

Table 1: Data fake rates for Cut-Based τ ID

Selection	fake rate	total(+)	total (-)	stat	bkg
Loose Bar	0.8358059	0.0854893	0.0819371	0.0414520	0.0573043
Loose Cra	0.7390505	0.1677230	0.1679953	0.1586584	0.0168282
Loose End	0.9089602	0.0878709	0.0882388	0.0518360	0.0513935
Loose (TOL) Bar	0.1942671	0.0366138	0.0354531	0.0293866	0.0102280
Loose (TOL) Cra	0.4004636	0.1428758	0.1566854	0.1191510	0.0115747
Loose (TOL) End	0.3355393	0.0490046	0.0484975	0.0361268	0.0180319
Loose (MOL) Bar	0.1092772	0.0306662	0.0297116	0.0264495	0.0017854
Loose (MOL) Cra	0.1138096	0.0590374	0.0631387	0.0589470	0.0026984
Loose (MOL) End	0.1251360	0.0506808	0.0501832	0.0209577	0.0064417
Medium Bar	0.7965753	0.0822255	0.0783289	0.0438541	0.0555330
Medium Cra	0.6260270	0.1683710	0.1692564	0.1594516	0.0149158
Medium End	0.8737023	0.1073581	0.1093155	0.0576297	0.0576785
Medium (TOL) Bar	0.1725064	0.0421013	0.0408272	0.0362389	0.0096399
Medium (TOL) Cra	0.3147419	0.1348810	0.1520948	0.1089827	0.0091863
Medium (TOL) End	0.2967847	0.0410079	0.0410331	0.0351665	0.0178529
Medium (MOL) Bar	0.0922579	0.0366255	0.0353433	0.0309995	0.0010527
Medium (MOL) Cra	0.1141475	0.0614843	0.0655100	0.0607905	0.0030364
Medium (MOL) End	0.1103253	0.0328556	0.0328334	0.0199929	0.0064677
Tight Bar	0.6947826	0.0804858	0.0793971	0.0399454	0.0530888
Tight Cra	0.3405434	0.1464145	0.1443529	0.1095916	0.0072101
Tight End	0.7775442	0.1000461	0.1028980	0.0550014	0.0475738
Tight (TOL) Bar	0.1397050	0.0246879	0.0238366	0.0167587	0.0110405
Tight (TOL) Cra	0.1426552	0.1081546	0.1091853	0.0679332	0.0037663
Tight (TOL) End	0.2638198	0.0374094	0.0378589	0.0323486	0.0145616
Tight (MOL) Bar	0.0741951	0.0167759	0.0157324	0.0118820	0.0057912
Tight (MOL) Cra	0.0854741	0.0525135	0.0579407	0.0514317	0.0021408
Tight (MOL) End	0.1069241	0.0224365	0.0224792	0.0194988	0.0060339

Table 2: Data fake rates for LLH-Based τ ID

Selection	fake rate	total(+)	total (-)	stat	bkg
Loose Bar	0.9132040	0.0835989	0.0815990	0.0429823	0.0630411
Loose Cra	0.7971351	0.1746845	0.1783830	0.1702926	0.0193574
Loose End	0.9186031	0.0883588	0.0893145	0.0556420	0.0461995
Loose (TOL) Bar	0.2221665	0.0489470	0.0475366	0.0383779	0.0104402
Loose (TOL) Cra	0.4305846	0.1429299	0.1560364	0.1279272	0.0139180
Loose (TOL) End	0.3399010	0.0523212	0.0520651	0.0424813	0.0164589
Loose (MOL) Bar	0.1259620	0.0454557	0.0438830	0.0340158	0.0005548
Loose (MOL) Cra	0.1143480	0.0604867	0.0645775	0.0603318	0.0032369
Loose (MOL) End	0.1261757	0.0558332	0.0553509	0.0303473	0.0045139
Medium Bar	0.8668545	0.0938142	0.0917288	0.0435685	0.0671803
Medium Cra	0.6827439	0.1753381	0.1757942	0.1598554	0.0160772
Medium End	0.8738739	0.0951647	0.0963234	0.0566211	0.0489481
Medium (TOL) Bar	0.2016779	0.0331687	0.0314662	0.0205493	0.0160101
Medium (TOL) Cra	0.3716312	0.1347116	0.1500210	0.1168712	0.0105201
Medium (TOL) End	0.3098972	0.0424328	0.0421637	0.0357119	0.0161286
Medium (MOL) Bar	0.1143692	0.0251499	0.0238506	0.0172121	0.0085060
Medium (MOL) Cra	0.0854561	0.0550961	0.0602880	0.0514166	0.0021228
Medium (MOL) End	0.1123168	0.0371438	0.0368917	0.0200321	0.0054919
Tight Bar	0.7759070	0.0883594	0.0850028	0.0418078	0.0592947
Tight Cra	0.4543462	0.1292184	0.1297756	0.1271574	0.0099017
Tight End	0.8328651	0.0966252	0.1000072	0.0550300	0.0494823
Tight (TOL) Bar	0.1732333	0.0286885	0.0278635	0.0188549	0.0136242
Tight (TOL) Cra	0.2283327	0.0882162	0.0990813	0.0879538	0.0061105
Tight (TOL) End	0.2915497	0.0393550	0.0389418	0.0340013	0.0155853
Tight (MOL) Bar	0.0988944	0.0194074	0.0190955	0.0138516	0.0076891
Tight (MOL) Cra	0.0569383	0.0493792	0.0560203	0.0413610	0.0013827
Tight (MOL) End	0.1034053	0.0298479	0.0298090	0.0190244	0.0054825

