

# Topology Analysis <sup>\*†‡§</sup>

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<sup>†</sup>This package is implemented referring to a program called TOPO, which is first developed by Prof. Shuxian Du from Zhengzhou University and later extended and maintained by Prof. Gang Li from Institute of High Energy Physics, Chinese Academy of Sciences. The TOPO program has been widely used by colleagues in BESIII collaboration. Several years ago, when I was a Ph.D. student working on the BESIII experiment, I learned the idea of topology analysis and a lot of programming techniques from the TOPO program. So, I really appreciate the original works of Prof. Du and Prof. Li very much. To meet my own needs and to practice developing analysis tools with C++, ROOT, and LaTeX, I wrote the package from scratch. At that time, the package functioned well but was relatively simple. At the end of 2017, when I just started my post-doctoral research at Beihang University, my co-supervisor Prof. Chengping Shen reminded me that it could be a useful tool for the Belle II experiment as well. So, I revised and extended it, making it more well-rounded and suitable for the Belle II experiment. Now, it also applies to many other similar high energy physics experiments. Here, I would like to thank Prof. Du and Prof. Li for their original works, and Prof. Shen for his suggestion, guidance, support, and encouragement.

<sup>‡</sup>Besides, I would like to thank all of the people who have helped me in the development of the program. I am particularly grateful to Prof. Xingtao Huang for his comments on the principles and styles of the program, to Remco de Boer for his suggestions on the tex output and the use of GitHub, and to Xi Chen for his discussions on the core algorithms. I am especially indebted to Prof. Xiqing Hao, Longke Li, Xiaoping Qin, Ilya Komarov, Yubo Li, Guanda Gong, Suxian Li, Junhao Yin, Prof. Xiaolong Wang, Yeqi Chen, Hannah Wakeling, Hongrong Qi, Hui Li, Ning Cao, Sanjeeda Bharati Das, Kazuki Kojima, Tingting Han, Fang Yan, Lin Wang, Meiru An, and Noreen Rauls for their advice in extending and perfecting the program. Also, I thank Xi'an Xiong, Runqiu Ma, Wencheng Yan, Sen Jia, Lu Cao, Dong Liu, Hongpeng Wang, Jiawei Zhang, Jiajun Liu, Maoqiang Jing, Yi Zhang, Wei Shan, and Yadi Wang for their efforts in helping me test the program.

<sup>§</sup>The paper on the tool has been published by *Computer Physics Communications*. You can find this paper and the preprint corresponding to it in the links [Comput. Phys. Commun. 258 \(2021\) 107540](#) and [arXiv:2001.04016](#), respectively. If the tool really helps your researches, we would appreciate it very much if you could cite the paper in your publications.

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Table 1: Decay trees and their respective initial-final states.

rowNo	decay tree (decay initial-final states)	iDcyTr	iDcyIFsts	nEtr	nCcEtr	nAllEtr	nCEtr
1	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^+\pi^+\pi^-\pi^-\gamma^I, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow \nu_\tau \bar{\nu}_\tau \pi^0 \pi^+ \pi^+ \pi^- \pi^- \gamma^I)$	13	13	150	—	150	150
2	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^+\pi^+\pi^-\pi^-, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow \nu_\tau \bar{\nu}_\tau \pi^0 \pi^+ \pi^+ \pi^- \pi^-)$	3	3	134	—	134	284
3	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^+\pi^+\pi^-\pi^-\gamma^I, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow \nu_\tau \bar{\nu}_\tau \pi^0 \pi^0 \pi^+ \pi^+ \pi^- \pi^- \gamma^I)$	45	32	127	—	127	411
4	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^+\pi^+\pi^-\pi^-, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow \nu_\tau \bar{\nu}_\tau \pi^0 \pi^0 \pi^+ \pi^+ \pi^- \pi^-)$	4	4	114	—	114	525
5	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^+\pi^+\pi^-\pi^-\gamma^I \gamma^I, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow \nu_\tau \bar{\nu}_\tau \pi^0 \pi^+ \pi^+ \pi^- \pi^- \gamma^I \gamma^I)$	21	21	93	—	93	618
6	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^+\pi^+\pi^-\pi^-\gamma^I \gamma^I, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow \nu_\tau \bar{\nu}_\tau \pi^0 \pi^0 \pi^+ \pi^+ \pi^- \pi^- \gamma^I \gamma^I)$	52	48	75	—	75	693
7	$e^+e^- \rightarrow \tau^+\tau^-\pi^+\pi^-\pi^-\gamma^I, \tau^+ \rightarrow \bar{\nu}_\tau \pi^+, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow \nu_\tau \bar{\nu}_\tau \pi^+ \pi^+ \pi^- \pi^- \gamma^I)$	16	16	30	29	59	752
8	$e^+e^- \rightarrow \tau^+\tau^-\pi^+\pi^+\pi^-\pi^-\pi^-\gamma^I, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow \nu_\tau \bar{\nu}_\tau \pi^+ \pi^+ \pi^- \pi^- \pi^- \gamma^I)$	44	10	56	—	56	808
9	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^+\pi^-\gamma^I, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow \nu_\tau \bar{\nu}_\tau \pi^0 \pi^0 \pi^+ \pi^- \gamma^I)$	34	34	55	—	55	863
10	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^+\pi^-\pi^-\gamma^I, \tau^+ \rightarrow \bar{\nu}_\tau \pi^+, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow \nu_\tau \bar{\nu}_\tau \pi^0 \pi^+ \pi^- \pi^- \gamma^I)$	88	13	18	33	51	914
11	$e^+e^- \rightarrow \tau^+\tau^-\pi^+\pi^+\pi^-, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau \pi^-$ $(e^+e^- \dashrightarrow \nu_\tau \bar{\nu}_\tau \pi^+ \pi^+ \pi^- \pi^-)$	7	7	25	23	48	962
12	$e^+e^- \rightarrow \tau^+\tau^-\pi^+\pi^-\pi^-\gamma^I \gamma^I, \tau^+ \rightarrow \bar{\nu}_\tau \pi^+, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow \nu_\tau \bar{\nu}_\tau \pi^+ \pi^+ \pi^- \pi^- \gamma^I \gamma^I)$	54	50	22	23	45	1007
13	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^+\pi^+\pi^-\pi^-\gamma^I \gamma^I \gamma^I, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow \nu_\tau \bar{\nu}_\tau \pi^0 \pi^+ \pi^+ \pi^- \pi^- \gamma^I \gamma^I \gamma^I)$	9	9	42	—	42	1049
14	$e^+e^- \rightarrow \tau^+\tau^-\pi^+\pi^+\pi^+\pi^-\pi^-, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow \nu_\tau \bar{\nu}_\tau \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^-)$	110	97	42	—	42	1091
15	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^+\pi^-\gamma^I, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow \nu_\tau \bar{\nu}_\tau \pi^0 \pi^0 \pi^+ \pi^- \gamma^I)$	20	20	41	—	41	1132
16	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^+\pi^+\pi^+\pi^-\pi^-\gamma^I, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow \nu_\tau \bar{\nu}_\tau \pi^0 \pi^+ \pi^+ \pi^+ \pi^- \pi^- \gamma^I)$	102	90	41	—	41	1173
17	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^0\pi^+\pi^-, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow \nu_\tau \bar{\nu}_\tau \pi^0 \pi^0 \pi^0 \pi^+ \pi^-)$	17	17	39	—	39	1212

