

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

Selection	fake rate	total(+)	total (-)	stat	bkg
Loose Bar	0.8743479	0.0504057	0.0508020	0.0128152	0.0324583
Loose Cra	0.8296047	0.0620385	0.0632037	0.0565742	0.0239620
Loose End	0.9216790	0.0449532	0.0448896	0.0154587	0.0209421
Loose (TOL) Bar	0.2084317	0.0235357	0.0235281	0.0103939	0.0063178
Loose (TOL) Cra	0.2645203	0.1050701	0.1051018	0.0336031	0.0074671
Loose (TOL) End	0.3085775	0.0258899	0.0260230	0.0121933	0.0068870
Loose (MOL) Bar	0.1145660	0.0150289	0.0148798	0.0088586	0.0028317
Loose (MOL) Cra	0.0834104	0.0321754	0.0327548	0.0173873	0.0019057
Loose (MOL) End	0.1374218	0.0185119	0.0189000	0.0080843	0.0030482
Medium Bar	0.8179286	0.0471118	0.0475294	0.0129823	0.0303962
Medium Cra	0.7276364	0.0655828	0.0658136	0.0578532	0.0191725
Medium End	0.8669495	0.0433872	0.0433722	0.0159238	0.0173613
Medium (TOL) Bar	0.1864218	0.0245063	0.0244592	0.0151913	0.0060939
Medium (TOL) Cra	0.2124045	0.1032191	0.1034269	0.0301381	0.0055080
Medium (TOL) End	0.2690292	0.0224986	0.0227050	0.0112852	0.0054835
Medium (MOL) Bar	0.0994942	0.0168595	0.0167269	0.0128800	0.0028592
Medium (MOL) Cra	0.0607441	0.0367275	0.0370154	0.0148428	0.0011829
Medium (MOL) End	0.1147867	0.0153922	0.0155765	0.0073254	0.0025197
Tight Bar	0.6535743	0.0400201	0.0402495	0.0126817	0.0247994
Tight Cra	0.5062565	0.0668250	0.0670725	0.0482719	0.0109587
Tight End	0.7148749	0.0558150	0.0464613	0.0179094	0.0163778
Tight (TOL) Bar	0.1338813	0.0180517	0.0179398	0.0117612	0.0038123
Tight (TOL) Cra	0.1120152	0.0969627	0.0964126	0.0204997	0.0022973
Tight (TOL) End	0.1742239	0.2229437	0.2177821	0.2048346	0.0468424
Tight (MOL) Bar	0.0686039	0.0106965	0.0104679	0.0077780	0.0015202
Tight (MOL) Cra	0.0287776	0.0278039	0.0281120	0.0098210	0.0005644
Tight (MOL) End	0.0957943	0.0114490	0.0117683	0.0066741	0.0021662

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

Selection	fake rate	total(+)	total (-)	stat	bkg
Loose Bar	0.9380065	0.0496040	0.0496880	0.0128882	0.0337788
Loose Cra	0.8761574	0.0659307	0.0661172	0.0582419	0.0266276
Loose End	0.9389547	0.0408309	0.0411805	0.0149896	0.0191454
Loose (TOL) Bar	0.2254592	0.0277820	0.0276739	0.0162366	0.0050105
Loose (TOL) Cra	0.2844078	0.1088112	0.1087483	0.0353030	0.0085458
Loose (TOL) End	0.3195178	0.0265232	0.0267144	0.0122049	0.0065573
Loose (MOL) Bar	0.1251189	0.0201021	0.0198091	0.0142861	0.0015210
Loose (MOL) Cra	0.0931421	0.0361795	0.0364444	0.0184977	0.0022330
Loose (MOL) End	0.1416169	0.0196330	0.0201034	0.0081192	0.0029087
Medium Bar	0.8918803	0.0529197	0.0530805	0.0134862	0.0344601
Medium Cra	0.7615191	0.0655131	0.0657787	0.0586707	0.0217072
Medium End	0.8912766	0.0432316	0.0434306	0.0161726	0.0178479
Medium (TOL) Bar	0.2113404	0.0251801	0.0249882	0.0124602	0.0075009
Medium (TOL) Cra	0.2126177	0.1005036	0.1007204	0.0301510	0.0057212
Medium (TOL) End	0.2969932	0.0236544	0.0237789	0.0119733	0.0061393
Medium (MOL) Bar	0.1168448	0.0162785	0.0159994	0.0100373	0.0040320
Medium (MOL) Cra	0.0705223	0.0335114	0.0338537	0.0159571	0.0015568
Medium (MOL) End	0.1297305	0.0156485	0.0158955	0.0078271	0.0027257
Tight Bar	0.8111201	0.0490966	0.0490868	0.0134418	0.0313530
Tight Cra	0.5865651	0.0554641	0.0575202	0.0520736	0.0128974
Tight End	0.8236857	0.0449536	0.0452172	0.0166186	0.0174438
Tight (TOL) Bar	0.1838122	0.0240137	0.0238508	0.0145376	0.0065042
Tight (TOL) Cra	0.1505914	0.0574185	0.0574748	0.0243382	0.0032560
Tight (TOL) End	0.2635087	0.0205869	0.0209622	0.0112816	0.0055980
Tight (MOL) Bar	0.1018761	0.0168799	0.0166961	0.0126392	0.0035155
Tight (MOL) Cra	0.0415927	0.0207639	0.0212493	0.0119368	0.0008403
Tight (MOL) End	0.1148123	0.0117774	0.0124213	0.0073499	0.0025453