Table 3: Data fake rates for BDT-Based τ ID

Selection	fake rate	total(+)	total (-)	stat	bkg
Loose Bar	0.8967133	0.0825825	0.0800886	0.0424925	0.0595797
Loose Cra	0.7631907	0.1811483	0.1846749	0.1730814	0.0131907
Loose End	0.9354431	0.0931980	0.0946872	0.0550239	0.0482028
Loose (TOL) Bar	0.2143504	0.0711530	0.0698577	0.0654047	0.0075100
Loose (TOL) Cra	0.4298431	0.1466857	0.1595251	0.1309306	0.0131764
Loose (TOL) End	0.3416041	0.0464535	0.0464243	0.0428742	0.0122272
Loose (MOL) Bar	0.1200480	0.0674546	0.0663439	0.0621221	0.0037305
Loose (MOL) Cra	0.1141320	0.0610669	0.0651164	0.0607778	0.0030209
Loose (MOL) End	0.1342468	0.0442842	0.0443839	0.0323663	0.0007157
Medium Bar	0.7799715	0.0841280	0.0802276	0.0416397	0.0568444
Medium Cra	0.6824923	0.1623590	0.1681341	0.1598861	0.0158256
Medium End	0.8448004	0.0840373	0.0843433	0.0533734	0.0495482
Medium (TOL) Bar	0.1798933	0.0298679	0.0285137	0.0192207	0.0137695
Medium (TOL) Cra	0.4003854	0.1282414	0.1433742	0.1221097	0.0114965
Medium (TOL) End	0.3069628	0.0423492	0.0420757	0.0344085	0.0161617
Medium (MOL) Bar	0.0986736	0.0196093	0.0198914	0.0138140	0.0074684
Medium (MOL) Cra	0.1139940	0.0647744	0.0685681	0.0601389	0.0028829
Medium (MOL) End	0.1154386	0.0380933	0.0381217	0.0200066	0.0056463
Tight Bar	0.5941810	0.0718715	0.0698384	0.0371541	0.0469498
Tight Cra	0.4552352	0.1310330	0.1334233	0.1281016	0.0107907
Tight End	0.6063867	0.0633474	0.0643350	0.0499202	0.0366537
Tight (TOL) Bar	0.1451485	0.0248036	0.0245687	0.0171059	0.0115980
Tight (TOL) Cra	0.1997819	0.0918139	0.1027815	0.0816117	0.0053374
Tight (TOL) End	0.2261316	0.0398718	0.0394186	0.0295236	0.0124818
Tight (MOL) Bar	0.0742591	0.0151452	0.0150540	0.0118854	0.0058552
Tight (MOL) Cra	0.0569440	0.0430754	0.0505533	0.0413668	0.0013884
Tight (MOL) End	0.0784468	0.0362883	0.0361948	0.0164102	0.0042628

Table 4: Data fake rates for Cut-Based τ ID + Loose Cut-Based e-veto

Selection	fake rate	total(+)	total (-)	stat	bkg
Loose Bar	0.0662419	0.0253890	0.0246942	0.0244230	0.0027240
Loose Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Loose End	0.6269687	0.0901052	0.0913027	0.0481244	0.0364643
Loose (TOL) Bar	0.0485702	0.0235685	0.0234147	0.0229832	0.0013389
Loose (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Loose (TOL) End	0.1440800	0.0242572	0.0244551	0.0225709	0.0075815
Loose (MOL) Bar	0.0250610	0.0229718	0.0228879	0.0223320	0.0009976
Loose (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Loose (MOL) End	0.0874799	0.0194698	0.0198207	0.0172085	0.0043939
Medium Bar	0.0607303	0.0239520	0.0232325	0.0228394	0.0037270
Medium Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium End	0.6225509	0.0985164	0.0997323	0.0521892	0.0409485
Medium (TOL) Bar	0.0448027	0.0216063	0.0214321	0.0209000	0.0024574
Medium (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium (TOL) End	0.1387962	0.0247797	0.0249686	0.0227658	0.0082324
Medium (MOL) Bar	0.0214497	0.0180449	0.0179943	0.0172261	0.0002770
Medium (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium (MOL) End	0.0817942	0.0180776	0.0184294	0.0169314	0.0046428
Tight Bar	0.0530086	0.0131858	0.0129991	0.0099462	0.0041487
Tight Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight End	0.5664272	0.0905607	0.0918721	0.0489338	0.0352700
Tight (TOL) Bar	0.0371061	0.0098661	0.0098177	0.0082572	0.0029042
Tight (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (TOL) End	0.1288589	0.0245946	0.0247323	0.0216135	0.0071971
Tight (MOL) Bar	0.0158967	0.0056632	0.0057035	0.0053448	0.0012387
Tight (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (MOL) End	0.0784598	0.0174752	0.0178066	0.0164488	0.0042758

