

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

Selection	fake rate	total(+)	total (-)	stat	bkg
Loose Bar	0.8855802	0.1154001	0.1214565	0.0530641	0.0795837
Loose Cra	0.8580868	0.1704165	0.1894357	0.1634519	0.0455868
Loose End	0.8737514	0.0876368	0.0877130	0.0485785	0.0330920
Loose (TOL) Bar	0.2507779	0.0563173	0.0564943	0.0415715	0.0179736
Loose (TOL) Cra	0.2630652	0.1209746	0.1211364	0.0907969	0.0130652
Loose (TOL) End	0.2746400	0.0446915	0.0494755	0.0415380	0.0054093
Loose (MOL) Bar	0.1485389	0.0438233	0.0434802	0.0389105	0.0056818
Loose (MOL) Cra	0.0654947	0.0432345	0.0439857	0.0402462	0.0029947
Loose (MOL) End	0.1132741	0.0263653	0.0276791	0.0191115	0.0061312
Medium Bar	0.8221361	0.1103692	0.1155644	0.0522446	0.0743406
Medium Cra	0.6949521	0.1616045	0.1648633	0.1386588	0.0282854
Medium End	0.8360540	0.0834243	0.0835983	0.0526080	0.0283617
Medium (TOL) Bar	0.2251052	0.0683710	0.0682420	0.0596834	0.0152287
Medium (TOL) Cra	0.2173293	0.1145534	0.1145440	0.0766151	0.0089960
Medium (TOL) End	0.2361199	0.0627750	0.0673193	0.0597858	0.0083856
Medium (MOL) Bar	0.1278777	0.0588362	0.0575812	0.0556254	0.0008936
Medium (MOL) Cra	0.0651239	0.0423765	0.0431167	0.0392357	0.0026239
Medium (MOL) End	0.0931259	0.0269635	0.0292355	0.0172770	0.0024665
Tight Bar	0.6670975	0.0972620	0.1003622	0.0553854	0.0603955
Tight Cra	0.4948686	0.1507535	0.1508664	0.1053484	0.0157020
Tight End	0.7092694	0.0878714	0.0882164	0.0470562	0.0334452
Tight (TOL) Bar	0.1761540	0.0490039	0.0491942	0.0386711	0.0121329
Tight (TOL) Cra	0.0861098	0.1080441	0.1068514	0.0439260	0.0027764
Tight (TOL) End	0.2193230	0.0486948	0.0497216	0.0272100	0.0105317
Tight (MOL) Bar	0.1034400	0.0356307	0.0352799	0.0311664	0.0029109
Tight (MOL) Cra	0.0215125	0.0375827	0.0376714	0.0216435	0.0006792
Tight (MOL) End	0.0875403	0.0184053	0.0196102	0.0166982	0.0051228

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

Selection	fake rate	total(+)	total (-)	stat	bkg
Loose Bar	0.9612851	0.1263316	0.1293690	0.0561033	0.0900328
Loose Cra	0.8506875	0.1536053	0.1551829	0.1441234	0.0381875
Loose End	0.9162269	0.0872754	0.0874875	0.0492465	0.0343587
Loose (TOL) Bar	0.2806015	0.0507036	0.0508843	0.0279378	0.0248696
Loose (TOL) Cra	0.2624569	0.1365792	0.1339594	0.0855426	0.0124569
Loose (TOL) End	0.2978671	0.0536308	0.0580696	0.0500549	0.0039110
Loose (MOL) Bar	0.1686129	0.0537605	0.0537305	0.0496234	0.0116464
Loose (MOL) Cra	0.0653418	0.0469884	0.0462971	0.0393698	0.0028418
Loose (MOL) End	0.1276784	0.0318408	0.0325562	0.0203362	0.0067993
Medium Bar	0.8971789	0.1216651	0.1269763	0.0566083	0.0841277
Medium Cra	0.7156467	0.1541363	0.1542879	0.1378159	0.0281467
Medium End	0.8409437	0.1059117	0.1072997	0.0537475	0.0305041
Medium (TOL) Bar	0.2621919	0.0677571	0.0674893	0.0562009	0.0205693
Medium (TOL) Cra	0.1518462	0.1300808	0.1272458	0.0621287	0.0060129
Medium (TOL) End	0.2645594	0.0804817	0.0895001	0.0416951	0.0035704
Medium (MOL) Bar	0.1562646	0.0534693	0.0520561	0.0494806	0.0063528
Medium (MOL) Cra	0.0650782	0.0482175	0.0475495	0.0391340	0.0025782
Medium (MOL) End	0.1045900	0.0253200	0.0255050	0.0184040	0.0056889
Tight Bar	0.8276539	0.1146266	0.1181088	0.0545219	0.0780948
Tight Cra	0.5826150	0.1333938	0.1318674	0.1166189	0.0201150
Tight End	0.7811782	0.0905642	0.0909948	0.0519080	0.0366727
Tight (TOL) Bar	0.2391853	0.0631552	0.0629553	0.0518847	0.0204904
Tight (TOL) Cra	0.1295048	0.0869515	0.0862960	0.0550020	0.0045048
Tight (TOL) End	0.2406913	0.0366086	0.0396684	0.0302326	0.0099220
Tight (MOL) Bar	0.1473555	0.0477200	0.0468827	0.0435618	0.0080257
Tight (MOL) Cra	0.0431418	0.0383911	0.0387431	0.0310153	0.0014752
Tight (MOL) End	0.0961938	0.0209728	0.0211492	0.0177040	0.0055345