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

Selection	fake rate	total(+)	total (-)	stat	bkg
Loose Bar	0.9046287	0.0491255	0.0491166	0.0133675	0.0325407
Loose Cra	0.8440897	0.0728308	0.0725123	0.0623962	0.0259078
Loose End	0.9201013	0.0374307	0.0377944	0.0155321	0.0184975
Loose (TOL) Bar	0.2175349	0.0273475	0.0271774	0.0168420	0.0044201
Loose (TOL) Cra	0.2685278	0.1173039	0.1167682	0.0354529	0.0083397
Loose (TOL) End	0.3101943	0.0288081	0.0290285	0.0173158	0.0054696
Loose (MOL) Bar	0.1207827	0.0198876	0.0196439	0.0150367	0.0008517
Loose (MOL) Cra	0.0899091	0.0400310	0.0400274	0.0184401	0.0021348
Loose (MOL) End	0.1384348	0.0200051	0.0206705	0.0080570	0.0027608
Medium Bar	0.7692374	0.0430310	0.0429739	0.0132888	0.0289440
Medium Cra	0.7440514	0.0681020	0.0689153	0.0565037	0.0199134
Medium End	0.7893278	0.0336591	0.0337604	0.0165004	0.0164626
Medium (TOL) Bar	0.1882952	0.0230798	0.0227867	0.0126346	0.0055946
Medium (TOL) Cra	0.2252714	0.1002864	0.1001865	0.0307100	0.0058356
Medium (TOL) End	0.2630851	0.0341465	0.0348201	0.0278766	0.0038740
Medium (MOL) Bar	0.1045454	0.0143011	0.0141075	0.0086065	0.0029492
Medium (MOL) Cra	0.0663554	0.0360487	0.0362926	0.0175735	0.0005247
Medium (MOL) End	0.1164880	0.0156201	0.0166737	0.0073866	0.0024871
Tight Bar	0.5016579	0.0285621	0.0286741	0.0114669	0.0191299
Tight Cra	0.5654326	0.0534918	0.0545325	0.0512661	0.0137085
Tight End	0.5388180	0.0197973	0.0197949	0.0154538	0.0112931
Tight (TOL) Bar	0.1342842	0.0152340	0.0149451	0.0057508	0.0050780
Tight (TOL) Cra	0.1507911	0.0613288	0.0615183	0.0243726	0.0034557
Tight (TOL) End	0.1155927	0.1585881	0.1480865	0.1258205	0.0556253
Tight (MOL) Bar	0.0745983	0.0095424	0.0094689	0.0042095	0.0027692
Tight (MOL) Cra	0.0415800	0.0192957	0.0203267	0.0119331	0.0008276
Tight (MOL) End	0.0771349	0.0129720	0.0131066	0.0059728	0.0017123

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

Selection	fake rate	total(+)	total (-)	stat	bkg
Loose Bar	0.0665766	0.0079557	0.0078909	0.0070077	0.0014342
Loose Cra	0.0449380	0.0200411	0.0201142	0.0124238	0.0010508
Loose End	0.6450212	0.0512568	0.0513461	0.0162537	0.0138985
Loose (TOL) Bar	0.0473914	0.0083365	0.0082446	0.0064839	0.0007995
Loose (TOL) Cra	0.0320952	0.0148102	0.0148219	0.0104037	0.0007473
Loose (TOL) End	0.1402856	0.0148270	0.0150057	0.0119114	0.0020108
Loose (MOL) Bar	0.0182025	0.0065340	0.0065132	0.0055627	0.0001322
Loose (MOL) Cra	0.0096383	0.0077867	0.0077957	0.0056086	0.0002339
Loose (MOL) End	0.0836953	0.0079786	0.0086401	0.0062342	0.0017707
Medium Bar	0.0614085	0.0098372	0.0097869	0.0092192	0.0014431
Medium Cra	0.0385330	0.0180406	0.0180857	0.0115074	0.0009155
Medium End	0.6296820	0.0514570	0.0516432	0.0161118	0.0132971
Medium (TOL) Bar	0.0432136	0.0095406	0.0094692	0.0082546	0.0009358
Medium (TOL) Cra	0.0288982	0.0140210	0.0140354	0.0098855	0.0006850
Medium (TOL) End	0.1341003	0.0161426	0.0162644	0.0136514	0.0018939
Medium (MOL) Bar	0.0158763	0.0071685	0.0071559	0.0066163	0.0000857
Medium (MOL) Cra	0.0064276	0.0053177	0.0053244	0.0045724	0.0001580
Medium (MOL) End	0.0792466	0.0076892	0.0083241	0.0060470	0.0016567
Tight Bar	0.0469443	0.0069176	0.0068672	0.0061138	0.0007838
Tight Cra	0.0160197	0.0087770	0.0086277	0.0072589	0.0003458
Tight End	0.5552901	0.0458941	0.0459146	0.0155327	0.0117270
Tight (TOL) Bar	0.0309636	0.0061647	0.0060927	0.0052248	0.0003338
Tight (TOL) Cra	0.0128159	0.0074375	0.0072924	0.0064760	0.0002767
Tight (TOL) End	0.0851251	0.1856395	0.1825968	0.1769837	0.0319100
Tight (MOL) Bar	0.0099101	0.0036087	0.0035951	0.0033348	0.0004436
Tight (MOL) Cra	0.0032065	0.0034882	0.0034907	0.0032152	0.0000717
Tight (MOL) End	0.0700058	0.0071851	0.0077728	0.0056729	0.0015186

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

Selection	fake rate	total(+)	total (-)	stat	bkg
Loose Bar	0.0676096	0.0116435	0.0114604	0.0107233	0.0014154
Loose Cra	0.0450114	0.0181532	0.0182395	0.0124609	0.0011243
Loose End	0.6519603	0.0496665	0.0499228	0.0158727	0.0130352
Loose (TOL) Bar	0.0480642	0.0119970	0.0119042	0.0100201	0.0017632
Loose (TOL) Cra	0.0321481	0.0132006	0.0132158	0.0104311	0.0008002
Loose (TOL) End	0.1400394	0.0267485	0.0268291	0.0253733	0.0004027
Loose (MOL) Bar	0.0168706	0.0101220	0.0100184	0.0081484	0.0025427
Loose (MOL) Cra	0.0032157	0.0032907	0.0032934	0.0032243	0.0000810
Loose (MOL) End	0.0831215	0.0078726	0.0087408	0.0061642	0.0016303
Medium Bar	0.0674016	0.0093442	0.0092187	0.0082392	0.0018278
Medium Cra	0.0352820	0.0153029	0.0153344	0.0109741	0.0007992
Medium End	0.6286250	0.0512573	0.0513711	0.0162148	0.0126735
Medium (TOL) Bar	0.0478698	0.0090882	0.0089327	0.0072761	0.0012779
Medium (TOL) Cra	0.0224493	0.0102190	0.0102900	0.0086588	0.0005057
Medium (TOL) End	0.1327157	0.0248812	0.0249288	0.0235180	0.0007910
Medium (MOL) Bar	0.0173612	0.0061255	0.0060658	0.0049265	0.0003207
Medium (MOL) Cra	0.0032102	0.0034937	0.0034963	0.0032199	0.0000754
Medium (MOL) End	0.0787481	0.0077236	0.0083654	0.0060293	0.0015916
Tight Bar	0.0586433	0.0086341	0.0085885	0.0078947	0.0014820
Tight Cra	0.0288477	0.0139928	0.0140070	0.0098533	0.0006345
Tight End	0.5948275	0.0512077	0.0514241	0.0160814	0.0131197
Tight (TOL) Bar	0.0404695	0.0086101	0.0085361	0.0070691	0.0009958
Tight (TOL) Cra	0.0224365	0.0113268	0.0113906	0.0086445	0.0004929
Tight (TOL) End	0.1233861	0.0114060	0.0116778	0.0076235	0.0020164
Tight (MOL) Bar	0.0148292	0.0057617	0.0057395	0.0045118	0.0001614
Tight (MOL) Cra	0.0032077	0.0034902	0.0034927	0.0032168	0.0000729
Tight (MOL) End	0.0717594	0.0076971	0.0083740	0.0057541	0.0015383