rowNo	decay tree (decay initial-final states)	iDcyTr	iDcyIFSts	nEtr	nCcEtr	nAllEtr	nCEtr
18	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^+\pi^-\pi^-, \tau^+ \rightarrow \bar{\nu}_\tau\pi^+, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^+\pi^-\pi^-)$	37	3	20	17	37	1249
19	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^+\pi^-, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^0\pi^+\pi^-)$	5	5	37	—	37	1286
20	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^+\pi^-\gamma^I\gamma^I, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^0\pi^+\pi^-\gamma^I\gamma^I)$	78	70	34	—	34	1320
21	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^+\pi^+\pi^-\gamma^I, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^0\pi^+\pi^+\pi^-\gamma^I)$	25	25	34	—	34	1354
22	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^+\pi^-\gamma^I\gamma^I, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^0\pi^+\pi^-\gamma^I\gamma^I)$	136	1	33	—	33	1387
23	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^+\pi^+\pi^-K^-\gamma^I, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^+\pi^+\pi^-K^-)$	28	28	14	17	31	1418
24	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^+\pi^+\pi^-\pi^-, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^0\pi^+\pi^+\pi^-)$	59	55	31	—	31	1449
25	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^+\pi^-\pi^-\gamma^I\gamma^I\gamma^I, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^0\pi^+\pi^+\pi^-\gamma^I\gamma^I\gamma^I)$	84	53	30	—	30	1479
26	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^+\pi^+\pi^-\pi^-\pi^-, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^+\pi^+\pi^-\pi^-)$	48	44	30	—	30	1509
27	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^+\pi^+\pi^-\pi^-\gamma^I, \tau^+ \rightarrow \bar{\nu}_\tau\gamma, \tau^- \rightarrow \nu_\tau, \pi^0 \rightarrow e^+e^-$ $(e^+e^- \dashrightarrow e^+e^-\nu_\tau\bar{\nu}_\tau\pi^0\pi^+\pi^-\pi^-\gamma^I)$	58	54	1	28	29	1538
28	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^+\gamma^I, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau\pi^-$ $(e^+e^- \dashrightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^+\pi^-\gamma^I)$	39	38	18	10	28	1566
29	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^+\pi^-\pi^-\gamma^I, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau, \pi^0 \rightarrow e^+e^-$ $(e^+e^- \dashrightarrow e^+e^-\nu_\tau\bar{\nu}_\tau\pi^+\pi^-\pi^-\gamma^I)$	26	26	26	—	26	1592
30	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^+\pi^-\pi^-\gamma^I\gamma^I, \tau^+ \rightarrow \bar{\nu}_\tau\pi^+, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^+\pi^-\pi^-\gamma^I\gamma^I)$	144	21	14	12	26	1618
31	$e^+e^- \rightarrow \tau^+\tau^-\pi^+\pi^-\pi^-\gamma^I, \tau^+ \rightarrow \mu^+\nu_\mu\bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow \mu^+\nu_\mu\bar{\nu}_\tau\pi^+\pi^-\pi^-\gamma^I)$	40	39	18	7	25	1643
32	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^+\pi^+\pi^-\pi^-\pi^-\gamma^I\gamma^I, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^+\pi^+\pi^-\pi^-\pi^-\gamma^I\gamma^I)$	180	153	25	—	25	1668
33	$e^+e^- \rightarrow \tau^+\tau^-\pi^+\pi^+\pi^-\pi^-\pi^-\gamma^I\gamma^I, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow \nu_\tau\bar{\nu}_\tau\pi^+\pi^+\pi^-\pi^-\pi^-\gamma^I\gamma^I)$	2	2	24	—	24	1692
34	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^+\pi^+\pi^-\pi^-, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau, \pi^0 \rightarrow e^+e^-$ $(e^+e^- \dashrightarrow e^+e^-\nu_\tau\bar{\nu}_\tau\pi^+\pi^-\pi^-)$	24	24	23	—	23	1715
35	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^+\pi^-\pi^-K^+, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^+\pi^-\pi^-K^+)$	108	88	17	6	23	1738

rowNo	decay tree (decay initial-final states)	iDcyTr	iDcyIFSts	nEtr	nCcEtr	nAllEtr	nCEtr
36	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^+, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \mu^-\bar{\nu}_\mu\nu_\tau$ $(e^+e^- \dashrightarrow \mu^-\bar{\nu}_\mu\nu_\tau\bar{\nu}_\tau\pi^0\pi^+)$	130	115	13	10	23	1761
37	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^+\pi^-\pi^-K^-\gamma^I, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^0\pi^+\pi^-\pi^-K^-\gamma^I)$	63	58	17	5	22	1783
38	$e^+e^- \rightarrow \tau^+\tau^-\pi^+\pi^-\pi^-\gamma^I, \tau^+ \rightarrow e^+\nu_e\bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow e^+\nu_e\nu_\tau\bar{\nu}_\tau\pi^+\pi^-\pi^-\gamma^I)$	42	41	10	11	21	1804
39	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^+\pi^+\pi^-\gamma^I\gamma^I, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau, \pi^0 \rightarrow e^+e^-$ $(e^+e^- \dashrightarrow e^+\nu_\tau\bar{\nu}_\tau\pi^0\pi^+\pi^+\pi^-\gamma^I\gamma^I)$	75	68	20	—	20	1824
40	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^-, \tau^+ \rightarrow \bar{\nu}_\tau\pi^+, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^+\pi^-)$	70	64	12	8	20	1844
41	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^+\pi^+\pi^-K^-\gamma^I\gamma^I, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^+\pi^+\pi^-K^-\gamma^I\gamma^I)$	105	93	9	11	20	1864
42	$e^+e^- \rightarrow \tau^+\tau^-\pi^+\pi^+\pi^-\pi^-K^-\gamma^I, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow \nu_\tau\bar{\nu}_\tau\pi^+\pi^+\pi^-\pi^-K^-\gamma^I)$	22	22	10	8	18	1882
43	$e^+e^- \rightarrow \tau^+\tau^-\pi^+\pi^-\pi^-, \tau^+ \rightarrow e^+\nu_e\bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow e^+\nu_e\nu_\tau\bar{\nu}_\tau\pi^+\pi^-\pi^-)$	103	91	5	13	18	1900
44	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^+\gamma^I, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \mu^-\bar{\nu}_\mu\nu_\tau$ $(e^+e^- \dashrightarrow \mu^-\bar{\nu}_\mu\nu_\tau\bar{\nu}_\tau\pi^0\pi^+\gamma^I)$	120	105	10	8	18	1918
45	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^+\pi^+\pi^-\pi^-\gamma^I\gamma^I, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau, \pi^0 \rightarrow e^+e^-$ $(e^+e^- \dashrightarrow e^+\nu_\tau\bar{\nu}_\tau\pi^+\pi^+\pi^-\pi^-\gamma^I\gamma^I)$	61	57	17	—	17	1935
46	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^+\pi^+\pi^-\pi^-\gamma^I\gamma^I\gamma^I\gamma^I, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^+\pi^+\pi^-\pi^-\gamma^I\gamma^I\gamma^I\gamma^I)$	104	92	17	—	17	1952
47	$e^+e^- \rightarrow \tau^+\tau^-\pi^+\pi^-\pi^-, \tau^+ \rightarrow \bar{\nu}_\tau K^+, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow \nu_\tau\bar{\nu}_\tau\pi^+\pi^-\pi^-K^+)$	152	130	9	8	17	1969
48	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^+\pi^-, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau, \pi^0 \rightarrow e^+e^-$ $(e^+e^- \dashrightarrow e^+\nu_\tau\bar{\nu}_\tau\pi^0\pi^+\pi^-)$	158	136	17	—	17	1986
49	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^0\pi^+\pi^-\gamma^I, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^0\pi^0\pi^+\pi^-\gamma^I)$	60	56	16	—	16	2002
50	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^+K^-, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^+K^-)$	91	80	9	6	15	2017
51	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^-\gamma^I\gamma^I, \tau^+ \rightarrow \bar{\nu}_\tau\pi^+, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^-\gamma^I\gamma^I)$	176	149	9	6	15	2032
52	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^-\gamma^I, \tau^+ \rightarrow e^+\nu_e\bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow e^+\nu_e\nu_\tau\bar{\nu}_\tau\pi^0\pi^-\gamma^I)$	189	161	7	8	15	2047
53	$e^+e^- \rightarrow \tau^+\tau^-\pi^+\pi^-\pi^-\gamma^I, \tau^+ \rightarrow \bar{\nu}_\tau K^+, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow \nu_\tau\bar{\nu}_\tau\pi^+\pi^-\pi^-\gamma^I)$	82	67	7	7	14	2061