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

Selection	fake rate	total(+)	total (-)	stat	bkg
Loose Bar	0.9453467	0.1201415	0.1221931	0.0557926	0.0846765
Loose Cra	0.8289139	0.1780228	0.1749395	0.1604674	0.0372473
Loose End	0.8900601	0.0774059	0.0776583	0.0497723	0.0329172
Loose (TOL) Bar	0.2644341	0.0552892	0.0551811	0.0428409	0.0175205
Loose (TOL) Cra	0.2409874	0.1648276	0.1505432	0.0860455	0.0118207
Loose (TOL) End	0.2830710	0.0473651	0.0548136	0.0430354	0.0028512
Loose (MOL) Bar	0.1575220	0.0449991	0.0445231	0.0418378	0.0040828
Loose (MOL) Cra	0.0873649	0.0672230	0.0546649	0.0473178	0.0040316
Loose (MOL) End	0.1177855	0.0347276	0.0369035	0.0195855	0.0051481
Medium Bar	0.8259655	0.1125228	0.1161606	0.0548362	0.0781701
Medium Cra	0.7122260	0.1603289	0.1596810	0.1280856	0.0247260
Medium End	0.7944593	0.0868697	0.0877573	0.0519288	0.0307230
Medium (TOL) Bar	0.2423680	0.0437077	0.0435330	0.0260229	0.0219094
Medium (TOL) Cra	0.1945548	0.1450197	0.1396753	0.0692595	0.0070548
Medium (TOL) End	0.2446369	0.0496520	0.0527989	0.0305596	0.0083732
Medium (MOL) Bar	0.1491016	0.0356211	0.0351684	0.0297686	0.0115355
Medium (MOL) Cra	0.0648175	0.0478474	0.0471938	0.0385034	0.0023175
Medium (MOL) End	0.0926614	0.0190775	0.0193179	0.0172286	0.0047493
Tight Bar	0.6351518	0.0925301	0.0983386	0.0476890	0.0601959
Tight Cra	0.6279089	0.1247108	0.1361467	0.1215043	0.0237422
Tight End	0.5828156	0.0892700	0.0892715	0.0752048	0.0168816
Tight (TOL) Bar	0.1983231	0.0377202	0.0375743	0.0230156	0.0184289
Tight (TOL) Cra	0.1728558	0.0652280	0.0662712	0.0642518	0.0061891
Tight (TOL) End	0.1719443	0.0586146	0.0589009	0.0393813	0.0038798
Tight (MOL) Bar	0.1165005	0.0230332	0.0228342	0.0166913	0.0106803
Tight (MOL) Cra	0.0647462	0.0468372	0.0474864	0.0382962	0.0022462
Tight (MOL) End	0.0551837	0.0167115	0.0168854	0.0130790	0.0029859

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

Selection	fake rate	total(+)	total (-)	stat	bkg
Loose Bar	0.0597966	0.0246594	0.0247180	0.0240343	0.0015956
Loose Cra	0.0435521	0.0339968	0.0323854	0.0320455	0.0018854
Loose End	0.6635540	0.0957603	0.0956393	0.0507084	0.0316858
Loose (TOL) Bar	0.0420415	0.0238951	0.0240537	0.0233163	0.0002866
Loose (TOL) Cra	0.0435602	0.0340049	0.0323939	0.0320532	0.0018935
Loose (TOL) End	0.1608332	0.0410887	0.0418249	0.0326595	0.0042398
Loose (MOL) Bar	0.0142451	0.0218678	0.0219427	0.0209836	0.0033916
Loose (MOL) Cra	0.0218082	0.0240845	0.0242343	0.0222694	0.0009749
Loose (MOL) End	0.0814095	0.0188587	0.0192451	0.0160743	0.0044864
Medium Bar	0.0576433	0.0421159	0.0422503	0.0418086	0.0005578
Medium Cra	0.0433143	0.0334226	0.0317507	0.0314530	0.0016476
Medium End	0.6481455	0.0993686	0.0996499	0.0588993	0.0272664
Medium (TOL) Bar	0.0400071	0.0392642	0.0394932	0.0387845	0.0023209
Medium (TOL) Cra	0.0433214	0.0334299	0.0317581	0.0314598	0.0016548
Medium (TOL) End	0.1533322	0.0497791	0.0509581	0.0447976	0.0005139
Medium (MOL) Bar	0.0115119	0.0344269	0.0345190	0.0331763	0.0061248
Medium (MOL) Cra	0.0216849	0.0237671	0.0239138	0.0219908	0.0008516
Medium (MOL) End	0.0782682	0.0180472	0.0191269	0.0156298	0.0040923
Tight Bar	0.0456701	0.0260087	0.0276004	0.0249049	0.0001853
Tight Cra	0.0214763	0.0262346	0.0220675	0.0215848	0.0006430
Tight End	0.5647239	0.0940241	0.0940335	0.0438360	0.0290096
Tight (TOL) Bar	0.0319518	0.0227847	0.0249898	0.0223006	0.0015579
Tight (TOL) Cra	0.0214793	0.0262385	0.0220710	0.0215884	0.0006460
Tight (TOL) End	0.1416405	0.0521884	0.0525906	0.0214608	0.0070251
Tight (MOL) Bar	0.0059260	0.0166169	0.0175665	0.0158358	0.0046560
Tight (MOL) Cra	0.0215023	0.0233728	0.0235150	0.0216158	0.0006689
Tight (MOL) End	0.0728415	0.0180553	0.0190588	0.0151222	0.0041601

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

Selection	fake rate	total(+)	total (-)	stat	bkg
Loose Bar	0.0682161	0.0378970	0.0380505	0.0373045	0.0029604
Loose Cra	0.0434697	0.0340833	0.0324424	0.0315664	0.0018030
Loose End	0.6781420	0.0948056	0.0947993	0.0612683	0.0297904
Loose (TOL) Bar	0.0486120	0.0351179	0.0352168	0.0345384	0.0009930
Loose (TOL) Cra	0.0434756	0.0340852	0.0324443	0.0315724	0.0018089
Loose (TOL) End	0.1583374	0.0490397	0.0512264	0.0467211	0.0010032
Loose (MOL) Bar	0.0189457	0.0316533	0.0316817	0.0307568	0.0022184
Loose (MOL) Cra	0.0217577	0.0247298	0.0248732	0.0220657	0.0009244
Loose (MOL) End	0.0782935	0.0167777	0.0179391	0.0156508	0.0041177
Medium Bar	0.0638553	0.0372911	0.0372436	0.0367583	0.0003632
Medium Cra	0.0216357	0.0265141	0.0224071	0.0219191	0.0008024
Medium End	0.6202560	0.2271739	0.2262741	0.1856846	0.0076186
Medium (TOL) Bar	0.0442118	0.0335182	0.0334387	0.0324310	0.0016436
Medium (TOL) Cra	0.0216395	0.0265187	0.0224115	0.0219237	0.0008061
Medium (TOL) End	0.1231392	0.1561390	0.1535637	0.1171727	0.0252125
Medium (MOL) Bar	0.0156578	0.0279041	0.0274443	0.0252049	0.0055062
Medium (MOL) Cra	0.0216716	0.0237316	0.0238781	0.0219627	0.0008382
Medium (MOL) End	0.0725360	0.0164514	0.0194891	0.0150731	0.0038546
Tight Bar	0.0577918	0.0338218	0.0338400	0.0333082	0.0031181
Tight Cra	0.0215487	0.0263435	0.0221974	0.0217305	0.0007154
Tight End	0.6096245	0.0949690	0.0950899	0.0465280	0.0327014
Tight (TOL) Bar	0.0421674	0.0301913	0.0302560	0.0297223	0.0016031
Tight (TOL) Cra	0.0215519	0.0263475	0.0222012	0.0217344	0.0007186
Tight (TOL) End	0.1393808	0.0397038	0.0405978	0.0285868	0.0047654
Tight (MOL) Bar	0.0175370	0.0232299	0.0232270	0.0225426	0.0018634
Tight (MOL) Cra	0.0215767	0.0235428	0.0236867	0.0217643	0.0007433
Tight (MOL) End	0.0698956	0.0175188	0.0185561	0.0148580	0.0039615