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

Selection	fake rate	total(+)	total (-)	stat	bkg
Loose Bar	0.0679325	0.0134566	0.0130817	0.0121908	0.0019553
Loose Cra	0.0418239	0.0157801	0.0157347	0.0120911	0.0010716
Loose End	0.6459918	0.0480013	0.0483504	0.0160576	0.0127019
Loose (TOL) Bar	0.0484225	0.0136340	0.0134041	0.0114711	0.0022677
Loose (TOL) Cra	0.0289520	0.0113354	0.0110535	0.0099389	0.0007388
Loose (TOL) End	0.1408954	0.0202567	0.0204720	0.0183428	0.0008471
Loose (MOL) Bar	0.0180484	0.0119702	0.0117992	0.0098770	0.0030906
Loose (MOL) Cra	0.0032182	0.0044969	0.0037248	0.0032291	0.0000834
Loose (MOL) End	0.0846665	0.0082293	0.0093133	0.0062444	0.0014415
Medium Bar	0.0580479	0.0061361	0.0060086	0.0047284	0.0013179
Medium Cra	0.0384762	0.0152443	0.0152958	0.0114468	0.0008587
Medium End	0.5514718	0.0436769	0.0439175	0.0155840	0.0113764
Medium (TOL) Bar	0.0418810	0.0063644	0.0062842	0.0041653	0.0008974
Medium (TOL) Cra	0.0256475	0.0104358	0.0104787	0.0092560	0.0005691
Medium (TOL) End	0.1148132	0.0397660	0.0421121	0.0386933	0.0043893
Medium (MOL) Bar	0.0152960	0.0041389	0.0040906	0.0026821	0.0000190
Medium (MOL) Cra	0.0032075	0.0032853	0.0032877	0.0032160	0.0000727
Medium (MOL) End	0.0712286	0.0070996	0.0379575	0.0057219	0.0014410
Tight Bar	0.0389851	0.0046028	0.0045797	0.0030036	0.0014527
Tight Cra	0.0288476	0.0139774	0.0139915	0.0098532	0.0006344
Tight End	0.3770190	0.0255502	0.0254131	0.0133876	0.0085752
Tight (TOL) Bar	0.0277872	0.0044056	0.0043315	0.0025248	0.0010400
Tight (TOL) Cra	0.0192299	0.0100017	0.0100986	0.0079815	0.0004212
Tight (TOL) End	0.0540101	0.0972888	0.0931213	0.0875968	0.0261806
Tight (MOL) Bar	0.0105319	0.0037901	0.0038138	0.0015433	0.0003939
Tight (MOL) Cra	0.0032076	0.0034898	0.0034923	0.0032167	0.0000728
Tight (MOL) End	0.0451714	0.0053603	0.0054823	0.0045326	0.0009581

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

Selection	fake rate	total(+)	total (-)	stat	bkg
Loose Bar	0.0211049	0.0060426	0.0060384	0.0055987	0.0000341
Loose Cra	0.0160583	0.0109053	0.0109221	0.0072751	0.0003843
Loose End	0.0690945	0.0071650	0.0073399	0.0056475	0.0014743
Loose (TOL) Bar	0.0161998	0.0061689	0.0061492	0.0055084	0.0001936
Loose (TOL) Cra	0.0128472	0.0093811	0.0093936	0.0064909	0.0003080
Loose (TOL) End	0.0341639	0.0099209	0.0099259	0.0074065	0.0003538
Loose (MOL) Bar	0.0105930	0.0061809	0.0061700	0.0053165	0.0004078
Loose (MOL) Cra	0.0064224	0.0062439	0.0062486	0.0045639	0.0001528
Loose (MOL) End	0.0206253	0.0085957	0.0086893	0.0063531	0.0001809
Medium Bar	0.0176877	0.0068690	0.0068651	0.0066621	0.0000000
Medium Cra	0.0160648	0.0099523	0.0099746	0.0072910	0.0003908
Medium End	0.0677298	0.0063867	0.0066088	0.0055775	0.0014099
Medium (TOL) Bar	0.0134742	0.0067248	0.0067135	0.0063698	0.0001151
Medium (TOL) Cra	0.0128522	0.0084651	0.0084819	0.0065028	0.0003131
Medium (TOL) End	0.0329301	0.0090858	0.0091101	0.0075268	0.0004203
Medium (MOL) Bar	0.0087551	0.0064693	0.0064640	0.0060248	0.0003044
Medium (MOL) Cra	0.0064280	0.0053180	0.0053247	0.0045727	0.0001584
Medium (MOL) End	0.0204156	0.0071456	0.0072932	0.0059786	0.0000428
Tight Bar	0.0113169	0.0035438	0.0034970	0.0034470	0.0003311
Tight Cra	0.0064115	0.0052983	0.0053050	0.0045579	0.0001419
Tight End	0.0571383	0.0056281	0.0059967	0.0051103	0.0012215
Tight (TOL) Bar	0.0081756	0.0033086	0.0032870	0.0031372	0.0004525
Tight (TOL) Cra	0.0064119	0.0052987	0.0053054	0.0045582	0.0001423
Tight (TOL) End	0.0269979	0.0050688	0.0051043	0.0034842	0.0005566
Tight (MOL) Bar	0.0049827	0.0028964	0.0028911	0.0027154	0.0006256
Tight (MOL) Cra	0.0032067	0.0034883	0.0034909	0.0032153	0.0000719
Tight (MOL) End	0.0154929	0.0036585	0.0038321	0.0026311	0.0003217