Table 5: Data fake rates for LLH-Based τ ID + Loose Cut-Based e-veto

Selection	fake rate	total(+)	total (-)	stat	bkg
Loose Bar	0.0688868	0.0389735	0.0378363	0.0363644	0.0027744
Loose Cra	0.0285429	0.0320151	0.0320438	0.0289554	0.0007651
Loose End	0.6356827	0.0958716	0.0971643	0.0498256	0.0362762
Loose (TOL) Bar	0.0563386	0.0360104	0.0354868	0.0340769	0.0006646
Loose (TOL) Cra	0.0285439	0.0320166	0.0320453	0.0289567	0.0007661
Loose (TOL) End	0.1469287	0.0247147	0.0249424	0.0230018	0.0074629
Loose (MOL) Bar	0.0286544	0.0351409	0.0348584	0.0324895	0.0022902
Loose (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Loose (MOL) End	0.0871945	0.0186105	0.0189897	0.0172732	0.0041084
Medium Bar	0.0689593	0.0138123	0.0127972	0.0114192	0.0054414
Medium Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium End	0.6133445	0.0985380	0.1001132	0.0500400	0.0347095
Medium (TOL) Bar	0.0530489	0.0119359	0.0117506	0.0099443	0.0041890
Medium (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium (TOL) End	0.1375494	0.0249466	0.0251230	0.0222976	0.0069856
Medium (MOL) Bar	0.0265155	0.0089464	0.0087749	0.0069405	0.0020856
Medium (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium (MOL) End	0.0770240	0.0167145	0.0170456	0.0162977	0.0028400
Tight Bar	0.0565838	0.0118690	0.0117719	0.0102930	0.0044665
Tight Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight End	0.5812508	0.0944847	0.0964955	0.0489102	0.0352567
Tight (TOL) Bar	0.0406713	0.0099829	0.0100789	0.0086607	0.0032120
Tight (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (TOL) End	0.1287024	0.0243949	0.0245323	0.0215073	0.0070407
Tight (MOL) Bar	0.0194452	0.0069597	0.0071870	0.0059239	0.0015298
Tight (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (MOL) End	0.0689631	0.0159229	0.0162028	0.0152912	0.0036812

Table 6: Data fake rates for BDT-Based τ ID + Loose Cut-Based e-veto

Selection	fake rate	total(+)	total (-)	stat	bkg
Loose Bar	0.0530351	0.1264008	0.1240286	0.1190724	0.0218835
Loose Cra	0.0284727	0.0319719	0.0320014	0.0289585	0.0006949
Loose End	0.6517237	0.0967283	0.0980349	0.0502097	0.0345130
Loose (TOL) Bar	0.0475984	0.1175095	0.1162141	0.1138607	0.0126622
Loose (TOL) Cra	0.0284742	0.0319738	0.0320034	0.0289602	0.0006964
Loose (TOL) End	0.1570253	0.0459645	0.0465518	0.0448900	0.0027226
Loose (MOL) Bar	0.0160723	0.1162623	0.1145612	0.1104129	0.0181296
Loose (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Loose (MOL) End	0.0955300	0.0423619	0.0437096	0.0421905	0.0023928
Medium Bar	0.0634206	0.0130012	0.0123028	0.0109072	0.0047887
Medium Cra	0.0284344	0.0318688	0.0318939	0.0288307	0.0006566
Medium End	0.5804679	0.0890232	0.0894530	0.0473065	0.0315065
Medium (TOL) Bar	0.0476257	0.0110416	0.0110108	0.0093898	0.0036518
Medium (TOL) Cra	0.0284357	0.0318707	0.0318958	0.0288323	0.0006579
Medium (TOL) End	0.1341447	0.0241364	0.0244647	0.0217222	0.0065482
Medium (MOL) Bar	0.0246879	0.0073489	0.0076085	0.0066839	0.0018866
Medium (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium (MOL) End	0.0778407	0.0167670	0.0173817	0.0161681	0.0036567
Tight Bar	0.0477451	0.0110639	0.0109302	0.0094154	0.0037712
Tight Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight End	0.4134647	0.0634830	0.0645621	0.0413947	0.0247407
Tight (TOL) Bar	0.0335986	0.0088549	0.0088317	0.0078442	0.0026540
Tight (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (TOL) End	0.1066994	0.0209270	0.0209732	0.0194068	0.0058092
Tight (MOL) Bar	0.0176769	0.0062364	0.0062618	0.0056428	0.0013902
Tight (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (MOL) End	0.0532819	0.0143941	0.0145733	0.0133397	0.0028368

Table 7: Data fake rates for Cut-Based τ ID + Medium Cut-Based e-veto

Selection	fake rate	total(+)	total (-)	stat	bkg
Loose Bar	0.0267965	0.0238071	0.0231744	0.0224248	0.0008908
Loose Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Loose End	0.0688066	0.0179932	0.0182280	0.0151548	0.0035247
Loose (TOL) Bar	0.0215816	0.0230289	0.0228222	0.0221206	0.0012197
Loose (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Loose (TOL) End	0.0311989	0.0191779	0.0192235	0.0100220	0.0015253
Loose (MOL) Bar	0.0183650	0.0238873	0.0237569	0.0230075	0.0011790
Loose (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Loose (MOL) End	0.0311667	0.0191577	0.0192033	0.0100117	0.0014931
Medium Bar	0.0213974	0.0191533	0.0184297	0.0172549	0.0002248
Medium Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium End	0.0661460	0.0162449	0.0165012	0.0150958	0.0038314
Medium (TOL) Bar	0.0180180	0.0177532	0.0175161	0.0165792	0.0001027
Medium (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium (TOL) End	0.0282721	0.0153221	0.0153828	0.0096179	0.0015659
Medium (MOL) Bar	0.0149624	0.0080816	0.0077936	0.0053271	0.0003044
Medium (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium (MOL) End	0.0282403	0.0153055	0.0153665	0.0096069	0.0015341
Tight Bar	0.0158966	0.0057988	0.0056662	0.0053447	0.0012386
Tight Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight End	0.0596529	0.0148245	0.0150505	0.0141995	0.0032731
Tight (TOL) Bar	0.0123641	0.0050870	0.0049958	0.0047048	0.0009635
Tight (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (TOL) End	0.0250519	0.0103912	0.0105108	0.0090032	0.0013130
Tight (MOL) Bar	0.0088315	0.0043698	0.0043165	0.0039687	0.0006882
Tight (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (MOL) End	0.0250423	0.0103867	0.0105065	0.0089998	0.0013034

