

# Topology Analysis <sup>\*†‡§</sup>

(v2.12.3)

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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	$e^+e^- \rightarrow \pi^0\pi^+D^{*-}D^{*0}\gamma^I, D^{*-} \rightarrow \pi^-\bar{D}^0, D^{*0} \rightarrow \pi^0D^0, \bar{D}^0 \rightarrow \pi^-K^+, D^0 \rightarrow \pi^0\pi^+K^-$ ( $e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^+\pi^-\pi^-K^+K^-\gamma^I$ )	31333	12691	279	285	564	564
2	$e^+e^- \rightarrow \pi^0\pi^-D^{*+}\bar{D}^{*0}, D^{*+} \rightarrow \pi^+D^0, \bar{D}^{*0} \rightarrow \pi^0\bar{D}^0, D^0 \rightarrow \pi^+K^-, \bar{D}^0 \rightarrow \pi^0\pi^-K^+$ ( $e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^+\pi^-\pi^-K^+K^-$ )	32960	12503	232	236	468	1032
3	$e^+e^- \rightarrow \pi^+\pi^-D^{*+}D^{*-}\gamma^I, D^{*+} \rightarrow \pi^+D^0, D^{*-} \rightarrow \pi^-\bar{D}^0, D^0 \rightarrow \pi^0\pi^+K^-, \bar{D}^0 \rightarrow \pi^-K^+$ ( $e^+e^- \rightarrow \pi^0\pi^+\pi^+\pi^-\pi^-\pi^-K^+K^-\gamma^I$ )	32424	13488	181	248	429	1461
4	$e^+e^- \rightarrow \pi^+\pi^-D^{*+}D^{*-}, D^{*+} \rightarrow \pi^+D^0, D^{*-} \rightarrow \pi^-\bar{D}^0, D^0 \rightarrow \pi^+K^-, \bar{D}^0 \rightarrow \pi^0\pi^-K^+$ ( $e^+e^- \rightarrow \pi^0\pi^+\pi^+\pi^-\pi^-\pi^-K^+K^-$ )	39952	12460	216	199	415	1876
5	$e^+e^- \rightarrow \pi^+D^{*-}D^{*0}\gamma^I, D^{*-} \rightarrow \pi^-\bar{D}^0, D^{*0} \rightarrow \pi^0D^0, \bar{D}^0 \rightarrow \pi^-K^+, D^0 \rightarrow \pi^0\pi^+K^-$ ( $e^+e^- \rightarrow \pi^0\pi^0\pi^+\pi^-\pi^-K^+K^-\gamma^I$ )	40905	12594	202	206	408	2284
6	$e^+e^- \rightarrow \pi^0\pi^+\pi^-D^{*+}D^{*-}, D^{*+} \rightarrow \pi^+D^0, D^{*-} \rightarrow \pi^-\bar{D}^0, D^0 \rightarrow \pi^+K^-, \bar{D}^0 \rightarrow \pi^0\pi^-K^+$ ( $e^+e^- \rightarrow \pi^0\pi^0\pi^+\pi^+\pi^-\pi^-K^+K^-$ )	31508	12473	194	161	355	2639
7	$e^+e^- \rightarrow \pi^0\pi^+\pi^-D^{*+}D^{*-}\gamma^I, D^{*+} \rightarrow \pi^+D^0, D^{*-} \rightarrow \pi^-\bar{D}^0, D^0 \rightarrow \pi^0\pi^+K^-, \bar{D}^0 \rightarrow \pi^-K^+$ ( $e^+e^- \rightarrow \pi^0\pi^0\pi^+\pi^+\pi^-\pi^-K^+K^-\gamma^I$ )	47622	12574	170	181	351	2990
8	$e^+e^- \rightarrow \pi^0\pi^+D^{*-}D^{*0}, D^{*-} \rightarrow \pi^-\bar{D}^0, D^{*0} \rightarrow \pi^0D^0, \bar{D}^0 \rightarrow \pi^0\pi^-K^+, D^0 \rightarrow \pi^+K^-$ ( $e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^+\pi^-\pi^-K^+K^-$ )	35268	12503	176	129	305	3295
9	$e^+e^- \rightarrow \pi^0\pi^+\pi^+\pi^-\rho^-K^+K^-, \rho^- \rightarrow \pi^0\pi^-$ ( $e^+e^- \rightarrow \pi^0\pi^0\pi^+\pi^+\pi^-\pi^-K^+K^-$ )	1659300	12865	148	152	300	3595
10	$e^+e^- \rightarrow \pi^0\pi^+D^{*-}D^{*0}\gamma^I, D^{*-} \rightarrow \pi^-\bar{D}^0, D^{*0} \rightarrow \pi^0D^0, \bar{D}^0 \rightarrow \pi^0\pi^-K^+, D^0 \rightarrow \pi^+K^-$ ( $e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^+\pi^-\pi^-K^+K^-\gamma^I$ )	36673	12691	166	126	292	3887
11	$e^+e^- \rightarrow \pi^0\pi^-D^{*+}\bar{D}^{*0}\gamma^I, D^{*+} \rightarrow \pi^+D^0, \bar{D}^{*0} \rightarrow \bar{D}^0\gamma, D^0 \rightarrow \pi^+K^-, \bar{D}^0 \rightarrow \pi^0\pi^-K^+$ ( $e^+e^- \rightarrow \pi^0\pi^0\pi^+\pi^+\pi^-\pi^-K^+K^-\gamma^I\gamma$ )	47113	12542	153	132	285	4172
12	$e^+e^- \rightarrow \pi^+D^{*-}D^{*0}, D^{*-} \rightarrow \pi^-\bar{D}^0, D^{*0} \rightarrow \pi^0D^0, \bar{D}^0 \rightarrow \pi^-K^+, D^0 \rightarrow \pi^0\pi^+K^-$ ( $e^+e^- \rightarrow \pi^0\pi^0\pi^+\pi^+\pi^-\pi^-K^+K^-$ )	33126	12865	120	154	274	4446
13	$e^+e^- \rightarrow \pi^0\pi^+D^{*-}D^{*0}\gamma^I\gamma^I, D^{*-} \rightarrow \pi^-\bar{D}^0, D^{*0} \rightarrow \pi^0D^0, \bar{D}^0 \rightarrow \pi^-K^+, D^0 \rightarrow \pi^0\pi^+K^-$ ( $e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^+\pi^-\pi^-K^+K^-\gamma^I\gamma^I$ )	41934	12439	136	138	274	4720
14	$e^+e^- \rightarrow \pi^0\pi^+\pi^-\pi^-\rho^+K^+K^-\gamma^I, \rho^+ \rightarrow \pi^0\pi^+$ ( $e^+e^- \rightarrow \pi^0\pi^0\pi^+\pi^+\pi^-\pi^-K^+K^-\gamma^I$ )	1658553	12594	126	145	271	4991
15	$e^+e^- \rightarrow \pi^0D^{*+}D^{*-}\gamma^I, D^{*+} \rightarrow \pi^+D^0, D^{*-} \rightarrow \pi^-\bar{D}^0, D^0 \rightarrow \pi^0\pi^+K^-, \bar{D}^0 \rightarrow \pi^-K^+$ ( $e^+e^- \rightarrow \pi^0\pi^0\pi^+\pi^+\pi^-\pi^-K^+K^-\gamma^I$ )	34019	12594	109	157	266	5257
16	$e^+e^- \rightarrow \pi^0\pi^-D^{*+}\bar{D}^{*0}, D^{*+} \rightarrow \pi^+D^0, \bar{D}^{*0} \rightarrow \bar{D}^0\gamma, D^0 \rightarrow \pi^+K^-, \bar{D}^0 \rightarrow \pi^0\pi^-K^+$ ( $e^+e^- \rightarrow \pi^0\pi^0\pi^+\pi^+\pi^-\pi^-K^+K^-\gamma$ )	35544	14568	129	137	266	5523
17	$e^+e^- \rightarrow \pi^+D^{*-}D^{*0}\gamma^I\gamma^I, D^{*-} \rightarrow \pi^-\bar{D}^0, D^{*0} \rightarrow \pi^0D^0, \bar{D}^0 \rightarrow \pi^-K^+, D^0 \rightarrow \pi^0\pi^+K^-$ ( $e^+e^- \rightarrow \pi^0\pi^0\pi^+\pi^+\pi^-\pi^-K^+K^-\gamma^I\gamma^I$ )	35147	13555	131	131	262	5785

rowNo	decay tree (decay initial-final states)	iDcyTr	iDcyIFSts	nEtr	nCcEtr	nAllEtr	nCEtr
18	$e^+e^- \rightarrow \pi^0\pi^+D^{*-}D^0\gamma^I, D^{*-} \rightarrow \pi^-\bar{D}^0, D^0 \rightarrow \pi^0\pi^+K^-, \bar{D}^0 \rightarrow \pi^-K^+$ ( $e^+e^- \dashrightarrow \pi^0\pi^0\pi^+\pi^+\pi^-\pi^-K^+K^-\gamma^I$ )	40230	12594	123	131	254	6039
19	$e^+e^- \rightarrow \pi^+D^{*-}D^{*0}\gamma^I, D^{*-} \rightarrow \pi^-\bar{D}^0, D^{*0} \rightarrow \pi^0D^0, \bar{D}^0 \rightarrow \pi^0\pi^-K^+, D^0 \rightarrow \pi^+K^-$ ( $e^+e^- \dashrightarrow \pi^0\pi^0\pi^+\pi^+\pi^-\pi^-K^+K^-\gamma^I$ )	45294	12594	148	104	252	6291
20	$e^+e^- \rightarrow \pi^+\pi^-D^{*0}\bar{D}^{*0}\gamma^I, D^{*0} \rightarrow \pi^0D^0, \bar{D}^{*0} \rightarrow \pi^0\bar{D}^0, D^0 \rightarrow \pi^0\pi^+K^-, \bar{D}^0 \rightarrow \pi^-K^+$ ( $e^+e^- \dashrightarrow \pi^0\pi^0\pi^0\pi^+\pi^+\pi^-\pi^-K^+K^-\gamma^I$ )	39695	12691	115	131	246	6537
21	$e^+e^- \rightarrow \pi^0\pi^0\pi^+\pi^+\pi^-\rho^-K^+K^-, \rho^- \rightarrow \pi^0\pi^-$ ( $e^+e^- \dashrightarrow \pi^0\pi^0\pi^0\pi^+\pi^+\pi^-\pi^-K^+K^-$ )	1659532	12503	131	108	239	6776
22	$e^+e^- \rightarrow \pi^0\rho^0\pi^+\pi^-\pi^-\rho^+K^+K^-, \rho^0 \rightarrow \pi^+\pi^-, \rho^+ \rightarrow \pi^0\pi^+$ ( $e^+e^- \dashrightarrow \pi^0\pi^0\pi^+\pi^+\pi^-\pi^-\pi^-K^+K^-$ )	1658403	12473	130	104	234	7010
23	$e^+e^- \rightarrow \pi^0\rho^0\pi^+\pi^-\pi^-\rho^+\gamma^I, \rho^0 \rightarrow \pi^+\pi^-, \rho^+ \rightarrow \pi^0\pi^+$ ( $e^+e^- \dashrightarrow \pi^0\pi^0\pi^+\pi^+\pi^-\pi^-\pi^-\gamma^I$ )	1661017	56444	122	106	228	7238
24	$e^+e^- \rightarrow \pi^0\pi^-D^{*+}\bar{D}^0, D^{*+} \rightarrow \pi^+D^0, \bar{D}^0 \rightarrow \pi^0\pi^-K^+, D^0 \rightarrow \pi^+K^-$ ( $e^+e^- \dashrightarrow \pi^0\pi^0\pi^+\pi^+\pi^-\pi^-K^+K^-$ )	34379	12865	125	99	224	7462
25	$e^+e^- \rightarrow \pi^0D^{*+}D^{*-}, D^{*+} \rightarrow \pi^+D^0, D^{*-} \rightarrow \pi^-\bar{D}^0, D^0 \rightarrow \pi^+K^-, \bar{D}^0 \rightarrow \pi^0\pi^-K^+$ ( $e^+e^- \dashrightarrow \pi^0\pi^0\pi^+\pi^+\pi^-\pi^-K^+K^-$ )	33473	12865	107	111	218	7680
26	$e^+e^- \rightarrow \pi^-D^{*+}\bar{D}^0\gamma^I, D^{*+} \rightarrow \pi^+D^0, \bar{D}^0 \rightarrow \pi^0\pi^-K^+, D^0 \rightarrow \pi^+K^-$ ( $e^+e^- \dashrightarrow \pi^0\pi^+\pi^+\pi^-\pi^-K^+K^-\gamma^I$ )	41951	13926	119	92	211	7891
27	$e^+e^- \rightarrow \pi^0\rho^0\pi^+\pi^+\pi^-\rho^-, \rho^0 \rightarrow \pi^+\pi^-, \rho^- \rightarrow \pi^0\pi^-$ ( $e^+e^- \dashrightarrow \pi^0\pi^0\pi^+\pi^+\pi^-\pi^-\pi^-$ )	1658623	118724	98	113	211	8102
28	$e^+e^- \rightarrow \pi^0\pi^+\pi^-\pi^-\rho^+\omega K^+K^-, \rho^+ \rightarrow \pi^0\pi^+, \omega \rightarrow \pi^0\pi^+\pi^-$ ( $e^+e^- \dashrightarrow \pi^0\pi^0\pi^0\pi^+\pi^+\pi^-\pi^-\pi^-K^+K^-$ )	1659951	12467	108	101	209	8311
29	$e^+e^- \rightarrow \pi^0\pi^+D^{*-}D^{*0}\gamma^I, D^{*-} \rightarrow \pi^-\bar{D}^0, D^{*0} \rightarrow \pi^0D^0, \bar{D}^0 \rightarrow \pi^-K^+, D^0 \rightarrow \pi^+K^-$ ( $e^+e^- \dashrightarrow \pi^0\pi^0\pi^+\pi^+\pi^-\pi^-K^+K^-\gamma^I$ )	48362	12594	121	85	206	8517
30	$e^+e^- \rightarrow \pi^+\pi^-\pi^-D^{*+}\bar{D}^{*0}, D^{*+} \rightarrow \pi^+D^0, \bar{D}^{*0} \rightarrow \pi^0\bar{D}^0, D^0 \rightarrow \pi^+K^-, \bar{D}^0 \rightarrow \pi^0\pi^-K^+$ ( $e^+e^- \dashrightarrow \pi^0\pi^0\pi^+\pi^+\pi^-\pi^-K^+K^-$ )	32460	12473	105	98	203	8720
31	$e^+e^- \rightarrow \pi^+\pi^-D^{*0}\bar{D}^{*0}, D^{*0} \rightarrow \pi^0D^0, \bar{D}^{*0} \rightarrow \pi^0\bar{D}^0, D^0 \rightarrow \pi^0\pi^+K^-, \bar{D}^0 \rightarrow \pi^-K^+$ ( $e^+e^- \dashrightarrow \pi^0\pi^0\pi^0\pi^+\pi^+\pi^-\pi^-K^+K^-$ )	32120	12503	97	105	202	8922
32	$e^+e^- \rightarrow \pi^+\pi^-D^{*+}D^{*-}\gamma^I\gamma^I, D^{*+} \rightarrow \pi^+D^0, D^{*-} \rightarrow \pi^-\bar{D}^0, D^0 \rightarrow \pi^0\pi^+K^-, \bar{D}^0 \rightarrow \pi^-K^+$ ( $e^+e^- \dashrightarrow \pi^0\pi^+\pi^+\pi^-\pi^-\pi^-K^+K^-\gamma^I\gamma^I$ )	33721	13290	89	113	202	9124
33	$e^+e^- \rightarrow \pi^+\pi^+\pi^-\rho^-\omega K^+K^-, \rho^- \rightarrow \pi^0\pi^-, \omega \rightarrow \pi^0\pi^+\pi^-$ ( $e^+e^- \dashrightarrow \pi^0\pi^0\pi^+\pi^+\pi^-\pi^-K^+K^-$ )	1659873	12473	107	94	201	9325
34	$e^+e^- \rightarrow \pi^0\pi^+\pi^-D^{*0}\bar{D}^{*0}, D^{*0} \rightarrow \pi^0D^0, \bar{D}^{*0} \rightarrow \pi^0\bar{D}^0, D^0 \rightarrow \pi^+K^-, \bar{D}^0 \rightarrow \pi^0\pi^-K^+$ ( $e^+e^- \dashrightarrow \pi^0\pi^0\pi^0\pi^+\pi^+\pi^-\pi^-K^+K^-$ )	37777	12577	104	95	199	9524
35	$e^+e^- \rightarrow \pi^+D^{*-}D^{*0}\gamma^I, D^{*-} \rightarrow \pi^-\bar{D}^0, D^{*0} \rightarrow D^0\gamma, \bar{D}^0 \rightarrow \pi^-K^+, D^0 \rightarrow \pi^0\pi^+K^-$ ( $e^+e^- \dashrightarrow \pi^0\pi^+\pi^+\pi^-\pi^-K^+K^-\gamma^I\gamma$ )	31791	13208	84	111	195	9719

rowNo	decay tree (decay initial-final states)	iDcyTr	iDcyIFSts	nEtr	nCcEtr	nAllEtr	nCEtr
36	$e^+e^- \rightarrow \pi^0\pi^0\pi^+D^{*-}D^{*0}, D^{*-} \rightarrow \pi^-\bar{D}^0, D^{*0} \rightarrow \pi^0D^0, \bar{D}^0 \rightarrow \pi^-K^+, D^0 \rightarrow \pi^0\pi^+K^-$ ( $e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^0\pi^+\pi^+\pi^-\pi^-K^+K^-$ )	33070	12577	88	105	193	9912
37	$e^+e^- \rightarrow \pi^0\rho^0\pi^-\rho^+K^+K^-\gamma^I, \rho^0 \rightarrow \pi^+\pi^-, \rho^+ \rightarrow \pi^0\pi^+$ ( $e^+e^- \rightarrow \pi^0\pi^0\pi^+\pi^+\pi^-\pi^-K^+K^-\gamma^I$ )	1663666	12594	98	95	193	10105
38	$e^+e^- \rightarrow \pi^0\pi^0\pi^+D^{*-}D^{*0}\gamma^I, D^{*-} \rightarrow \pi^-\bar{D}^0, D^{*0} \rightarrow \pi^0D^0, \bar{D}^0 \rightarrow \pi^-K^+, D^0 \rightarrow \pi^0\pi^+K^-$ ( $e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^0\pi^+\pi^-\pi^-K^+K^-\gamma^I$ )	35988	12557	81	111	192	10297
39	$e^+e^- \rightarrow \pi^+\pi^+\pi^-\rho^-K^+K^-\gamma^I, \rho^- \rightarrow \pi^0\pi^-$ ( $e^+e^- \rightarrow \pi^0\pi^+\pi^+\pi^-\pi^-K^+K^-\gamma^I$ )	1659990	13926	102	89	191	10488
40	$e^+e^- \rightarrow \pi^0\pi^+\pi^-D^{*0}\bar{D}^{*0}\gamma^I, D^{*0} \rightarrow \pi^0D^0, \bar{D}^{*0} \rightarrow \pi^0\bar{D}^0, D^0 \rightarrow \pi^+K^-, \bar{D}^0 \rightarrow \pi^0\pi^-K^+$ ( $e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^0\pi^+\pi^-\pi^-K^+K^-\gamma^I$ )	34407	12557	97	93	190	10678
41	$e^+e^- \rightarrow \pi^+\pi^-\rho^-D^{*+}\bar{D}^{*0}, \rho^- \rightarrow \pi^0\pi^-, D^{*+} \rightarrow \pi^+D^0, \bar{D}^{*0} \rightarrow \pi^0\bar{D}^0, D^0 \rightarrow \pi^+K^-, \bar{D}^0 \rightarrow \pi^0\pi^-K^+$ ( $e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^+\pi^+\pi^-\pi^-K^+K^-$ )	47452	12467	105	84	189	10867
42	$e^+e^- \rightarrow \pi^0D^{*+}D^{*-}\gamma^I\gamma^I, D^{*+} \rightarrow \pi^+D^0, D^{*-} \rightarrow \pi^-\bar{D}^0, D^0 \rightarrow \pi^+K^-, \bar{D}^0 \rightarrow \pi^0\pi^-K^+$ ( $e^+e^- \rightarrow \pi^0\pi^0\pi^+\pi^+\pi^-\pi^-K^+K^-\gamma^I\gamma^I$ )	52084	13555	104	85	189	11056
43	$e^+e^- \rightarrow \pi^+\omega D^{*-}D^{*0}\gamma^I, \omega \rightarrow \pi^0\pi^+\pi^-, D^{*-} \rightarrow \pi^-\bar{D}^0, D^{*0} \rightarrow \pi^0D^0, \bar{D}^0 \rightarrow \pi^-K^+, D^0 \rightarrow \pi^0\pi^+K^-$ ( $e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^+\pi^+\pi^-\pi^-K^+K^-\gamma^I$ )	39071	12703	85	99	184	11240
44	$e^+e^- \rightarrow \pi^+\pi^+\pi^-D^{*-}D^{*0}\gamma^I, D^{*-} \rightarrow \pi^-\bar{D}^0, D^{*0} \rightarrow \pi^0D^0, \bar{D}^0 \rightarrow \pi^-K^+, D^0 \rightarrow \pi^0\pi^+K^-$ ( $e^+e^- \rightarrow \pi^0\pi^0\pi^+\pi^+\pi^-\pi^-K^+K^-\gamma^I$ )	63956	12574	98	86	184	11424
45	$e^+e^- \rightarrow \pi^0\rho^0\pi^+\pi^-\pi^-\rho^+, \rho^0 \rightarrow \pi^+\pi^-, \rho^+ \rightarrow \pi^0\pi^+$ ( $e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^+\pi^+\pi^-\pi^-$ )	1659082	49609	98	84	182	11606
46	$e^+e^- \rightarrow \pi^0\rho^0\pi^-\rho^+K^+K^-, \rho^0 \rightarrow \pi^+\pi^-, \rho^+ \rightarrow \pi^0\pi^+$ ( $e^+e^- \rightarrow \pi^0\pi^0\pi^+\pi^+\pi^-\pi^-K^+K^-$ )	1658729	12865	88	93	181	11787
47	$e^+e^- \rightarrow \pi^0\rho^0\pi^+\pi^-\pi^-\omega\gamma^I, \rho^0 \rightarrow \pi^+\pi^-, \rho^- \rightarrow \pi^0\pi^-, \omega \rightarrow \pi^0\pi^+\pi^-$ ( $e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\gamma^I$ )	1659062	48010	88	91	179	11966
48	$e^+e^- \rightarrow \pi^0\pi^+D^{*-}D^{*0}, D^{*-} \rightarrow \pi^-\bar{D}^0, D^{*0} \rightarrow \pi^0D^0, \bar{D}^0 \rightarrow \pi^-K^+, D^0 \rightarrow \pi^+K^-$ ( $e^+e^- \rightarrow \pi^0\pi^0\pi^+\pi^+\pi^-\pi^-K^+K^-$ )	52364	12865	80	98	178	12144
49	$e^+e^- \rightarrow \pi^0\rho^0\pi^+\pi^-\pi^-\rho^-K^+K^-\gamma^I, \rho^0 \rightarrow \pi^+\pi^-, \rho^- \rightarrow \pi^0\pi^-$ ( $e^+e^- \rightarrow \pi^0\pi^0\pi^+\pi^+\pi^-\pi^-K^+K^-\gamma^I$ )	1658507	12574	80	98	178	12322
50	$e^+e^- \rightarrow \pi^+\pi^+\pi^-\rho^-K^+K^-, \rho^- \rightarrow \pi^0\pi^-$ ( $e^+e^- \rightarrow \pi^0\pi^+\pi^+\pi^-\pi^-K^+K^-$ )	1660226	13199	90	88	178	12500
51	$e^+e^- \rightarrow \pi^0\pi^+\pi^-\pi^-\rho^+\omega\gamma^I, \rho^+ \rightarrow \pi^0\pi^+, \omega \rightarrow \pi^0\pi^+\pi^-$ ( $e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^+\pi^+\pi^-\pi^-\gamma^I$ )	1661327	44265	93	85	178	12678
52	$e^+e^- \rightarrow \pi^0\pi^+\rho^-\omega K^+K^-\gamma^I, \rho^- \rightarrow \pi^0\pi^-, \omega \rightarrow \pi^0\pi^+\pi^-$ ( $e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^+\pi^+\pi^-\pi^-K^+K^-\gamma^I$ )	1658562	12691	87	89	176	12854