rowNo	decay tree (decay initial-final states)	iDcyTr	iDcyIFSts	nEtr	nCcEtr	nAllEtr	nCEtr
54	$e^+e^- \rightarrow \tau^+\tau^-\pi^+\pi^+\pi^-, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \mu^-\bar{\nu}_\mu\nu_\tau$ $(e^+e^- \dashrightarrow \mu^-\bar{\nu}_\mu\nu_\tau\bar{\nu}_\tau\pi^+\pi^-\pi^-)$	30	30	4	10	14	2075
55	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^+\gamma^I\gamma^I, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow e^-\bar{\nu}_e\nu_\tau$ $(e^+e^- \dashrightarrow e^-\bar{\nu}_e\nu_\tau\bar{\nu}_\tau\pi^0\pi^+\gamma^I\gamma^I)$	113	100	6	8	14	2089
56	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^+\pi^+\pi^-\pi^-, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau, \pi^0 \rightarrow e^+e^-$ $(e^+e^- \dashrightarrow e^+e^-\nu_\tau\bar{\nu}_\tau\pi^0\pi^+\pi^-\pi^-)$	114	101	14	—	14	2103
57	$e^+e^- \rightarrow \tau^+\tau^-\pi^+\pi^+\pi^-\gamma^I\gamma^I\gamma^I, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau\pi^-$ $(e^+e^- \dashrightarrow \nu_\tau\bar{\nu}_\tau\pi^+\pi^+\pi^-\pi^-\gamma^I\gamma^I\gamma^I)$	128	113	3	11	14	2117
58	$e^+e^- \rightarrow \tau^+\tau^-\pi^+\pi^-\pi^-\gamma^I\gamma^I, \tau^+ \rightarrow e^+\nu_e\bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow e^+\nu_e\bar{\nu}_\tau\pi^+\pi^-\pi^-\gamma^I\gamma^I)$	193	165	9	5	14	2131
59	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^+\pi^-\gamma^I, \tau^+ \rightarrow \bar{\nu}_\tau K^+, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^+\pi^-\pi^-K^+\gamma^I)$	69	28	10	3	13	2144
60	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^+\pi^-\gamma^I, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau, \pi^0 \rightarrow e^+e^-$ $(e^+e^- \dashrightarrow e^+\nu_\tau\bar{\nu}_\tau\pi^0\pi^+\pi^-\gamma^I)$	138	121	13	—	13	2157
61	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^0\pi^+\pi^-, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^0\pi^0\pi^+\pi^-)$	145	75	13	—	13	2170
62	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^+\gamma^I\gamma^I, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \mu^-\bar{\nu}_\mu\nu_\tau$ $(e^+e^- \dashrightarrow \mu^-\bar{\nu}_\mu\nu_\tau\bar{\nu}_\tau\pi^0\pi^+\gamma^I\gamma^I)$	236	203	7	6	13	2183
63	$e^+e^- \rightarrow \tau^+\tau^-\pi^+\pi^+\pi^+\pi^-\pi^-K^-, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow \nu_\tau\bar{\nu}_\tau\pi^+\pi^+\pi^+\pi^-\pi^-K^-)$	14	14	8	4	12	2195
64	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^+\pi^+\pi^-\pi^-, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau, \pi^0 \rightarrow e^+e^-$ $(e^+e^- \dashrightarrow e^+\nu_\tau\bar{\nu}_\tau\pi^0\pi^+\pi^+\pi^-\pi^-)$	72	66	12	—	12	2207
65	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^+\pi^-\gamma^I\gamma^I, \tau^+ \rightarrow \bar{\nu}_\tau K^+, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^+\pi^-\pi^-K^+\gamma^I\gamma^I)$	174	93	6	6	12	2219
66	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^+\pi^+\pi^+\pi^-\pi^-, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^0\pi^+\pi^+\pi^+\pi^-\pi^-)$	239	206	12	—	12	2231
67	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^+\pi^+\pi^-K^-, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^0\pi^+\pi^-\pi^-K^-)$	73	42	6	5	11	2242
68	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^+\pi^-\pi^-, \tau^+ \rightarrow \bar{\nu}_\tau K^+, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^+\pi^-\pi^-K^+)$	100	88	8	3	11	2253
69	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^+\gamma^I, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau K^-$ $(e^+e^- \dashrightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^+K^-\gamma^I)$	134	119	7	4	11	2264
70	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^+, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau\pi^-$ $(e^+e^- \dashrightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^0\pi^+\pi^-)$	47	5	5	5	10	2274
71	$e^+e^- \rightarrow \tau^+\tau^-\pi^+\pi^+\pi^-\gamma^I\gamma^I, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau K^-$ $(e^+e^- \dashrightarrow \nu_\tau\bar{\nu}_\tau\pi^+\pi^+\pi^-\pi^-K^-\gamma^I\gamma^I)$	80	72	4	6	10	2284