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

Selection	fake rate	total(+)	total (-)	stat	bkg
Loose Bar	0.0196066	0.0093614	0.0092366	0.0077571	0.0026108
Loose Cra	0.0192774	0.0119621	0.0119881	0.0079951	0.0004686
Loose End	0.0694088	0.0071073	0.0073919	0.0056222	0.0013550
Loose (TOL) Bar	0.0150896	0.0094595	0.0093685	0.0077782	0.0023823
Loose (TOL) Cra	0.0160651	0.0105303	0.0105508	0.0072801	0.0003911
Loose (TOL) End	0.0310382	0.0178757	0.0178352	0.0157753	0.0023385
Loose (MOL) Bar	0.0088919	0.0096599	0.0095293	0.0072406	0.0029717
Loose (MOL) Cra	0.0032119	0.0043320	0.0043340	0.0032204	0.0000771
Loose (MOL) End	0.0166891	0.0158345	0.0160175	0.0139394	0.0032502
Medium Bar	0.0203464	0.0057193	0.0056923	0.0051110	0.0005017
Medium Cra	0.0128376	0.0084550	0.0084723	0.0064950	0.0002985
Medium End	0.0641490	0.0062740	0.0064504	0.0054255	0.0012968
Medium (TOL) Bar	0.0157133	0.0055915	0.0055383	0.0047621	0.0003984
Medium (TOL) Cra	0.0096286	0.0069240	0.0069359	0.0056088	0.0002242
Medium (TOL) End	0.0271878	0.0112683	0.0111707	0.0086905	0.0018542
Medium (MOL) Bar	0.0100033	0.0052471	0.0052041	0.0041005	0.0000809
Medium (MOL) Cra	0.0032104	0.0034939	0.0034966	0.0032201	0.0000757
Medium (MOL) End	0.0147292	0.0096578	0.0096695	0.0074255	0.0021759
Tight Bar	0.0164899	0.0051132	0.0051119	0.0044959	0.0003122
Tight Cra	0.0096206	0.0069184	0.0069300	0.0056015	0.0002162
Tight End	0.0566989	0.0055301	0.0057630	0.0050974	0.0012156
Tight (TOL) Bar	0.0120092	0.0050689	0.0050503	0.0041245	0.0001455
Tight (TOL) Cra	0.0096215	0.0069190	0.0069307	0.0056019	0.0002171
Tight (TOL) End	0.0264899	0.0049850	0.0050234	0.0034572	0.0004821
Tight (MOL) Bar	0.0076965	0.0047351	0.0047281	0.0034480	0.0000688
Tight (MOL) Cra	0.0032079	0.0034904	0.0034930	0.0032170	0.0000731
Tight (MOL) End	0.0136691	0.0071620	0.0073593	0.0065702	0.0006352

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

Selection	fake rate	total(+)	total (-)	stat	bkg
Loose Bar	0.0211468	0.0112107	0.0108502	0.0091919	0.0030119
Loose Cra	0.0193165	0.0105554	0.0103771	0.0080449	0.0005077
Loose End	0.0692123	0.0143739	0.0145417	0.0134068	0.0007251
Loose (TOL) Bar	0.0166915	0.0114253	0.0110872	0.0093727	0.0027218
Loose (TOL) Cra	0.0160977	0.0091028	0.0089593	0.0073207	0.0004238
Loose (TOL) End	0.0320143	0.0137628	0.0138959	0.0108392	0.0030962
Loose (MOL) Bar	0.0103419	0.0114411	0.0112256	0.0090493	0.0034631
Loose (MOL) Cra	0.0032184	0.0040973	0.0032309	0.0032293	0.0000836
Loose (MOL) End	0.0190331	0.0118852	0.0122802	0.0094046	0.0030735
Medium Bar	0.0181297	0.0036717	0.0036118	0.0028021	0.0000106
Medium Cra	0.0160408	0.0099240	0.0099445	0.0072681	0.0003669
Medium End	0.0537810	0.0322785	0.0416353	0.0318320	0.0025692
Medium (TOL) Bar	0.0142383	0.0036457	0.0036218	0.0026026	0.0000019
Medium (TOL) Cra	0.0128330	0.0084422	0.0084576	0.0064843	0.0002938
Medium (TOL) End	0.0170410	0.0219432	0.0277831	0.0193040	0.0098337
Medium (MOL) Bar	0.0092999	0.0034594	0.0034266	0.0022069	0.0001911
Medium (MOL) Cra	0.0032077	0.0034893	0.0034916	0.0032163	0.0000729
Medium (MOL) End	0.0074928	0.0169951	0.0185735	0.0149077	0.0081119
Tight Bar	0.0125487	0.0029588	0.0029716	0.0016860	0.0004693
Tight Cra	0.0096203	0.0069145	0.0069257	0.0056013	0.0002159
Tight End	0.0442587	0.0057394	0.0059523	0.0044850	0.0009124
Tight (TOL) Bar	0.0091873	0.0031018	0.0030739	0.0014406	0.0003435
Tight (TOL) Cra	0.0064137	0.0053016	0.0053081	0.0045609	0.0001441
Tight (TOL) End	0.0161836	0.0195589	0.0190636	0.0170707	0.0033223
Tight (MOL) Bar	0.0060502	0.0031227	0.0031530	0.0011675	0.0002262
Tight (MOL) Cra	0.0032078	0.0034900	0.0034925	0.0032169	0.0000730
Tight (MOL) End	0.0061454	0.0135377	0.0129689	0.0123221	0.0038243

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

Selection	fake rate	total(+)	total (-)	stat	bkg
Loose Bar	0.0076631	0.0048585	0.0048252	0.0046286	0.0003179
Loose Cra	0.0064222	0.0061846	0.0061893	0.0045649	0.0001526
Loose End	0.0575803	0.0063727	0.0068513	0.0051386	0.0012301
Loose (TOL) Bar	0.0067765	0.0048508	0.0048158	0.0045959	0.0003417
Loose (TOL) Cra	0.0064222	0.0061843	0.0061890	0.0045649	0.0001526
Loose (TOL) End	0.0242243	0.0065256	0.0067543	0.0033073	0.0003838
Loose (MOL) Bar	0.0046013	0.0048766	0.0048615	0.0045669	0.0003599
Loose (MOL) Cra	0.0064200	0.0057705	0.0057755	0.0045620	0.0001504
Loose (MOL) End	0.0174751	0.0081034	0.0082263	0.0061514	0.0001366
Medium Bar	0.0057012	0.0047894	0.0047745	0.0046440	0.0003385
Medium Cra	0.0064272	0.0053164	0.0053231	0.0045718	0.0001576
Medium End	0.0571101	0.0056109	0.0061640	0.0051078	0.0011933
Medium (TOL) Bar	0.0050417	0.0047527	0.0047369	0.0045917	0.0003509
Medium (TOL) Cra	0.0064272	0.0053164	0.0053231	0.0045718	0.0001576
Medium (TOL) End	0.0238853	0.0051219	0.0054699	0.0032734	0.0004783
Medium (MOL) Bar	0.0030792	0.0046442	0.0046408	0.0044488	0.0003721
Medium (MOL) Cra	0.0064281	0.0053178	0.0053245	0.0045725	0.0001586
Medium (MOL) End	0.0169011	0.0068805	0.0070753	0.0058218	0.0000039
Tight Bar	0.0031330	0.0016533	0.0016588	0.0015064	0.0003182
Tight Cra	0.0032066	0.0034883	0.0034908	0.0032152	0.0000718
Tight End	0.0482873	0.0049971	0.0057220	0.0046881	0.0010398
Tight (TOL) Bar	0.0029139	0.0016021	0.0016077	0.0014641	0.0003216
Tight (TOL) Cra	0.0032066	0.0034883	0.0034908	0.0032152	0.0000718
Tight (TOL) End	0.0190345	0.0041284	0.0045027	0.0029192	0.0003955
Tight (MOL) Bar	0.0015702	0.0013517	0.0013955	0.0012548	0.0003711
Tight (MOL) Cra	0.0032068	0.0034885	0.0034910	0.0032154	0.0000720
Tight (MOL) End	0.0128396	0.0032416	0.0035132	0.0023936	0.0002691