rowNo	decay tree (decay initial-final states)	iDcyTr	iDcyIFSts	nEtr	nCcEtr	nAllEtr	nCEtr
53	$e^+e^- \rightarrow \pi^+ D^{*-} D^{*0} \gamma^I, D^{*-} \rightarrow \pi^- \bar{D}^0, D^{*0} \rightarrow \pi^0 D^0, \bar{D}^0 \rightarrow \pi^- K^+, D^0 \rightarrow \pi^+ K^-$ ( $e^+e^- \rightarrow \pi^0 \pi^+ \pi^+ \pi^- \pi^- K^+ K^- \gamma^I$ )	32852	13926	87	88	175	13029
54	$e^+e^- \rightarrow \pi^0 \pi^- D^{*+} \bar{D}^{*0} \gamma^I, D^{*+} \rightarrow \pi^+ D^0, \bar{D}^{*0} \rightarrow \bar{D}^0 \gamma, D^0 \rightarrow \pi^0 \pi^+ K^-, \bar{D}^0 \rightarrow \pi^- K^+$ ( $e^+e^- \rightarrow \pi^0 \pi^0 \pi^+ \pi^+ \pi^- \pi^- K^+ K^- \gamma^I \gamma^I$ )	33430	12542	89	86	175	13204
55	$e^+e^- \rightarrow \pi^0 \pi^0 D^{*+} D^{*-} \gamma^I, D^{*+} \rightarrow \pi^+ D^0, D^{*-} \rightarrow \pi^- \bar{D}^0, D^0 \rightarrow \pi^0 \pi^+ K^-, \bar{D}^0 \rightarrow \pi^- K^+$ ( $e^+e^- \rightarrow \pi^0 \pi^0 \pi^0 \pi^+ \pi^+ \pi^- \pi^- K^+ K^- \gamma^I$ )	37588	12691	84	90	174	13378
56	$e^+e^- \rightarrow \rho^0 \pi^+ \pi^+ \pi^- \rho^- K^+ K^-, \rho^0 \rightarrow \pi^+ \pi^-, \rho^- \rightarrow \pi^0 \pi^-$ ( $e^+e^- \rightarrow \pi^0 \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- K^+ K^-$ )	1659605	12460	95	78	173	13551
57	$e^+e^- \rightarrow \pi^0 \pi^0 \pi^+ \pi^+ \pi^- \rho^- K^+ K^- \gamma^I, \rho^- \rightarrow \pi^0 \pi^-$ ( $e^+e^- \rightarrow \pi^0 \pi^0 \pi^0 \pi^+ \pi^+ \pi^- \pi^- K^+ K^- \gamma^I$ )	1660881	12691	83	90	173	13724
58	$e^+e^- \rightarrow \pi^+ \omega D^{*-} D^{*0}, \omega \rightarrow \pi^0 \pi^+ \pi^-, D^{*-} \rightarrow \pi^- \bar{D}^0, D^{*0} \rightarrow \pi^0 D^0, \bar{D}^0 \rightarrow \pi^- K^+, D^0 \rightarrow \pi^0 \pi^+ K^-$ ( $e^+e^- \rightarrow \pi^0 \pi^0 \pi^0 \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- K^+ K^-$ )	30862	12467	79	93	172	13896
59	$e^+e^- \rightarrow \pi^0 \pi^+ \pi^+ \pi^- \rho^- \omega K^+ K^- \gamma^I, \rho^- \rightarrow \pi^0 \pi^-, \omega \rightarrow \pi^0 \pi^+ \pi^-$ ( $e^+e^- \rightarrow \pi^0 \pi^0 \pi^0 \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- K^+ K^- \gamma^I$ )	1663076	12703	83	89	172	14068
60	$e^+e^- \rightarrow \pi^0 \rho^0 \pi^+ \pi^- \pi^- \rho^+ \omega, \rho^0 \rightarrow \pi^+ \pi^-, \rho^+ \rightarrow \pi^0 \pi^+, \omega \rightarrow \pi^0 \pi^+ \pi^-$ ( $e^+e^- \rightarrow \pi^0 \pi^0 \pi^0 \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^-$ )	1658945	52915	101	70	171	14239
61	$e^+e^- \rightarrow \pi^0 \rho^0 \pi^+ \pi^- \omega K^+ K^-, \rho^0 \rightarrow \pi^+ \pi^-, \omega \rightarrow \pi^0 \pi^+ \pi^-$ ( $e^+e^- \rightarrow \pi^0 \pi^0 \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- K^+ K^-$ )	1661322	12473	171	—	171	14410
62	$e^+e^- \rightarrow \pi^0 \pi^+ \omega D^{*-} D^{*0}, \omega \rightarrow \pi^0 \pi^+ \pi^-, D^{*-} \rightarrow \pi^- \bar{D}^0, D^{*0} \rightarrow \pi^0 D^0, \bar{D}^0 \rightarrow \pi^- K^+, D^0 \rightarrow \pi^0 \pi^+ K^-$ ( $e^+e^- \rightarrow \pi^0 \pi^0 \pi^0 \pi^0 \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- K^+ K^-$ )	33562	12704	75	95	170	14580
63	$e^+e^- \rightarrow \pi^+ \pi^- \pi^- \rho^+ \omega K^+ K^- \gamma^I, \rho^+ \rightarrow \pi^0 \pi^+, \omega \rightarrow \pi^0 \pi^+ \pi^-$ ( $e^+e^- \rightarrow \pi^0 \pi^0 \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- K^+ K^- \gamma^I$ )	1658444	12574	93	76	169	14749
64	$e^+e^- \rightarrow \pi^0 \pi^- \rho^+ D^{*+} D^{*-} \gamma^I, \rho^+ \rightarrow \pi^0 \pi^+, D^{*+} \rightarrow \pi^+ D^0, D^{*-} \rightarrow \pi^- \bar{D}^0, D^0 \rightarrow \pi^+ K^-, \bar{D}^0 \rightarrow \pi^0 \pi^- K^+$ ( $e^+e^- \rightarrow \pi^0 \pi^0 \pi^0 \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- K^+ K^- \gamma^I$ )	42437	12703	92	76	168	14917
65	$e^+e^- \rightarrow \pi^0 \pi^+ D^{*-} D^{*0} \gamma^I \gamma^I, D^{*-} \rightarrow \pi^- \bar{D}^0, D^{*0} \rightarrow \pi^0 D^0, \bar{D}^0 \rightarrow \pi^0 \pi^- K^+, D^0 \rightarrow \pi^+ K^-$ ( $e^+e^- \rightarrow \pi^0 \pi^0 \pi^0 \pi^+ \pi^+ \pi^- \pi^- K^+ K^- \gamma^I \gamma^I$ )	32552	12439	83	83	166	15083
66	$e^+e^- \rightarrow \pi^- \rho^+ D^{*+} D^{*-}, \rho^+ \rightarrow \pi^0 \pi^+, D^{*+} \rightarrow \pi^+ D^0, D^{*-} \rightarrow \pi^- \bar{D}^0, D^0 \rightarrow \pi^0 \pi^+ K^-, \bar{D}^0 \rightarrow \pi^- K^+$ ( $e^+e^- \rightarrow \pi^0 \pi^0 \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- K^+ K^-$ )	31948	12473	78	87	165	15248
67	$e^+e^- \rightarrow \pi^0 \pi^+ \rho^- D^{*+} D^{*-} \gamma^I, \rho^- \rightarrow \pi^0 \pi^-, D^{*+} \rightarrow \pi^+ D^0, D^{*-} \rightarrow \pi^- \bar{D}^0, D^0 \rightarrow \pi^+ K^-, \bar{D}^0 \rightarrow \pi^0 \pi^- K^+$ ( $e^+e^- \rightarrow \pi^0 \pi^0 \pi^0 \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- K^+ K^- \gamma^I$ )	32576	12703	103	62	165	15413

rowNo	decay tree (decay initial-final states)	iDcyTr	iDcyIFSts	nEtr	nCcEtr	nAllEtr	nCEtr
68	$e^+e^- \rightarrow \pi^0 \rho^- D^{*+} \bar{D}^{*0} \gamma^I, \rho^- \rightarrow \pi^0 \pi^-, D^{*+} \rightarrow \pi^+ D^0, \bar{D}^{*0} \rightarrow \pi^0 \bar{D}^0, D^0 \rightarrow \pi^+ K^-,$ $\bar{D}^0 \rightarrow \pi^0 \pi^- K^+$ ( $e^+e^- \rightarrow \pi^0 \pi^0 \pi^0 \pi^+ \pi^+ \pi^- \pi^- K^+ K^- \gamma^I$ )	33720	12557	84	81	165	15578
69	$e^+e^- \rightarrow \pi^0 \pi^- D^{*+} \bar{D}^{*0}, D^{*+} \rightarrow \pi^+ D^0, \bar{D}^{*0} \rightarrow \bar{D}^0 \gamma, D^0 \rightarrow \pi^0 \pi^+ K^-, \bar{D}^0 \rightarrow \pi^- K^+$ ( $e^+e^- \rightarrow \pi^0 \pi^0 \pi^+ \pi^+ \pi^- \pi^- K^+ K^- \gamma$ )	63980	14568	94	71	165	15743
70	$e^+e^- \rightarrow \pi^0 \rho^- D^{*+} \bar{D}^{*0}, \rho^- \rightarrow \pi^0 \pi^-, D^{*+} \rightarrow \pi^+ D^0, \bar{D}^{*0} \rightarrow \pi^0 \bar{D}^0, D^0 \rightarrow \pi^+ K^-,$ $\bar{D}^0 \rightarrow \pi^0 \pi^- K^+$ ( $e^+e^- \rightarrow \pi^0 \pi^0 \pi^0 \pi^+ \pi^+ \pi^- \pi^- K^+ K^-$ )	53111	12577	85	79	164	15907
71	$e^+e^- \rightarrow \pi^0 \pi^+ \pi^- \rho^+ \rho^- K^+ K^-, \rho^+ \rightarrow \pi^0 \pi^+, \rho^- \rightarrow \pi^0 \pi^-$ ( $e^+e^- \rightarrow \pi^0 \pi^0 \pi^0 \pi^+ \pi^+ \pi^- \pi^- K^+ K^-$ )	1658875	12503	164	—	164	16071
72	$e^+e^- \rightarrow \pi^0 \pi^- \rho^+ \omega K^+ K^-, \rho^+ \rightarrow \pi^0 \pi^+, \omega \rightarrow \pi^0 \pi^+ \pi^-$ ( $e^+e^- \rightarrow \pi^0 \pi^0 \pi^0 \pi^+ \pi^+ \pi^- \pi^- K^+ K^-$ )	1661462	12503	86	78	164	16235
73	$e^+e^- \rightarrow \pi^0 \pi^0 \rho^0 \pi^+ \pi^- \pi^- \rho^+ \gamma^I, \rho^0 \rightarrow \pi^+ \pi^-, \rho^+ \rightarrow \pi^0 \pi^+$ ( $e^+e^- \rightarrow \pi^0 \pi^0 \pi^0 \pi^+ \pi^+ \pi^- \pi^- \pi^- \gamma^I$ )	1659084	44265	77	86	163	16398
74	$e^+e^- \rightarrow \pi^0 \pi^0 \pi^+ \pi^+ \pi^- \rho^- \omega \gamma^I, \rho^- \rightarrow \pi^0 \pi^-, \omega \rightarrow \pi^0 \pi^+ \pi^-$ ( $e^+e^- \rightarrow \pi^0 \pi^0 \pi^0 \pi^0 \pi^+ \pi^+ \pi^- \pi^- \pi^- \gamma^I$ )	1666906	41174	73	90	163	16561
75	$e^+e^- \rightarrow \pi^0 \rho^0 \pi^+ D^{*-} D^{*0}, \rho^0 \rightarrow \pi^+ \pi^-, D^{*-} \rightarrow \pi^- \bar{D}^0, D^{*0} \rightarrow \pi^0 D^0, \bar{D}^0 \rightarrow \pi^- K^+,$ $D^0 \rightarrow \pi^0 \pi^+ K^-$ ( $e^+e^- \rightarrow \pi^0 \pi^0 \pi^0 \pi^+ \pi^+ \pi^- \pi^- \pi^- K^+ K^-$ )	46664	12467	65	96	161	16722
76	$e^+e^- \rightarrow \pi^0 \pi^+ \rho^- D^{*+} D^{*-}, \rho^- \rightarrow \pi^0 \pi^-, D^{*+} \rightarrow \pi^+ D^0, D^{*-} \rightarrow \pi^- \bar{D}^0, D^0 \rightarrow \pi^+ K^-,$ $\bar{D}^0 \rightarrow \pi^0 \pi^- K^+$ ( $e^+e^- \rightarrow \pi^0 \pi^0 \pi^0 \pi^+ \pi^+ \pi^- \pi^- \pi^- K^+ K^-$ )	36317	12467	83	77	160	16882
77	$e^+e^- \rightarrow \pi^+ \pi^- \omega D^{*+} D^{*-}, \omega \rightarrow \pi^0 \pi^+ \pi^-, D^{*+} \rightarrow \pi^+ D^0, D^{*-} \rightarrow \pi^- \bar{D}^0, D^0 \rightarrow \pi^+ K^-,$ $\bar{D}^0 \rightarrow \pi^0 \pi^- K^+$ ( $e^+e^- \rightarrow \pi^0 \pi^0 \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- K^+ K^-$ )	36799	12513	84	76	160	17042
78	$e^+e^- \rightarrow \pi^0 \pi^+ \pi^- D^{*+} D^{*-} \gamma^I \gamma^I, D^{*+} \rightarrow \pi^+ D^0, D^{*-} \rightarrow \pi^- \bar{D}^0, D^0 \rightarrow \pi^0 \pi^+ K^-, \bar{D}^0 \rightarrow \pi^- K^+$ ( $e^+e^- \rightarrow \pi^0 \pi^0 \pi^+ \pi^+ \pi^- \pi^- \pi^- K^+ K^- \gamma^I \gamma^I$ )	43849	13322	70	90	160	17202
79	$e^+e^- \rightarrow \pi^0 \pi^+ \pi^+ \pi^- \pi^- \rho^- \gamma^I, \rho^- \rightarrow \pi^0 \pi^-$ ( $e^+e^- \rightarrow \pi^0 \pi^0 \pi^+ \pi^+ \pi^- \pi^- \pi^- \gamma^I$ )	1658870	56444	83	77	160	17362
80	$e^+e^- \rightarrow \pi^0 D^{*0} \bar{D}^{*0} \gamma^I, D^{*0} \rightarrow \pi^0 D^0, \bar{D}^{*0} \rightarrow \pi^0 \bar{D}^0, D^0 \rightarrow \pi^+ K^-, \bar{D}^0 \rightarrow \pi^0 \pi^- K^+$ ( $e^+e^- \rightarrow \pi^0 \pi^0 \pi^0 \pi^0 \pi^+ \pi^- K^+ K^- \gamma^I$ )	35345	15190	70	89	159	17521
81	$e^+e^- \rightarrow \pi^- D^{*+} \bar{D}^{*0}, D^{*+} \rightarrow \pi^+ D^0, \bar{D}^{*0} \rightarrow \pi^0 \bar{D}^0, D^0 \rightarrow \pi^0 \pi^+ K^-, \bar{D}^0 \rightarrow \pi^- K^+$ ( $e^+e^- \rightarrow \pi^0 \pi^0 \pi^+ \pi^+ \pi^- \pi^- K^+ K^-$ )	37259	12865	79	80	159	17680
82	$e^+e^- \rightarrow \pi^+ \pi^- \rho^- D^{*+} \bar{D}^{*0} \gamma^I, \rho^- \rightarrow \pi^0 \pi^-, D^{*+} \rightarrow \pi^+ D^0, \bar{D}^{*0} \rightarrow \pi^0 \bar{D}^0, D^0 \rightarrow \pi^+ K^-,$ $\bar{D}^0 \rightarrow \pi^0 \pi^- K^+$ ( $e^+e^- \rightarrow \pi^0 \pi^0 \pi^0 \pi^+ \pi^+ \pi^- \pi^- \pi^- K^+ K^- \gamma^I$ )	64123	12703	82	77	159	17839

