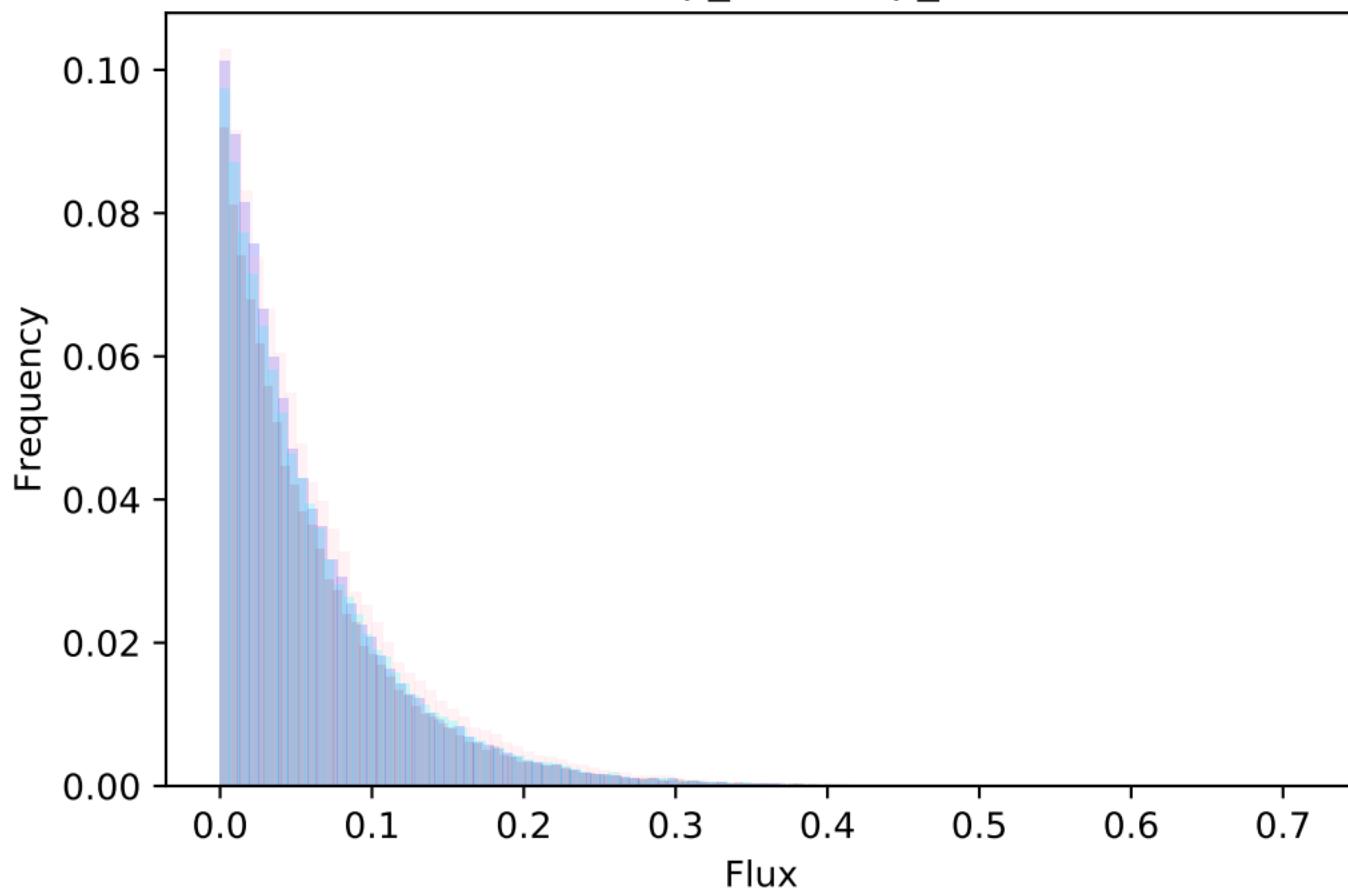
437:Thr_c --> Thr_m



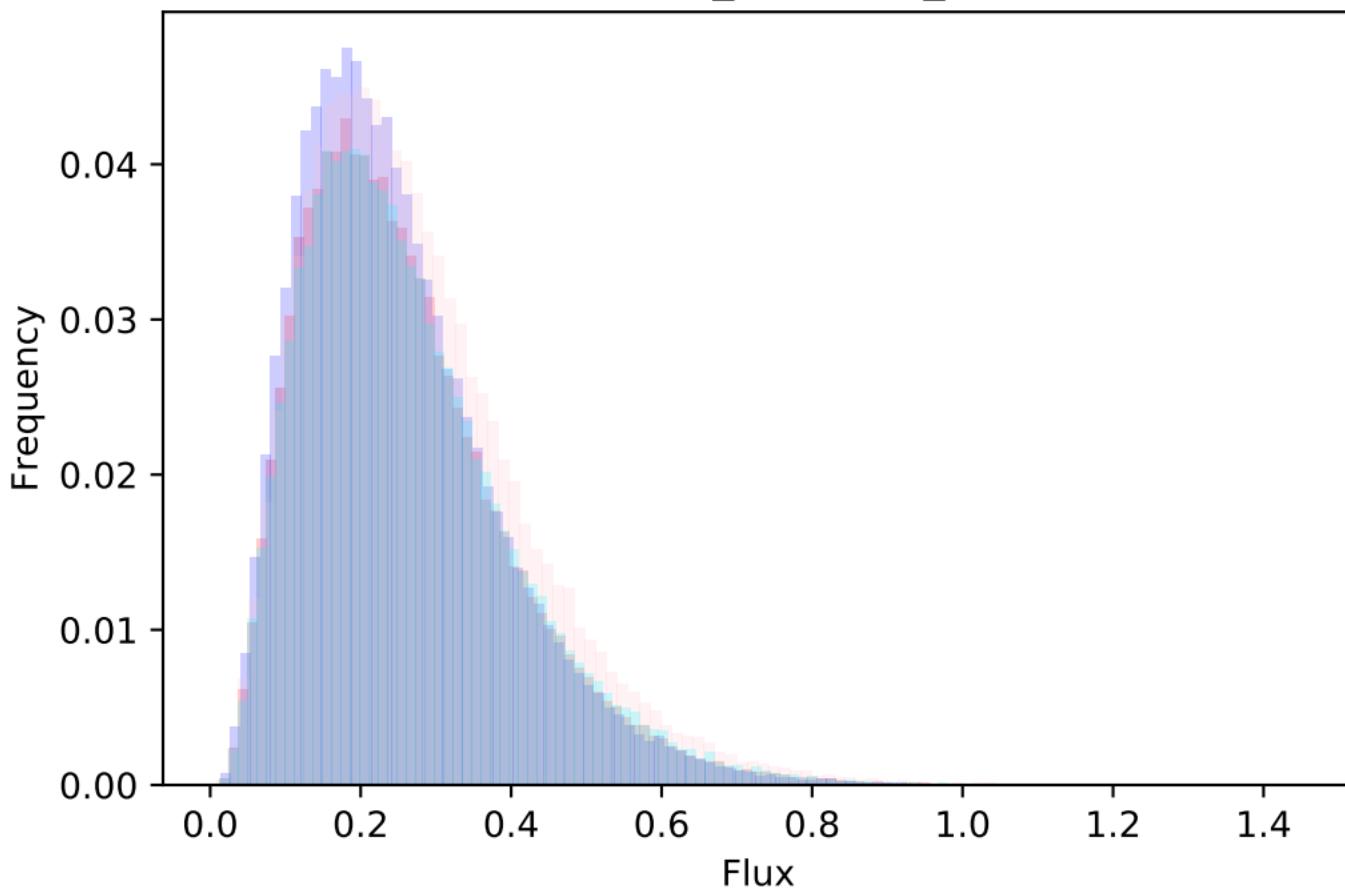
438:Trp_h --> Trp_c



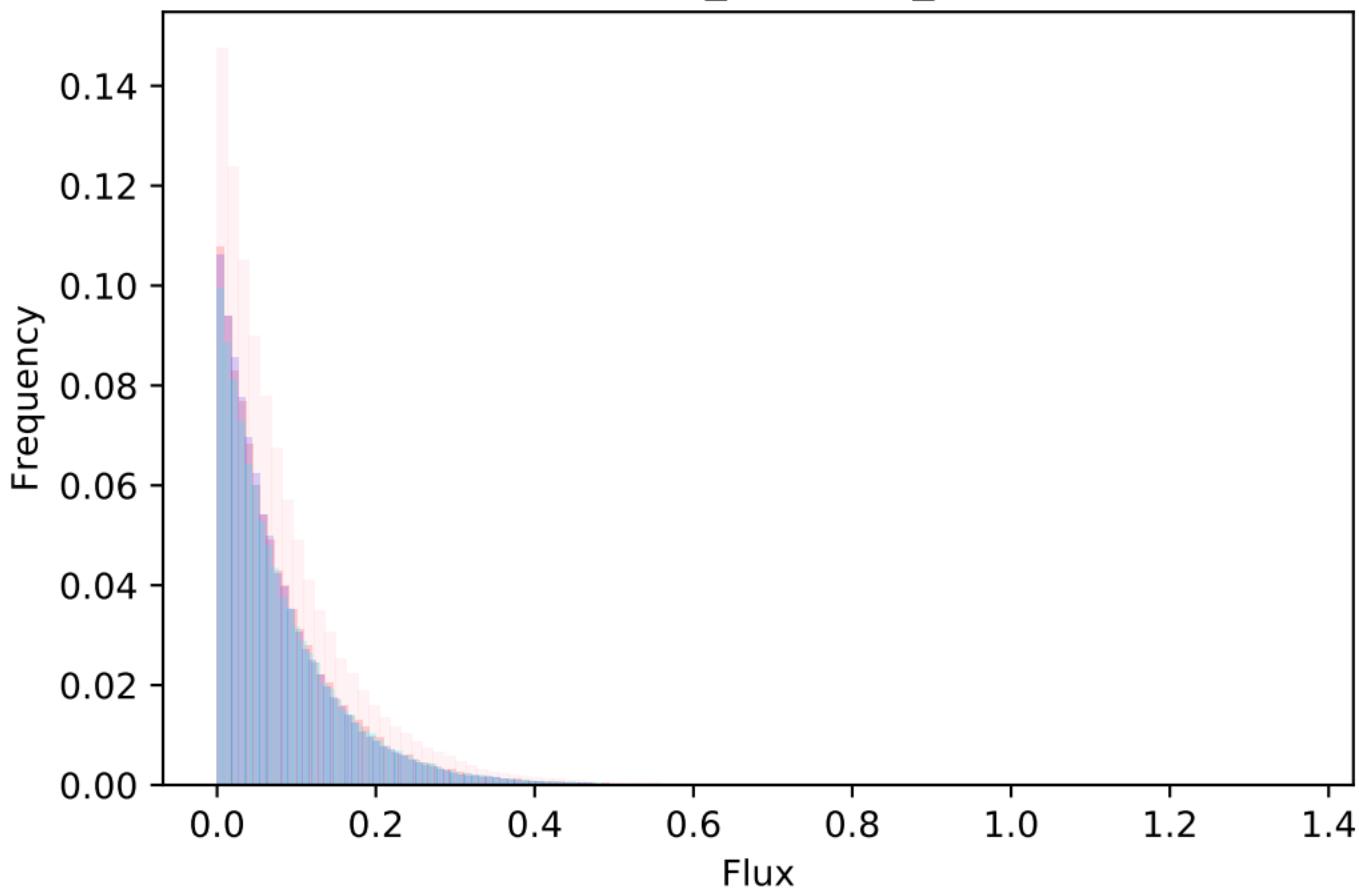
439:Trp_c --> Trp_m



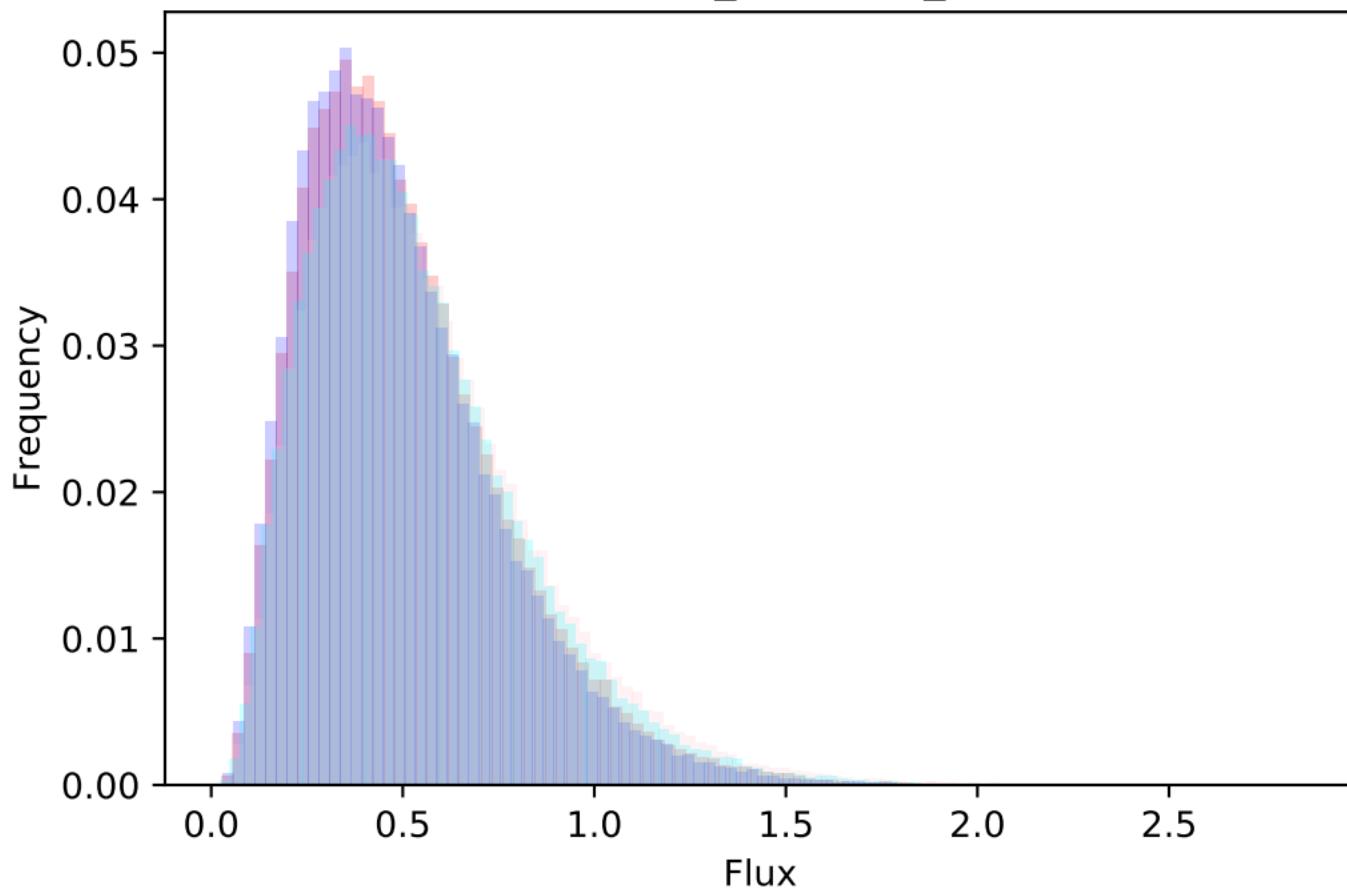
440:Tyr_h --> Tyr_c



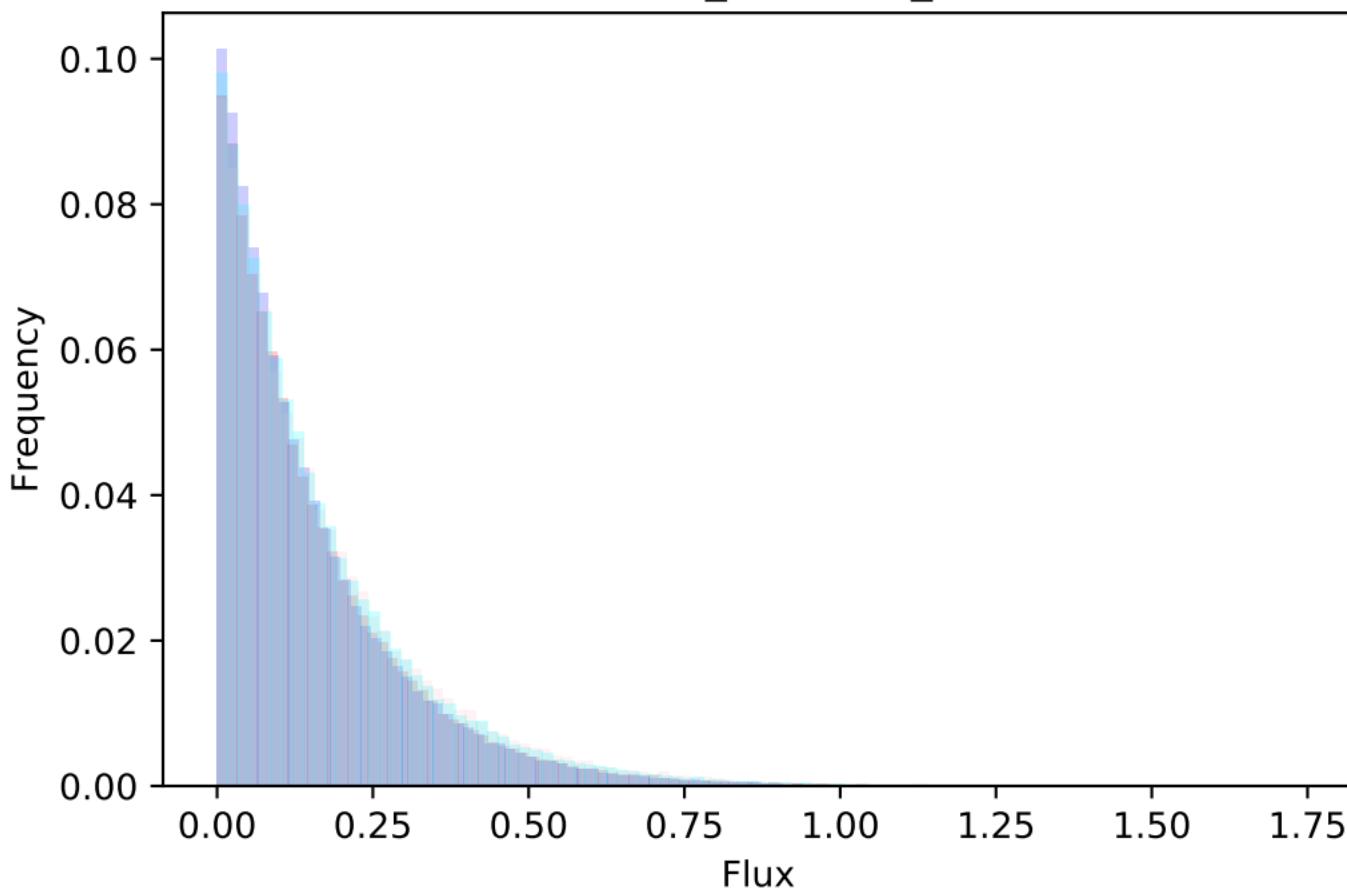
441:Tyr_c --> Tyr_m



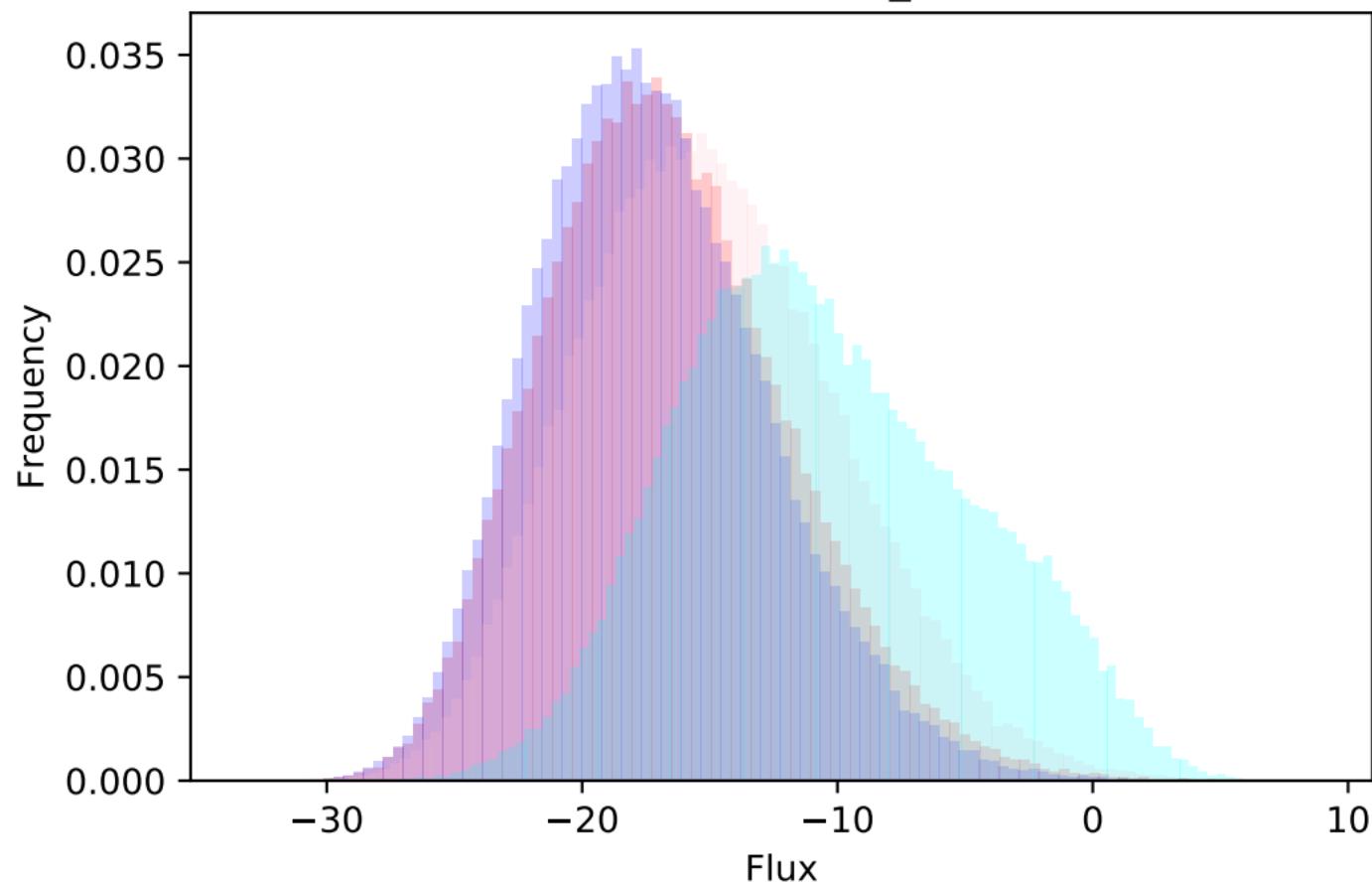
442:Val_h --> Val_c



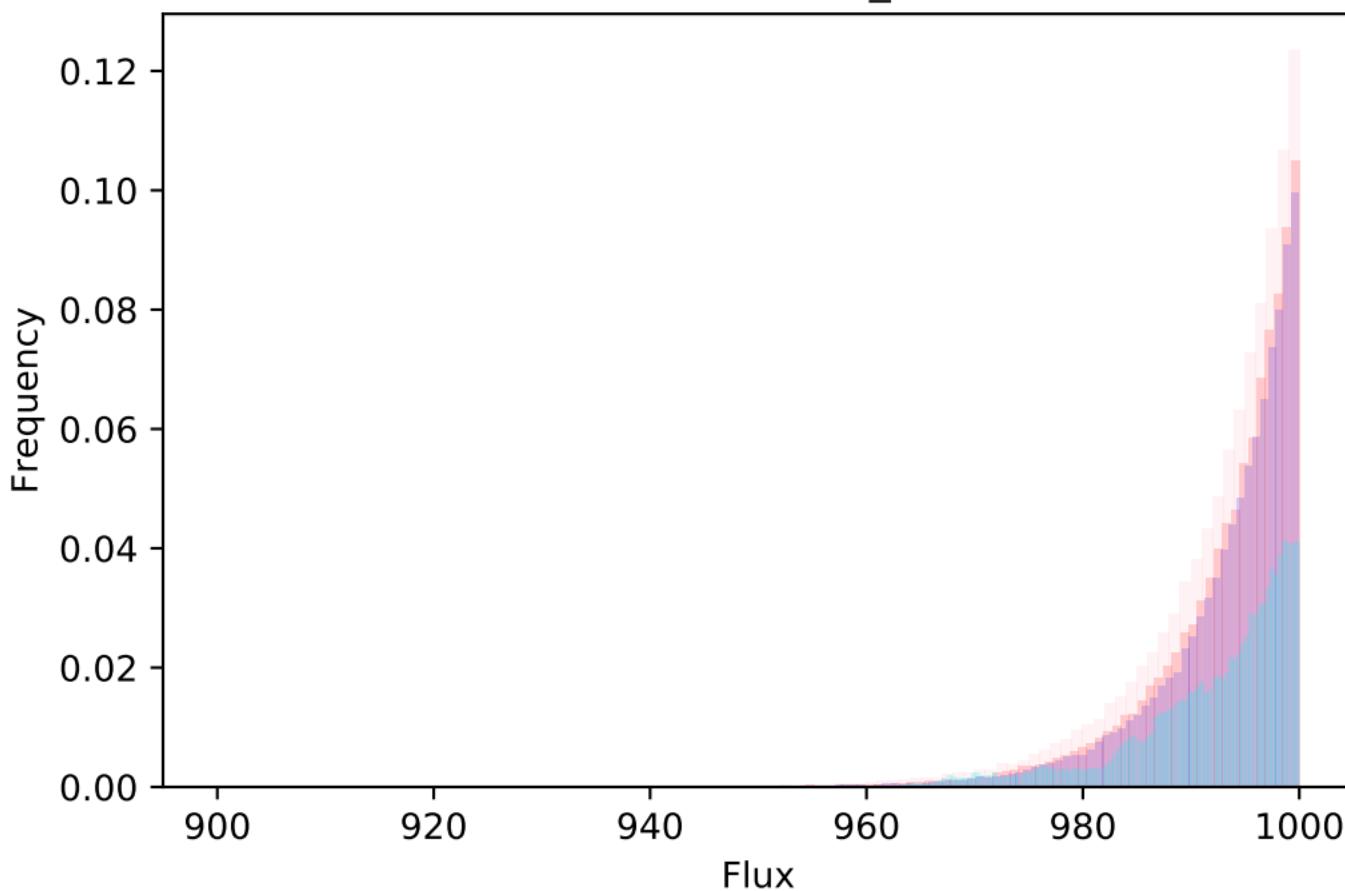
443:Val_c --> Val_m



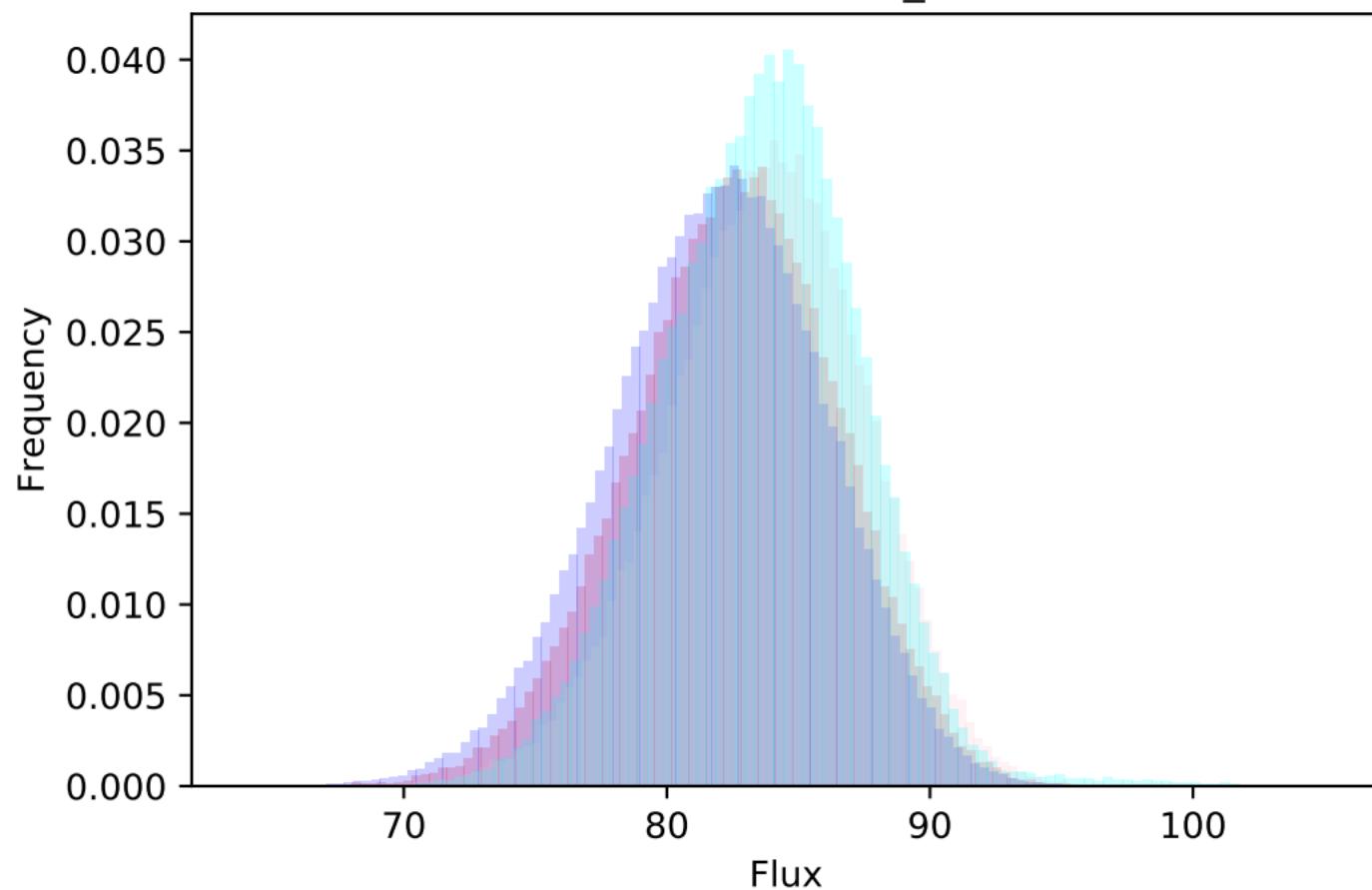
444: $\leq \Rightarrow H_c$



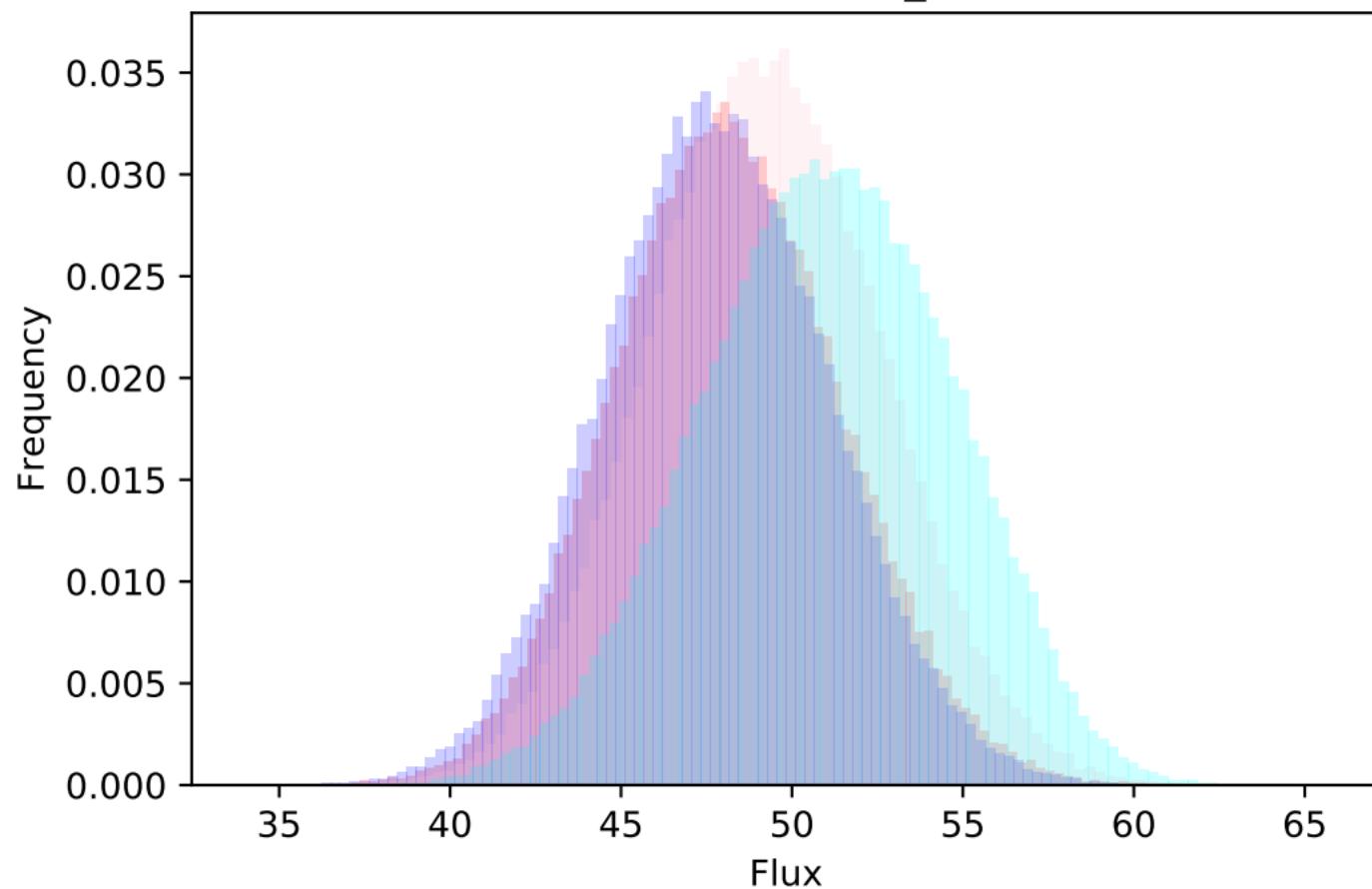
445: --> hnu_h

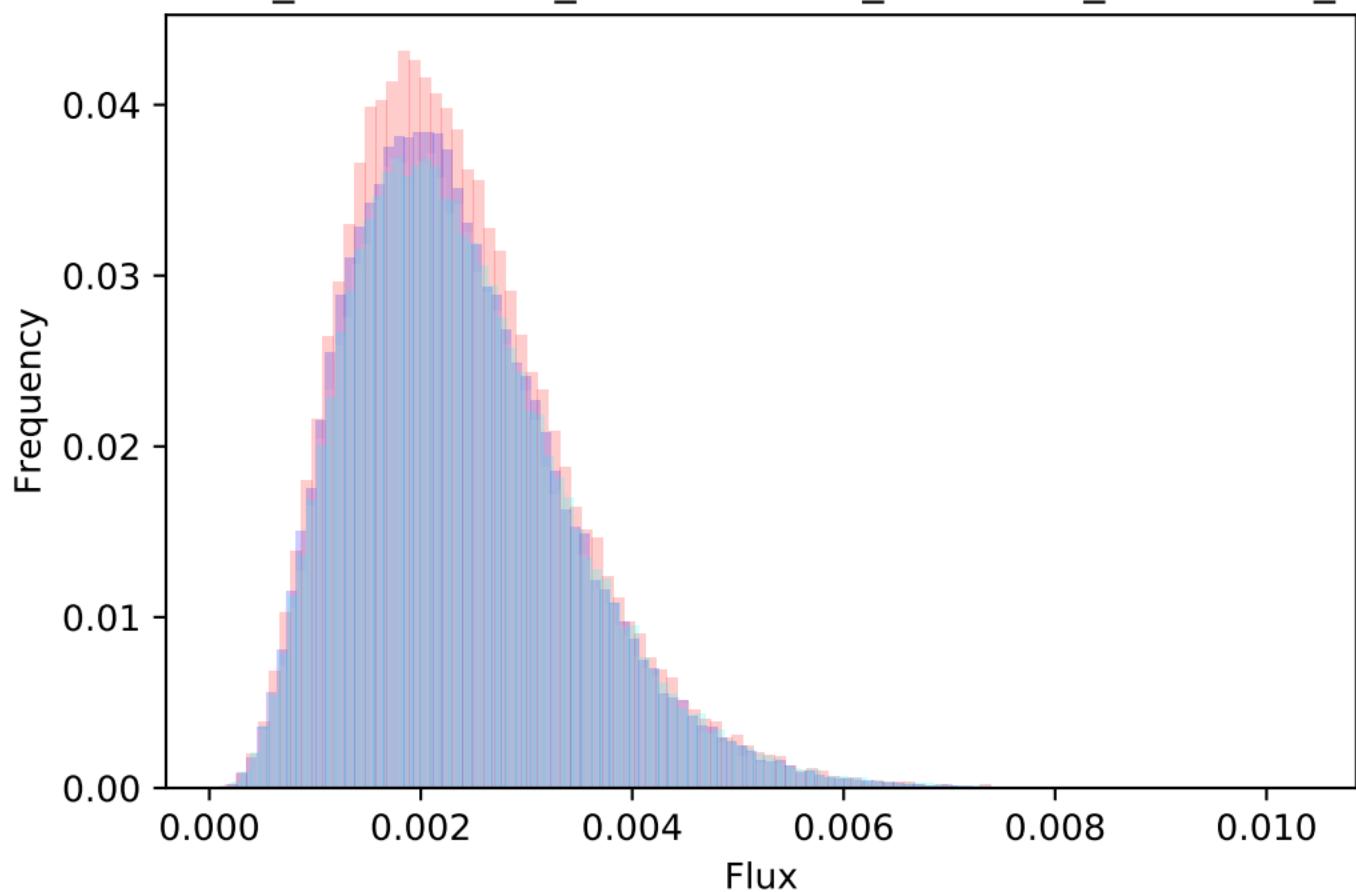


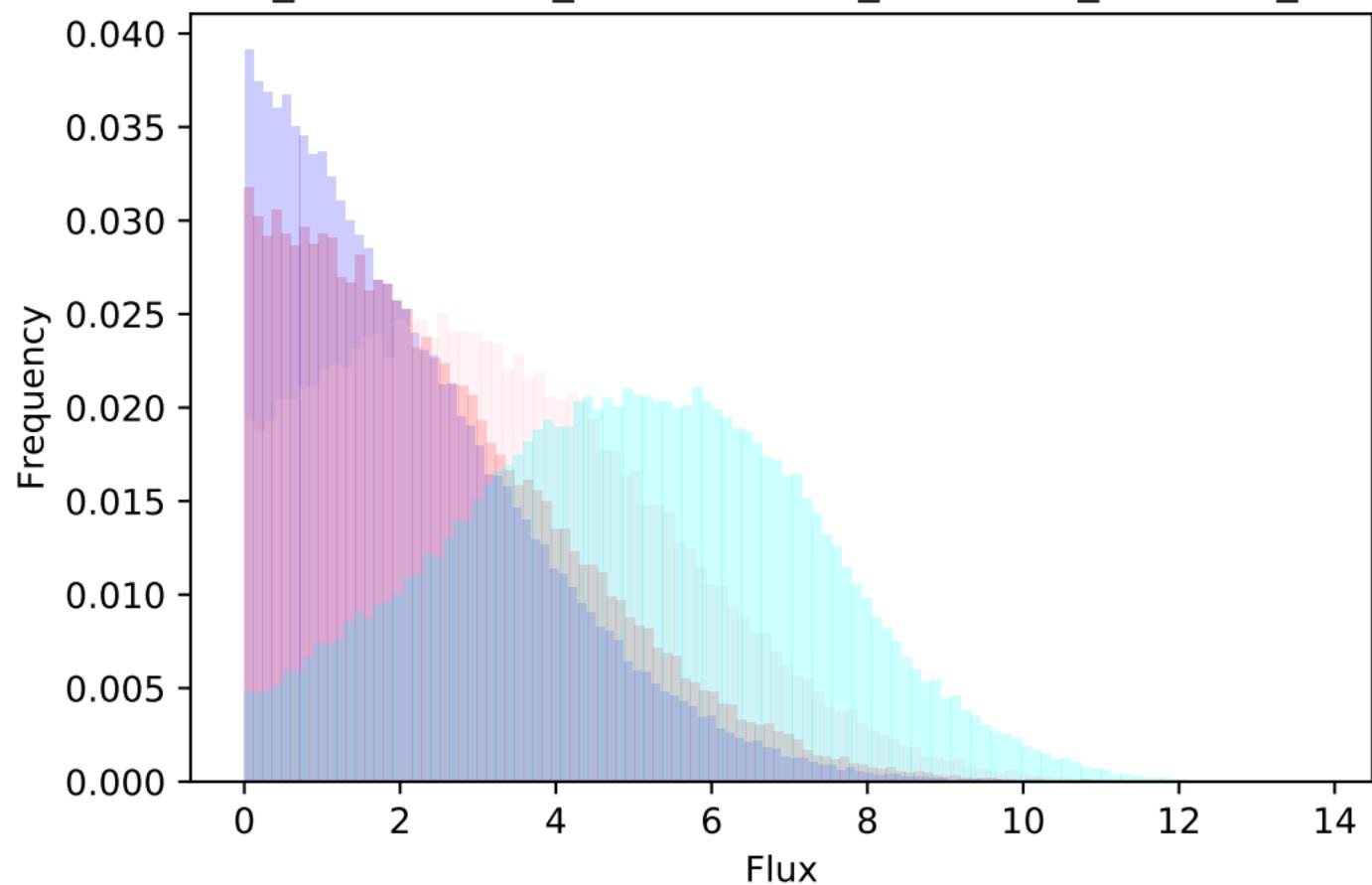
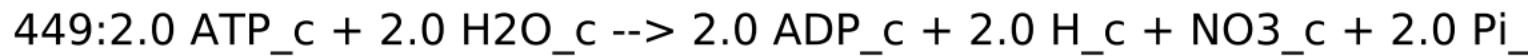
446: --> CO2_c