rowNo	decay tree (decay initial-final states)	iDcyTr	iDcyIFSts	nEtr	nCcEtr	nAllEtr	nCEtr
72	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^+\pi^-\pi^-\gamma^I\gamma^I, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^0\pi^+\pi^-\pi^-\gamma^I\gamma^I)$	0	0	10	—	10	2294
73	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^+\pi^-\pi^-K^+\gamma^I\gamma^I\gamma^I, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^+\pi^-\pi^-K^+\gamma^I\gamma^I\gamma^I)$	101	89	7	3	10	2304
74	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^-K^+\gamma^I, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^0\pi^-K^+\gamma^I)$	115	15	5	5	10	2314
75	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^+\pi^-\gamma^I, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau, \pi^0 \rightarrow e^+e^-$ $(e^+e^- \dashrightarrow e^+e^-\nu_\tau\bar{\nu}_\tau\pi^0\pi^0\pi^+\pi^-\gamma^I)$	126	111	10	—	10	2324
76	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^+\pi^-\gamma^I\gamma^I\gamma^I, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^0\pi^+\pi^-\gamma^I\gamma^I\gamma^I)$	140	123	10	—	10	2334
77	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^-, \tau^+ \rightarrow e^+\nu_e\bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow e^+\nu_e\nu_\tau\bar{\nu}_\tau\pi^0\pi^-)$	166	142	7	3	10	2344
78	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^+\pi^-, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau, \pi^0 \rightarrow e^+e^-$ $(e^+e^- \dashrightarrow e^+e^-\nu_\tau\bar{\nu}_\tau\pi^0\pi^0\pi^+\pi^-)$	217	187	10	—	10	2354
79	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^+\pi^-\gamma^I\gamma^I, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau, \pi^0 \rightarrow e^+e^-$ $(e^+e^- \dashrightarrow e^+e^-\nu_\tau\bar{\nu}_\tau\pi^0\pi^0\pi^+\pi^-\gamma^I\gamma^I)$	273	234	10	—	10	2364
80	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^+\pi^-\gamma^I\gamma^I\gamma^I, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^0\pi^+\pi^-\gamma^I\gamma^I\gamma^I)$	11	11	9	—	9	2373
81	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^+\pi^-\gamma^I\gamma^I\gamma^I, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau, \pi^0 \rightarrow e^+e^-$ $(e^+e^- \dashrightarrow e^+e^-\nu_\tau\bar{\nu}_\tau\pi^0\pi^+\pi^-\gamma^I\gamma^I\gamma^I)$	90	79	8	—	8	2381
82	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^+\pi^-\gamma^I\gamma^I\gamma^I, \tau^+ \rightarrow \bar{\nu}_\tau\pi^+, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^+\pi^+\pi^-\gamma^I\gamma^I\gamma^I)$	94	9	5	3	8	2389
83	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^-\gamma^I, \tau^+ \rightarrow \bar{\nu}_\tau\pi^+, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^0\pi^+\gamma^I)$	162	34	6	2	8	2397
84	$e^+e^- \rightarrow \tau^+\tau^-\pi^+\pi^-\gamma^I\gamma^I, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \mu^-\bar{\nu}_\mu\nu_\tau$ $(e^+e^- \dashrightarrow \mu^-\bar{\nu}_\mu\nu_\tau\bar{\nu}_\tau\pi^+\pi^-\gamma^I\gamma^I)$	192	164	3	5	8	2405
85	$e^+e^- \rightarrow \tau^+\tau^-\pi^+\pi^-\gamma^I\gamma^I\gamma^I, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau K^-$ $(e^+e^- \dashrightarrow \nu_\tau\bar{\nu}_\tau\pi^+\pi^-\gamma^I\gamma^I\gamma^I)$	219	189	4	4	8	2413
86	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^+\gamma^I\gamma^I\gamma^I, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau\pi^-$ $(e^+e^- \dashrightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^+\pi^-\gamma^I\gamma^I\gamma^I)$	232	200	7	1	8	2421
87	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^+\pi^-\pi^-\pi^-K^+, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^+\pi^-\pi^-\pi^-K^+)$	257	129	5	3	8	2429
88	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^-\gamma^I, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^0\pi^-\gamma^I)$	272	233	2	6	8	2437
89	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^+\gamma^I, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow e^-\bar{\nu}_e\nu_\tau$ $(e^+e^- \dashrightarrow e^-\bar{\nu}_e\nu_\tau\bar{\nu}_\tau\pi^0\pi^+\gamma^I)$	98	86	3	4	7	2444

rowNo	decay tree (decay initial-final states)	iDcyTr	iDcyIFSts	nEtr	nCcEtr	nAllEtr	nCEtr
90	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^+\pi^+\pi^-\pi^-\gamma^I\gamma^I\gamma^I, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^+\pi^+\pi^-\pi^-\gamma^I\gamma^I\gamma^I)$	119	104	7	—	7	2451
91	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^0\pi^+\pi^-\gamma^I\gamma^I, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^0\pi^0\pi^+\pi^-\gamma^I\gamma^I)$	206	177	7	—	7	2458
92	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^-\gamma^I\gamma^I, \tau^+ \rightarrow e^+\nu_e\bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau, \pi^0 \rightarrow e^+e^-$ $(e^+e^- \dashrightarrow e^+e^+\nu_e\nu_\tau\bar{\nu}_\tau\pi^-\gamma^I\gamma^I)$	212	182	5	2	7	2465
93	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^+\pi^-\gamma^I\gamma^I, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau, \pi^0 \rightarrow e^+e^-$ $(e^+e^- \dashrightarrow e^+e^-\nu_\tau\bar{\nu}_\tau\pi^0\pi^+\pi^-\gamma^I\gamma^I)$	230	198	7	—	7	2472
94	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^+\pi^+\pi^-\pi^-\gamma^I, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau, \pi^0 \rightarrow e^+e^-$ $(e^+e^- \dashrightarrow e^+e^-\nu_\tau\bar{\nu}_\tau\pi^0\pi^0\pi^+\pi^-\gamma^I)$	263	224	7	—	7	2479
95	$e^+e^- \rightarrow \tau^+\tau^-\pi^+\pi^+\pi^-\pi^-\gamma^I\gamma^I\gamma^I, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow \nu_\tau\bar{\nu}_\tau\pi^+\pi^+\pi^-\pi^-\gamma^I\gamma^I\gamma^I)$	76	69	6	—	6	2485
96	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^+K^-\gamma^I, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^0\pi^+K^-\gamma^I)$	53	49	4	2	6	2491
97	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^-\pi^-K_S^0\gamma^I, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^-\pi^-K_S^0\gamma^I)$	112	99	6	—	6	2497
98	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^+\pi^-\pi^-\gamma^I\gamma^I, \tau^+ \rightarrow \bar{\nu}_\tau\pi^+, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^0\pi^+\pi^-\pi^-\gamma^I\gamma^I)$	118	48	6	0	6	2503
99	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^+\pi^-\pi^-K^+, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau, \pi^0 \rightarrow e^+e^-$ $(e^+e^- \dashrightarrow e^+e^-\nu_\tau\bar{\nu}_\tau\pi^0\pi^+\pi^-\pi^-K^+)$	132	117	3	3	6	2509
100	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^+\pi^+\pi^-\pi^-\pi^-\gamma^I, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau$ $(e^+e^- \dashrightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^0\pi^+\pi^+\pi^-\pi^-\pi^-\gamma^I)$	133	118	6	—	6	2515
rest	$e^+e^- \rightarrow \text{others (452 in total)}$ $(e^+e^- \dashrightarrow \text{corresponding to others})$	—	—	—	—	823	3338

Table 2: Decay initial-final states.