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

Selection	fake rate	total(+)	total (-)	stat	bkg
Loose Bar	0.0065975	0.0073805	0.0072778	0.0060298	0.0022463
Loose Cra	0.0064241	0.0053111	0.0053176	0.0045668	0.0001545
Loose End	0.0579213	0.0063260	0.0069815	0.0051239	0.0011376
Loose (TOL) Bar	0.0060067	0.0073890	0.0072822	0.0060161	0.0021900
Loose (TOL) Cra	0.0064241	0.0053111	0.0053176	0.0045668	0.0001545
Loose (TOL) End	0.0216768	0.0184619	0.0185244	0.0166676	0.0017302
Loose (MOL) Bar	0.0032798	0.0075017	0.0074096	0.0057408	0.0025442
Loose (MOL) Cra	0.0032107	0.0034928	0.0034953	0.0032191	0.0000759
Loose (MOL) End	0.0151247	0.0177959	0.0178994	0.0165694	0.0013469
Medium Bar	0.0067140	0.0035846	0.0034761	0.0030582	0.0000272
Medium Cra	0.0032090	0.0034920	0.0034946	0.0032186	0.0000742
Medium End	0.0535469	0.0054864	0.0059700	0.0049441	0.0010978
Medium (TOL) Bar	0.0062938	0.0035600	0.0034502	0.0030123	0.0000384
Medium (TOL) Cra	0.0032090	0.0034920	0.0034946	0.0032186	0.0000742
Medium (TOL) End	0.0185205	0.0101234	0.0101384	0.0081830	0.0014188
Medium (MOL) Bar	0.0038074	0.0033499	0.0032924	0.0026439	0.0000753
Medium (MOL) Cra	0.0032094	0.0034927	0.0034953	0.0032191	0.0000746
Medium (MOL) End	0.0127724	0.0096047	0.0096413	0.0082487	0.0010984
Tight Bar	0.0051551	0.0026621	0.0026220	0.0020417	0.0000217
Tight Cra	0.0032077	0.0034902	0.0034927	0.0032168	0.0000729
Tight End	0.0478467	0.0049124	0.0056636	0.0046716	0.0010326
Tight (TOL) Bar	0.0047069	0.0026408	0.0025995	0.0019675	0.0000386
Tight (TOL) Cra	0.0032077	0.0034902	0.0034927	0.0032168	0.0000729
Tight (TOL) End	0.0181484	0.0039400	0.0043596	0.0028510	0.0003764
Tight (MOL) Bar	0.0024655	0.0025199	0.0025070	0.0015422	0.0001229
Tight (MOL) Cra	0.0032080	0.0034906	0.0034931	0.0032172	0.0000733
Tight (MOL) End	0.0119497	0.0030246	0.0033435	0.0023087	0.0002462

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

Selection	fake rate	total(+)	total (-)	stat	bkg
Loose Bar	0.0079047	0.0093802	0.0089720	0.0077401	0.0026647
Loose Cra	0.0064371	0.0051265	0.0046444	0.0045826	0.0001675
Loose End	0.0583251	0.0067959	0.0074015	0.0051494	0.0011079
Loose (TOL) Bar	0.0073532	0.0094724	0.0090087	0.0077948	0.0025692
Loose (TOL) Cra	0.0064371	0.0051265	0.0046444	0.0045827	0.0001676
Loose (TOL) End	0.0221442	0.0136456	0.0139575	0.0109913	0.0029967
Loose (MOL) Bar	0.0045406	0.0099731	0.0094104	0.0078673	0.0030091
Loose (MOL) Cra	0.0032171	0.0041363	0.0032809	0.0032279	0.0000823
Loose (MOL) End	0.0165249	0.0124584	0.0126919	0.0102396	0.0021140
Medium Bar	0.0063924	0.0023269	0.0022374	0.0018122	0.0002944
Medium Cra	0.0032073	0.0034886	0.0034909	0.0032158	0.0000725
Medium End	0.0234288	0.0857480	0.0859058	0.0768131	0.0246857
Medium (TOL) Bar	0.0059567	0.0023052	0.0022223	0.0017688	0.0002987
Medium (TOL) Cra	0.0032073	0.0034886	0.0034909	0.0032158	0.0000725
Medium (TOL) End	0.0000000	0.0191630	0.0191630	0.0000000	0.0190724
Medium (MOL) Bar	0.0037486	0.0021379	0.0020832	0.0015119	0.0003498
Medium (MOL) Cra	0.0032065	0.0034878	0.0034901	0.0032150	0.0000717
Medium (MOL) End	0.0000000	0.0133119	0.0133119	0.0000000	0.0130039
Tight Bar	0.0035857	0.0021269	0.0020882	0.0008978	0.0001344
Tight Cra	0.0032077	0.0034899	0.0034924	0.0032168	0.0000729
Tight End	0.0385048	0.0051111	0.0052923	0.0041760	0.0007934
Tight (TOL) Bar	0.0031375	0.0021570	0.0021183	0.0008397	0.0001176
Tight (TOL) Cra	0.0032077	0.0034899	0.0034924	0.0032168	0.0000729
Tight (TOL) End	0.0141556	0.0043469	0.0043566	0.0025136	0.0002847
Tight (MOL) Bar	0.0020170	0.0022162	0.0022101	0.0006729	0.0000756
Tight (MOL) Cra	0.0032080	0.0034903	0.0034928	0.0032172	0.0000733
Tight (MOL) End	0.0084048	0.0037067	0.0037188	0.0019334	0.0001690