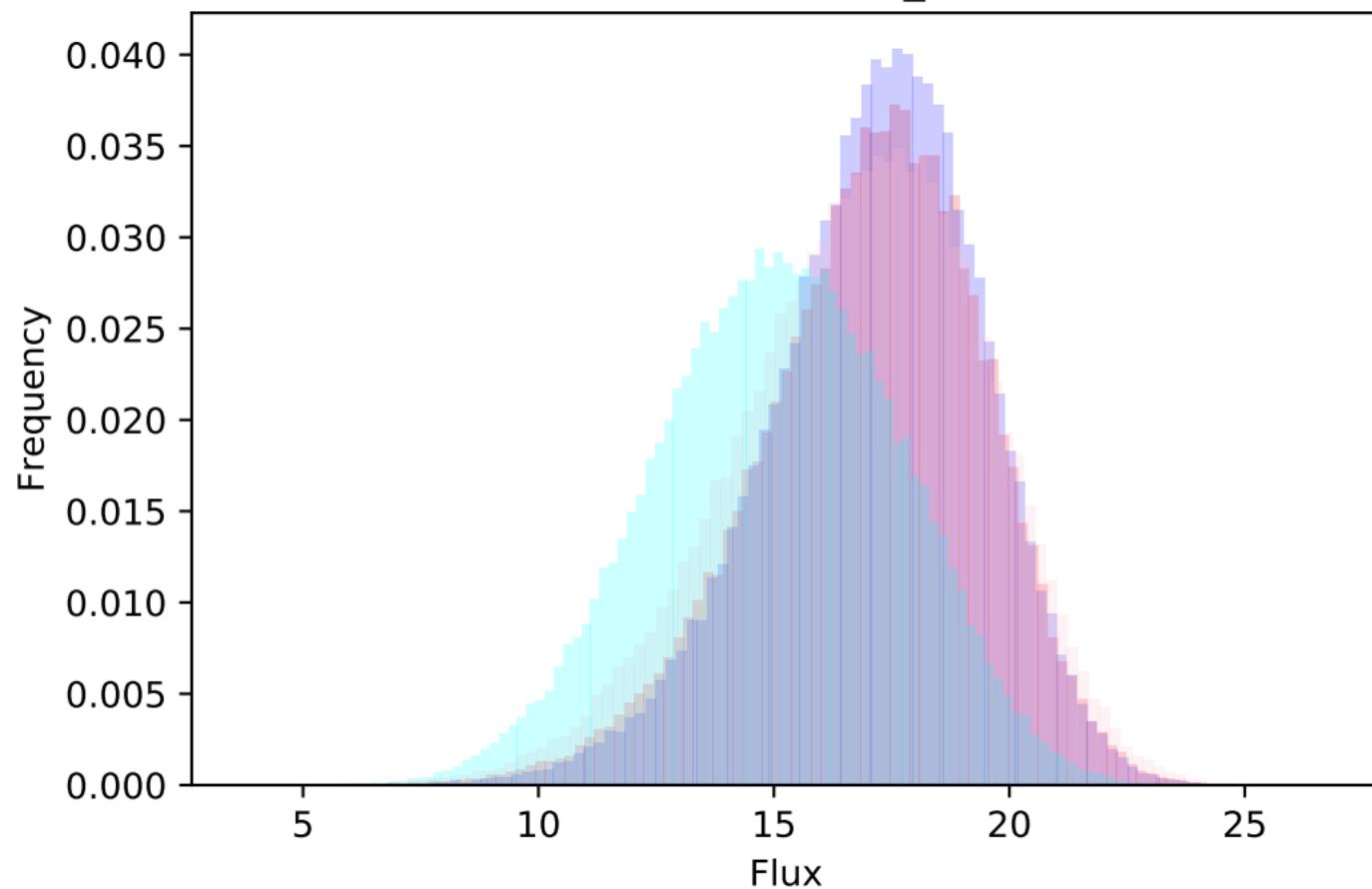
447: --> H2O_c

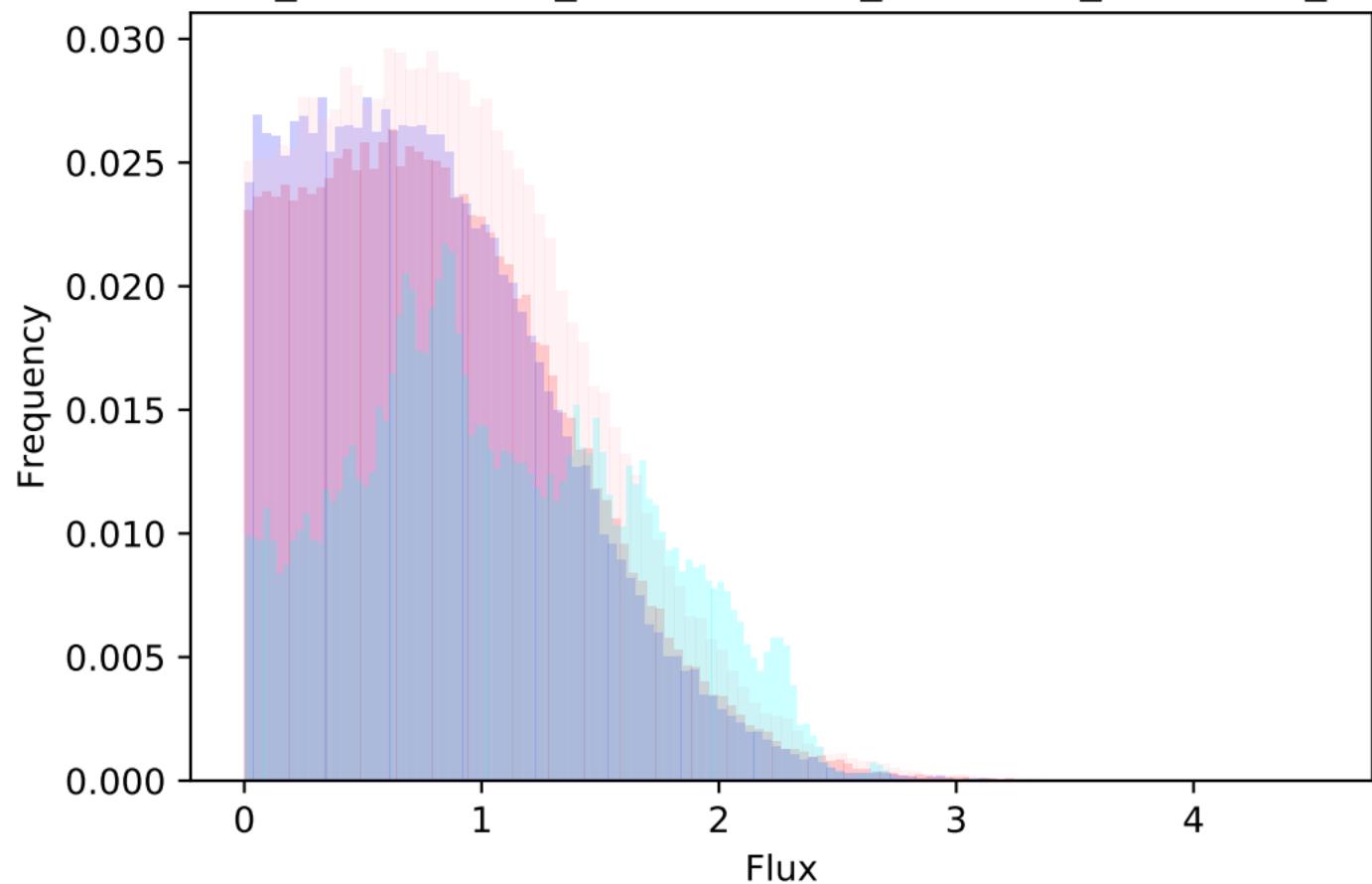




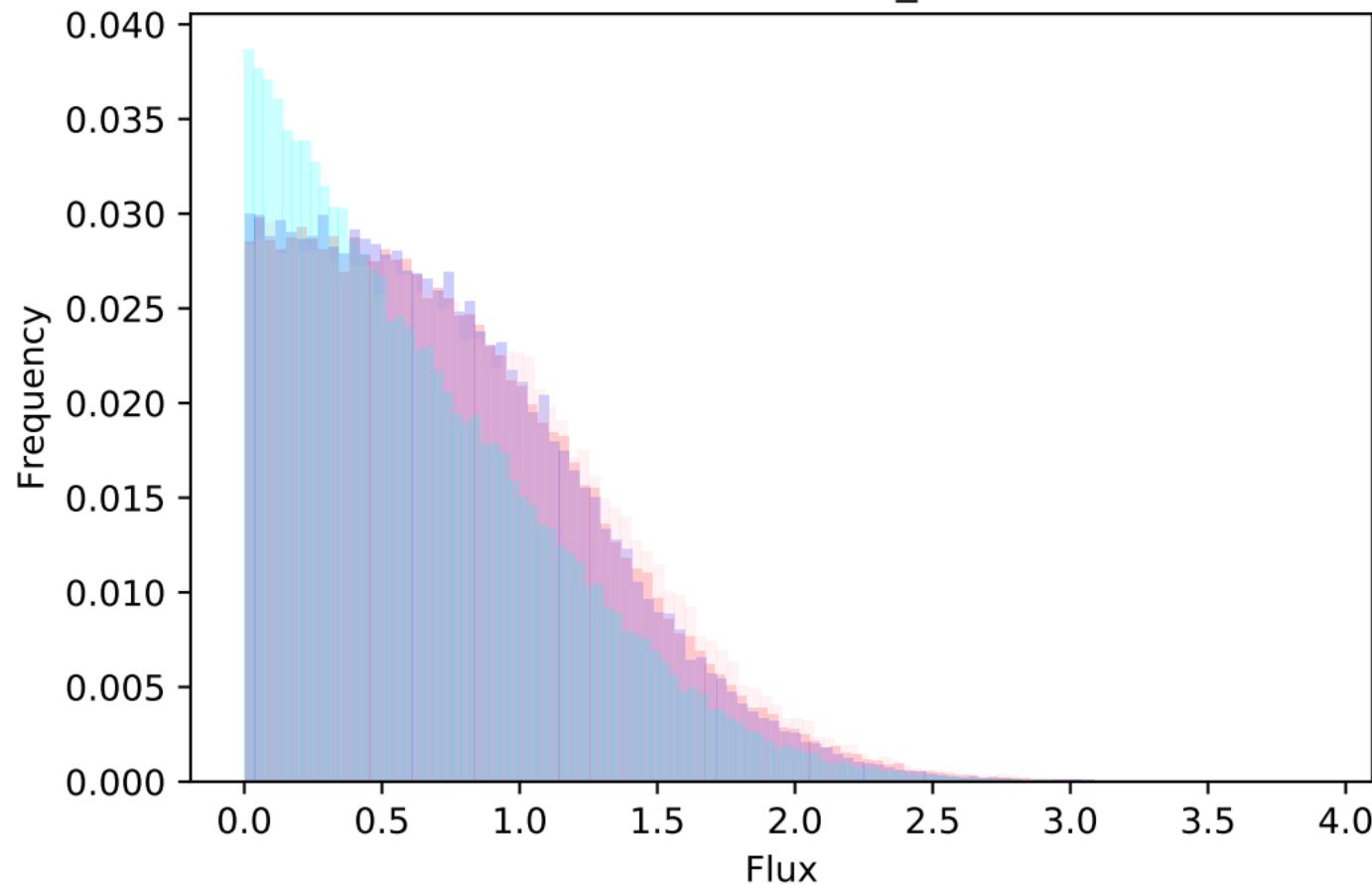


450: --> NH4_c

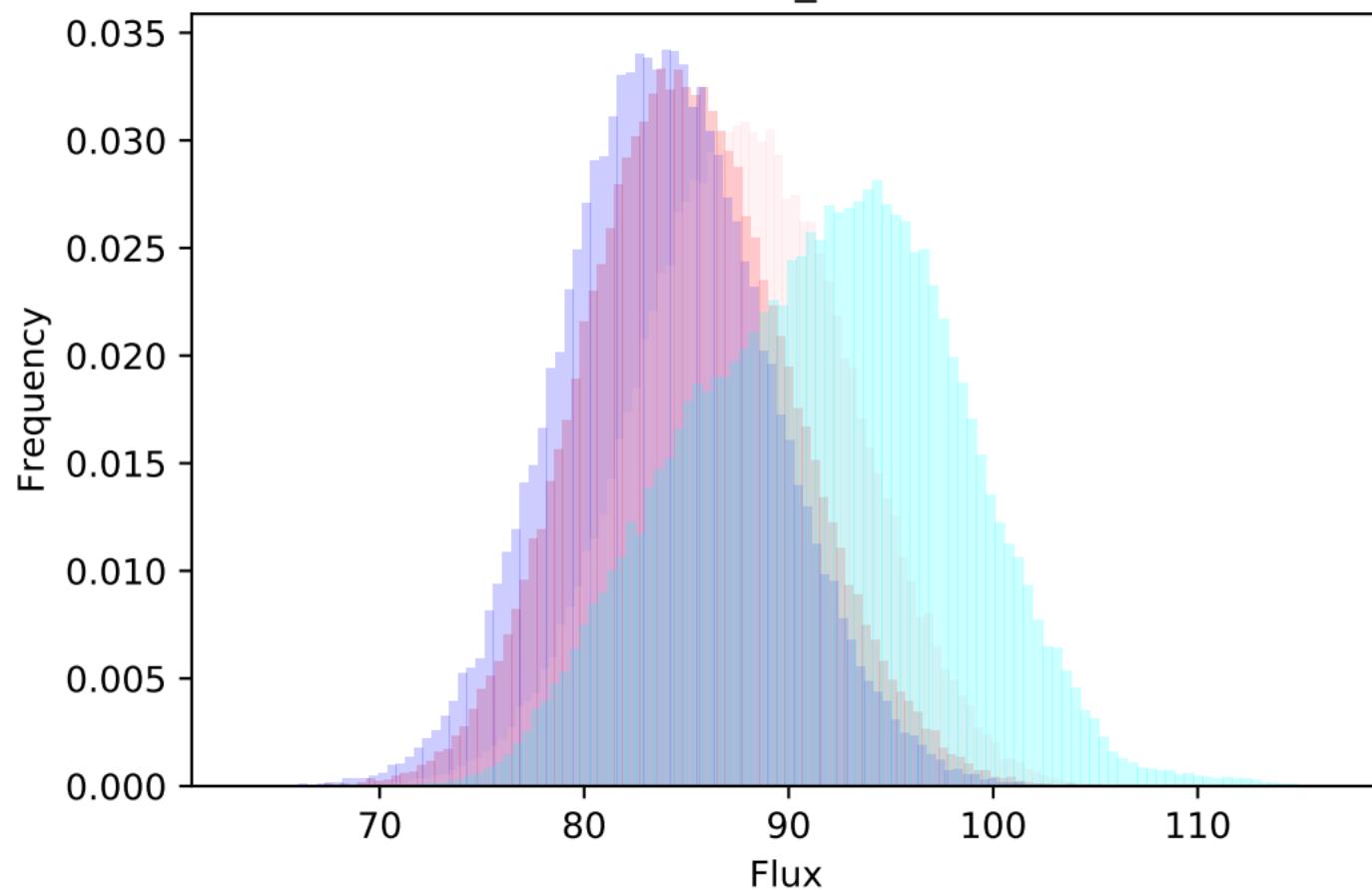




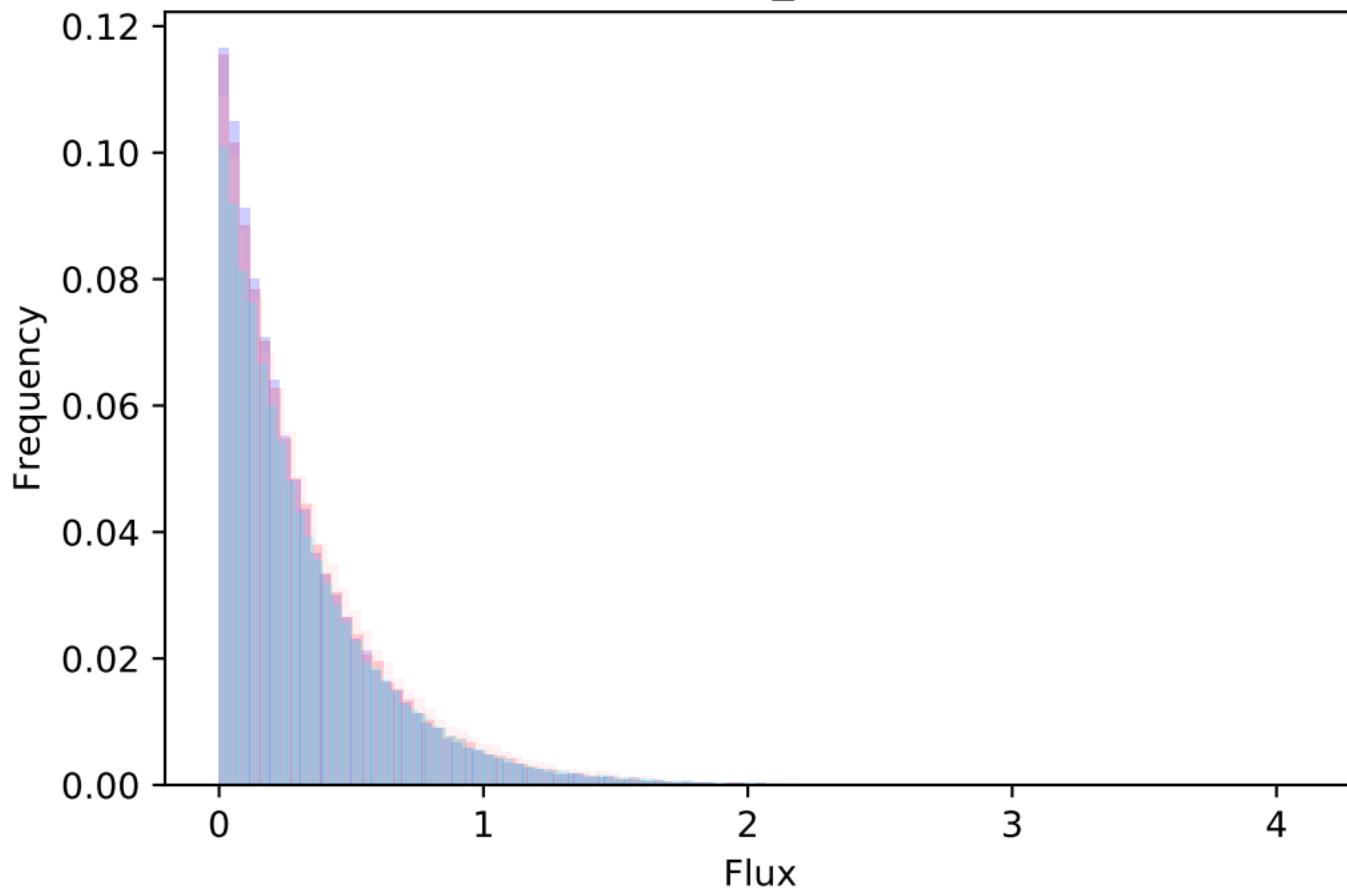
452: --> H2S_c



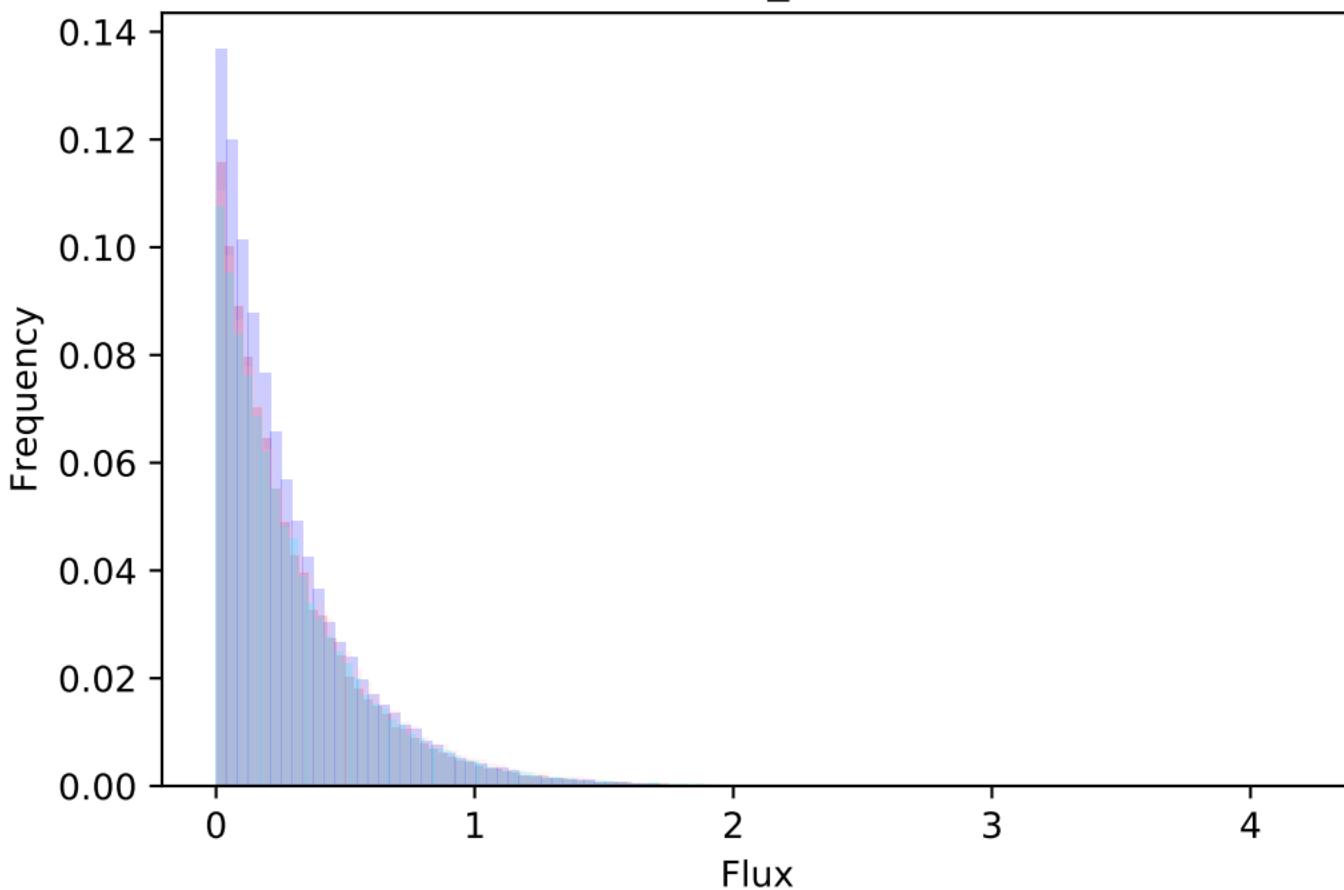
453:O2_c -->



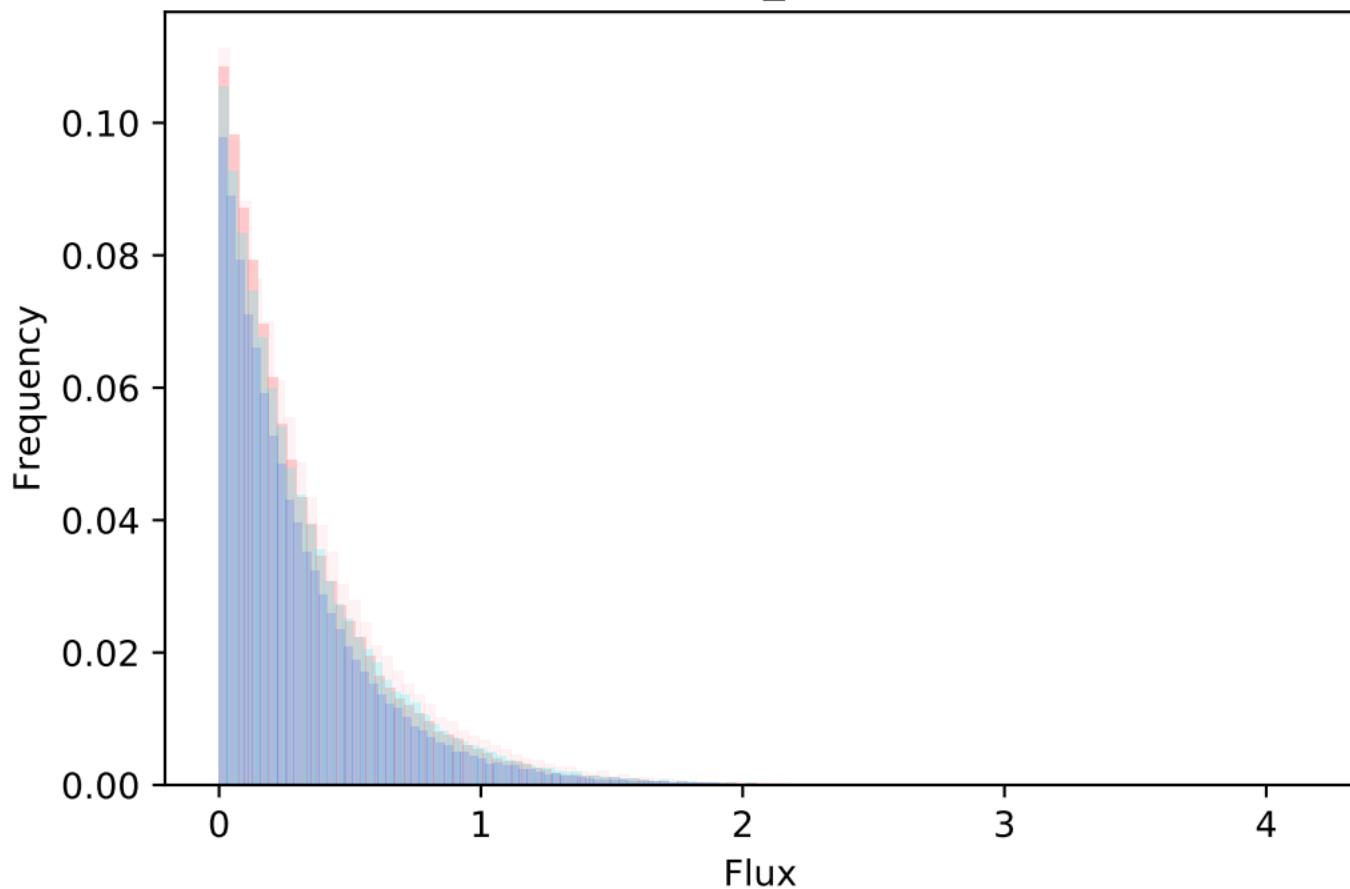
454:Ala_c -->



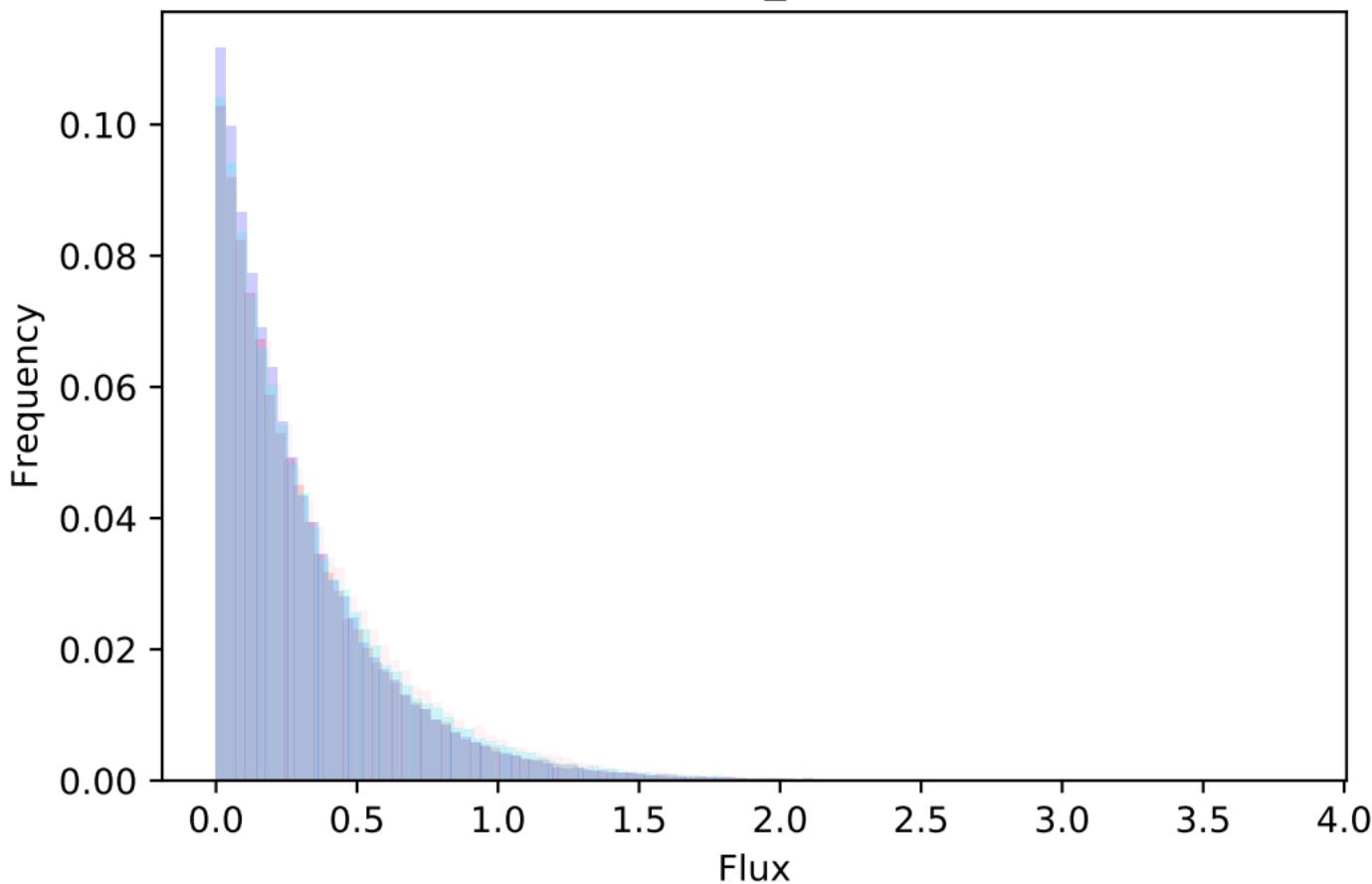
455:Ala_h -->



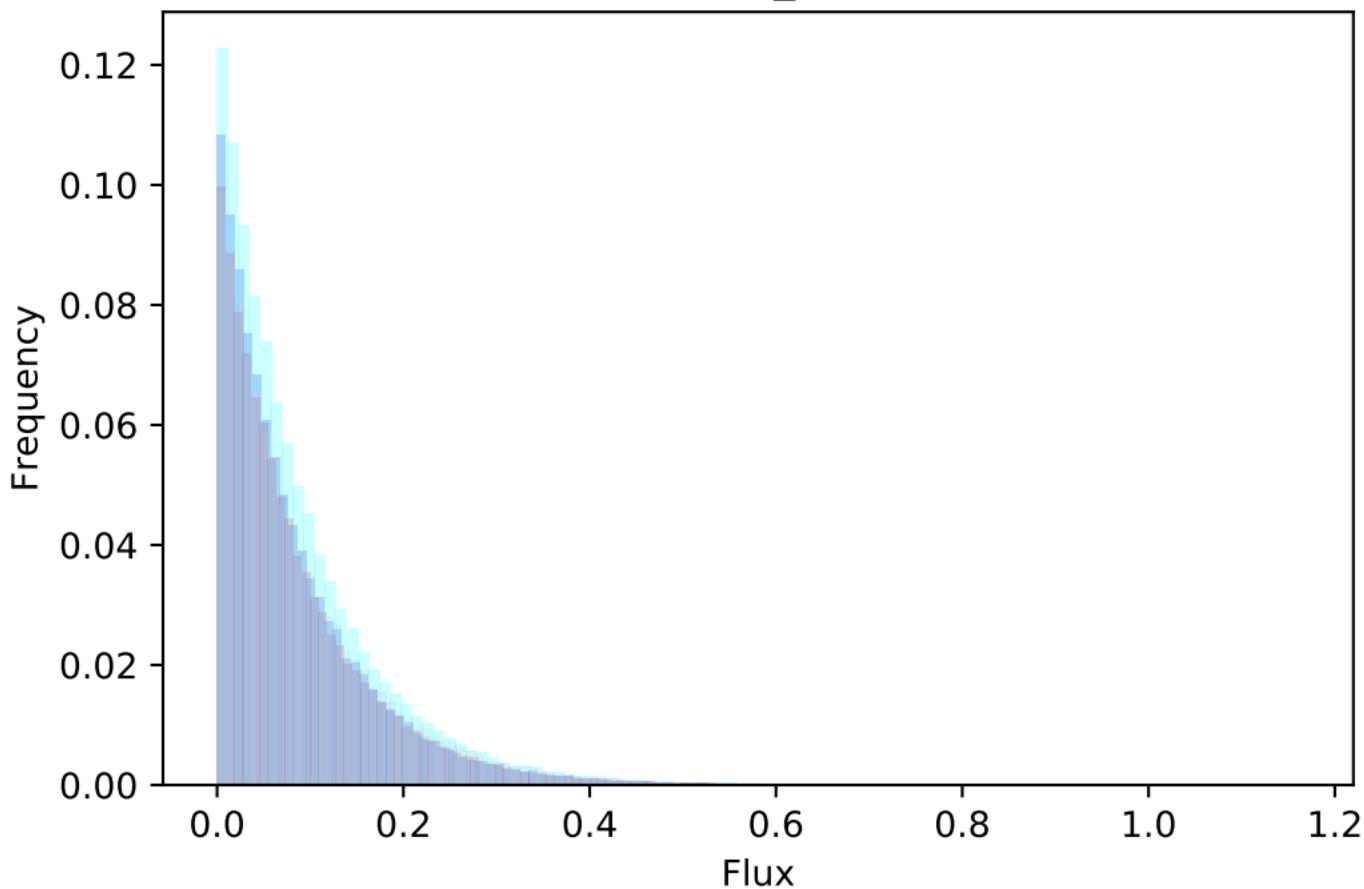
456:Ala_m -->



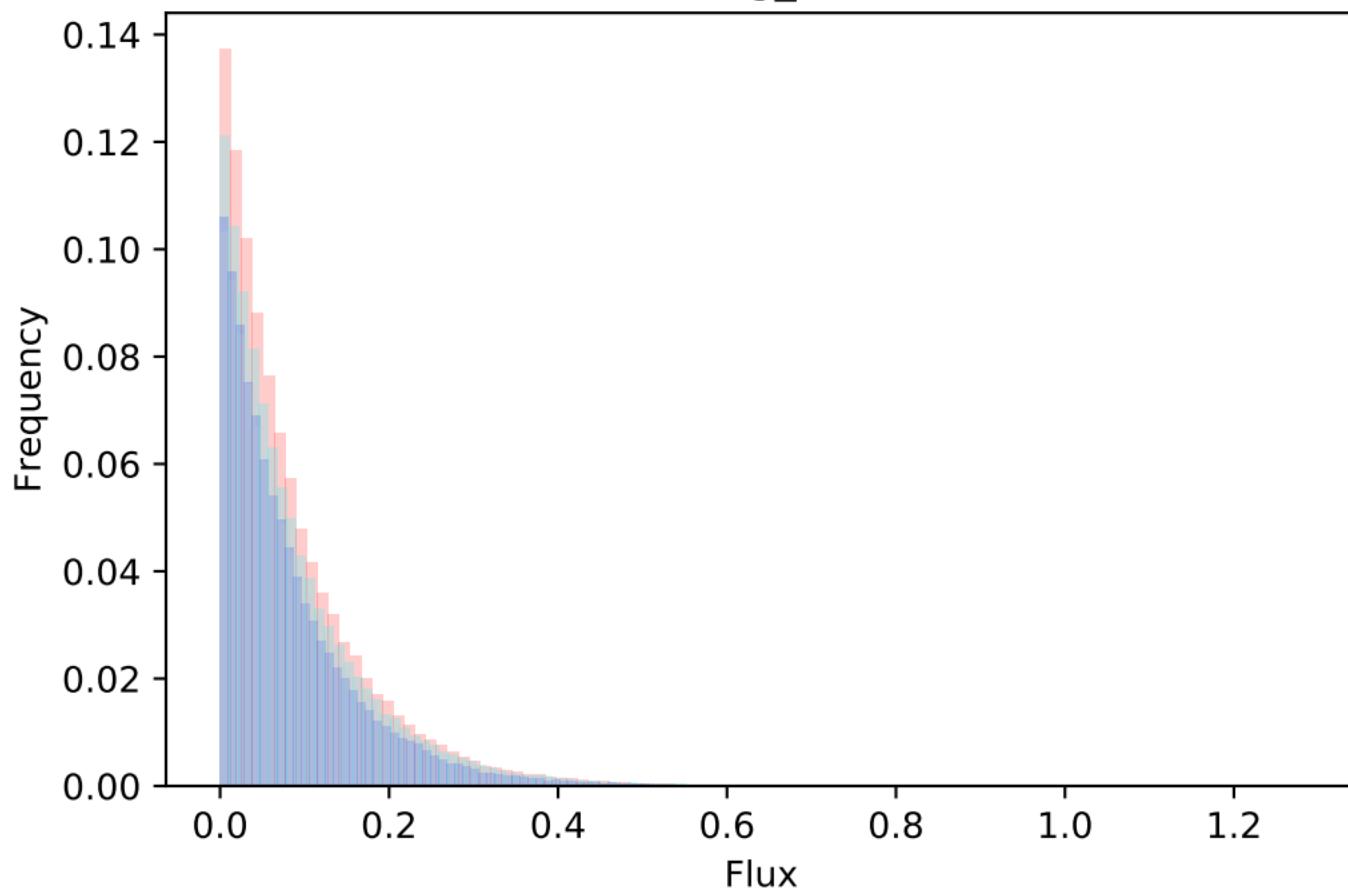
457:Ala_p -->



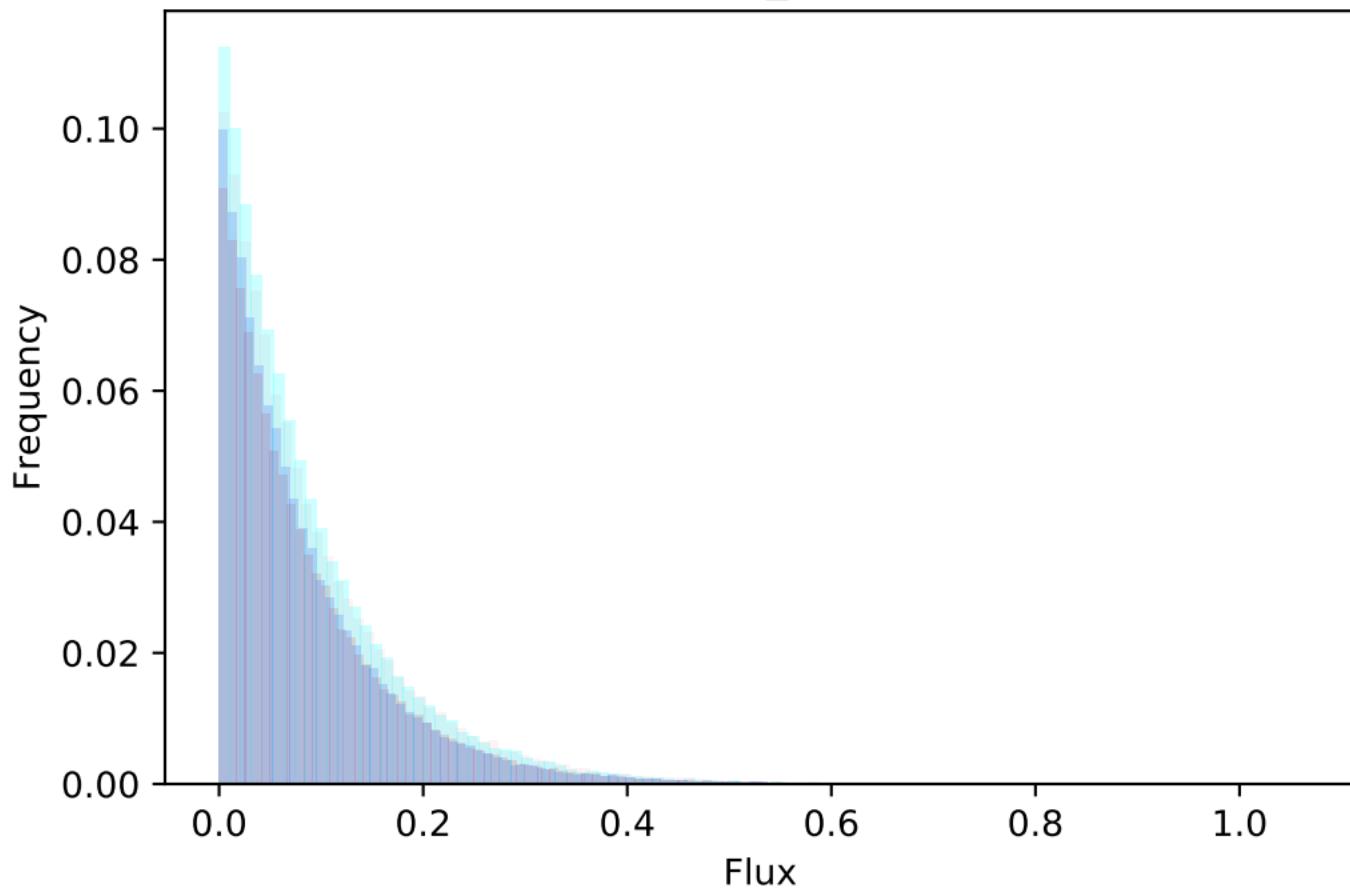
458:Arg_c -->



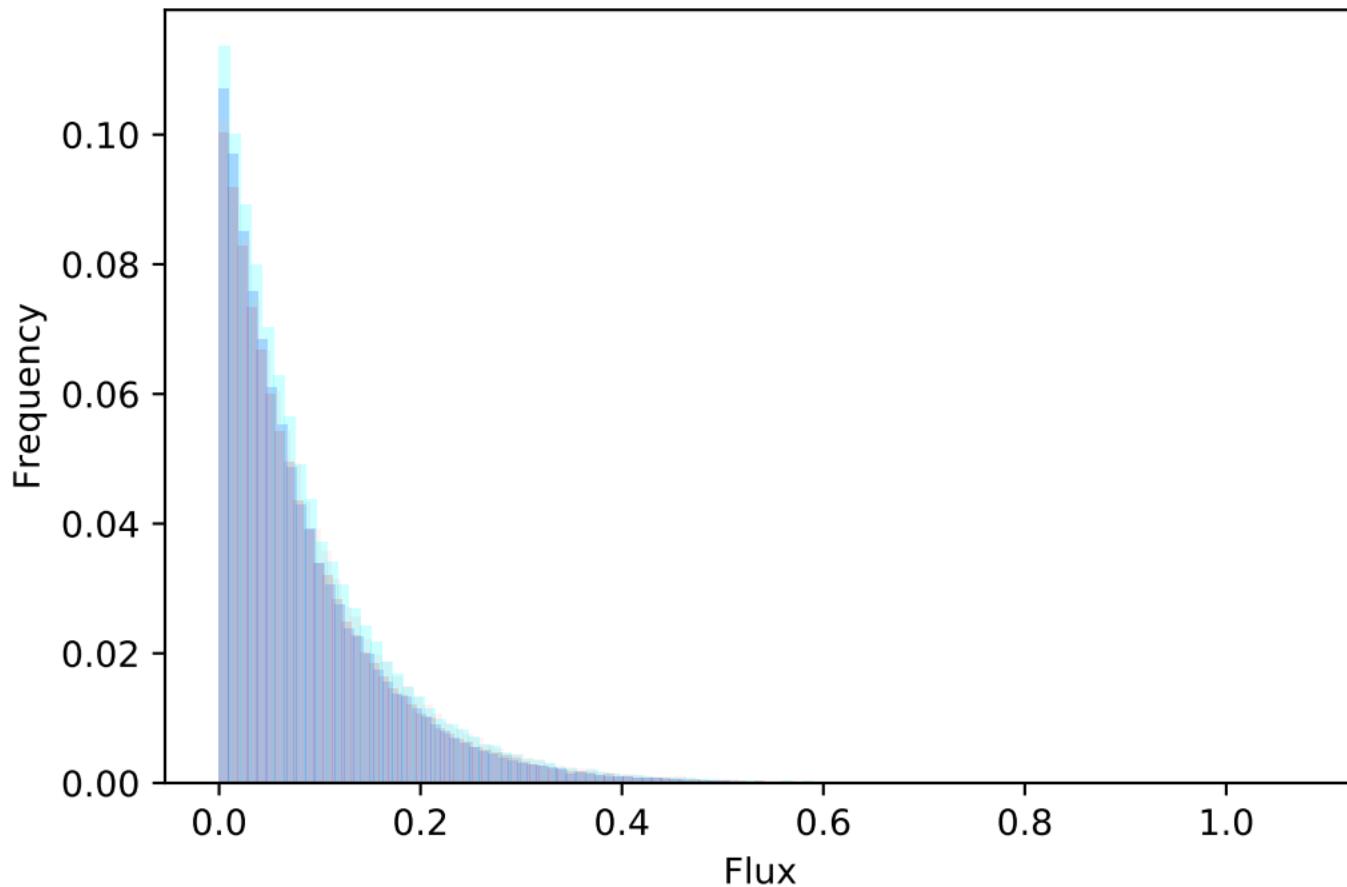
459:Arg_h -->



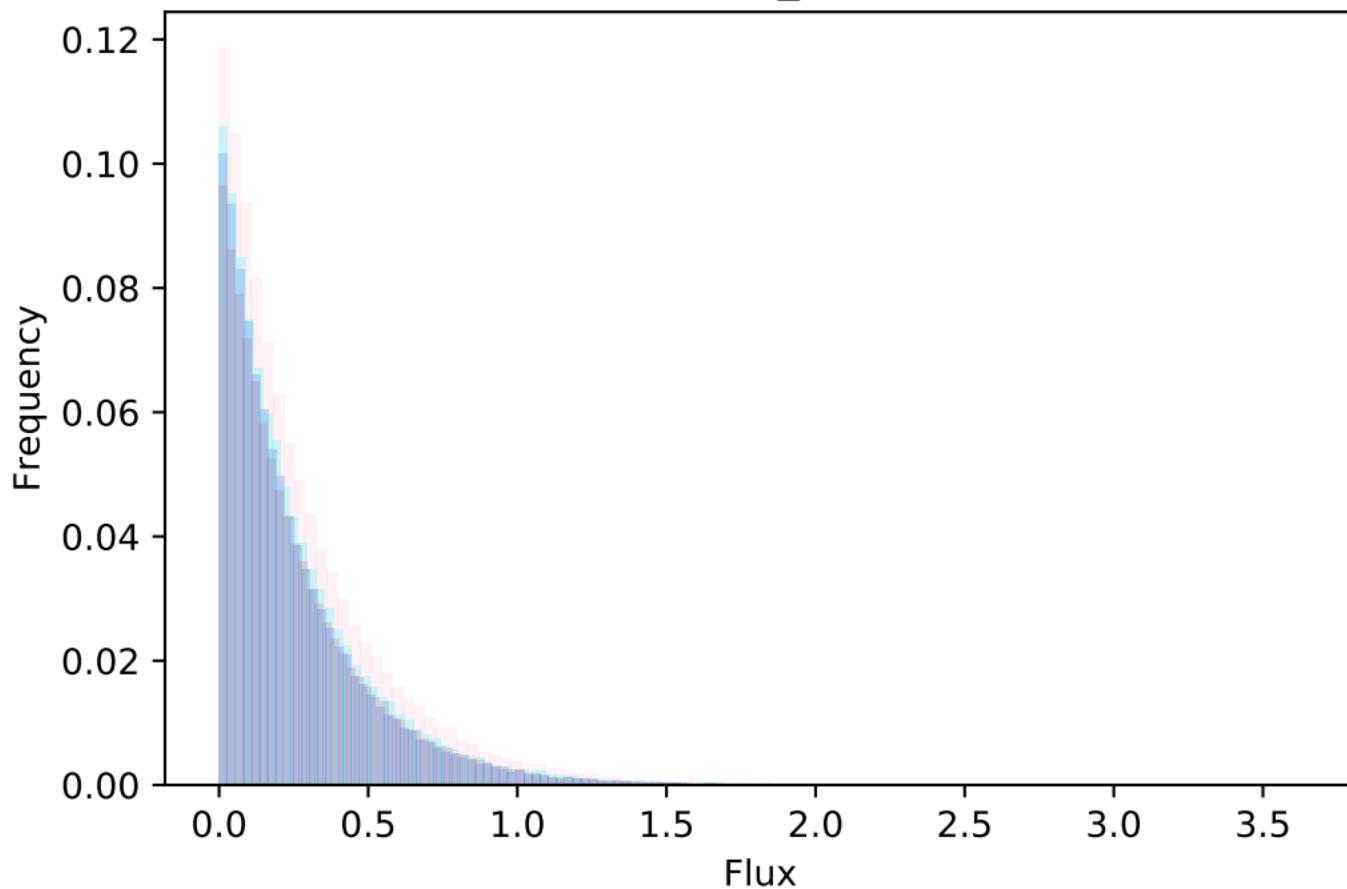
460:Arg_m -->



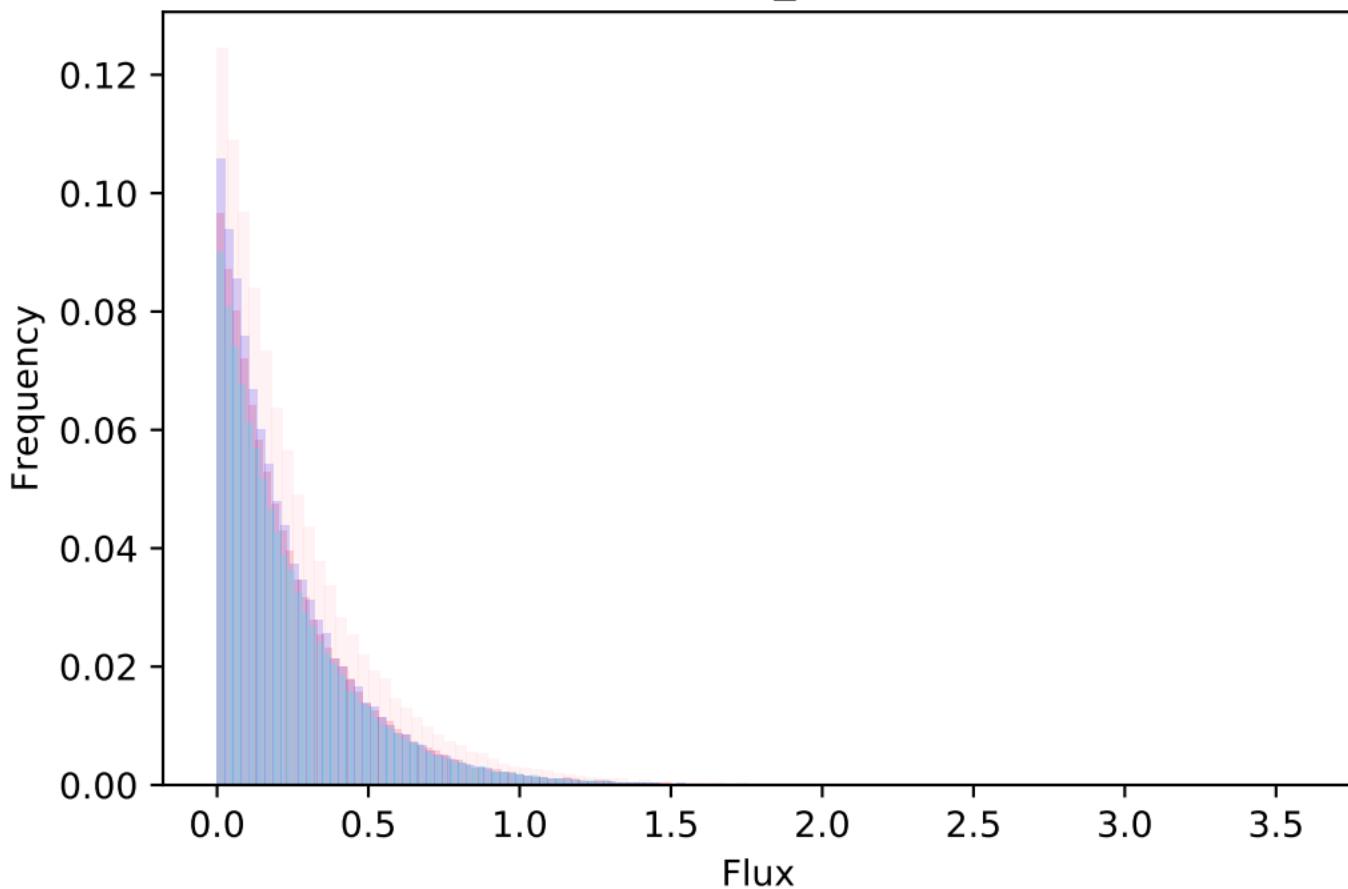
461:Arg_p -->



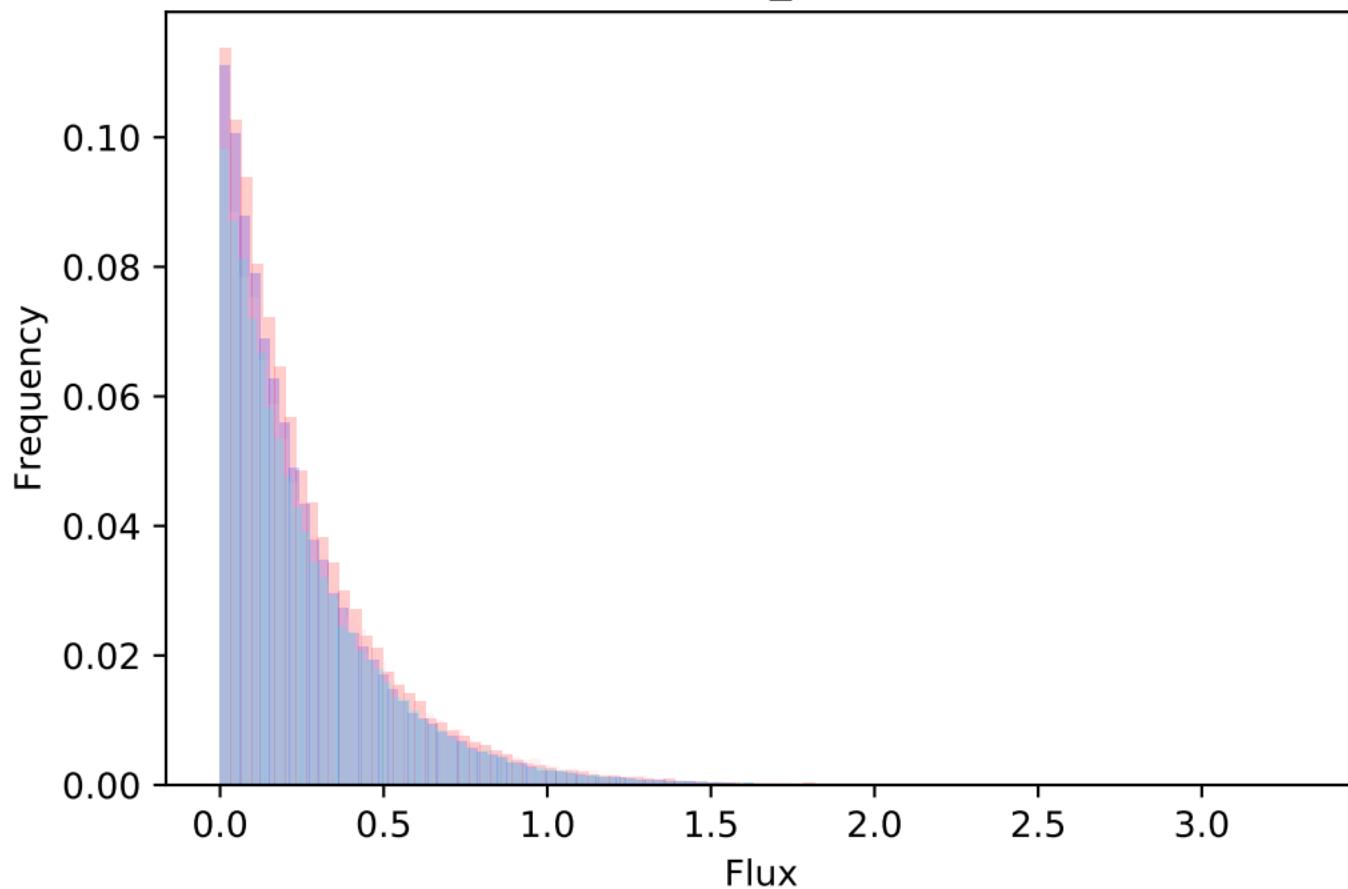
462:Asn_c -->



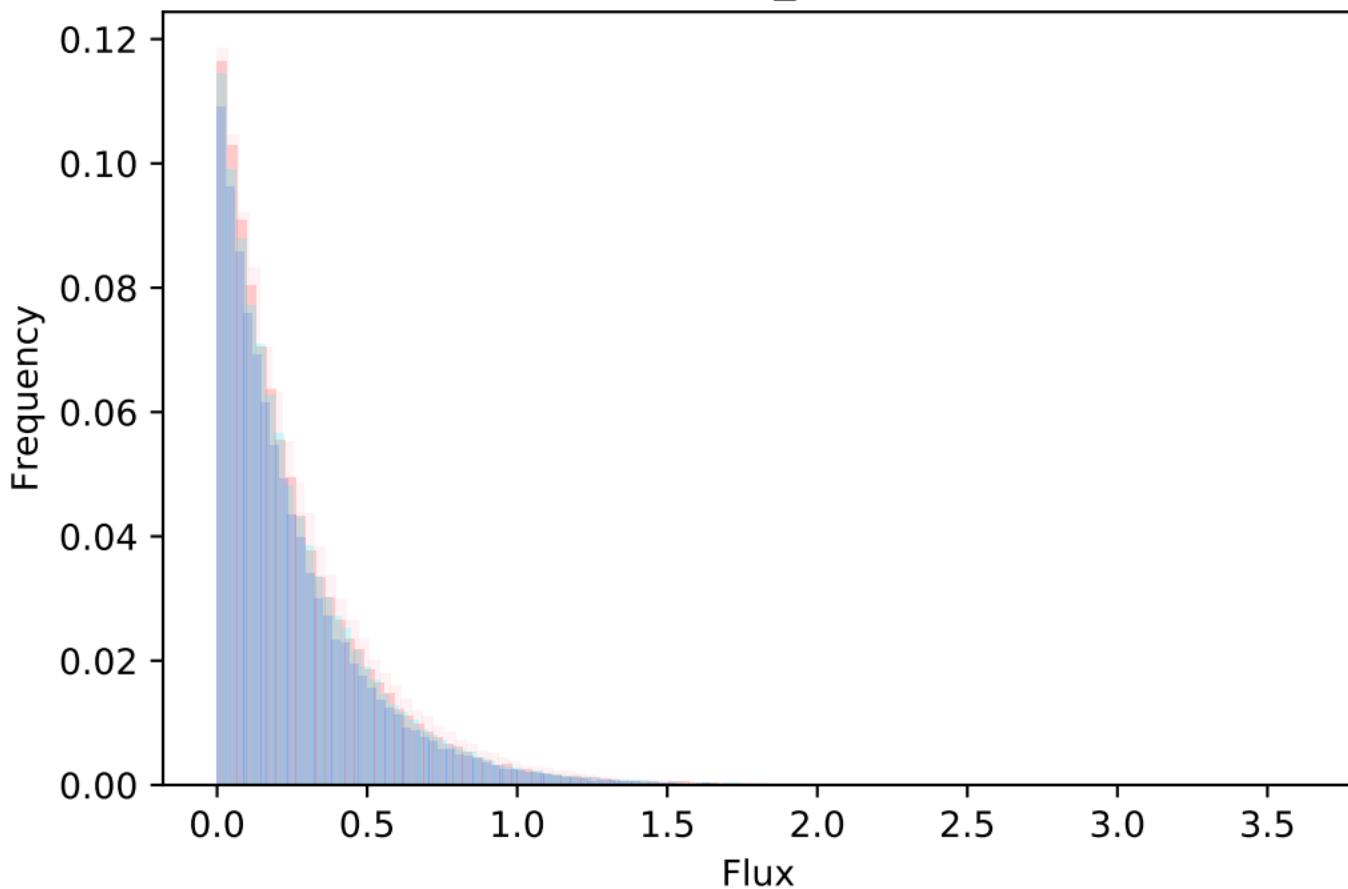