rowNo	decay tree (decay initial-final states)	iDcyTr	iDcyIFSts	nEtr	nCcEtr	nAllEtr	nCEtr
83	$e^+e^- \rightarrow \pi^0\pi^-\rho^+K^+K^-\gamma^I, \rho^+ \rightarrow \pi^0\pi^+$ ( $e^+e^- \rightarrow \pi^0\pi^0\pi^+\pi^-K^+K^-\gamma^I$ )	1658676	18597	58	101	159	17998
84	$e^+e^- \rightarrow \pi^+D^{*-}D^{*0}\gamma^I\gamma^I, D^{*-} \rightarrow \pi^-\bar{D}^0, D^{*0} \rightarrow \pi^0D^0, \bar{D}^0 \rightarrow \pi^0\pi^-K^+, D^0 \rightarrow \pi^+K^-$ ( $e^+e^- \rightarrow \pi^0\pi^0\pi^+\pi^-\pi^-K^+K^-\gamma^I\gamma^I$ )	38938	13555	85	72	157	18155
85	$e^+e^- \rightarrow \rho^0\pi^-D^{*+}\bar{D}^{*0}, \rho^0 \rightarrow \pi^+\pi^-, D^{*+} \rightarrow \pi^+D^0, \bar{D}^{*0} \rightarrow \pi^0\bar{D}^0, D^0 \rightarrow \pi^+K^-,$ $\bar{D}^0 \rightarrow \pi^0\pi^-K^+$ ( $e^+e^- \rightarrow \pi^0\pi^0\pi^+\pi^+\pi^-\pi^-\pi^-K^+K^-$ )	48464	12473	88	69	157	18312
86	$e^+e^- \rightarrow \pi^0\rho^0\pi^+\pi^-K^+K^-\gamma^I, \rho^0 \rightarrow \pi^+\pi^-$ ( $e^+e^- \rightarrow \pi^0\pi^+\pi^+\pi^-\pi^-K^+K^-\gamma^I$ )	1658501	13926	157	—	157	18469
87	$e^+e^- \rightarrow \rho^0\pi^+\pi^-\pi^-\rho^+K^+K^-\gamma^I, \rho^0 \rightarrow \pi^+\pi^-, \rho^+ \rightarrow \pi^0\pi^+$ ( $e^+e^- \rightarrow \pi^0\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-K^+K^-\gamma^I$ )	1664985	13488	88	69	157	18626
88	$e^+e^- \rightarrow \pi^0\pi^-\rho^+D^{*+}D^{*-}, \rho^+ \rightarrow \pi^0\pi^+, D^{*+} \rightarrow \pi^+D^0, D^{*-} \rightarrow \pi^-\bar{D}^0, D^0 \rightarrow \pi^+K^-,$ $\bar{D}^0 \rightarrow \pi^0\pi^-K^+$ ( $e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^+\pi^+\pi^-\pi^-\pi^-K^+K^-$ )	32653	12467	92	64	156	18782
89	$e^+e^- \rightarrow \pi^0\pi^+D^{*-}D^{*0}\gamma^I\gamma^I, D^{*-} \rightarrow \pi^-\bar{D}^0, D^{*0} \rightarrow D^0\gamma, \bar{D}^0 \rightarrow \pi^-K^+, D^0 \rightarrow \pi^0\pi^+K^-$ ( $e^+e^- \rightarrow \pi^0\pi^0\pi^+\pi^+\pi^-\pi^-K^+K^-\gamma^I\gamma^I$ )	58097	12457	73	81	154	18936
90	$e^+e^- \rightarrow \pi^0\rho^0\pi^-D^{*+}\bar{D}^{*0}\gamma^I, \rho^0 \rightarrow \pi^+\pi^-, D^{*+} \rightarrow \pi^+D^0, \bar{D}^{*0} \rightarrow \pi^0\bar{D}^0, D^0 \rightarrow \pi^+K^-,$ $\bar{D}^0 \rightarrow \pi^0\pi^-K^+$ ( $e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^+\pi^+\pi^-\pi^-\pi^-K^+K^-\gamma^I$ )	77509	12703	78	76	154	19090
91	$e^+e^- \rightarrow \pi^0\pi^+\pi^-\omega K^+K^-\gamma^I, \omega \rightarrow \pi^0\pi^+\pi^-$ ( $e^+e^- \rightarrow \pi^0\pi^0\pi^+\pi^+\pi^-\pi^-K^+K^-\gamma^I$ )	1658934	12594	154	—	154	19244
92	$e^+e^- \rightarrow \pi^-D^{*+}\bar{D}^0, D^{*+} \rightarrow \pi^+D^0, \bar{D}^0 \rightarrow \pi^0\pi^-K^+, D^0 \rightarrow \pi^+K^-$ ( $e^+e^- \rightarrow \pi^0\pi^+\pi^+\pi^-\pi^-K^+K^-$ )	33510	13199	76	77	153	19397
93	$e^+e^- \rightarrow \pi^+\rho^-D^{*+}D^{*-}\gamma^I, \rho^- \rightarrow \pi^0\pi^-, D^{*+} \rightarrow \pi^+D^0, D^{*-} \rightarrow \pi^-\bar{D}^0, D^0 \rightarrow \pi^0\pi^+K^-,$ $\bar{D}^0 \rightarrow \pi^-K^+$ ( $e^+e^- \rightarrow \pi^0\pi^0\pi^+\pi^+\pi^-\pi^-\pi^-K^+K^-\gamma^I$ )	40279	12574	69	84	153	19550
94	$e^+e^- \rightarrow \pi^0\pi^+\pi^-\pi^-\rho^+\omega, \rho^+ \rightarrow \pi^0\pi^+, \omega \rightarrow \pi^0\pi^+\pi^-$ ( $e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^+\pi^+\pi^-\pi^-\pi^-$ )	1660264	49609	80	73	153	19703
95	$e^+e^- \rightarrow \pi^0\pi^+\omega D^{*-}D^{*0}\gamma^I, \omega \rightarrow \pi^0\pi^+\pi^-, D^{*-} \rightarrow \pi^-\bar{D}^0, D^{*0} \rightarrow \pi^0D^0, \bar{D}^0 \rightarrow \pi^-K^+,$ $D^0 \rightarrow \pi^0\pi^+K^-$ ( $e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^0\pi^+\pi^+\pi^-\pi^-\pi^-K^+K^-\gamma^I$ )	63132	12742	68	83	151	19854
96	$e^+e^- \rightarrow \pi^+\pi^-D^+D^{*-}\gamma^I, D^+ \rightarrow \pi^+\pi^+K^-, D^{*-} \rightarrow \pi^-\bar{D}^0, \bar{D}^0 \rightarrow \pi^-K^+$ ( $e^+e^- \rightarrow \pi^+\pi^+\pi^+\pi^-\pi^-\pi^-K^+K^-\gamma^I$ )	42730	13351	71	79	150	20004
97	$e^+e^- \rightarrow \pi^+\pi^-D^{*+}D^{*-}\gamma^I, D^{*+} \rightarrow \pi^+D^0, D^{*-} \rightarrow \pi^0D^-, D^0 \rightarrow \pi^+K^-, D^- \rightarrow \pi^-\pi^-K^+$ ( $e^+e^- \rightarrow \pi^0\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-K^+K^-\gamma^I$ )	44838	13488	76	74	150	20154
98	$e^+e^- \rightarrow \tau^+\tau^-\pi^0\pi^+\pi^+\pi^-\pi^-\gamma^I, \tau^+ \rightarrow \bar{\nu}_\tau, \tau^- \rightarrow \nu_\tau$ ( $e^+e^- \rightarrow \nu_\tau\bar{\nu}_\tau\pi^0\pi^+\pi^+\pi^-\pi^-\gamma^I$ )	1746908	122036	150	—	150	20304



rowNo	decay tree (decay initial-final states)	iDcyTr	iDcyIFSts	nEtr	nCcEtr	nAllEtr	nCEtr
99	$e^+e^- \rightarrow \pi^0\pi^0 D^{*+}D^{*-}, D^{*+} \rightarrow \pi^+D^0, D^{*-} \rightarrow \pi^-\bar{D}^0, D^0 \rightarrow \pi^0\pi^+K^-, \bar{D}^0 \rightarrow \pi^-K^+$ ( $e^+e^- \dashrightarrow \pi^0\pi^0\pi^0\pi^+\pi^+\pi^-\pi^-K^+K^-$ )	37336	12503	75	74	149	20453
100	$e^+e^- \rightarrow \pi^0\pi^+\pi^+\pi^-\pi^-\pi^-\rho^+\omega, \rho^+ \rightarrow \pi^0\pi^+, \omega \rightarrow \pi^0\pi^+\pi^-$ ( $e^+e^- \dashrightarrow \pi^0\pi^0\pi^0\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-$ )	1658744	52915	86	62	148	20601
rest	$e^+e^- \rightarrow$ others (1834479 in total) ( $e^+e^- \dashrightarrow$ corresponding to others)	—	—	—	—	2588085	2608686

Table 2: Decay initial-final states.

rowNo	decay initial-final states	iDcyIFSts	nEtr	nCcEtr	nAllEtr	nCEtr
1	$e^+e^- \rightarrow \pi^0\pi^0\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-K^+K^-$	12467	14495	—	14495	14495
2	$e^+e^- \rightarrow \pi^0\pi^0\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-K^+K^-\gamma^I$	12703	13694	—	13694	28189
3	$e^+e^- \rightarrow \pi^0\pi^0\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-K^+K^-$	12473	11495	—	11495	39684
4	$e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-K^+K^-$	12704	11417	—	11417	51101
5	$e^+e^- \rightarrow \pi^0\pi^0\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-K^+K^-\gamma^I$	12574	11402	—	11402	62503
6	$e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-K^+K^-\gamma^I$	12742	10702	—	10702	73205
7	$e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-K^+K^-$	12520	9053	—	9053	82258
8	$e^+e^- \rightarrow \pi^0\pi^0\pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-K^+K^-$	12513	8432	—	8432	90690
9	$e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-K^+K^-\gamma^I$	12708	7943	—	7943	98633
10	$e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^+\pi^+\pi^-\pi^-K^+K^-\gamma^I$	12691	7863	—	7863	106496
11	$e^+e^- \rightarrow \pi^0\pi^0\pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-K^+K^-\gamma^I$	12645	7681	—	7681	114177
12	$e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^+\pi^+\pi^-\pi^-K^+K^-$	12503	7357	—	7357	121534
13	$e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^+\pi^+\pi^-\pi^-K^+K^-\gamma^I$	12557	6927	—	6927	128461
14	$e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^+\pi^+\pi^-\pi^-K^+K^-$	12577	6777	—	6777	135238
15	$e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-K^-$	13170	3587	3116	6703	141941
16	$e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^0\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-K^+K^-$	12568	6642	—	6642	148583
17	$e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^0\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-K^+K^-$	12446	6485	—	6485	155068
18	$e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-K^+K^-\gamma^I\gamma^I$	12491	6437	—	6437	161505
19	$e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-K^+\gamma^I$	12921	2925	3363	6288	167793
20	$e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-K^+\gamma^I$	12666	2767	3332	6099	173892
21	$e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-K^+$	13224	2772	3317	6089	179981
22	$e^+e^- \rightarrow \pi^0\pi^0\pi^+\pi^+\pi^-\pi^-K^+K^-\gamma^I$	12594	5968	—	5968	185949
23	$e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^0\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-K^+K^-\gamma^I$	12499	5859	—	5859	191808
24	$e^+e^- \rightarrow \pi^0\pi^0\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-K^+K^-\gamma^I\gamma^I$	13322	5725	—	5725	197533
25	$e^+e^- \rightarrow \pi^0\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-K^+K^-\gamma^I$	13488	5511	—	5511	203044
26	$e^+e^- \rightarrow \pi^0\pi^0\pi^0K_L^0\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-K^+$	12692	2510	2948	5458	208502
27	$e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-K^-$	13066	3000	2416	5416	213918
28	$e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^0\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-K^+$	12690	2463	2931	5394	219312
29	$e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^0\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-K^+K^-\gamma^I$	12454	5312	—	5312	224624
30	$e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-K^+K^-\gamma$	12652	5295	—	5295	229919
31	$e^+e^- \rightarrow \pi^0\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-K^+K^-$	12460	5220	—	5220	235139
32	$e^+e^- \rightarrow \pi^0\pi^0\pi^0K_L^0\pi^+\pi^+\pi^+\pi^-\pi^-K^-\gamma^I$	13535	2710	2383	5093	240232

rowNo	decay initial-final states	iDcyIFSts	nEtr	nCcEtr	nAllEtr	nCEtr
33	$e^+e^- \rightarrow \pi^0\pi^0\pi^0 K_L^0\pi^+\pi^+\pi^-\pi^-\pi^- K^+$	12684	2328	2760	5088	245320
34	$e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^0\pi^+\pi^+\pi^+\pi^-\pi^-\pi^- K^-\gamma^I$	12489	2719	2362	5081	250401
35	$e^+e^- \rightarrow \pi^0\pi^0\pi^0 K_L^0\pi^+\pi^+\pi^+\pi^-\pi^-\pi^- K^-\gamma^I$	13179	2755	2248	5003	255404
36	$e^+e^- \rightarrow \pi^0\pi^0\pi^+\pi^+\pi^-\pi^- K^+K^-$	12865	4999	—	4999	260403
37	$e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^- K^+\gamma^I$	13347	2228	2682	4910	265313
38	$e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^+\pi^+\pi^+\pi^-\pi^-\pi^- K^+K^-\gamma^I\gamma$	12768	4833	—	4833	270146
39	$e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^- K^-$	12628	2659	2066	4725	274871
40	$e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^+\pi^+\pi^+\pi^-\pi^-\pi^- K^+K^-\gamma^I\gamma^I$	12735	4699	—	4699	279570
41	$e^+e^- \rightarrow \pi^0\pi^0\pi^+\pi^+\pi^-\pi^- K^+K^-\gamma$	12871	3155	1361	4516	284086
42	$e^+e^- \rightarrow \pi^0\pi^0\pi^+\pi^+\pi^-\pi^- K^+K^-\gamma^I\gamma$	12529	4497	—	4497	288583
43	$e^+e^- \rightarrow \pi^0\pi^0\pi^0 K_L^0\pi^+\pi^+\pi^-\pi^- K^-\gamma^I$	13767	2386	2101	4487	293070
44	$e^+e^- \rightarrow \pi^0\pi^+\pi^+\pi^+\pi^-\pi^-\pi^- K^+K^-$	12880	4480	—	4480	297550
45	$e^+e^- \rightarrow \pi^0\pi^0 K_L^0\pi^+\pi^+\pi^+\pi^-\pi^-\pi^- K^-$	12479	2472	1993	4465	302015
46	$e^+e^- \rightarrow \pi^0\pi^0\pi^0 K_L^0\pi^+\pi^+\pi^-\pi^-\pi^-\pi^- K^+$	13161	2056	2391	4447	306462
47	$e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^0\pi^+\pi^+\pi^-\pi^- K^+K^-$	12480	4445	—	4445	310907
48	$e^+e^- \rightarrow \pi^0\pi^+\pi^+\pi^+\pi^-\pi^-\pi^- K^+K^-\gamma^I$	12527	4344	—	4344	315251
49	$e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^+\pi^+\pi^-\pi^- K^+K^-\gamma^I\gamma^I$	12439	4298	—	4298	319549
50	$e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^+\pi^+\pi^+\pi^-\pi^-\pi^- K^+\gamma^I$	12672	1906	2346	4252	323801
51	$e^+e^- \rightarrow \pi^0\pi^0\pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^- K^-$	12608	2349	1883	4232	328033
52	$e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^0\pi^+\pi^-\pi^- K^+K^-\gamma^I$	14488	4223	—	4223	332256
53	$e^+e^- \rightarrow \pi^0\pi^0\pi^+\pi^+\pi^+\pi^-\pi^-\pi^- K^+\gamma^I$	12613	1877	2329	4206	336462
54	$e^+e^- \rightarrow \pi^0\pi^0 K_L^0\pi^+\pi^+\pi^+\pi^-\pi^-\pi^- K^-\gamma^I$	13517	2290	1891	4181	340643
55	$e^+e^- \rightarrow \pi^0\pi^0\pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^- K^-\gamma^I$	13289	2220	1779	3999	344642
56	$e^+e^- \rightarrow \pi^0\pi^0\pi^+\pi^+\pi^+\pi^-\pi^-\pi^- K^+$	12611	1842	2147	3989	348631
57	$e^+e^- \rightarrow \pi^0\pi^0 K_L^0\pi^+\pi^+\pi^-\pi^- K^-\gamma^I$	13104	2097	1861	3958	352589
58	$e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^0\pi^+\pi^+\pi^-\pi^- K^+K^-\gamma$	12890	3940	—	3940	356529
59	$e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^0\pi^0\pi^+\pi^+\pi^+\pi^-\pi^-\pi^- K^-$	13054	2019	1690	3709	360238
60	$e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^0\pi^+\pi^+\pi^-\pi^- K^-\gamma^I$	14142	1871	1761	3632	363870
61	$e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^0\pi^+\pi^+\pi^-\pi^- K^-\gamma^I$	12861	1875	1752	3627	367497
62	$e^+e^- \rightarrow \pi^0\pi^0 K_L^0\pi^+\pi^+\pi^-\pi^- K^-$	13550	1904	1641	3545	371042
63	$e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^0\pi^+\pi^+\pi^-\pi^- K^-$	13948	1808	1699	3507	374549
64	$e^+e^- \rightarrow \pi^0\pi^0\pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^- K^+K^-\gamma$	12575	1206	2250	3456	378005
65	$e^+e^- \rightarrow \pi^0\pi^0\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^- K^+K^-\gamma^I\gamma^I$	12796	3429	—	3429	381434
66	$e^+e^- \rightarrow \pi^0\pi^0\pi^+\pi^+\pi^-\pi^- K^+K^-\gamma^I\gamma^I$	13555	3406	—	3406	384840

rowNo	decay initial-final states	iDcyIFSts	nEtr	nCcEtr	nAllEtr	nCEtr
67	$e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^+\pi^-\pi^-\pi^-K^+K^-\gamma^I\gamma^I$	12860	3368	—	3368	388208
68	$e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^+\pi^+\pi^-\pi^-K^+K^-\gamma^I\gamma$	14257	3356	—	3356	391564
69	$e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-K^+K^-\gamma^I\gamma^I$	12482	3353	—	3353	394917
70	$e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^0\pi^+\pi^+\pi^-\pi^-\pi^-K^+K^-\gamma^I\gamma$	12572	3344	—	3344	398261
71	$e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^0\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-K^+\gamma^I$	12827	1469	1823	3292	401553
72	$e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^0\pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-K^-$	12603	1837	1425	3262	404815
73	$e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^0K_L^0\pi^+\pi^+\pi^-\pi^-K^-$	12453	1753	1500	3253	408068
74	$e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^0\pi^0\pi^+\pi^+\pi^-\pi^-\pi^-K^+K^-\gamma^I\gamma$	13852	1064	2182	3246	411314
75	$e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^+\pi^+\pi^-\pi^-K^+K^-\gamma$	12714	3226	—	3226	414540
76	$e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^0\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-K^+K^-$	12844	3181	—	3181	417721
77	$e^+e^- \rightarrow \pi^0\pi^0\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-K^+K^-\gamma$	12928	3172	—	3172	420893
78	$e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^0K_L^0\pi^+\pi^+\pi^-\pi^-K^-\gamma^I$	12555	1612	1468	3080	423973
79	$e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^0\pi^+\pi^+\pi^-\pi^-\pi^-K^+\gamma^I\gamma^I$	12893	1377	1638	3015	426988
80	$e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^0\pi^0\pi^+\pi^+\pi^-\pi^-\pi^-K^+K^-$	14059	2969	—	2969	429957
81	$e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-K^+\gamma^I\gamma^I$	13152	1363	1575	2938	432895
82	$e^+e^- \rightarrow \pi^0\pi^0\pi^0K_L^0\pi^+\pi^+\pi^-\pi^-K^-\gamma$	13344	1345	1589	2934	435829
83	$e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-K^+K^-\gamma$	13577	2875	—	2875	438704
84	$e^+e^- \rightarrow \pi^0\pi^+\pi^+\pi^-\pi^-\pi^-K^+K^-\gamma^I\gamma^I$	13290	2871	—	2871	441575
85	$e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^0\pi^0\pi^+\pi^+\pi^-\pi^-K^+$	12962	1331	1503	2834	444409
86	$e^+e^- \rightarrow \pi^0\pi^0\pi^+\pi^+\pi^-\pi^-\pi^-K^+K^-\gamma^I\gamma^I\gamma\gamma$	12903	1107	1717	2824	447233
87	$e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^+\pi^+\pi^-\pi^-K^+K^-\gamma$	13405	2027	788	2815	450048
88	$e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^0K_L^0\pi^+\pi^+\pi^-\pi^-\pi^-K^+$	12899	1306	1490	2796	452844
89	$e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^0\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-K^+\gamma^I$	12476	1250	1539	2789	455633
90	$e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^0\pi^0\pi^+\pi^+\pi^-\pi^-K^+\gamma^I$	12856	1327	1429	2756	458389
91	$e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^0\pi^+\pi^+\pi^-\pi^-K^+K^-\gamma^I\gamma$	14166	2742	—	2742	461131
92	$e^+e^- \rightarrow \pi^0\pi^0\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-K^+K^-\gamma^I\gamma$	12955	2295	415	2710	463841
93	$e^+e^- \rightarrow \pi^0\pi^0\pi^+\pi^+\pi^-\pi^-K^+K^-\gamma^I\gamma$	12542	2655	—	2655	466496
94	$e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^+\pi^+\pi^-\pi^-K^+\gamma^I$	13688	1271	1375	2646	469142
95	$e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^0\pi^+\pi^+\pi^-\pi^-\pi^-K^+K^-\gamma^I\gamma^I$	13094	2627	—	2627	471769
96	$e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^0\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-K^+K^-\gamma^I$	12937	2603	—	2603	474372
97	$e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-K^+K^-\gamma^I\gamma$	13621	2583	—	2583	476955
98	$e^+e^- \rightarrow \pi^0\pi^0\pi^0\pi^+\pi^+\pi^-\pi^-\pi^-K^+K^+K^-$	12548	1221	1353	2574	479529
99	$e^+e^- \rightarrow \pi^0\pi^0\pi^0K_L^0\pi^+\pi^+\pi^-\pi^-K^-$	12806	1844	658	2502	482031
100	$e^+e^- \rightarrow \pi^0\pi^+\pi^+\pi^-\pi^-K^+K^-\gamma^I$	13926	2497	—	2497	484528

rowNo	decay initial-final states	iDcyIFSts	nEtr	nCcEtr	nAllEtr	nCEtr
rest	$e^+e^- \rightarrow$ others (125697 in total)	—	—	—	2124158	2608686

Table 3: Decay branches of  $D_s^+$ .