rowNo	decay initial-final states	iDcyIFSts	nEtr	nCcEtr	nAllEtr	nCEtr
1	$e^+e^- \rightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^+\pi^+\pi^-\pi^-\gamma^I$	13	201	—	201	201
2	$e^+e^- \rightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^+\pi^+\pi^-\pi^-$	3	171	—	171	372
3	$e^+e^- \rightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^0\pi^+\pi^+\pi^-\pi^-\gamma^I$	32	130	—	130	502
4	$e^+e^- \rightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^+\pi^+\pi^-\pi^-\gamma^I\gamma^I$	21	119	—	119	621
5	$e^+e^- \rightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^0\pi^+\pi^+\pi^-\pi^-$	4	118	—	118	739
6	$e^+e^- \rightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^0\pi^+\pi^+\pi^-\pi^-\gamma^I\gamma^I$	48	82	—	82	821
7	$e^+e^- \rightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^0\pi^+\pi^-\gamma^I$	34	63	—	63	884
8	$e^+e^- \rightarrow \nu_\tau\bar{\nu}_\tau\pi^+\pi^+\pi^-\pi^-\gamma^I$	16	59	—	59	943
9	$e^+e^- \rightarrow \nu_\tau\bar{\nu}_\tau\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\gamma^I$	10	57	—	57	1000
10	$e^+e^- \rightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^+\pi^+\pi^-\pi^-\gamma^I\gamma^I\gamma^I$	9	50	—	50	1050
11	$e^+e^- \rightarrow \nu_\tau\bar{\nu}_\tau\pi^+\pi^+\pi^-\pi^-$	7	48	—	48	1098
12	$e^+e^- \rightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^0\pi^+\pi^-$	5	47	—	47	1145
13	$e^+e^- \rightarrow \nu_\tau\bar{\nu}_\tau\pi^+\pi^+\pi^-\pi^-\gamma^I\gamma^I$	50	46	—	46	1191
14	$e^+e^- \rightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^0\pi^+\pi^-\gamma^I$	20	44	—	44	1235
15	$e^+e^- \rightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^+\pi^+\pi^-K^-\gamma^I$	28	17	27	44	1279
16	$e^+e^- \rightarrow \nu_\tau\bar{\nu}_\tau\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-$	97	43	—	43	1322
17	$e^+e^- \rightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^0\pi^0\pi^+\pi^-$	17	42	—	42	1364
18	$e^+e^- \rightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-\gamma^I$	90	41	—	41	1405
19	$e^+e^- \rightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^0\pi^+\pi^-\gamma^I\gamma^I$	1	38	—	38	1443
20	$e^+e^- \rightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^+\pi^-\pi^-K^+$	88	26	10	36	1479
21	$e^+e^- \rightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^0\pi^0\pi^+\pi^-\gamma^I\gamma^I$	70	35	—	35	1514
22	$e^+e^- \rightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^0\pi^+\pi^-\pi^-\gamma^I$	25	34	—	34	1548
23	$e^+e^- \rightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^+\pi^+\pi^-K^-\gamma^I\gamma^I$	93	15	18	33	1581
24	$e^+e^- \rightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^0\pi^+\pi^+\pi^-\pi^-\gamma^I\gamma^I\gamma^I$	53	32	—	32	1613
25	$e^+e^- \rightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^0\pi^0\pi^+\pi^+\pi^-\pi^-$	55	31	—	31	1644
26	$e^+e^- \rightarrow e^+e^-\nu_\tau\bar{\nu}_\tau\pi^+\pi^+\pi^-\pi^-\gamma^I$	26	31	—	31	1675
27	$e^+e^- \rightarrow e^+e^-\nu_\tau\bar{\nu}_\tau\pi^0\pi^+\pi^+\pi^-\pi^-\gamma^I\gamma$	54	1	30	31	1706
28	$e^+e^- \rightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^+\pi^+\pi^+\pi^-\pi^-$	44	30	—	30	1736
29	$e^+e^- \rightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^0\pi^+\pi^+\pi^-\pi^-K^-\gamma^I$	58	20	8	28	1764
30	$e^+e^- \rightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^+\pi^-\gamma^I$	38	28	—	28	1792
31	$e^+e^- \rightarrow e^+e^-\nu_\tau\bar{\nu}_\tau\pi^+\pi^+\pi^-\pi^-$	24	26	—	26	1818
32	$e^+e^- \rightarrow \mu^+\nu_\mu\nu_\tau\bar{\nu}_\tau\pi^+\pi^-\pi^-\gamma^I$	39	18	7	25	1843

rowNo	decay initial-final states	iDcyIFSts	nEtr	nCcEtr	nAllEtr	nCEtr
33	$e^+e^- \rightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^+\pi^+\pi^-\pi^-\pi^-\gamma^I\gamma^I$	153	25	—	25	1868
34	$e^+e^- \rightarrow \nu_\tau\bar{\nu}_\tau\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-\gamma^I\gamma^I$	2	24	—	24	1892
35	$e^+e^- \rightarrow \mu^-\bar{\nu}_\mu\nu_\tau\bar{\nu}_\tau\pi^0\pi^+$	115	13	10	23	1915
36	$e^+e^- \rightarrow \nu_\tau\bar{\nu}_\tau\pi^+\pi^-\pi^-K^+$	130	13	9	22	1937
37	$e^+e^- \rightarrow e^+e^-\nu_\tau\bar{\nu}_\tau\pi^0\pi^+\pi^-\pi^-\gamma^I\gamma^I$	68	21	—	21	1958
38	$e^+e^- \rightarrow e^+e^-\nu_\tau\bar{\nu}_\tau\pi^+\pi^+\pi^-\pi^-\gamma^I\gamma^I$	57	21	—	21	1979
39	$e^+e^- \rightarrow e^+\nu_e\nu_\tau\bar{\nu}_\tau\pi^+\pi^-\pi^-\gamma^I$	41	10	11	21	2000
40	$e^+e^- \rightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^+\pi^-$	64	20	—	20	2020
41	$e^+e^- \rightarrow e^+\nu_e\nu_\tau\bar{\nu}_\tau\pi^+\pi^-\pi^-$	91	7	13	20	2040
42	$e^+e^- \rightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^+\pi^+\pi^-\pi^-\gamma^I\gamma^I\gamma^I\gamma^I$	92	18	—	18	2058
43	$e^+e^- \rightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^0\pi^+K^-$	80	11	7	18	2076
44	$e^+e^- \rightarrow \nu_\tau\bar{\nu}_\tau\pi^+\pi^+\pi^+\pi^-\pi^-K^-\gamma^I$	22	10	8	18	2094
45	$e^+e^- \rightarrow \mu^-\bar{\nu}_\mu\nu_\tau\bar{\nu}_\tau\pi^0\pi^+\gamma^I$	105	10	8	18	2112
46	$e^+e^- \rightarrow e^+e^-\nu_\tau\bar{\nu}_\tau\pi^0\pi^+\pi^-$	136	18	—	18	2130
47	$e^+e^- \rightarrow \nu_\tau\bar{\nu}_\tau\pi^+\pi^+\pi^-K^-\gamma^I$	67	10	7	17	2147
48	$e^+e^- \rightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^0\pi^0\pi^0\pi^+\pi^-\gamma^I$	56	16	—	16	2163
49	$e^+e^- \rightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^0\pi^-K^+\gamma^I$	15	7	8	15	2178
50	$e^+e^- \rightarrow e^+e^-\nu_\tau\bar{\nu}_\tau\pi^0\pi^+\pi^+\pi^-\pi^-$	101	15	—	15	2193
51	$e^+e^- \rightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^+\pi^-\gamma^I\gamma^I$	149	15	—	15	2208
52	$e^+e^- \rightarrow e^+\nu_e\nu_\tau\bar{\nu}_\tau\pi^0\pi^-\gamma^I$	161	7	8	15	2223
53	$e^+e^- \rightarrow \mu^-\bar{\nu}_\mu\nu_\tau\bar{\nu}_\tau\pi^+\pi^+\pi^-$	30	4	10	14	2237
54	$e^+e^- \rightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^0\pi^0\pi^0\pi^+\pi^-$	75	14	—	14	2251
55	$e^+e^- \rightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^+\pi^-\pi^-K^+$	42	6	8	14	2265
56	$e^+e^- \rightarrow e^-\bar{\nu}_e\nu_\tau\bar{\nu}_\tau\pi^0\pi^+\gamma^I\gamma^I$	100	6	8	14	2279
57	$e^+e^- \rightarrow \nu_\tau\bar{\nu}_\tau\pi^+\pi^+\pi^-\pi^-\gamma^I\gamma^I\gamma^I$	113	14	—	14	2293
58	$e^+e^- \rightarrow e^+e^-\nu_\tau\bar{\nu}_\tau\pi^0\pi^+\pi^-\gamma^I\gamma^I$	121	14	—	14	2307
59	$e^+e^- \rightarrow e^+\nu_e\nu_\tau\bar{\nu}_\tau\pi^+\pi^-\pi^-\gamma^I\gamma^I$	165	9	5	14	2321
60	$e^+e^- \rightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^+\pi^-\pi^-K^+\gamma^I\gamma^I\gamma^I$	89	9	4	13	2334
61	$e^+e^- \rightarrow \nu_\tau\bar{\nu}_\tau\pi^+\pi^+\pi^-K^-\gamma^I\gamma^I$	72	6	7	13	2347
62	$e^+e^- \rightarrow e^+e^-\nu_\tau\bar{\nu}_\tau\pi^0\pi^0\pi^+\pi^+\pi^-\pi^-$	66	13	—	13	2360
63	$e^+e^- \rightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^+K^-\gamma^I$	119	9	4	13	2373
64	$e^+e^- \rightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^+\pi^+\pi^-\pi^-K^-\gamma^I\gamma^I$	132	7	6	13	2386
65	$e^+e^- \rightarrow \mu^-\bar{\nu}_\mu\nu_\tau\bar{\nu}_\tau\pi^0\pi^+\gamma^I\gamma^I$	203	7	6	13	2399
66	$e^+e^- \rightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-$	206	13	—	13	2412