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

Selection	fake rate	total(+)	total (-)	stat	bkg
Loose Bar	0.0669225	0.0283417	0.0283246	0.0275017	0.0018606
Loose Cra	0.0217636	0.0413825	0.0258878	0.0222161	0.0009303
Loose End	0.6679664	0.0855316	0.0859011	0.0544936	0.0278565
Loose (TOL) Bar	0.0432946	0.0265998	0.0265761	0.0249536	0.0043244
Loose (TOL) Cra	0.0217678	0.0413922	0.0258976	0.0222210	0.0009344
Loose (TOL) End	0.1556046	0.0386266	0.0437699	0.0359992	0.0009888
Loose (MOL) Bar	0.0142949	0.0273136	0.0272002	0.0238355	0.0086328
Loose (MOL) Cra	0.0218077	0.0264990	0.0223249	0.0222681	0.0009744
Loose (MOL) End	0.0759546	0.0294681	0.0345799	0.0282593	0.0017788
Medium Bar	0.0568090	0.0208108	0.0207786	0.0197274	0.0038990
Medium Cra	0.0215538	0.0264375	0.0222563	0.0217471	0.0007205
Medium End	0.6056415	0.0961658	0.0961898	0.0538588	0.0259712
Medium (TOL) Bar	0.0431861	0.0186075	0.0185949	0.0175635	0.0026217
Medium (TOL) Cra	0.0215571	0.0264417	0.0222602	0.0217510	0.0007238
Medium (TOL) End	0.1383088	0.0484953	0.0489727	0.0243619	0.0036934
Medium (MOL) Bar	0.0190240	0.0149314	0.0149194	0.0139947	0.0003763
Medium (MOL) Cra	0.0215872	0.0235280	0.0236657	0.0217863	0.0007538
Medium (MOL) End	0.0637380	0.0311267	0.0311041	0.0140955	0.0032984
Tight Bar	0.0408149	0.0111088	0.0112703	0.0092796	0.0037779
Tight Cra	0.0215488	0.0263442	0.0221982	0.0217306	0.0007155
Tight End	0.4520154	0.0977756	0.0977977	0.0801910	0.0179494
Tight (TOL) Bar	0.0310997	0.0104123	0.0106735	0.0080257	0.0028810
Tight (TOL) Cra	0.0215520	0.0263482	0.0222020	0.0217345	0.0007187
Tight (TOL) End	0.0965169	0.0459576	0.0458371	0.0304410	0.0023842
Tight (MOL) Bar	0.0136007	0.0093754	0.0094683	0.0052144	0.0012550
Tight (MOL) Cra	0.0215767	0.0235423	0.0236861	0.0217643	0.0007433
Tight (MOL) End	0.0406311	0.0121004	0.0129528	0.0111290	0.0021696

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

Selection	fake rate	total(+)	total (-)	stat	bkg
Loose Bar	0.0145197	0.0205074	0.0206076	0.0201079	0.0031170
Loose Cra	0.0217974	0.0240701	0.0242196	0.0222567	0.0009641
Loose End	0.0821667	0.0258381	0.0289146	0.0253537	0.0024964
Loose (TOL) Bar	0.0103767	0.0211027	0.0212282	0.0205063	0.0037327
Loose (TOL) Cra	0.0218001	0.0240738	0.0242234	0.0222599	0.0009668
Loose (TOL) End	0.0356680	0.0212599	0.0240048	0.0203634	0.0027935
Loose (MOL) Bar	0.0026672	0.0204838	0.0205954	0.0194174	0.0043874
Loose (MOL) Cra	0.0218082	0.0240842	0.0242340	0.0222694	0.0009749
Loose (MOL) End	0.0210116	0.0179629	0.0192475	0.0178094	0.0009664
Medium Bar	0.0115420	0.0339157	0.0340096	0.0330559	0.0060947
Medium Cra	0.0216753	0.0237546	0.0239011	0.0219795	0.0008420
Medium End	0.0792972	0.0407797	0.0449317	0.0407244	0.0003731
Medium (TOL) Bar	0.0076470	0.0331550	0.0332531	0.0321006	0.0064624
Medium (TOL) Cra	0.0216778	0.0237578	0.0239044	0.0219823	0.0008444
Medium (TOL) End	0.0290494	0.0330377	0.0377153	0.0316254	0.0094122
Medium (MOL) Bar	0.0000000	0.0095777	0.0088221	0.0000000	0.0070547
Medium (MOL) Cra	0.0216849	0.0237668	0.0239135	0.0219908	0.0008516
Medium (MOL) End	0.0174613	0.0280393	0.0299663	0.0275929	0.0045168
Tight Bar	0.0118408	0.0180316	0.0195291	0.0173831	0.0040322
Tight Cra	0.0214964	0.0233652	0.0235073	0.0216088	0.0006630
Tight End	0.0725006	0.0159115	0.0175516	0.0150423	0.0038193
Tight (TOL) Bar	0.0079465	0.0169730	0.0186780	0.0162617	0.0043991
Tight (TOL) Cra	0.0214984	0.0233679	0.0235100	0.0216112	0.0006651
Tight (TOL) End	0.0347281	0.0162101	0.0166502	0.0102140	0.0017611
Tight (MOL) Bar	0.0000000	0.0056781	0.0053435	0.0000000	0.0052910
Tight (MOL) Cra	0.0215023	0.0233727	0.0235149	0.0216158	0.0006689
Tight (MOL) End	0.0174299	0.0074201	0.0076574	0.0071854	0.0009464