rowNo	decay branch of $D_s^+$	iDcyBrP	nCase	nCcCase	nAllCase	nCCase
1	$D_s^+ \rightarrow \rho^+ \eta$	11	13492	14726	28218	28218
2	$D_s^+ \rightarrow \rho^+ \phi$	6	10199	11674	21873	50091
3	$D_s^+ \rightarrow \rho^+ \eta'$	4	8761	9902	18663	68754
4	$D_s^+ \rightarrow \bar{K}^* K^{*+}$	21	8422	9483	17905	86659
5	$D_s^+ \rightarrow \pi^+ K^+ K^-$	9	7011	7916	14927	101586
6	$D_s^+ \rightarrow \tau^+ \nu_\tau$	8	6481	7349	13830	115416
7	$D_s^+ \rightarrow \bar{K}^0 K^{*+}$	5	6402	7313	13715	129131
8	$D_s^+ \rightarrow \pi^0 \pi^+ \pi^+ \pi^+ \pi^- \pi^-$	23	6127	7441	13568	142699
9	$D_s^+ \rightarrow \pi^+ \eta'$	14	6213	7058	13271	155970
10	$D_s^+ \rightarrow \pi^0 \pi^+ \omega$	16	3907	4507	8414	164384
11	$D_s^+ \rightarrow \pi^+ \eta \omega$	2	3045	3416	6461	170845
12	$D_s^+ \rightarrow \mu^+ \nu_\mu \eta$	26	3055	3355	6410	177255
13	$D_s^+ \rightarrow e^+ \nu_e \eta$	17	2938	3387	6325	183580
14	$D_s^+ \rightarrow \pi^+ \eta$	22	2817	3196	6013	189593
15	$D_s^+ \rightarrow \pi^+ \phi$	44	2800	3203	6003	195596
16	$D_s^+ \rightarrow e^+ \nu_e \phi$	36	2810	3102	5912	201508
17	$D_s^+ \rightarrow K_S^0 K^+$	3	2549	2776	5325	206833
18	$D_s^+ \rightarrow K_L^0 K^+$	7	2303	2519	4822	211655
19	$D_s^+ \rightarrow \pi^+ \pi^+ \pi^- \omega$	1	2120	2603	4723	216378
20	$D_s^+ \rightarrow \mu^+ \nu_\mu \phi$	18	2150	2370	4520	220898
21	$D_s^+ \rightarrow K^* K^+$	19	1831	2086	3917	224815
22	$D_s^+ \rightarrow \pi^0 \pi^+ \pi^+ \pi^- \eta$	27	1566	1761	3327	228142
23	$D_s^+ \rightarrow \pi^+ \pi^+ \pi^+ \pi^- \pi^- \eta$	20	1467	1854	3321	231463
24	$D_s^+ \rightarrow \pi^+ \pi^+ \pi^-$	30	1499	1692	3191	234654
25	$D_s^+ \rightarrow \pi^+ \pi^+ \pi^- \phi$	53	1452	1721	3173	237827
26	$D_s^+ \rightarrow \mu^+ \nu_\mu \eta'$	28	1428	1699	3127	240954
27	$D_s^+ \rightarrow \pi^+ \pi^+ \pi^- \eta$	13	1359	1574	2933	243887
28	$D_s^+ \rightarrow \pi^0 \pi^0 \pi^+ \omega$	39	1200	1365	2565	246452
29	$D_s^+ \rightarrow \pi^+ \pi^- K_S^0 K^+$	42	1190	1355	2545	248997
30	$D_s^+ \rightarrow e^+ \nu_e \eta'$	38	1140	1192	2332	251329
31	$D_s^+ \rightarrow K_L^0 \pi^+ \pi^- K^+$	12	1104	1226	2330	253659
32	$D_s^+ \rightarrow \pi^+ \pi^- K^+$	15	986	1121	2107	255766
33	$D_s^+ \rightarrow \pi^+ \pi^+ \pi^+ \pi^- \pi^-$	35	952	1107	2059	257825

rowNo	decay branch of $D_s^+$	iDcyBrP	nCase	nCcCase	nAllCase	nCCase
34	$D_s^+ \rightarrow \pi^0 \pi^+ \phi$	10	894	1096	1990	259815
35	$D_s^+ \rightarrow \pi^0 \pi^0 \pi^+$	45	914	985	1899	261714
36	$D_s^+ \rightarrow \pi^0 \pi^0 \pi^0 \pi^+ \eta$	47	843	927	1770	263484
37	$D_s^+ \rightarrow \pi^0 \pi^0 \pi^+ \pi^+ \pi^- \eta$	0	790	945	1735	265219
38	$D_s^+ \rightarrow \pi^0 \pi^0 \pi^+ \eta$	61	695	846	1541	266760
39	$D_s^+ \rightarrow \pi^0 \pi^+ K_S^0$	37	657	721	1378	268138
40	$D_s^+ \rightarrow \pi^0 K_L^0 \pi^+$	58	603	691	1294	269432
41	$D_s^+ \rightarrow \mu^+ \nu_\mu$	32	569	657	1226	270658
42	$D_s^+ \rightarrow \pi^0 \pi^0 \pi^+ \phi$	59	525	592	1117	271775
43	$D_s^+ \rightarrow \pi^0 \pi^+ K^*$	48	470	573	1043	272818
44	$D_s^+ \rightarrow \rho^+ K^*$	33	484	557	1041	273859
45	$D_s^+ \rightarrow e^+ \nu_e K^0$	34	435	516	951	274810
46	$D_s^+ \rightarrow \pi^0 \pi^0 \pi^0 \pi^+ \eta$	72	442	498	940	275750
47	$D_s^+ \rightarrow \pi^+ \omega$	49	382	435	817	276567
48	$D_s^+ \rightarrow \pi^0 \bar{K}^* K^{*+}$	64	365	399	764	277331
49	$D_s^+ \rightarrow \pi^+ \pi^+ \pi^- K_S^0$	51	351	391	742	278073
50	$D_s^+ \rightarrow K_L^0 \pi^+ \pi^+ \pi^-$	40	335	392	727	278800
51	$D_s^+ \rightarrow \pi^0 \bar{K}^0 K^+$	25	331	315	646	279446
52	$D_s^+ \rightarrow \eta K^+$	29	301	317	618	280064
53	$D_s^+ \rightarrow K^+ \eta'$	60	278	328	606	280670
54	$D_s^+ \rightarrow e^+ \nu_e K^*$	46	210	276	486	281156
55	$D_s^+ \rightarrow \mu^+ \nu_\mu K^0$	65	200	246	446	281602
56	$D_s^+ \rightarrow e^+ \nu_e \omega$	31	188	227	415	282017
57	$D_s^+ \rightarrow \pi^+ K_S^0$	52	204	207	411	282428
58	$D_s^+ \rightarrow \mu^+ \nu_\mu \omega$	41	193	209	402	282830
59	$D_s^+ \rightarrow K_L^0 \pi^+$	50	178	155	333	283163
60	$D_s^+ \rightarrow \pi^0 K^+$	43	149	128	277	283440
61	$D_s^+ \rightarrow \bar{n} p$	56	128	133	261	283701
62	$D_s^+ \rightarrow K_S^0 a_1^+$	57	132	121	253	283954
63	$D_s^+ \rightarrow K_L^0 a_1^+$	74	101	137	238	284192
64	$D_s^+ \rightarrow \pi^+ \pi^+ \pi^- K_S^0 K_S^0$	66	111	122	233	284425
65	$D_s^+ \rightarrow \pi^0 \pi^0 \bar{K}^0 K^+$	24	106	121	227	284652
66	$D_s^+ \rightarrow \pi^0 \bar{K}^0 K^{*+}$	73	97	128	225	284877
67	$D_s^+ \rightarrow \pi^+ K^*$	67	100	125	225	285102
68	$D_s^+ \rightarrow \mu^+ \nu_\mu K^*$	55	98	126	224	285326

rowNo	decay branch of $D_s^+$	iDcyBrP	nCase	nCcCase	nAllCase	nCCase
69	$D_s^+ \rightarrow \pi^0 \bar{K}^* K^+$	78	120	102	222	285548
70	$D_s^+ \rightarrow K_L^0 K_L^0 \pi^+ \pi^+ \pi^-$	63	94	112	206	285754
71	$D_s^+ \rightarrow \pi^+ f_2(1270)$	75	86	87	173	285927
72	$D_s^+ \rightarrow \pi^0 \pi^+$	69	47	44	91	286018
73	$D_s^+ \rightarrow K^+ K^+ K^-$	62	30	23	53	286071
74	$D_s^+ \rightarrow K^+ \phi$	68	27	26	53	286124
75	$D_s^+ \rightarrow \pi^0 K^+ \eta'$	54	31	20	51	286175
76	$D_s^+ \rightarrow \pi^+ \pi^- K^+ \eta'$	70	14	32	46	286221
77	$D_s^+ \rightarrow \pi^+ \pi^- \eta K^+$	71	21	22	43	286264
78	$D_s^+ \rightarrow \pi^0 \eta K^+$	76	15	26	41	286305
79	$D_s^+ \rightarrow \pi^- K^+ K^+$	77	16	22	38	286343
80	$D_s^+ \rightarrow \pi^0 \rho^+$	79	17	10	27	286370



Table 4: Decay branches of  $D^{*+}$ .

rowNo	decay branch of $D^{*+}$	iDcyBrP	nCase	nCcCase	nAllCase	nCCase
1	$D^{*+} \rightarrow \pi^+ D^0$	0	669433	613499	1282932	1282932
2	$D^{*+} \rightarrow \pi^0 D^+$	1	101478	113260	214738	1497670
3	$D^{*+} \rightarrow D^+ \gamma$	2	4846	5607	10453	1508123
4	$D^{*+} \rightarrow D^+ \gamma \gamma$	3	1	0	1	1508124

Table 5: Decay branches of  $D^{*0}$ .

rowNo	decay branch of $D^{*0}$	iDcyBrP	nCase	nCcCase	nAllCase	nCCase
1	$D^{*0} \rightarrow \pi^0 D^0$	0	539150	538801	1077951	1077951
2	$D^{*0} \rightarrow D^0 \gamma$	1	273961	274351	548312	1626263

Table 6: Decay branches of  $D^0$ .

rowNo	decay branch of $D^0$	iDcyBrP	nCase	nCcCase	nAllCase	nCCase
1	$D^0 \rightarrow \pi^+ K^-$	3	1119014	978951	2097965	2097965
2	$D^0 \rightarrow \pi^0 \pi^+ K^-$	1	113046	121373	234419	2332384
3	$D^0 \rightarrow K^- a_1^+$	0	52208	59831	112039	2444423
4	$D^0 \rightarrow \rho^+ K^{*-}$	11	46749	53165	99914	2544337
5	$D^0 \rightarrow e^+ \nu_e K^-$	7	41740	42507	84247	2628584
6	$D^0 \rightarrow \mu^+ \nu_\mu K^-$	14	24179	26070	50249	2678833
7	$D^0 \rightarrow \pi^0 \pi^0 \pi^+ K^-$	19	18615	20295	38910	2717743
8	$D^0 \rightarrow \pi^+ \pi^- K_S^0$	15	17666	21055	38721	2756464
9	$D^0 \rightarrow K_L^0 \pi^+ \pi^-$	31	17047	19594	36641	2793105
10	$D^0 \rightarrow \pi^+ \pi^- \bar{K}^*$	2	15681	18124	33805	2826910
11	$D^0 \rightarrow e^+ \nu_e K^{*-}$	4	15485	17223	32708	2859618
12	$D^0 \rightarrow \pi^0 \pi^+ \pi^- \bar{K}^*$	9	13562	15634	29196	2888814
13	$D^0 \rightarrow \pi^+ \omega K^-$	12	13030	15272	28302	2917116
14	$D^0 \rightarrow \mu^+ \nu_\mu K^{*-}$	20	11795	13667	25462	2942578
15	$D^0 \rightarrow \pi^0 \pi^+ \pi^-$	39	11222	12497	23719	2966297
16	$D^0 \rightarrow \pi^+ K_1^-$	8	10632	12276	22908	2989205
17	$D^0 \rightarrow \rho^0 \bar{K}^*$	13	9990	11629	21619	3010824
18	$D^0 \rightarrow \omega \bar{K}^*$	60	7895	8905	16800	3027624
19	$D^0 \rightarrow \pi^0 K_S^0$	45	7792	8912	16704	3044328
20	$D^0 \rightarrow \omega K_S^0$	61	7598	8920	16518	3060846
21	$D^0 \rightarrow \pi^0 \pi^0 \bar{K}^*$	5	7822	8573	16395	3077241
22	$D^0 \rightarrow \pi^0 \eta K_S^0$	10	7644	8569	16213	3093454
23	$D^0 \rightarrow K_L^0 \omega$	51	7166	8405	15571	3109025
24	$D^0 \rightarrow \pi^0 \pi^0 \pi^0 \pi^+ \pi^- K_S^0$	64	7233	8223	15456	3124481
25	$D^0 \rightarrow \pi^0 K_L^0 \eta$	65	7207	8036	15243	3139724
26	$D^0 \rightarrow K_S^0 \eta'$	50	6966	8197	15163	3154887
27	$D^0 \rightarrow \pi^0 \pi^0 \pi^+ \pi^-$	27	6902	7720	14622	3169509
28	$D^0 \rightarrow \pi^+ \eta K^-$	28	7045	7549	14594	3184103
29	$D^0 \rightarrow \pi^0 \pi^0 \pi^0 K_L^0 \pi^+ \pi^-$	26	6810	7675	14485	3198588
30	$D^0 \rightarrow K_L^0 \eta'$	41	6608	7711	14319	3212907
31	$D^0 \rightarrow \pi^0 \pi^0 \pi^+ \pi^- K_S^0$	59	6385	7348	13733	3226640
32	$D^0 \rightarrow \pi^0 \pi^0 \pi^0 K_S^0$	44	6555	7113	13668	3240308
33	$D^0 \rightarrow \pi^0 \pi^+ K^{*-}$	52	6284	7226	13510	3253818

rowNo	decay branch of $D^0$	iDcyBrP	nCase	nCcCase	nAllCase	nCCCase
34	$D^0 \rightarrow \pi^0 \pi^0 K_L^0 \pi^+ \pi^-$	30	6290	7069	13359	3267177
35	$D^0 \rightarrow \pi^0 \pi^0 \pi^0 K_L^0$	55	5947	6709	12656	3279833
36	$D^0 \rightarrow \pi^+ \pi^+ \pi^- K^-$	29	5751	6550	12301	3292134
37	$D^0 \rightarrow \pi^0 K_L^0$	18	5626	6631	12257	3304391
38	$D^0 \rightarrow \pi^0 \pi^0 K_S^0$	79	5623	6421	12044	3316435
39	$D^0 \rightarrow \pi^+ K^- \eta'$	43	5585	6255	11840	3328275
40	$D^0 \rightarrow \pi^0 \pi^0 K_L^0$	53	5319	5895	11214	3339489
41	$D^0 \rightarrow \pi^0 \bar{K}_1^0$	37	4558	5162	9720	3349209
42	$D^0 \rightarrow \pi^0 \rho^+ K^-$	33	4589	5038	9627	3358836
43	$D^0 \rightarrow \pi^0 \pi^0 \pi^0 \pi^+ \pi^-$	36	4431	4837	9268	3368104
44	$D^0 \rightarrow \pi^0 \bar{K}^*$	17	4356	4912	9268	3377372
45	$D^0 \rightarrow \pi^0 \pi^+ \pi^- K_S^0$	71	4144	4865	9009	3386381
46	$D^0 \rightarrow K^+ K^-$	73	4196	4496	8692	3395073
47	$D^0 \rightarrow \pi^0 K_L^0 \pi^+ \pi^-$	67	3959	4421	8380	3403453
48	$D^0 \rightarrow \pi^+ \pi^+ \pi^- \pi^-$	34	3699	4364	8063	3411516
49	$D^0 \rightarrow \eta K_S^0$	23	3600	3989	7589	3419105
50	$D^0 \rightarrow \rho^0 \pi^+ K^-$	48	3269	3947	7216	3426321
51	$D^0 \rightarrow \pi^- K^+$	106	3313	3819	7132	3433453
52	$D^0 \rightarrow K_L^0 \eta$	58	3262	3659	6921	3440374
53	$D^0 \rightarrow K^- K^{*+}$	22	3068	3522	6590	3446964
54	$D^0 \rightarrow \pi^0 \pi^0 \pi^0 \pi^+ K^-$	69	2738	3096	5834	3452798
55	$D^0 \rightarrow K_S^0 K^+ K^-$	38	2643	2991	5634	3458432
56	$D^0 \rightarrow K_L^0 K^+ K^-$	42	2491	2898	5389	3463821
57	$D^0 \rightarrow \pi^0 \pi^+ \pi^- K^+ K^-$	68	2142	2487	4629	3468450
58	$D^0 \rightarrow \pi^+ \pi^+ \pi^- \pi^- K_S^0$	91	1920	2366	4286	3472736
59	$D^0 \rightarrow \pi^0 \pi^0 K^+ K^-$	49	2032	2158	4190	3476926
60	$D^0 \rightarrow e^+ \nu_e \pi^-$	62	1890	2225	4115	3481041
61	$D^0 \rightarrow \mu^+ \nu_\mu \pi^- \bar{K}^0$	74	1825	2193	4018	3485059
62	$D^0 \rightarrow K_L^0 \pi^+ \pi^+ \pi^- \pi^-$	94	1710	2121	3831	3488890
63	$D^0 \rightarrow \mu^+ \nu_\mu \pi^-$	46	1672	1898	3570	3492460
64	$D^0 \rightarrow \eta \eta$	24	1595	1739	3334	3495794
65	$D^0 \rightarrow K_S^0 \phi$	6	1295	1478	2773	3498567
66	$D^0 \rightarrow e^+ \nu_e \rho^-$	85	1274	1389	2663	3501230
67	$D^0 \rightarrow K_L^0 \phi$	47	1217	1440	2657	3503887
68	$D^0 \rightarrow \eta \bar{K}^*$	84	1190	1362	2552	3506439

rowNo	decay branch of $D^0$	iDcyBrP	nCase	nCcCase	nAllCase	nCCCase
69	$D^0 \rightarrow \rho^0 \rho^0$	66	1121	1421	2542	3508981
70	$D^0 \rightarrow \mu^+ \nu_\mu \rho^-$	90	1164	1350	2514	3511495
71	$D^0 \rightarrow K^+ K^{*-}$	103	1171	1305	2476	3513971
72	$D^0 \rightarrow \pi^+ \pi^- \omega$	80	1148	1310	2458	3516429
73	$D^0 \rightarrow \pi^+ \pi^-$	16	1139	1265	2404	3518833
74	$D^0 \rightarrow \pi^+ \pi^- K^+ K^-$	75	1093	1296	2389	3521222
75	$D^0 \rightarrow \pi^+ K_S^0 K^-$	35	1126	1252	2378	3523600
76	$D^0 \rightarrow \pi^0 \pi^+ \pi^+ \pi^- \pi^-$	87	1033	1240	2273	3525873
77	$D^0 \rightarrow e^+ \nu_e \pi^- \bar{K}^0$	82	1035	1219	2254	3528127
78	$D^0 \rightarrow \pi^- K_S^0 K^+$	92	1027	1174	2201	3530328
79	$D^0 \rightarrow K_L^0 \pi^+ K^-$	76	1042	1133	2175	3532503
80	$D^0 \rightarrow \mu^+ \nu_\mu \pi^0 K^-$	105	1035	1123	2158	3534661
81	$D^0 \rightarrow K_L^0 \pi^- K^+$	102	902	1103	2005	3536666
82	$D^0 \rightarrow \pi^+ \pi^- K_S^0 K_S^0$	21	838	1031	1869	3538535
83	$D^0 \rightarrow \eta \eta'$	72	831	1005	1836	3540371
84	$D^0 \rightarrow \pi^0 \phi$	56	865	970	1835	3542206
85	$D^0 \rightarrow K^* \bar{K}^*$	63	773	954	1727	3543933
86	$D^0 \rightarrow \pi^+ \pi^- \eta$	110	795	878	1673	3545606
87	$D^0 \rightarrow K_L^0 K_L^0 \pi^+ \pi^-$	112	768	854	1622	3547228
88	$D^0 \rightarrow \pi^0 \eta'$	54	724	784	1508	3548736
89	$D^0 \rightarrow e^+ \nu_e \pi^0 K^-$	32	712	780	1492	3550228
90	$D^0 \rightarrow \bar{K}^* \eta'$	93	658	819	1477	3551705
91	$D^0 \rightarrow \pi^+ \pi^- \phi$	77	629	775	1404	3553109
92	$D^0 \rightarrow \pi^0 \eta \eta$	25	597	690	1287	3554396
93	$D^0 \rightarrow e^+ \nu_e K_1^-$	40	580	655	1235	3555631
94	$D^0 \rightarrow \pi^0 K^+ K^-$	57	520	596	1116	3556747
95	$D^0 \rightarrow \pi^0 \pi^0$	98	483	605	1088	3557835
96	$D^0 \rightarrow \mu^+ \nu_\mu K_1^-$	100	476	603	1079	3558914
97	$D^0 \rightarrow K_S^0 K_S^0 K_S^0$	81	460	583	1043	3559957
98	$D^0 \rightarrow \pi^0 \eta$	97	460	498	958	3560915
99	$D^0 \rightarrow \pi^0 \pi^0 K_S^0 K_S^0$	83	423	520	943	3561858
100	$D^0 \rightarrow \pi^0 \pi^0 K_L^0 K_L^0$	88	420	448	868	3562726
rest	$D^0 \rightarrow \text{others (26 in total)}$	—	3875	4449	8324	3571050

Table 7: Decay branches of  $\pi^0$ .

rowNo	decay branch of $\pi^0$	iDcyBrP	nCase	nCcCase	nAllCase	nCCase
1	$\pi^0 \rightarrow e^+ e^-$	0	342330	—	342330	342330
2	$\pi^0 \rightarrow e^+ e^+ e^- e^-$	1	1574	—	1574	343904

Table 8: Cascade decay branches of  $D_s^+$ .