Table 8: Data fake rates for LLH-Based τ ID + Medium Cut-Based e-veto

Selection	fake rate	total(+)	total (-)	stat	bkg
Loose Bar	0.0256822	0.0321423	0.0310579	0.0260896	0.0052624
Loose Cra	0.0284692	0.0319292	0.0319555	0.0288844	0.0006915
Loose End	0.0717988	0.0169852	0.0172671	0.0155619	0.0035495
Loose (TOL) Bar	0.0272563	0.0307623	0.0303593	0.0281402	0.0004310
Loose (TOL) Cra	0.0284701	0.0319304	0.0319567	0.0288854	0.0006923
Loose (TOL) End	0.0272233	0.0288467	0.0289851	0.0252576	0.0024503
Loose (MOL) Bar	0.0263990	0.0126280	0.0124673	0.0069011	0.0019690
Loose (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Loose (MOL) End	0.0240753	0.0310641	0.0312313	0.0258599	0.0026309
Medium Bar	0.0265151	0.0101811	0.0094058	0.0069404	0.0020852
Medium Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium End	0.0618962	0.0148502	0.0151776	0.0144760	0.0025490
Medium (TOL) Bar	0.0229802	0.0088306	0.0086562	0.0064499	0.0018076
Medium (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium (TOL) End	0.0163623	0.0217401	0.0218675	0.0192455	0.0044092
Medium (MOL) Bar	0.0194452	0.0087813	0.0086053	0.0059226	0.0015299
Medium (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium (MOL) End	0.0125358	0.0244111	0.0245339	0.0210364	0.0052683
Tight Bar	0.0194450	0.0069140	0.0069894	0.0059238	0.0015297
Tight Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight End	0.0470296	0.0128362	0.0132733	0.0124869	0.0025192
Tight (TOL) Bar	0.0159097	0.0067295	0.0068581	0.0053485	0.0012517
Tight (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (TOL) End	0.0187674	0.0100192	0.0102213	0.0077516	0.0009632
Tight (MOL) Bar	0.0123744	0.0064005	0.0065778	0.0047083	0.0009738
Tight (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (MOL) End	0.0156344	0.0098975	0.0101485	0.0070600	0.0007976

Table 9: Data fake rates for BDT-Based τ ID + Medium Cut-Based e-veto

Selection	fake rate	total(+)	total (-)	stat	bkg
Loose Bar	0.0051696	0.1064817	0.1024701	0.0906400	0.0290324
Loose Cra	0.0285073	0.0320168	0.0320476	0.0289995	0.0007295
Loose End	0.0784605	0.0379964	0.0397694	0.0378577	0.0016582
Loose (TOL) Bar	0.0167352	0.1144697	0.1127109	0.1088136	0.0142094
Loose (TOL) Cra	0.0285082	0.0320181	0.0320488	0.0290005	0.0007304
Loose (TOL) End	0.0310718	0.0339207	0.0370738	0.0313111	0.0104712
Loose (MOL) Bar	0.0102142	0.1226253	0.1204487	0.1156214	0.0174731
Loose (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Loose (MOL) End	0.0275893	0.0359800	0.0393974	0.0324724	0.0109864
Medium Bar	0.0246573	0.0084347	0.0080705	0.0066753	0.0018560
Medium Cra	0.0284647	0.0319097	0.0319358	0.0288675	0.0006870
Medium End	0.0560324	0.0139865	0.0152579	0.0135844	0.0026199
Medium (TOL) Bar	0.0211610	0.0073251	0.0074180	0.0061770	0.0016170
Medium (TOL) Cra	0.0284656	0.0319109	0.0319370	0.0288685	0.0006878
Medium (TOL) End	0.0248604	0.0116507	0.0126486	0.0089057	0.0011216
Medium (MOL) Bar	0.0176345	0.0065597	0.0067923	0.0056287	0.0013478
Medium (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium (MOL) End	0.0217413	0.0116056	0.0126921	0.0083130	0.0009698
Tight Bar	0.0176767	0.0061885	0.0060422	0.0056427	0.0013900
Tight Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight End	0.0470117	0.0131682	0.0135961	0.0124868	0.0025014
Tight (TOL) Bar	0.0141414	0.0058474	0.0057486	0.0050377	0.0011121
Tight (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (TOL) End	0.0187697	0.0117068	0.0118805	0.0077538	0.0009655
Tight (MOL) Bar	0.0106061	0.0053730	0.0053127	0.0043547	0.0008342
Tight (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (MOL) End	0.0156373	0.0117377	0.0119505	0.0070628	0.0008005

Table 10: Data fake rates for Cut-Based τ ID + Tight Cut-Based e-veto

Selection	fake rate	total(+)	total (-)	stat	bkg
Loose Bar	0.0132031	0.0188379	0.0185004	0.0183889	0.0014549
Loose Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Loose End	0.0626924	0.0180154	0.0182106	0.0144480	0.0033453
Loose (TOL) Bar	0.0115705	0.0188172	0.0184556	0.0183431	0.0014588
Loose (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Loose (TOL) End	0.0250147	0.0197410	0.0198063	0.0089580	0.0012758
Loose (MOL) Bar	0.0108457	0.0251091	0.0249022	0.0248761	0.0005550
Loose (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Loose (MOL) End	0.0249853	0.0197173	0.0197828	0.0089474	0.0012464
Medium Bar	0.0073594	0.0150730	0.0148878	0.0146536	0.0007839
Medium Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium End	0.0598253	0.0157831	0.0159990	0.0142986	0.0034455
Medium (TOL) Bar	0.0076504	0.0148981	0.0147171	0.0145229	0.0004929
Medium (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium (TOL) End	0.0219811	0.0156156	0.0157202	0.0084421	0.0012096
Medium (MOL) Bar	0.0070537	0.0043012	0.0039256	0.0035390	0.0005390
Medium (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium (MOL) End	0.0219529	0.0155971	0.0157019	0.0084311	0.0011814
Tight Bar	0.0070651	0.0039888	0.0039519	0.0035463	0.0005505
Tight Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight End	0.0533542	0.0138108	0.0141195	0.0133787	0.0029091
Tight (TOL) Bar	0.0070652	0.0039780	0.0039410	0.0035464	0.0005506
Tight (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (TOL) End	0.0187815	0.0100114	0.0102141	0.0077631	0.0009774
Tight (MOL) Bar	0.0052989	0.0033850	0.0033606	0.0030683	0.0004129
Tight (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (MOL) End	0.0187722	0.0100062	0.0102090	0.0077592	0.0009680