463:Asn_h -->



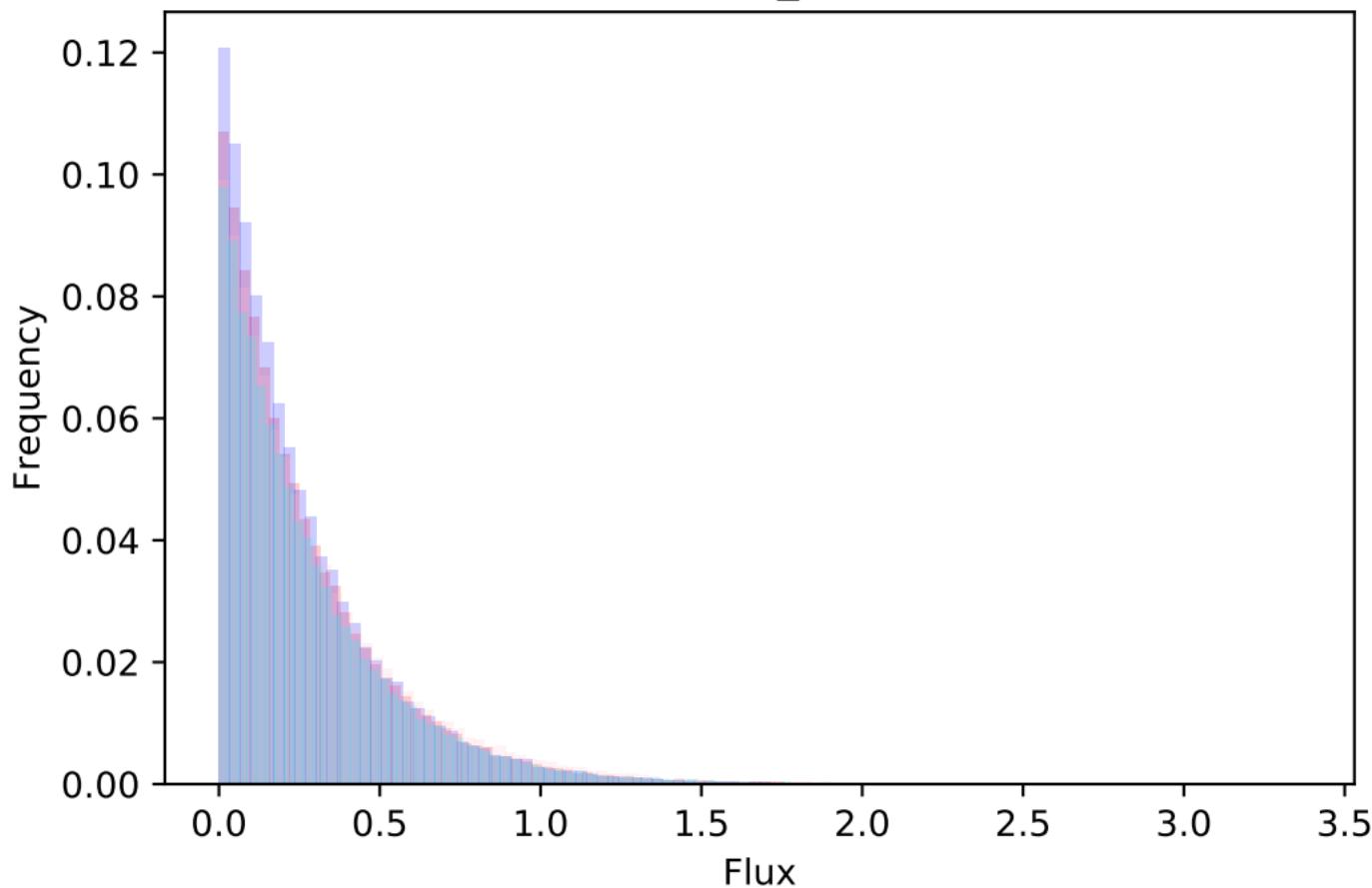
464:Asn_m -->



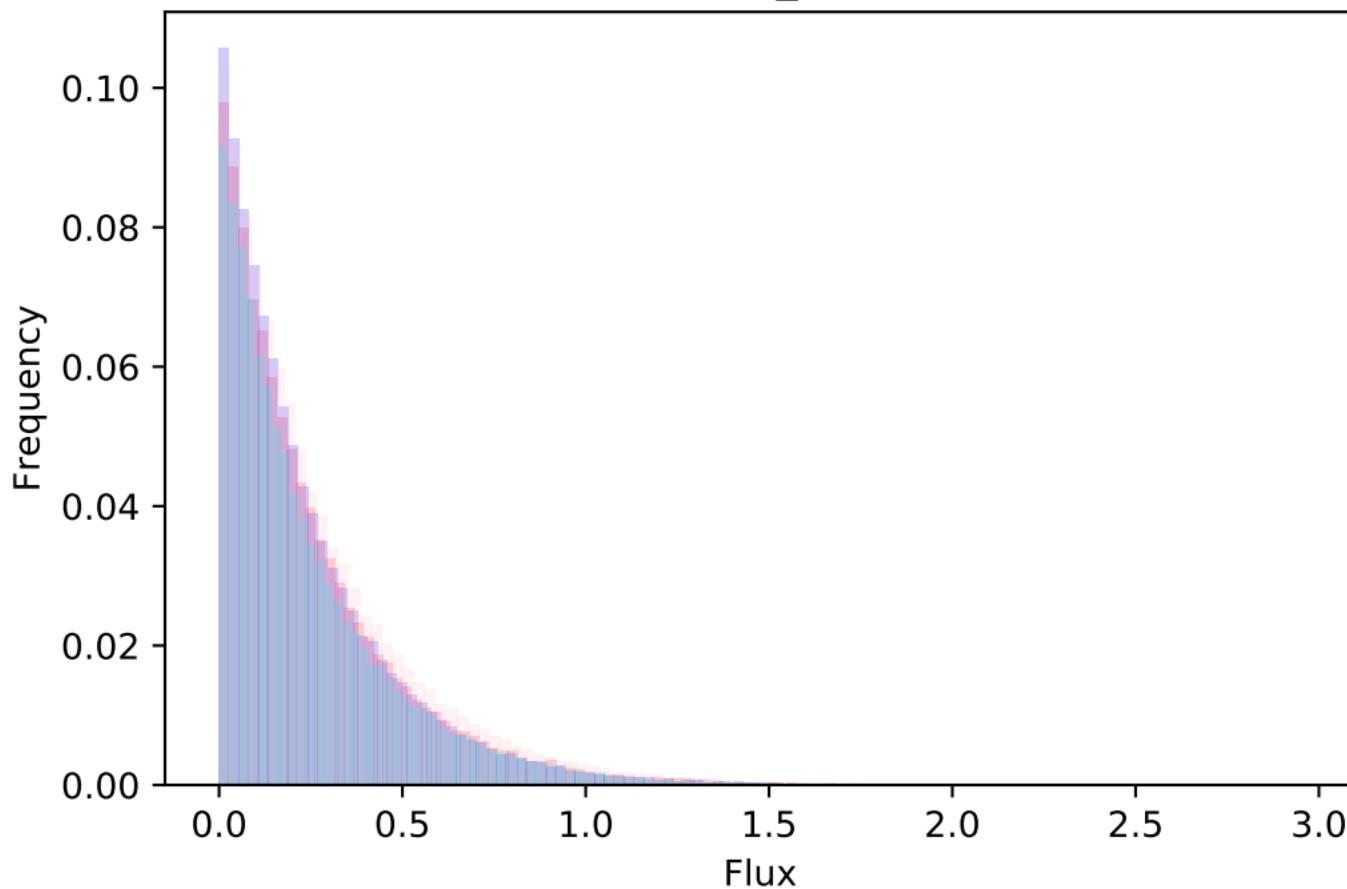
465:Asn_p -->



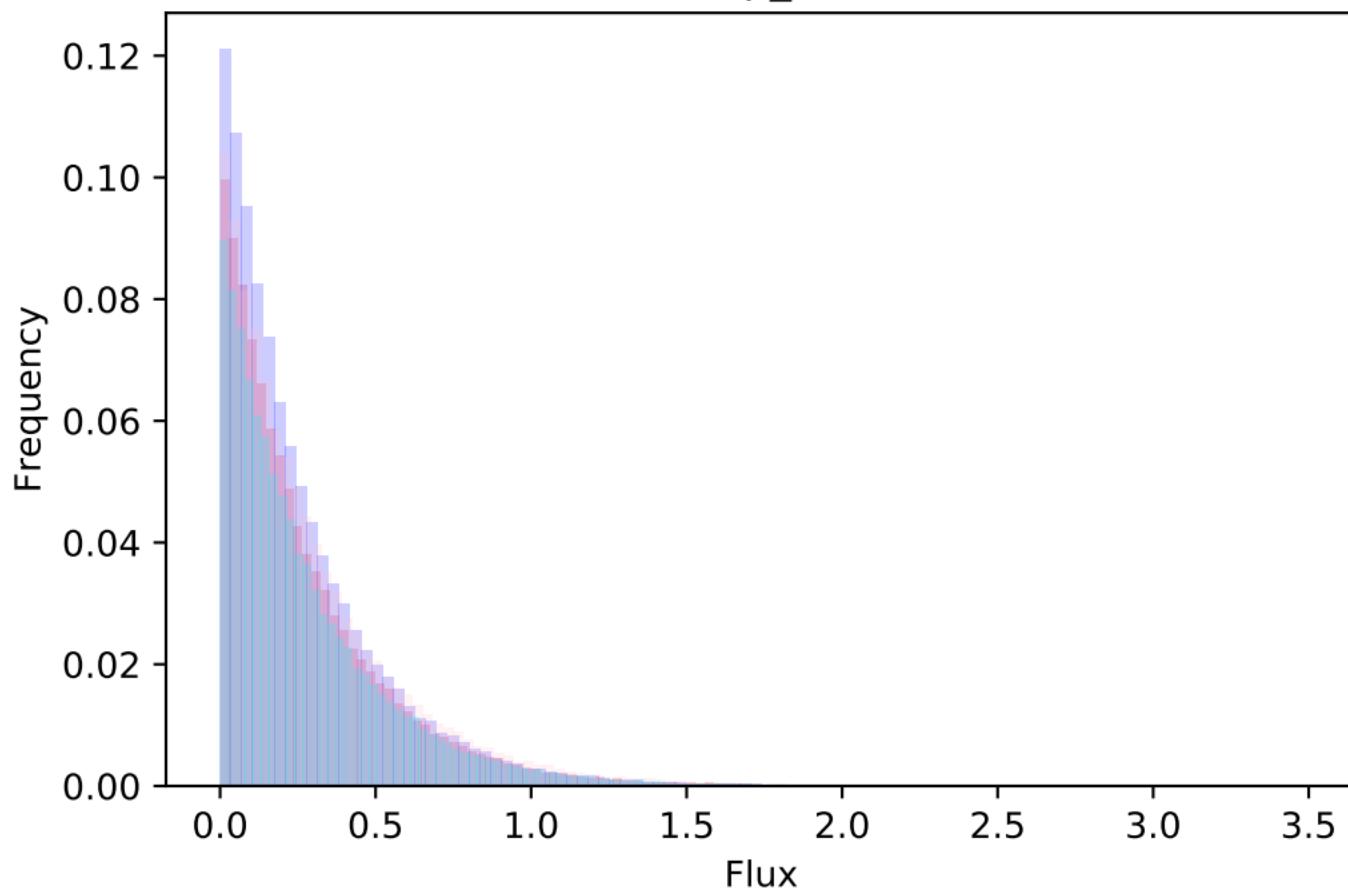
466:Asp_c -->



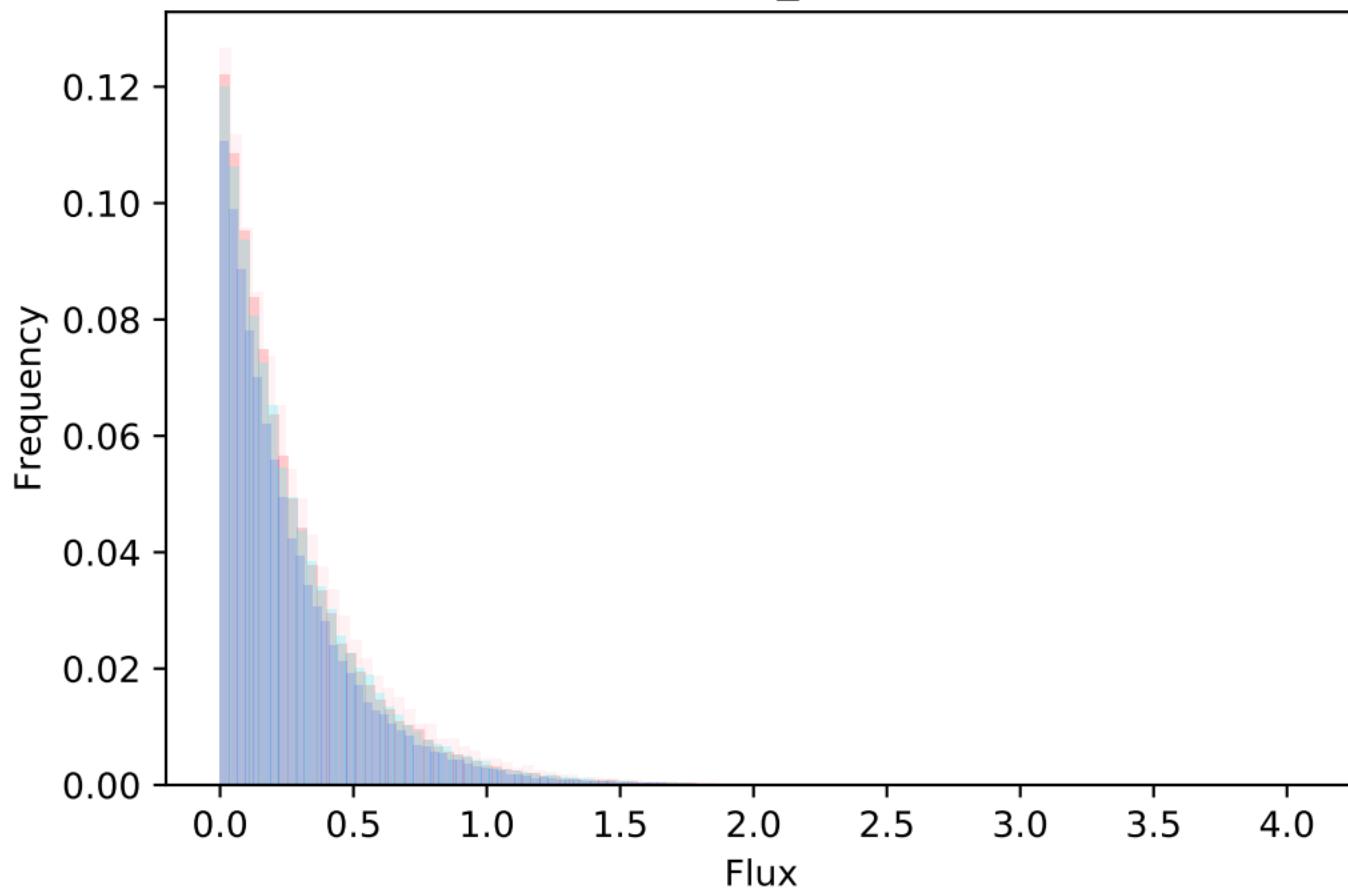
467:Asp_h -->



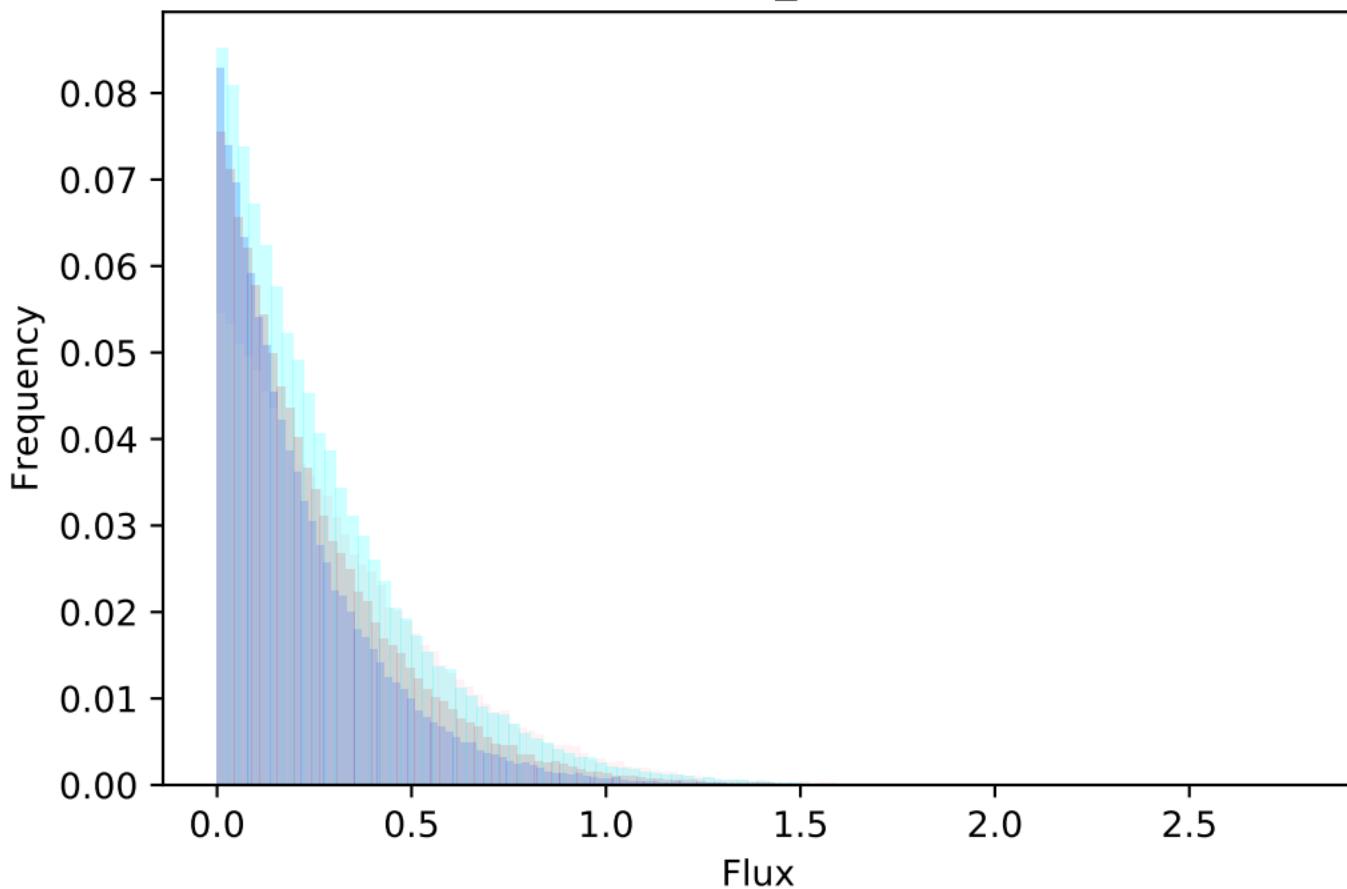
468:Asp_m -->



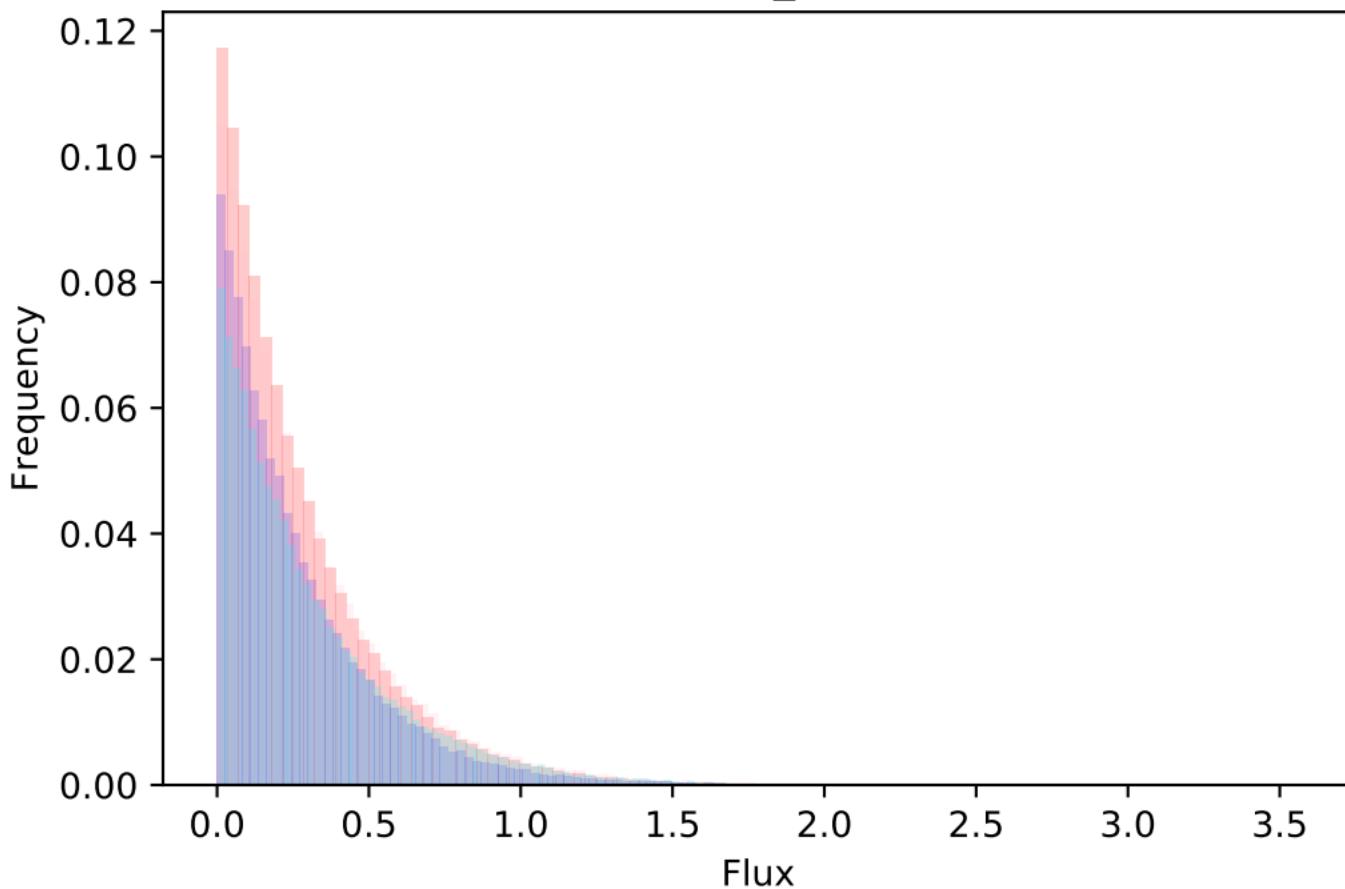
469:Asp_p -->



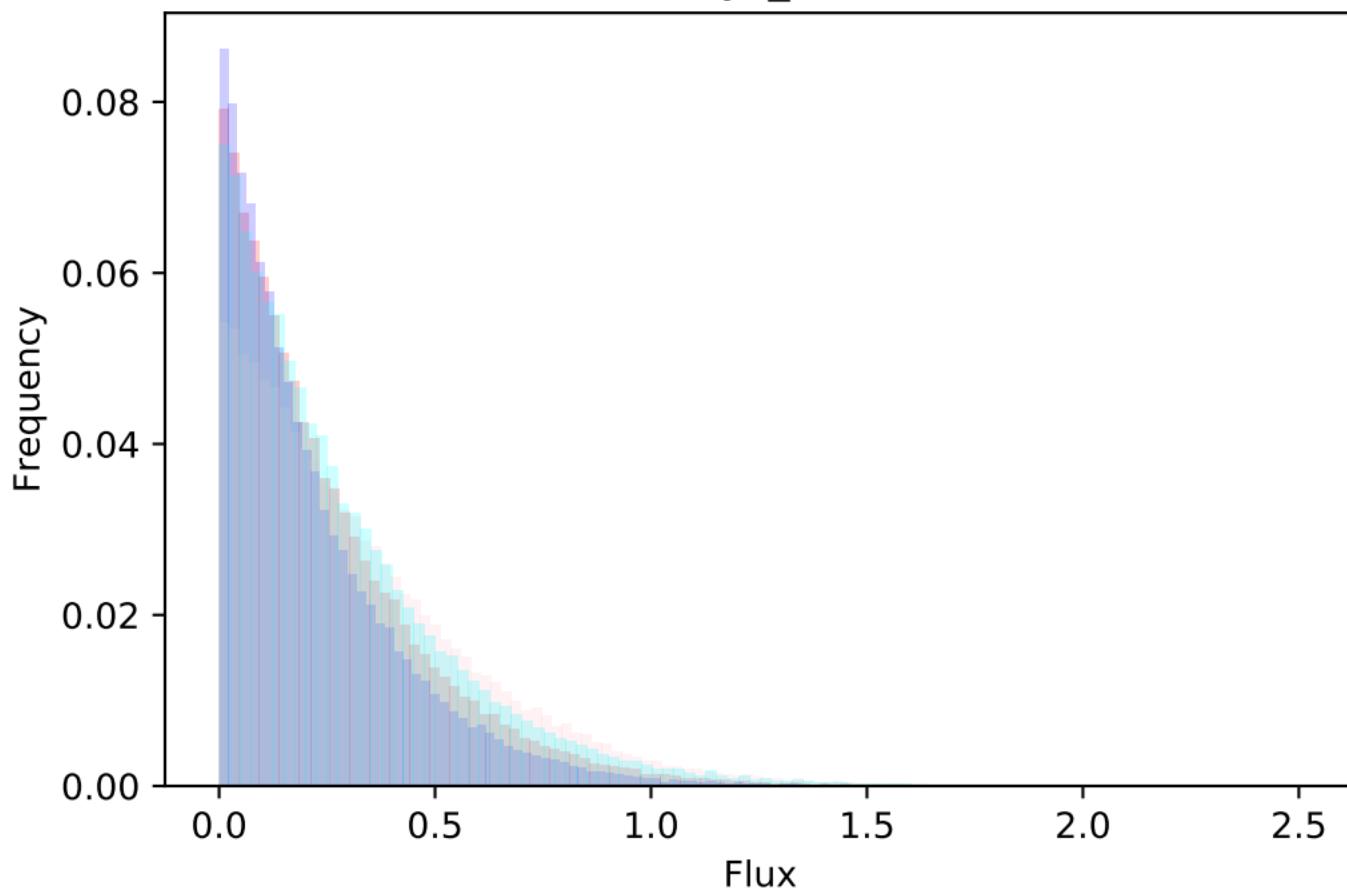
470:Cys_c -->



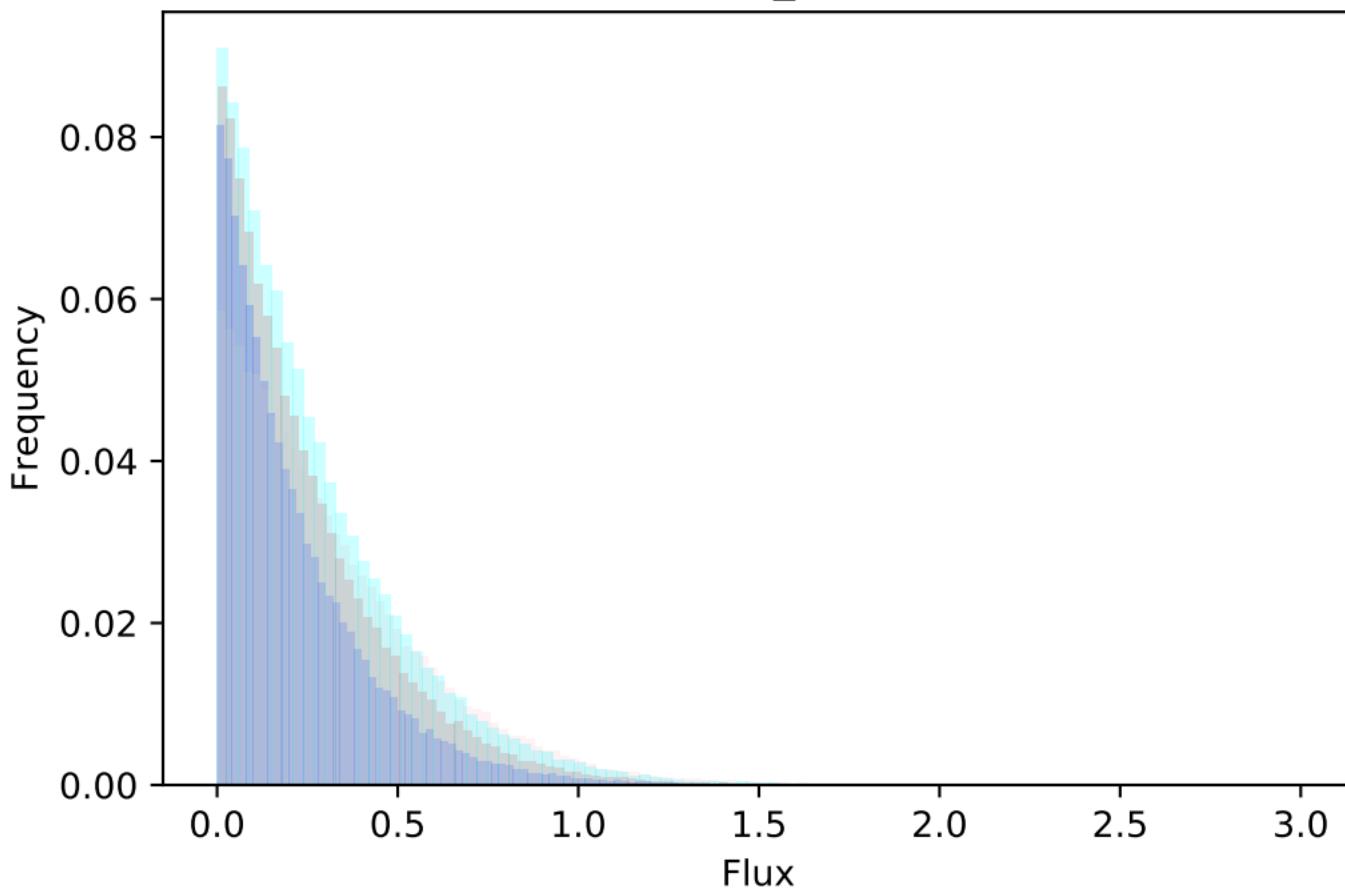
471:Cys_h -->



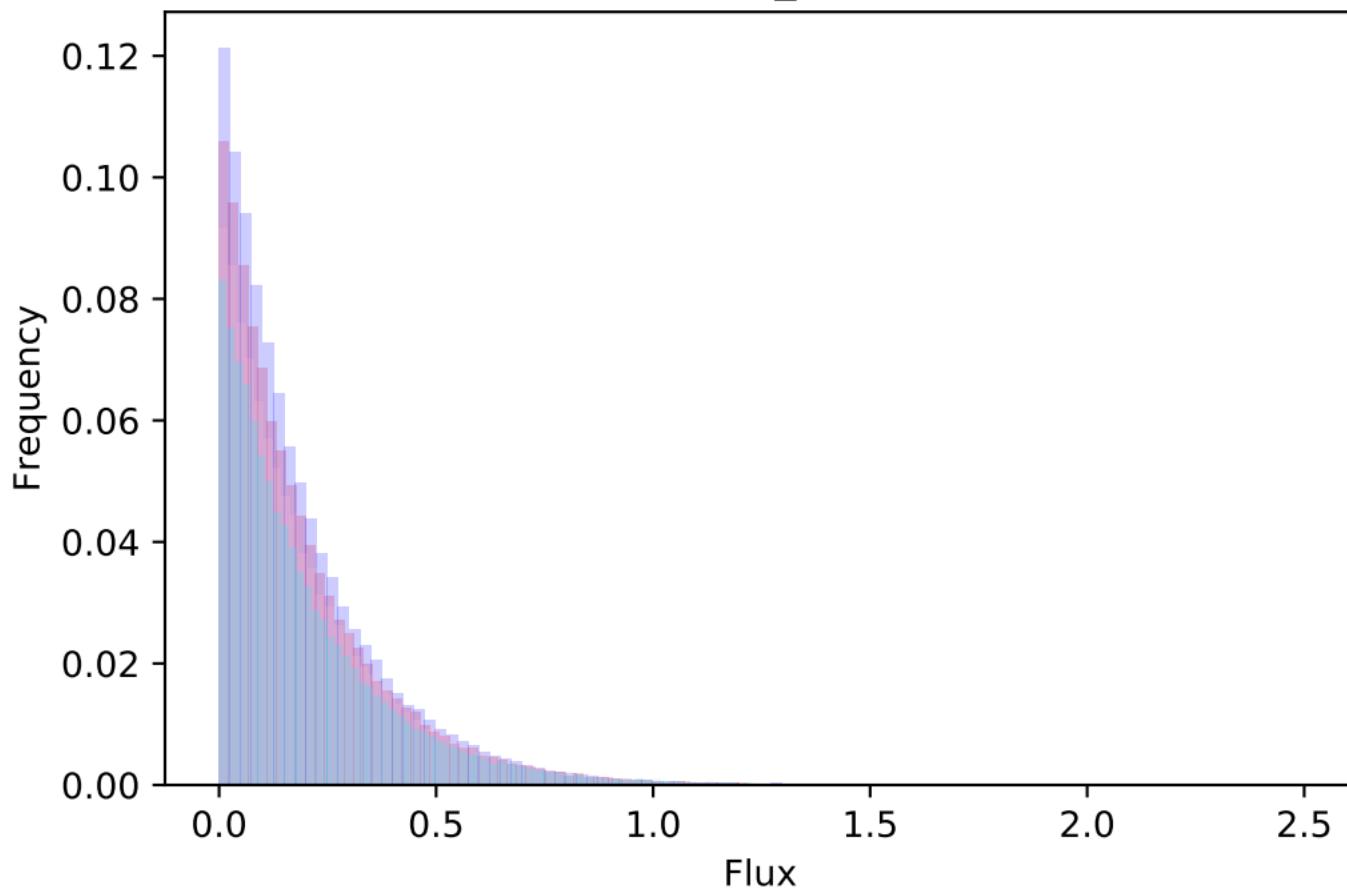
472:Cys_m -->



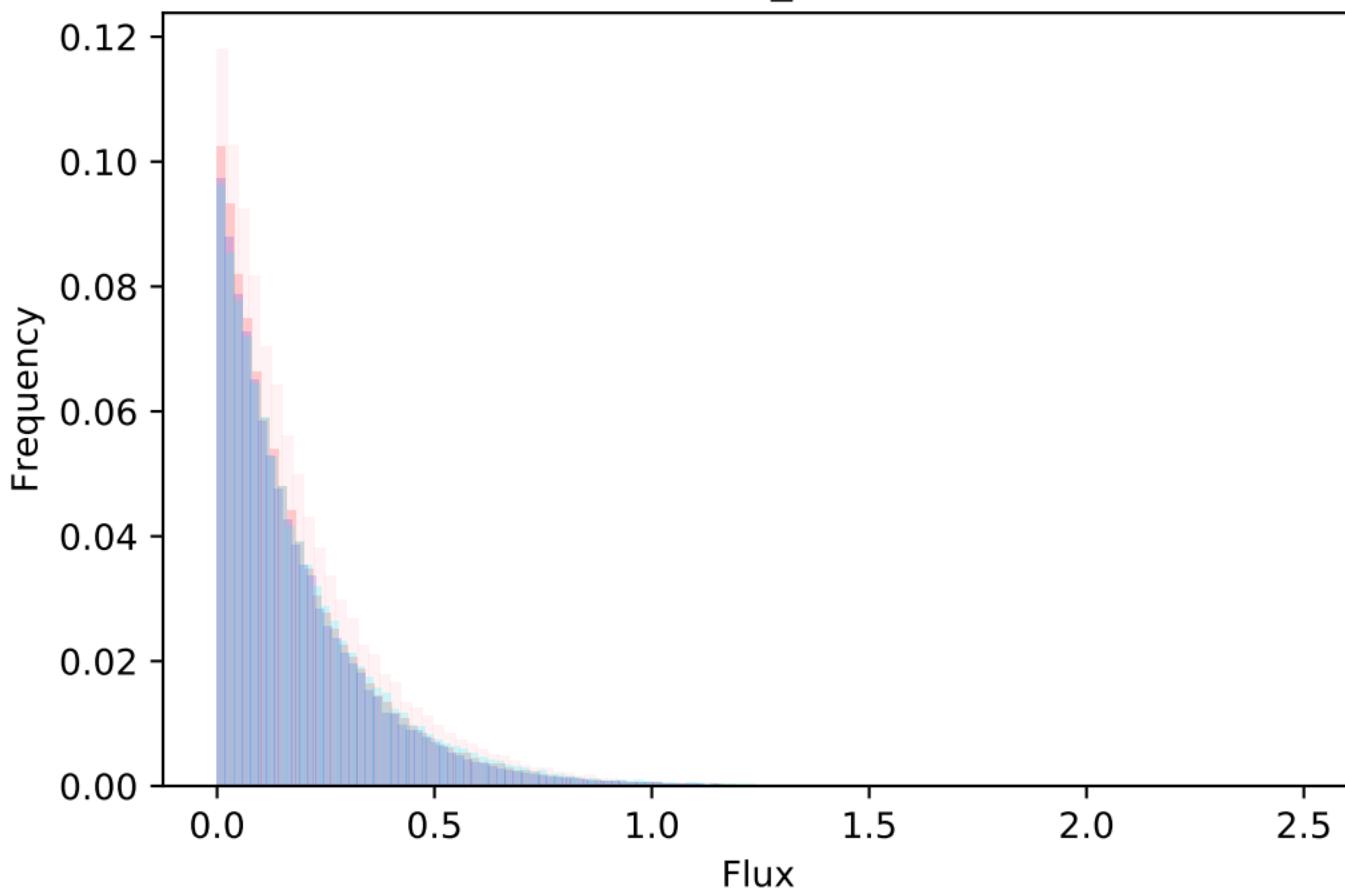
473:Cys_p -->



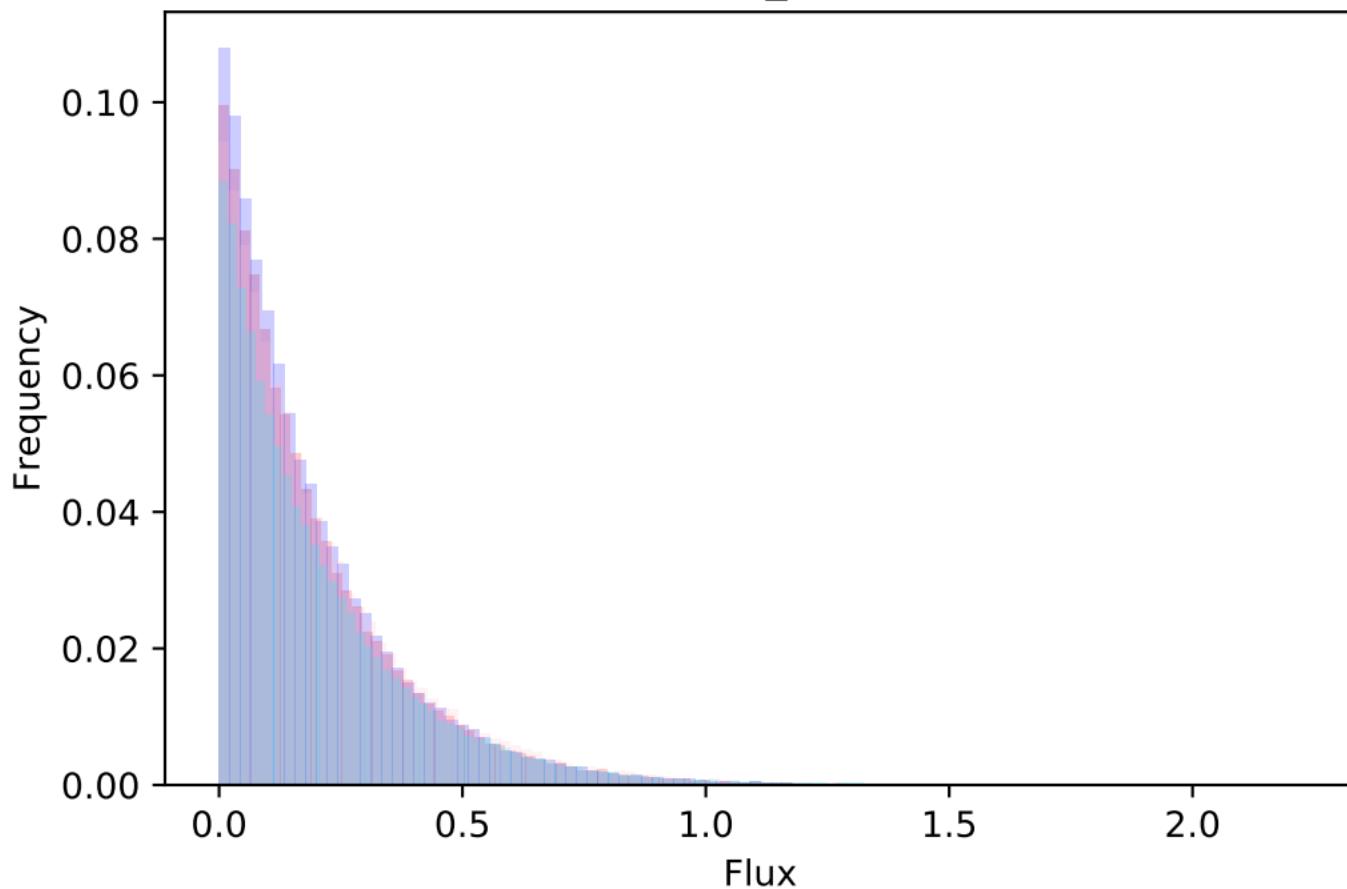
474:Gln_c -->



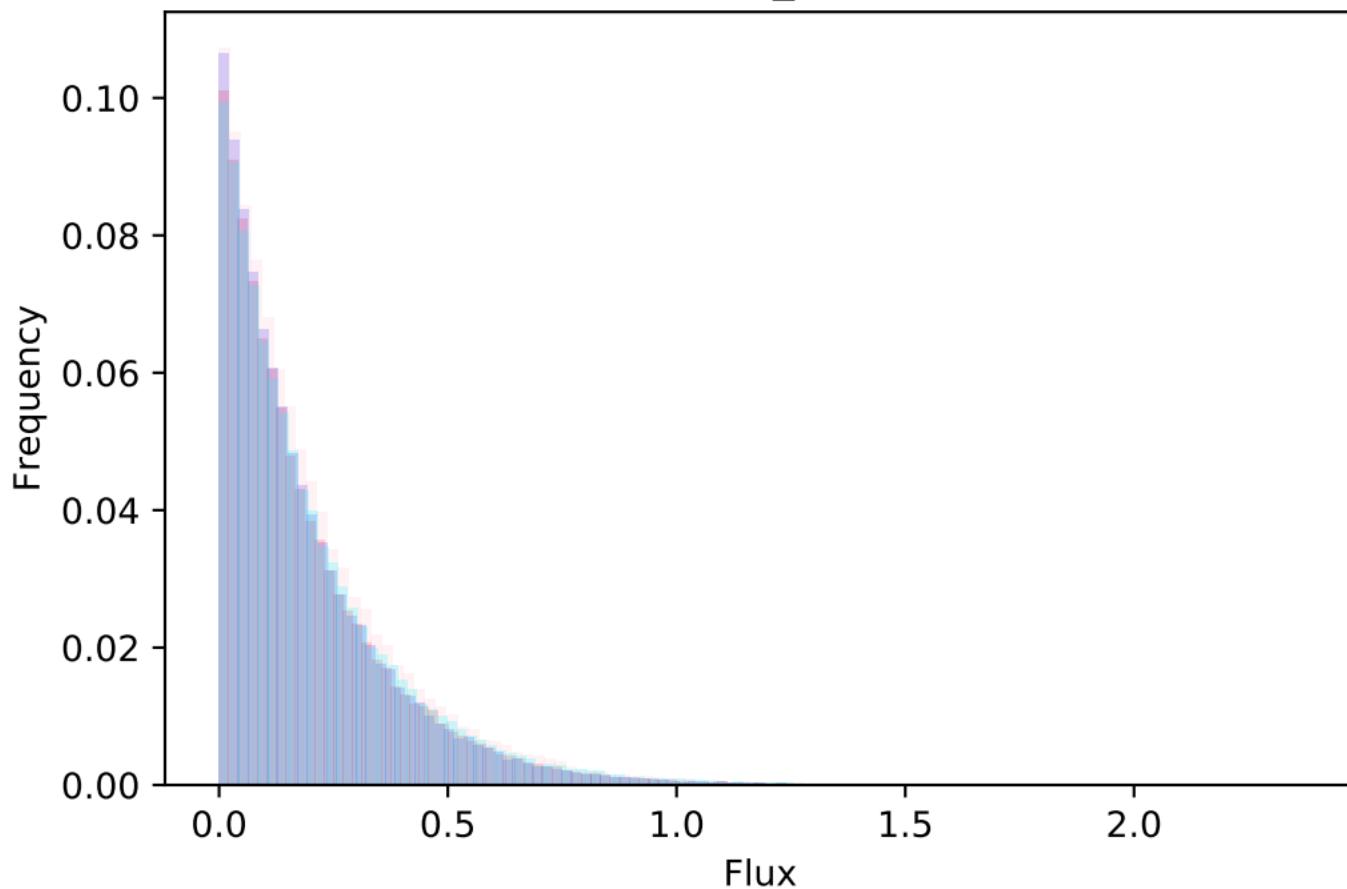
475:Gln_h -->



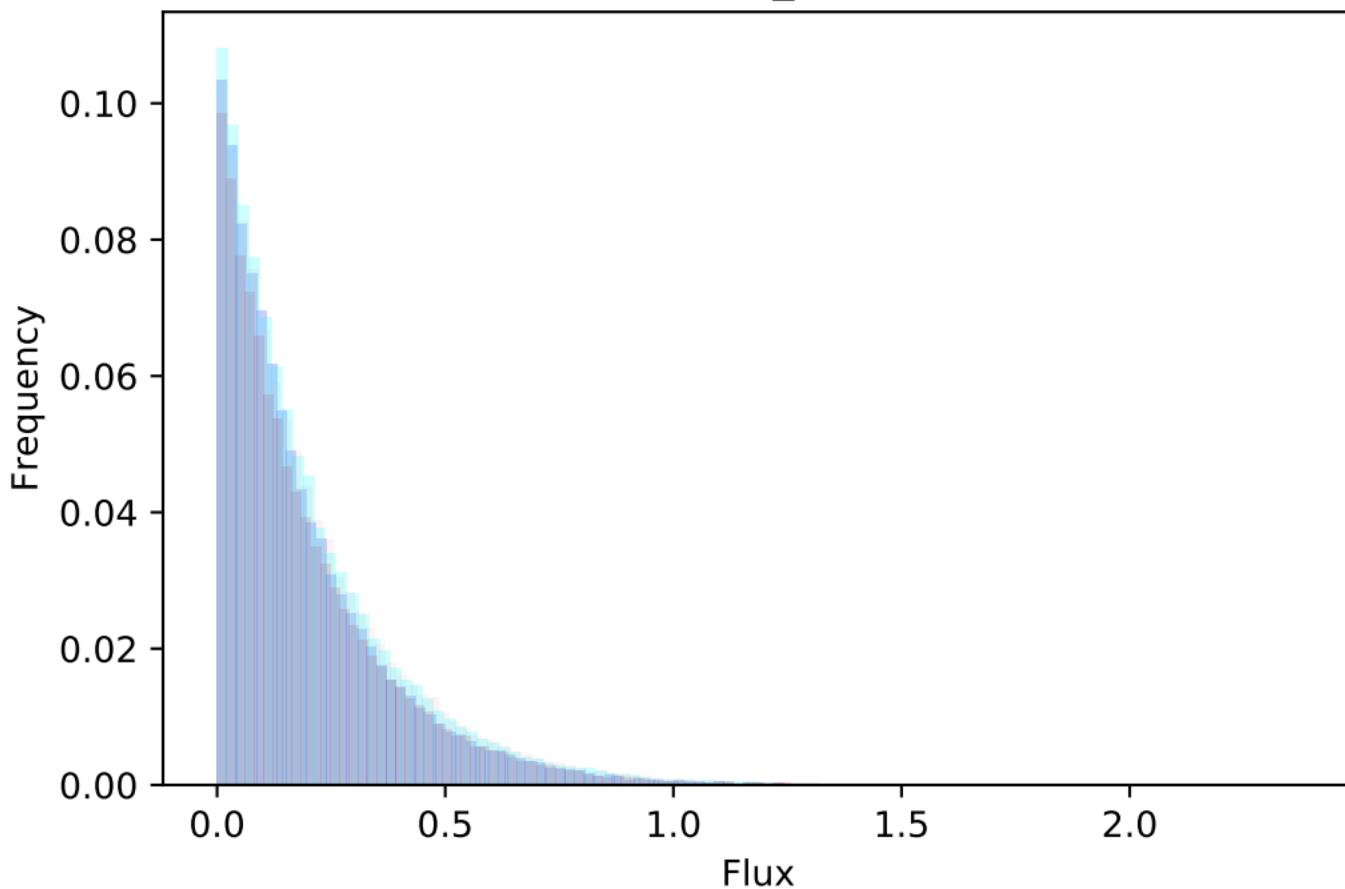
476:Gln_m -->



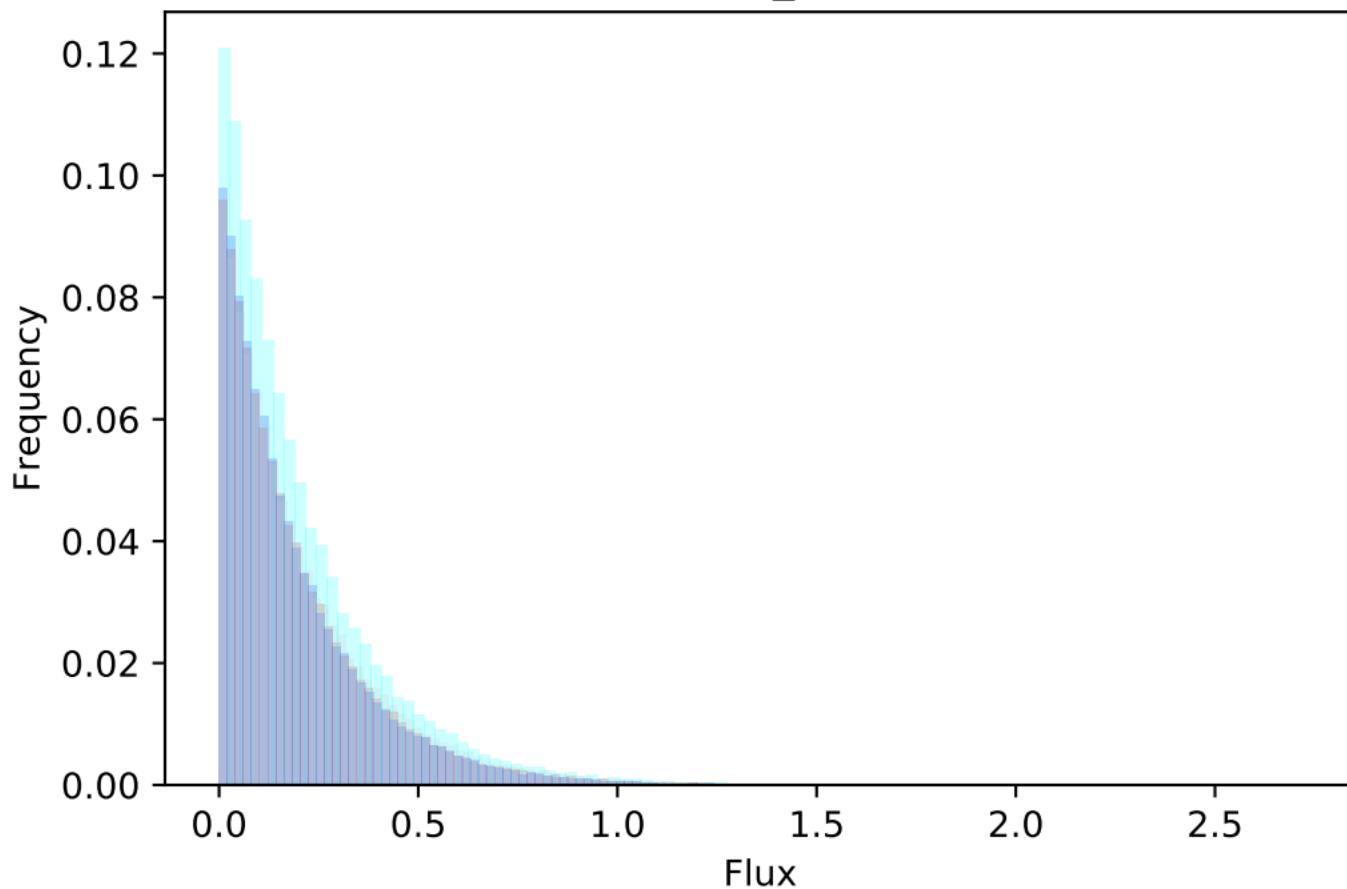
477:Gln_p -->



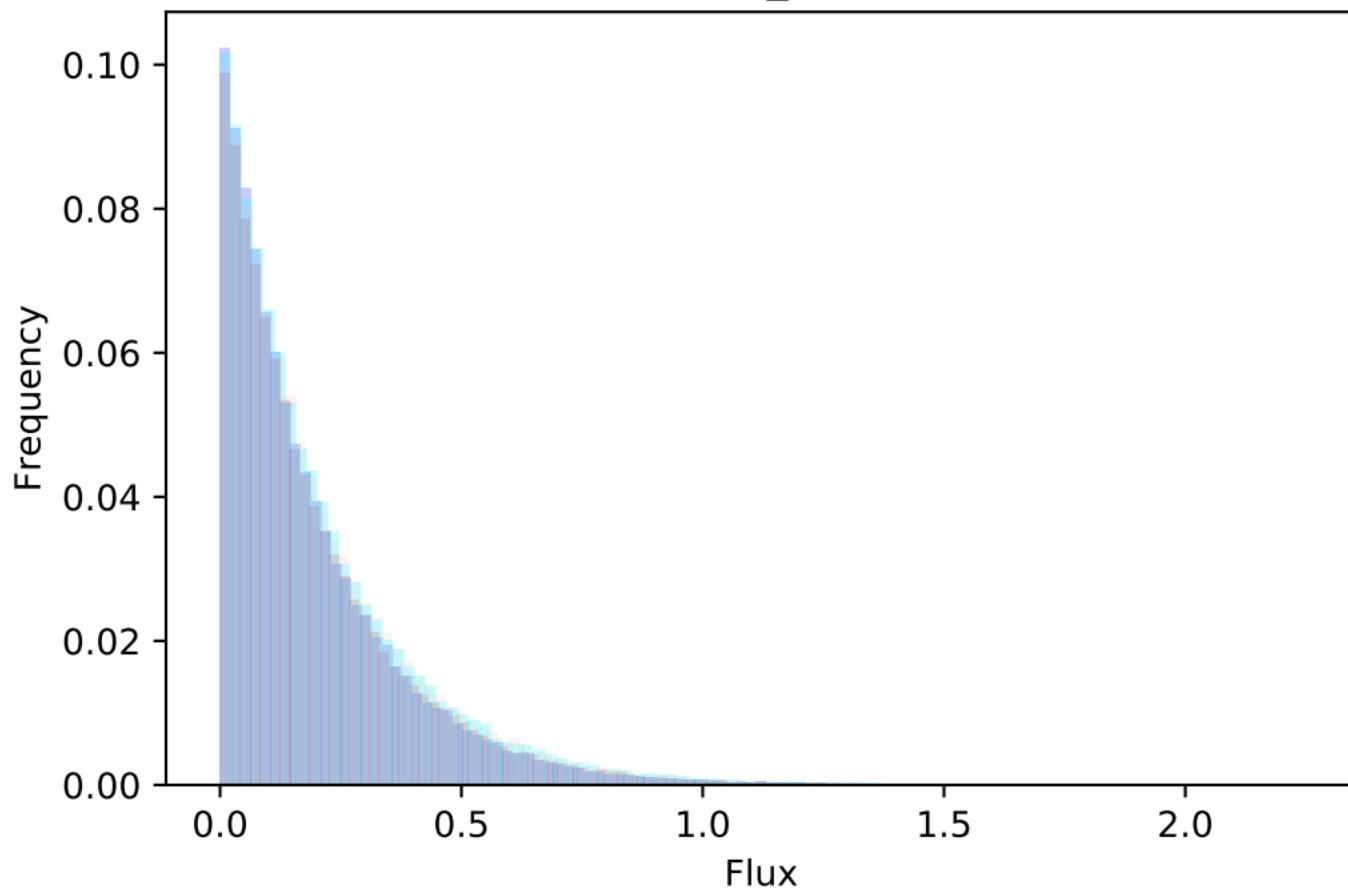