rowNo	decay initial-final states	iDcyIFSts	nEtr	nCcEtr	nAllEtr	nCEtr
67	$e^+ e^- \rightarrow \nu_\tau \bar{\nu}_\tau \pi^+ \pi^+ \pi^- \pi^- K^-$	14	8	4	12	2424
68	$e^+ e^- \rightarrow \nu_\tau \bar{\nu}_\tau \pi^0 \pi^0 \pi^+ \pi^- \gamma^I \gamma^I \gamma^I$	123	11	—	11	2435
69	$e^+ e^- \rightarrow e^+ e^- \nu_\tau \bar{\nu}_\tau \pi^0 \pi^0 \pi^+ \pi^-$	187	11	—	11	2446
70	$e^+ e^- \rightarrow \nu_\tau \bar{\nu}_\tau \pi^0 \pi^0 \pi^0 \pi^+ \pi^+ \pi^- \pi^- \gamma^I \gamma^I$	0	10	—	10	2456
71	$e^+ e^- \rightarrow e^+ e^- \nu_\tau \bar{\nu}_\tau \pi^0 \pi^+ \pi^- \gamma^I \gamma^I \gamma^I$	79	10	—	10	2466
72	$e^+ e^- \rightarrow e^+ e^- \nu_\tau \bar{\nu}_\tau \pi^0 \pi^0 \pi^+ \pi^- \gamma^I$	111	10	—	10	2476
73	$e^+ e^- \rightarrow \nu_\tau \bar{\nu}_\tau \pi^0 \pi^+ \pi^+ \pi^- \pi^- K^+$	129	7	3	10	2486
74	$e^+ e^- \rightarrow e^+ \nu_e \nu_\tau \bar{\nu}_\tau \pi^0 \pi^-$	142	7	3	10	2496
75	$e^+ e^- \rightarrow \nu_\tau \bar{\nu}_\tau \pi^+ \pi^+ \pi^- K^- \gamma^I \gamma^I \gamma^I$	189	6	4	10	2506
76	$e^+ e^- \rightarrow e^+ e^- \nu_\tau \bar{\nu}_\tau \pi^0 \pi^+ \pi^- \gamma^I \gamma^I$	198	10	—	10	2516
77	$e^+ e^- \rightarrow \nu_\tau \bar{\nu}_\tau \pi^0 \pi^0 \pi^0 \pi^- K^+$	233	2	8	10	2526
78	$e^+ e^- \rightarrow e^+ e^- \nu_\tau \bar{\nu}_\tau \pi^0 \pi^0 \pi^+ \pi^- \gamma^I \gamma^I$	234	10	—	10	2536
79	$e^+ e^- \rightarrow \nu_\tau \bar{\nu}_\tau \pi^0 \pi^0 \pi^0 \pi^+ \pi^- \gamma^I \gamma^I \gamma^I$	11	9	—	9	2545
80	$e^+ e^- \rightarrow \nu_\tau \bar{\nu}_\tau \pi^0 \pi^+ \pi^+ \pi^- \pi^- K^- \gamma^I$	95	3	5	8	2553
81	$e^+ e^- \rightarrow \nu_\tau \bar{\nu}_\tau \pi^0 \pi^0 \pi^+ \pi^+ \pi^- \pi^- \pi^- \gamma^I$	118	8	—	8	2561
82	$e^+ e^- \rightarrow \mu^- \bar{\nu}_\mu \nu_\tau \bar{\nu}_\tau \pi^+ \pi^+ \pi^- \gamma^I \gamma^I$	164	3	5	8	2569
83	$e^+ e^- \rightarrow \nu_\tau \bar{\nu}_\tau \pi^0 \pi^0 \pi^0 \pi^+ \pi^- \pi^- K^+ \gamma^I$	169	5	3	8	2577
84	$e^+ e^- \rightarrow \nu_\tau \bar{\nu}_\tau \pi^0 \pi^+ \pi^- \gamma^I \gamma^I \gamma^I$	200	8	—	8	2585
85	$e^+ e^- \rightarrow e^- \bar{\nu}_e \nu_\tau \bar{\nu}_\tau \pi^0 \pi^0 \pi^+ \gamma^I$	86	3	4	7	2592
86	$e^+ e^- \rightarrow \nu_\tau \bar{\nu}_\tau \pi^0 \pi^+ \pi^+ \pi^- \pi^- \gamma^I \gamma^I \gamma^I \gamma^I$	12	7	—	7	2599
87	$e^+ e^- \rightarrow \nu_\tau \bar{\nu}_\tau \pi^0 \pi^0 \pi^0 \pi^+ K^- \gamma^I$	49	4	3	7	2606
88	$e^+ e^- \rightarrow \nu_\tau \bar{\nu}_\tau \pi^0 \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \gamma^I \gamma^I \gamma^I$	104	7	—	7	2613
89	$e^+ e^- \rightarrow \nu_\tau \bar{\nu}_\tau \pi^0 \pi^0 \pi^0 \pi^+ \pi^- \pi^- \pi^- \gamma^I \gamma^I \gamma^I$	116	7	—	7	2620
90	$e^+ e^- \rightarrow e^+ e^- \nu_\tau \bar{\nu}_\tau \pi^0 \pi^+ \pi^- \pi^- K^+$	117	3	4	7	2627
91	$e^+ e^- \rightarrow \nu_\tau \bar{\nu}_\tau \pi^0 \pi^0 \pi^0 \pi^+ \pi^- \gamma^I \gamma^I$	177	7	—	7	2634
92	$e^+ e^- \rightarrow e^+ e^+ e^- \nu_e \nu_\tau \bar{\nu}_\tau \pi^- \gamma^I \gamma^I$	182	5	2	7	2641
93	$e^+ e^- \rightarrow e^+ e^- \nu_\tau \bar{\nu}_\tau \pi^0 \pi^0 \pi^+ \pi^- \pi^- \gamma^I$	224	7	—	7	2648
94	$e^+ e^- \rightarrow \nu_\tau \bar{\nu}_\tau \pi^0 \pi^0 \pi^+ \pi^+ \pi^- \pi^- \gamma^I \gamma^I \gamma^I \gamma^I$	262	7	—	7	2655
95	$e^+ e^- \rightarrow \nu_\tau \bar{\nu}_\tau \pi^0 \pi^0 \pi^0 \pi^+ \pi^+ \pi^- K^-$	96	3	3	6	2661
96	$e^+ e^- \rightarrow \nu_\tau \bar{\nu}_\tau \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \gamma^I \gamma^I \gamma^I$	69	6	—	6	2667
97	$e^+ e^- \rightarrow \nu_\tau \bar{\nu}_\tau \pi^0 \pi^+ \pi^- K_S^0 \gamma^I$	99	6	—	6	2673
98	$e^+ e^- \rightarrow \nu_\tau \bar{\nu}_\tau \pi^0 \pi^+ \pi^+ \pi^+ \pi^- \pi^- K^- \gamma^I \gamma^I$	167	5	1	6	2679
99	$e^+ e^- \rightarrow e^- \bar{\nu}_e \nu_\tau \bar{\nu}_\tau \pi^0 \pi^+ \pi^+ \pi^- \gamma^I$	184	3	3	6	2685
100	$e^+ e^- \rightarrow \nu_\tau \bar{\nu}_\tau \pi^0 \pi^+ K^- \gamma^I \gamma^I \gamma^I$	249	3	3	6	2691

rowNo	decay initial-final states		iDcyIFSts	nEtr	nCcEtr	nAllEtr	nCEtr
rest	$e^+ e^- \dashrightarrow$	others (350 in total)	—	—	—	647	3338