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

Selection	fake rate	total(+)	total (-)	stat	bkg
Loose Bar	0.0164409	0.0302361	0.0302409	0.0296677	0.0029594
Loose Cra	0.0216783	0.0251011	0.0252399	0.0219824	0.0008450
Loose End	0.0728173	0.0458481	0.0583849	0.0446050	0.0041058
Loose (TOL) Bar	0.0128216	0.0300011	0.0300052	0.0292650	0.0030515
Loose (TOL) Cra	0.0216807	0.0250948	0.0252337	0.0219853	0.0008474
Loose (TOL) End	0.0226863	0.0392382	0.0439332	0.0331310	0.0130280
Loose (MOL) Bar	0.0039024	0.0284116	0.0284139	0.0267298	0.0049159
Loose (MOL) Cra	0.0216834	0.0248435	0.0249839	0.0219890	0.0008501
Loose (MOL) End	0.0128940	0.0322847	0.0337118	0.0281372	0.0063367
Medium Bar	0.0137001	0.0261219	0.0256317	0.0240744	0.0057003
Medium Cra	0.0216625	0.0237195	0.0238658	0.0219516	0.0008292
Medium End	0.0601316	0.0566242	0.0569086	0.0501545	0.0085497
Medium (TOL) Bar	0.0097949	0.0252438	0.0247018	0.0226942	0.0060781
Medium (TOL) Cra	0.0216650	0.0237229	0.0238692	0.0219547	0.0008316
Medium (TOL) End	0.0162364	0.0328101	0.0317569	0.0248197	0.0112361
Medium (MOL) Bar	0.0019683	0.0227419	0.0220806	0.0187694	0.0068500
Medium (MOL) Cra	0.0216716	0.0237313	0.0238778	0.0219627	0.0008382
Medium (MOL) End	0.0076777	0.0209233	0.0204221	0.0178904	0.0060586
Tight Bar	0.0155877	0.0220984	0.0220966	0.0218292	0.0020490
Tight Cra	0.0215701	0.0235342	0.0236780	0.0217563	0.0007367
Tight End	0.0668248	0.0151870	0.0171032	0.0144876	0.0036380
Tight (TOL) Bar	0.0116909	0.0207733	0.0207748	0.0203151	0.0024184
Tight (TOL) Cra	0.0215722	0.0235372	0.0236810	0.0217589	0.0007389
Tight (TOL) End	0.0289924	0.0113185	0.0120816	0.0093343	0.0015199
Tight (MOL) Bar	0.0038969	0.0178720	0.0178847	0.0168117	0.0031578
Tight (MOL) Cra	0.0215767	0.0235427	0.0236865	0.0217643	0.0007433
Tight (MOL) End	0.0145178	0.0067598	0.0070814	0.0065526	0.0007815

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

Selection	fake rate	total(+)	total (-)	stat	bkg
Loose Bar	0.0133509	0.0236674	0.0235688	0.0213067	0.0078132
Loose Cra	0.0217970	0.0264579	0.0222789	0.0222555	0.0009636
Loose End	0.0678798	0.0296938	0.0541834	0.0270227	0.0035487
Loose (TOL) Bar	0.0094783	0.0236478	0.0235293	0.0208028	0.0081584
Loose (TOL) Cra	0.0217997	0.0264620	0.0222831	0.0222586	0.0009664
Loose (TOL) End	0.0230302	0.0258978	0.0346566	0.0215480	0.0099369
Loose (MOL) Bar	0.0000000	0.0147238	0.0144072	0.0000000	0.0105820
Loose (MOL) Cra	0.0218077	0.0265491	0.0223843	0.0222681	0.0009744
Loose (MOL) End	0.0131516	0.0245399	0.0278419	0.0182827	0.0060792
Medium Bar	0.0172181	0.0131024	0.0130914	0.0128360	0.0004186
Medium Cra	0.0215784	0.0235169	0.0236545	0.0217760	0.0007451
Medium End	0.0664657	0.0396842	0.0399741	0.0143928	0.0032789
Medium (TOL) Bar	0.0132617	0.0125254	0.0125028	0.0120115	0.0008477
Medium (TOL) Cra	0.0215806	0.0235199	0.0236575	0.0217786	0.0007473
Medium (TOL) End	0.0259643	0.0278059	0.0275121	0.0087921	0.0012390
Medium (MOL) Bar	0.0055552	0.0103935	0.0103568	0.0091111	0.0014995
Medium (MOL) Cra	0.0215872	0.0235279	0.0236655	0.0217863	0.0007538
Medium (MOL) End	0.0115550	0.0138782	0.0129663	0.0058194	0.0005660
Tight Bar	0.0136003	0.0072725	0.0072681	0.0052143	0.0012546
Tight Cra	0.0215701	0.0235339	0.0236777	0.0217563	0.0007367
Tight End	0.0579313	0.0140817	0.0150841	0.0134001	0.0029862
Tight (TOL) Bar	0.0097145	0.0072436	0.0072506	0.0043893	0.0008962
Tight (TOL) Cra	0.0215722	0.0235369	0.0236806	0.0217589	0.0007389
Tight (TOL) End	0.0260274	0.0121598	0.0122328	0.0088158	0.0013021
Tight (MOL) Bar	0.0038858	0.0072725	0.0075016	0.0027591	0.0003584
Tight (MOL) Cra	0.0215767	0.0235423	0.0236861	0.0217643	0.0007433
Tight (MOL) End	0.0115853	0.0070115	0.0069873	0.0058353	0.0005963