Table 11: Data fake rates for LLH-Based τ ID + Tight Cut-Based e-veto

Selection	fake rate	total(+)	total (-)	stat	bkg
Loose Bar	0.0176129	0.0095956	0.0089403	0.0056179	0.0013263
Loose Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Loose End	0.0657072	0.0167486	0.0169892	0.0148644	0.0033927
Loose (TOL) Bar	0.0176131	0.0100804	0.0094587	0.0056180	0.0013265
Loose (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Loose (TOL) End	0.0240601	0.0181371	0.0182850	0.0089480	0.0003212
Loose (MOL) Bar	0.0158467	0.0102407	0.0096289	0.0053235	0.0011887
Loose (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Loose (MOL) End	0.0203975	0.0188645	0.0190581	0.0083436	0.0003740
Medium Bar	0.0106056	0.0062594	0.0051779	0.0043540	0.0008336
Medium Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium End	0.0563179	0.0141927	0.0144522	0.0137304	0.0029054
Medium (TOL) Bar	0.0106057	0.0062977	0.0052242	0.0043540	0.0008337
Medium (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium (TOL) End	0.0133105	0.0201329	0.0203045	0.0176016	0.0015263
Medium (MOL) Bar	0.0088381	0.0062017	0.0051065	0.0039710	0.0006948
Medium (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium (MOL) End	0.0096694	0.0222180	0.0223905	0.0187020	0.0022001
Tight Bar	0.0070707	0.0037019	0.0036631	0.0035489	0.0005561
Tight Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight End	0.0438840	0.0124022	0.0129146	0.0120398	0.0023410
Tight (TOL) Bar	0.0070708	0.0037020	0.0036631	0.0035489	0.0005561
Tight (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (TOL) End	0.0156355	0.0098981	0.0101491	0.0070610	0.0007988
Tight (MOL) Bar	0.0053031	0.0032234	0.0031983	0.0030706	0.0004171
Tight (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (MOL) End	0.0125025	0.0098209	0.0101252	0.0063001	0.0006331

Table 12: Data fake rates for BDT-Based τ ID + Tight Cut-Based e-veto

Selection	fake rate	total(+)	total (-)	stat	bkg
Loose Bar	0.0000000	0.0414766	0.0321174	0.0000000	0.0195440
Loose Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Loose End	0.0769267	0.0168901	0.0188729	0.0162128	0.0027427
Loose (TOL) Bar	0.0000000	0.0429277	0.0339705	0.0000000	0.0195440
Loose (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Loose (TOL) End	0.0291133	0.0321795	0.0346107	0.0295601	0.0064950
Loose (MOL) Bar	0.0000000	0.0402723	0.0319726	0.0000000	0.0179153
Loose (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Loose (MOL) End	0.0246057	0.0351952	0.0377048	0.0307345	0.0080353
Medium Bar	0.0105801	0.0048458	0.0054959	0.0043438	0.0008081
Medium Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium End	0.0529087	0.0136192	0.0150117	0.0131801	0.0024636
Medium (TOL) Bar	0.0105802	0.0048252	0.0056002	0.0043438	0.0008082
Medium (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium (TOL) End	0.0217480	0.0116094	0.0126960	0.0083155	0.0009765
Medium (MOL) Bar	0.0088169	0.0050171	0.0064078	0.0039617	0.0006736
Medium (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium (MOL) End	0.0186286	0.0116014	0.0127762	0.0076812	0.0008244
Tight Bar	0.0053028	0.0036494	0.0031982	0.0030704	0.0004168
Tight Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight End	0.0438665	0.0128652	0.0133612	0.0120392	0.0023234
Tight (TOL) Bar	0.0053028	0.0036494	0.0031982	0.0030704	0.0004168
Tight (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (TOL) End	0.0156371	0.0117373	0.0119501	0.0070626	0.0008003
Tight (MOL) Bar	0.0035352	0.0032244	0.0027017	0.0025046	0.0002779
Tight (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (MOL) End	0.0125049	0.0118065	0.0120612	0.0063024	0.0006355