rowNo	cascade decay branch of $D_s^+$	iCascDcyBrP	nCase	nCcCase	nAllCase	nCCase
1	$D_s^+ \rightarrow \pi^+ K^+ K^-$	9	7011	7916	14927	14927
2	$D_s^+ \rightarrow \pi^0 \pi^+ \pi^+ \pi^- \pi^-$	32	5883	7194	13077	28004
3	$D_s^+ \rightarrow \rho^+ \phi, \rho^+ \rightarrow \pi^0 \pi^+, \phi \rightarrow K^+ K^-$	6	4661	5222	9883	37887
4	$D_s^+ \rightarrow \rho^+ \eta, \rho^+ \rightarrow \pi^0 \pi^+, \eta \rightarrow \gamma \gamma$	33	4456	4962	9418	47305
5	$D_s^+ \rightarrow \rho^+ \eta, \rho^+ \rightarrow \pi^0 \pi^+, \eta \rightarrow \pi^0 \pi^0 \pi^0$	62	4174	4580	8754	56059
6	$D_s^+ \rightarrow \pi^0 \pi^+ \omega, \omega \rightarrow \pi^0 \pi^+ \pi^-$	19	3270	3794	7064	63123
7	$D_s^+ \rightarrow \rho^+ \eta, \rho^+ \rightarrow \pi^0 \pi^+, \eta \rightarrow \pi^0 \pi^+ \pi^-$	78	2948	3199	6147	69270
8	$D_s^+ \rightarrow \rho^+ \eta', \rho^+ \rightarrow \pi^0 \pi^+, \eta' \rightarrow \rho^0 \gamma, \rho^0 \rightarrow \pi^+ \pi^-$	71	2147	2465	4612	73882
9	$D_s^+ \rightarrow K_L^0 K^+$	7	2164	2360	4524	78406
10	$D_s^+ \rightarrow \rho^+ \phi, \rho^+ \rightarrow \pi^0 \pi^+, \phi \rightarrow K_L^0 K_S^0, K_S^0 \rightarrow \pi^+ \pi^-$	14	2037	2336	4373	82779
11	$D_s^+ \rightarrow \pi^+ \pi^+ \pi^- \omega, \omega \rightarrow \pi^0 \pi^+ \pi^-$	1	1812	2248	4060	86839
12	$D_s^+ \rightarrow \bar{K}^* K^{*+}, \bar{K}^* \rightarrow \pi^+ K^-, K^{*+} \rightarrow \pi^0 K^+$	86	1853	2070	3923	90762
13	$D_s^+ \rightarrow K_S^0 K^+, K_S^0 \rightarrow \pi^+ \pi^-$	3	1768	1941	3709	94471
14	$D_s^+ \rightarrow \tau^+ \nu_\tau, \tau^+ \rightarrow \bar{\nu}_\tau \pi^0 \pi^+$	90	1660	1873	3533	98004
15	$D_s^+ \rightarrow \pi^+ \eta', \eta' \rightarrow \rho^0 \gamma, \rho^0 \rightarrow \pi^+ \pi^-$	48	1617	1856	3473	101477
16	$D_s^+ \rightarrow \bar{K}^* K^{*+}, \bar{K}^* \rightarrow \pi^+ K^-, K^{*+} \rightarrow \pi^+ K^0, K^0 \rightarrow K_L^0$	75	1499	1739	3238	104715
17	$D_s^+ \rightarrow \pi^+ \pi^+ \pi^-$	53	1499	1692	3191	107906
18	$D_s^+ \rightarrow \rho^+ \eta', \rho^+ \rightarrow \pi^0 \pi^+, \eta' \rightarrow \pi^+ \pi^- \eta, \eta \rightarrow \gamma \gamma$	47	1316	1588	2904	110810
19	$D_s^+ \rightarrow e^+ \nu_e \phi, \phi \rightarrow K^+ K^-$	70	1355	1465	2820	113630
20	$D_s^+ \rightarrow \rho^+ \eta', \rho^+ \rightarrow \pi^0 \pi^+, \eta' \rightarrow \pi^+ \pi^- \eta, \eta \rightarrow \pi^0 \pi^0 \pi^0$	118	1254	1366	2620	116250
21	$D_s^+ \rightarrow \bar{K}^* K^{*+}, \bar{K}^* \rightarrow \pi^+ K^-, K^{*+} \rightarrow \pi^+ K^0, K^0 \rightarrow K_S^0, K_S^0 \rightarrow \pi^+ \pi^-$	138	1194	1379	2573	118823
22	$D_s^+ \rightarrow \pi^+ \phi, \phi \rightarrow K_L^0 K_S^0, K_S^0 \rightarrow \pi^+ \pi^-$	95	1105	1288	2393	121216
23	$D_s^+ \rightarrow \bar{K}^0 K^{*+}, \bar{K}^0 \rightarrow K_L^0, K^{*+} \rightarrow \pi^0 K^+$	30	1091	1177	2268	123484
24	$D_s^+ \rightarrow \mu^+ \nu_\mu \eta, \eta \rightarrow \pi^0 \pi^0 \pi^0$	100	1096	1114	2210	125694
25	$D_s^+ \rightarrow e^+ \nu_e \eta, \eta \rightarrow \gamma \gamma$	128	1006	1175	2181	127875
26	$D_s^+ \rightarrow K_L^0 \pi^+ \pi^- K^+$	12	1025	1130	2155	130030
27	$D_s^+ \rightarrow \tau^+ \nu_\tau, \tau^+ \rightarrow e^+ \nu_e \bar{\nu}_\tau$	35	990	1139	2129	132159
28	$D_s^+ \rightarrow \mu^+ \nu_\mu \phi, \phi \rightarrow K^+ K^-$	23	985	1125	2110	134269
29	$D_s^+ \rightarrow \mu^+ \nu_\mu \eta, \eta \rightarrow \gamma \gamma$	40	991	1116	2107	136376
30	$D_s^+ \rightarrow \pi^+ \pi^- K^+$	18	986	1121	2107	138483
31	$D_s^+ \rightarrow \tau^+ \nu_\tau, \tau^+ \rightarrow \mu^+ \nu_\mu \bar{\nu}_\tau$	145	996	1110	2106	140589
32	$D_s^+ \rightarrow \pi^0 \pi^0 \pi^+ \omega, \omega \rightarrow \pi^0 \pi^+ \pi^-$	84	984	1121	2105	142694

rowNo	cascade decay branch of $D_s^+$	iCaseDcyBrP	nCase	nCcCase	nAllCase	nCCase
33	$D_s^+ \rightarrow \pi^+ \eta', \eta' \rightarrow \pi^+ \pi^- \eta, \eta \rightarrow \gamma \gamma$	17	953	1121	2074	144768
34	$D_s^+ \rightarrow \pi^+ \pi^+ \pi^+ \pi^- \pi^-$	67	952	1107	2059	146827
35	$D_s^+ \rightarrow \pi^+ \eta, \eta \rightarrow \gamma \gamma$	29	972	1059	2031	148858
36	$D_s^+ \rightarrow \rho^+ \phi, \rho^+ \rightarrow \pi^0 \pi^+, \phi \rightarrow K_L^0 K_S^0, K_S^0 \rightarrow \pi^0 \pi^0$	108	899	1132	2031	150889
37	$D_s^+ \rightarrow \pi^+ \eta \omega, \eta \rightarrow \gamma \gamma, \omega \rightarrow \pi^0 \pi^+ \pi^-$	36	960	1043	2003	152892
38	$D_s^+ \rightarrow e^+ \nu_e \eta, \eta \rightarrow \pi^0 \pi^0 \pi^0$	122	933	1069	2002	154894
39	$D_s^+ \rightarrow \pi^+ \eta', \eta' \rightarrow \pi^+ \pi^- \eta, \eta \rightarrow \pi^0 \pi^0 \pi^0$	26	879	1031	1910	156804
40	$D_s^+ \rightarrow \pi^+ \eta, \eta \rightarrow \pi^0 \pi^0 \pi^0$	59	881	1007	1888	158692
41	$D_s^+ \rightarrow \bar{K}^0 K^{*+}, \bar{K}^0 \rightarrow K_S^0, K^{*+} \rightarrow \pi^0 K^+, K_S^0 \rightarrow \pi^+ \pi^-$	140	815	961	1776	160468
42	$D_s^+ \rightarrow \pi^+ \eta \omega, \eta \rightarrow \pi^0 \pi^0 \pi^0, \omega \rightarrow \pi^0 \pi^+ \pi^-$	99	793	975	1768	162236
43	$D_s^+ \rightarrow \pi^+ \pi^- K_S^0 K^+, K_S^0 \rightarrow \pi^+ \pi^-$	137	795	938	1733	163969
44	$D_s^+ \rightarrow \pi^0 \pi^0 \pi^+$	97	826	904	1730	165699
45	$D_s^+ \rightarrow \rho^+ \eta', \rho^+ \rightarrow \pi^0 \pi^+, \eta' \rightarrow \pi^+ \pi^- \eta, \eta \rightarrow \pi^0 \pi^+ \pi^-$	52	779	939	1718	167417
46	$D_s^+ \rightarrow \bar{K}^0 K^{*+}, \bar{K}^0 \rightarrow K_L^0, K^{*+} \rightarrow \pi^+ K^0, K^0 \rightarrow K_L^0$	39	788	913	1701	169118
47	$D_s^+ \rightarrow \tau^+ \nu_\tau, \tau^+ \rightarrow \bar{\nu}_\tau \pi^+$	55	761	892	1653	170771
48	$D_s^+ \rightarrow K^* K^+, K^* \rightarrow \pi^0 K^0, K^0 \rightarrow K_L^0$	113	788	865	1653	172424
49	$D_s^+ \rightarrow \pi^+ \pi^+ \pi^- \phi, \phi \rightarrow K^+ K^-$	166	716	792	1508	173932
50	$D_s^+ \rightarrow K_S^0 K^+, K_S^0 \rightarrow \pi^0 \pi^0$	82	712	754	1466	175398
51	$D_s^+ \rightarrow e^+ \nu_e \eta, \eta \rightarrow \pi^0 \pi^+ \pi^-$	21	694	771	1465	176863
52	$D_s^+ \rightarrow \mu^+ \nu_\mu \eta, \eta \rightarrow \pi^0 \pi^+ \pi^-$	56	655	790	1445	178308
53	$D_s^+ \rightarrow \pi^+ \eta, \eta \rightarrow \pi^0 \pi^+ \pi^-$	51	639	741	1380	179688
54	$D_s^+ \rightarrow \bar{K}^0 K^{*+}, \bar{K}^0 \rightarrow K_L^0, K^{*+} \rightarrow \pi^+ K^0, K^0 \rightarrow K_S^0, K_S^0 \rightarrow \pi^+ \pi^-$	188	626	751	1377	181065
55	$D_s^+ \rightarrow \rho^+ \eta', \rho^+ \rightarrow \pi^0 \pi^+, \eta' \rightarrow \pi^0 \pi^0 \eta, \eta \rightarrow \gamma \gamma$	16	637	715	1352	182417
56	$D_s^+ \rightarrow \bar{K}^0 K^{*+}, \bar{K}^0 \rightarrow K_S^0, K^{*+} \rightarrow \pi^+ K^0, K_S^0 \rightarrow \pi^+ \pi^-, K^0 \rightarrow K_L^0$	49	618	719	1337	183754
57	$D_s^+ \rightarrow K^* K^+, K^* \rightarrow \pi^0 K^0, K^0 \rightarrow K_S^0, K_S^0 \rightarrow \pi^+ \pi^-$	24	586	733	1319	185073
58	$D_s^+ \rightarrow \rho^+ \eta, \rho^+ \rightarrow \pi^0 \pi^+, \eta \rightarrow \pi^0 \pi^0 \pi^0, \pi^0 \rightarrow e^+ e^-$	20	665	652	1317	186390
59	$D_s^+ \rightarrow \pi^+ \eta', \eta' \rightarrow \pi^+ \pi^- \eta, \eta \rightarrow \pi^0 \pi^+ \pi^-$	126	615	693	1308	187698
60	$D_s^+ \rightarrow \rho^+ \eta', \rho^+ \rightarrow \pi^0 \pi^+, \eta' \rightarrow \pi^0 \pi^0 \eta, \eta \rightarrow \pi^0 \pi^0 \pi^0$	77	648	636	1284	188982
61	$D_s^+ \rightarrow \tau^+ \nu_\tau, \tau^+ \rightarrow \bar{\nu}_\tau \pi^+ \pi^+ \pi^-$	50	592	650	1242	190224
62	$D_s^+ \rightarrow \pi^+ \eta \omega, \eta \rightarrow \pi^0 \pi^+ \pi^-, \omega \rightarrow \pi^0 \pi^+ \pi^-$	2	564	677	1241	191465
63	$D_s^+ \rightarrow \mu^+ \nu_\mu$	64	569	657	1226	192691
64	$D_s^+ \rightarrow \pi^+ \pi^+ \pi^+ \pi^- \pi^- \eta, \eta \rightarrow \gamma \gamma$	25	542	670	1212	193903
65	$D_s^+ \rightarrow e^+ \nu_e \phi, \phi \rightarrow K_L^0 K_S^0, K_S^0 \rightarrow \pi^+ \pi^-$	196	554	648	1202	195105



rowNo	cascade decay branch of $D_s^+$	iCaseDcyBrP	nCase	nCcCase	nAllCase	nCCase
66	$D_s^+ \rightarrow \bar{K}^* K^{*+}, \bar{K}^* \rightarrow \pi^+ K^-, K^{*+} \rightarrow \pi^+ K^0, K^0 \rightarrow K_S^0,$ $K_S^0 \rightarrow \pi^0 \pi^0$	109	558	638	1196	196301
67	$D_s^+ \rightarrow \rho^+ \eta, \rho^+ \rightarrow \pi^0 \pi^+, \eta \rightarrow \pi^+ \pi^-$	41	547	625	1172	197473
68	$D_s^+ \rightarrow \tau^+ \nu_\tau, \tau^+ \rightarrow \bar{\nu}_\tau \pi^0 \pi^0 \pi^+$	111	542	622	1164	198637
69	$D_s^+ \rightarrow \pi^0 K_L^0 \pi^+$	195	544	612	1156	199793
70	$D_s^+ \rightarrow \rho^+ \phi, \rho^+ \rightarrow \pi^0 \pi^+, \phi \rightarrow \pi^+ \rho^-, \rho^- \rightarrow \pi^0 \pi^-$	210	543	613	1156	200949
71	$D_s^+ \rightarrow \pi^+ \phi, \phi \rightarrow K_L^0 K_S^0, K_S^0 \rightarrow \pi^0 \pi^0$	96	534	573	1107	202056
72	$D_s^+ \rightarrow \pi^0 \pi^+ \pi^+ \pi^- \eta, \eta \rightarrow \gamma \gamma$	61	536	570	1106	203162
73	$D_s^+ \rightarrow \rho^+ \phi, \rho^+ \rightarrow \pi^0 \pi^+, \phi \rightarrow \pi^0 \rho^0, \rho^0 \rightarrow \pi^+ \pi^-$	160	530	567	1097	204259
74	$D_s^+ \rightarrow \rho^+ \phi, \rho^+ \rightarrow \pi^0 \pi^+, \phi \rightarrow \pi^- \rho^+, \rho^+ \rightarrow \pi^0 \pi^+$	42	496	584	1080	205339
75	$D_s^+ \rightarrow \bar{K}^0 K^{*+}, \bar{K}^0 \rightarrow K_S^0, K^{*+} \rightarrow \pi^+ K^0, K_S^0 \rightarrow \pi^+ \pi^-,$ $K^0 \rightarrow K_S^0, K_S^0 \rightarrow \pi^+ \pi^-$	285	508	572	1080	206419
76	$D_s^+ \rightarrow \pi^+ \pi^+ \pi^+ \pi^- \pi^- \eta, \eta \rightarrow \pi^0 \pi^0 \pi^0$	198	476	583	1059	207478
77	$D_s^+ \rightarrow \pi^0 \pi^+ \pi^+ \pi^- \eta, \eta \rightarrow \pi^0 \pi^0 \pi^0$	43	474	583	1057	208535
78	$D_s^+ \rightarrow \pi^+ \pi^+ \pi^- \eta, \eta \rightarrow \gamma \gamma$	15	448	586	1034	209569
79	$D_s^+ \rightarrow \pi^+ \eta', \eta' \rightarrow \pi^0 \pi^0 \eta, \eta \rightarrow \gamma \gamma$	104	488	500	988	210557
80	$D_s^+ \rightarrow \rho^+ \eta', \rho^+ \rightarrow \pi^0 \pi^+, \eta' \rightarrow \pi^0 \pi^0 \eta, \eta \rightarrow \pi^0 \pi^+ \pi^-$	159	477	497	974	211531
81	$D_s^+ \rightarrow \pi^+ \eta', \eta' \rightarrow \pi^0 \pi^0 \eta, \eta \rightarrow \pi^0 \pi^0 \pi^0$	272	441	513	954	212485
82	$D_s^+ \rightarrow \bar{K}^* K^{*+}, \bar{K}^* \rightarrow \pi^0 \bar{K}^0, K^{*+} \rightarrow \pi^0 K^+, \bar{K}^0 \rightarrow K_L^0$	132	459	491	950	213435
83	$D_s^+ \rightarrow \pi^+ \pi^+ \pi^- \eta, \eta \rightarrow \pi^0 \pi^0 \pi^0$	31	456	490	946	214381
84	$D_s^+ \rightarrow \mu^+ \nu_\mu \phi, \phi \rightarrow K_L^0 K_S^0, K_S^0 \rightarrow \pi^+ \pi^-$	224	459	457	916	215297
85	$D_s^+ \rightarrow \pi^0 \pi^+ K_S^0, K_S^0 \rightarrow \pi^+ \pi^-$	73	438	462	900	216197
86	$D_s^+ \rightarrow \pi^0 \pi^+ \phi, \phi \rightarrow K^+ K^-$	10	395	466	861	217058
87	$D_s^+ \rightarrow \bar{K}^* K^{*+}, \bar{K}^* \rightarrow \pi^0 \bar{K}^0, K^{*+} \rightarrow \pi^+ K^0, \bar{K}^0 \rightarrow K_L^0,$ $K^0 \rightarrow K_L^0$	263	372	471	843	217901
88	$D_s^+ \rightarrow \mu^+ \nu_\mu \eta', \eta' \rightarrow \rho^0 \gamma, \rho^0 \rightarrow \pi^+ \pi^-$	124	370	453	823	218724
89	$D_s^+ \rightarrow \pi^+ \pi^- K_S^0 K^+, K_S^0 \rightarrow \pi^0 \pi^0$	93	368	390	758	219482
90	$D_s^+ \rightarrow \bar{K}^* K^{*+}, \bar{K}^* \rightarrow \pi^0 \bar{K}^0, K^{*+} \rightarrow \pi^0 K^+, \bar{K}^0 \rightarrow K_S^0,$ $K_S^0 \rightarrow \pi^+ \pi^-$	88	343	388	731	220213
91	$D_s^+ \rightarrow \bar{K}^0 K^{*+}, \bar{K}^0 \rightarrow K_S^0, K^{*+} \rightarrow \pi^0 K^+, K_S^0 \rightarrow \pi^0 \pi^0$	89	336	395	731	220944
92	$D_s^+ \rightarrow \pi^0 \pi^+ \pi^+ \pi^- \eta, \eta \rightarrow \pi^0 \pi^+ \pi^-$	114	334	382	716	221660
93	$D_s^+ \rightarrow \tau^+ \nu_\tau, \tau^+ \rightarrow \bar{\nu}_\tau \pi^0 \pi^+ \pi^+ \pi^-$	150	333	381	714	222374
94	$D_s^+ \rightarrow \pi^+ \pi^+ \pi^+ \pi^- \pi^- \eta, \eta \rightarrow \pi^0 \pi^+ \pi^-$	152	306	404	710	223084
95	$D_s^+ \rightarrow \pi^+ \omega, \omega \rightarrow \pi^0 \pi^+ \pi^-$	136	323	371	694	223778
96	$D_s^+ \rightarrow \rho^+ K^*, \rho^+ \rightarrow \pi^0 \pi^+, K^* \rightarrow \pi^- K^+$	279	312	375	687	224465

rowNo	cascade decay branch of $D_s^+$	iCascDcyBrP	nCase	nCcCase	nAllCase	nCCase
97	$D_s^+ \rightarrow K_L^0 \pi^+ \pi^+ \pi^-$	85	310	369	679	225144
98	$D_s^+ \rightarrow \pi^0 \pi^+ K^*, K^* \rightarrow \pi^- K^+$	144	299	380	679	225823
99	$D_s^+ \rightarrow \pi^+ \eta', \eta' \rightarrow \pi^0 \pi^0 \eta, \eta \rightarrow \pi^0 \pi^+ \pi^-$	125	332	345	677	226500
100	$D_s^+ \rightarrow \pi^+ \pi^+ \pi^- \phi, \phi \rightarrow K_L^0 K_S^0, K_S^0 \rightarrow \pi^+ \pi^-$	208	294	374	668	227168
rest	$D_s^+ \rightarrow \text{others (1819 in total)}$	—	27933	31269	59202	286370

Table 9: Cascade decay branches of  $D^{*+}$ .