478:Glu_c -->



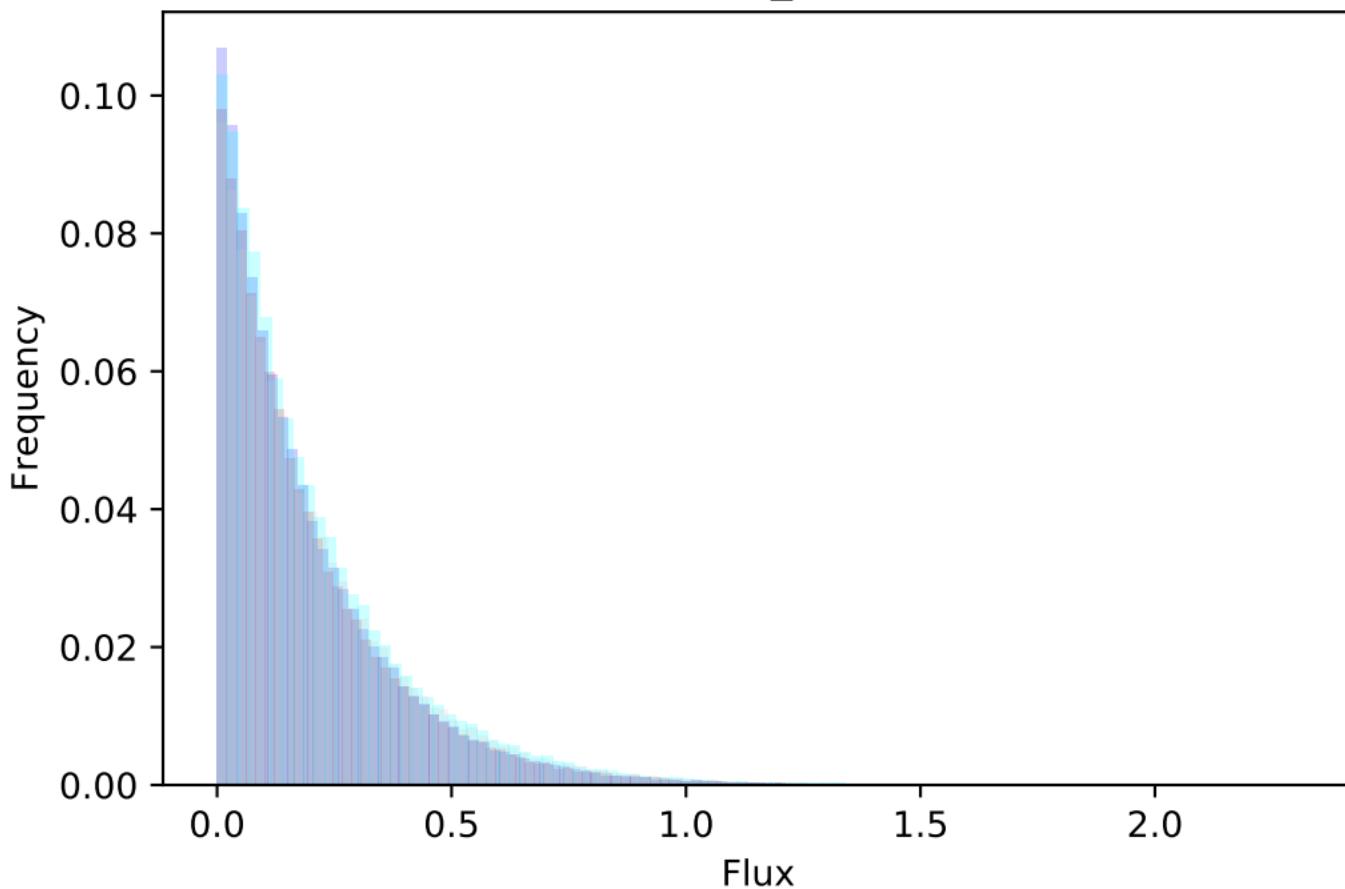
479:Glu_h -->



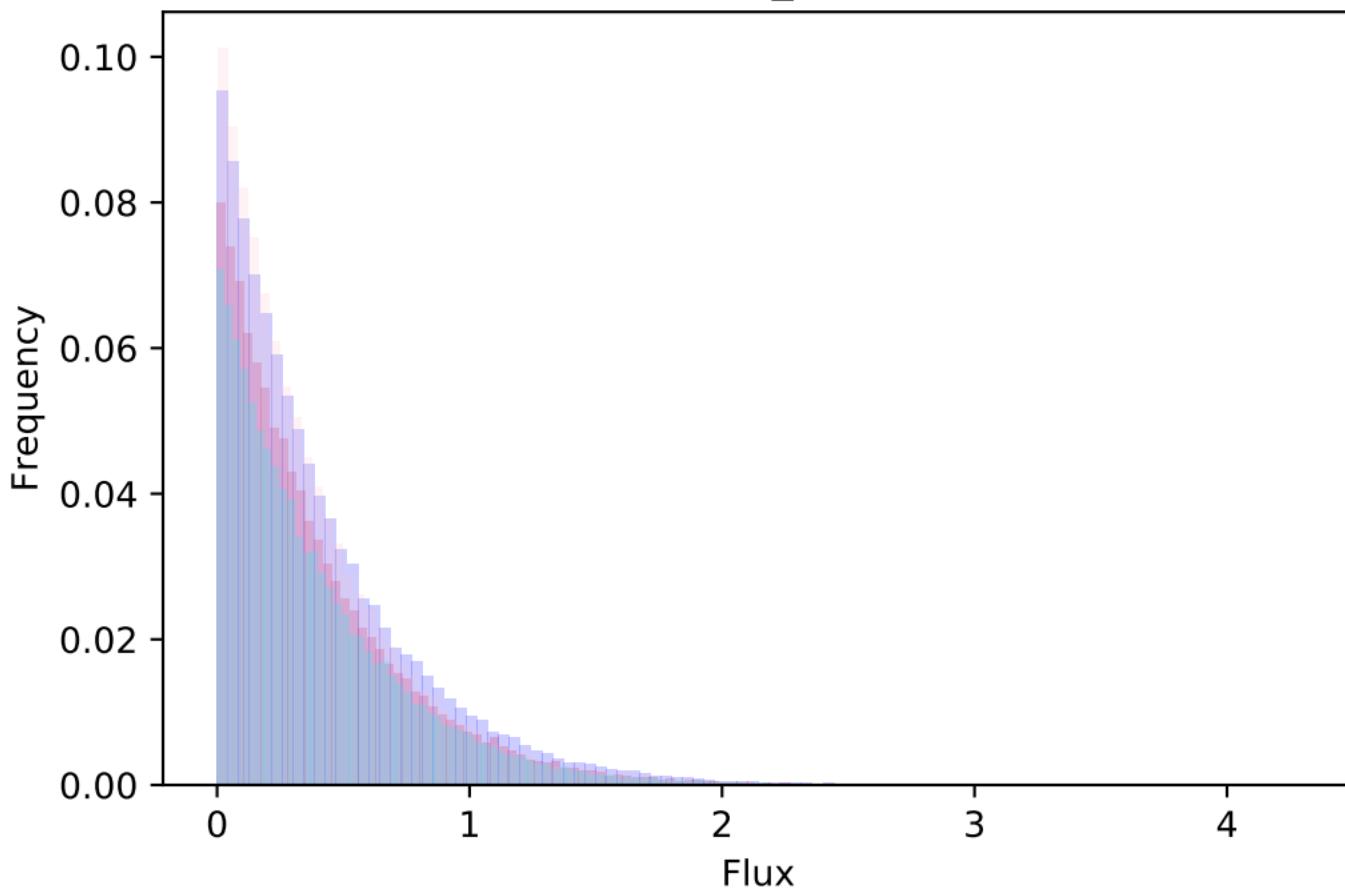
480:Glu_m -->



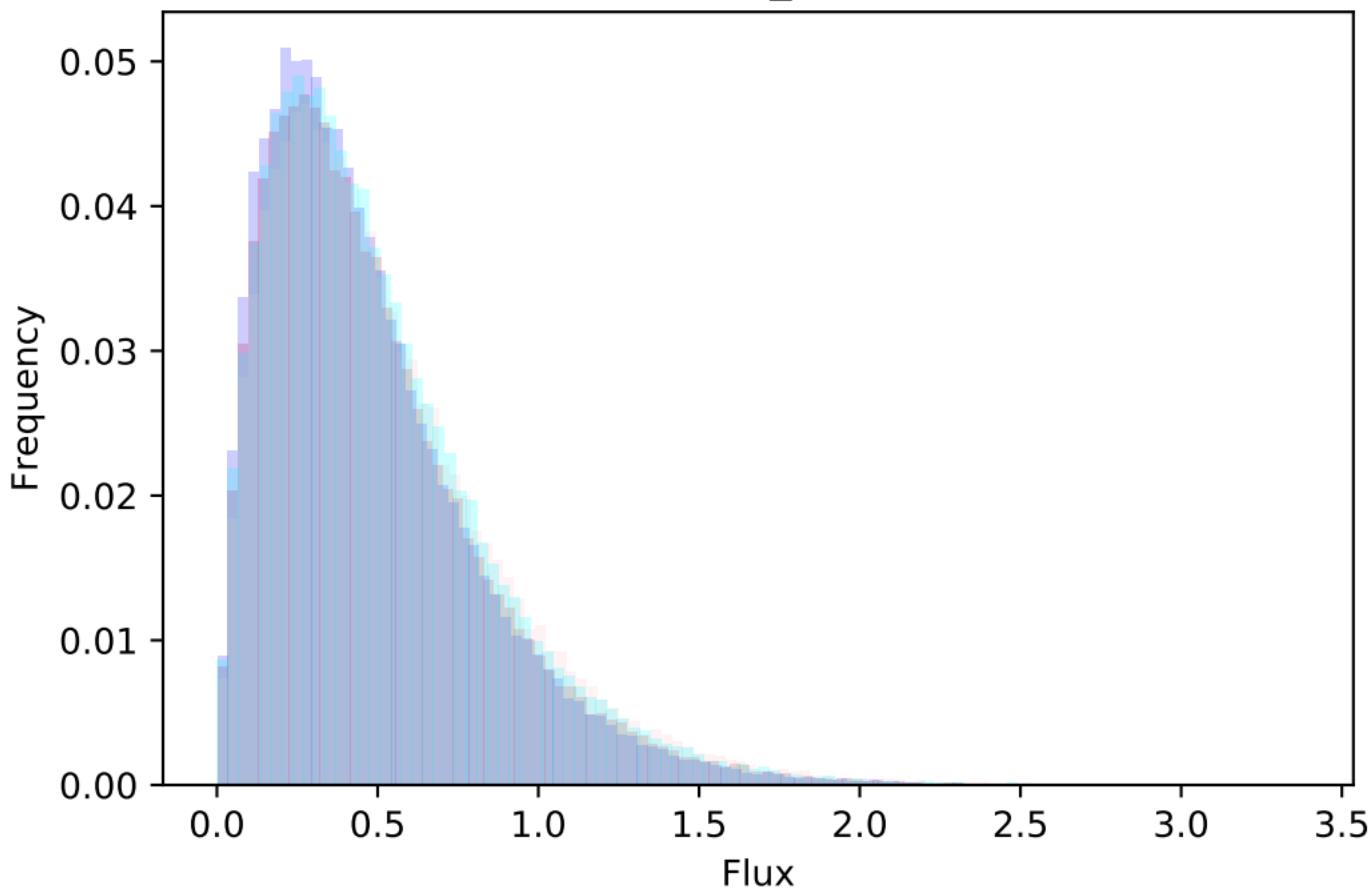
481:Glu_p -->



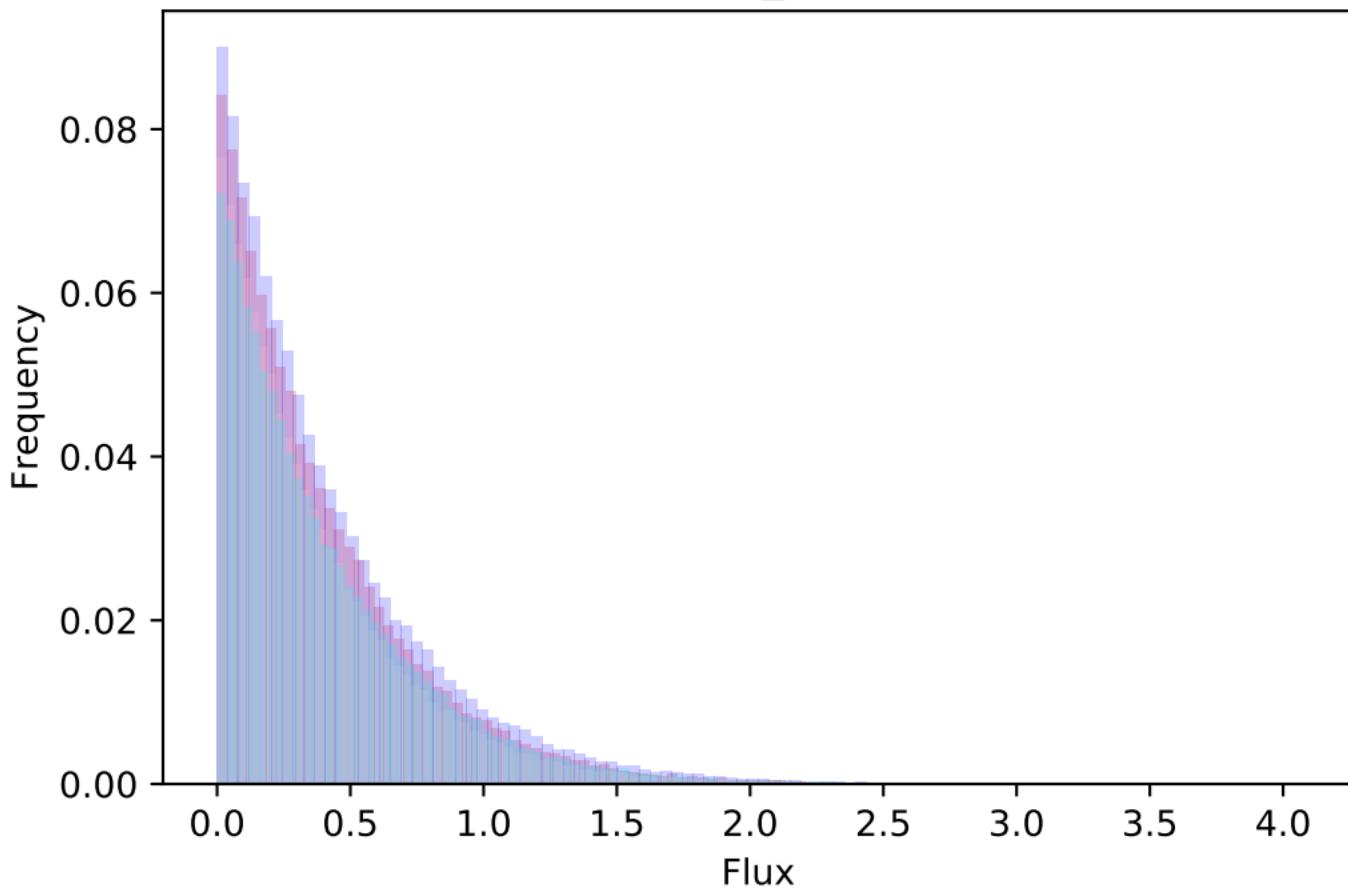
482:Gly_c -->



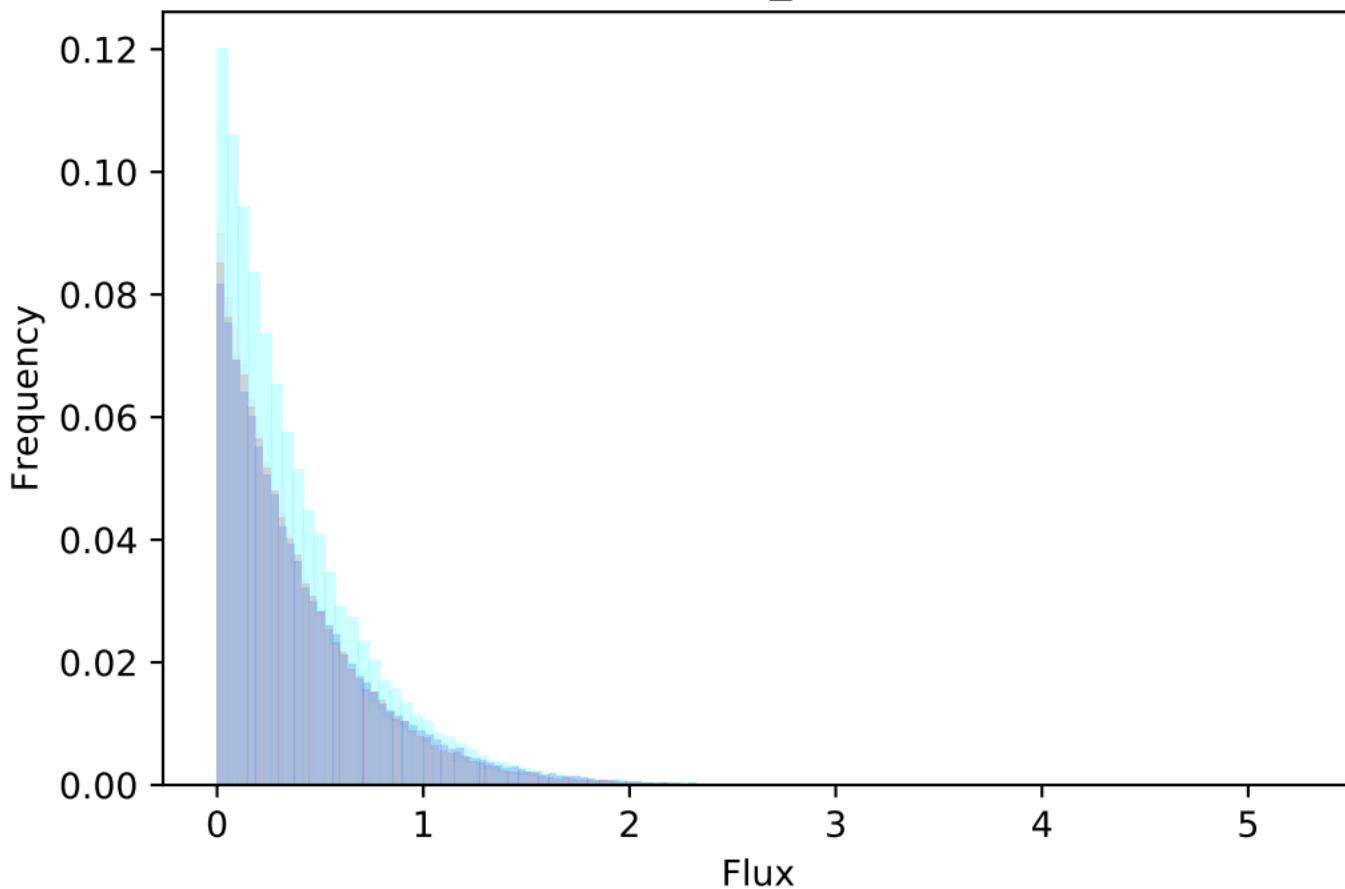
483:Gly_h -->



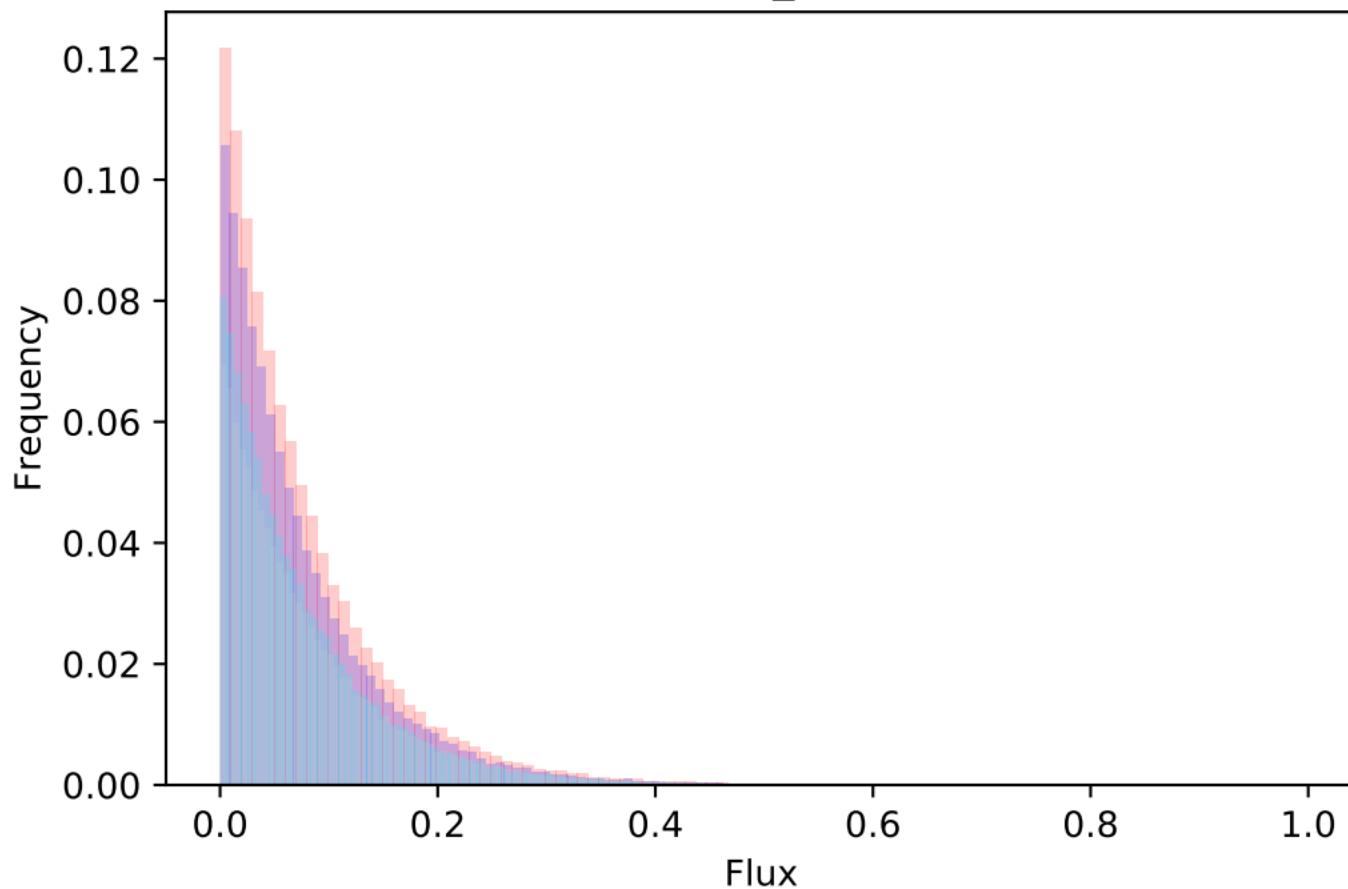
484:Gly_m -->



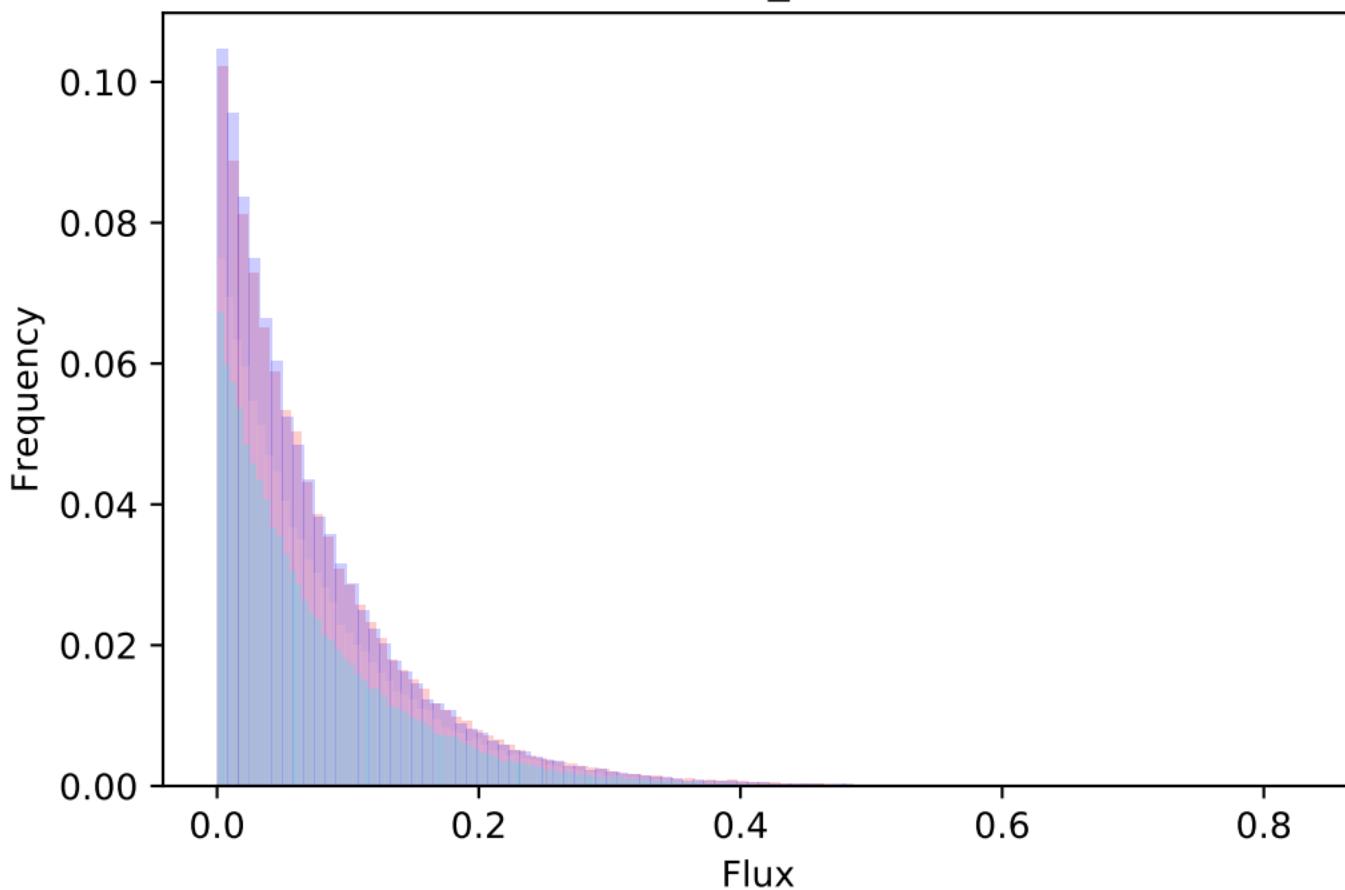
485:Gly_p -->



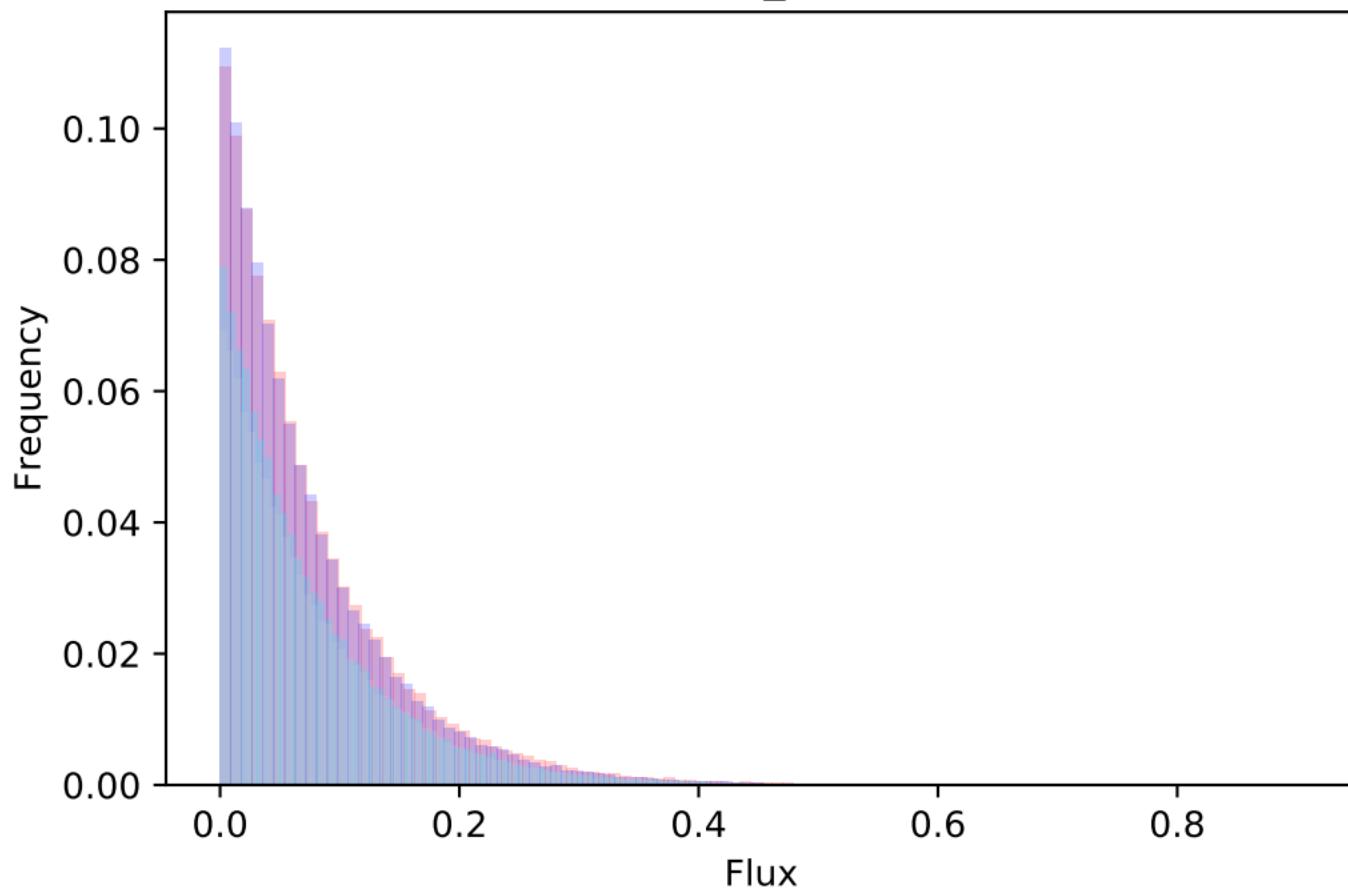
486:His_c -->



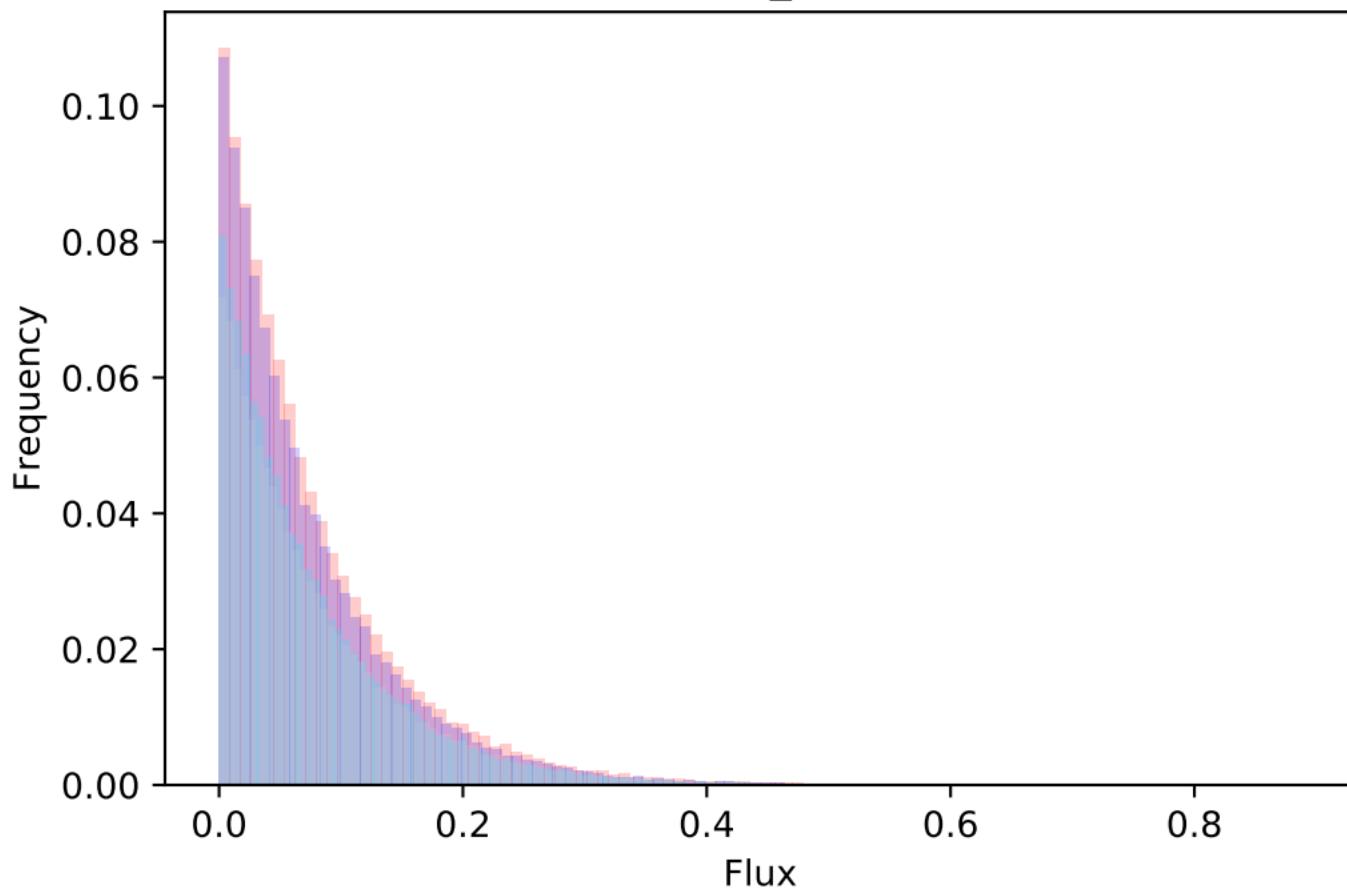
487:His_h -->



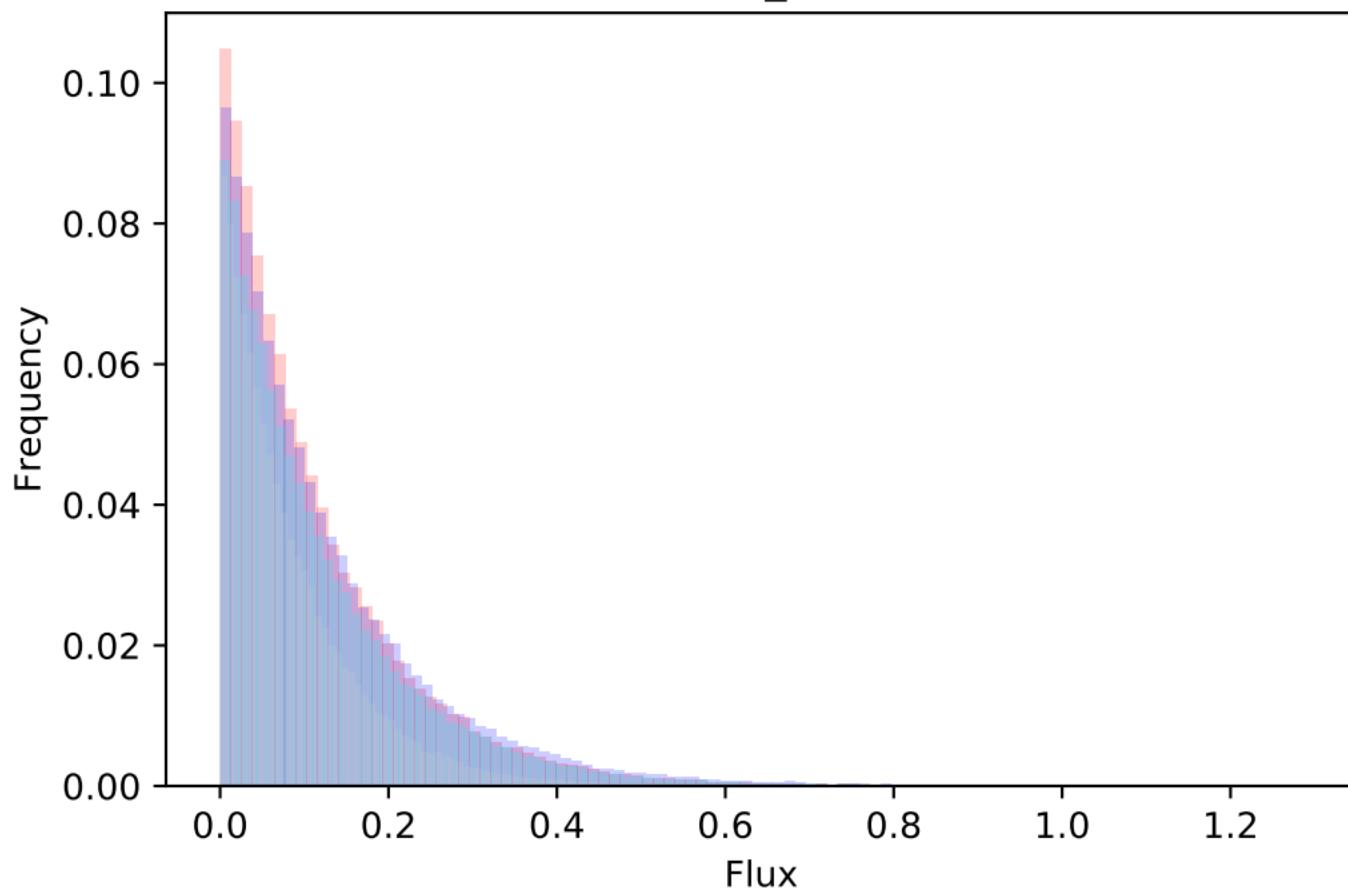
488:His_m -->



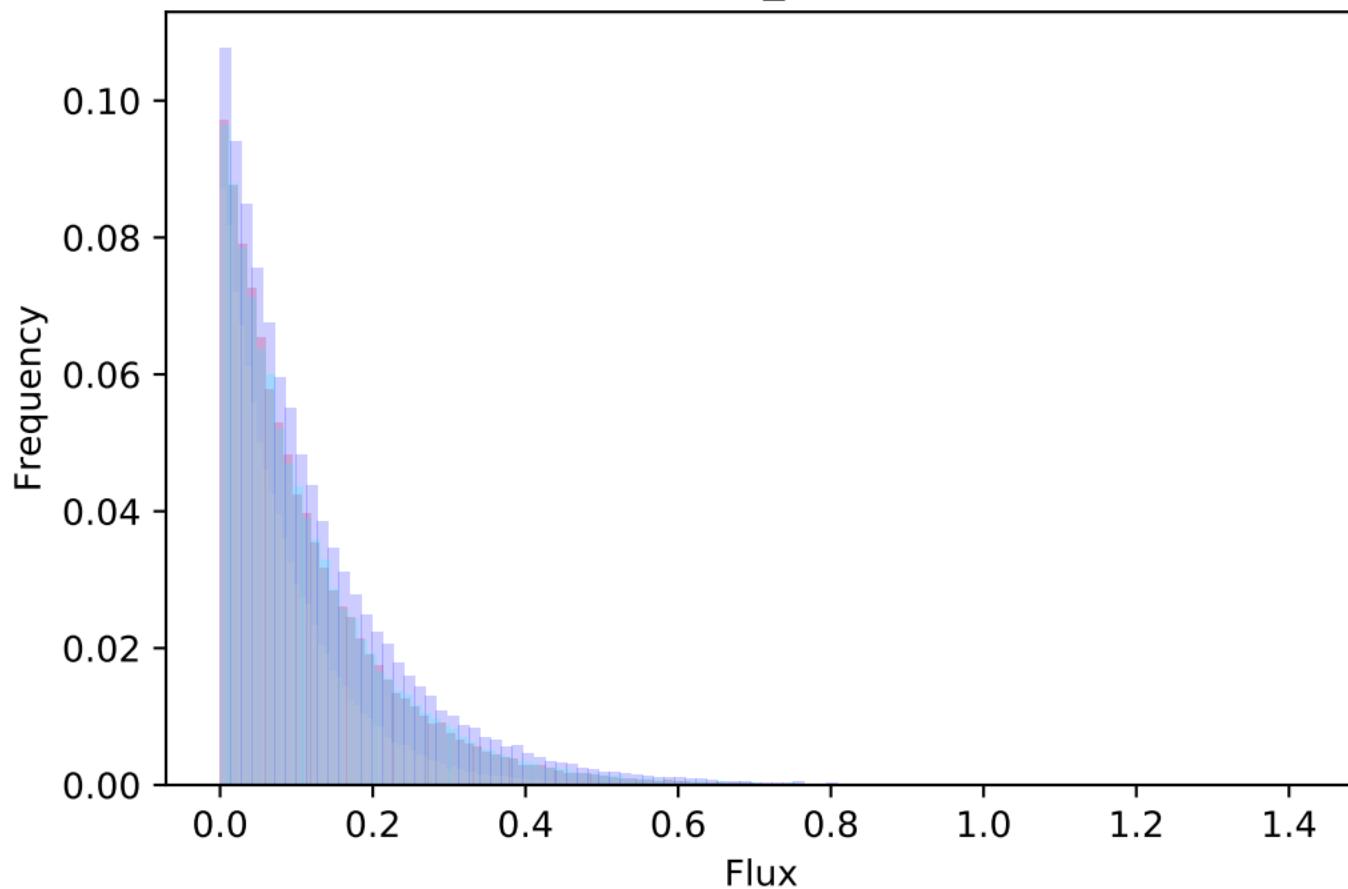
489:His_p -->



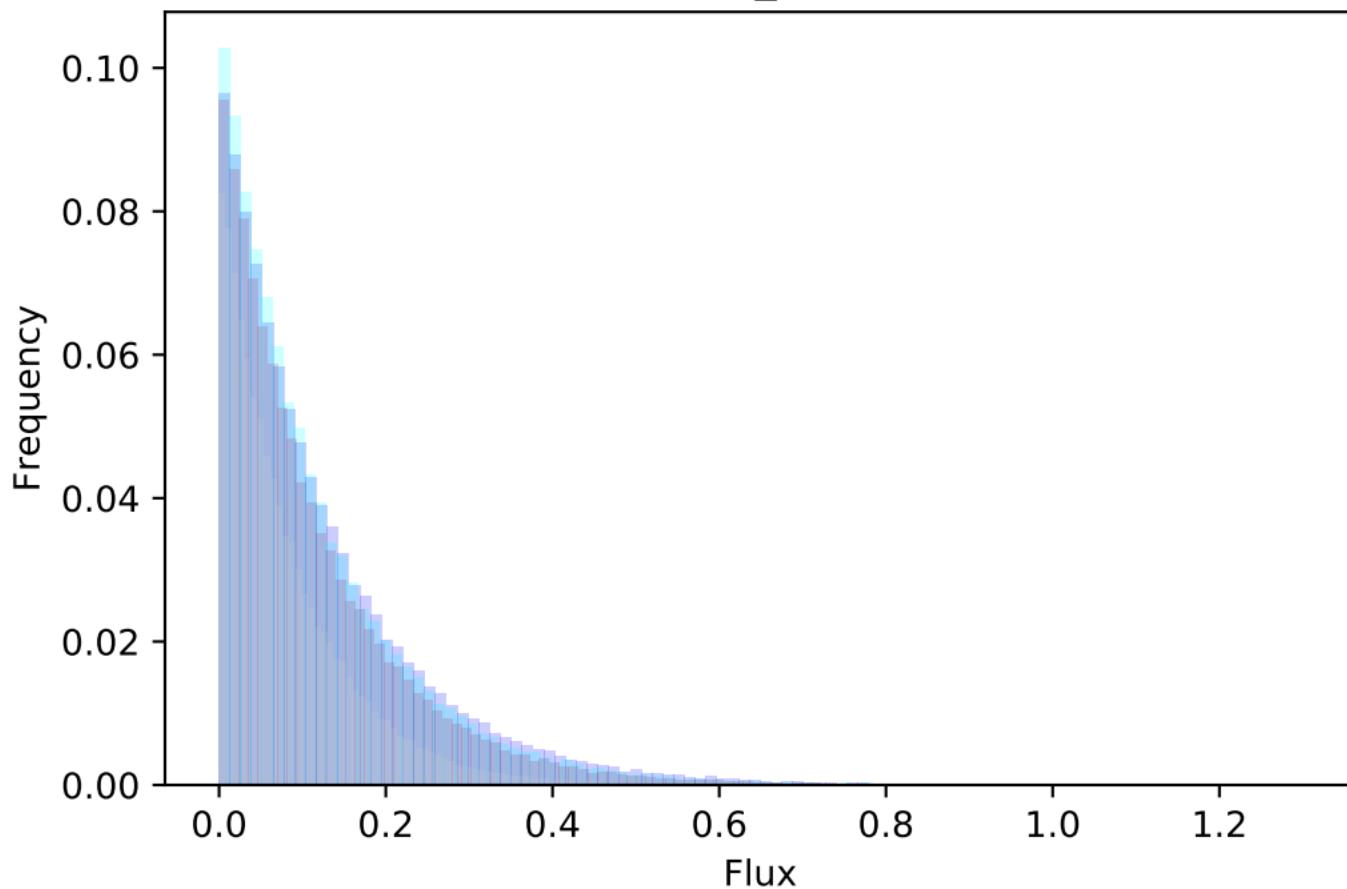
490:lle_c -->



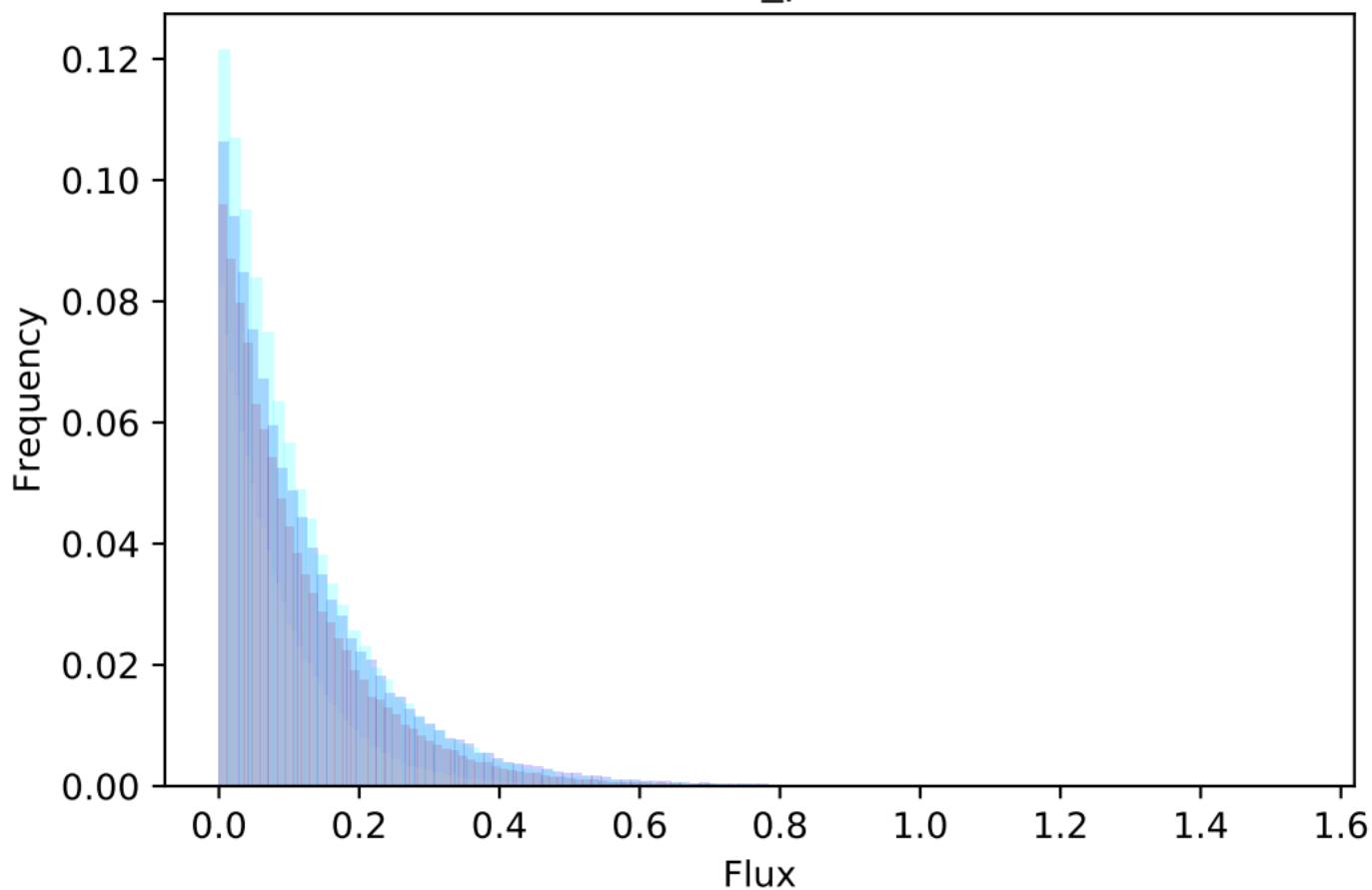
491:lle_h -->



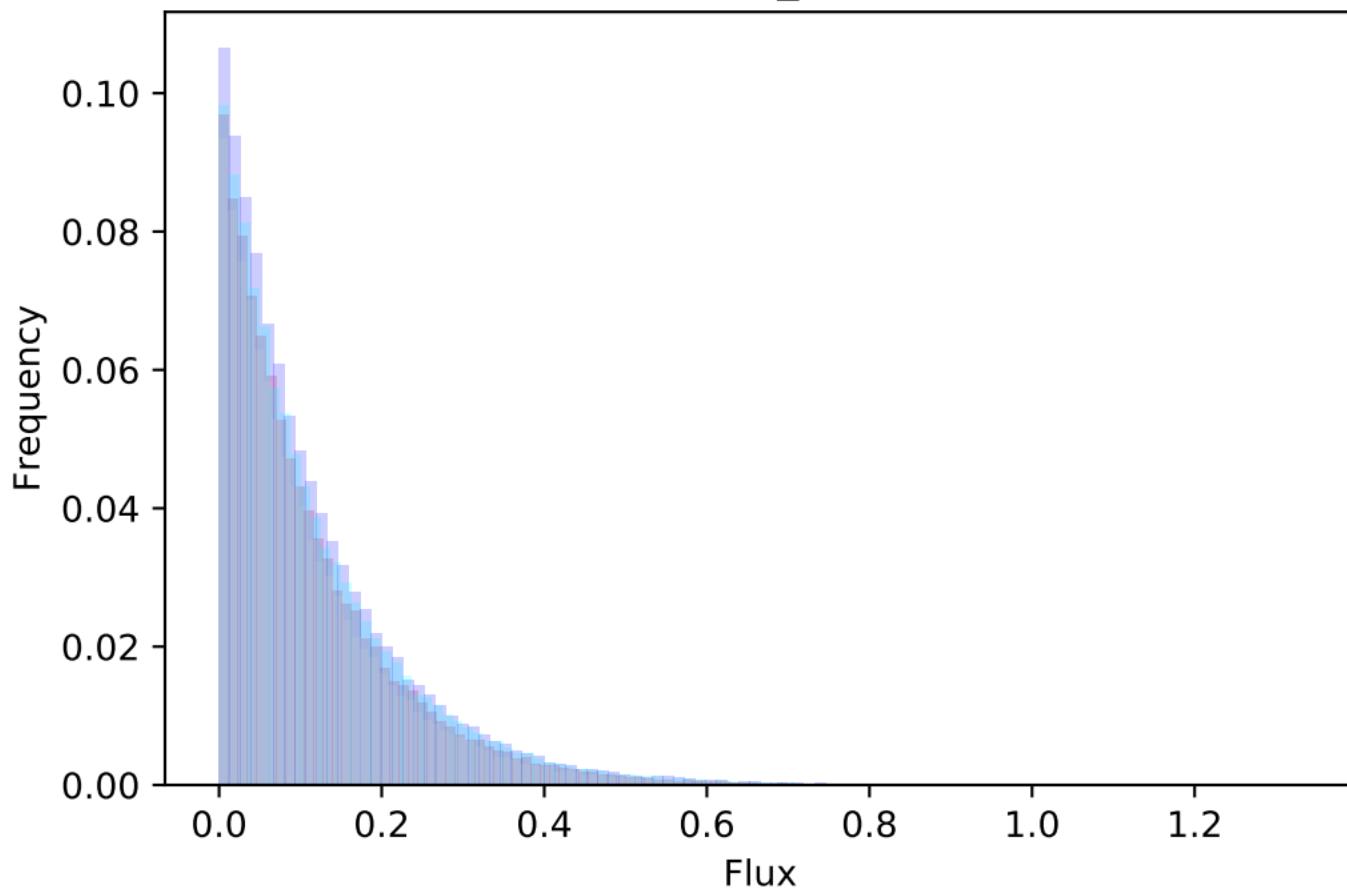
492:Ile_m -->



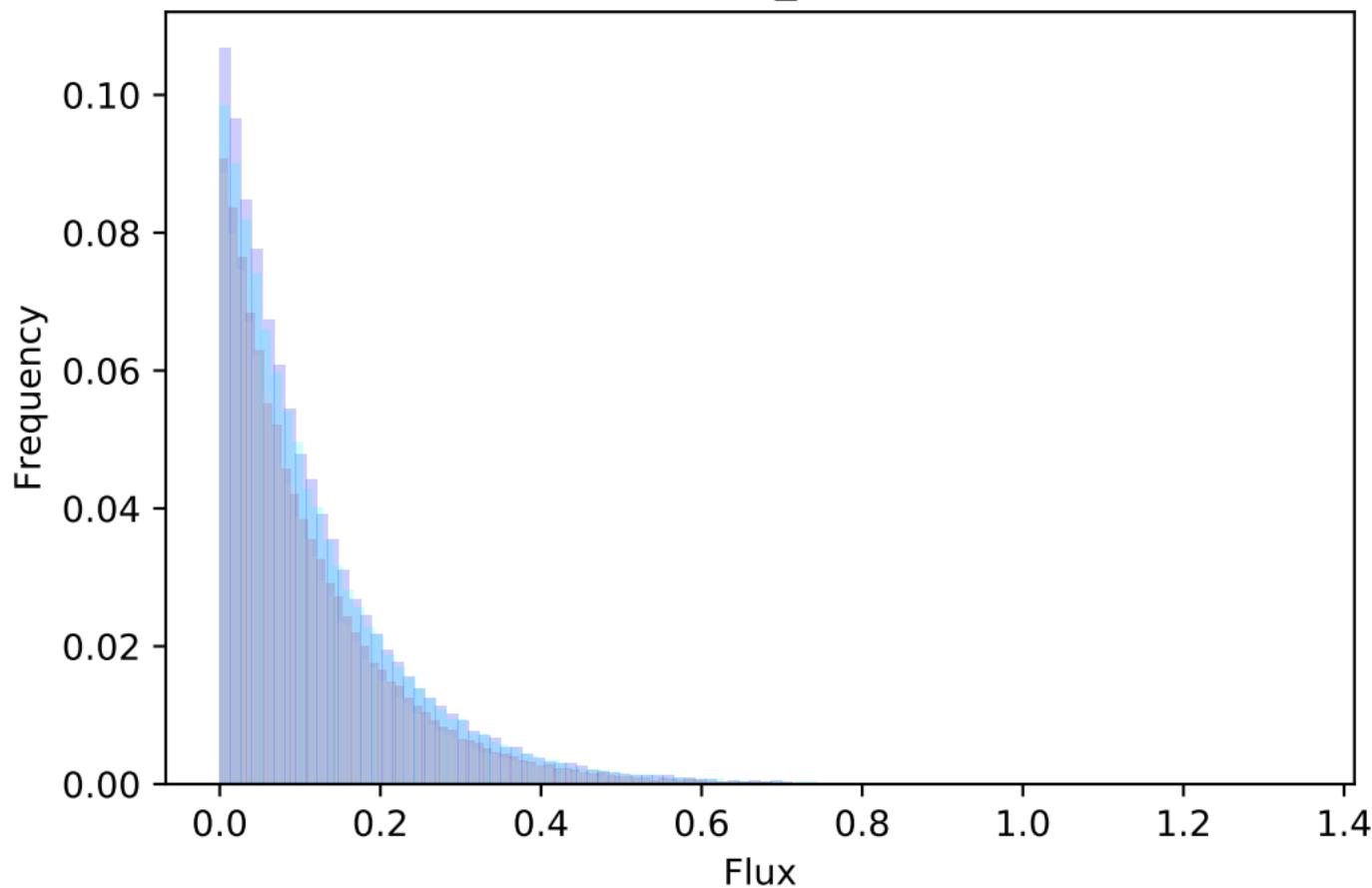