Table 13: Data fake rates for Cut-Based τ ID + Loose BDT-Based e-veto

Selection	fake rate	total(+)	total (-)	stat	bkg
Loose Bar	0.0142476	0.0195711	0.0194335	0.0183018	0.0052964
Loose Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Loose End	0.1313737	0.0256804	0.0251255	0.0215909	0.0067447
Loose (TOL) Bar	0.0106961	0.0194125	0.0192736	0.0179397	0.0055905
Loose (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Loose (TOL) End	0.0687568	0.0273073	0.0257526	0.0152060	0.0034749
Loose (MOL) Bar	0.0085394	0.0204546	0.0203060	0.0188379	0.0061186
Loose (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Loose (MOL) End	0.0235895	0.0401518	0.0397498	0.0274778	0.0001494
Medium Bar	0.0035740	0.0220920	0.0216109	0.0180721	0.0061980
Medium Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium End	0.1130933	0.0219270	0.0225763	0.0202338	0.0062683
Medium (TOL) Bar	0.0017886	0.0218949	0.0214093	0.0176100	0.0063547
Medium (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium (TOL) End	0.0533569	0.0155541	0.0154000	0.0134263	0.0029118
Medium (MOL) Bar	0.0000000	0.0133543	0.0124848	0.0000000	0.0065147
Medium (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium (MOL) End	0.0188039	0.0134002	0.0133599	0.0077830	0.0009997
Tight Bar	0.0070648	0.0036420	0.0038869	0.0035461	0.0005501
Tight Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight End	0.0845462	0.0202558	0.0202689	0.0171082	0.0044275
Tight (TOL) Bar	0.0052986	0.0031365	0.0034741	0.0030681	0.0004126
Tight (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (TOL) End	0.0375473	0.0116973	0.0116389	0.0111022	0.0019390
Tight (MOL) Bar	0.0052988	0.0031350	0.0034728	0.0030682	0.0004128
Tight (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (MOL) End	0.0156336	0.0074429	0.0073920	0.0070644	0.0007968

Table 14: Data fake rates for LLH-Based τ ID + Loose BDT-Based e-veto

Selection	fake rate	total(+)	total (-)	stat	bkg
Loose Bar	0.0208347	0.0344478	0.0328413	0.0231048	0.0101099
Loose Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Loose End	0.1257765	0.0291383	0.0287572	0.0257259	0.0041148
Loose (TOL) Bar	0.0218209	0.0323471	0.0309037	0.0228229	0.0074951
Loose (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Loose (TOL) End	0.0625128	0.0300895	0.0285593	0.0193355	0.0001982
Loose (MOL) Bar	0.0153637	0.0318412	0.0299908	0.0232567	0.0074376
Loose (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Loose (MOL) End	0.0174862	0.0338036	0.0332715	0.0149268	0.0032853
Medium Bar	0.0169887	0.0093632	0.0085699	0.0074441	0.0007021
Medium Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium End	0.0925232	0.0205932	0.0204916	0.0199767	0.0035025
Medium (TOL) Bar	0.0152159	0.0092203	0.0084110	0.0071435	0.0005579
Medium (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium (TOL) End	0.0390332	0.0193581	0.0178201	0.0137544	0.0004575
Medium (MOL) Bar	0.0118046	0.0087636	0.0079208	0.0063558	0.0004039
Medium (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium (MOL) End	0.0064144	0.0188901	0.0186828	0.0094430	0.0024877
Tight Bar	0.0105925	0.0052975	0.0054076	0.0043490	0.0008206
Tight Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight End	0.0719621	0.0164358	0.0166403	0.0156425	0.0037128
Tight (TOL) Bar	0.0088271	0.0051038	0.0052480	0.0039664	0.0006838
Tight (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (TOL) End	0.0312674	0.0122048	0.0120026	0.0100803	0.0015938
Tight (MOL) Bar	0.0088276	0.0050998	0.0052441	0.0039666	0.0006843
Tight (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (MOL) End	0.0062472	0.0120998	0.0120948	0.0044348	0.0003124

Table 15: Data fake rates for BDT-Based τ ID + Loose BDT-Based e-veto

Selection	fake rate	total(+)	total (-)	stat	bkg
Loose Bar	0.0119143	0.0579652	0.0560566	0.0462960	0.0190303
Loose Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Loose End	0.1381076	0.0303853	0.0317731	0.0269027	0.0016091
Loose (TOL) Bar	0.0131743	0.0550477	0.0532408	0.0457504	0.0145130
Loose (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Loose (TOL) End	0.0720334	0.0221499	0.0225794	0.0204339	0.0021506
Loose (MOL) Bar	0.0083416	0.0571386	0.0533158	0.0463484	0.0144597
Loose (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Loose (MOL) End	0.0288792	0.0199625	0.0208621	0.0182501	0.0067291
Medium Bar	0.0175939	0.0068682	0.0068905	0.0056153	0.0013072
Medium Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium End	0.0838910	0.0201406	0.0182687	0.0168211	0.0037723
Medium (TOL) Bar	0.0158537	0.0070747	0.0070503	0.0053290	0.0011957
Medium (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium (TOL) End	0.0465855	0.0178045	0.0163514	0.0123230	0.0020751
Medium (MOL) Bar	0.0140931	0.0053157	0.0053862	0.0050200	0.0010638
Medium (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium (MOL) End	0.0155137	0.0158661	0.0160241	0.0069960	0.0006769
Tight Bar	0.0053024	0.0041723	0.0037841	0.0030702	0.0004164
Tight Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight End	0.0531584	0.0156923	0.0152548	0.0133070	0.0027133
Tight (TOL) Bar	0.0035349	0.0039148	0.0034969	0.0025044	0.0002776
Tight (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (TOL) End	0.0281334	0.0159921	0.0152664	0.0095426	0.0014271
Tight (MOL) Bar	0.0035351	0.0039151	0.0034971	0.0025045	0.0002778
Tight (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (MOL) End	0.0062481	0.0144170	0.0144128	0.0044358	0.0003133