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

Selection	fake rate	total(+)	total (-)	stat	bkg
Loose Bar	0.0026773	0.0176344	0.0176682	0.0171939	0.0026137
Loose Cra	0.0217927	0.0240483	0.0241978	0.0222349	0.0009593
Loose End	0.0782856	0.0168492	0.0204720	0.0156807	0.0041098
Loose (TOL) Bar	0.0026755	0.0176491	0.0176822	0.0172102	0.0026155
Loose (TOL) Cra	0.0217928	0.0240484	0.0241979	0.0222350	0.0009594
Loose (TOL) End	0.0317174	0.0217307	0.0239423	0.0213548	0.0012497
Loose (MOL) Bar	0.0000000	0.0025274	0.0025274	0.0000000	0.0017637
Loose (MOL) Cra	0.0217948	0.0240512	0.0242007	0.0222375	0.0009614
Loose (MOL) End	0.0198347	0.0082354	0.0099196	0.0077641	0.0006039
Medium Bar	0.0026860	0.0222701	0.0222416	0.0217991	0.0026050
Medium Cra	0.0216713	0.0237372	0.0238836	0.0219623	0.0008380
Medium End	0.0780738	0.0166433	0.0223092	0.0155582	0.0038980
Medium (TOL) Bar	0.0026792	0.0223158	0.0222859	0.0218437	0.0026118
Medium (TOL) Cra	0.0216714	0.0237373	0.0238837	0.0219624	0.0008380
Medium (TOL) End	0.0215657	0.0488297	0.0498748	0.0471610	0.0114014
Medium (MOL) Bar	0.0000000	0.0026340	0.0026340	0.0000000	0.0017637
Medium (MOL) Cra	0.0216731	0.0237396	0.0238861	0.0219645	0.0008398
Medium (MOL) End	0.0166385	0.0083903	0.0103553	0.0077154	0.0025923
Tight Bar	0.0039786	0.0087383	0.0095681	0.0084615	0.0013124
Tight Cra	0.0215022	0.0233726	0.0235148	0.0216158	0.0006689
Tight End	0.0666835	0.0150432	0.0169492	0.0143866	0.0034967
Tight (TOL) Bar	0.0040050	0.0086483	0.0094967	0.0083654	0.0012860
Tight (TOL) Cra	0.0215023	0.0233727	0.0235149	0.0216158	0.0006689
Tight (TOL) End	0.0289322	0.0156825	0.0162352	0.0092938	0.0014596
Tight (MOL) Bar	0.0000000	0.0017637	0.0017637	0.0000000	0.0017637
Tight (MOL) Cra	0.0215023	0.0233727	0.0235149	0.0216158	0.0006689
Tight (MOL) End	0.0145205	0.0066768	0.0069976	0.0065469	0.0007842

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

Selection	fake rate	total(+)	total (-)	stat	bkg
Loose Bar	0.0067297	0.0046596	0.0050926	0.0038991	0.0003250
Loose Cra	0.0216704	0.0237320	0.0238784	0.0219612	0.0008370
Loose End	0.0564616	0.1574459	0.1574297	0.1545271	0.0149670
Loose (TOL) Bar	0.0076693	0.0043390	0.0050825	0.0039049	0.0006146
Loose (TOL) Cra	0.0216704	0.0237321	0.0238785	0.0219613	0.0008371
Loose (TOL) End	0.0055280	0.0738126	0.0714239	0.0611613	0.0246918
Loose (MOL) Bar	0.0008064	0.0262433	0.0262557	0.0256133	0.0027209
Loose (MOL) Cra	0.0216716	0.0237335	0.0238800	0.0219627	0.0008382
Loose (MOL) End	0.0088438	0.0674736	0.0671127	0.0648944	0.0076397
Medium Bar	0.0060956	0.0095162	0.0093393	0.0083452	0.0009590
Medium Cra	0.0216705	0.0237299	0.0238763	0.0219614	0.0008372
Medium End	0.0587141	0.0611448	0.0617077	0.0604260	0.0044727
Medium (TOL) Bar	0.0061339	0.0095237	0.0093499	0.0083652	0.0009207
Medium (TOL) Cra	0.0216706	0.0237300	0.0238764	0.0219615	0.0008373
Medium (TOL) End	0.0135596	0.0277685	0.0273589	0.0221687	0.0084184
Medium (MOL) Bar	0.0021646	0.0084096	0.0086415	0.0068887	0.0013627
Medium (MOL) Cra	0.0216716	0.0237312	0.0238777	0.0219627	0.0008382
Medium (MOL) End	0.0082402	0.0190015	0.0190321	0.0179789	0.0027488
Tight Bar	0.0058348	0.0040733	0.0041118	0.0033893	0.0005438
Tight Cra	0.0215766	0.0235426	0.0236864	0.0217642	0.0007433
Tight End	0.0611483	0.0144389	0.0166306	0.0138354	0.0034560
Tight (TOL) Bar	0.0058348	0.0040757	0.0041142	0.0033894	0.0005438
Tight (TOL) Cra	0.0215766	0.0235426	0.0236864	0.0217642	0.0007433
Tight (TOL) End	0.0232445	0.0088837	0.0100129	0.0083391	0.0012665
Tight (MOL) Bar	0.0019449	0.0029582	0.0035403	0.0019489	0.0001812
Tight (MOL) Cra	0.0215767	0.0235427	0.0236865	0.0217643	0.0007433
Tight (MOL) End	0.0116389	0.0059361	0.0063690	0.0058630	0.0006499

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

Selection	fake rate	total(+)	total (-)	stat	bkg
Loose Bar	0.0012824	0.0215688	0.0213430	0.0183808	0.0075359
Loose Cra	0.0217921	0.0268302	0.0227189	0.0222333	0.0009588
Loose End	0.0619368	0.0407740	0.0534051	0.0380092	0.0039972
Loose (TOL) Bar	0.0013133	0.0216448	0.0214090	0.0184325	0.0075050
Loose (TOL) Cra	0.0217922	0.0268303	0.0227191	0.0222334	0.0009589
Loose (TOL) End	0.0140386	0.0358639	0.0385136	0.0293891	0.0134339
Loose (MOL) Bar	0.0000000	0.0073234	0.0073234	0.0000000	0.0052910
Loose (MOL) Cra	0.0217941	0.0268329	0.0227215	0.0222358	0.0009608
Loose (MOL) End	0.0100216	0.0303169	0.0319303	0.0253557	0.0064619
Medium Bar	0.0058348	0.0047359	0.0047674	0.0033893	0.0005437
Medium Cra	0.0215750	0.0235030	0.0236405	0.0217622	0.0007417
Medium End	0.0607752	0.0163968	0.0171804	0.0137143	0.0030829
Medium (TOL) Bar	0.0058348	0.0047501	0.0047816	0.0033893	0.0005438
Medium (TOL) Cra	0.0215751	0.0235031	0.0236406	0.0217623	0.0007417
Medium (TOL) End	0.0202241	0.0116698	0.0108891	0.0077355	0.0009933
Medium (MOL) Bar	0.0019449	0.0040340	0.0044784	0.0019489	0.0001812
Medium (MOL) Cra	0.0215767	0.0235051	0.0236427	0.0217643	0.0007433
Medium (MOL) End	0.0086784	0.0120748	0.0109486	0.0050367	0.0004366
Tight Bar	0.0058380	0.0061279	0.0061536	0.0033916	0.0005470
Tight Cra	0.0215759	0.0235412	0.0236851	0.0217633	0.0007426
Tight End	0.0522107	0.0132453	0.0144229	0.0126760	0.0027601
Tight (TOL) Bar	0.0058380	0.0061279	0.0061536	0.0033916	0.0005470
Tight (TOL) Cra	0.0215759	0.0235412	0.0236851	0.0217633	0.0007426
Tight (TOL) End	0.0202716	0.0081206	0.0082972	0.0077552	0.0010409
Tight (MOL) Bar	0.0019460	0.0059653	0.0062747	0.0019500	0.0001823
Tight (MOL) Cra	0.0215767	0.0235421	0.0236860	0.0217643	0.0007433
Tight (MOL) End	0.0087007	0.0051566	0.0051367	0.0050501	0.0004589