rowNo	cascade decay branch of $D^{*+}$	iCascDcyBrP	nCase	nCcCase	nAllCase	nCCase
1	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow \pi^+ K^-$	22	456077	370897	826974	826974
2	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow \pi^0 \pi^+ K^-$	16	32823	35964	68787	895761
3	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow e^+ \nu_e K^-$	23	10846	11371	22217	917978
4	$D^{*+} \rightarrow \pi^0 D^+, D^+ \rightarrow \pi^+ \pi^+ K^-$	33	8990	9804	18794	936772
5	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow \mu^+ \nu_\mu K^-$	6	7288	7954	15242	952014
6	$D^{*+} \rightarrow \pi^0 D^+, D^+ \rightarrow \pi^0 K_L^0 \pi^+$	10	6327	6982	13309	965323
7	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow \pi^0 \pi^0 \pi^+ K^-$	60	5216	5901	11117	976440
8	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow K_L^0 \pi^+ \pi^-$	50	4960	5852	10812	987252
9	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow K^- a_1^+, a_1^+ \rightarrow \pi^0 \rho^+, \rho^+ \rightarrow \pi^0 \pi^+$	26	5027	5596	10623	997875
10	$D^{*+} \rightarrow \pi^0 D^+, D^+ \rightarrow \pi^0 \pi^+ K_S^0, K_S^0 \rightarrow \pi^+ \pi^-$	17	4746	5398	10144	1008019
11	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow K^- a_1^+, a_1^+ \rightarrow \rho^0 \pi^+, \rho^0 \rightarrow \pi^+ \pi^-$	45	4596	5423	10019	1018038
12	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow \rho^+ K^{*-}, \rho^+ \rightarrow \pi^0 \pi^+, K^{*-} \rightarrow \pi^0 K^-$	14	4607	5230	9837	1027875
13	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow \rho^+ K^{*-}, \rho^+ \rightarrow \pi^0 \pi^+, K^{*-} \rightarrow \pi^- \bar{K}^0, \bar{K}^0 \rightarrow K_L^0$	79	4214	4771	8985	1036860
14	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow \pi^+ \pi^- K_S^0, K_S^0 \rightarrow \pi^+ \pi^-$	129	3749	4518	8267	1045127
15	$D^{*+} \rightarrow \pi^0 D^+, D^+ \rightarrow e^+ \nu_e \bar{K}^*, \bar{K}^* \rightarrow \pi^+ K^-$	51	3808	4177	7985	1053112
16	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow \pi^+ \omega K^-, \omega \rightarrow \pi^0 \pi^+ \pi^-$	20	3360	4199	7559	1060671
17	$D^{*+} \rightarrow \pi^0 D^+, D^+ \rightarrow e^+ \nu_e \bar{K}^0, \bar{K}^0 \rightarrow K_L^0$	21	3468	3964	7432	1068103
18	$D^{*+} \rightarrow \pi^0 D^+, D^+ \rightarrow \mu^+ \nu_\mu \bar{K}^0, \bar{K}^0 \rightarrow K_L^0$	83	3397	3810	7207	1075310
19	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow \pi^0 \pi^+ \pi^-$	154	3470	3699	7169	1082479
20	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow \pi^+ \pi^- \bar{K}^*, \bar{K}^* \rightarrow \pi^+ K^-$	105	3199	3800	6999	1089478
21	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow \rho^+ K^{*-}, \rho^+ \rightarrow \pi^0 \pi^+, K^{*-} \rightarrow \pi^- \bar{K}^0, \bar{K}^0 \rightarrow K_S^0, K_S^0 \rightarrow \pi^+ \pi^-$	96	3160	3822	6982	1096460
22	$D^{*+} \rightarrow \pi^0 D^+, D^+ \rightarrow \mu^+ \nu_\mu \bar{K}^*, \bar{K}^* \rightarrow \pi^+ K^-$	88	3140	3426	6566	1103026
23	$D^{*+} \rightarrow \pi^0 D^+, D^+ \rightarrow \pi^0 \pi^+ \bar{K}^*, \bar{K}^* \rightarrow \pi^+ K^-$	30	3049	3170	6219	1109245
24	$D^{*+} \rightarrow \pi^0 D^+, D^+ \rightarrow e^+ \nu_e \bar{K}^0, \bar{K}^0 \rightarrow K_S^0, K_S^0 \rightarrow \pi^+ \pi^-$	8	2588	3118	5706	1114951
25	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow \pi^0 \pi^+ \pi^- \bar{K}^*, \bar{K}^* \rightarrow \pi^+ K^-$	213	2552	3027	5579	1120530
26	$D^{*+} \rightarrow \pi^0 D^+, D^+ \rightarrow \mu^+ \nu_\mu \bar{K}^0, \bar{K}^0 \rightarrow K_S^0, K_S^0 \rightarrow \pi^+ \pi^-$	35	2557	2932	5489	1126019
27	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow K^- a_1^+, a_1^+ \rightarrow \pi^+ \pi^+ \pi^-$	1	2253	2644	4897	1130916
28	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow \rho^0 \bar{K}^*, \rho^0 \rightarrow \pi^+ \pi^-, \bar{K}^* \rightarrow \pi^+ K^-$	0	2035	2392	4427	1135343
29	$D^{*+} \rightarrow \pi^0 D^+, D^+ \rightarrow \pi^0 \pi^+ K_S^0, K_S^0 \rightarrow \pi^0 \pi^0$	145	2098	2304	4402	1139745
30	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow \pi^0 \pi^0 \pi^+ \pi^-$	9	2000	2298	4298	1144043
31	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow K_L^0 \omega, \omega \rightarrow \pi^0 \pi^+ \pi^-$	110	1788	2196	3984	1148027

rowNo	cascade decay branch of $D^{*+}$	iCascDcyBrP	nCase	nCcCase	nAllCase	nCCCase
32	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow \pi^+ \pi^+ \pi^- K^-$	165	1813	2066	3879	1151906
33	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow \pi^0 \pi^0 \pi^0 K_L^0 \pi^+ \pi^-$	126	1744	2006	3750	1155656
34	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow K^- a_1^+, a_1^+ \rightarrow \pi^+ f_0(600), f_0(600) \rightarrow \pi^+ \pi^-$	24	1681	2044	3725	1159381
35	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow \pi^0 K_L^0$	178	1648	2015	3663	1163044
36	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow \pi^+ \pi^- K_S^0, K_S^0 \rightarrow \pi^0 \pi^0$	200	1635	2024	3659	1166703
37	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow \pi^0 \pi^0 K_L^0 \pi^+ \pi^-$	113	1736	1889	3625	1170328
38	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow e^+ \nu_e K^{*-}, K^{*-} \rightarrow \pi^0 K^-$	40	1744	1814	3558	1173886
39	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow \pi^0 K_S^0, K_S^0 \rightarrow \pi^+ \pi^-$	85	1584	1968	3552	1177438
40	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow \pi^0 \pi^0 \pi^0 K_L^0$	218	1536	1830	3366	1180804
41	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow \pi^0 \pi^0 K_L^0$	47	1508	1698	3206	1184010
42	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow \rho^+ K^{*-}, \rho^+ \rightarrow \pi^0 \pi^+, K^{*-} \rightarrow \pi^- \bar{K}^0, \bar{K}^0 \rightarrow K_S^0, K_S^0 \rightarrow \pi^0 \pi^0$	139	1428	1689	3117	1187127
43	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow \pi^0 \pi^0 \bar{K}^*, \bar{K}^* \rightarrow \pi^+ K^-$	95	1470	1600	3070	1190197
44	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow \omega K_S^0, \omega \rightarrow \pi^0 \pi^+ \pi^-, K_S^0 \rightarrow \pi^+ \pi^-$	32	1333	1694	3027	1193224
45	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow \pi^0 \pi^0 \pi^0 \pi^+ \pi^- K_S^0, K_S^0 \rightarrow \pi^+ \pi^-$	55	1386	1630	3016	1196240
46	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow \omega \bar{K}^*, \omega \rightarrow \pi^0 \pi^+ \pi^-, \bar{K}^* \rightarrow \pi^+ K^-$	134	1384	1547	2931	1199171
47	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow \pi^0 \pi^+ K^-, \pi^0 \rightarrow e^+ e^-$	117	1419	1446	2865	1202036
48	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow \pi^0 \rho^+ K^-, \rho^+ \rightarrow \pi^0 \pi^+$	174	1347	1501	2848	1204884
49	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow e^+ \nu_e K^{*-}, K^{*-} \rightarrow \pi^- \bar{K}^0, \bar{K}^0 \rightarrow K_L^0$	59	1335	1502	2837	1207721
50	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow K^+ K^-$	73	1370	1446	2816	1210537
51	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow \pi^0 \pi^0 \pi^+ \pi^- K_S^0, K_S^0 \rightarrow \pi^+ \pi^-$	158	1251	1496	2747	1213284
52	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow \mu^+ \nu_\mu K^{*-}, K^{*-} \rightarrow \pi^0 K^-$	205	1310	1410	2720	1216004
53	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow \pi^0 \pi^0 \pi^0 K_S^0, K_S^0 \rightarrow \pi^+ \pi^-$	147	1305	1402	2707	1218711
54	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow \pi^0 \pi^0 \pi^0 \pi^+ \pi^-$	29	1228	1379	2607	1221318
55	$D^{*+} \rightarrow \pi^0 D^+, D^+ \rightarrow K_L^0 \pi^+$	90	1257	1341	2598	1223916
56	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow \pi^+ \pi^+ \pi^- \pi^-$	11	1133	1380	2513	1226429
57	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow \mu^+ \nu_\mu K^{*-}, K^{*-} \rightarrow \pi^- \bar{K}^0, \bar{K}^0 \rightarrow K_L^0$	219	1104	1321	2425	1228854
58	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow \pi^0 \pi^0 K_S^0, K_S^0 \rightarrow \pi^+ \pi^-$	101	1121	1295	2416	1231270
59	$D^{*+} \rightarrow \pi^0 D^+, D^+ \rightarrow \pi^+ K_S^0, K_S^0 \rightarrow \pi^+ \pi^-$	184	1147	1264	2411	1233681
60	$D^{*+} \rightarrow \pi^0 D^+, D^+ \rightarrow e^+ \nu_e \bar{K}^0, \bar{K}^0 \rightarrow K_S^0, K_S^0 \rightarrow \pi^0 \pi^0$	78	1125	1272	2397	1236078
61	$D^{*+} \rightarrow \pi^0 D^+, D^+ \rightarrow \mu^+ \nu_\mu \bar{K}^0, \bar{K}^0 \rightarrow K_S^0, K_S^0 \rightarrow \pi^0 \pi^0$	256	1113	1268	2381	1238459
62	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow \rho^0 \pi^+ K^-, \rho^0 \rightarrow \pi^+ \pi^-$	19	1044	1324	2368	1240827
63	$D^{*+} \rightarrow \pi^0 D^+, D^+ \rightarrow \pi^0 \pi^+ \pi^+ \pi^-$	214	1093	1256	2349	1243176
64	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow \pi^0 K_L^0 \pi^+ \pi^-$	140	1073	1209	2282	1245458
65	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow \pi^- K^+$	183	1006	1248	2254	1247712

rowNo	cascade decay branch of $D^{*+}$	iCaseDcyBrP	nCase	nCcCase	nAllCase	nCCCase
66	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow e^+ \nu_e K^{*-}, K^{*-} \rightarrow \pi^- \bar{K}^0, \bar{K}^0 \rightarrow K_S^0, K_S^0 \rightarrow \pi^+ \pi^-$	265	1004	1157	2161	1249873
67	$D^{*+} \rightarrow \pi^0 D^+, D^+ \rightarrow \pi^+ K^+ K^-$	135	929	1046	1975	1251848
68	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow K^- a_1^+, a_1^+ \rightarrow \pi^+ f_0(600), f_0(600) \rightarrow \pi^0 \pi^0$	146	894	965	1859	1253707
69	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow \pi^0 \pi^+ \pi^- K_S^0, K_S^0 \rightarrow \pi^+ \pi^-$	390	854	979	1833	1255540
70	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow \mu^+ \nu_\mu K^{*-}, K^{*-} \rightarrow \pi^- \bar{K}^0, \bar{K}^0 \rightarrow K_S^0, K_S^0 \rightarrow \pi^+ \pi^-$	65	823	952	1775	1257315
71	$D^{*+} \rightarrow \pi^0 D^+, D^+ \rightarrow \pi^0 \pi^+ \pi^+ \pi^- \eta, \eta \rightarrow \gamma \gamma$	253	783	972	1755	1259070
72	$D^{*+} \rightarrow \pi^0 D^+, D^+ \rightarrow \rho^+ \bar{K}^*, \rho^+ \rightarrow \pi^0 \pi^+, \bar{K}^* \rightarrow \pi^+ K^-$	86	857	893	1750	1260820
73	$D^{*+} \rightarrow \pi^0 D^+, D^+ \rightarrow e^+ \nu_e \pi^+ K^-$	69	822	886	1708	1262528
74	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow \pi^0 \pi^0 \pi^+ K^-$	226	791	909	1700	1264228
75	$D^{*+} \rightarrow \pi^0 D^+, D^+ \rightarrow e^+ \nu_e \bar{K}^*, \bar{K}^* \rightarrow \pi^0 \bar{K}^0, \bar{K}^0 \rightarrow K_L^0$	115	745	871	1616	1265844
76	$D^{*+} \rightarrow \pi^0 D^+, D^+ \rightarrow \pi^0 \pi^+ \pi^+ \pi^- \eta, \eta \rightarrow \pi^0 \pi^0 \pi^0$	128	705	867	1572	1267416
77	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow K_L^0 K^+ K^-$	46	708	855	1563	1268979
78	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow \pi^0 K_L^0 \eta, \eta \rightarrow \gamma \gamma$	412	743	809	1552	1270531
79	$D^{*+} \rightarrow \pi^0 D^+, D^+ \rightarrow \pi^+ \pi^+ \pi^- \eta, \eta \rightarrow \gamma \gamma$	162	710	839	1549	1272080
80	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow \pi^+ \pi^- \bar{K}^*, \bar{K}^* \rightarrow \pi^0 \bar{K}^0, \bar{K}^0 \rightarrow K_L^0$	28	687	861	1548	1273628
81	$D^{*+} \rightarrow \pi^0 D^+, D^+ \rightarrow \pi^+ \rho^+ K^-, \rho^+ \rightarrow \pi^0 \pi^+$	38	677	849	1526	1275154
82	$D^{*+} \rightarrow \pi^0 D^+, D^+ \rightarrow K_L^0 a_1^+, a_1^+ \rightarrow \pi^0 \rho^+, \rho^+ \rightarrow \pi^0 \pi^+$	272	715	798	1513	1276667
83	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow \pi^+ \eta K^-, \eta \rightarrow \gamma \gamma$	293	695	816	1511	1278178
84	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow \pi^0 K_S^0, K_S^0 \rightarrow \pi^0 \pi^0$	27	676	796	1472	1279650
85	$D^{*+} \rightarrow \pi^0 D^+, D^+ \rightarrow \mu^+ \nu_\mu \bar{K}^*, \bar{K}^* \rightarrow \pi^0 \bar{K}^0, \bar{K}^0 \rightarrow K_L^0$	439	731	741	1472	1281122
86	$D^{*+} \rightarrow \pi^0 D^+, D^+ \rightarrow \pi^0 \pi^+ \bar{K}^*, \bar{K}^* \rightarrow \pi^0 \bar{K}^0, \bar{K}^0 \rightarrow K_L^0$	381	677	781	1458	1282580
87	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow \pi^+ \eta K^-, \eta \rightarrow \pi^0 \pi^0 \pi^0$	99	687	742	1429	1284009
88	$D^{*+} \rightarrow \pi^0 D^+, D^+ \rightarrow K_L^0 a_1^+, a_1^+ \rightarrow \rho^0 \pi^+, \rho^0 \rightarrow \pi^+ \pi^-$	270	640	776	1416	1285425
89	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow \pi^0 K_L^0 \eta, \eta \rightarrow \pi^0 \pi^0 \pi^0$	221	688	724	1412	1286837
90	$D^{*+} \rightarrow \pi^0 D^+, D^+ \rightarrow \pi^+ \pi^+ \pi^- \eta, \eta \rightarrow \pi^0 \pi^0 \pi^0$	291	650	757	1407	1288244
91	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow \pi^0 \pi^+ \pi^- \bar{K}^*, \bar{K}^* \rightarrow \pi^0 \bar{K}^0, \bar{K}^0 \rightarrow K_L^0$	208	625	768	1393	1289637
92	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow \pi^0 \pi^+ \pi^- K^+ K^-$	37	650	737	1387	1291024
93	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow \omega K_S^0, \omega \rightarrow \pi^0 \pi^+ \pi^-, K_S^0 \rightarrow \pi^0 \pi^0$	74	627	754	1381	1292405
94	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow \pi^0 \pi^0 \pi^0 \pi^+ \pi^- K_S^0, K_S^0 \rightarrow \pi^0 \pi^0$	247	642	738	1380	1293785
95	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow \pi^0 \pi^+ K^{*-}, K^{*-} \rightarrow \pi^0 K^-$	310	618	718	1336	1295121
96	$D^{*+} \rightarrow \pi^0 D^+, D^+ \rightarrow \pi^0 \pi^+ K^+ K^-$	237	641	662	1303	1296424
97	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow \pi^0 \pi^+ K^{*-}, K^{*-} \rightarrow \pi^- \bar{K}^0, \bar{K}^0 \rightarrow K_L^0$	142	539	711	1250	1297674
98	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow e^+ \nu_e \pi^-$	396	588	650	1238	1298912

rowNo	cascade decay branch of $D^{*+}$	iCascDcyBrP	nCase	nCcCase	nAllCase	nCCase
99	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow \pi^0 \eta K_S^0, \eta \rightarrow \gamma\gamma, K_S^0 \rightarrow \pi^+ \pi^-$	273	566	670	1236	1300148
100	$D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow \pi^+ \pi^- \bar{K}^*, \bar{K}^* \rightarrow \pi^0 \bar{K}^0, \bar{K}^0 \rightarrow K_S^0, K_S^0 \rightarrow \pi^+ \pi^-$	119	570	652	1222	1301370
rest	$D^{*+} \rightarrow \text{others (5275 in total)}$	—	97002	109752	206754	1508124

Table 10: Cascade decay branches of  $D^{*0}$ .

rowNo	cascade decay branch of $D^{*0}$	iCascDcyBrP	nCase	nCcCase	nAllCase	nCCase
1	$D^{*0} \rightarrow \pi^0 D^0, D^0 \rightarrow \pi^+ K^-$	2	297683	275080	572763	572763
2	$D^{*0} \rightarrow D^0 \gamma, D^0 \rightarrow \pi^+ K^-$	41	160713	146952	307665	880428
3	$D^{*0} \rightarrow \pi^0 D^0, D^0 \rightarrow \pi^0 \pi^+ K^-$	1	33070	35214	68284	948712
4	$D^{*0} \rightarrow D^0 \gamma, D^0 \rightarrow \pi^0 \pi^+ K^-$	12	17839	19055	36894	985606
5	$D^{*0} \rightarrow \pi^0 D^0, \pi^0 \rightarrow e^+ e^-, D^0 \rightarrow \pi^+ K^-$	131	18422	17527	35949	1021555
6	$D^{*0} \rightarrow \pi^0 D^0, D^0 \rightarrow e^+ \nu_e K^-$	5	13246	13242	26488	1048043
7	$D^{*0} \rightarrow \pi^0 D^0, D^0 \rightarrow \mu^+ \nu_\mu K^-$	7	7478	7856	15334	1063377
8	$D^{*0} \rightarrow D^0 \gamma, D^0 \rightarrow e^+ \nu_e K^-$	20	7158	7171	14329	1077706
9	$D^{*0} \rightarrow \pi^0 D^0, D^0 \rightarrow \pi^0 \pi^0 \pi^+ K^-$	34	5334	5692	11026	1088732
10	$D^{*0} \rightarrow \pi^0 D^0, D^0 \rightarrow K_L^0 \pi^+ \pi^-$	56	4971	5581	10552	1099284
11	$D^{*0} \rightarrow \pi^0 D^0, D^0 \rightarrow K^- a_1^+, a_1^+ \rightarrow \pi^0 \rho^+, \rho^+ \rightarrow \pi^0 \pi^+$	31	4943	5331	10274	1109558
12	$D^{*0} \rightarrow \pi^0 D^0, D^0 \rightarrow K^- a_1^+, a_1^+ \rightarrow \rho^0 \pi^+, \rho^0 \rightarrow \pi^+ \pi^-$	6	4663	5468	10131	1119689
13	$D^{*0} \rightarrow \pi^0 D^0, D^0 \rightarrow \rho^+ K^{*-}, \rho^+ \rightarrow \pi^0 \pi^+, K^{*-} \rightarrow \pi^0 K^-$	16	4681	5029	9710	1129399
14	$D^{*0} \rightarrow \pi^0 D^0, D^0 \rightarrow \rho^+ K^{*-}, \rho^+ \rightarrow \pi^0 \pi^+, K^{*-} \rightarrow \pi^- \bar{K}^0, \bar{K}^0 \rightarrow K_L^0$	33	3919	4582	8501	1137900
15	$D^{*0} \rightarrow D^0 \gamma, D^0 \rightarrow \mu^+ \nu_\mu K^-$	21	3941	4333	8274	1146174
16	$D^{*0} \rightarrow \pi^0 D^0, D^0 \rightarrow \pi^+ \pi^- K_S^0, K_S^0 \rightarrow \pi^+ \pi^-$	69	3694	4432	8126	1154300
17	$D^{*0} \rightarrow \pi^0 D^0, D^0 \rightarrow \pi^+ \omega K^-, \omega \rightarrow \pi^0 \pi^+ \pi^-$	17	3447	4131	7578	1161878
18	$D^{*0} \rightarrow \pi^0 D^0, D^0 \rightarrow \pi^0 \pi^+ \pi^-$	51	3271	3669	6940	1168818
19	$D^{*0} \rightarrow \pi^0 D^0, D^0 \rightarrow \pi^+ \pi^- \bar{K}^*, \bar{K}^* \rightarrow \pi^+ K^-$	53	3190	3597	6787	1175605
20	$D^{*0} \rightarrow \pi^0 D^0, D^0 \rightarrow \rho^+ K^{*-}, \rho^+ \rightarrow \pi^0 \pi^+, K^{*-} \rightarrow \pi^- \bar{K}^0, \bar{K}^0 \rightarrow K_S^0, K_S^0 \rightarrow \pi^+ \pi^-$	9	3079	3706	6785	1182390
21	$D^{*0} \rightarrow D^0 \gamma, D^0 \rightarrow \pi^0 \pi^0 \pi^+ K^-$	60	2852	3031	5883	1188273
22	$D^{*0} \rightarrow D^0 \gamma, D^0 \rightarrow K^- a_1^+, a_1^+ \rightarrow \pi^0 \rho^+, \rho^+ \rightarrow \pi^0 \pi^+$	32	2669	2969	5638	1193911
23	$D^{*0} \rightarrow \pi^0 D^0, D^0 \rightarrow \pi^0 \pi^+ \pi^- \bar{K}^*, \bar{K}^* \rightarrow \pi^+ K^-$	120	2635	2966	5601	1199512
24	$D^{*0} \rightarrow D^0 \gamma, D^0 \rightarrow K_L^0 \pi^+ \pi^-$	23	2561	2987	5548	1205060
25	$D^{*0} \rightarrow D^0 \gamma, D^0 \rightarrow K^- a_1^+, a_1^+ \rightarrow \rho^0 \pi^+, \rho^0 \rightarrow \pi^+ \pi^-$	118	2446	2880	5326	1210386
26	$D^{*0} \rightarrow D^0 \gamma, D^0 \rightarrow \rho^+ K^{*-}, \rho^+ \rightarrow \pi^0 \pi^+, K^{*-} \rightarrow \pi^0 K^-$	25	2422	2657	5079	1215465
27	$D^{*0} \rightarrow \pi^0 D^0, D^0 \rightarrow K^- a_1^+, a_1^+ \rightarrow \pi^+ \pi^+ \pi^-$	30	2292	2621	4913	1220378
28	$D^{*0} \rightarrow D^0 \gamma, D^0 \rightarrow \rho^+ K^{*-}, \rho^+ \rightarrow \pi^0 \pi^+, K^{*-} \rightarrow \pi^- \bar{K}^0, \bar{K}^0 \rightarrow K_L^0$	114	2200	2481	4681	1225059
29	$D^{*0} \rightarrow \pi^0 D^0, D^0 \rightarrow \rho^0 \bar{K}^*, \rho^0 \rightarrow \pi^+ \pi^-, \bar{K}^* \rightarrow \pi^+ K^-$	43	2011	2312	4323	1229382
30	$D^{*0} \rightarrow D^0 \gamma, D^0 \rightarrow \pi^+ \pi^- K_S^0, K_S^0 \rightarrow \pi^+ \pi^-$	145	1958	2361	4319	1233701