Table 16: Data fake rates for Cut-Based τ ID + Medium BDT-Based e-veto

Selection	fake rate	total(+)	total (-)	stat	bkg
Loose Bar	0.0094425	0.0181110	0.0178582	0.0168322	0.0052155
Loose Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Loose End	0.0312692	0.0162549	0.0161078	0.0100668	0.0015956
Loose (TOL) Bar	0.0076388	0.0179890	0.0177578	0.0166238	0.0053905
Loose (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Loose (TOL) End	0.0187565	0.0171623	0.0170140	0.0077417	0.0009523
Loose (MOL) Bar	0.0053473	0.0200105	0.0197291	0.0184747	0.0060534
Loose (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Loose (MOL) End	0.0156323	0.0184615	0.0183079	0.0070555	0.0007955
Medium Bar	0.0009117	0.0184935	0.0178768	0.0146090	0.0056030
Medium Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium End	0.0219335	0.0091487	0.0090681	0.0084232	0.0011620
Medium (TOL) Bar	0.0009134	0.0185296	0.0179083	0.0146173	0.0056012
Medium (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium (TOL) End	0.0125311	0.0080289	0.0079990	0.0063237	0.0006617
Medium (MOL) Bar	0.0000000	0.0109581	0.0097752	0.0000000	0.0048860
Medium (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium (MOL) End	0.0093994	0.0097716	0.0097578	0.0054647	0.0004974
Tight Bar	0.0035325	0.0026050	0.0025907	0.0025027	0.0002751
Tight Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight End	0.0156299	0.0072686	0.0072166	0.0070626	0.0007931
Tight (TOL) Bar	0.0035325	0.0026066	0.0025923	0.0025027	0.0002752
Tight (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (TOL) End	0.0093768	0.0058956	0.0058725	0.0054477	0.0004747
Tight (MOL) Bar	0.0035326	0.0026222	0.0026080	0.0025028	0.0002752
Tight (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (MOL) End	0.0062516	0.0058290	0.0058187	0.0044391	0.0003168

Table 17: Data fake rates for LLH-Based τ ID + Medium BDT-Based e-veto

Selection	fake rate	total(+)	total (-)	stat	bkg
Loose Bar	0.0214422	0.0230789	0.0225179	0.0197290	0.0013591
Loose Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Loose End	0.0247129	0.0214011	0.0212767	0.0159334	0.0019933
Loose (TOL) Bar	0.0226692	0.0227048	0.0223793	0.0201176	0.0001321
Loose (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Loose (TOL) End	0.0121846	0.0217184	0.0215329	0.0137883	0.0026522
Loose (MOL) Bar	0.0193190	0.0124747	0.0119766	0.0058775	0.0014036
Loose (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Loose (MOL) End	0.0090724	0.0250853	0.0249041	0.0133727	0.0027970
Medium Bar	0.0100610	0.0079860	0.0070355	0.0059753	0.0002890
Medium Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium End	0.0107165	0.0144087	0.0142000	0.0105616	0.0011530
Medium (TOL) Bar	0.0100782	0.0079717	0.0070208	0.0059559	0.0003062
Medium (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium (TOL) End	0.0015281	0.0135224	0.0132181	0.0073280	0.0014392
Medium (MOL) Bar	0.0087870	0.0065053	0.0054384	0.0039693	0.0006437
Medium (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium (MOL) End	0.0000000	0.0112228	0.0111324	0.0000000	0.0000000
Tight Bar	0.0052965	0.0038023	0.0037804	0.0030667	0.0004105
Tight Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight End	0.0062456	0.0076781	0.0076703	0.0044337	0.0003109
Tight (TOL) Bar	0.0052965	0.0038023	0.0037804	0.0030667	0.0004105
Tight (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (TOL) End	0.0000000	0.0074917	0.0074917	0.0000000	0.0000000
Tight (MOL) Bar	0.0052966	0.0037998	0.0037778	0.0030668	0.0004106
Tight (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (MOL) End	0.0000000	0.0074926	0.0074926	0.0000000	0.0000000

Table 18: Data fake rates for BDT-Based τ ID + Medium BDT-Based e-veto

Selection	fake rate	total(+)	total (-)	stat	bkg
Loose Bar	0.0057762	0.0550690	0.0517683	0.0451827	0.0153964
Loose Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Loose End	0.0384591	0.0226290	0.0231185	0.0194438	0.0060513
Loose (TOL) Bar	0.0066868	0.0555723	0.0522882	0.0461272	0.0144858
Loose (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Loose (TOL) End	0.0193589	0.0189180	0.0197702	0.0167038	0.0073473
Loose (MOL) Bar	0.0000000	0.0421735	0.0343752	0.0000000	0.0179153
Loose (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Loose (MOL) End	0.0169792	0.0178154	0.0189879	0.0158040	0.0067597
Medium Bar	0.0123285	0.0050058	0.0050918	0.0046903	0.0009278
Medium Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium End	0.0217209	0.0100432	0.0102060	0.0083051	0.0009494
Medium (TOL) Bar	0.0123285	0.0050081	0.0051030	0.0046903	0.0009278
Medium (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium (TOL) End	0.0124091	0.0097086	0.0100152	0.0062462	0.0005396
Medium (MOL) Bar	0.0105674	0.0045912	0.0051917	0.0043385	0.0007954
Medium (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium (MOL) End	0.0093071	0.0096894	0.0100515	0.0054007	0.0004051
Tight Bar	0.0035351	0.0039151	0.0034972	0.0025045	0.0002778
Tight Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight End	0.0062472	0.0097941	0.0097880	0.0044352	0.0003125
Tight (TOL) Bar	0.0035352	0.0039151	0.0034972	0.0025045	0.0002778
Tight (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (TOL) End	0.0031234	0.0098575	0.0098560	0.0031297	0.0001560
Tight (MOL) Bar	0.0035352	0.0039153	0.0034973	0.0025046	0.0002779
Tight (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (MOL) End	0.0000000	0.0099734	0.0099734	0.0000000	0.0000000