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

Selection	fake rate	total(+)	total (-)	stat	bkg
Loose Bar	0.0109574	0.0283424	0.0284912	0.0278958	0.0049157
Loose Cra	0.0654576	0.0486161	0.0492836	0.0400552	0.0029576
Loose End	0.0890303	0.0304757	0.0308228	0.0289543	0.0016290
Loose (TOL) Bar	0.0090337	0.0281149	0.0282752	0.0276379	0.0050757
Loose (TOL) Cra	0.0654576	0.0486161	0.0492836	0.0400552	0.0029576
Loose (TOL) End	0.0600568	0.0269357	0.0280633	0.0257455	0.0003827
Loose (MOL) Bar	0.0032208	0.0276031	0.0277563	0.0270163	0.0055975
Loose (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Loose (MOL) End	0.0377400	0.0111141	0.0116986	0.0106786	0.0020258
Medium Bar	0.0037616	0.0320654	0.0320767	0.0310503	0.0068204
Medium Cra	0.0433735	0.0363078	0.0366913	0.0315095	0.0017068
Medium End	0.0659775	0.0519145	0.0545736	0.0500657	0.0136929
Medium (TOL) Bar	0.0018762	0.0313995	0.0312382	0.0303047	0.0069421
Medium (TOL) Cra	0.0433735	0.0363078	0.0366913	0.0315095	0.0017068
Medium (TOL) End	0.0394145	0.0463662	0.0490811	0.0450880	0.0100361
Medium (MOL) Bar	0.0000000	0.0035273	0.0035273	0.0000000	0.0035273
Medium (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium (MOL) End	0.0221028	0.0434287	0.0442535	0.0429758	0.0026225
Tight Bar	0.0019809	0.0156312	0.0156524	0.0146647	0.0050738
Tight Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight End	0.0491403	0.0232744	0.0238094	0.0122278	0.0024370
Tight (TOL) Bar	0.0019841	0.0156256	0.0156471	0.0146595	0.0050706
Tight (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (TOL) End	0.0318025	0.0210090	0.0214287	0.0097540	0.0015827
Tight (MOL) Bar	0.0000000	0.0017637	0.0017637	0.0000000	0.0017637
Tight (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (MOL) End	0.0203254	0.0089514	0.0096867	0.0077697	0.0010947

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

Selection	fake rate	total(+)	total (-)	stat	bkg
Loose Bar	0.0172690	0.0295759	0.0298964	0.0291166	0.0021313
Loose Cra	0.0653042	0.0489157	0.0495672	0.0392151	0.0028042
Loose End	0.1151442	0.0428467	0.0442652	0.0420393	0.0029877
Loose (TOL) Bar	0.0152311	0.0292590	0.0295733	0.0287001	0.0024056
Loose (TOL) Cra	0.0653042	0.0489157	0.0495672	0.0392151	0.0028042
Loose (TOL) End	0.0752694	0.0370302	0.0390167	0.0367371	0.0016537
Loose (MOL) Bar	0.0072018	0.0285495	0.0288871	0.0278056	0.0033802
Loose (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Loose (MOL) End	0.0464033	0.0131242	0.0134658	0.0118723	0.0024473
Medium Bar	0.0098065	0.0255680	0.0250579	0.0222406	0.0060665
Medium Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium End	0.0850025	0.0451886	0.0460851	0.0165483	0.0025850
Medium (TOL) Bar	0.0078483	0.0250629	0.0245315	0.0213884	0.0062611
Medium (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium (TOL) End	0.0515609	0.0315209	0.0328781	0.0126414	0.0021104
Medium (MOL) Bar	0.0000000	0.0138389	0.0125820	0.0000000	0.0070547
Medium (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium (MOL) End	0.0261318	0.0093741	0.0092737	0.0088473	0.0014065
Tight Bar	0.0077932	0.0198705	0.0198765	0.0186551	0.0027889
Tight Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight End	0.0639738	0.0184058	0.0186141	0.0141907	0.0035342
Tight (TOL) Bar	0.0077933	0.0198751	0.0198811	0.0186554	0.0027887
Tight (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (TOL) End	0.0348845	0.0129922	0.0130989	0.0103010	0.0019174
Tight (MOL) Bar	0.0019484	0.0172581	0.0172749	0.0157986	0.0033427
Tight (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (MOL) End	0.0203905	0.0091262	0.0090687	0.0078115	0.0011598