rowNo	cascade decay branch of $D^{*0}$	iCaseDcyBrP	nCase	nCcCase	nAllCase	nCCase
31	$D^{*0} \rightarrow \pi^0 D^0, D^0 \rightarrow \pi^0 \pi^0 \pi^+ \pi^-$	126	1920	2166	4086	1237787
32	$D^{*0} \rightarrow D^0 \gamma, D^0 \rightarrow \pi^+ \omega K^-, \omega \rightarrow \pi^0 \pi^+ \pi^-$	123	1808	2186	3994	1241781
33	$D^{*0} \rightarrow \pi^0 D^0, D^0 \rightarrow K_L^0 \omega, \omega \rightarrow \pi^0 \pi^+ \pi^-$	146	1868	2106	3974	1245755
34	$D^{*0} \rightarrow \pi^0 D^0, D^0 \rightarrow e^+ \nu_e K^{*-}, K^{*-} \rightarrow \pi^0 K^-$	3	1863	1992	3855	1249610
35	$D^{*0} \rightarrow \pi^0 D^0, D^0 \rightarrow \pi^0 \pi^0 \pi^0 K_L^0 \pi^+ \pi^-$	15	1733	1957	3690	1253300
36	$D^{*0} \rightarrow D^0 \gamma, D^0 \rightarrow \pi^0 \pi^+ \pi^-$	42	1730	1952	3682	1256982
37	$D^{*0} \rightarrow \pi^0 D^0, D^0 \rightarrow \pi^+ \pi^+ \pi^- K^-$	193	1701	1943	3644	1260626
38	$D^{*0} \rightarrow D^0 \gamma, D^0 \rightarrow \rho^+ K^{*-}, \rho^+ \rightarrow \pi^0 \pi^+, K^{*-} \rightarrow \pi^- \bar{K}^0, \bar{K}^0 \rightarrow K_S^0, K_S^0 \rightarrow \pi^+ \pi^-$	158	1622	1990	3612	1264238
39	$D^{*0} \rightarrow \pi^0 D^0, D^0 \rightarrow \pi^0 \pi^0 K_L^0 \pi^+ \pi^-$	159	1675	1927	3602	1267840
40	$D^{*0} \rightarrow D^0 \gamma, D^0 \rightarrow \pi^+ \pi^- \bar{K}^*, \bar{K}^* \rightarrow \pi^+ K^-$	100	1661	1916	3577	1271417
41	$D^{*0} \rightarrow \pi^0 D^0, D^0 \rightarrow K^- a_1^+, a_1^+ \rightarrow \pi^+ f_0(600), f_0(600) \rightarrow \pi^+ \pi^-$	0	1576	1953	3529	1274946
42	$D^{*0} \rightarrow \pi^0 D^0, D^0 \rightarrow \pi^0 K_S^0, K_S^0 \rightarrow \pi^+ \pi^-$	364	1635	1852	3487	1278433
43	$D^{*0} \rightarrow \pi^0 D^0, D^0 \rightarrow \pi^+ \pi^- K_S^0, K_S^0 \rightarrow \pi^0 \pi^0$	107	1652	1799	3451	1281884
44	$D^{*0} \rightarrow \pi^0 D^0, D^0 \rightarrow \pi^0 K_L^0$	331	1604	1831	3435	1285319
45	$D^{*0} \rightarrow \pi^0 D^0, D^0 \rightarrow \pi^0 \pi^0 \pi^0 K_L^0$	232	1546	1693	3239	1288558
46	$D^{*0} \rightarrow \pi^0 D^0, D^0 \rightarrow \pi^0 \pi^0 \bar{K}^*, \bar{K}^* \rightarrow \pi^+ K^-$	38	1536	1621	3157	1291715
47	$D^{*0} \rightarrow \pi^0 D^0, \pi^0 \rightarrow e^+ e^-, D^0 \rightarrow \pi^0 \pi^+ K^-$	119	1575	1537	3112	1294827
48	$D^{*0} \rightarrow D^0 \gamma, D^0 \rightarrow \pi^0 \pi^+ \pi^- \bar{K}^*, \bar{K}^* \rightarrow \pi^+ K^-$	97	1399	1667	3066	1297893
49	$D^{*0} \rightarrow \pi^0 D^0, D^0 \rightarrow \pi^0 \pi^+ K^-, \pi^0 \rightarrow e^+ e^-$	40	1396	1648	3044	1300937
50	$D^{*0} \rightarrow \pi^0 D^0, D^0 \rightarrow \rho^+ K^{*-}, \rho^+ \rightarrow \pi^0 \pi^+, K^{*-} \rightarrow \pi^- \bar{K}^0, \bar{K}^0 \rightarrow K_S^0, K_S^0 \rightarrow \pi^0 \pi^0$	157	1442	1530	2972	1303909
51	$D^{*0} \rightarrow \pi^0 D^0, D^0 \rightarrow \pi^0 \pi^0 K_L^0$	141	1427	1540	2967	1306876
52	$D^{*0} \rightarrow \pi^0 D^0, D^0 \rightarrow \omega K_S^0, \omega \rightarrow \pi^0 \pi^+ \pi^-, K_S^0 \rightarrow \pi^+ \pi^-$	101	1396	1564	2960	1309836
53	$D^{*0} \rightarrow \pi^0 D^0, D^0 \rightarrow \pi^0 \pi^0 \pi^0 \pi^+ \pi^- K_S^0, K_S^0 \rightarrow \pi^+ \pi^-$	121	1354	1531	2885	1312721
54	$D^{*0} \rightarrow \pi^0 D^0, D^0 \rightarrow \omega \bar{K}^*, \omega \rightarrow \pi^0 \pi^+ \pi^-, \bar{K}^* \rightarrow \pi^+ K^-$	344	1318	1508	2826	1315547
55	$D^{*0} \rightarrow \pi^0 D^0, D^0 \rightarrow \pi^0 \rho^+ K^-, \rho^+ \rightarrow \pi^0 \pi^+$	92	1291	1458	2749	1318296
56	$D^{*0} \rightarrow \pi^0 D^0, D^0 \rightarrow e^+ \nu_e K^{*-}, K^{*-} \rightarrow \pi^- \bar{K}^0, \bar{K}^0 \rightarrow K_L^0$	13	1269	1458	2727	1321023
57	$D^{*0} \rightarrow \pi^0 D^0, D^0 \rightarrow \pi^0 \pi^0 \pi^+ \pi^- K_S^0, K_S^0 \rightarrow \pi^+ \pi^-$	99	1254	1448	2702	1323725
58	$D^{*0} \rightarrow \pi^0 D^0, D^0 \rightarrow \mu^+ \nu_\mu K^{*-}, K^{*-} \rightarrow \pi^0 K^-$	26	1228	1370	2598	1326323
59	$D^{*0} \rightarrow D^0 \gamma, D^0 \rightarrow K^- a_1^+, a_1^+ \rightarrow \pi^+ \pi^+ \pi^-$	75	1178	1406	2584	1328907
60	$D^{*0} \rightarrow \pi^0 D^0, D^0 \rightarrow K^+ K^-$	138	1205	1336	2541	1331448
61	$D^{*0} \rightarrow \pi^0 D^0, D^0 \rightarrow \pi^0 \pi^0 \pi^0 K_S^0, K_S^0 \rightarrow \pi^+ \pi^-$	160	1205	1331	2536	1333984
62	$D^{*0} \rightarrow \pi^0 D^0, D^0 \rightarrow \pi^0 \pi^0 \pi^0 \pi^+ \pi^-$	64	1228	1306	2534	1336518
63	$D^{*0} \rightarrow \pi^0 D^0, D^0 \rightarrow \pi^+ \pi^+ \pi^- \pi^-$	52	1193	1291	2484	1339002



rowNo	cascade decay branch of $D^{*0}$	iCaseDcyBrP	nCase	nCcCase	nAllCase	nCCase
64	$D^{*0} \rightarrow \pi^0 D^0, D^0 \rightarrow \pi^0 \pi^0 K_S^0, K_S^0 \rightarrow \pi^+ \pi^-$	192	1094	1337	2431	1341433
65	$D^{*0} \rightarrow \pi^0 D^0, D^0 \rightarrow \pi^0 K_L^0 \pi^+ \pi^-$	127	1090	1247	2337	1343770
66	$D^{*0} \rightarrow \pi^0 D^0, D^0 \rightarrow \mu^+ \nu_\mu K^{*-}, K^{*-} \rightarrow \pi^- \bar{K}^0, \bar{K}^0 \rightarrow K_L^0$	194	1041	1240	2281	1346051
67	$D^{*0} \rightarrow D^0 \gamma, D^0 \rightarrow \rho^0 \bar{K}^*, \rho^0 \rightarrow \pi^+ \pi^-, \bar{K}^* \rightarrow \pi^+ K^-$	18	1002	1263	2265	1348316
68	$D^{*0} \rightarrow D^0 \gamma, D^0 \rightarrow \pi^0 \pi^0 \pi^+ \pi^-$	234	1052	1198	2250	1350566
69	$D^{*0} \rightarrow \pi^0 D^0, D^0 \rightarrow \rho^0 \pi^+ K^-, \rho^0 \rightarrow \pi^+ \pi^-$	201	1012	1151	2163	1352729
70	$D^{*0} \rightarrow \pi^0 D^0, D^0 \rightarrow \pi^- K^+$	796	1013	1145	2158	1354887
71	$D^{*0} \rightarrow D^0 \gamma, D^0 \rightarrow e^+ \nu_e K^{*-}, K^{*-} \rightarrow \pi^0 K^-$	36	1018	1112	2130	1357017
72	$D^{*0} \rightarrow D^0 \gamma, D^0 \rightarrow K_L^0 \omega, \omega \rightarrow \pi^0 \pi^+ \pi^-$	203	950	1144	2094	1359111
73	$D^{*0} \rightarrow D^0 \gamma, D^0 \rightarrow \pi^+ \pi^+ \pi^- K^-$	54	945	1096	2041	1361152
74	$D^{*0} \rightarrow \pi^0 D^0, D^0 \rightarrow e^+ \nu_e K^{*-}, K^{*-} \rightarrow \pi^- \bar{K}^0, \bar{K}^0 \rightarrow K_S^0, K_S^0 \rightarrow \pi^+ \pi^-$	39	921	1108	2029	1363181
75	$D^{*0} \rightarrow D^0 \gamma, D^0 \rightarrow \pi^0 \pi^0 \pi^0 K_L^0 \pi^+ \pi^-$	186	897	1041	1938	1365119
76	$D^{*0} \rightarrow D^0 \gamma, D^0 \rightarrow K^- a_1^+, a_1^+ \rightarrow \pi^+ f_0(600), f_0(600) \rightarrow \pi^+ \pi^-$	134	881	997	1878	1366997
77	$D^{*0} \rightarrow D^0 \gamma, D^0 \rightarrow \pi^0 \pi^0 K_L^0 \pi^+ \pi^-$	184	844	1007	1851	1368848
78	$D^{*0} \rightarrow \pi^0 D^0, D^0 \rightarrow K^- a_1^+, a_1^+ \rightarrow \pi^+ f_0(600), f_0(600) \rightarrow \pi^0 \pi^0$	182	884	948	1832	1370680
79	$D^{*0} \rightarrow D^0 \gamma, D^0 \rightarrow \pi^+ \pi^- K_S^0, K_S^0 \rightarrow \pi^0 \pi^0$	8	832	977	1809	1372489
80	$D^{*0} \rightarrow \pi^0 D^0, D^0 \rightarrow \pi^0 \pi^+ \pi^- K_S^0, K_S^0 \rightarrow \pi^+ \pi^-$	250	840	969	1809	1374298
81	$D^{*0} \rightarrow \pi^0 D^0, D^0 \rightarrow \mu^+ \nu_\mu K^{*-}, K^{*-} \rightarrow \pi^- \bar{K}^0, \bar{K}^0 \rightarrow K_S^0, K_S^0 \rightarrow \pi^+ \pi^-$	142	807	967	1774	1376072
82	$D^{*0} \rightarrow D^0 \gamma, D^0 \rightarrow \pi^0 K_S^0, K_S^0 \rightarrow \pi^+ \pi^-$	49	837	933	1770	1377842
83	$D^{*0} \rightarrow D^0 \gamma, D^0 \rightarrow \pi^0 K_L^0$	338	805	961	1766	1379608
84	$D^{*0} \rightarrow D^0 \gamma, D^0 \rightarrow \pi^0 \pi^0 \pi^0 K_L^0$	294	772	940	1712	1381320
85	$D^{*0} \rightarrow D^0 \gamma, D^0 \rightarrow \omega \bar{K}^*, \omega \rightarrow \pi^0 \pi^+ \pi^-, \bar{K}^* \rightarrow \pi^+ K^-$	139	766	880	1646	1382966
86	$D^{*0} \rightarrow D^0 \gamma, D^0 \rightarrow \omega K_S^0, \omega \rightarrow \pi^0 \pi^+ \pi^-, K_S^0 \rightarrow \pi^+ \pi^-$	353	728	892	1620	1384586
87	$D^{*0} \rightarrow \pi^0 D^0, D^0 \rightarrow \pi^+ \eta K^-, \eta \rightarrow \gamma \gamma$	113	773	830	1603	1386189
88	$D^{*0} \rightarrow D^0 \gamma, D^0 \rightarrow \pi^0 \pi^+ K^-, \pi^0 \rightarrow e^+ e^-$	174	748	853	1601	1387790
89	$D^{*0} \rightarrow \pi^0 D^0, D^0 \rightarrow \pi^0 \pi^0 \pi^0 \pi^+ K^-$	94	760	831	1591	1389381
90	$D^{*0} \rightarrow D^0 \gamma, D^0 \rightarrow \rho^+ K^{*-}, \rho^+ \rightarrow \pi^0 \pi^+, K^{*-} \rightarrow \pi^- \bar{K}^0, \bar{K}^0 \rightarrow K_S^0, K_S^0 \rightarrow \pi^0 \pi^0$	208	741	839	1580	1390961
91	$D^{*0} \rightarrow D^0 \gamma, D^0 \rightarrow \pi^0 \pi^0 \bar{K}^*, \bar{K}^* \rightarrow \pi^+ K^-$	148	750	828	1578	1392539
92	$D^{*0} \rightarrow D^0 \gamma, D^0 \rightarrow \pi^0 \pi^0 \pi^0 \pi^+ \pi^- K_S^0, K_S^0 \rightarrow \pi^+ \pi^-$	104	751	825	1576	1394115
93	$D^{*0} \rightarrow D^0 \gamma, D^0 \rightarrow \pi^0 \pi^0 K_L^0$	67	748	823	1571	1395686
94	$D^{*0} \rightarrow \pi^0 D^0, D^0 \rightarrow \pi^+ \pi^- \bar{K}^*, \bar{K}^* \rightarrow \pi^0 \bar{K}^0, \bar{K}^0 \rightarrow K_L^0$	288	730	813	1543	1397229
95	$D^{*0} \rightarrow \pi^0 D^0, D^0 \rightarrow K_L^0 K^+ K^-$	62	740	799	1539	1398768

rowNo	cascade decay branch of $D^{*0}$	iCaseDcyBrP	nCase	nCcCase	nAllCase	nCCase
96	$D^{*0} \rightarrow D^0 \gamma, D^0 \rightarrow \pi^0 \pi^0 \pi^+ \pi^- K_S^0, K_S^0 \rightarrow \pi^+ \pi^-$	271	665	769	1434	1400202
97	$D^{*0} \rightarrow D^0 \gamma, D^0 \rightarrow \pi^0 \rho^+ K^-, \rho^+ \rightarrow \pi^0 \pi^+$	172	707	725	1432	1401634
98	$D^{*0} \rightarrow \pi^0 D^0, D^0 \rightarrow \pi^+ \eta K^-, \eta \rightarrow \pi^0 \pi^0 \pi^0$	359	697	734	1431	1403065
99	$D^{*0} \rightarrow D^0 \gamma, D^0 \rightarrow e^+ \nu_e K^{*-}, K^{*-} \rightarrow \pi^- \bar{K}^0, \bar{K}^0 \rightarrow K_L^0$	180	667	753	1420	1404485
100	$D^{*0} \rightarrow D^0 \gamma, D^0 \rightarrow \mu^+ \nu_\mu K^{*-}, K^{*-} \rightarrow \pi^0 K^-$	245	656	763	1419	1405904
rest	$D^{*0} \rightarrow \text{others (5237 in total)}$	—	103671	116688	220359	1626263

Table 11: Cascade decay branches of  $D^0$ .

rowNo	cascade decay branch of $D^0$	iCascDcyBrP	nCase	nCcCase	nAllCase	nCCCase
1	$D^0 \rightarrow \pi^+ K^-$	2	1119014	978951	2097965	2097965
2	$D^0 \rightarrow \pi^0 \pi^+ K^-$	1	108406	116345	224751	2322716
3	$D^0 \rightarrow e^+ \nu_e K^-$	8	41740	42507	84247	2406963
4	$D^0 \rightarrow \mu^+ \nu_\mu K^-$	16	24179	26070	50249	2457212
5	$D^0 \rightarrow \pi^0 \pi^0 \pi^+ K^-$	23	17240	18853	36093	2493305
6	$D^0 \rightarrow K_L^0 \pi^+ \pi^-$	42	15951	18364	34315	2527620
7	$D^0 \rightarrow K^- a_1^+, a_1^+ \rightarrow \pi^0 \rho^+, \rho^+ \rightarrow \pi^0 \pi^+$	7	16139	17832	33971	2561591
8	$D^0 \rightarrow K^- a_1^+, a_1^+ \rightarrow \rho^0 \pi^+, \rho^0 \rightarrow \pi^+ \pi^-$	11	15027	17627	32654	2594245
9	$D^0 \rightarrow \rho^+ K^{*-}, \rho^+ \rightarrow \pi^0 \pi^+, K^{*-} \rightarrow \pi^0 K^-$	12	15086	16627	31713	2625958
10	$D^0 \rightarrow \rho^+ K^{*-}, \rho^+ \rightarrow \pi^0 \pi^+, K^{*-} \rightarrow \pi^- \bar{K}^0, \bar{K}^0 \rightarrow K_L^0$	50	13141	15090	28231	2654189
11	$D^0 \rightarrow \pi^+ \pi^- K_S^0, K_S^0 \rightarrow \pi^+ \pi^-$	57	11983	14423	26406	2680595
12	$D^0 \rightarrow \pi^+ \omega K^-, \omega \rightarrow \pi^0 \pi^+ \pi^-$	14	11238	13349	24587	2705182
13	$D^0 \rightarrow \pi^0 \pi^+ \pi^-$	54	10782	12000	22782	2727964
14	$D^0 \rightarrow \rho^+ K^{*-}, \rho^+ \rightarrow \pi^0 \pi^+, K^{*-} \rightarrow \pi^- \bar{K}^0, \bar{K}^0 \rightarrow K_S^0, K_S^0 \rightarrow \pi^+ \pi^-$	18	10103	12122	22225	2750189
15	$D^0 \rightarrow \pi^+ \pi^- \bar{K}^*, \bar{K}^* \rightarrow \pi^+ K^-$	3	10332	11871	22203	2772392
16	$D^0 \rightarrow \pi^0 \pi^+ \pi^- \bar{K}^*, \bar{K}^* \rightarrow \pi^+ K^-$	10	8493	9777	18270	2790662
17	$D^0 \rightarrow K^- a_1^+, a_1^+ \rightarrow \pi^+ \pi^+ \pi^-$	20	7344	8662	16006	2806668
18	$D^0 \rightarrow \rho^0 \bar{K}^*, \rho^0 \rightarrow \pi^+ \pi^-, \bar{K}^* \rightarrow \pi^+ K^-$	15	6438	7608	14046	2820714
19	$D^0 \rightarrow \pi^0 \pi^0 \pi^+ \pi^-$	34	6395	7219	13614	2834328
20	$D^0 \rightarrow K_L^0 \omega, \omega \rightarrow \pi^0 \pi^+ \pi^-$	119	5827	6972	12799	2847127
21	$D^0 \rightarrow e^+ \nu_e K^{*-}, K^{*-} \rightarrow \pi^0 K^-$	4	6179	6458	12637	2859764
22	$D^0 \rightarrow \pi^+ \pi^+ \pi^- K^-$	38	5751	6550	12301	2872065
23	$D^0 \rightarrow \pi^0 \pi^0 \pi^0 K_L^0 \pi^+ \pi^-$	31	5585	6394	11979	2884044
24	$D^0 \rightarrow K^- a_1^+, a_1^+ \rightarrow \pi^+ f_0(600), f_0(600) \rightarrow \pi^+ \pi^-$	0	5341	6402	11743	2895787
25	$D^0 \rightarrow \pi^0 \pi^0 K_L^0 \pi^+ \pi^-$	40	5412	6157	11569	2907356
26	$D^0 \rightarrow \pi^+ \pi^- K_S^0, K_S^0 \rightarrow \pi^0 \pi^0$	17	5252	6165	11417	2918773
27	$D^0 \rightarrow \pi^0 K_L^0$	129	5176	6107	11283	2930056
28	$D^0 \rightarrow \pi^0 K_S^0, K_S^0 \rightarrow \pi^+ \pi^-$	65	5191	5998	11189	2941245
29	$D^0 \rightarrow \pi^0 \pi^0 \pi^0 K_L^0$	90	4943	5624	10567	2951812
30	$D^0 \rightarrow \pi^0 \pi^0 \bar{K}^*, \bar{K}^* \rightarrow \pi^+ K^-$	5	4860	5225	10085	2961897
31	$D^0 \rightarrow \pi^0 \pi^0 K_L^0$	87	4672	5143	9815	2971712