Table 3: Decay branches of  $\pi^0$ .

rowNo	decay branch of $\pi^0$	iDcyBrP	nCase	nCcCase	nAllCase	nCCase
1	$\pi^0 \rightarrow e^+e^-$	0	445	—	445	445

Table 4: Cascade decay branches of  $\pi^0$ .

rowNo	cascade decay branch of $\pi^0$	iCascDcyBrP	nCase	nCcCase	nAllCase	nCCase
1	$\pi^0 \rightarrow e^+e^-$	0	445	—	445	445

Table 5: Decay final states of  $\pi^0$ .

rowNo	decay final state of $\pi^0$	iDcyFStP	nCase	nCcCase	nAllCase	nCCase
1	$\pi^0 \rightarrow e^+ e^-$	0	445	—	445	445

Table 6: Production branches of  $\pi^0$ .

rowNo	production branch of $\pi^0$	iProdBrP	nCase	nCcCase	nAllCase	nCCase
1	$e^+e^- \rightarrow \tau^+\tau^- \cancel{\pi^0} \cancel{\pi^0} \pi^+ \pi^+ \pi^- \pi^- \gamma^I$	29	312	0	312	312
2	$e^+e^- \rightarrow \tau^+\tau^- \cancel{\pi^0} \cancel{\pi^0} \pi^+ \pi^+ \pi^- \pi^-$	3	256	0	256	568
3	$e^+e^- \rightarrow \tau^+\tau^- \cancel{\pi^0} \cancel{\pi^0} \pi^+ \pi^+ \pi^- \pi^- \gamma^I \gamma^I$	34	190	0	190	758
4	$e^+e^- \rightarrow \tau^+\tau^- \cancel{\pi^0} \pi^+ \pi^+ \pi^- \pi^- \gamma^I$	10	176	0	176	934
5	$e^+e^- \rightarrow \tau^+\tau^- \cancel{\pi^0} \pi^+ \pi^+ \pi^- \pi^-$	2	159	0	159	1093
6	$e^+e^- \rightarrow \tau^+\tau^- \cancel{\pi^0} \cancel{\pi^0} \pi^+ \pi^- \gamma^I$	15	156	0	156	1249
7	$e^+e^- \rightarrow \tau^+\tau^- \cancel{\pi^0} \cancel{\pi^0} \cancel{\pi^0} \pi^+ \pi^-$	12	153	0	153	1402
8	$e^+e^- \rightarrow \tau^+\tau^- \cancel{\pi^0} \cancel{\pi^0} \pi^+ \pi^- \gamma^I$	20	146	0	146	1548
9	$e^+e^- \rightarrow \tau^+\tau^- \cancel{\pi^0} \cancel{\pi^0} \cancel{\pi^0} \pi^+ \pi^- \gamma^I \gamma^I$	51	132	0	132	1680
10	$e^+e^- \rightarrow \tau^+\tau^- \cancel{\pi^0} \cancel{\pi^0} \cancel{\pi^0} \pi^+ \pi^+ \pi^- \pi^-$	38	129	0	129	1809
11	$e^+e^- \rightarrow \tau^+\tau^- \cancel{\pi^0} \cancel{\pi^0} \cancel{\pi^0} \pi^+ \pi^+ \pi^- \pi^- \gamma^I$	17	123	0	123	1932
12	$e^+e^- \rightarrow \tau^+\tau^- \cancel{\pi^0} \cancel{\pi^0} \pi^+ \pi^-$	4	114	0	114	2046
13	$e^+e^- \rightarrow \tau^+\tau^- \cancel{\pi^0} \pi^+ \pi^+ \pi^- \pi^- \gamma^I \gamma^I$	16	111	0	111	2157
14	$e^+e^- \rightarrow \tau^+\tau^- \cancel{\pi^0} \cancel{\pi^0} \cancel{\pi^0} \pi^+ \pi^- \gamma^I$	39	84	0	84	2241
15	$e^+e^- \rightarrow \tau^+\tau^- \cancel{\pi^0} \cancel{\pi^0} \pi^+ \pi^- \gamma^I \gamma^I$	92	80	0	80	2321
16	$e^+e^- \rightarrow \tau^+\tau^- \cancel{\pi^0} \cancel{\pi^0} \cancel{\pi^0} \pi^+ \pi^-$	44	76	0	76	2397
17	$e^+e^- \rightarrow \tau^+\tau^- \cancel{\pi^0} \cancel{\pi^0} \pi^+ \pi^+ \pi^- \pi^- \gamma^I \gamma^I \gamma^I$	55	66	0	66	2463
18	$e^+e^- \rightarrow \tau^+\tau^- \cancel{\pi^0} \pi^+ \pi^+ \pi^- \gamma^I$	49	46	0	46	2509
19	$e^+e^- \rightarrow \tau^+\tau^- \cancel{\pi^0} \pi^+ \gamma^I$	25	46	0	46	2555
20	$e^+e^- \rightarrow \tau^+\tau^- \cancel{\pi^0} \cancel{\pi^0} \cancel{\pi^0} \pi^+ \pi^- \gamma^I \gamma^I$	84	44	0	44	2599
21	$e^+e^- \rightarrow \tau^+\tau^- \cancel{\pi^0} \pi^+ \pi^+ \pi^- \pi^- \gamma^I \gamma^I \gamma^I$	7	43	0	43	2642
22	$e^+e^- \rightarrow \tau^+\tau^- \cancel{\pi^0} \pi^+ \pi^+ \pi^- \pi^- \pi^- \gamma^I$	70	42	0	42	2684
23	$e^+e^- \rightarrow \tau^+\tau^- \cancel{\pi^0} \cancel{\pi^0} \cancel{\pi^0} \pi^+ \pi^+ \pi^- \pi^- \gamma^I \gamma^I$	0	39	0	39	2723
24	$e^+e^- \rightarrow \tau^+\tau^- \cancel{\pi^0} \pi^- \gamma^I$	5	37	0	37	2760
25	$e^+e^- \rightarrow \tau^+\tau^- \cancel{\pi^0} \pi^+ \pi^- \pi^- \gamma^I$	46	37	0	37	2797
26	$e^+e^- \rightarrow \tau^+\tau^- \cancel{\pi^0} \pi^-$	47	37	0	37	2834
27	$e^+e^- \rightarrow \tau^+\tau^- \cancel{\pi^0} \cancel{\pi^0} \pi^+ \pi^- \gamma^I \gamma^I \gamma^I$	8	36	0	36	2870
28	$e^+e^- \rightarrow \tau^+\tau^- \cancel{\pi^0} \cancel{\pi^0} \pi^+ \pi^+ \pi^- K^- \gamma^I$	42	36	0	36	2906
29	$e^+e^- \rightarrow \tau^+\tau^- \cancel{\pi^0} \cancel{\pi^0} \pi^+ \pi^- \gamma^I \gamma^I \gamma^I$	60	36	0	36	2942
30	$e^+e^- \rightarrow \tau^+\tau^- \cancel{\pi^0} \pi^- \gamma^I \gamma^I$	13	35	0	35	2977
31	$e^+e^- \rightarrow \tau^+\tau^- \cancel{\pi^0} \pi^+ \pi^- \pi^-$	23	35	0	35	3012
32	$e^+e^- \rightarrow \tau^+\tau^- \cancel{\pi^0} \cancel{\pi^0} \pi^- \gamma^I$	11	32	0	32	3044