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

Selection	fake rate	total(+)	total (-)	stat	bkg
Loose Bar	0.0084877	0.0265034	0.0262955	0.0227862	0.0091490
Loose Cra	0.0218048	0.0264678	0.0222887	0.0222641	0.0009715
Loose End	0.1042162	0.0306779	0.0346081	0.0303515	0.0029267
Loose (TOL) Bar	0.0064196	0.0262999	0.0260985	0.0224447	0.0094534
Loose (TOL) Cra	0.0218048	0.0264678	0.0222887	0.0222641	0.0009715
Loose (TOL) End	0.0631173	0.0258034	0.0309709	0.0250577	0.0028167
Loose (MOL) Bar	0.0000000	0.0114732	0.0114732	0.0000000	0.0088183
Loose (MOL) Cra	0.0000000	0.0205622	0.0098671	0.0000000	0.0000000
Loose (MOL) End	0.0368835	0.0142423	0.0164605	0.0106443	0.0011692
Medium Bar	0.0118005	0.0121773	0.0121842	0.0107403	0.0005452
Medium Cra	0.0215819	0.0235213	0.0236589	0.0217801	0.0007486
Medium End	0.0865250	0.0488552	0.0488756	0.0165776	0.0041074
Medium (TOL) Bar	0.0098431	0.0118041	0.0118152	0.0100780	0.0007389
Medium (TOL) Cra	0.0215819	0.0235213	0.0236589	0.0217801	0.0007486
Medium (TOL) End	0.0491285	0.0327356	0.0328590	0.0122690	0.0024252
Medium (MOL) Bar	0.0020029	0.0094871	0.0095344	0.0069776	0.0015244
Medium (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium (MOL) End	0.0260559	0.0169874	0.0169724	0.0088253	0.0013306
Tight Bar	0.0077711	0.0071128	0.0072978	0.0039177	0.0007164
Tight Cra	0.0215742	0.0235397	0.0236835	0.0217613	0.0007409
Tight End	0.0608362	0.0237625	0.0239019	0.0137542	0.0031439
Tight (TOL) Bar	0.0077712	0.0071129	0.0072979	0.0039177	0.0007165
Tight (TOL) Cra	0.0215742	0.0235397	0.0236835	0.0217613	0.0007409
Tight (TOL) End	0.0318537	0.0184166	0.0184739	0.0097927	0.0016339
Tight (MOL) Bar	0.0019428	0.0074044	0.0076551	0.0019469	0.0001792
Tight (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (MOL) End	0.0145095	0.0093799	0.0093507	0.0065488	0.0007732

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

Selection	fake rate	total(+)	total (-)	stat	bkg
Loose Bar	0.0096031	0.0247711	0.0250107	0.0245906	0.0027426
Loose Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Loose End	0.0158805	0.0229624	0.0225394	0.0212066	0.0033502
Loose (TOL) Bar	0.0095910	0.0248503	0.0250887	0.0246679	0.0027547
Loose (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Loose (TOL) End	0.0100487	0.0214637	0.0214268	0.0203627	0.0036876
Loose (MOL) Bar	0.0052507	0.0272964	0.0274662	0.0270490	0.0035677
Loose (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Loose (MOL) End	0.0100805	0.0213669	0.0210111	0.0203082	0.0009085
Medium Bar	0.0040873	0.0272392	0.0273490	0.0270167	0.0029674
Medium Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium End	0.0099042	0.0355638	0.0358117	0.0332760	0.0093266
Medium (TOL) Bar	0.0040783	0.0273026	0.0274114	0.0270795	0.0029764
Medium (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium (TOL) End	0.0043659	0.0327458	0.0329579	0.0305900	0.0093704
Medium (MOL) Bar	0.0003300	0.0252328	0.0251932	0.0249855	0.0031974
Medium (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium (MOL) End	0.0052555	0.0387006	0.0389041	0.0372726	0.0057335
Tight Bar	0.0029985	0.0140745	0.0143904	0.0135563	0.0022925
Tight Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight End	0.0115792	0.0091582	0.0083053	0.0058271	0.0005902
Tight (TOL) Bar	0.0030051	0.0140482	0.0143660	0.0135286	0.0022859
Tight (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (TOL) End	0.0057889	0.0071225	0.0071162	0.0041067	0.0002944
Tight (MOL) Bar	0.0000000	0.0017637	0.0017637	0.0000000	0.0017637
Tight (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (MOL) End	0.0058033	0.0043268	0.0043160	0.0041171	0.0003088

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

Selection	fake rate	total(+)	total (-)	stat	bkg
Loose Bar	0.0135680	0.0059397	0.0093313	0.0051922	0.0012223
Loose Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Loose End	0.0120982	0.0293127	0.0295470	0.0264775	0.0071326
Loose (TOL) Bar	0.0135681	0.0060088	0.0092273	0.0051922	0.0012224
Loose (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Loose (TOL) End	0.0064281	0.0267619	0.0274757	0.0241202	0.0073082
Loose (MOL) Bar	0.0096877	0.0050186	0.0086511	0.0043711	0.0008694
Loose (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Loose (MOL) End	0.0074535	0.0308765	0.0312581	0.0294144	0.0035355
Medium Bar	0.0081398	0.0220579	0.0219924	0.0202422	0.0024422
Medium Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium End	0.0053848	0.0101120	0.0102461	0.0080623	0.0028569
Medium (TOL) Bar	0.0081543	0.0221277	0.0220631	0.0203181	0.0024277
Medium (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium (TOL) End	0.0000000	0.0027473	0.0027473	0.0000000	0.0027473
Medium (MOL) Bar	0.0045387	0.0215888	0.0215463	0.0199450	0.0025160
Medium (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium (MOL) End	0.0012911	0.0060349	0.0061714	0.0057120	0.0014561
Tight Bar	0.0097199	0.0060084	0.0062003	0.0043902	0.0009015
Tight Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight End	0.0087296	0.0063447	0.0051601	0.0050697	0.0004878
Tight (TOL) Bar	0.0097199	0.0060228	0.0062143	0.0043902	0.0009015
Tight (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (TOL) End	0.0029094	0.0029916	0.0029881	0.0029152	0.0001622
Tight (MOL) Bar	0.0058318	0.0048455	0.0051475	0.0033872	0.0005408
Tight (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (MOL) End	0.0029097	0.0029920	0.0029884	0.0029155	0.0001625