Table 19: Data fake rates for Cut-Based τ ID + Tight BDT-Based e-veto

Selection	fake rate	total(+)	total (-)	stat	bkg
Loose Bar	0.0078824	0.0184106	0.0181144	0.0168896	0.0051469
Loose Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Loose End	0.0125052	0.0118651	0.0118446	0.0062990	0.0006357
Loose (TOL) Bar	0.0059314	0.0184354	0.0181638	0.0167481	0.0054693
Loose (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Loose (TOL) End	0.0125052	0.0118674	0.0118469	0.0062990	0.0006358
Loose (MOL) Bar	0.0035289	0.0223042	0.0214982	0.0199787	0.0062431
Loose (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Loose (MOL) End	0.0125057	0.0118679	0.0118474	0.0062992	0.0006362
Medium Bar	0.0000000	0.0139409	0.0124168	0.0000000	0.0065147
Medium Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium End	0.0093996	0.0063266	0.0063053	0.0054649	0.0004976
Medium (TOL) Bar	0.0000000	0.0139409	0.0124168	0.0000000	0.0065147
Medium (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium (TOL) End	0.0093997	0.0063266	0.0063053	0.0054649	0.0004976
Medium (MOL) Bar	0.0000000	0.0123060	0.0109108	0.0000000	0.0048860
Medium (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium (MOL) End	0.0094000	0.0056063	0.0055822	0.0054651	0.0004980
Tight Bar	0.0035313	0.0026399	0.0026257	0.0025018	0.0002739
Tight Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight End	0.0062515	0.0046440	0.0046310	0.0044391	0.0003168
Tight (TOL) Bar	0.0035313	0.0026399	0.0026257	0.0025018	0.0002739
Tight (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (TOL) End	0.0062515	0.0046440	0.0046310	0.0044391	0.0003168
Tight (MOL) Bar	0.0035313	0.0026690	0.0026549	0.0025018	0.0002740
Tight (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (MOL) End	0.0062517	0.0046469	0.0046339	0.0044392	0.0003169

Table 20: Data fake rates for LLH-Based τ ID + Tight BDT-Based e-veto

Selection	fake rate	total(+)	total (-)	stat	bkg
Loose Bar	0.0175637	0.0125822	0.0120882	0.0055994	0.0012770
Loose Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Loose End	0.0077895	0.0179741	0.0179756	0.0131790	0.0011126
Loose (TOL) Bar	0.0175637	0.0125746	0.0120803	0.0055994	0.0012770
Loose (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Loose (TOL) End	0.0077955	0.0180015	0.0180031	0.0132225	0.0011065
Loose (MOL) Bar	0.0158008	0.0126400	0.0121485	0.0053054	0.0011428
Loose (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Loose (MOL) End	0.0078445	0.0199252	0.0199281	0.0157833	0.0010576
Medium Bar	0.0065025	0.0085588	0.0076060	0.0058675	0.0000122
Medium Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium End	0.0000000	0.0060395	0.0060395	0.0000000	0.0000000
Medium (TOL) Bar	0.0065025	0.0085588	0.0076060	0.0058675	0.0000122
Medium (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium (TOL) End	0.0000000	0.0074809	0.0074809	0.0000000	0.0000000
Medium (MOL) Bar	0.0070643	0.0069817	0.0060281	0.0035456	0.0005497
Medium (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium (MOL) End	0.0000000	0.0074811	0.0074811	0.0000000	0.0000000
Tight Bar	0.0035310	0.0035078	0.0034972	0.0025016	0.0002737
Tight Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight End	0.0000000	0.0049947	0.0049947	0.0000000	0.0000000
Tight (TOL) Bar	0.0035310	0.0035078	0.0034972	0.0025016	0.0002737
Tight (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (TOL) End	0.0000000	0.0049947	0.0049947	0.0000000	0.0000000
Tight (MOL) Bar	0.0035310	0.0035066	0.0034960	0.0025016	0.0002737
Tight (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (MOL) End	0.0000000	0.0049948	0.0049948	0.0000000	0.0000000

Table 21: Data fake rates for BDT-Based τ ID + Tight BDT-Based e-veto

Selection	fake rate	total(+)	total (-)	stat	bkg
Loose Bar	0.0000000	0.0368366	0.0302820	0.0000000	0.0146580
Loose Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Loose End	0.0153780	0.0167877	0.0174125	0.0145755	0.0024262
Loose (TOL) Bar	0.0000000	0.0368366	0.0302820	0.0000000	0.0146580
Loose (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Loose (TOL) End	0.0186267	0.0118535	0.0143597	0.0076979	0.0008225
Loose (MOL) Bar	0.0000000	0.0368211	0.0302680	0.0000000	0.0146580
Loose (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Loose (MOL) End	0.0186271	0.0132219	0.0157598	0.0076981	0.0008230
Medium Bar	0.0070446	0.0039386	0.0041011	0.0035356	0.0005299
Medium Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium End	0.0031018	0.0074831	0.0074811	0.0031071	0.0001345
Medium (TOL) Bar	0.0070446	0.0039386	0.0041011	0.0035356	0.0005299
Medium (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium (TOL) End	0.0031018	0.0074831	0.0074811	0.0031071	0.0001345
Medium (MOL) Bar	0.0070447	0.0037976	0.0044152	0.0035357	0.0005301
Medium (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium (MOL) End	0.0031019	0.0074833	0.0074813	0.0031072	0.0001345
Tight Bar	0.0017676	0.0036785	0.0032288	0.0017693	0.0001389
Tight Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight End	0.0000000	0.0074792	0.0074792	0.0000000	0.0000000
Tight (TOL) Bar	0.0017676	0.0036785	0.0032288	0.0017693	0.0001389
Tight (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (TOL) End	0.0000000	0.0074792	0.0074792	0.0000000	0.0000000
Tight (MOL) Bar	0.0017676	0.0036786	0.0032288	0.0017693	0.0001389
Tight (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (MOL) End	0.0000000	0.0074794	0.0074794	0.0000000	0.0000000