rowNo	production branch of $\pi^0$	iProdBrP	nCase	nCcCase	nAllCase	nCCase
33	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^+\pi^+\pi^-\pi^-\pi^-$	31	30	0	30	3074
34	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^+$	50	29	0	29	3103
35	$\omega \rightarrow \pi^0\pi^+\pi^-$	100	29	—	29	3132
36	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^+$	30	28	0	28	3160
37	$\eta \rightarrow \pi^0\pi^0\pi^0$	57	27	—	27	3187
38	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^+\pi^+\pi^-\pi^-\pi^-\gamma^I\gamma^I$	118	27	0	27	3214
39	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^+\pi^+\pi^-$	80	26	0	26	3240
40	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-$	149	26	0	26	3266
41	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^+\gamma^I$	67	24	0	24	3290
42	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^+\pi^-\pi^-\gamma^I\gamma^I$	95	24	0	24	3314
43	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^0\pi^0\pi^+\pi^+\pi^-\pi^-\gamma^I\gamma^I$	115	24	0	24	3338
44	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^+\gamma^I\gamma^I$	76	23	0	23	3361
45	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^+K^-$	61	22	0	22	3383
46	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^+\pi^-\gamma^I\gamma^I$	127	22	0	22	3405
47	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^0\pi^+\pi^-\gamma^I\gamma^I\gamma^I\gamma^I$	121	21	0	21	3426
48	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^0\pi^+K^-$	176	21	0	21	3447
49	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^0\pi^0\pi^+\pi^+\pi^-\pi^-\gamma^I$	33	20	0	20	3467
50	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^+\pi^+\pi^-\pi^-\gamma^I\gamma^I\gamma^I\gamma^I$	32	20	0	20	3487
51	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^0\pi^0\pi^+\pi^-\gamma^I$	223	20	0	20	3507
52	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^+\pi^+\pi^-K^-$	48	18	0	18	3525
53	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^+\pi^+\pi^-K^-\gamma^I$	18	18	0	18	3543
54	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^-$	40	18	0	18	3561
55	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^0\pi^+\pi^+\pi^-\pi^-\gamma^I\gamma^I\gamma^I$	191	18	0	18	3579
56	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^+\pi^-\pi^-K^+$	73	17	0	17	3596
57	$\eta \rightarrow \pi^0\pi^+\pi^-$	28	17	—	17	3613
58	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^+\pi^-\pi^-K^+\gamma^I$	108	17	0	17	3630
59	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^+\pi^-\pi^-\gamma^I\gamma^I$	81	16	0	16	3646
60	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^-\pi^+K^+$	93	16	0	16	3662
61	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^+\pi^-\pi^-K^+$	90	16	0	16	3678
62	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^+\gamma^I\gamma^I\gamma^I$	105	16	0	16	3694
63	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^0\pi^0\pi^+\pi^-\pi^-\gamma^I\gamma^I\gamma^I\gamma^I$	113	16	0	16	3710
64	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^+\pi^+\pi^-\pi^-\gamma^I\gamma^I\gamma^I\gamma^I$	161	16	0	16	3726
65	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^0\pi^+\pi^-K^-\gamma^I$	35	15	0	15	3741
66	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^0\pi^-\gamma^I$	165	15	0	15	3756

rowNo	production branch of $\pi^0$	iProdBrP	nCase	nCcCase	nAllCase	nCCase
67	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^0\pi^+\pi^-\pi^-K^+\gamma^I$	212	15	0	15	3771
68	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^-\gamma^I\gamma^I$	1	14	0	14	3785
69	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^+\pi^-\pi^-K^+\gamma^I$	86	14	0	14	3799
70	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^-K^+\gamma^I$	77	12	0	12	3811
71	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^+\pi^+\pi^-\pi^-\pi^-\gamma^I$	91	12	0	12	3823
72	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^0\pi^+\pi^-\pi^-K^+$	85	12	0	12	3835
73	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^+\pi^+\pi^-\pi^-\pi^-\gamma^I\gamma^I$	78	12	0	12	3847
74	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^+K^-\gamma^I$	87	12	0	12	3859
75	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^+\gamma^I\gamma^I$	107	12	0	12	3871
76	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^0\pi^-K^+$	136	12	0	12	3883
77	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^0\pi^-K^+\gamma^I$	154	12	0	12	3895
78	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^0\pi^-K^+\gamma^I\gamma^I$	164	12	0	12	3907
79	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^0\pi^+$	209	12	0	12	3919
80	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^0\pi^0\pi^-K^+$	244	12	0	12	3931
81	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^+\pi^-\pi^-K^+\gamma^I\gamma^I$	126	11	0	11	3942
82	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^+K^-\gamma^I\gamma^I$	45	10	0	10	3952
83	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^+\pi^-\pi^-\gamma^I\gamma^I\gamma^I\gamma^I$	64	10	0	10	3962
84	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^0\pi^0\pi^+\pi^-$	59	10	0	10	3972
85	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^+\pi^+\pi^-\gamma^I$	19	10	0	10	3982
86	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^+\pi^-\pi^-K^-\gamma^I\gamma^I$	71	10	0	10	3992
87	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^+\pi^-\pi^-K^-$	124	10	0	10	4002
88	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^0\pi^0\pi^+K^-\gamma^I$	133	10	0	10	4012
89	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^0\pi^+\pi^+\pi^-\pi^-\gamma^I\gamma^I\gamma^I\gamma^I$	122	9	0	9	4021
90	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^-\gamma^I\gamma^I\gamma^I\gamma^I$	202	9	0	9	4030
91	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^0\pi^+\gamma^I$	231	9	0	9	4039
92	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^0\pi^+\pi^-\gamma^I\gamma^I\gamma^I\gamma^I\gamma^I$	275	9	0	9	4048
93	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^+\pi^+\pi^-\pi^-\pi^-\gamma^I\gamma^I\gamma^I\gamma^I$	82	8	0	8	4056
94	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^0\pi^0\pi^+K^-\gamma^I\gamma^I$	52	8	0	8	4064
95	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^+\pi^-K_S^0$	142	8	0	8	4072
96	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^0\pi^-\pi^-K^+\gamma^I$	143	8	0	8	4080
97	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^+\pi^-\gamma^I\gamma^I\gamma^I\gamma^I$	175	8	0	8	4088
98	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^0\pi^0\pi^+K^-\gamma^I$	195	8	0	8	4096
99	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^+\pi^-\pi^-K^+\gamma^I\gamma^I\gamma^I$	69	7	0	7	4103
100	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^0\pi^+K_S^0K^-\gamma^I$	22	6	0	6	4109

rowNo	production branch of $\pi^0$		iProdBrP	nCase	nCcCase	nAllCase	nCCase
rest	others	(211 in total)	—	—	—	529	4638

Table 7: Production branches of  $e^+$ .

rowNo	production branch of $e^+$	iProdBrP	nCase	nCcCase	nAllCase	nCCase
1	$\pi^0 \rightarrow e^+ e^-$	0	445	445	890	890
2	$\tau^+ \rightarrow e^+ \nu_e \bar{\nu}_\tau$	1	97	97	194	1084

Table 8: Mothers of  $\pi^0$ .

rowNo	mother of $\pi^0$	PDGMoth	nCase	nCcCase	nAllCase	nCCase
1	$e^+e^-$	99999999	4564	—	4564	4564
2	$\eta$	221	44	—	44	4608
3	$\omega$	223	30	—	30	4638

Table 9: Mothers of  $e^+$ .

rowNo	mother of $e^+$	PDGMoth	nCase	nCcCase	nAllCase	nCCase
1	$\pi^0$	111	445	445	890	890
2	$\tau^+$	-15	97	97	194	1084