493:Ile_p -->



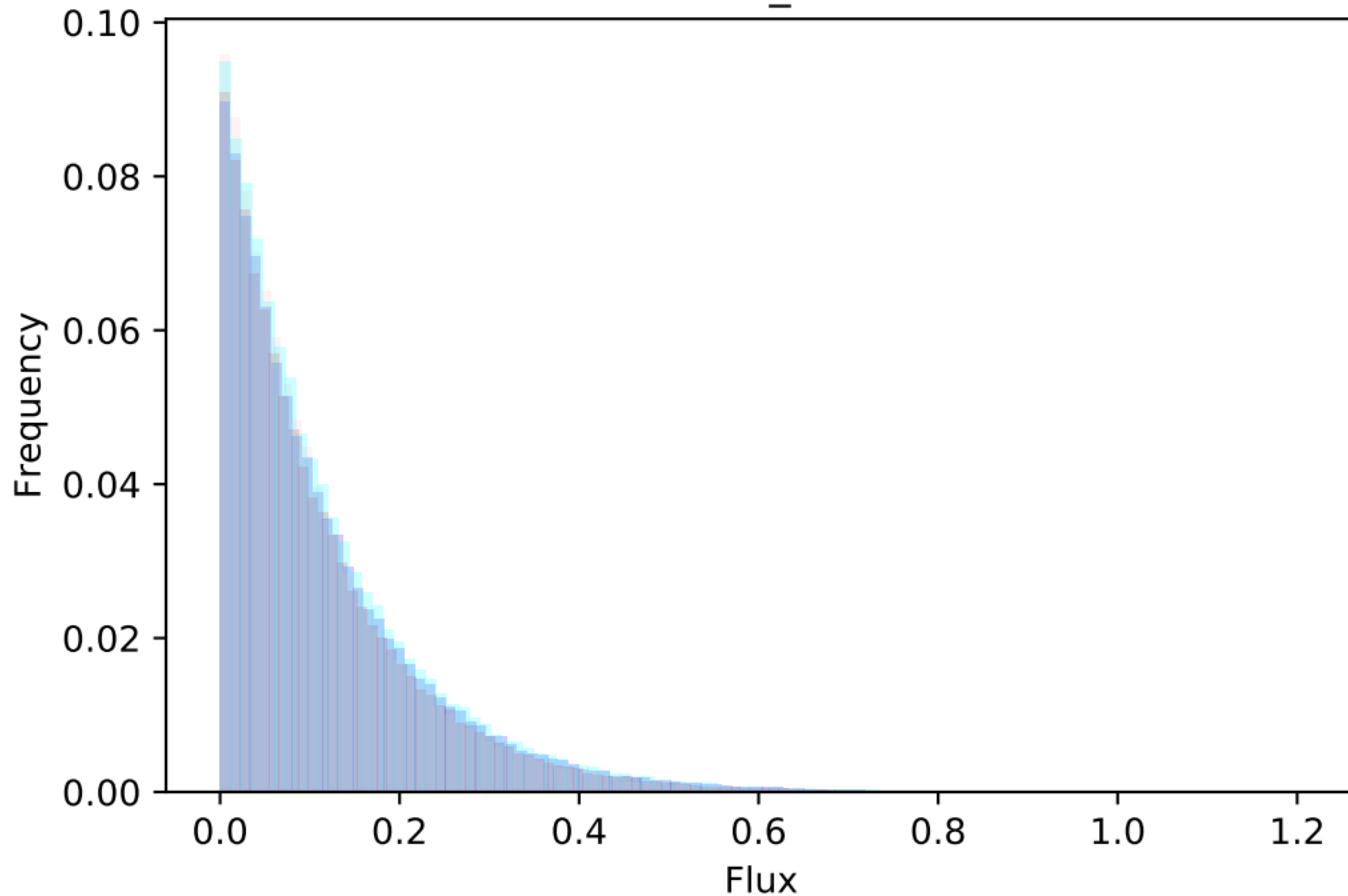
494:Leu_c -->



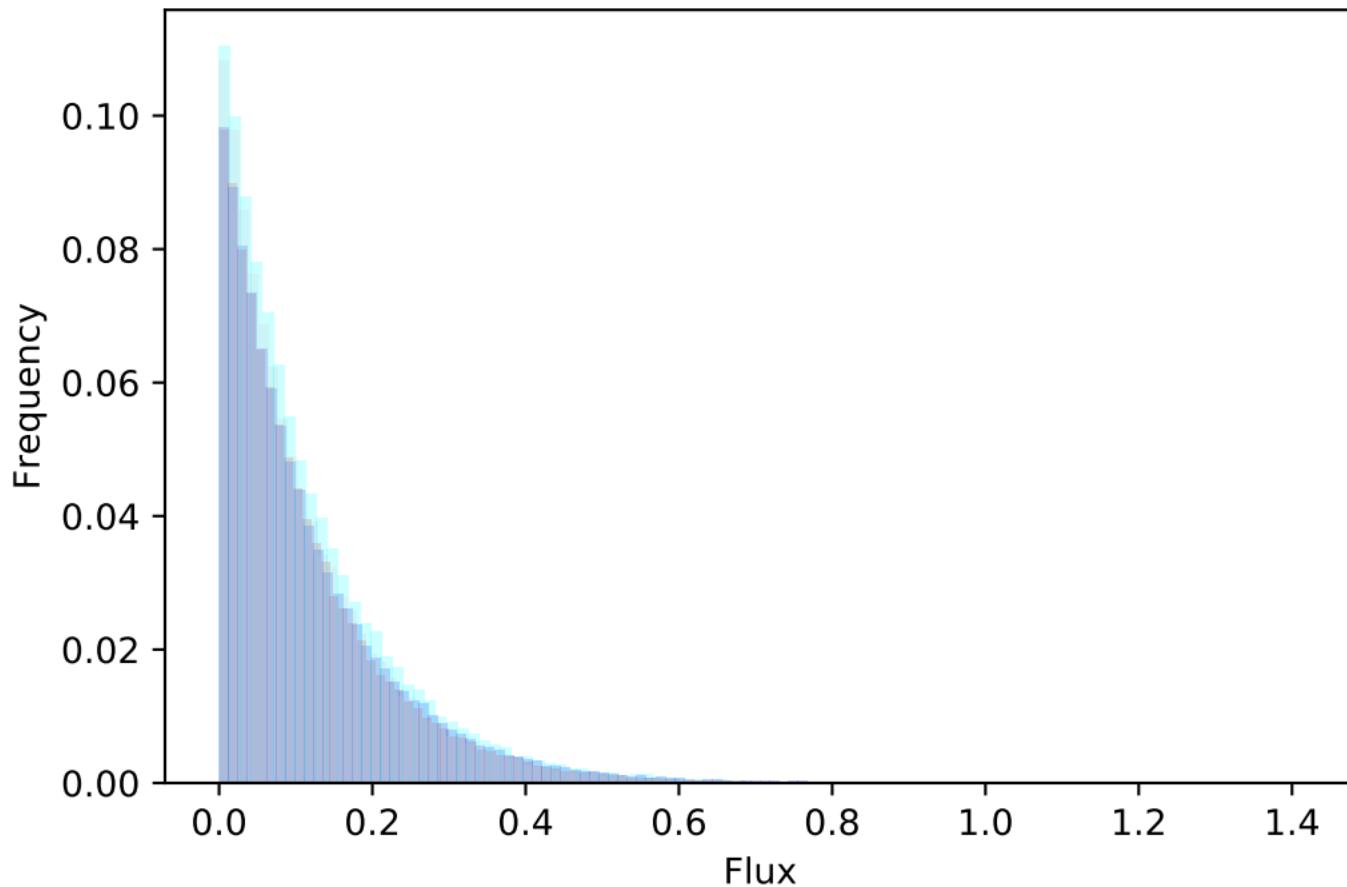
495:Leu_h -->



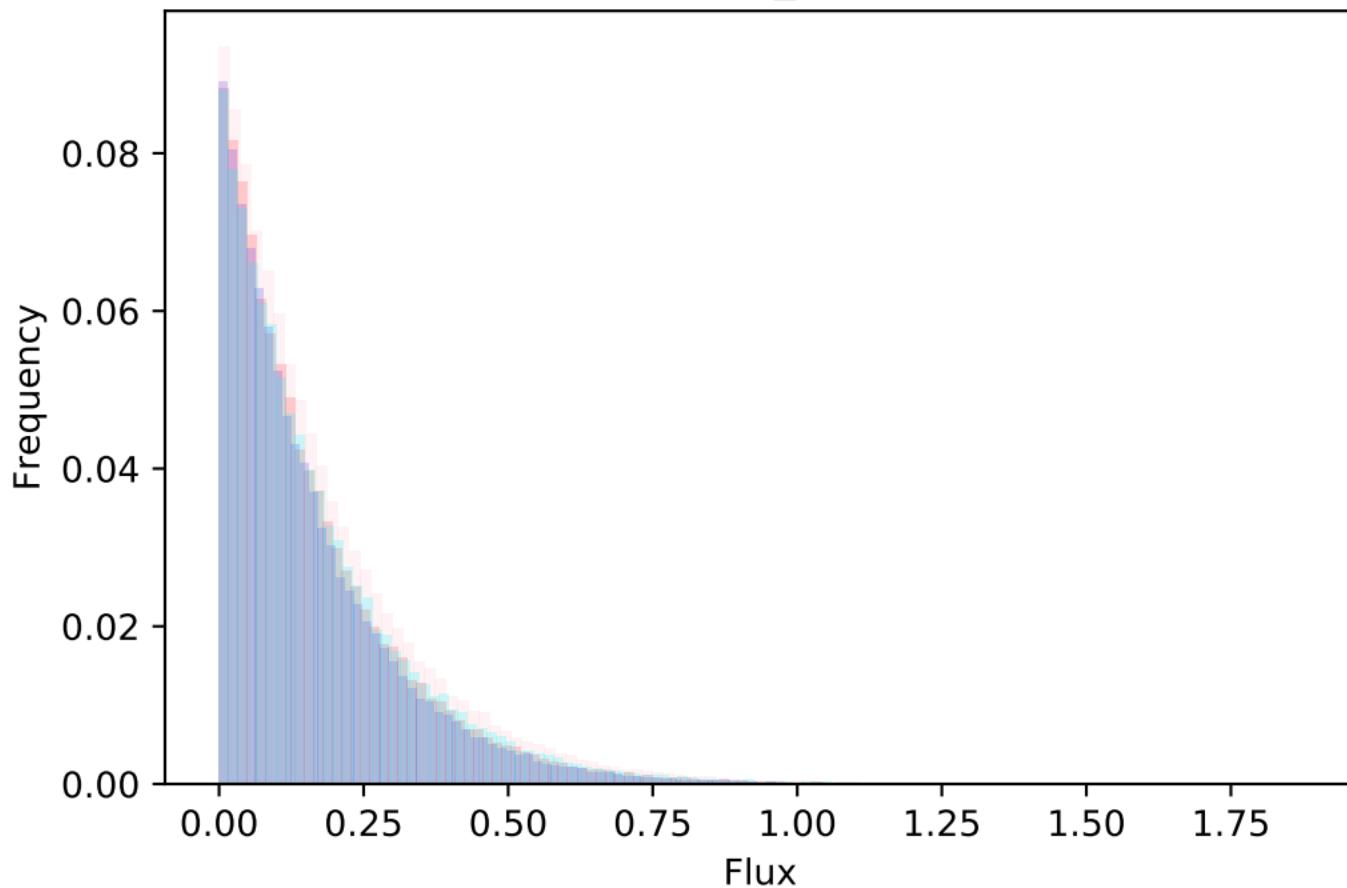
496:Leu_m -->



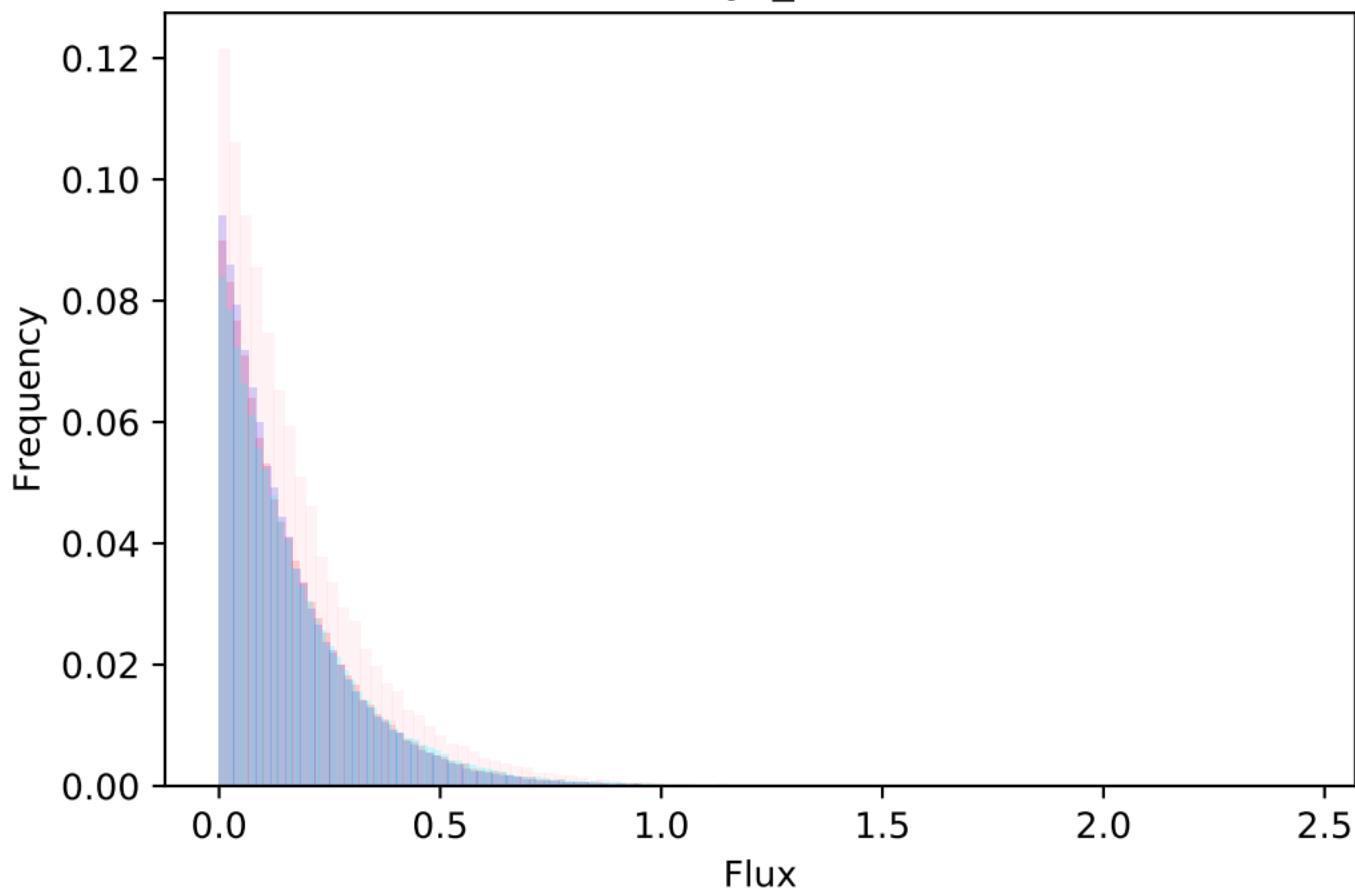
497:Leu_p -->



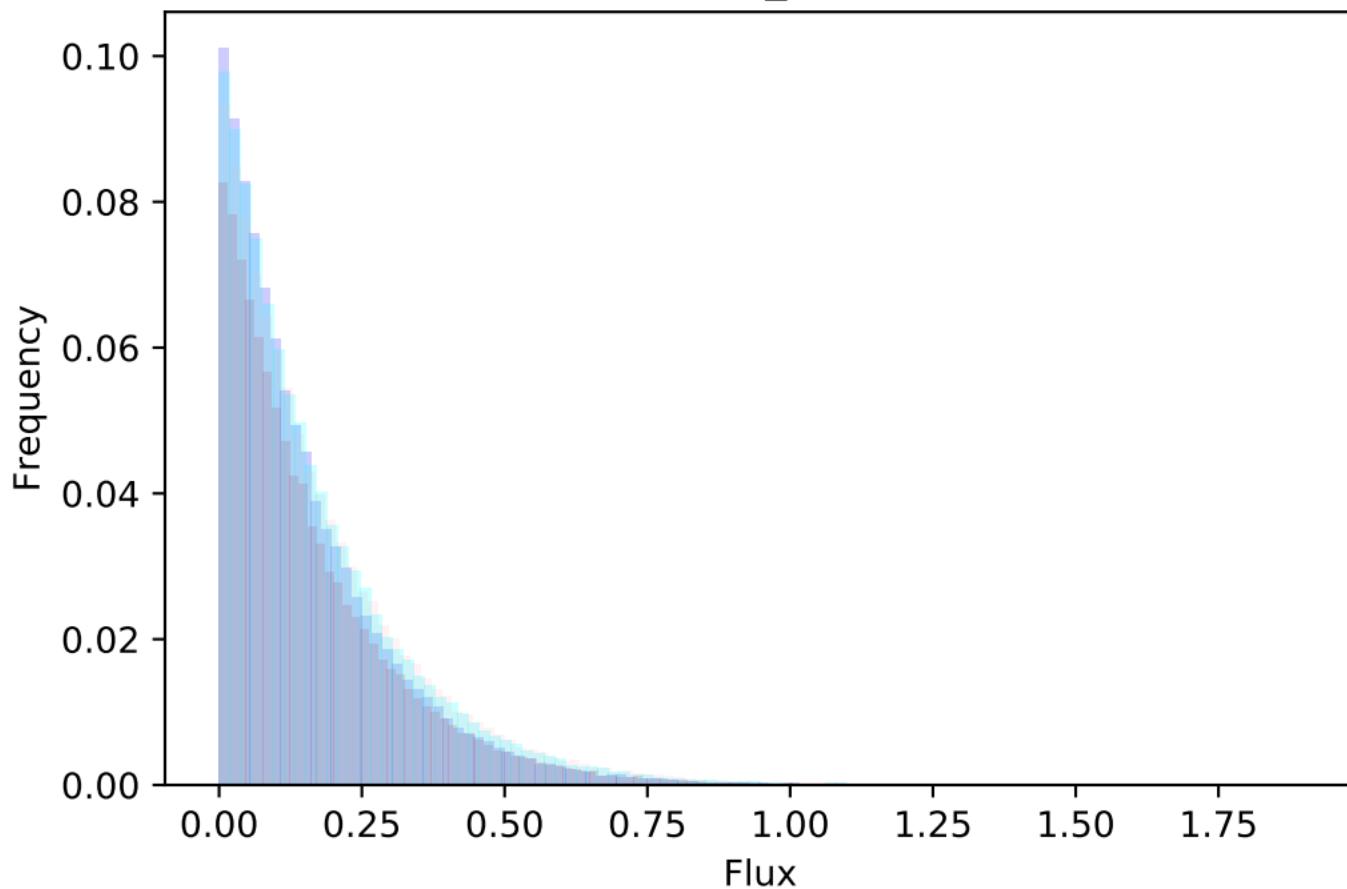
498:Lys_c -->



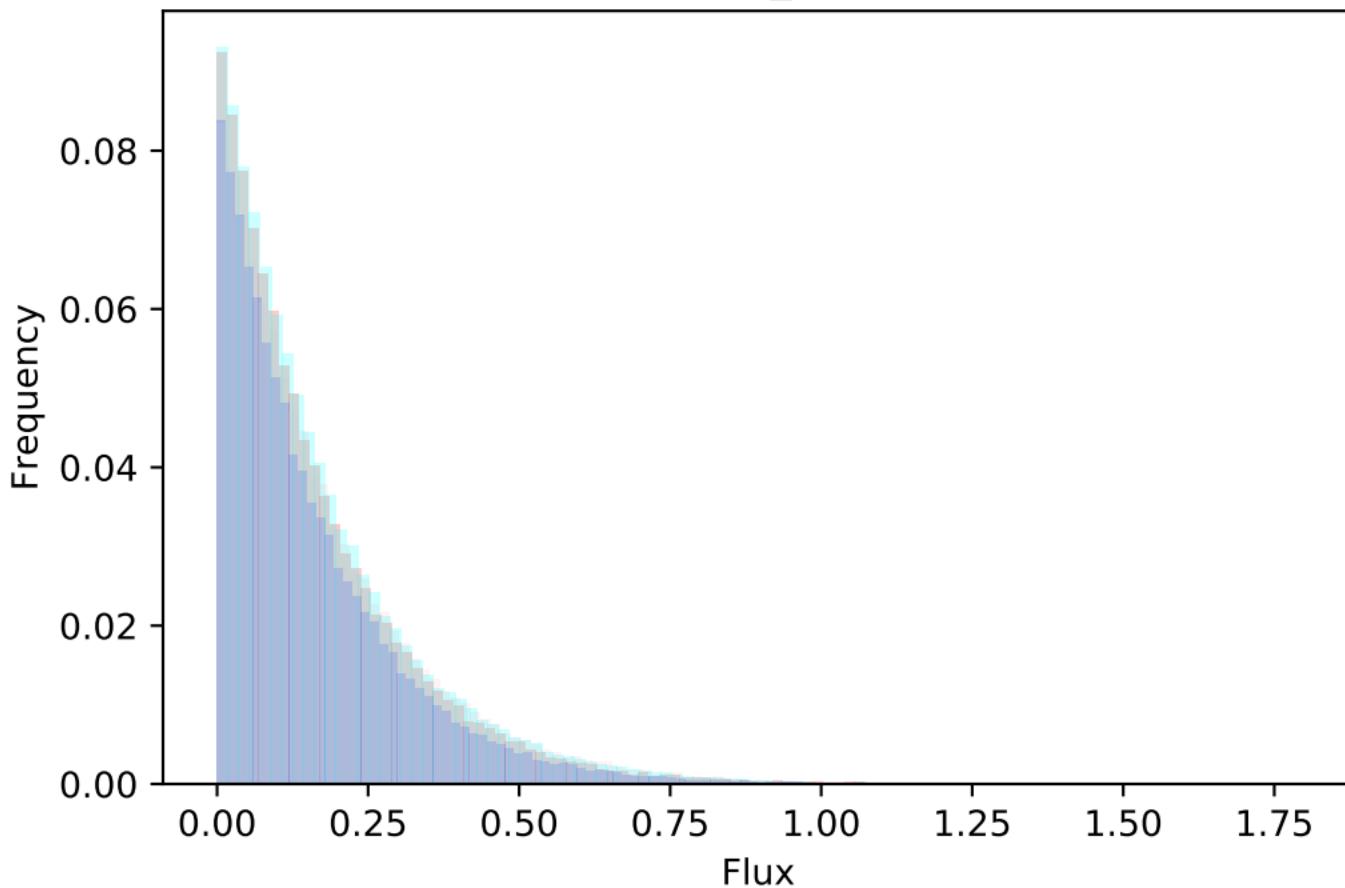
499:Lys_h -->



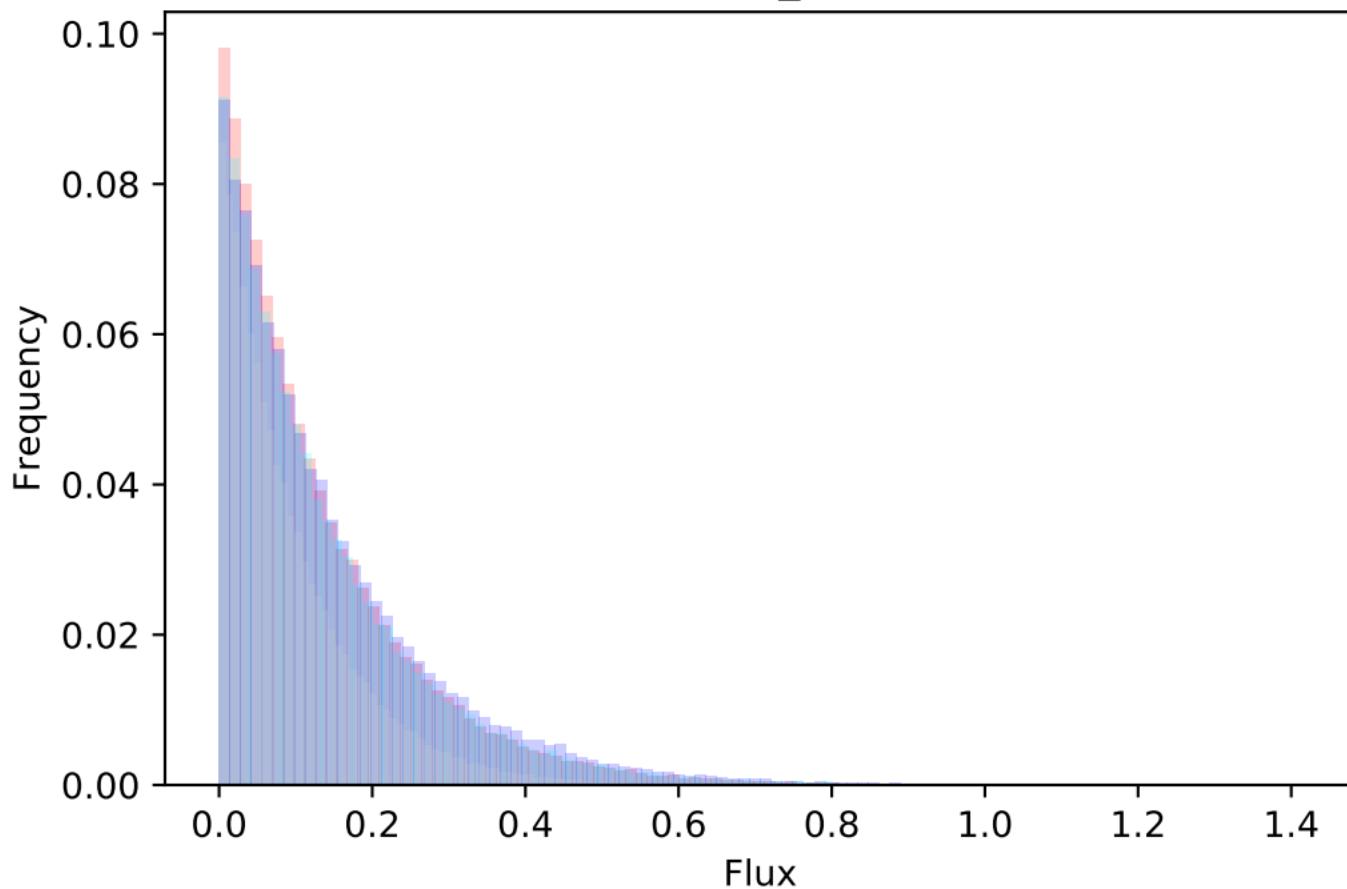
500:Lys_m -->



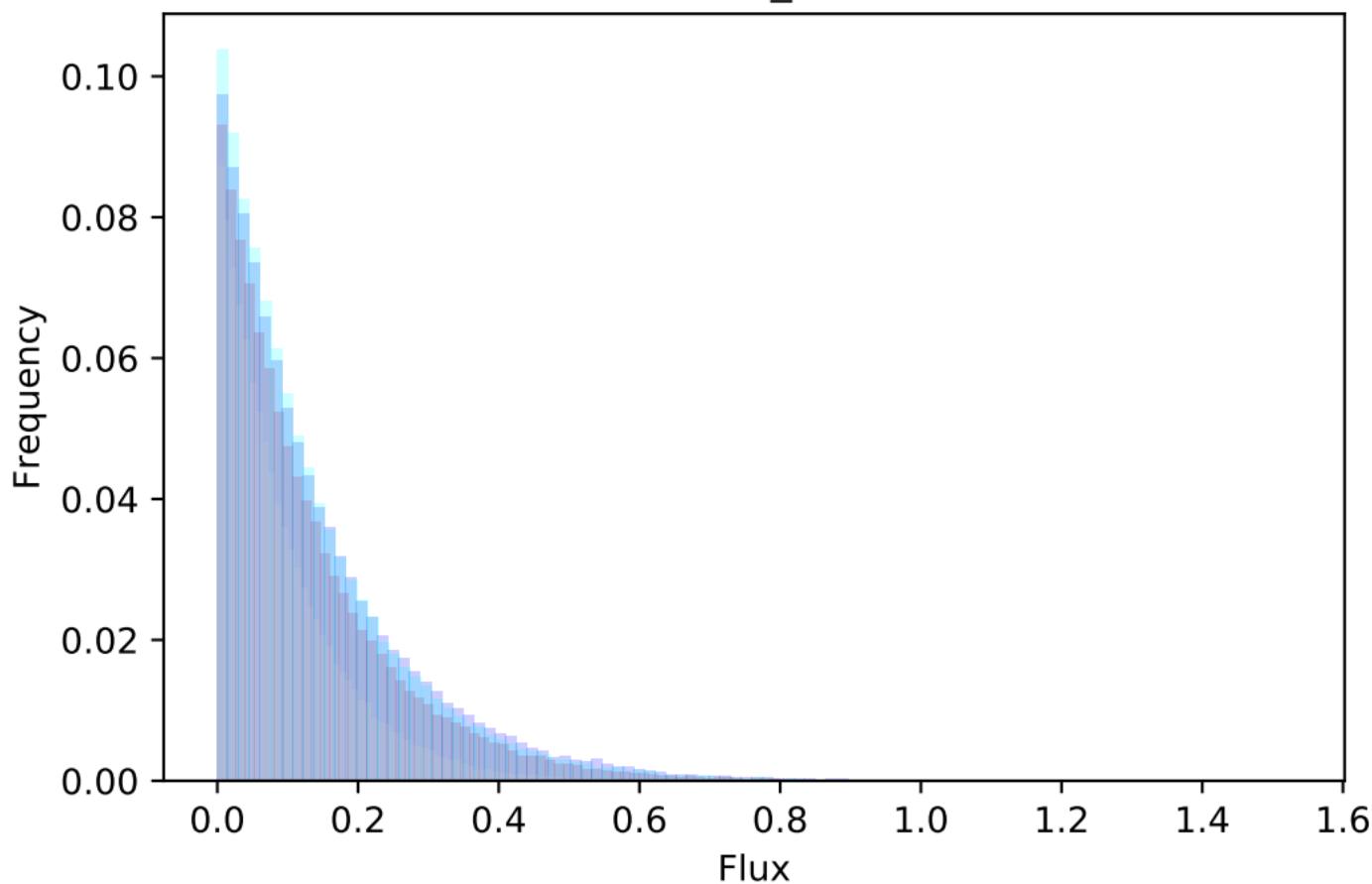
501:Lys_p -->



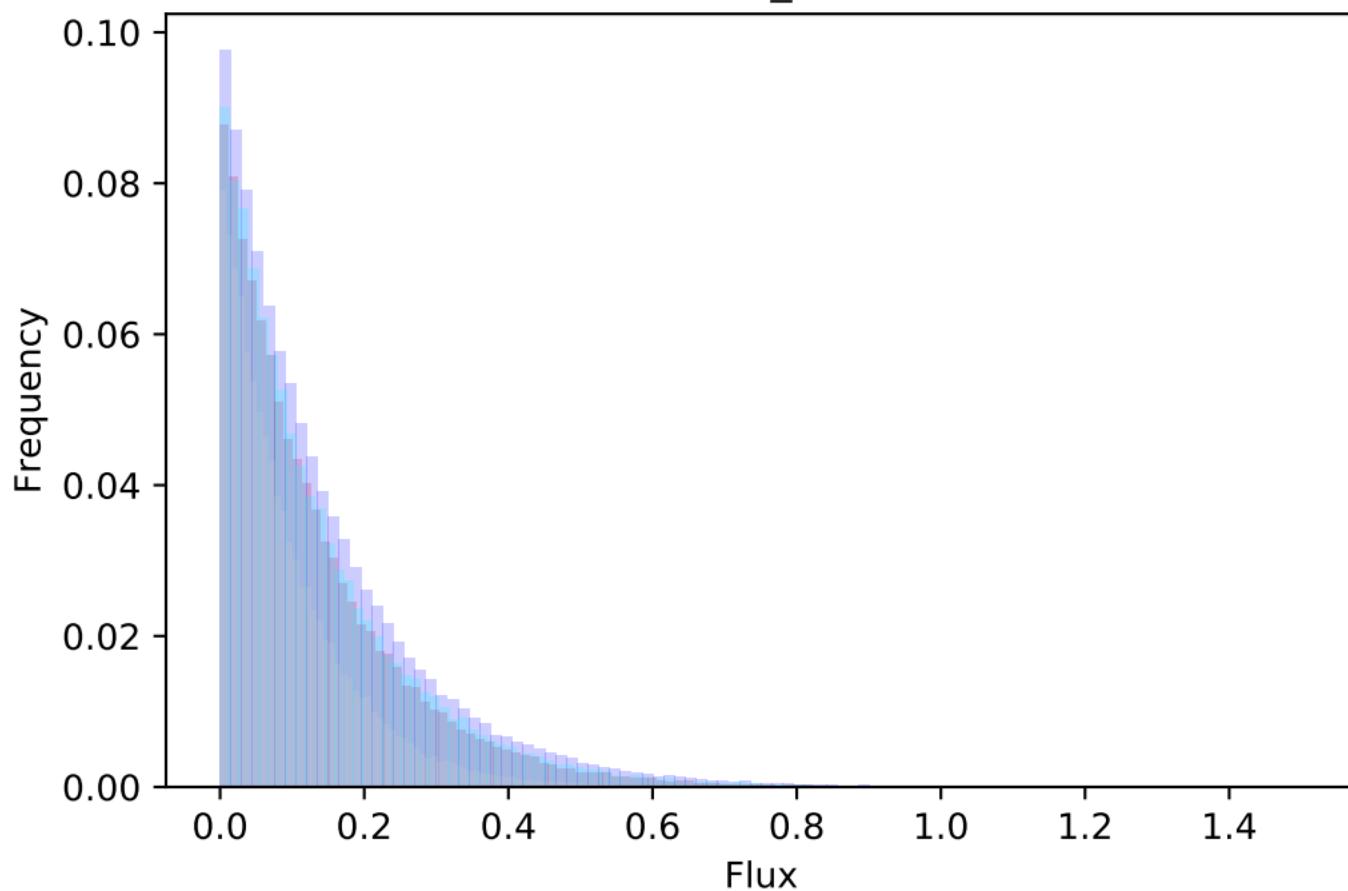
502:Met_c -->



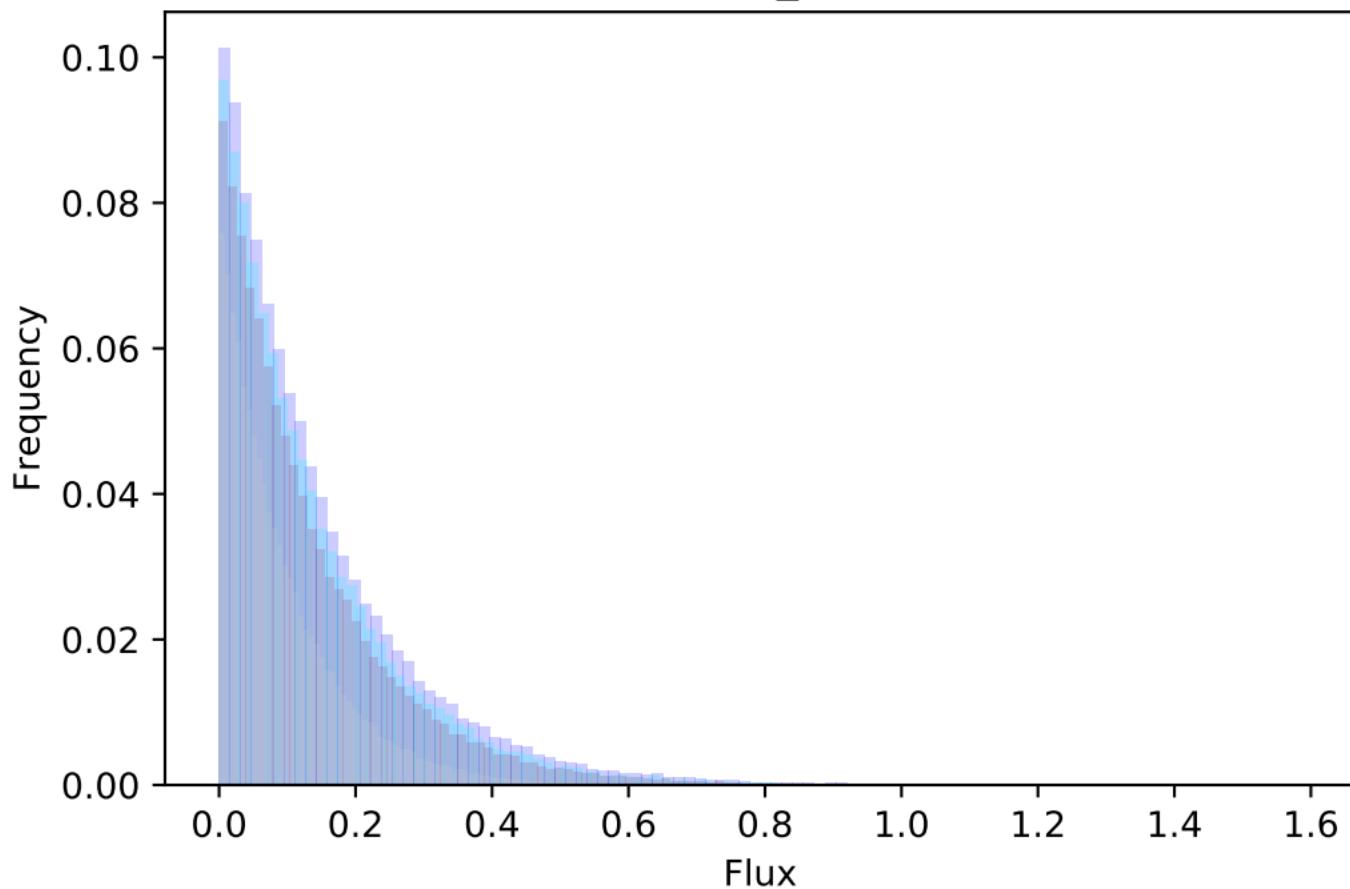
503:Met_h -->



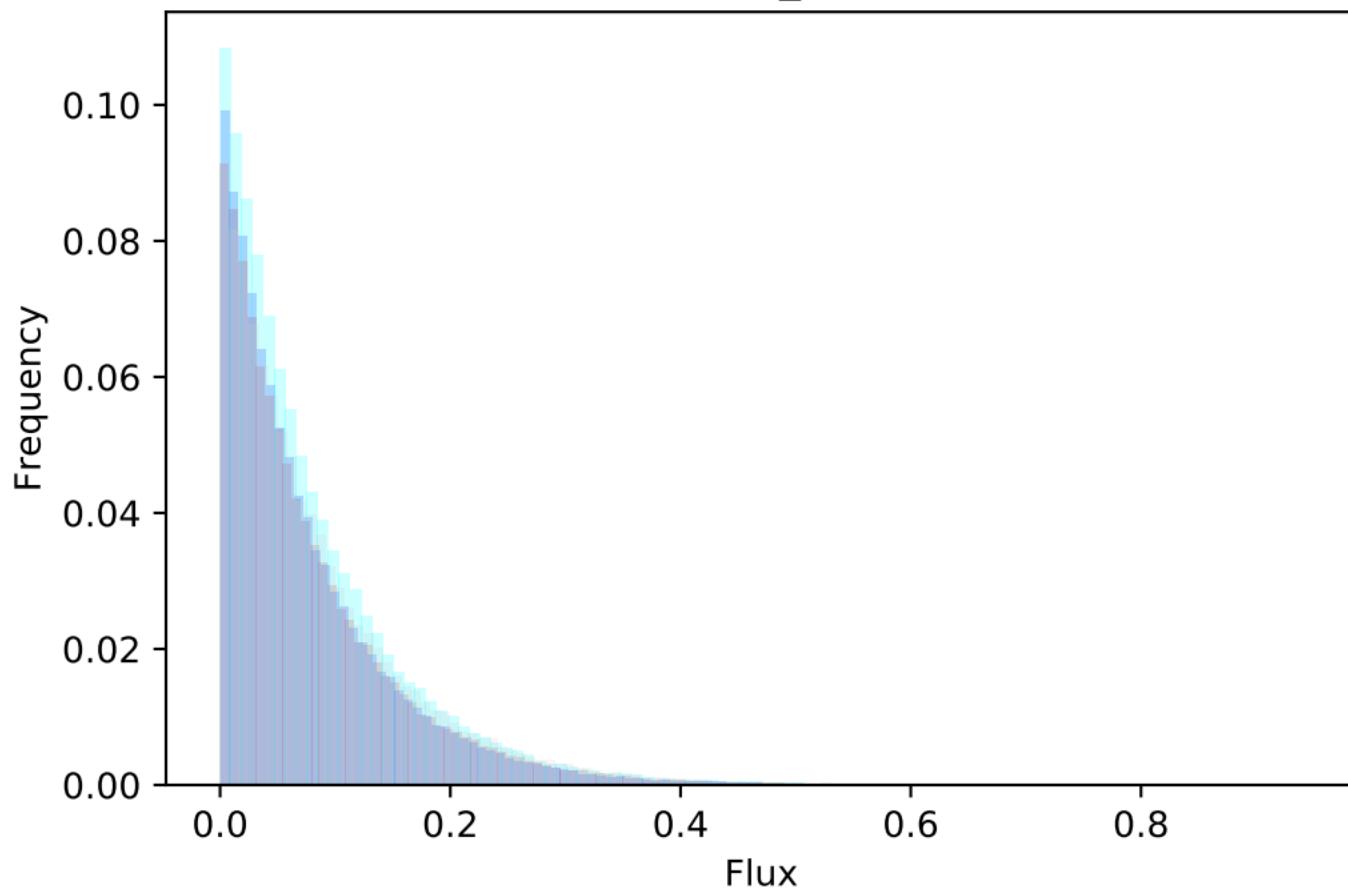
504:Met_m -->



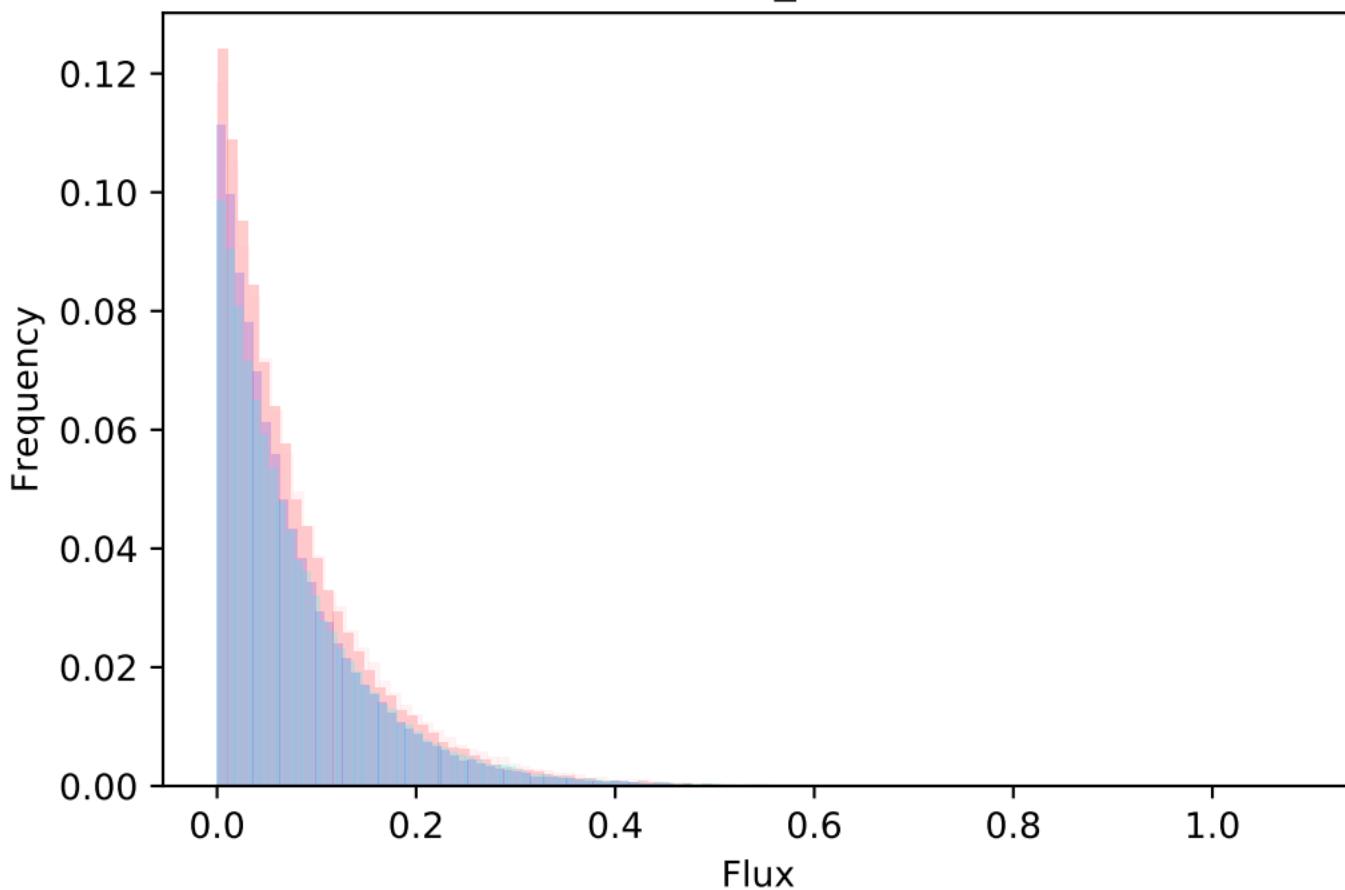
505:Met_p -->



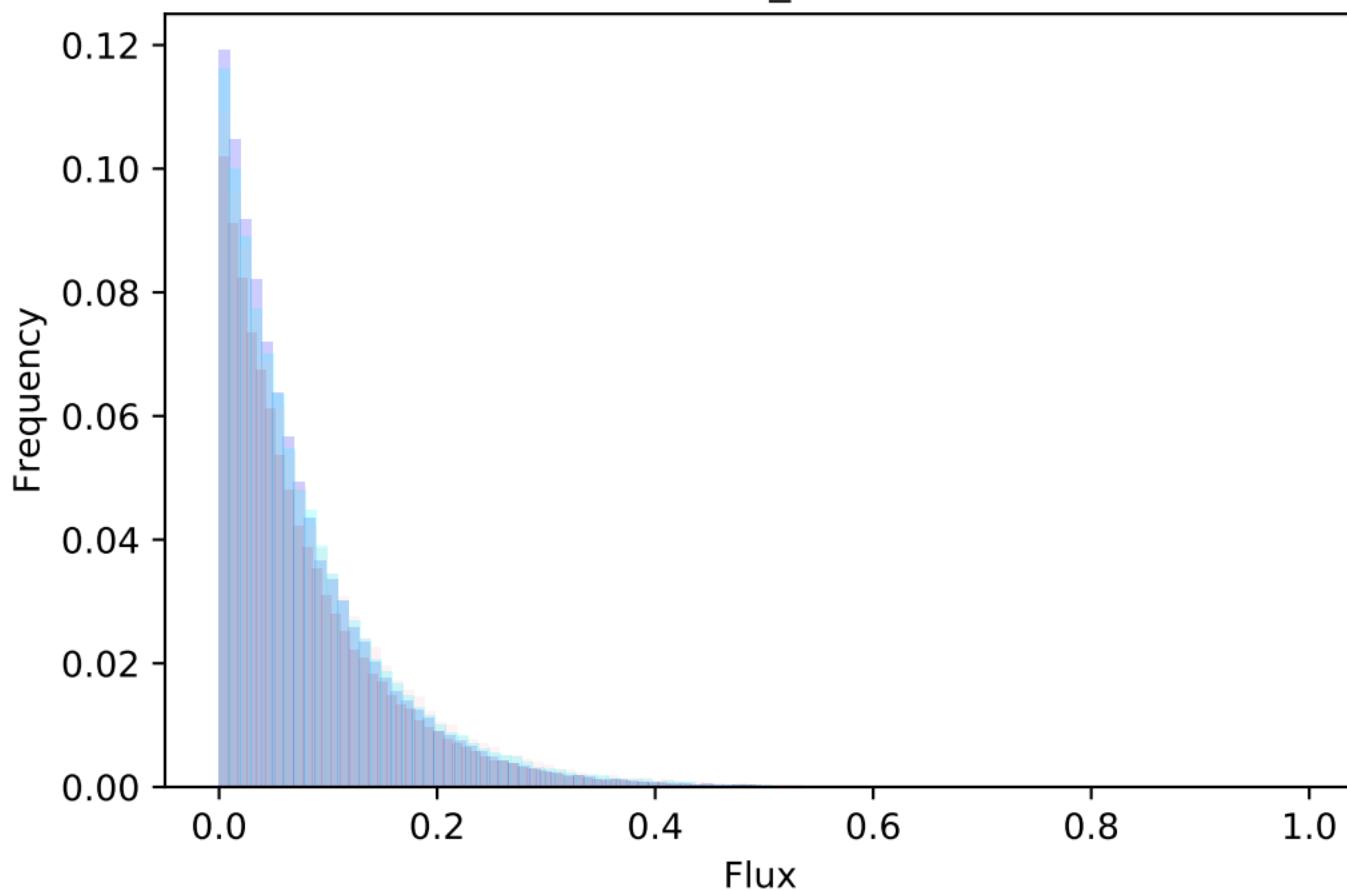
506:Phe_c -->



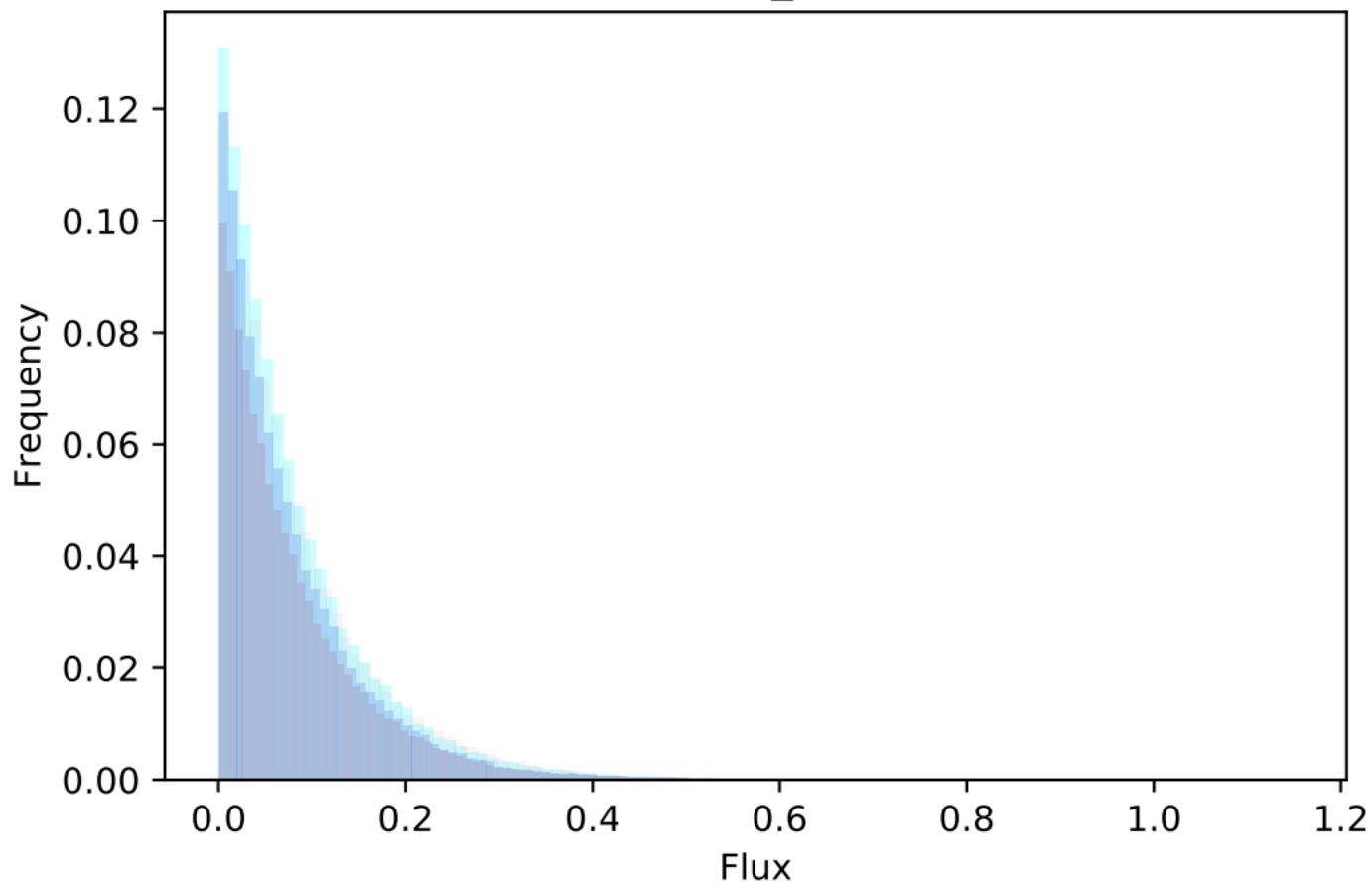
507:Phe_h -->



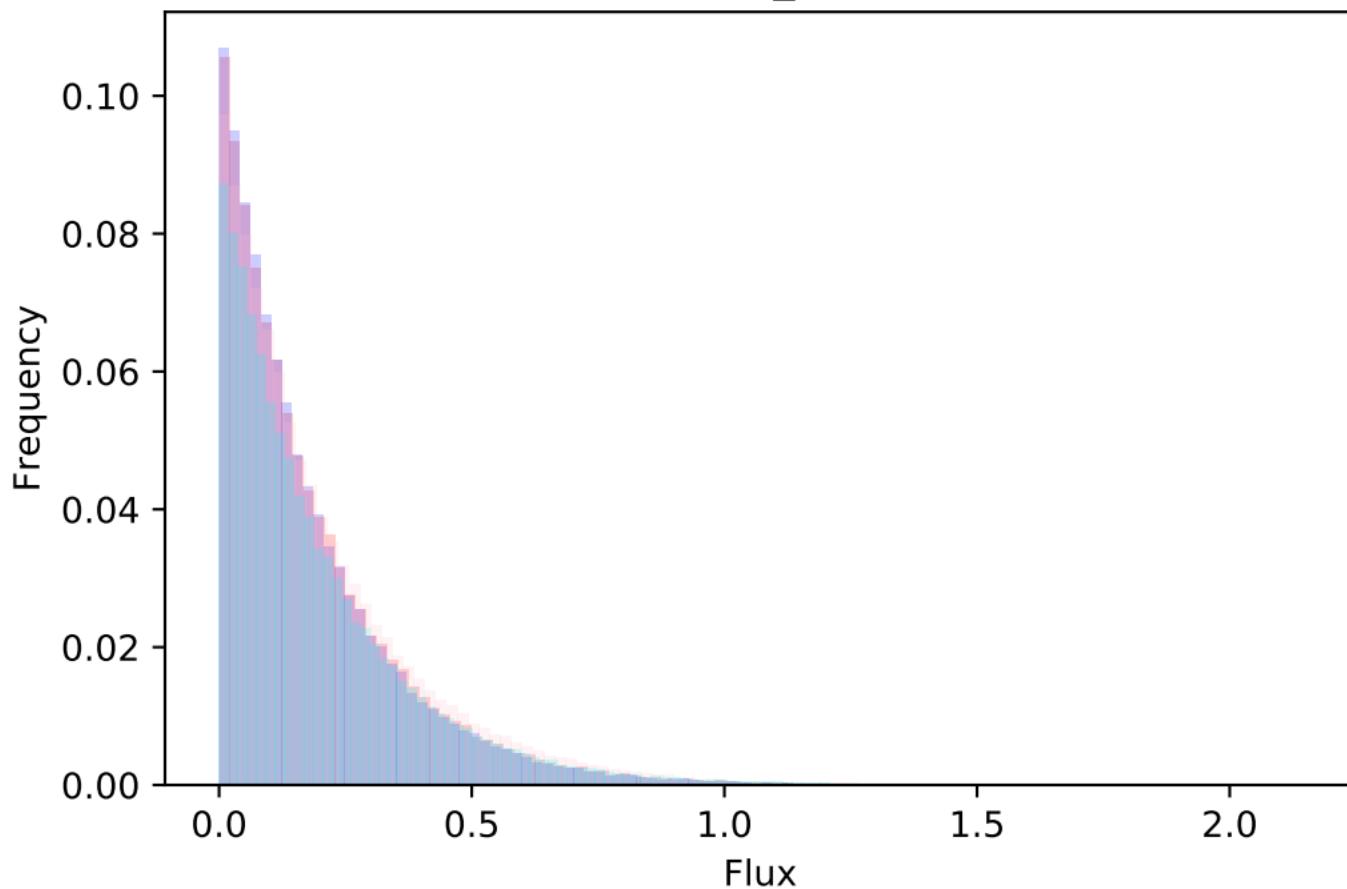