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

Selection	fake rate	total(+)	total (-)	stat	bkg
Loose Bar	0.0189089	0.0063056	0.0064495	0.0058088	0.0009358
Loose Cra	0.0289130	0.0181119	0.0181469	0.0098562	0.0006999
Loose End	0.0865778	0.0104166	0.0106910	0.0097080	0.0011855
Loose (TOL) Bar	0.0166109	0.0062682	0.0063878	0.0057658	0.0010767
Loose (TOL) Cra	0.0289130	0.0181119	0.0181469	0.0098562	0.0006999
Loose (TOL) End	0.0517308	0.0066258	0.0066130	0.0048630	0.0010156
Loose (MOL) Bar	0.0104834	0.0062176	0.0063820	0.0057695	0.0011646
Loose (MOL) Cra	0.0128530	0.0105516	0.0105634	0.0064939	0.0003138
Loose (MOL) End	0.0274429	0.0074245	0.0074215	0.0035181	0.0005681
Medium Bar	0.0122357	0.0071491	0.0071986	0.0066470	0.0009222
Medium Cra	0.0160668	0.0105149	0.0105360	0.0072919	0.0003929
Medium End	0.0678726	0.0113372	0.0116691	0.0107670	0.0006858
Medium (TOL) Bar	0.0106103	0.0069806	0.0070106	0.0064525	0.0010377
Medium (TOL) Cra	0.0160668	0.0105149	0.0105360	0.0072919	0.0003929
Medium (TOL) End	0.0367122	0.0046421	0.0046910	0.0040702	0.0007347
Medium (MOL) Bar	0.0052212	0.0066918	0.0067447	0.0061212	0.0010342
Medium (MOL) Cra	0.0032139	0.0039686	0.0039708	0.0032236	0.0000791
Medium (MOL) End	0.0177000	0.0045937	0.0046373	0.0028135	0.0003614
Tight Bar	0.0069625	0.0027834	0.0029717	0.0026287	0.0003714
Tight Cra	0.0032059	0.0034888	0.0034913	0.0032146	0.0000711
Tight End	0.0338399	0.0129202	0.0110478	0.0043775	0.0077726
Tight (TOL) Bar	0.0060413	0.0027036	0.0028351	0.0025222	0.0004297
Tight (TOL) Cra	0.0032059	0.0034888	0.0034913	0.0032146	0.0000711
Tight (TOL) End	0.0256575	0.0039700	0.0045509	0.0033940	0.0005167
Tight (MOL) Bar	0.0032088	0.0023167	0.0024649	0.0021202	0.0004582
Tight (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (MOL) End	0.0128359	0.0025732	0.0027196	0.0023929	0.0002654

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

Selection	fake rate	total(+)	total (-)	stat	bkg
Loose Bar	0.0198127	0.0113559	0.0111903	0.0083325	0.0039147
Loose Cra	0.0289588	0.0143636	0.0144129	0.0098802	0.0007457
Loose End	0.0912393	0.0141260	0.0145007	0.0137093	0.0006549
Loose (TOL) Bar	0.0176600	0.0113631	0.0111945	0.0083810	0.0039104
Loose (TOL) Cra	0.0289588	0.0143630	0.0144123	0.0098802	0.0007457
Loose (TOL) End	0.0549995	0.0121840	0.0121850	0.0116252	0.0004838
Loose (MOL) Bar	0.0097433	0.0110625	0.0108867	0.0082142	0.0040617
Loose (MOL) Cra	0.0096492	0.0060643	0.0060773	0.0056151	0.0002448
Loose (MOL) End	0.0291530	0.0075713	0.0075872	0.0036154	0.0005444
Medium Bar	0.0173205	0.0051600	0.0051261	0.0040799	0.0001515
Medium Cra	0.0128404	0.0084615	0.0084789	0.0064964	0.0003012
Medium End	0.0677639	0.0084226	0.0084675	0.0077772	0.0002899
Medium (TOL) Bar	0.0157154	0.0050432	0.0049727	0.0039442	0.0002467
Medium (TOL) Cra	0.0128404	0.0084615	0.0084789	0.0064964	0.0003012
Medium (TOL) End	0.0386818	0.0065753	0.0064496	0.0060466	0.0003299
Medium (MOL) Bar	0.0092949	0.0048004	0.0047514	0.0035204	0.0004118
Medium (MOL) Cra	0.0064215	0.0053124	0.0053193	0.0045679	0.0001519
Medium (MOL) End	0.0190913	0.0069252	0.0067950	0.0052415	0.0004146
Tight Bar	0.0119840	0.0050417	0.0050757	0.0041694	0.0000954
Tight Cra	0.0096272	0.0069245	0.0069362	0.0056053	0.0002228
Tight End	0.0453153	0.0083290	0.0088008	0.0079128	0.0002352
Tight (TOL) Bar	0.0106053	0.0048745	0.0048795	0.0039699	0.0001798
Tight (TOL) Cra	0.0096272	0.0069245	0.0069362	0.0056053	0.0002228
Tight (TOL) End	0.0247885	0.0064484	0.0064634	0.0062673	0.0003524
Tight (MOL) Bar	0.0070317	0.0042659	0.0043151	0.0033913	0.0000865
Tight (MOL) Cra	0.0032092	0.0034920	0.0034946	0.0032184	0.0000744
Tight (MOL) End	0.0146083	0.0027850	0.0029561	0.0025554	0.0003040

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

Selection	fake rate	total(+)	total (-)	stat	bkg
Loose Bar	0.0180154	0.0117760	0.0115665	0.0088042	0.0042021
Loose Cra	0.0193184	0.0094896	0.0092908	0.0080457	0.0005096
Loose End	0.0864918	0.0114386	0.0121744	0.0110062	0.0002009
Loose (TOL) Bar	0.0160773	0.0114644	0.0112296	0.0085700	0.0039831
Loose (TOL) Cra	0.0193184	0.0094893	0.0092906	0.0080457	0.0005096
Loose (TOL) End	0.0497959	0.0097648	0.0098101	0.0089514	0.0004858
Loose (MOL) Bar	0.0090674	0.0113460	0.0110412	0.0084980	0.0040905
Loose (MOL) Cra	0.0064374	0.0051483	0.0046684	0.0045826	0.0001678
Loose (MOL) End	0.0271241	0.0103003	0.0103694	0.0070763	0.0002494
Medium Bar	0.0142273	0.0044881	0.0044038	0.0031725	0.0006562
Medium Cra	0.0128344	0.0074192	0.0074368	0.0064850	0.0002952
Medium End	0.0418208	0.0409070	0.0470884	0.0380288	0.0127956
Medium (TOL) Bar	0.0128300	0.0043103	0.0042208	0.0030090	0.0005436
Medium (TOL) Cra	0.0128344	0.0074192	0.0074368	0.0064850	0.0002952
Medium (TOL) End	0.0206831	0.0312775	0.0357835	0.0287115	0.0100928
Medium (MOL) Bar	0.0076188	0.0035173	0.0034872	0.0025825	0.0005779
Medium (MOL) Cra	0.0032078	0.0032857	0.0032881	0.0032164	0.0000730
Medium (MOL) End	0.0107177	0.0236915	0.0255462	0.0226537	0.0061874
Tight Bar	0.0091882	0.0025070	0.0027145	0.0014407	0.0003444
Tight Cra	0.0096227	0.0069195	0.0069307	0.0056027	0.0002184
Tight End	0.0316208	0.0315452	0.0311264	0.0295504	0.0052236
Tight (TOL) Bar	0.0078435	0.0025495	0.0026941	0.0013303	0.0002939
Tight (TOL) Cra	0.0096227	0.0069195	0.0069307	0.0056027	0.0002184
Tight (TOL) End	0.0138429	0.0238882	0.0229300	0.0209736	0.0060964
Tight (MOL) Bar	0.0044819	0.0025827	0.0027335	0.0010042	0.0001679
Tight (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (MOL) End	0.0110632	0.0047713	0.0047876	0.0022206	0.0002266