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

Selection	fake rate	total(+)	total (-)	stat	bkg
Loose Bar	0.0040500	0.0280681	0.0278770	0.0242938	0.0082957
Loose Cra	0.0000000	0.0223417	0.0131852	0.0000000	0.0000000
Loose End	0.0117552	0.0232906	0.0249200	0.0195297	0.0074756
Loose (TOL) Bar	0.0041335	0.0281712	0.0279753	0.0243898	0.0082122
Loose (TOL) Cra	0.0000000	0.0223417	0.0131852	0.0000000	0.0000000
Loose (TOL) End	0.0059068	0.0217396	0.0225278	0.0181645	0.0078295
Loose (MOL) Bar	0.0000000	0.0136701	0.0134510	0.0000000	0.0088183
Loose (MOL) Cra	0.0000000	0.0223433	0.0131859	0.0000000	0.0000000
Loose (MOL) End	0.0061587	0.0222054	0.0230437	0.0178930	0.0048303
Medium Bar	0.0077795	0.0076526	0.0078247	0.0039214	0.0007248
Medium Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium End	0.0086785	0.0107073	0.0100649	0.0050380	0.0004367
Medium (TOL) Bar	0.0077795	0.0076675	0.0078393	0.0039214	0.0007248
Medium (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium (TOL) End	0.0028925	0.0041049	0.0041026	0.0028979	0.0001453
Medium (MOL) Bar	0.0038897	0.0065032	0.0067587	0.0027617	0.0003624
Medium (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium (MOL) End	0.0028929	0.0041055	0.0041032	0.0028982	0.0001457
Tight Bar	0.0058380	0.0071839	0.0073914	0.0033916	0.0005470
Tight Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight End	0.0058005	0.0064368	0.0054116	0.0041169	0.0003060
Tight (TOL) Bar	0.0058380	0.0071839	0.0073915	0.0033916	0.0005470
Tight (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (TOL) End	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (MOL) Bar	0.0019460	0.0074135	0.0076647	0.0019500	0.0001823
Tight (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (MOL) End	0.0000000	0.0000000	0.0000000	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	0.0003281	0.0208754	0.0208780	0.0206262	0.0031992
Loose Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Loose End	0.0107973	0.0066279	0.0071053	0.0058238	0.0001917
Loose (TOL) Bar	0.0003281	0.0208754	0.0208780	0.0206262	0.0031992
Loose (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Loose (TOL) End	0.0076360	0.0062681	0.0068460	0.0050348	0.0006058
Loose (MOL) Bar	0.0000000	0.0017637	0.0017637	0.0000000	0.0017637
Loose (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Loose (MOL) End	0.0086891	0.0056285	0.0056884	0.0050395	0.0004474
Medium Bar	0.0007592	0.0214047	0.0213760	0.0211759	0.0027681
Medium Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium End	0.0043652	0.0435610	0.0426232	0.0413984	0.0066238
Medium (TOL) Bar	0.0007592	0.0214047	0.0213760	0.0211759	0.0027681
Medium (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium (TOL) End	0.0014550	0.0393422	0.0392758	0.0378719	0.0067868
Medium (MOL) Bar	0.0000000	0.0017791	0.0017637	0.0000000	0.0017637
Medium (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium (MOL) End	0.0014550	0.0405996	0.0405352	0.0396764	0.0067868
Tight Bar	0.0020570	0.0081526	0.0084081	0.0077484	0.0014703
Tight Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight End	0.0058033	0.0043268	0.0043160	0.0041171	0.0003088
Tight (TOL) Bar	0.0020570	0.0081526	0.0084081	0.0077484	0.0014703
Tight (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (TOL) End	0.0029014	0.0029813	0.0029775	0.0029062	0.0001542
Tight (MOL) Bar	0.0000000	0.0017637	0.0017637	0.0000000	0.0017637
Tight (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (MOL) End	0.0029015	0.0029814	0.0029775	0.0029063	0.0001542

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

Selection	fake rate	total(+)	total (-)	stat	bkg
Loose Bar	0.0058178	0.0035051	0.0059981	0.0033774	0.0005268
Loose Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Loose End	0.0000000	0.0144244	0.0141550	0.0000000	0.0082418
Loose (TOL) Bar	0.0058178	0.0035051	0.0059981	0.0033774	0.0005268
Loose (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Loose (TOL) End	0.0000000	0.0107209	0.0107209	0.0000000	0.0054945
Loose (MOL) Bar	0.0038770	0.0029371	0.0048640	0.0027515	0.0003497
Loose (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Loose (MOL) End	0.0000000	0.0107213	0.0107213	0.0000000	0.0054945
Medium Bar	0.0021365	0.0182861	0.0181964	0.0166023	0.0031545
Medium Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium End	0.0028944	0.0033742	0.0033709	0.0028991	0.0001471
Medium (TOL) Bar	0.0021365	0.0182861	0.0181964	0.0166023	0.0031545
Medium (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium (TOL) End	0.0000000	0.0022974	0.0022974	0.0000000	0.0000000
Medium (MOL) Bar	0.0000000	0.0086946	0.0080565	0.0000000	0.0035273
Medium (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium (MOL) End	0.0000000	0.0022974	0.0022974	0.0000000	0.0000000
Tight Bar	0.0038878	0.0034495	0.0039098	0.0027601	0.0003604
Tight Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight End	0.0029051	0.0029864	0.0029825	0.0029104	0.0001579
Tight (TOL) Bar	0.0038878	0.0034495	0.0039098	0.0027601	0.0003604
Tight (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (TOL) End	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (MOL) Bar	0.0019439	0.0031796	0.0037267	0.0019478	0.0001802
Tight (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (MOL) End	0.0000000	0.0000000	0.0000000	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	0.0100592	0.0100592	0.0000000	0.0070547
Loose Cra	0.0000000	0.0223858	0.0132587	0.0000000	0.0000000
Loose End	0.0000000	0.0214016	0.0214016	0.0000000	0.0109890
Loose (TOL) Bar	0.0000000	0.0100592	0.0100592	0.0000000	0.0070547
Loose (TOL) Cra	0.0000000	0.0223858	0.0132587	0.0000000	0.0000000
Loose (TOL) End	0.0000000	0.0180597	0.0180597	0.0000000	0.0082418
Loose (MOL) Bar	0.0000000	0.0072143	0.0072143	0.0000000	0.0052910
Loose (MOL) Cra	0.0000000	0.0223865	0.0132591	0.0000000	0.0000000
Loose (MOL) End	0.0000000	0.0180602	0.0180602	0.0000000	0.0082418
Medium Bar	0.0038897	0.0050982	0.0054203	0.0027617	0.0003623
Medium Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium End	0.0028929	0.0041055	0.0041029	0.0028983	0.0001457
Medium (TOL) Bar	0.0038897	0.0050982	0.0054203	0.0027617	0.0003623
Medium (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium (TOL) End	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium (MOL) Bar	0.0019448	0.0051047	0.0054627	0.0019488	0.0001812
Medium (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium (MOL) End	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight Bar	0.0038920	0.0059120	0.0061925	0.0027635	0.0003647
Tight Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight End	0.0029004	0.0041165	0.0041138	0.0029058	0.0001531
Tight (TOL) Bar	0.0038920	0.0059120	0.0061925	0.0027635	0.0003647
Tight (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (TOL) End	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (MOL) Bar	0.0019460	0.0059656	0.0062749	0.0019500	0.0001823
Tight (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (MOL) End	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000