508:Phe_m -->



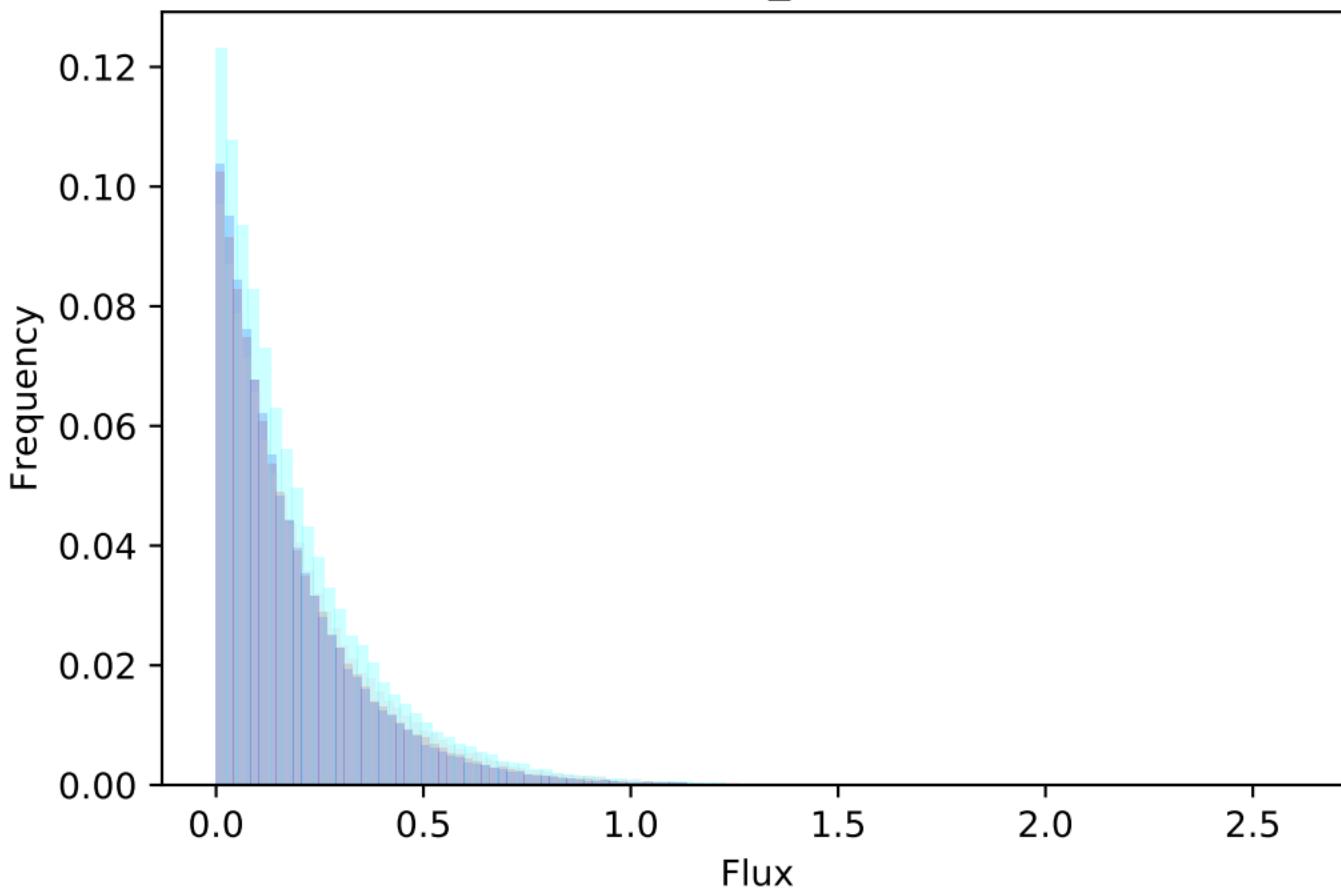
509:Phe_p -->



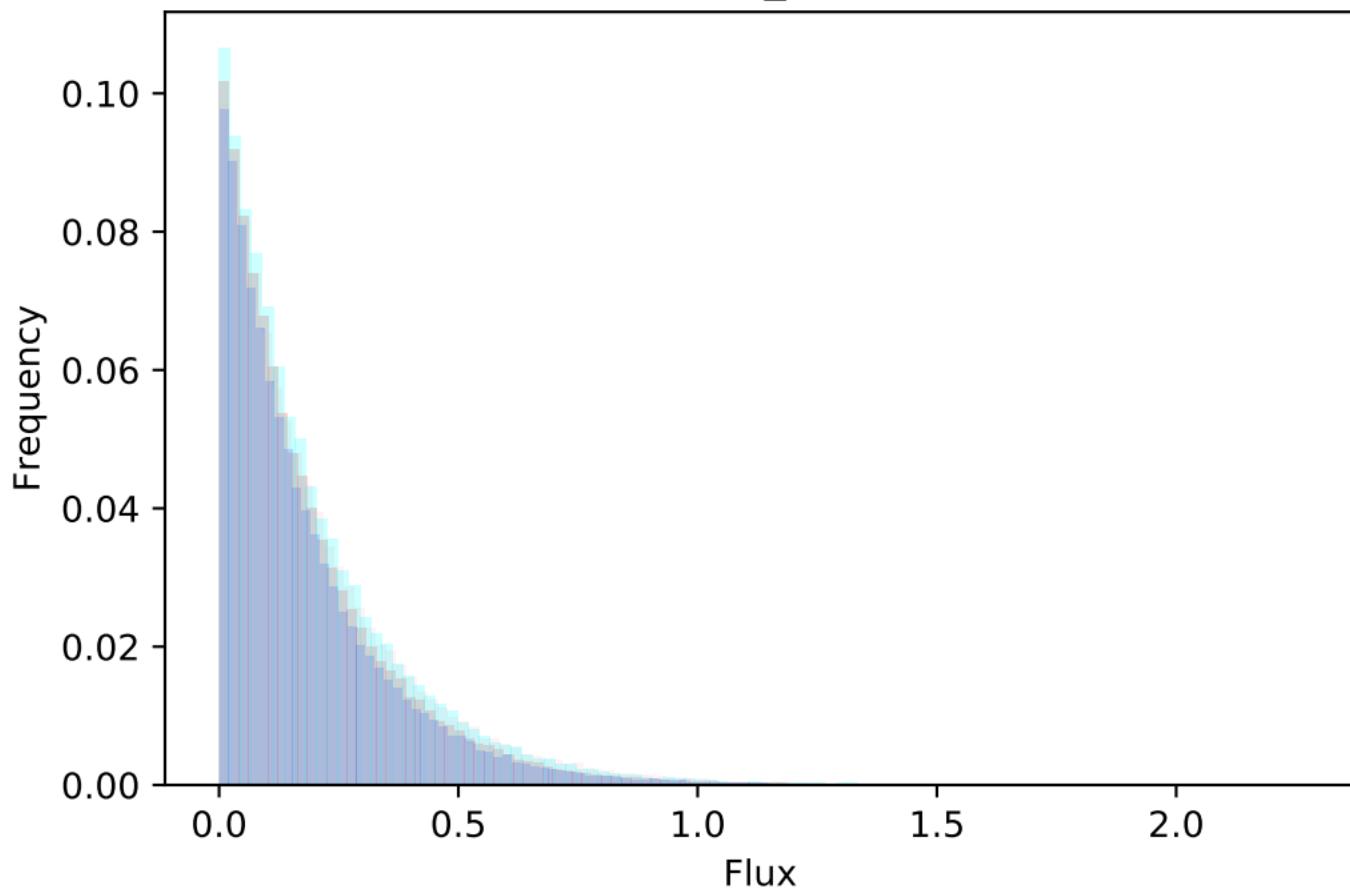
510:Pro_c -->



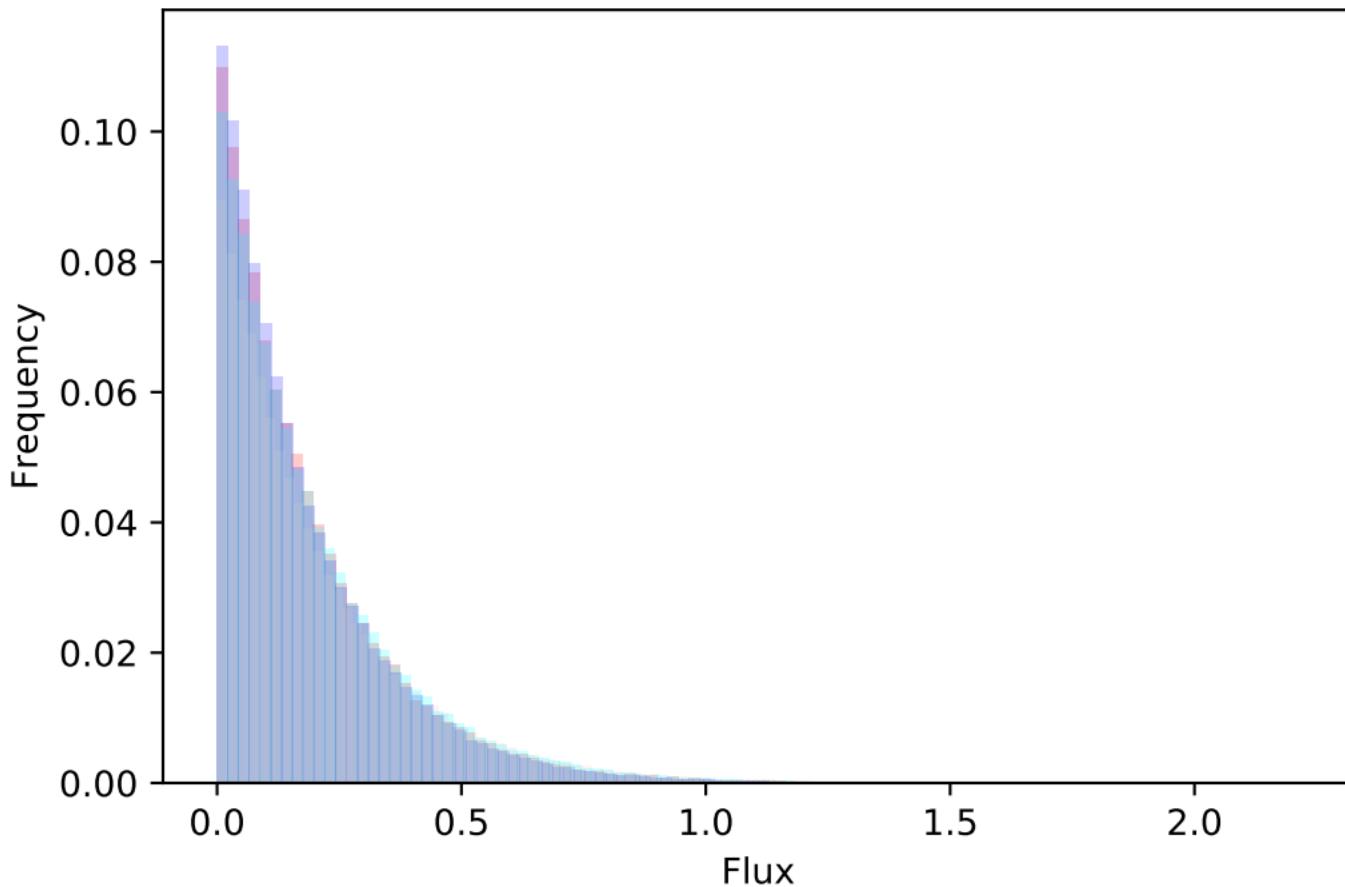
511:Pro_h -->



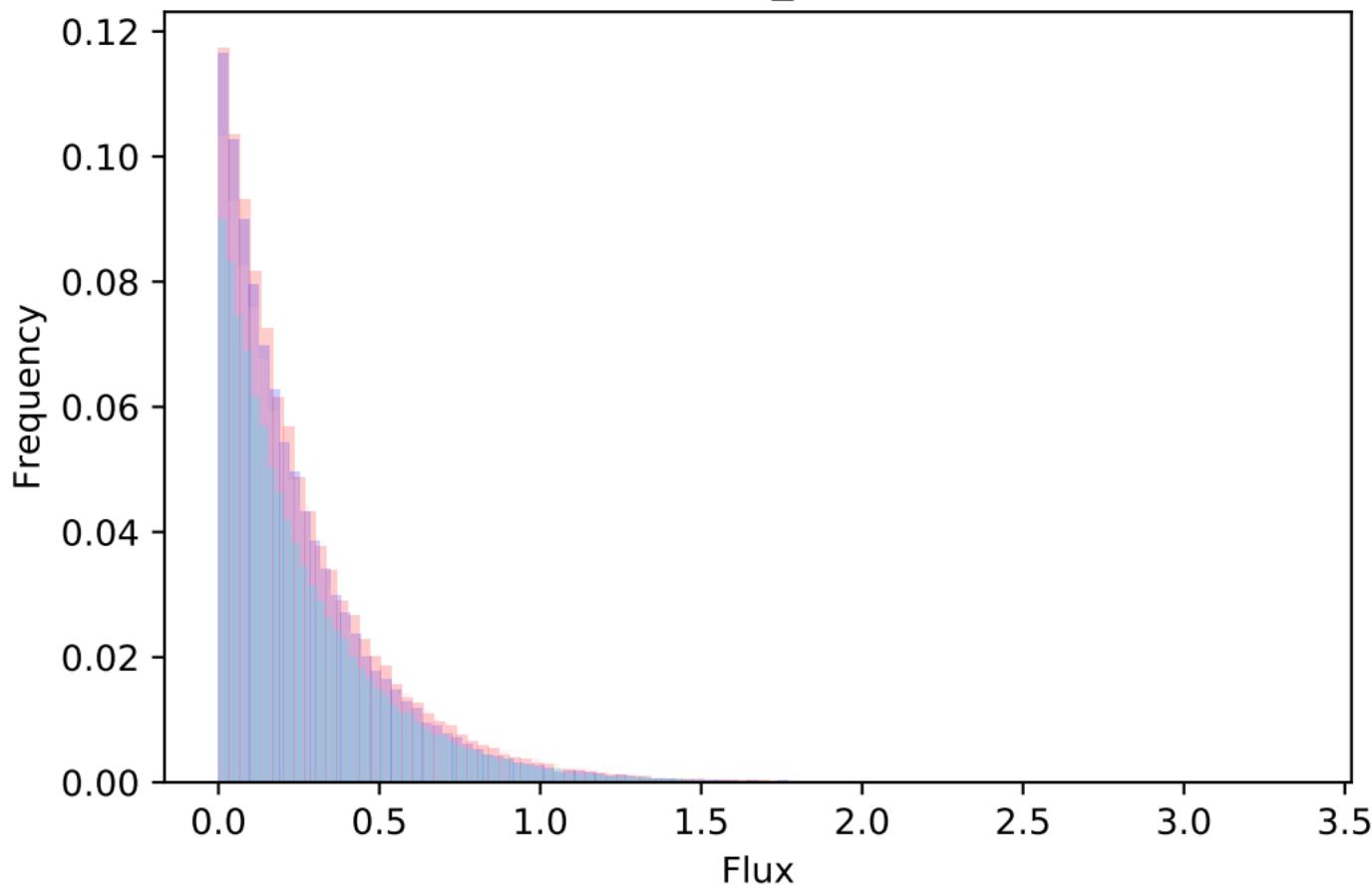
512:Pro_m -->



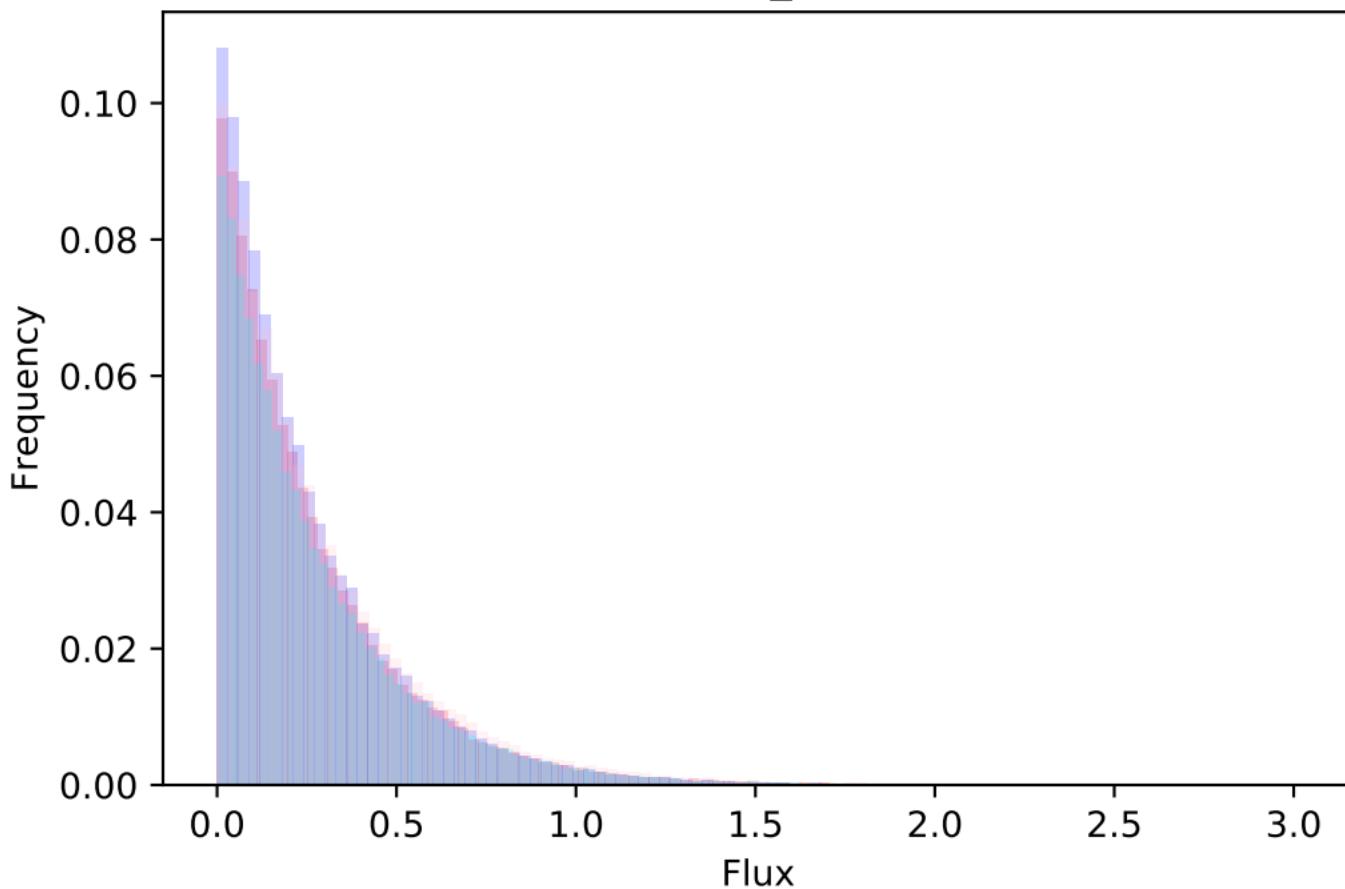
513:Pro_p -->



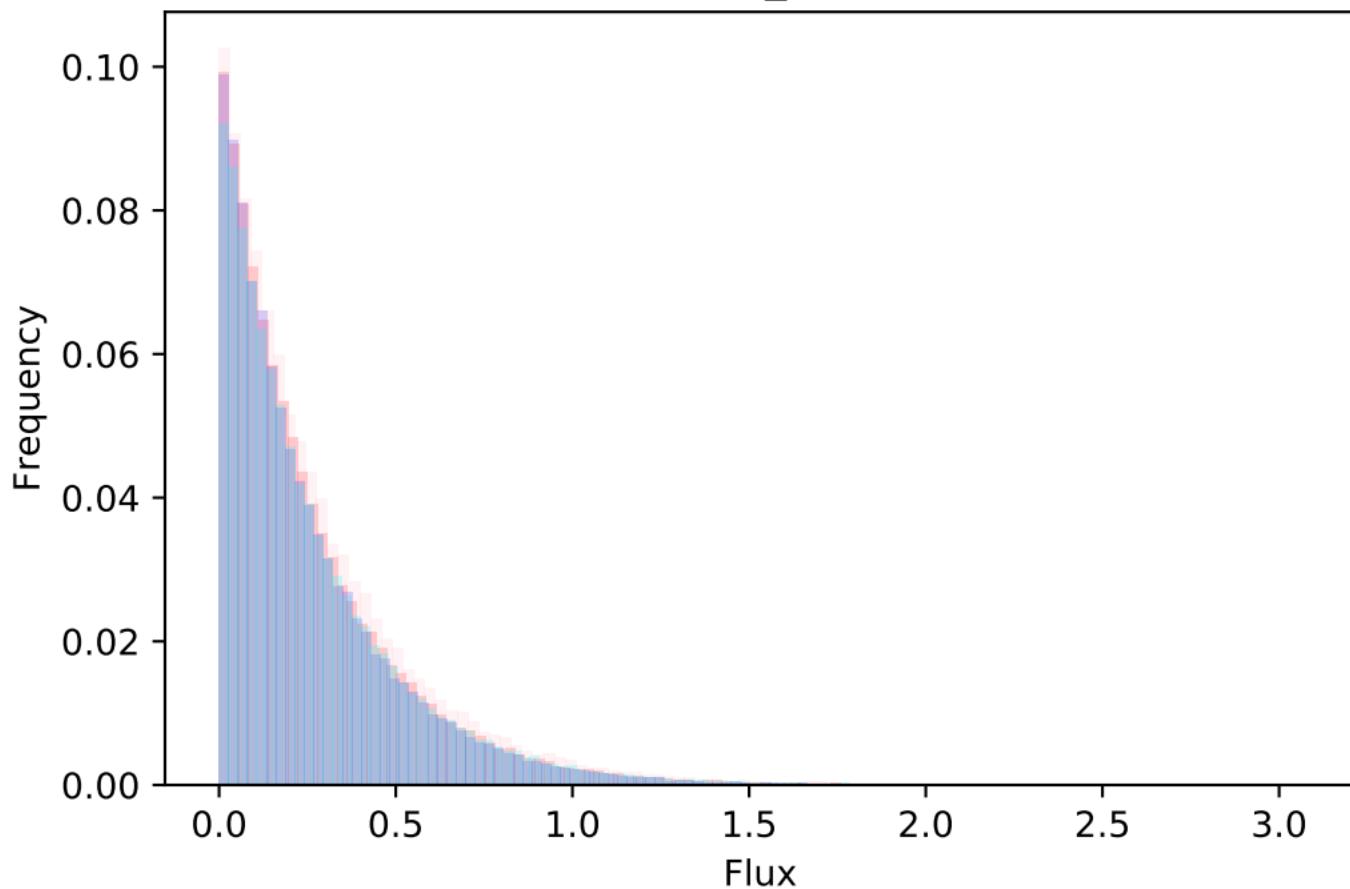
514:Ser_c -->



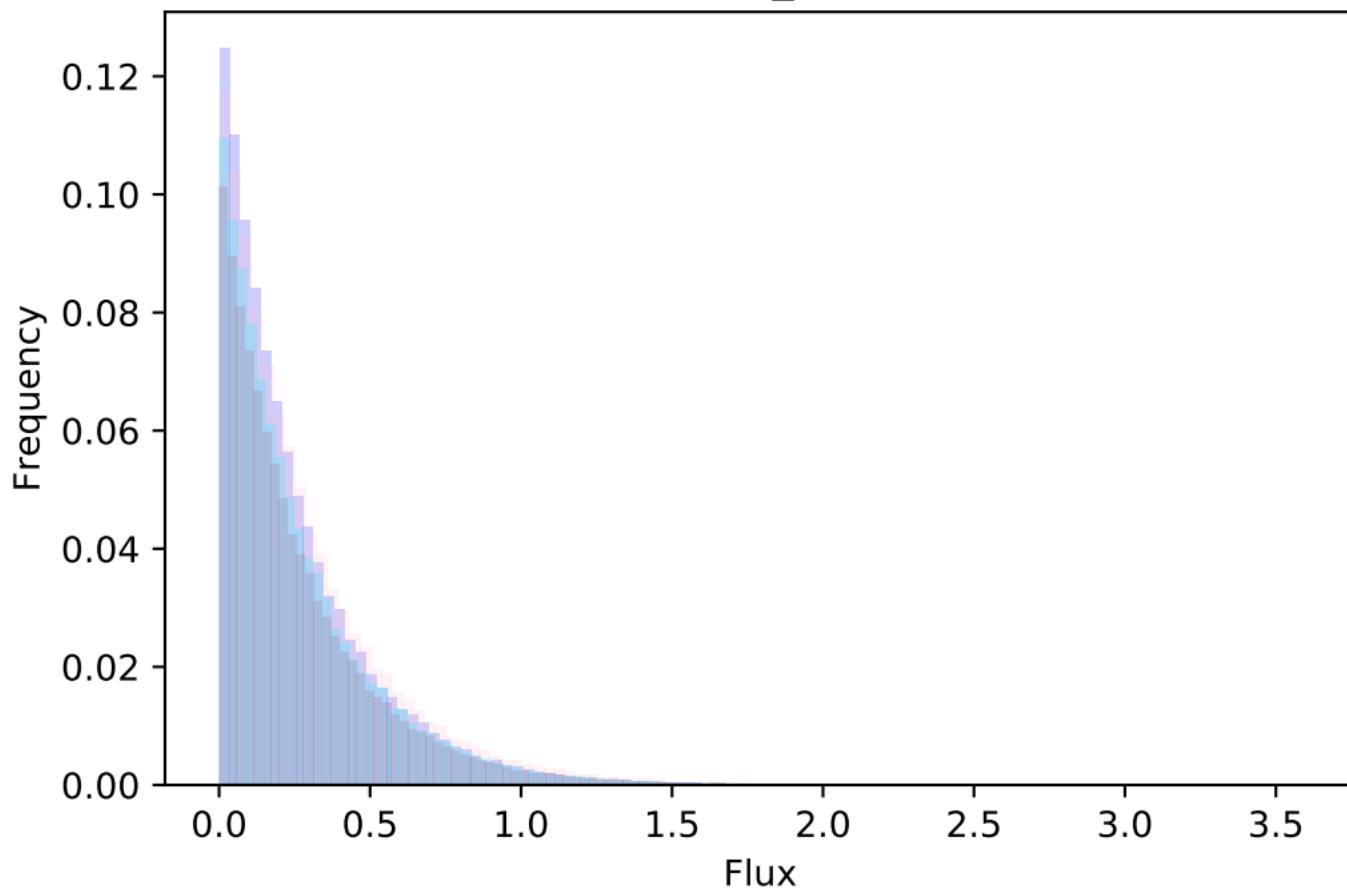
515:Ser_h -->



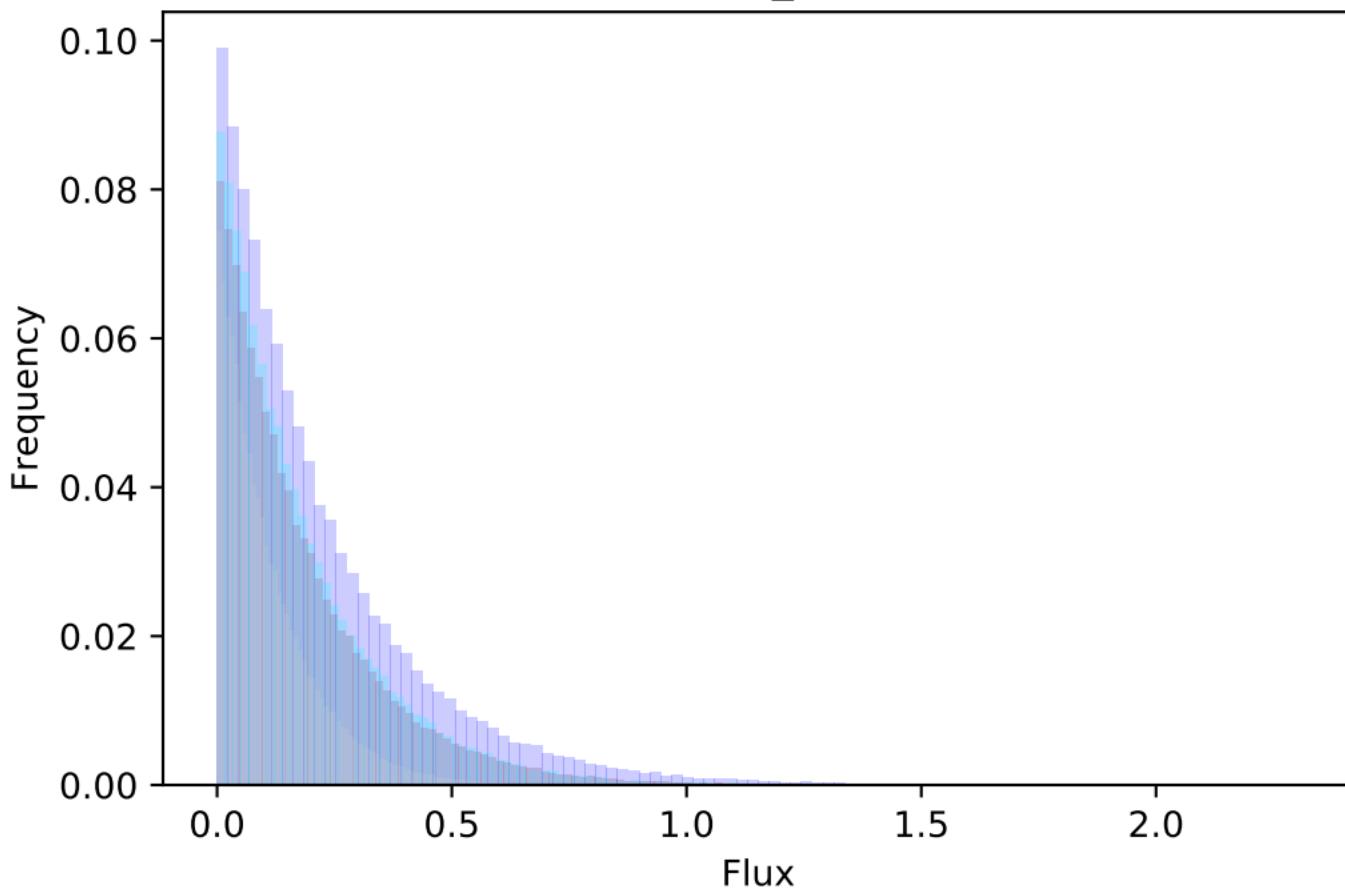
516:Ser_m -->



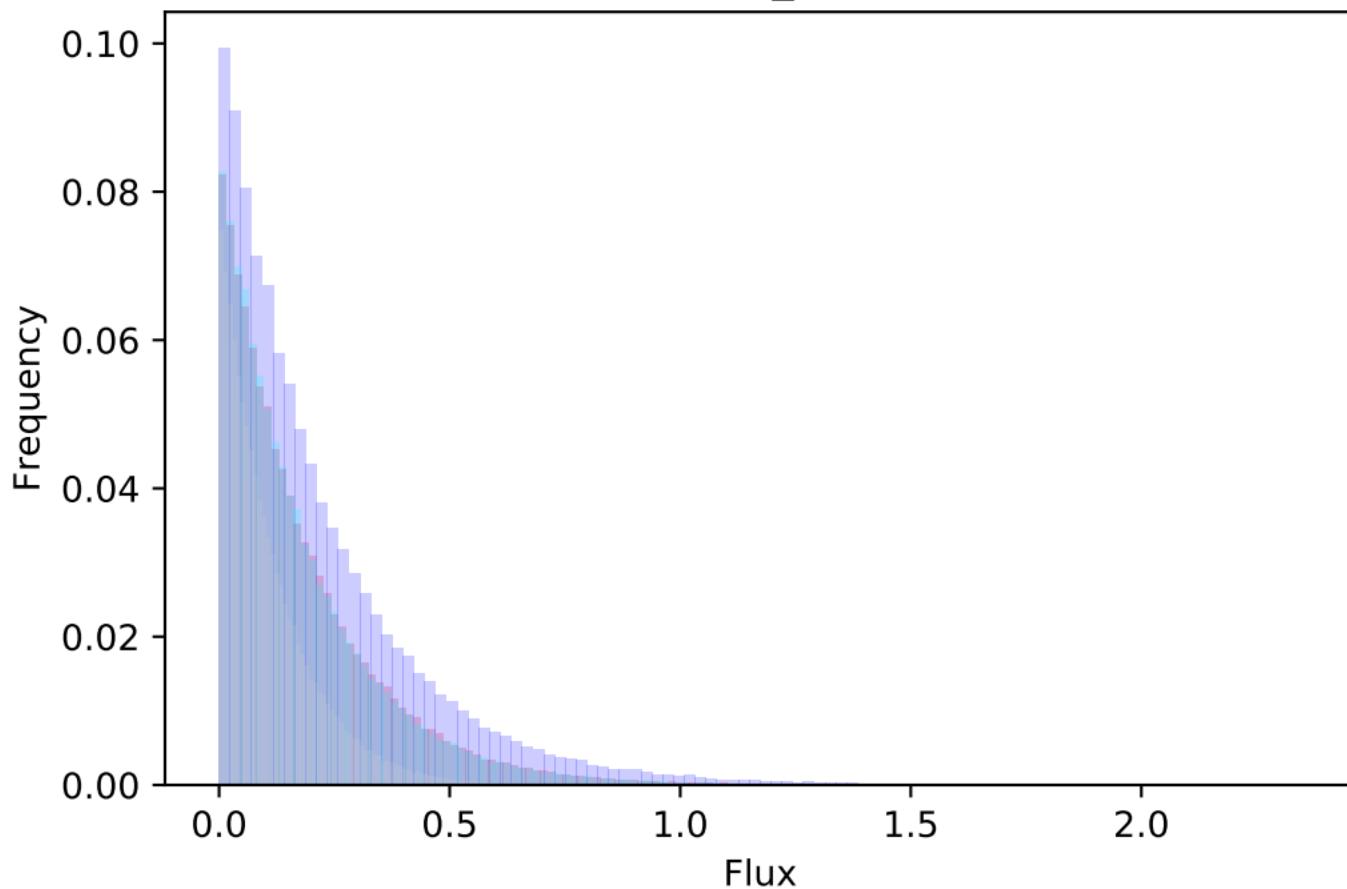
517:Ser_p -->



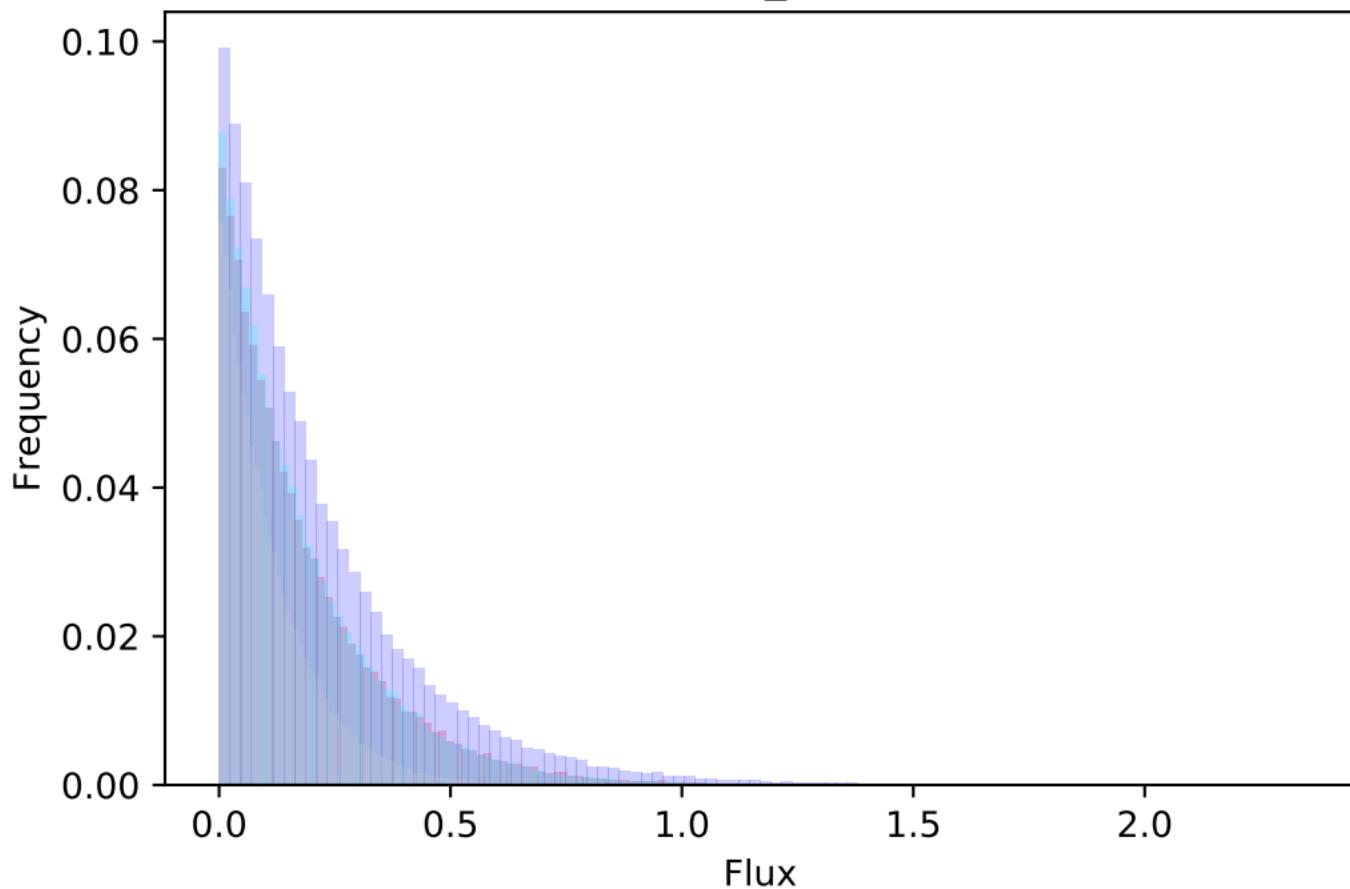
518:Thr_c -->



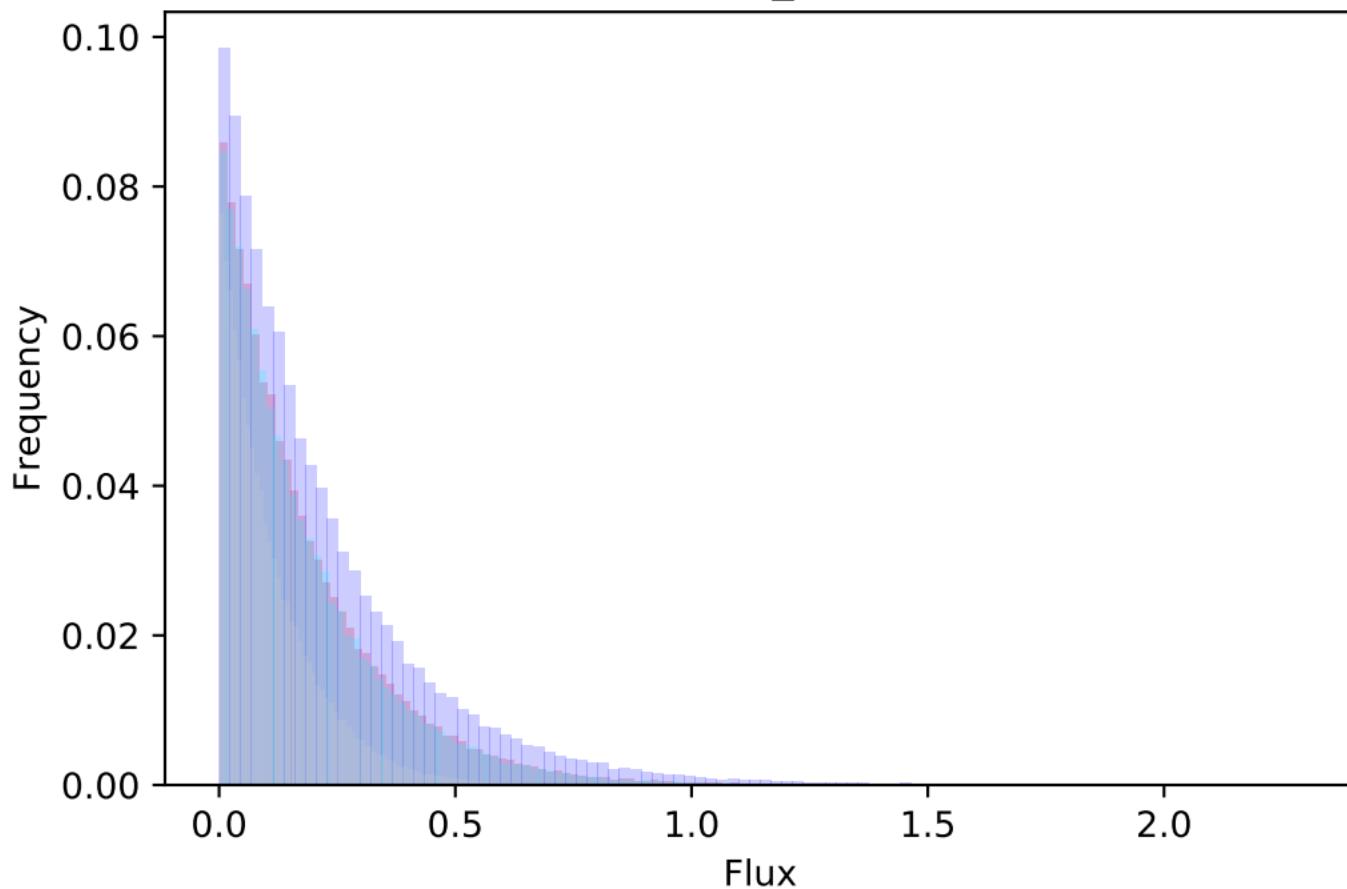
519:Thr_h -->



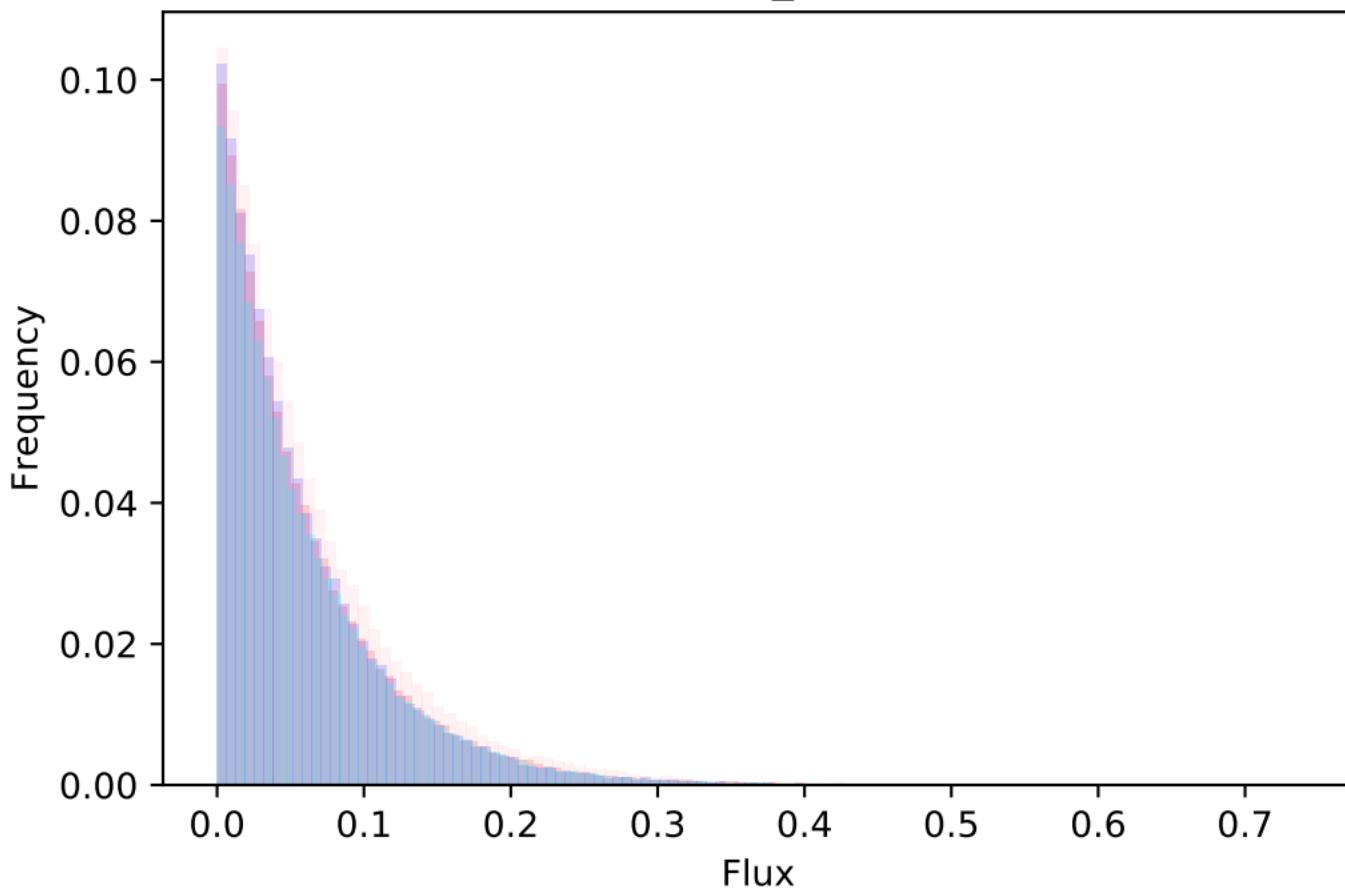
520:Thr_m -->



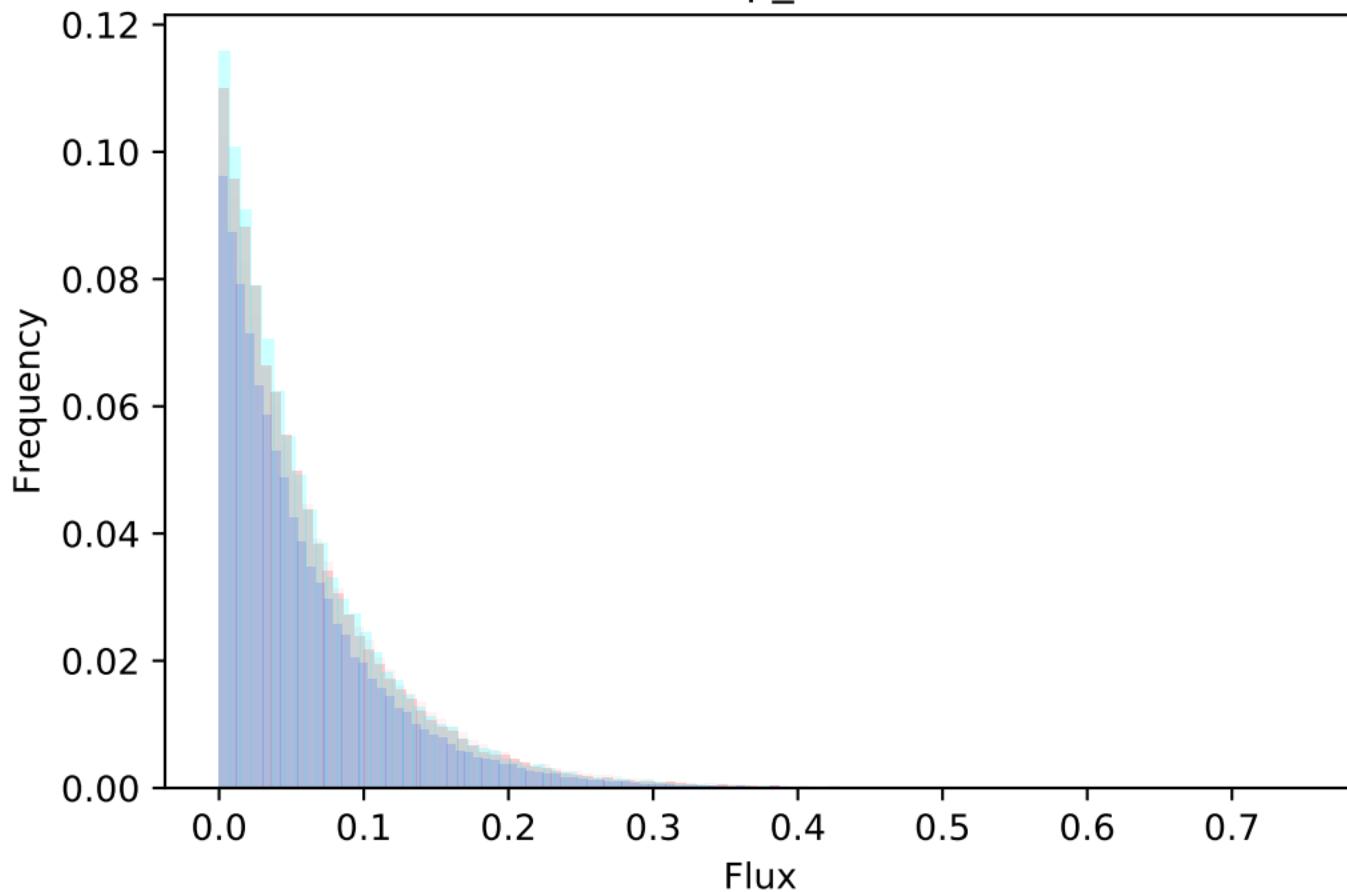
521:Thr_p -->



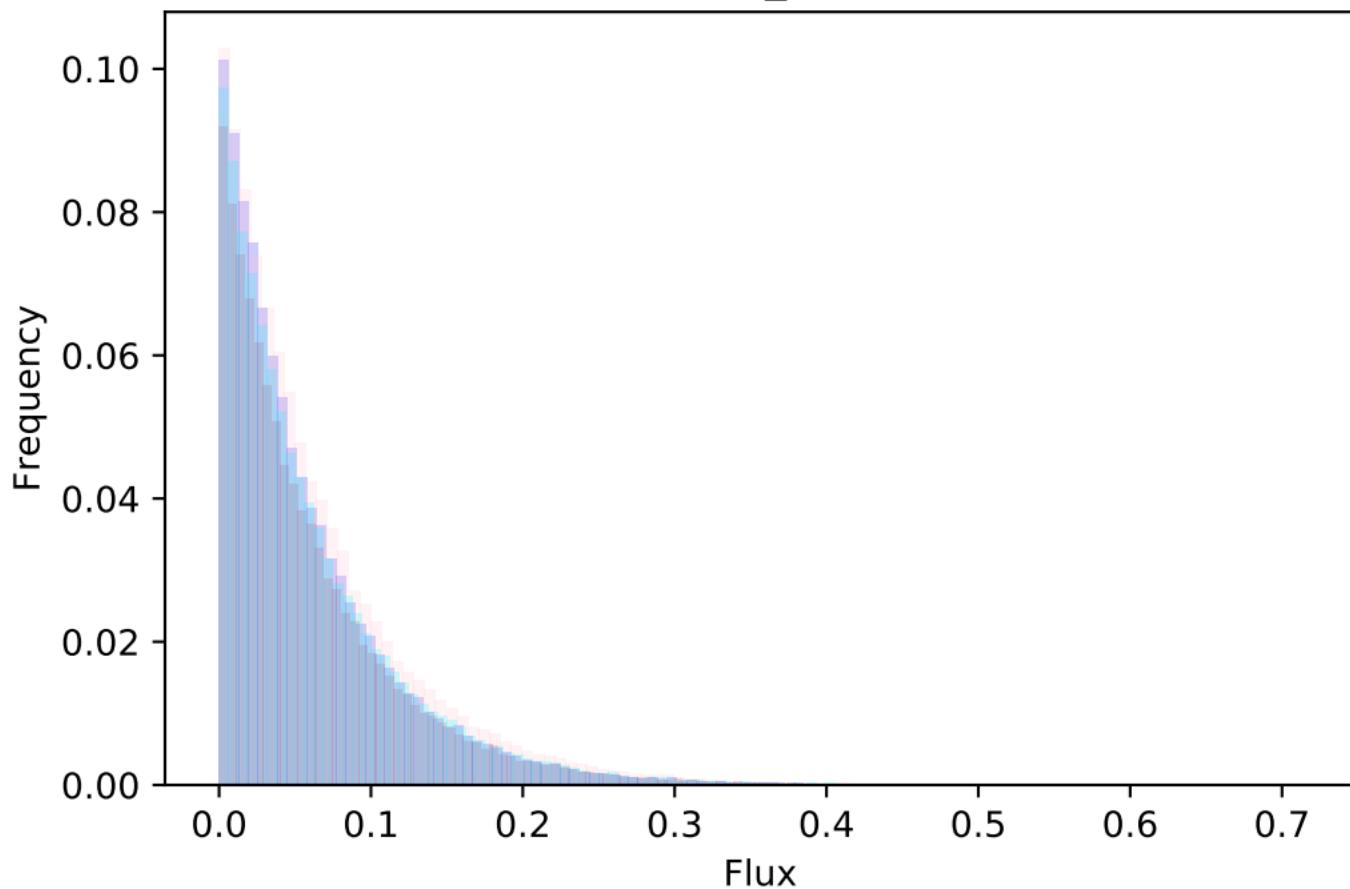
522:Trp_c -->



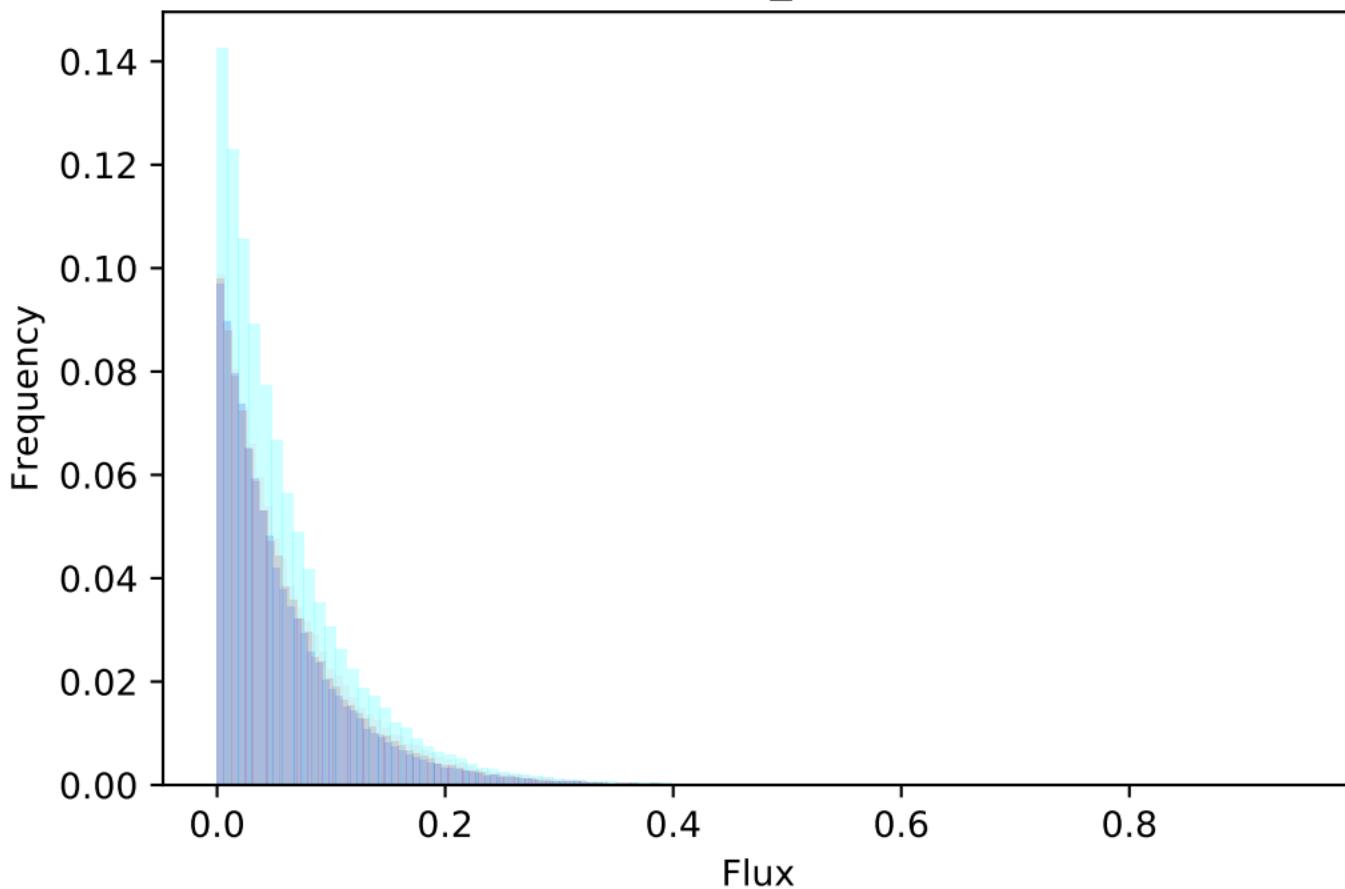