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

Selection	fake rate	total(+)	total (-)	stat	bkg
Loose Bar	0.0074556	0.0056098	0.0056092	0.0050358	0.0009568
Loose Cra	0.0032111	0.0045588	0.0045605	0.0032190	0.0000763
Loose End	0.0154665	0.0089604	0.0088677	0.0061633	0.0005716
Loose (TOL) Bar	0.0069675	0.0055959	0.0055959	0.0050645	0.0010135
Loose (TOL) Cra	0.0032111	0.0045588	0.0045605	0.0032190	0.0000763
Loose (TOL) End	0.0090095	0.0080919	0.0080540	0.0058100	0.0009601
Loose (MOL) Bar	0.0056349	0.0057866	0.0058176	0.0053791	0.0008362
Loose (MOL) Cra	0.0032114	0.0045594	0.0045611	0.0032195	0.0000766
Loose (MOL) End	0.0067798	0.0086611	0.0086358	0.0055498	0.0005891
Medium Bar	0.0042776	0.0060079	0.0059999	0.0053077	0.0008993
Medium Cra	0.0032125	0.0038989	0.0039012	0.0032216	0.0000777
Medium End	0.0110378	0.0070871	0.0071169	0.0061692	0.0006657
Medium (TOL) Bar	0.0040383	0.0059102	0.0059018	0.0052708	0.0009229
Medium (TOL) Cra	0.0032125	0.0038989	0.0039012	0.0032216	0.0000777
Medium (TOL) End	0.0064027	0.0065513	0.0065514	0.0057059	0.0009661
Medium (MOL) Bar	0.0028208	0.0059591	0.0059515	0.0054725	0.0006304
Medium (MOL) Cra	0.0032126	0.0034971	0.0034996	0.0032218	0.0000779
Medium (MOL) End	0.0048735	0.0068086	0.0068133	0.0054637	0.0003281
Tight Bar	0.0019659	0.0020499	0.0020499	0.0019020	0.0004068
Tight Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight End	0.0017786	0.0236822	0.0229433	0.0217952	0.0051568
Tight (TOL) Bar	0.0019715	0.0020492	0.0020492	0.0019015	0.0004012
Tight (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (TOL) End	0.0000000	0.0050995	0.0049380	0.0000000	0.0039012
Tight (MOL) Bar	0.0014192	0.0018318	0.0018441	0.0017811	0.0003064
Tight (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (MOL) End	0.0000000	0.0056325	0.0048473	0.0000000	0.0026008

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

Selection	fake rate	total(+)	total (-)	stat	bkg
Loose Bar	0.0070136	0.0096943	0.0094887	0.0071831	0.0031244
Loose Cra	0.0032178	0.0035011	0.0035036	0.0032265	0.0000830
Loose End	0.0128111	0.0105848	0.0105325	0.0087756	0.0032270
Loose (TOL) Bar	0.0066134	0.0098413	0.0096164	0.0073902	0.0033089
Loose (TOL) Cra	0.0032178	0.0035011	0.0035036	0.0032265	0.0000830
Loose (TOL) End	0.0055352	0.0098596	0.0098050	0.0078588	0.0040009
Loose (MOL) Bar	0.0046650	0.0101758	0.0098374	0.0079271	0.0031003
Loose (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Loose (MOL) End	0.0027049	0.0103991	0.0103307	0.0074753	0.0037970
Medium Bar	0.0065570	0.0041624	0.0040418	0.0029115	0.0001298
Medium Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium End	0.0061889	0.0058812	0.0056773	0.0043314	0.0020469
Medium (TOL) Bar	0.0063186	0.0040381	0.0039119	0.0028843	0.0001525
Medium (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium (TOL) End	0.0014683	0.0051283	0.0049877	0.0033092	0.0024329
Medium (MOL) Bar	0.0049050	0.0039132	0.0038394	0.0029574	0.0000562
Medium (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium (MOL) End	0.0000000	0.0036210	0.0035658	0.0000000	0.0017339
Tight Bar	0.0046641	0.0040281	0.0039887	0.0028727	0.0000814
Tight Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight End	0.0054422	0.0039482	0.0039436	0.0036224	0.0006263
Tight (TOL) Bar	0.0044279	0.0038900	0.0038477	0.0028224	0.0001019
Tight (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (TOL) End	0.0018194	0.0029598	0.0029335	0.0027059	0.0007814
Tight (MOL) Bar	0.0033024	0.0025400	0.0025371	0.0008690	0.0000669
Tight (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (MOL) End	0.0004735	0.0029859	0.0029703	0.0023284	0.0008269

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

Selection	fake rate	total(+)	total (-)	stat	bkg
Loose Bar	0.0071715	0.0111358	0.0105371	0.0080904	0.0033979
Loose Cra	0.0032205	0.0041408	0.0032847	0.0032315	0.0000857
Loose End	0.0146838	0.0082063	0.0085142	0.0072284	0.0030882
Loose (TOL) Bar	0.0069483	0.0110388	0.0104262	0.0080700	0.0034055
Loose (TOL) Cra	0.0032205	0.0041408	0.0032847	0.0032315	0.0000857
Loose (TOL) End	0.0062479	0.0079368	0.0080028	0.0066337	0.0041552
Loose (MOL) Bar	0.0065755	0.0115234	0.0112590	0.0099169	0.0020526
Loose (MOL) Cra	0.0000000	0.0034413	0.0019000	0.0000000	0.0000000
Loose (MOL) End	0.0027328	0.0081800	0.0082530	0.0062267	0.0042027
Medium Bar	0.0060398	0.0035952	0.0035461	0.0023212	0.0004313
Medium Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium End	0.0026435	0.0130669	0.0133316	0.0112763	0.0064592
Medium (TOL) Bar	0.0058060	0.0034545	0.0034054	0.0022859	0.0004494
Medium (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium (TOL) End	0.0000000	0.0043346	0.0043346	0.0000000	0.0043346
Medium (MOL) Bar	0.0045259	0.0030284	0.0030137	0.0023677	0.0002195
Medium (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium (MOL) End	0.0000000	0.0026008	0.0026008	0.0000000	0.0026008
Tight Bar	0.0038102	0.0023293	0.0023069	0.0009257	0.0001432
Tight Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight End	0.0035515	0.0099120	0.0097794	0.0096422	0.0012166
Tight (TOL) Bar	0.0035861	0.0023440	0.0023228	0.0008979	0.0001348
Tight (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (TOL) End	0.0004444	0.0067667	0.0066055	0.0064631	0.0012895
Tight (MOL) Bar	0.0026895	0.0024140	0.0024262	0.0007773	0.0001011
Tight (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (MOL) End	0.0000000	0.0006454	0.0004335	0.0000000	0.0004335