523:Trp_h -->



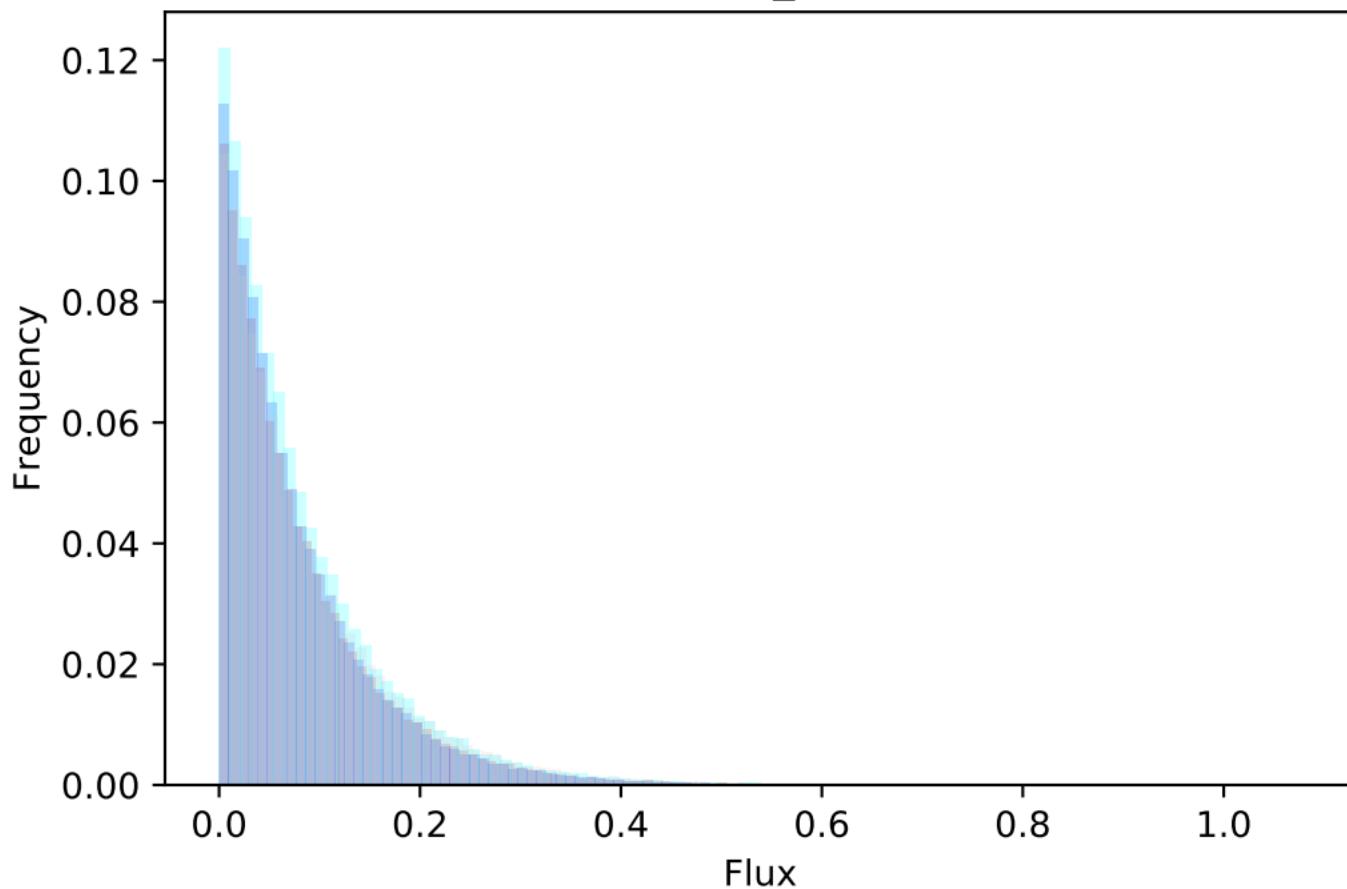
524:Trp_m -->



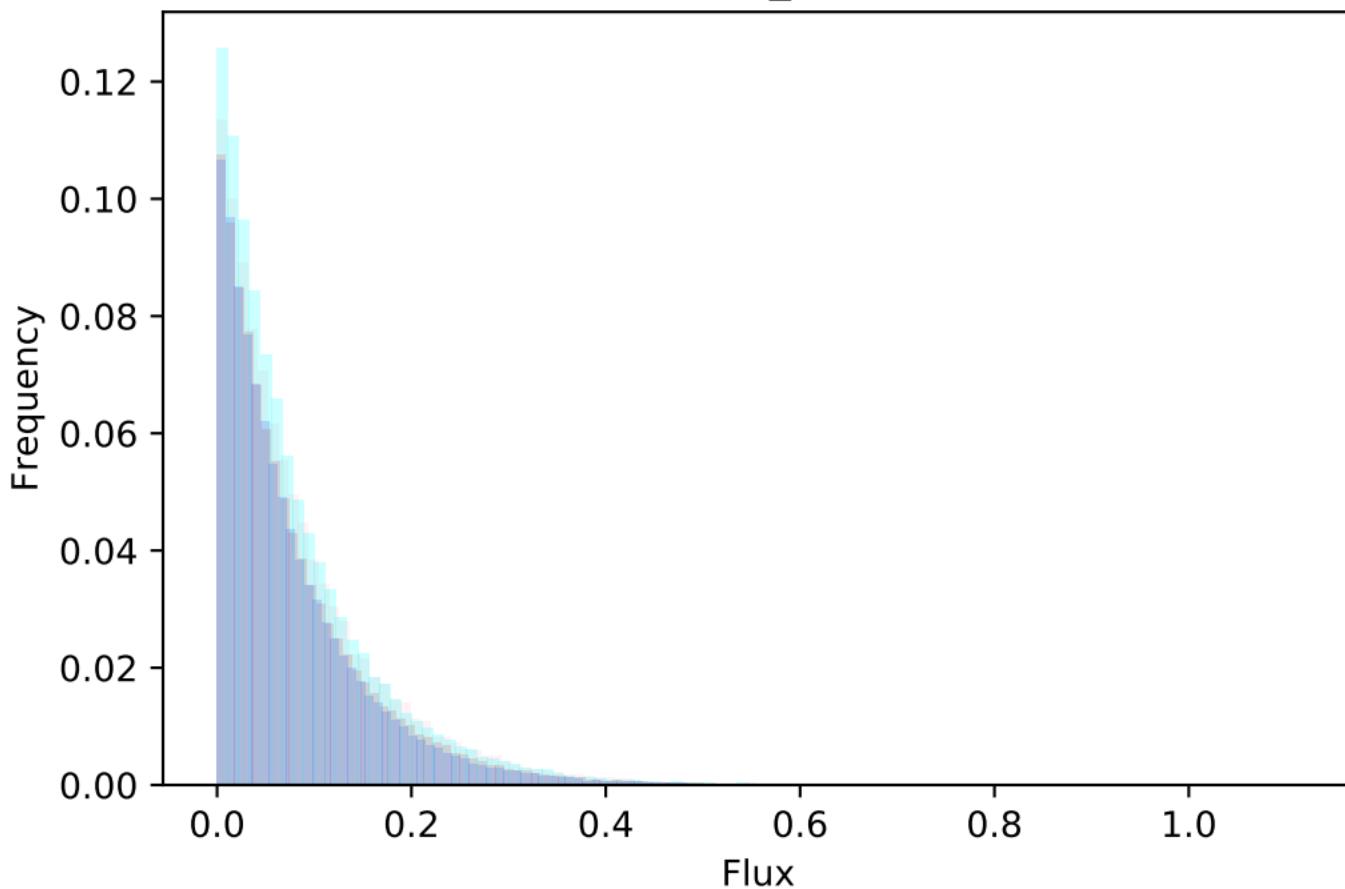
525:Trp_p -->



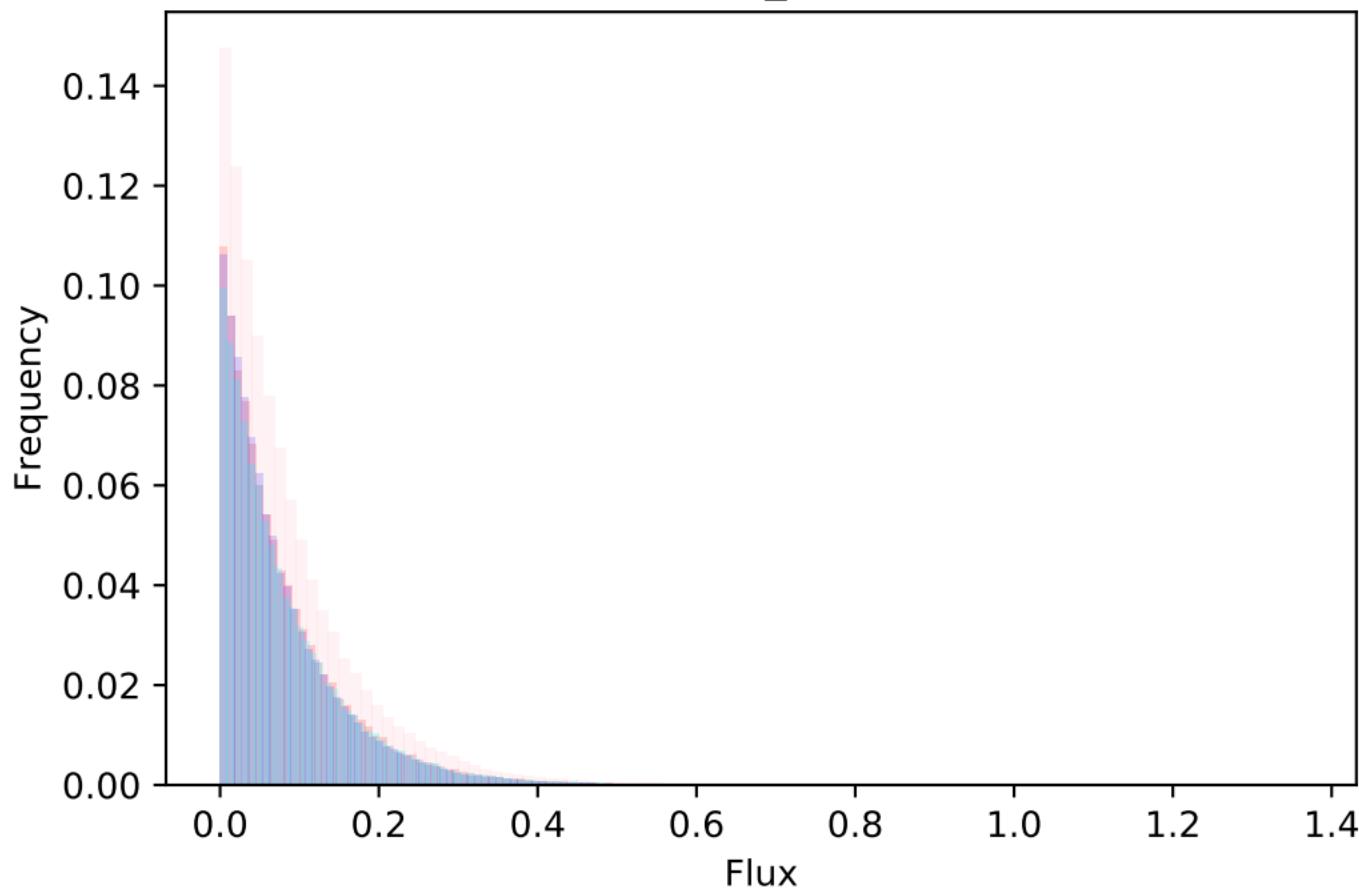
526:Tyr_c -->



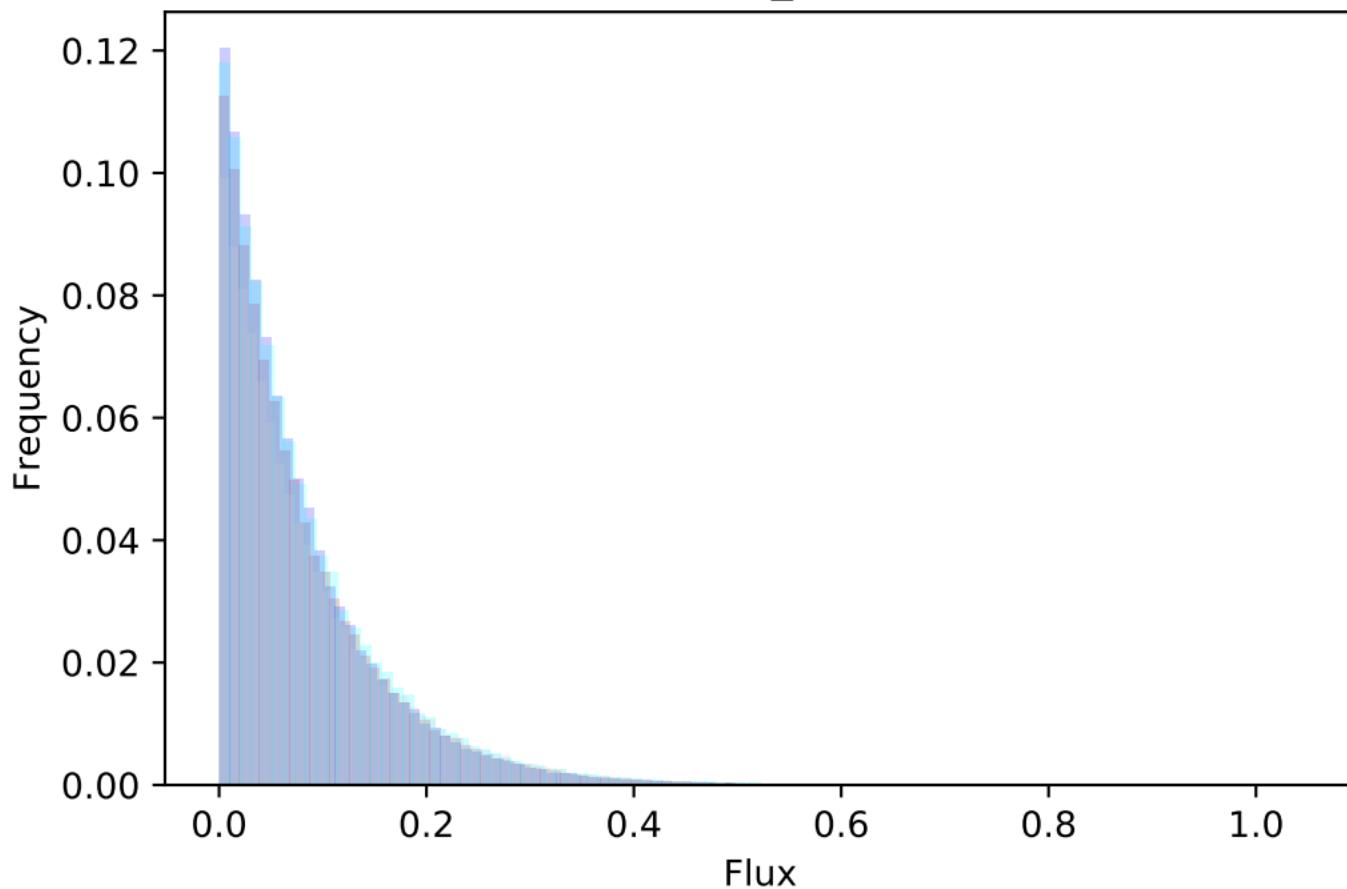
527:Tyr_h -->



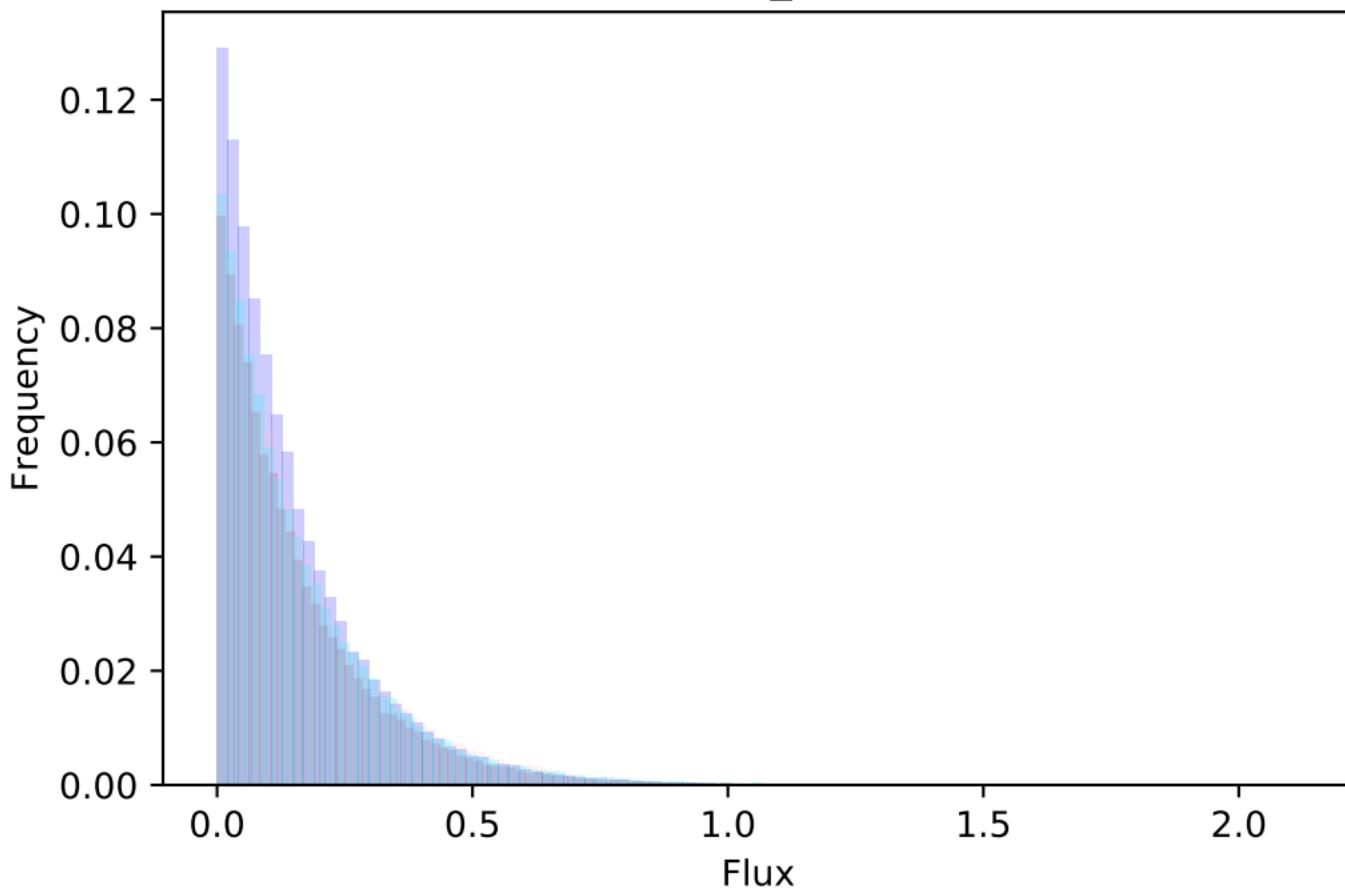
528:Tyr_m -->



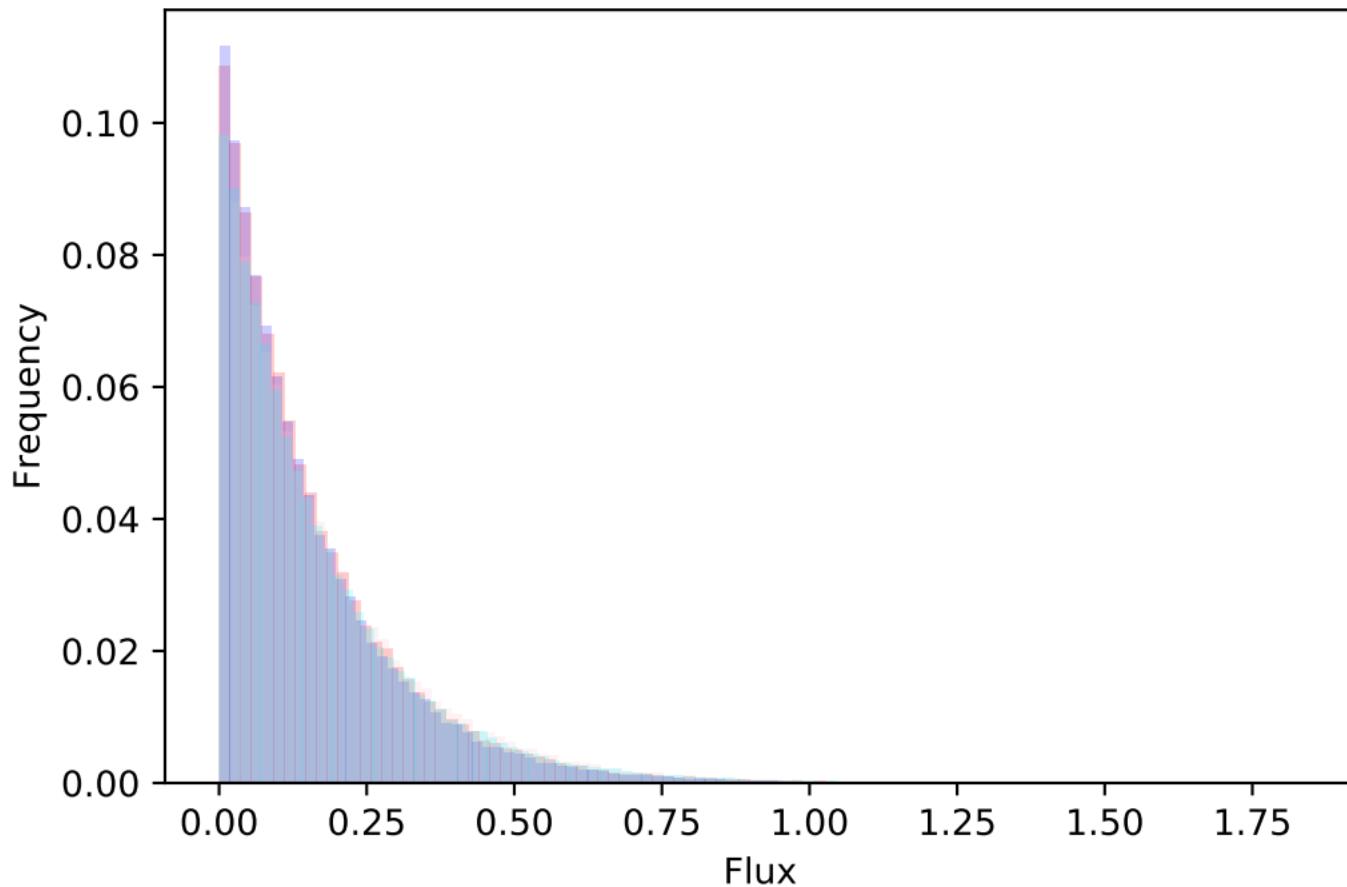
529:Tyr_p -->



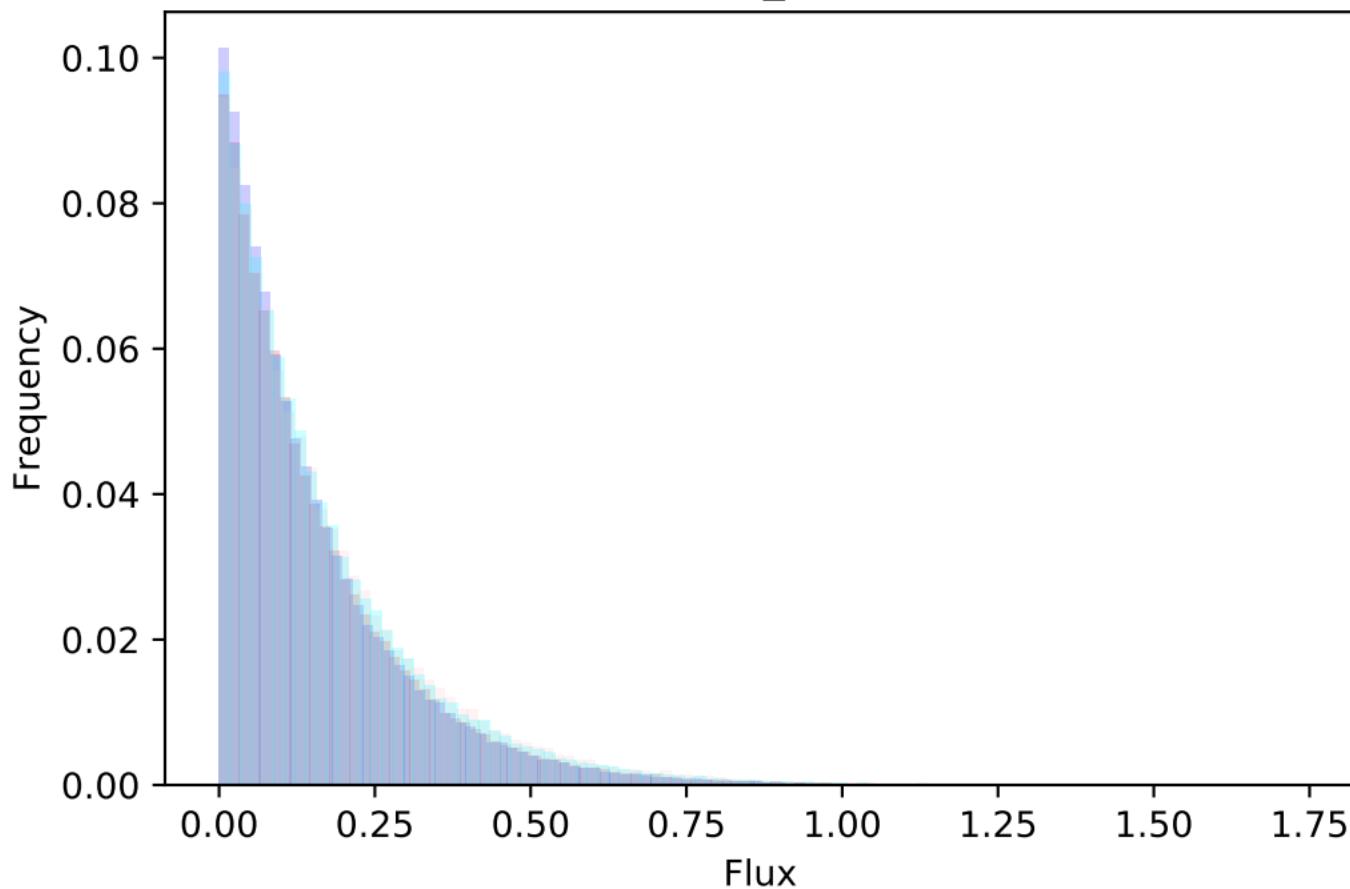
530:Val_c -->



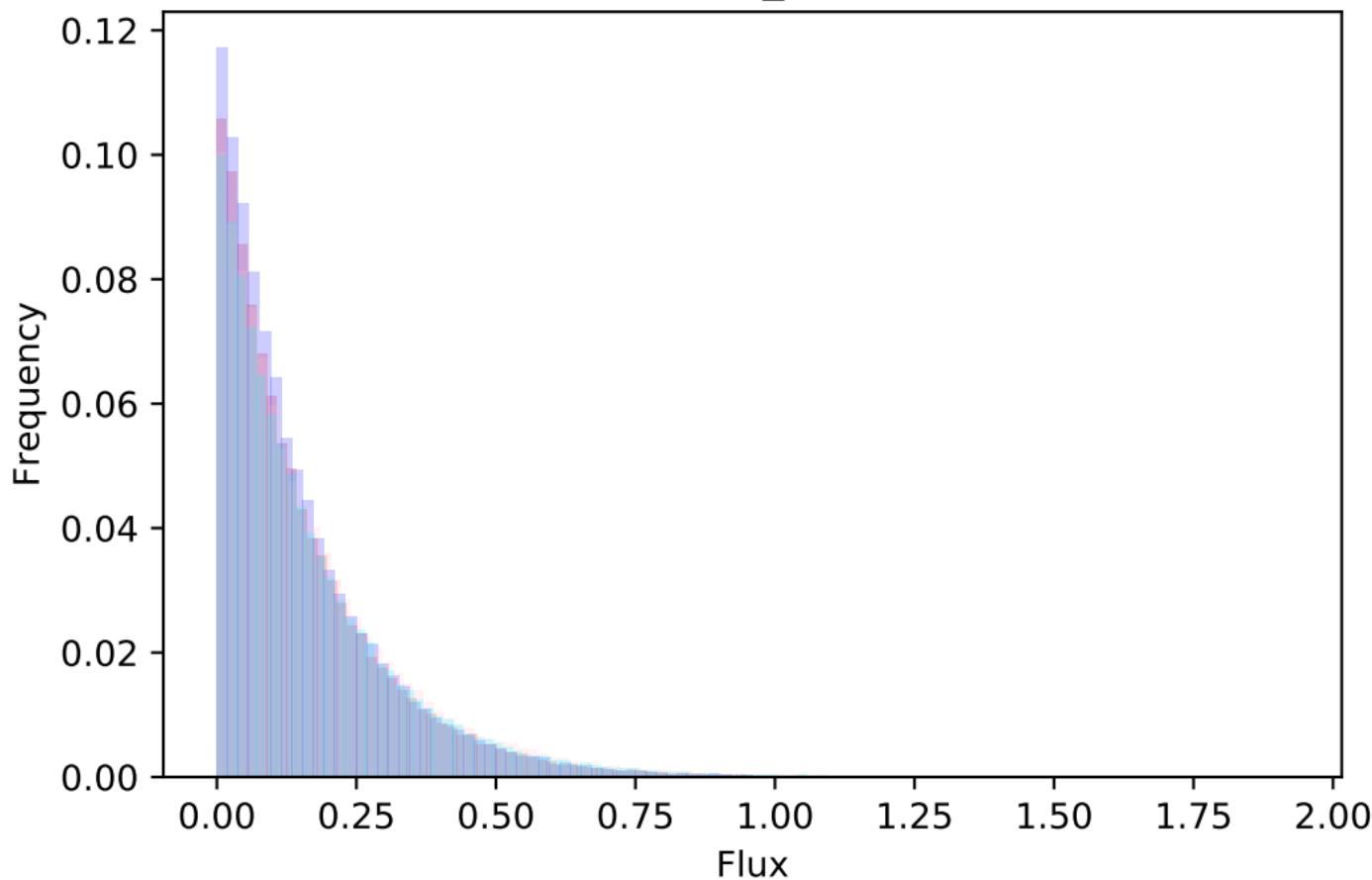
531:Val_h -->



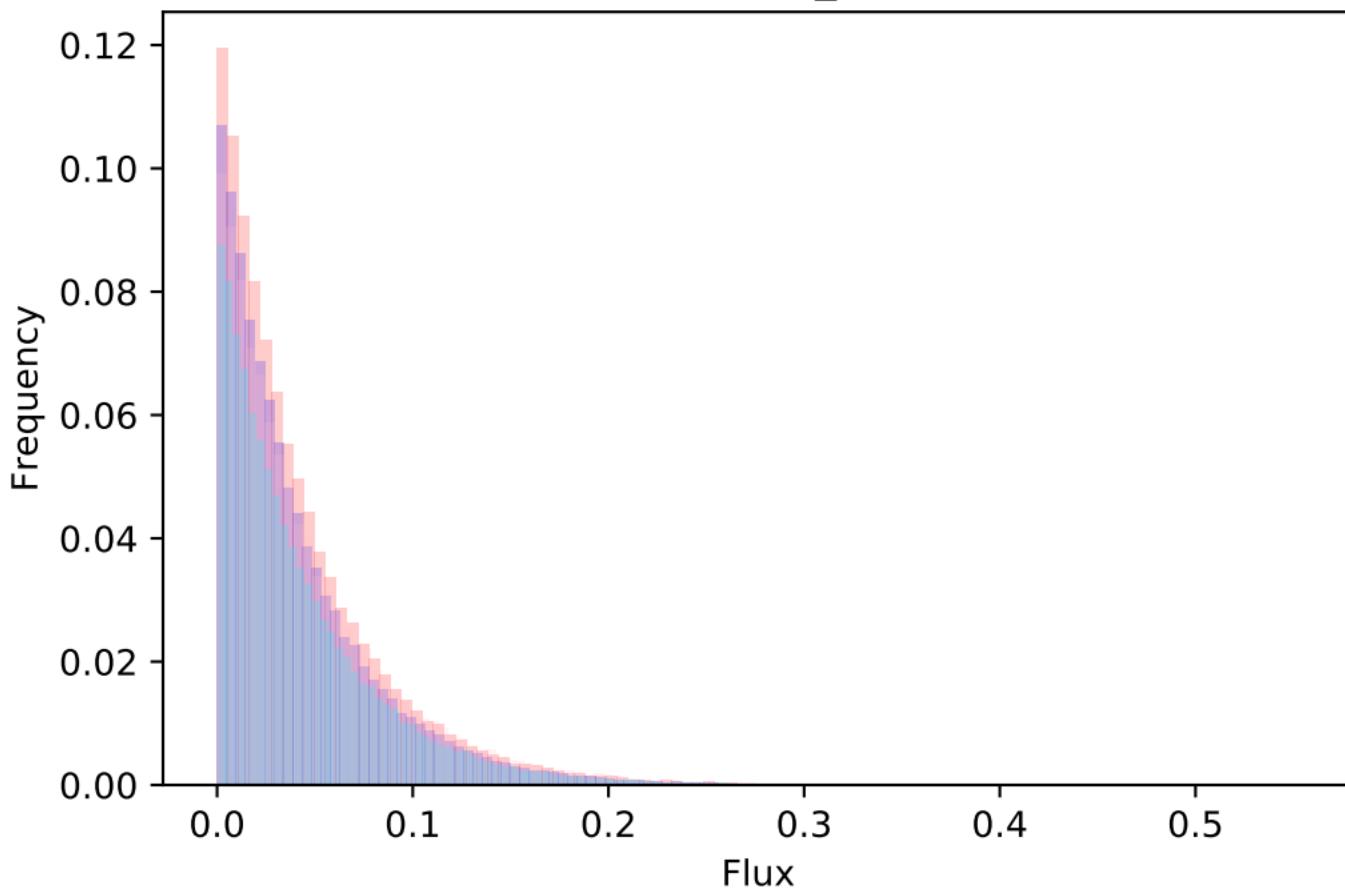
532:Val_m -->



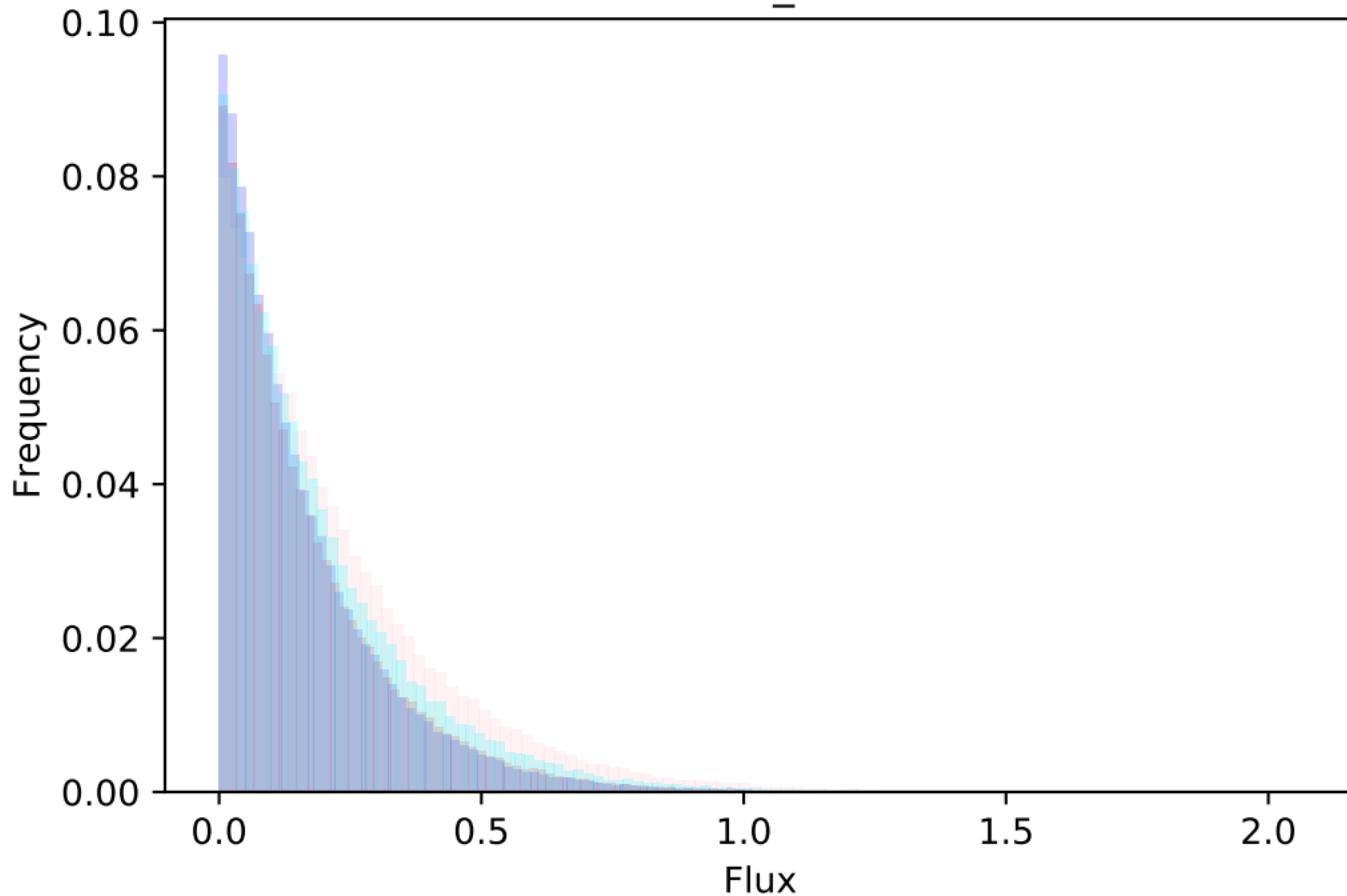
533:Val_p -->



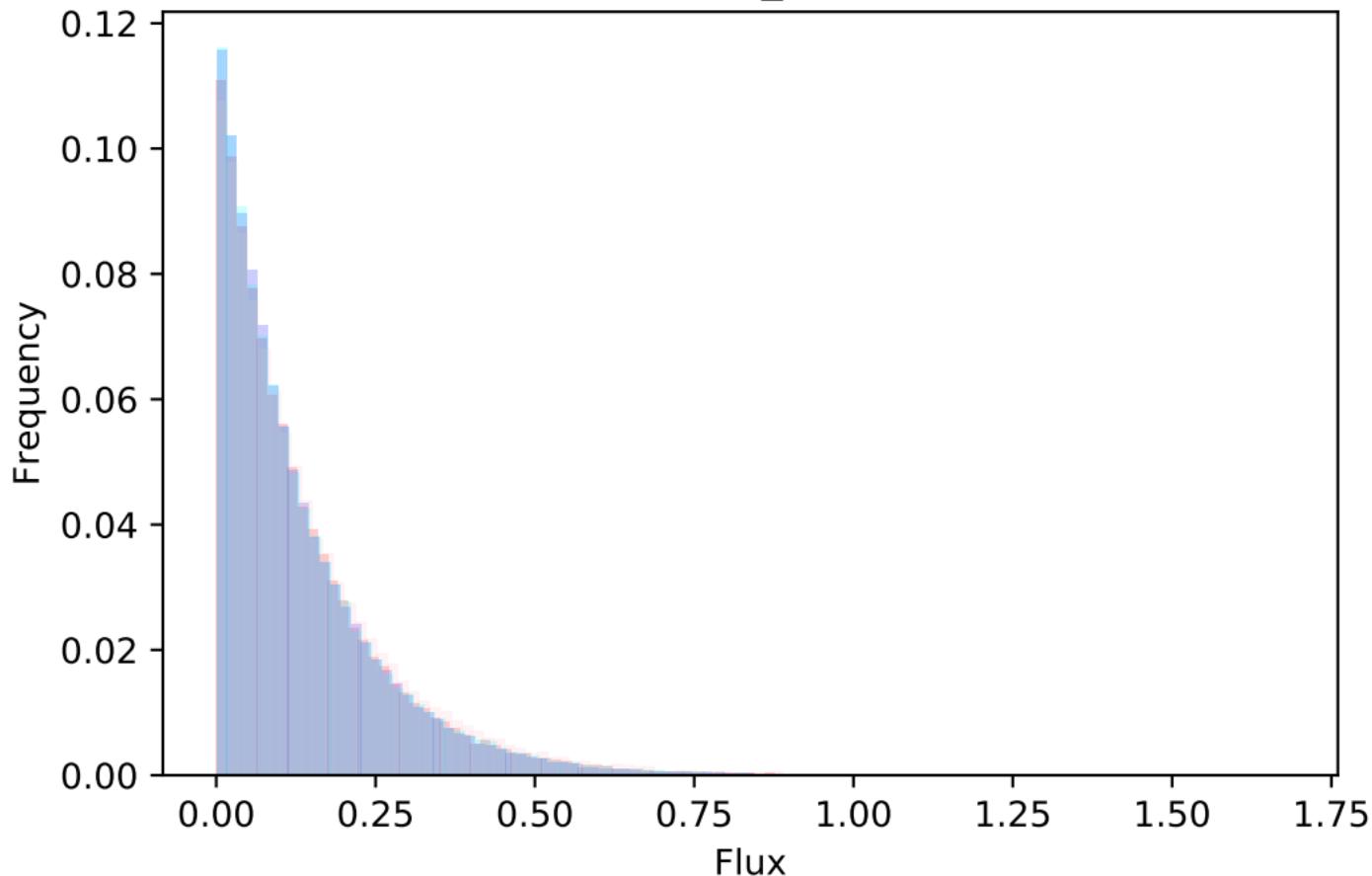
534:starch3_h -->



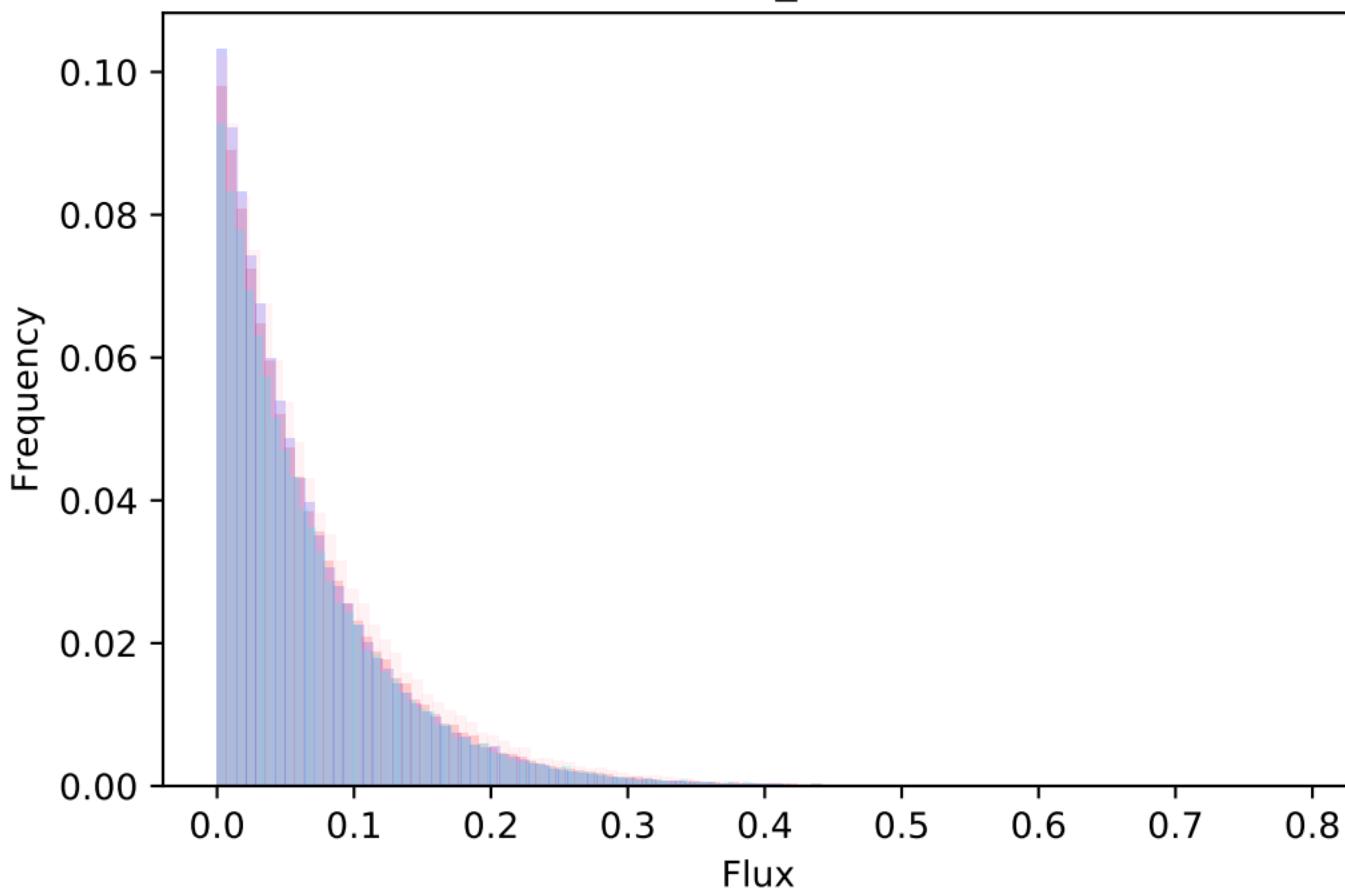
535:Glc_c -->



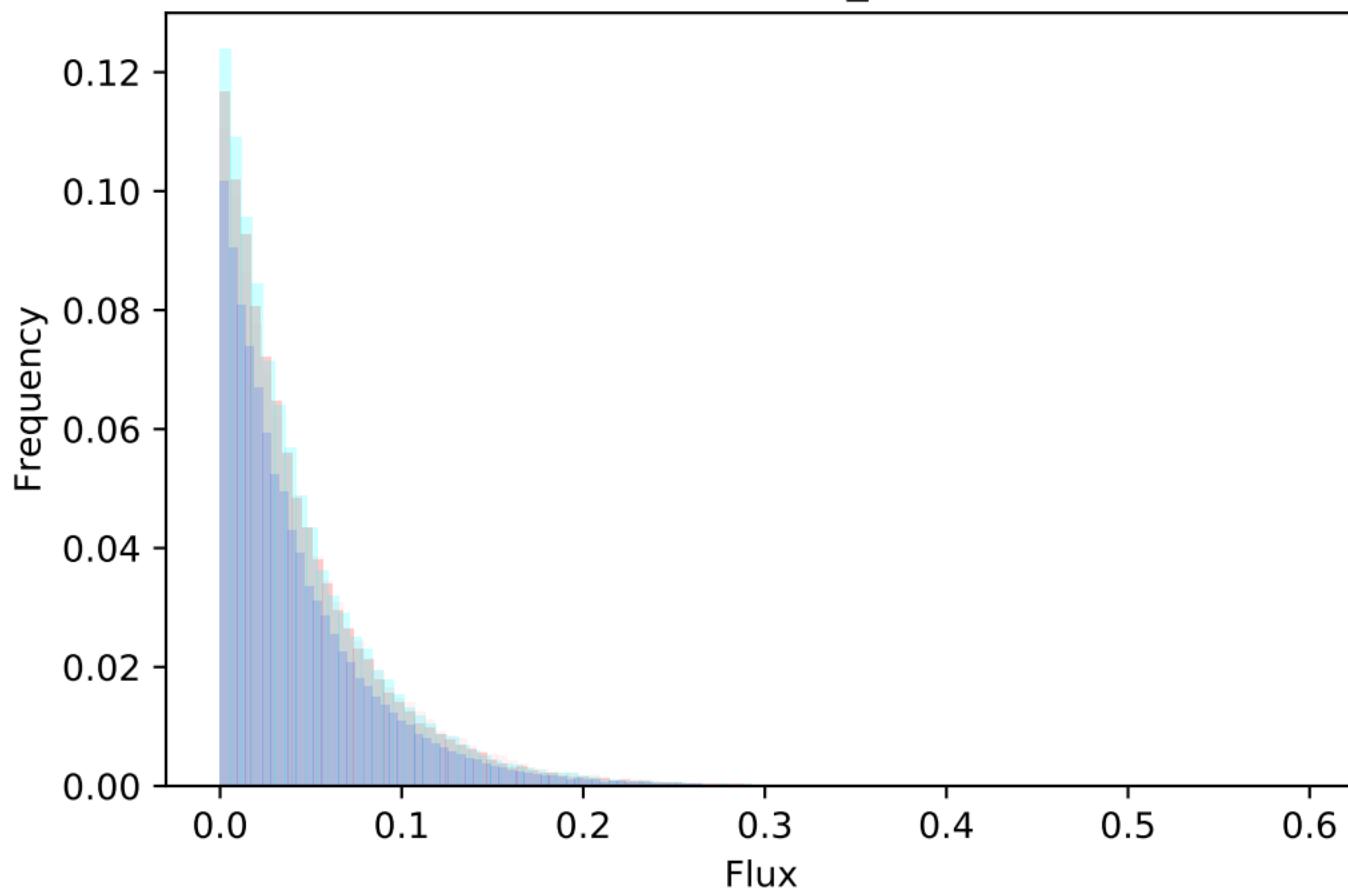
536:Frc_c -->



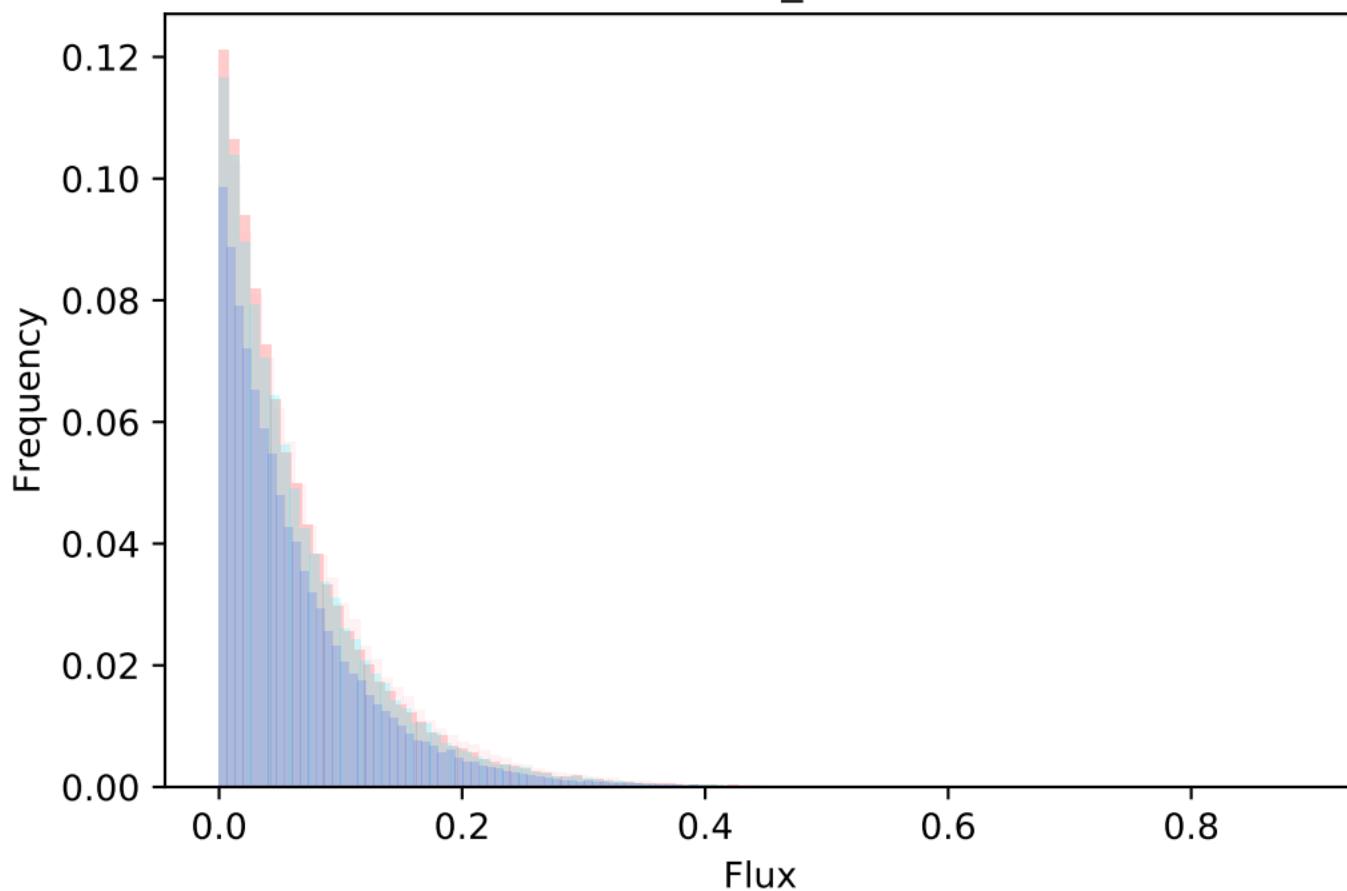
537:Suc_c -->



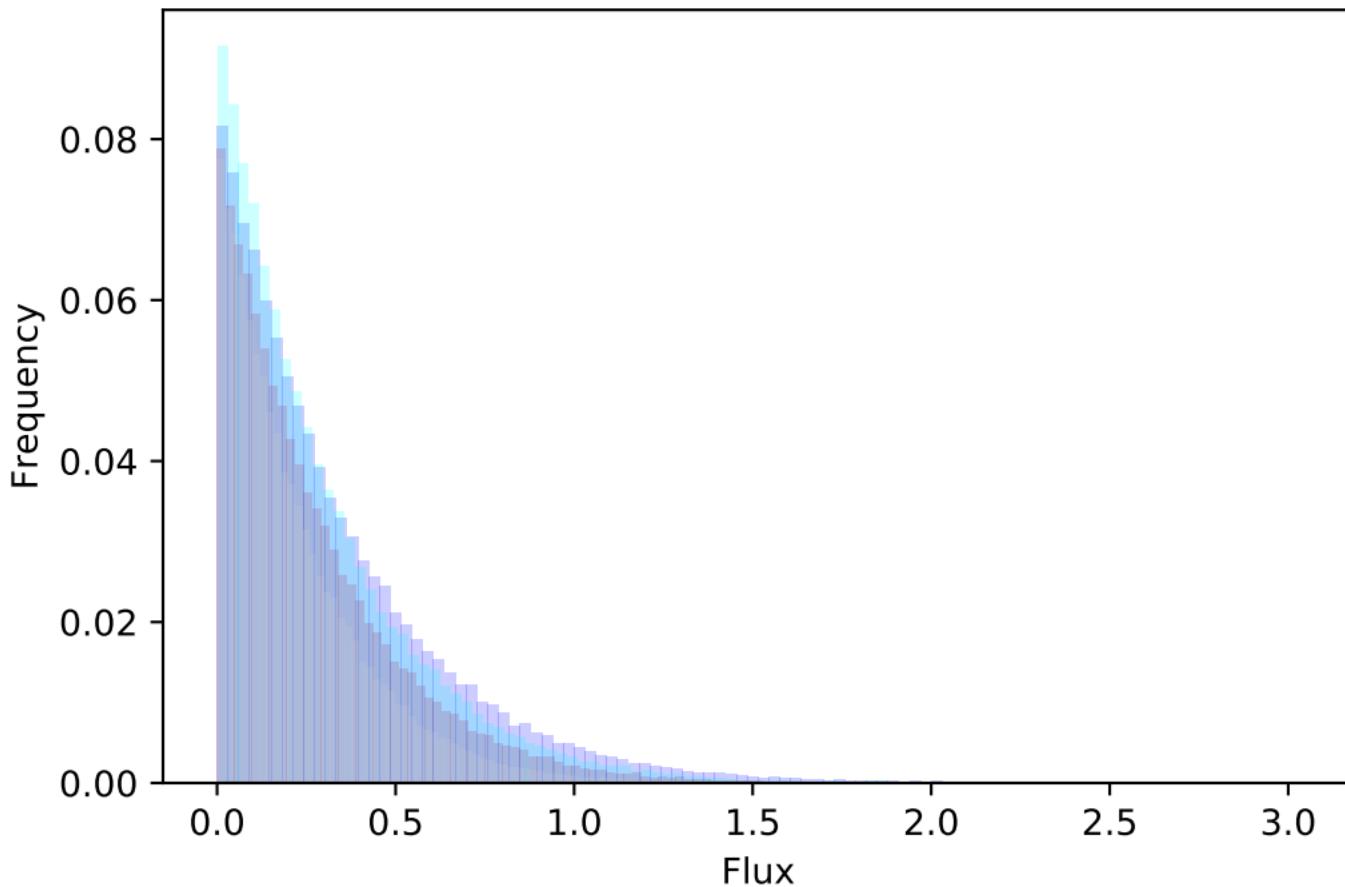
538:cellulose3_c -->



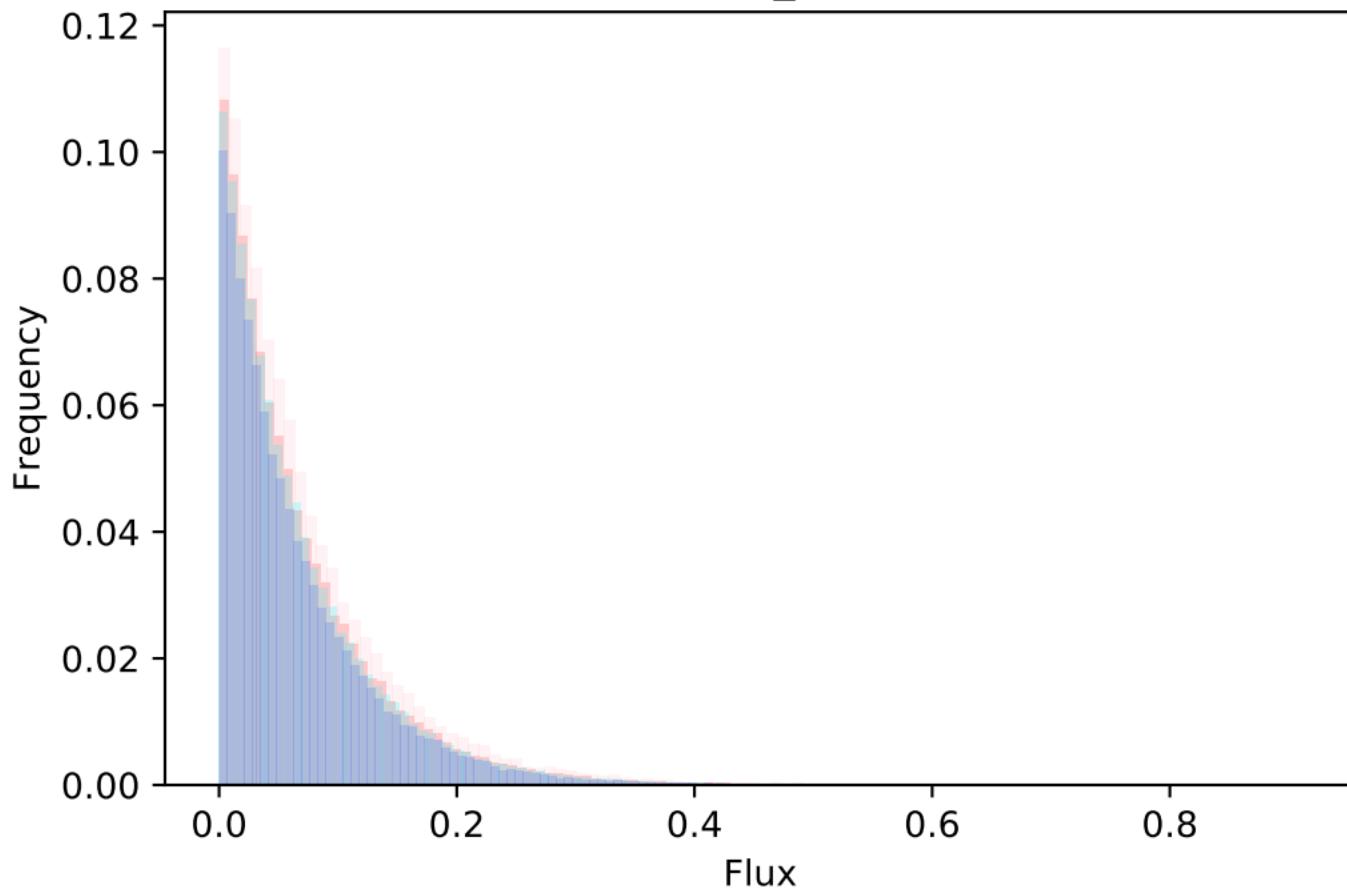
539:Mas_c -->

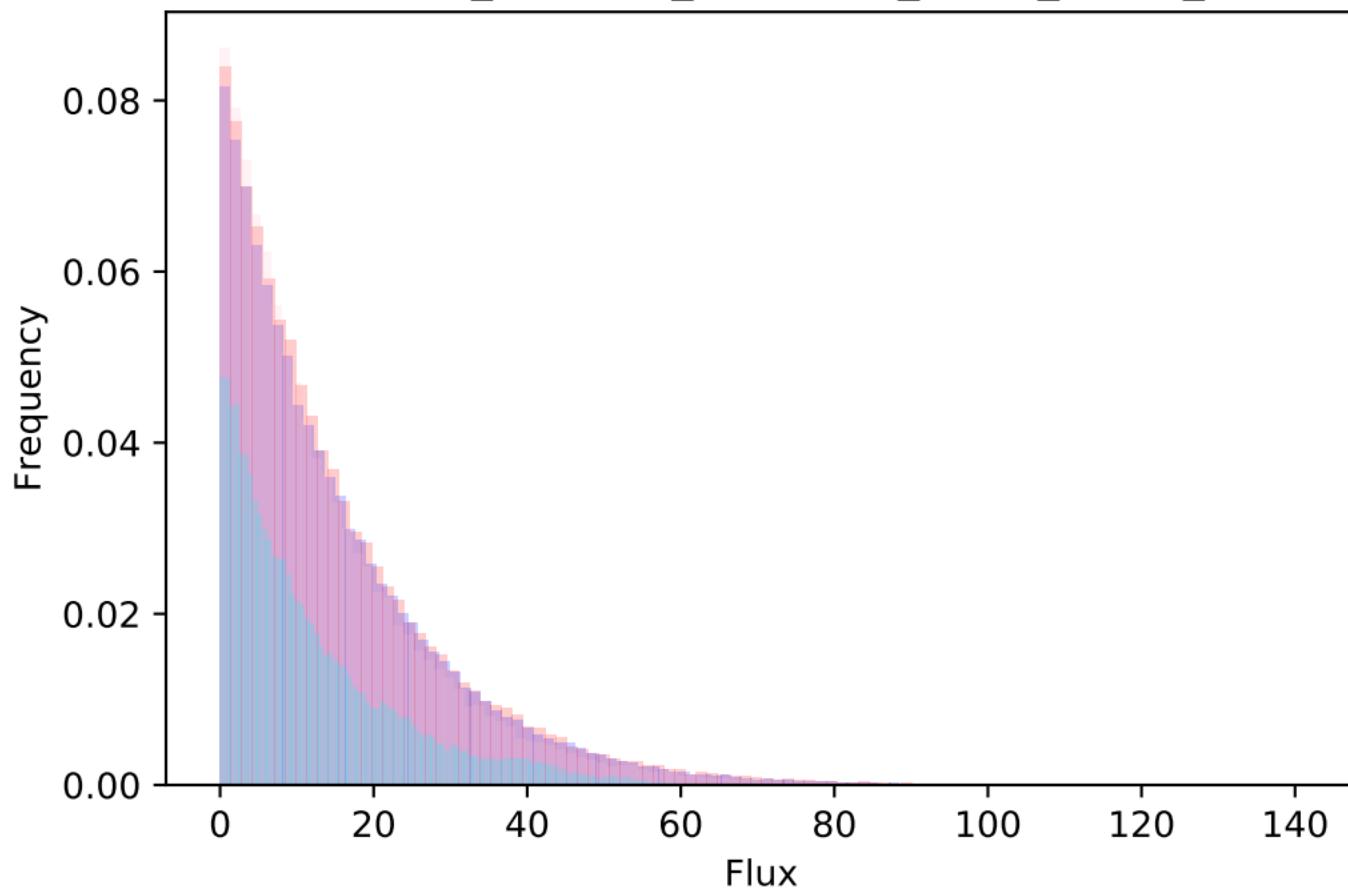
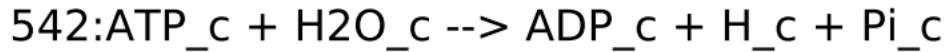


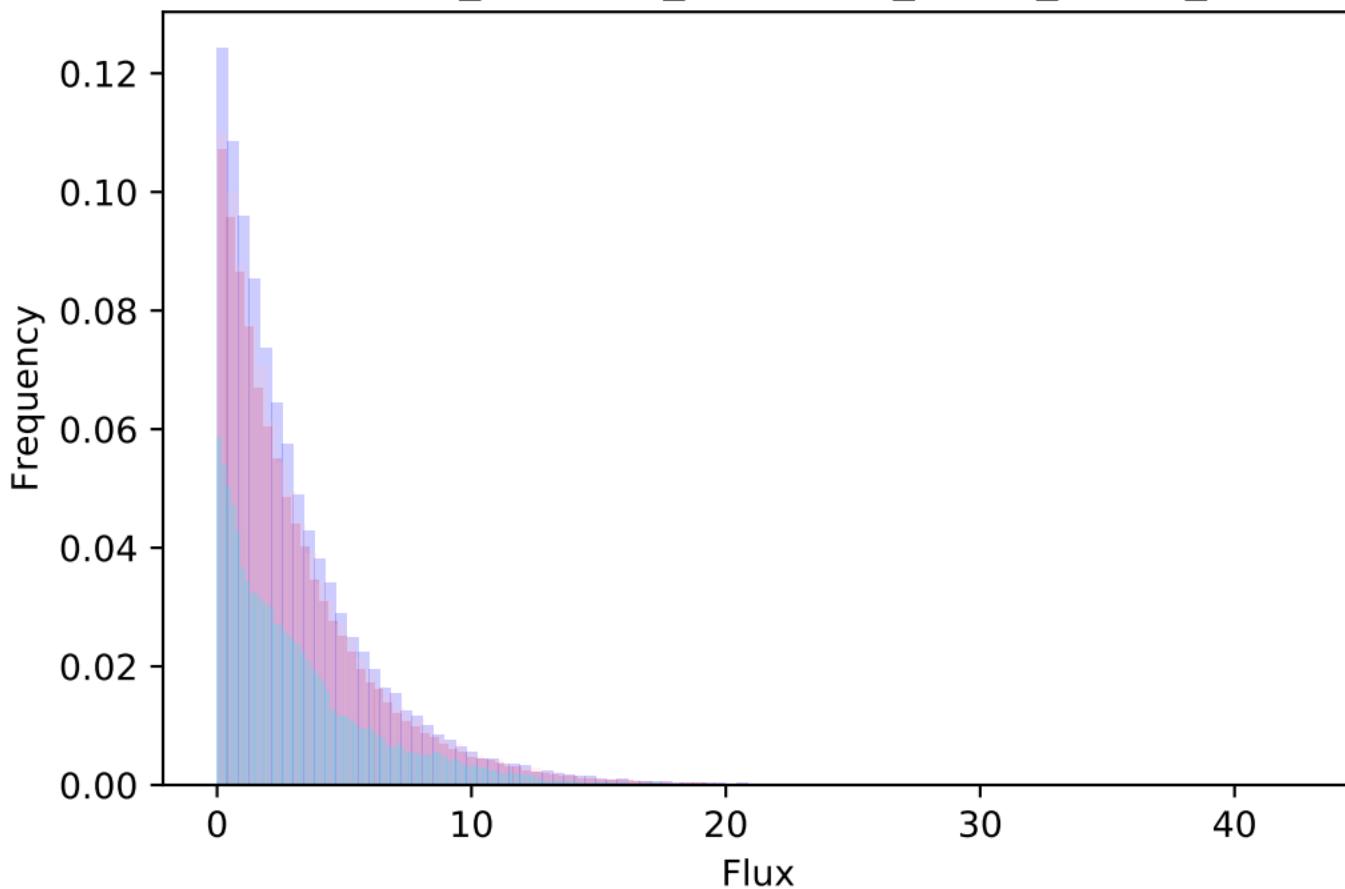
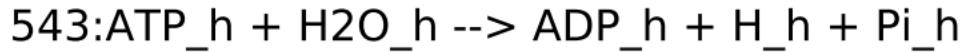
540:M_DASH_ACP_h --> ACP_h + H_h

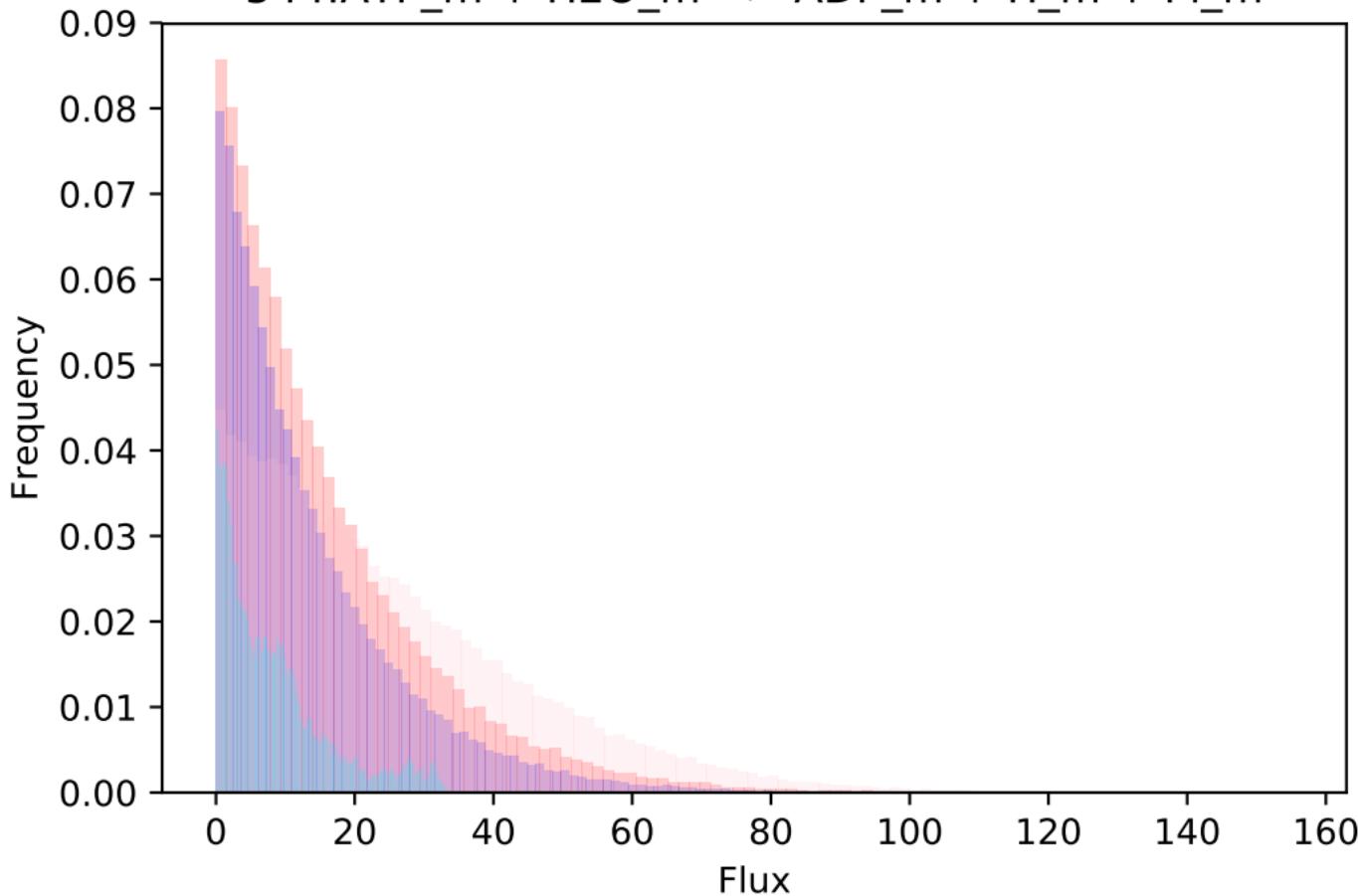
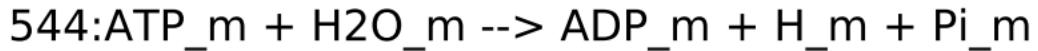


541:Tre_c -->

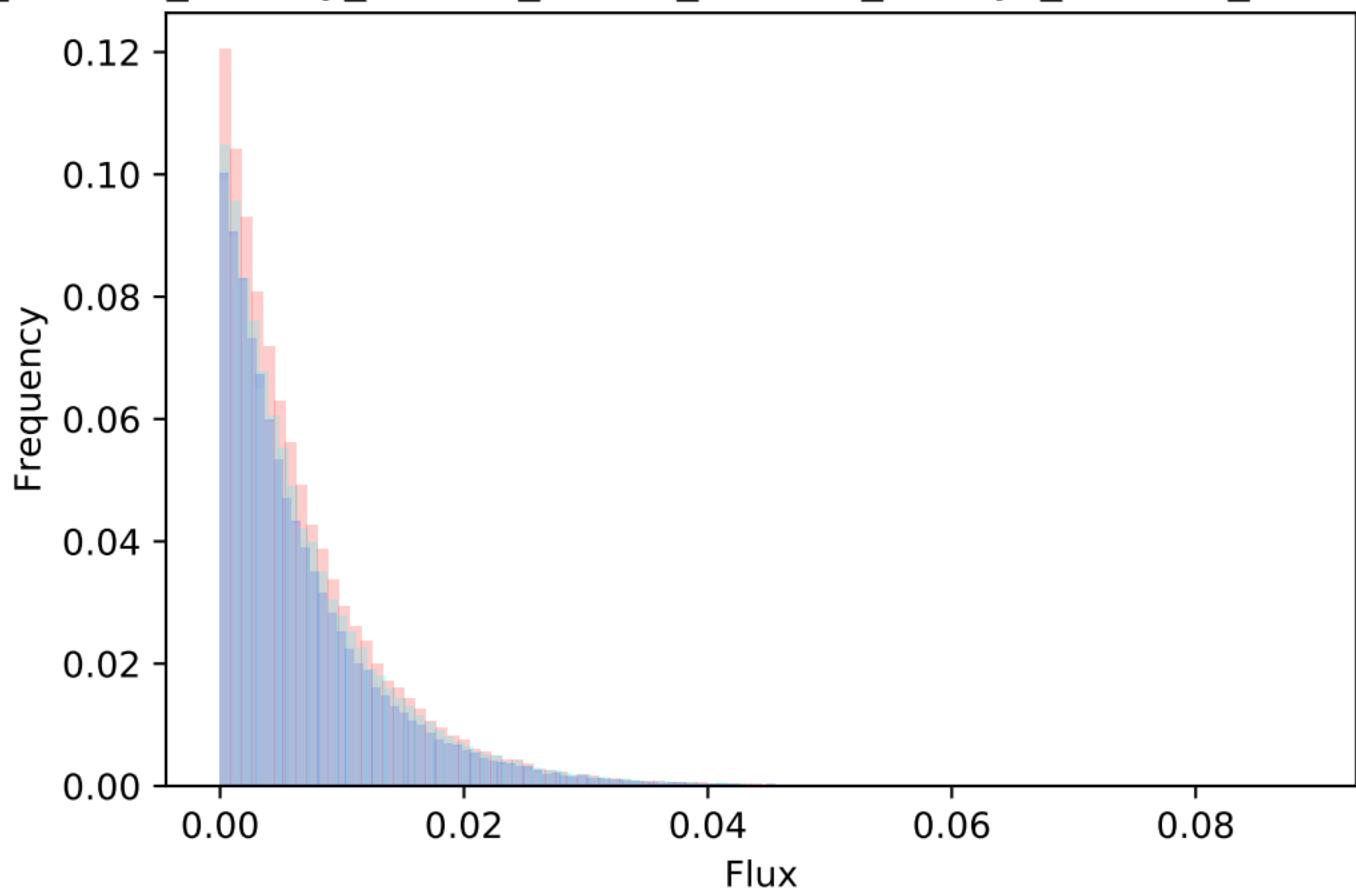




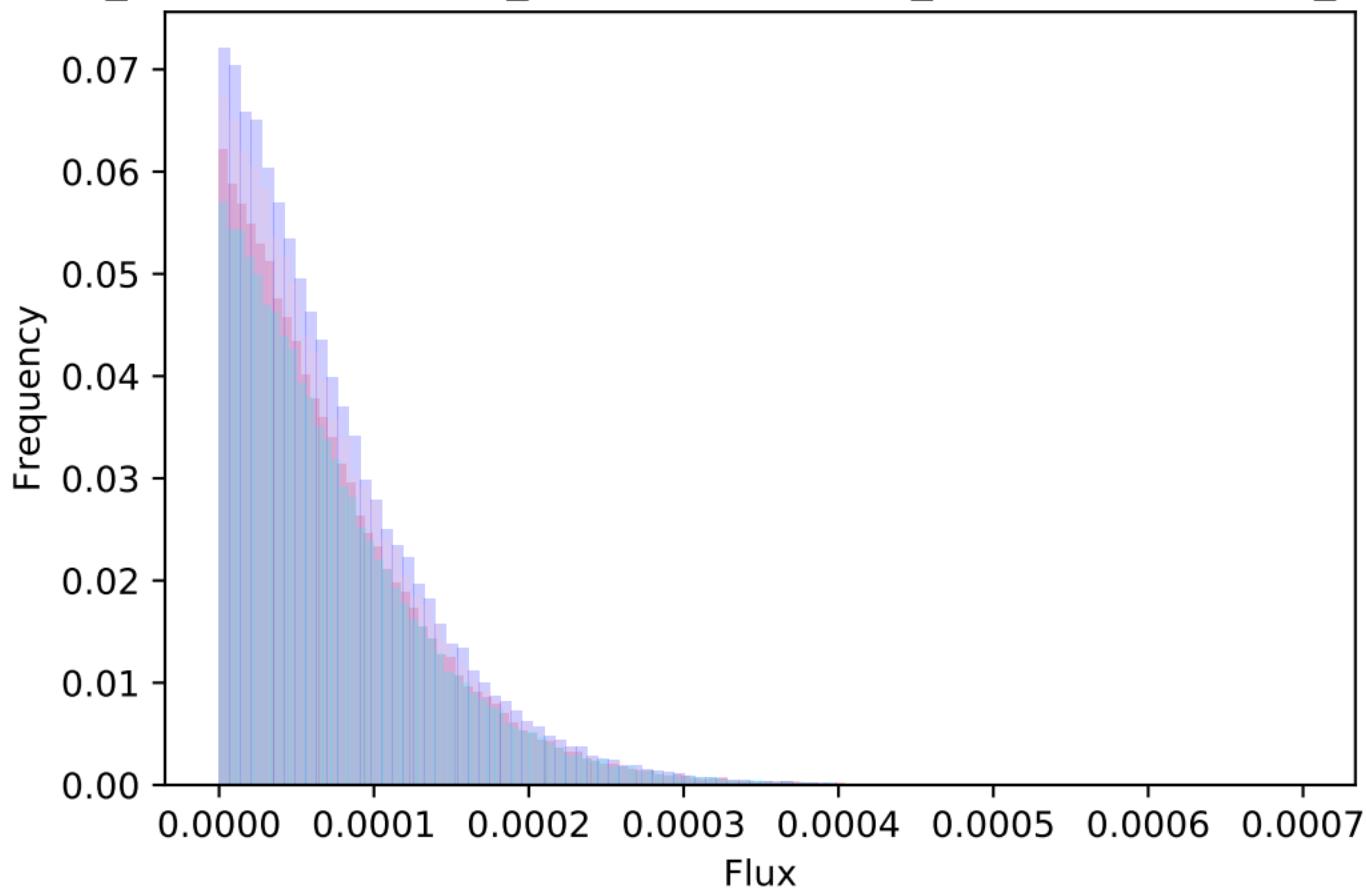




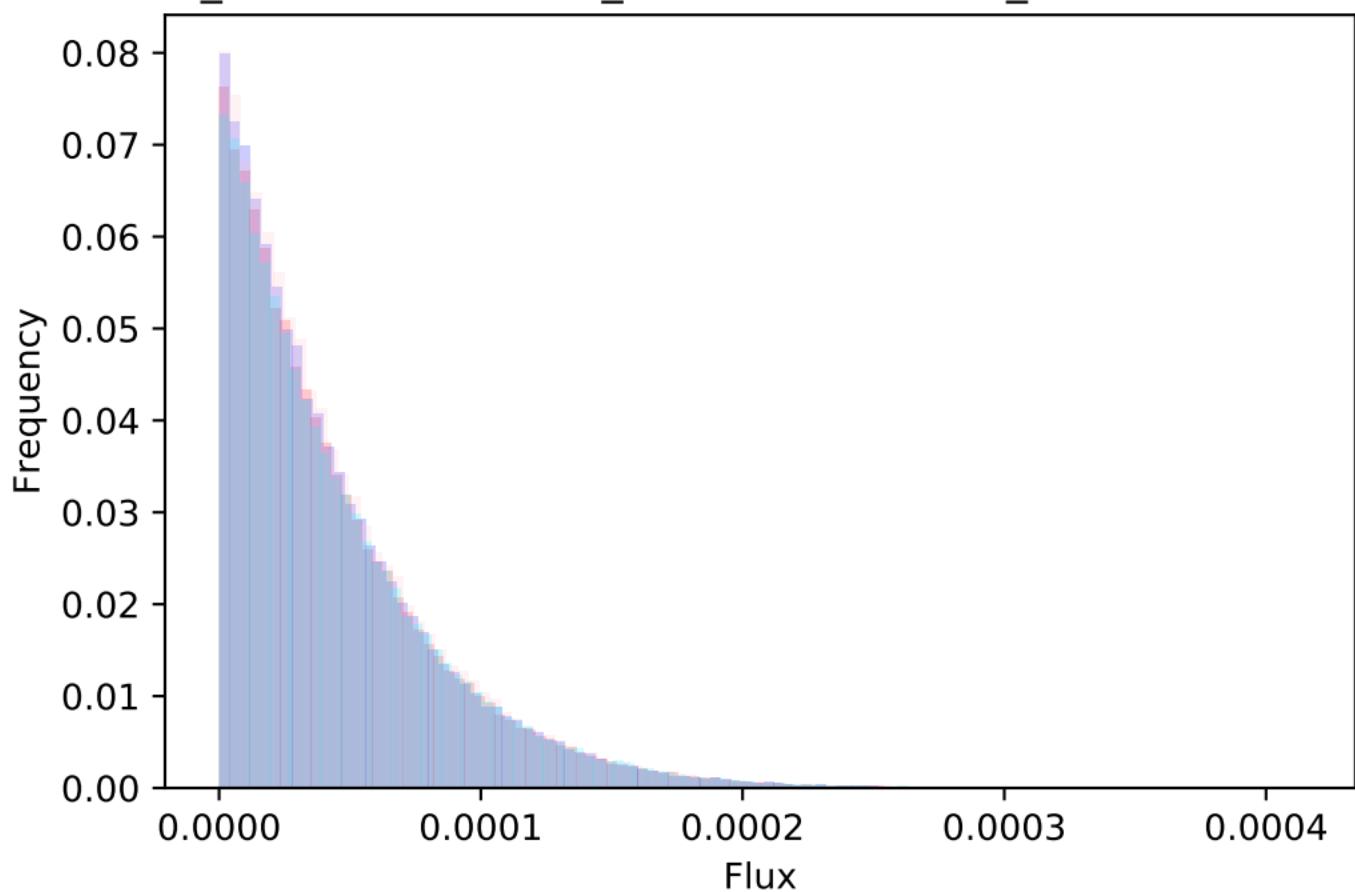
n_c + Glu_c + Gly_c + His_c + Ile_c + Leu_c + Lys_c + Met_c + Phe_c +



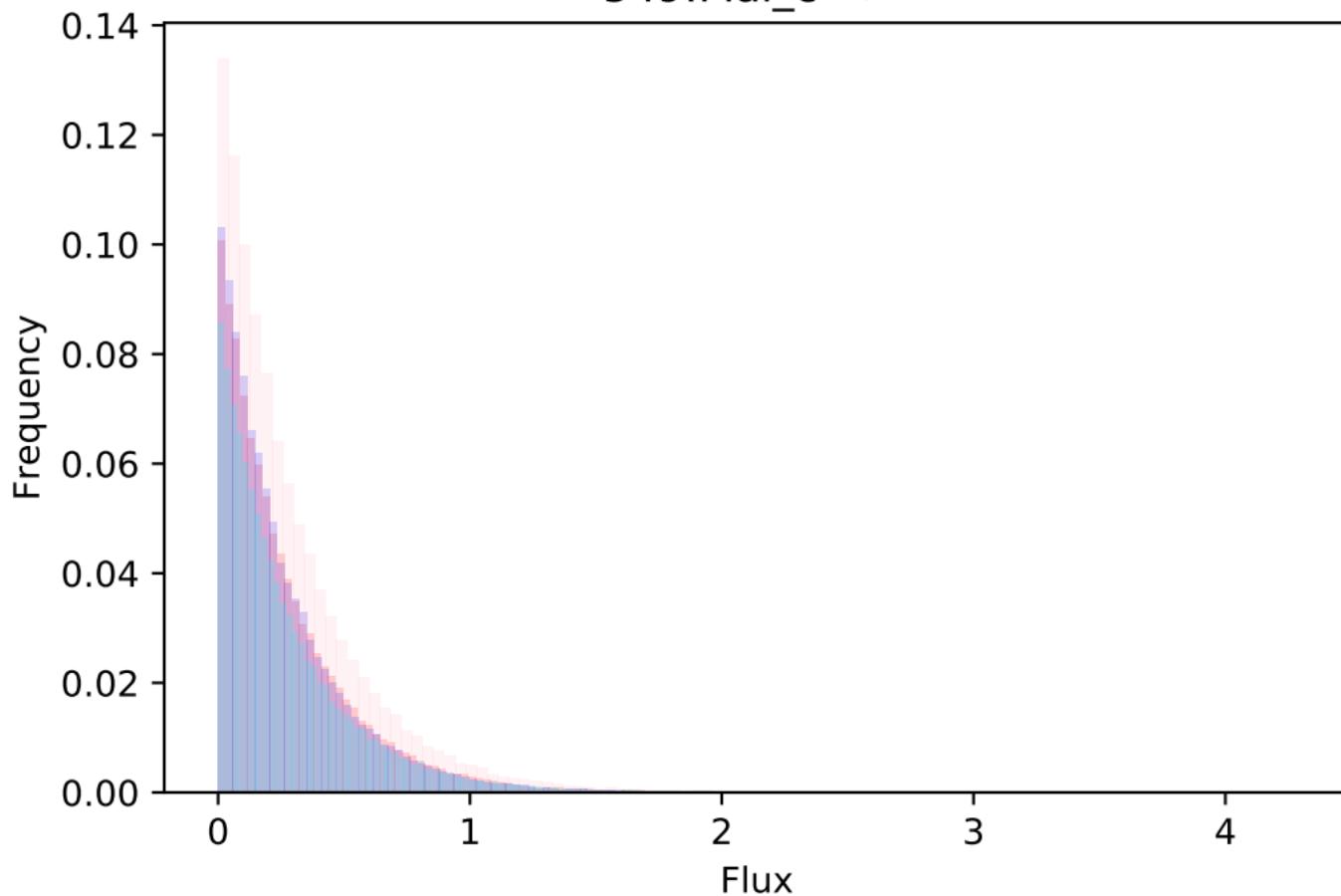
99 Mal_m + 2.27742 Mas_c + 30.37981 Met_c + 14.60727 Orn_h + 59.6



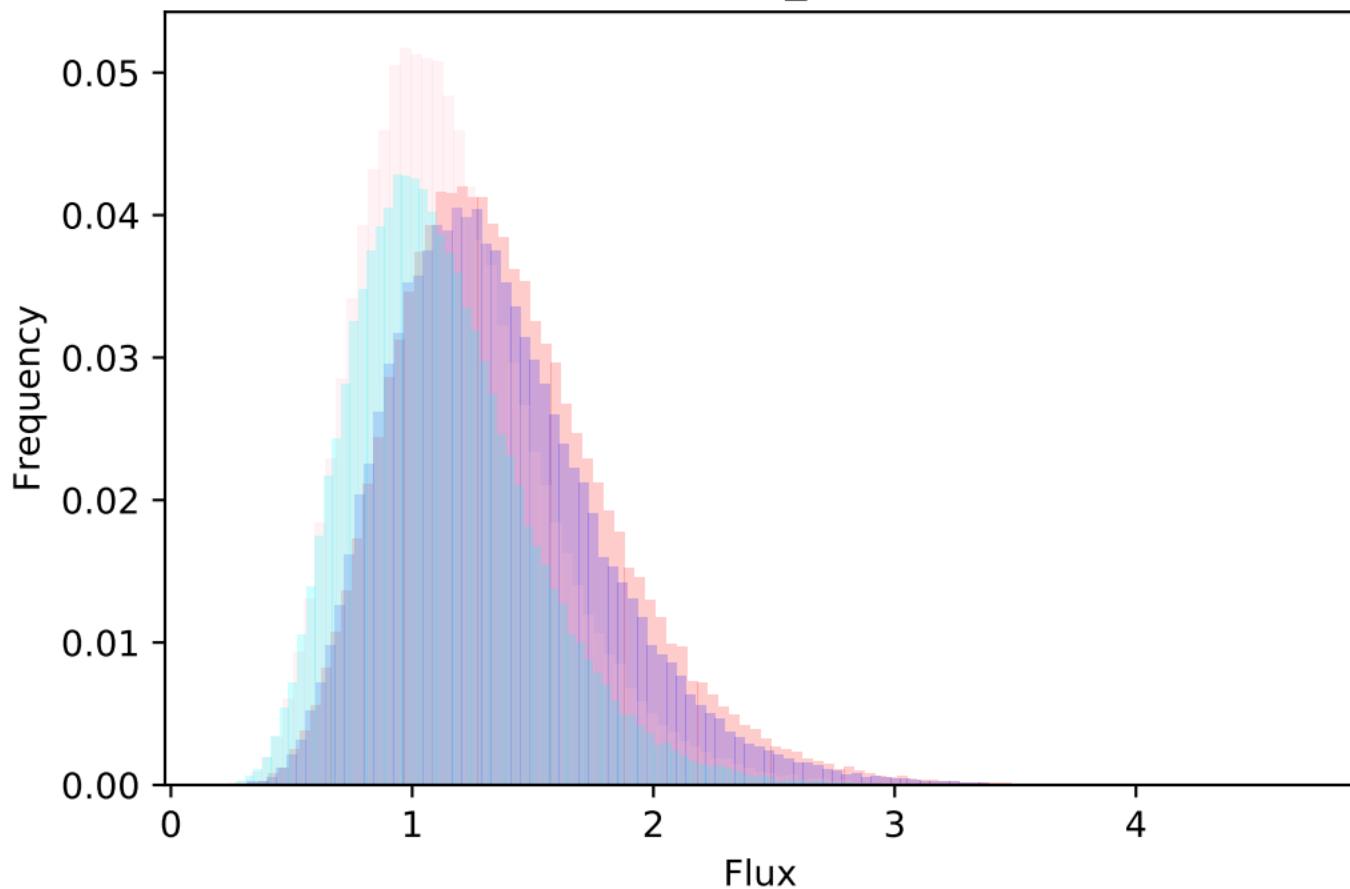
89856 Mal_m + 5.37965 Mas_c + 51.81818 Met_c + 9.64682 Orn_h + 1



549:Mal_c -->



550:Fum_c -->



551:starch1_h -->