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

Selection	fake rate	total(+)	total (-)	stat	bkg
Loose Bar	0.0043715	0.0052050	0.0052220	0.0047436	0.0010211
Loose Cra	0.0032112	0.0045590	0.0045606	0.0032191	0.0000764
Loose End	0.0061656	0.0064511	0.0064637	0.0051455	0.0003364
Loose (TOL) Bar	0.0041070	0.0052548	0.0052720	0.0047805	0.0010699
Loose (TOL) Cra	0.0032112	0.0045590	0.0045606	0.0032191	0.0000764
Loose (TOL) End	0.0052651	0.0065104	0.0065235	0.0050958	0.0003699
Loose (MOL) Bar	0.0034291	0.0055396	0.0055679	0.0050747	0.0008849
Loose (MOL) Cra	0.0032114	0.0045594	0.0045611	0.0032195	0.0000766
Loose (MOL) End	0.0053116	0.0039299	0.0039332	0.0015363	0.0001100
Medium Bar	0.0022868	0.0053866	0.0053811	0.0046438	0.0009487
Medium Cra	0.0032126	0.0035958	0.0035983	0.0032218	0.0000778
Medium End	0.0042603	0.0057301	0.0057321	0.0052947	0.0005078
Medium (TOL) Bar	0.0022925	0.0053895	0.0053840	0.0046476	0.0009431
Medium (TOL) Cra	0.0032126	0.0035958	0.0035983	0.0032218	0.0000778
Medium (TOL) End	0.0038798	0.0058052	0.0058088	0.0052587	0.0004548
Medium (MOL) Bar	0.0016473	0.0055770	0.0055732	0.0047494	0.0007254
Medium (MOL) Cra	0.0032126	0.0034968	0.0034993	0.0032218	0.0000779
Medium (MOL) End	0.0039802	0.0024002	0.0023885	0.0013283	0.0000791
Tight Bar	0.0007980	0.0017760	0.0017912	0.0016250	0.0004962
Tight Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight End	0.0022126	0.0012696	0.0012594	0.0009902	0.0000453
Tight (TOL) Bar	0.0007980	0.0017760	0.0017912	0.0016250	0.0004962
Tight (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (TOL) End	0.0017701	0.0012290	0.0012223	0.0008855	0.0000362
Tight (MOL) Bar	0.0006769	0.0017170	0.0017460	0.0015847	0.0004017
Tight (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (MOL) End	0.0013276	0.0011930	0.0011891	0.0007668	0.0000272

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

Selection	fake rate	total(+)	total (-)	stat	bkg
Loose Bar	0.0030164	0.0093140	0.0090195	0.0064010	0.0034547
Loose Cra	0.0032122	0.0034944	0.0034968	0.0032208	0.0000774
Loose End	0.0032962	0.0082829	0.0082718	0.0076656	0.0023389
Loose (TOL) Bar	0.0027935	0.0095873	0.0092647	0.0065835	0.0036776
Loose (TOL) Cra	0.0032122	0.0034944	0.0034968	0.0032208	0.0000774
Loose (TOL) End	0.0020109	0.0078449	0.0078388	0.0072019	0.0023238
Loose (MOL) Bar	0.0009464	0.0105756	0.0097724	0.0063927	0.0042305
Loose (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Loose (MOL) End	0.0015188	0.0084036	0.0083989	0.0074187	0.0023824
Medium Bar	0.0036906	0.0034831	0.0033926	0.0024849	0.0001920
Medium Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium End	0.0007454	0.0039784	0.0039015	0.0031423	0.0014220
Medium (TOL) Bar	0.0036906	0.0034832	0.0033927	0.0024850	0.0001920
Medium (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium (TOL) End	0.0000000	0.0023139	0.0021946	0.0000000	0.0013004
Medium (MOL) Bar	0.0028525	0.0035586	0.0035224	0.0026448	0.0001673
Medium (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium (MOL) End	0.0000000	0.0017500	0.0017212	0.0000000	0.0008669
Tight Bar	0.0021723	0.0032160	0.0031923	0.0022934	0.0002004
Tight Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight End	0.0017707	0.0010149	0.0010068	0.0008859	0.0000368
Tight (TOL) Bar	0.0021723	0.0032160	0.0031923	0.0022934	0.0002004
Tight (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (TOL) End	0.0008853	0.0008741	0.0008717	0.0006262	0.0000184
Tight (MOL) Bar	0.0013368	0.0030971	0.0030977	0.0020871	0.0001731
Tight (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (MOL) End	0.0004427	0.0008075	0.0008069	0.0004427	0.0000092

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

Selection	fake rate	total(+)	total (-)	stat	bkg
Loose Bar	0.0049320	0.0104644	0.0100510	0.0074824	0.0026176
Loose Cra	0.0032188	0.0041389	0.0032832	0.0032297	0.0000840
Loose End	0.0035542	0.0072642	0.0073228	0.0065977	0.0029478
Loose (TOL) Bar	0.0049322	0.0104641	0.0100507	0.0074822	0.0026174
Loose (TOL) Cra	0.0032188	0.0041389	0.0032832	0.0032297	0.0000840
Loose (TOL) End	0.0026030	0.0072004	0.0072593	0.0064711	0.0030321
Loose (MOL) Bar	0.0069294	0.0052421	0.0050911	0.0012477	0.0002426
Loose (MOL) Cra	0.0000000	0.0034418	0.0019008	0.0000000	0.0000000
Loose (MOL) End	0.0023421	0.0090656	0.0091567	0.0065230	0.0024260
Medium Bar	0.0035597	0.0027824	0.0027433	0.0015665	0.0003229
Medium Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium End	0.0000000	0.0026008	0.0026008	0.0000000	0.0026008
Medium (TOL) Bar	0.0035597	0.0027824	0.0027434	0.0015665	0.0003229
Medium (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium (TOL) End	0.0000000	0.0017339	0.0017339	0.0000000	0.0017339
Medium (MOL) Bar	0.0029083	0.0024851	0.0024694	0.0016448	0.0001115
Medium (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Medium (MOL) End	0.0000000	0.0008669	0.0008669	0.0000000	0.0008669
Tight Bar	0.0024654	0.0022808	0.0022656	0.0007442	0.0000927
Tight Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight End	0.0006679	0.0049416	0.0047823	0.0046137	0.0010660
Tight (TOL) Bar	0.0024654	0.0022808	0.0022656	0.0007442	0.0000927
Tight (TOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (TOL) End	0.0000000	0.0012907	0.0008669	0.0000000	0.0008669
Tight (MOL) Bar	0.0017930	0.0023185	0.0023383	0.0006344	0.0000674
Tight (MOL) Cra	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tight (MOL) End	0.0000000	0.0006454	0.0004335	0.0000000	0.0004335