rowNo	cascade decay branch of $D^0$	iCascDcyBrP	nCase	nCcCase	nAllCase	nCCCase
32	$D^0 \rightarrow \rho^+ K^{*-}, \rho^+ \rightarrow \pi^0 \pi^+, K^{*-} \rightarrow \pi^- \bar{K}^0, \bar{K}^0 \rightarrow K_S^0, K_S^0 \rightarrow \pi^0 \pi^0$	71	4561	5192	9753	2981465
33	$D^0 \rightarrow \omega K_S^0, \omega \rightarrow \pi^0 \pi^+ \pi^-, K_S^0 \rightarrow \pi^+ \pi^-$	102	4399	5314	9713	2991178
34	$D^0 \rightarrow \pi^0 \pi^+ K^-, \pi^0 \rightarrow e^+ e^-$	32	4620	5006	9626	3000804
35	$D^0 \rightarrow \omega \bar{K}^*, \omega \rightarrow \pi^0 \pi^+ \pi^-, \bar{K}^* \rightarrow \pi^+ K^-$	135	4498	5072	9570	3010374
36	$D^0 \rightarrow \pi^0 \pi^0 \pi^0 \pi^+ \pi^- K_S^0, K_S^0 \rightarrow \pi^+ \pi^-$	134	4439	5101	9540	3019914
37	$D^0 \rightarrow \pi^0 \rho^+ K^-, \rho^+ \rightarrow \pi^0 \pi^+$	44	4245	4665	8910	3028824
38	$D^0 \rightarrow e^+ \nu_e K^{*-}, K^{*-} \rightarrow \pi^- \bar{K}^0, \bar{K}^0 \rightarrow K_L^0$	28	4165	4740	8905	3037729
39	$D^0 \rightarrow \pi^0 \pi^0 \pi^+ \pi^- K_S^0, K_S^0 \rightarrow \pi^+ \pi^-$	97	4061	4696	8757	3046486
40	$D^0 \rightarrow K^+ K^-$	145	4196	4496	8692	3055178
41	$D^0 \rightarrow \mu^+ \nu_\mu K^{*-}, K^{*-} \rightarrow \pi^0 K^-$	24	4109	4528	8637	3063815
42	$D^0 \rightarrow \pi^0 \pi^0 \pi^0 K_S^0, K_S^0 \rightarrow \pi^+ \pi^-$	99	4053	4399	8452	3072267
43	$D^0 \rightarrow \pi^0 \pi^0 \pi^0 \pi^+ \pi^-$	48	3959	4373	8332	3080599
44	$D^0 \rightarrow \pi^+ \pi^+ \pi^- \pi^-$	45	3699	4364	8063	3088662
45	$D^0 \rightarrow \pi^0 \pi^0 K_S^0, K_S^0 \rightarrow \pi^+ \pi^-$	153	3575	4183	7758	3096420
46	$D^0 \rightarrow \pi^0 K_L^0 \pi^+ \pi^-$	121	3556	3942	7498	3103918
47	$D^0 \rightarrow \mu^+ \nu_\mu K^{*-}, K^{*-} \rightarrow \pi^- \bar{K}^0, \bar{K}^0 \rightarrow K_L^0$	33	3392	4088	7480	3111398
48	$D^0 \rightarrow \rho^0 \pi^+ K^-, \rho^0 \rightarrow \pi^+ \pi^-$	74	3265	3943	7208	3118606
49	$D^0 \rightarrow \pi^- K^+$	334	3313	3819	7132	3125738
50	$D^0 \rightarrow e^+ \nu_e K^{*-}, K^{*-} \rightarrow \pi^- \bar{K}^0, \bar{K}^0 \rightarrow K_S^0, K_S^0 \rightarrow \pi^+ \pi^-$	53	3131	3703	6834	3132572
51	$D^0 \rightarrow K^- a_1^+, a_1^+ \rightarrow \pi^+ f_0(600), f_0(600) \rightarrow \pi^0 \pi^0$	35	2886	3107	5993	3138565
52	$D^0 \rightarrow \pi^0 \pi^+ \pi^- K_S^0, K_S^0 \rightarrow \pi^+ \pi^-$	136	2709	3174	5883	3144448
53	$D^0 \rightarrow \mu^+ \nu_\mu K^{*-}, K^{*-} \rightarrow \pi^- \bar{K}^0, \bar{K}^0 \rightarrow K_S^0, K_S^0 \rightarrow \pi^+ \pi^-$	66	2613	3125	5738	3150186
54	$D^0 \rightarrow \pi^0 \pi^0 \pi^0 \pi^+ K^-$	123	2461	2778	5239	3155425
55	$D^0 \rightarrow \pi^+ \eta K^-, \eta \rightarrow \gamma \gamma$	36	2453	2702	5155	3160580
56	$D^0 \rightarrow K_L^0 K^+ K^-$	60	2331	2691	5022	3165602
57	$D^0 \rightarrow \pi^+ \pi^- \bar{K}^*, \bar{K}^* \rightarrow \pi^0 \bar{K}^0, \bar{K}^0 \rightarrow K_L^0$	41	2293	2668	4961	3170563
58	$D^0 \rightarrow \pi^0 K_L^0 \eta, \eta \rightarrow \gamma \gamma$	128	2244	2489	4733	3175296
59	$D^0 \rightarrow \pi^+ \eta K^-, \eta \rightarrow \pi^0 \pi^0 \pi^0$	105	2263	2338	4601	3179897
60	$D^0 \rightarrow \pi^0 K_S^0, K_S^0 \rightarrow \pi^0 \pi^0$	91	2130	2448	4578	3184475
61	$D^0 \rightarrow \pi^0 \pi^+ \pi^- K^+ K^-$	122	2043	2393	4436	3188911
62	$D^0 \rightarrow \pi^0 \pi^+ K^{*-}, K^{*-} \rightarrow \pi^0 K^-$	83	2027	2329	4356	3193267
63	$D^0 \rightarrow \pi^0 K_L^0 \eta, \eta \rightarrow \pi^0 \pi^0 \pi^0$	110	2056	2289	4345	3197612
64	$D^0 \rightarrow \omega K_S^0, \omega \rightarrow \pi^0 \pi^+ \pi^-, K_S^0 \rightarrow \pi^0 \pi^0$	200	2024	2293	4317	3201929
65	$D^0 \rightarrow \pi^0 \pi^+ \pi^- \bar{K}^*, \bar{K}^* \rightarrow \pi^0 \bar{K}^0, \bar{K}^0 \rightarrow K_L^0$	68	1963	2286	4249	3206178

rowNo	cascade decay branch of $D^0$	iCascDcyBrP	nCase	nCcCase	nAllCase	nCCCase
66	$D^0 \rightarrow \pi^0 \pi^0 \pi^0 \pi^+ \pi^- K_S^0, K_S^0 \rightarrow \pi^0 \pi^0$	165	1973	2223	4196	3210374
67	$D^0 \rightarrow e^+ \nu_e \pi^-$	104	1890	2225	4115	3214489
68	$D^0 \rightarrow \pi^+ \pi^- \bar{K}^*, \bar{K}^* \rightarrow \pi^0 \bar{K}^0, \bar{K}^0 \rightarrow K_S^0, K_S^0 \rightarrow \pi^+ \pi^-$	100	1771	2126	3897	3218386
69	$D^0 \rightarrow \pi^0 \pi^0 K^+ K^-$	166	1872	2005	3877	3222263
70	$D^0 \rightarrow \pi^0 \bar{K}^*, \bar{K}^* \rightarrow \pi^0 \bar{K}^0, \bar{K}^0 \rightarrow K_L^0$	19	1801	2070	3871	3226134
71	$D^0 \rightarrow \pi^0 \pi^+ K^{*-}, K^{*-} \rightarrow \pi^- \bar{K}^0, \bar{K}^0 \rightarrow K_L^0$	303	1742	2067	3809	3229943
72	$D^0 \rightarrow K_S^0 K^+ K^-, K_S^0 \rightarrow \pi^+ \pi^-$	49	1755	2051	3806	3233749
73	$D^0 \rightarrow \pi^0 \eta K_S^0, \eta \rightarrow \gamma \gamma, K_S^0 \rightarrow \pi^+ \pi^-$	77	1783	1996	3779	3237528
74	$D^0 \rightarrow \pi^0 \pi^0 \pi^+ \pi^- K_S^0, K_S^0 \rightarrow \pi^0 \pi^0$	187	1752	2020	3772	3241300
75	$D^0 \rightarrow \pi^0 \pi^0 \pi^0 K_S^0, K_S^0 \rightarrow \pi^0 \pi^0$	64	1749	1847	3596	3244896
76	$D^0 \rightarrow \mu^+ \nu_\mu \pi^-$	67	1672	1898	3570	3248466
77	$D^0 \rightarrow K_L^0 \pi^+ \pi^+ \pi^- \pi^-$	250	1588	1972	3560	3252026
78	$D^0 \rightarrow K_L^0 \eta', \eta' \rightarrow \rho^0 \gamma, \rho^0 \rightarrow \pi^+ \pi^-$	59	1642	1903	3545	3255571
79	$D^0 \rightarrow \pi^0 \eta K_S^0, \eta \rightarrow \pi^0 \pi^0 \pi^0, K_S^0 \rightarrow \pi^+ \pi^-$	210	1655	1791	3446	3259017
80	$D^0 \rightarrow \pi^0 \pi^+ \pi^- \bar{K}^*, \bar{K}^* \rightarrow \pi^0 \bar{K}^0, \bar{K}^0 \rightarrow K_S^0, K_S^0 \rightarrow \pi^+ \pi^-$	137	1468	1845	3313	3262330
81	$D^0 \rightarrow \rho^0 \bar{K}^*, \rho^0 \rightarrow \pi^+ \pi^-, \bar{K}^* \rightarrow \pi^0 \bar{K}^0, \bar{K}^0 \rightarrow K_L^0$	37	1565	1723	3288	3265618
82	$D^0 \rightarrow \pi^0 \pi^0 K_S^0, K_S^0 \rightarrow \pi^0 \pi^0$	270	1568	1720	3288	3268906
83	$D^0 \rightarrow \pi^+ \eta K^-, \eta \rightarrow \pi^0 \pi^+ \pi^-$	194	1559	1689	3248	3272154
84	$D^0 \rightarrow \pi^+ K_1^-, K_1^- \rightarrow \pi^+ \pi^- K^-$	52	1489	1717	3206	3275360
85	$D^0 \rightarrow \pi^0 K_L^0 \eta, \eta \rightarrow \pi^0 \pi^+ \pi^-$	169	1496	1682	3178	3278538
86	$D^0 \rightarrow \pi^0 \bar{K}^*, \bar{K}^* \rightarrow \pi^0 \bar{K}^0, \bar{K}^0 \rightarrow K_S^0, K_S^0 \rightarrow \pi^+ \pi^-$	198	1472	1582	3054	3281592
87	$D^0 \rightarrow \pi^+ K^- \eta', \eta' \rightarrow \rho^0 \gamma, \rho^0 \rightarrow \pi^+ \pi^-$	62	1415	1637	3052	3284644
88	$D^0 \rightarrow \pi^0 \pi^+ K^{*-}, K^{*-} \rightarrow \pi^- \bar{K}^0, \bar{K}^0 \rightarrow K_S^0, K_S^0 \rightarrow \pi^+ \pi^-$	154	1378	1616	2994	3287638
89	$D^0 \rightarrow e^+ \nu_e K^{*-}, K^{*-} \rightarrow \pi^- \bar{K}^0, \bar{K}^0 \rightarrow K_S^0, K_S^0 \rightarrow \pi^0 \pi^0$	143	1362	1623	2985	3290623
90	$D^0 \rightarrow \pi^+ \pi^+ \pi^- \pi^- K_S^0, K_S^0 \rightarrow \pi^+ \pi^-$	231	1306	1626	2932	3293555
91	$D^0 \rightarrow \pi^+ K_1^-, K_1^- \rightarrow \rho^0 K^-, \rho^0 \rightarrow \pi^+ \pi^-$	118	1357	1574	2931	3296486
92	$D^0 \rightarrow \pi^+ K_1^-, K_1^- \rightarrow \rho^- \bar{K}^0, \rho^- \rightarrow \pi^0 \pi^-, \bar{K}^0 \rightarrow K_L^0$	158	1265	1521	2786	3299272
93	$D^0 \rightarrow \pi^0 \pi^0 \pi^+ K^-, \pi^0 \rightarrow e^+ e^-$	116	1349	1411	2760	3302032
94	$D^0 \rightarrow K_S^0 \eta', K_S^0 \rightarrow \pi^+ \pi^-, \eta' \rightarrow \rho^0 \gamma, \rho^0 \rightarrow \pi^+ \pi^-$	89	1269	1389	2658	3304690
95	$D^0 \rightarrow \pi^0 \pi^+ \pi^- K_S^0, K_S^0 \rightarrow \pi^0 \pi^0$	208	1173	1428	2601	3307291
96	$D^0 \rightarrow e^+ \nu_e \rho^-, \rho^- \rightarrow \pi^0 \pi^-$	192	1228	1349	2577	3309868
97	$D^0 \rightarrow \rho^0 \rho^0, \rho^0 \rightarrow \pi^+ \pi^-, \rho^0 \rightarrow \pi^+ \pi^-$	114	1119	1420	2539	3312407
98	$D^0 \rightarrow \rho^+ K^{*-}, \rho^+ \rightarrow \pi^0 \pi^+, K^{*-} \rightarrow \pi^0 K^-, \pi^0 \rightarrow e^+ e^-$	217	1237	1283	2520	3314927
99	$D^0 \rightarrow \mu^+ \nu_\mu K^{*-}, K^{*-} \rightarrow \pi^- \bar{K}^0, \bar{K}^0 \rightarrow K_S^0, K_S^0 \rightarrow \pi^0 \pi^0$	107	1190	1327	2517	3317444

rowNo	cascade decay branch of $D^0$	iCascDcyBrP	nCase	nCcCase	nAllCase	nCCase
100	$D^0 \rightarrow \pi^0 \bar{K}_1^0, \bar{K}_1^0 \rightarrow \rho^+ K^-, \rho^+ \rightarrow \pi^0 \pi^+$	47	1200	1278	2478	3319922
rest	$D^0 \rightarrow \text{others (3343 in total)}$	—	117653	133475	251128	3571050

Table 12: 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	342330	—	342330	342330
2	$\pi^0 \rightarrow e^+e^+e^-e^-$	1	1574	—	1574	343904

Table 13: Decay final states of  $D^{*+}$ .

rowNo	decay final state of $D^{*+}$	iDcyFStP	nCase	nCcCase	nAllCase	nCCase
1	$D^{*+} \rightarrow \pi^+ \pi^+ K^-$	18	456077	370897	826974	826974
2	$D^{*+} \rightarrow \pi^0 \pi^+ \pi^+ K^-$	14	41813	45768	87581	914555
3	$D^{*+} \rightarrow \pi^0 \pi^0 \pi^+ \pi^+ K^-$	11	26203	29152	55355	969910
4	$D^{*+} \rightarrow \pi^+ \pi^+ \pi^+ \pi^- K^-$	0	18432	21773	40205	1010115
5	$D^{*+} \rightarrow \pi^0 K_L^0 \pi^+ \pi^+ \pi^-$	22	12979	15228	28207	1038322
6	$D^{*+} \rightarrow \pi^0 \pi^0 \pi^+ \pi^+ \pi^-$	8	11392	13227	24619	1062941
7	$D^{*+} \rightarrow \pi^0 \pi^+ \pi^+ \pi^+ \pi^- \pi^-$	3	10723	12847	23570	1086511
8	$D^{*+} \rightarrow e^+ \nu_e \pi^+ K^-$	19	10846	11371	22217	1108728
9	$D^{*+} \rightarrow \pi^0 \pi^0 \pi^0 \pi^+ \pi^-$	23	9701	11050	20751	1129479
10	$D^{*+} \rightarrow \pi^0 \pi^+ \pi^+ \pi^- K^-$	16	8925	10687	19612	1149091
11	$D^{*+} \rightarrow \pi^0 \pi^0 K_L^0 \pi^+$	9	8405	9331	17736	1166827
12	$D^{*+} \rightarrow \mu^+ \nu_\mu \pi^+ K^-$	5	7288	7954	15242	1182069
13	$D^{*+} \rightarrow \pi^0 \pi^+ \pi^+ \pi^-$	53	6573	7382	13955	1196024
14	$D^{*+} \rightarrow e^+ \nu_e \pi^0 \pi^+ K^-$	28	6566	7079	13645	1209669
15	$D^{*+} \rightarrow \pi^+ \pi^+ \pi^+ \pi^- \pi^-$	10	5277	6472	11749	1221418
16	$D^{*+} \rightarrow K_L^0 \pi^+ \pi^+ \pi^-$	34	5039	5940	10979	1232397
17	$D^{*+} \rightarrow \mu^+ \nu_\mu \pi^0 \pi^+ K^-$	55	4932	5377	10309	1242706
18	$D^{*+} \rightarrow \pi^0 \pi^0 \pi^0 K_L^0 \pi^+$	33	4311	5015	9326	1252032
19	$D^{*+} \rightarrow \pi^0 \pi^0 \pi^+ \pi^+ \pi^- \pi^-$	69	4162	5080	9242	1261274
20	$D^{*+} \rightarrow \pi^0 \pi^0 K_L^0 \pi^+ \pi^-$	38	4313	4798	9111	1270385
21	$D^{*+} \rightarrow \pi^0 \pi^0 \pi^0 \pi^+ \pi^-$	2	3798	4398	8196	1278581
22	$D^{*+} \rightarrow e^+ \nu_e \pi^0 K_L^0$	17	3468	3964	7432	1286013
23	$D^{*+} \rightarrow \mu^+ \nu_\mu \pi^0 K_L^0$	52	3397	3810	7207	1293220
24	$D^{*+} \rightarrow \pi^0 \pi^0 \pi^0 \pi^+$	75	3417	3723	7140	1300360
25	$D^{*+} \rightarrow e^+ \nu_e \pi^0 \pi^+ \pi^-$	7	3221	3771	6992	1307352
26	$D^{*+} \rightarrow \mu^+ \nu_\mu \pi^0 \pi^+ \pi^-$	24	3155	3638	6793	1314145
27	$D^{*+} \rightarrow \pi^0 K_L^0 \pi^+$	56	2905	3356	6261	1320406
28	$D^{*+} \rightarrow \pi^0 \pi^0 \pi^0 \pi^+ \pi^+ \pi^- \pi^-$	37	2458	2855	5313	1325719
29	$D^{*+} \rightarrow \pi^0 \pi^0 \pi^0 \pi^+ \pi^+ K^-$	4	2293	2548	4841	1330560
30	$D^{*+} \rightarrow \pi^0 \pi^0 \pi^0 K_L^0 \pi^+ \pi^-$	70	2217	2549	4766	1335326
31	$D^{*+} \rightarrow \pi^0 \pi^0 \pi^0 \pi^0 \pi^+ \pi^+ \pi^-$	57	2017	2391	4408	1339734
32	$D^{*+} \rightarrow e^+ e^- \pi^0 \pi^+ \pi^+ K^-$	6	2109	2190	4299	1344033
33	$D^{*+} \rightarrow \pi^0 \pi^+ \pi^+ \pi^- \gamma \gamma$	79	1859	2157	4016	1348049



rowNo	decay final state of $D^{*+}$	iDcyFStP	nCase	nCcCase	nAllCase	nCCase
34	$D^{*+} \rightarrow e^+ e^- \pi^+ \pi^+ K^-$	67	1902	1944	3846	1351895
35	$D^{*+} \rightarrow \pi^0 \pi^+ K^+ K^-$	58	1675	1901	3576	1355471
36	$D^{*+} \rightarrow \pi^0 \pi^0 \pi^0 \pi^0 \pi^+$	63	1580	1817	3397	1358868
37	$D^{*+} \rightarrow \pi^0 \pi^0 \pi^0 \pi^+$	21	1555	1823	3378	1362246
38	$D^{*+} \rightarrow \pi^0 \pi^0 \pi^+ K^+ K^-$	110	1600	1603	3203	1365449
39	$D^{*+} \rightarrow e^+ \nu_e K_L^0 \pi^+ \pi^-$	40	1475	1663	3138	1368587
40	$D^{*+} \rightarrow e^+ \nu_e \pi^0 \pi^0 \pi^+ \pi^-$	27	1536	1518	3054	1371641
41	$D^{*+} \rightarrow \mu^+ \nu_\mu K_L^0 \pi^+ \pi^-$	100	1392	1626	3018	1374659
42	$D^{*+} \rightarrow \pi^+ K^+ K^-$	46	1370	1446	2816	1377475
43	$D^{*+} \rightarrow \pi^0 \pi^0 \pi^0 \pi^0 K_L^0 \pi^+$	59	1335	1435	2770	1380245
44	$D^{*+} \rightarrow \mu^+ \nu_\mu \pi^0 \pi^0 \pi^+ \pi^-$	122	1351	1413	2764	1383009
45	$D^{*+} \rightarrow \pi^0 K_L^0 \pi^+ \gamma \gamma$	127	1194	1338	2532	1385541
46	$D^{*+} \rightarrow e^+ \nu_e \pi^+ \pi^+ \pi^- \pi^-$	126	1210	1291	2501	1388042
47	$D^{*+} \rightarrow \pi^0 \pi^0 \pi^+ \pi^+ \pi^- \gamma \gamma$	119	1108	1333	2441	1390483
48	$D^{*+} \rightarrow e^+ \nu_e \pi^0 \pi^0 \pi^0$	49	1125	1272	2397	1392880
49	$D^{*+} \rightarrow \mu^+ \nu_\mu \pi^0 \pi^0 \pi^0$	121	1113	1268	2381	1395261
50	$D^{*+} \rightarrow \pi^+ \pi^+ \pi^- K^+ K^-$	87	1116	1259	2375	1397636
51	$D^{*+} \rightarrow \mu^+ \nu_\mu \pi^+ \pi^+ \pi^- \pi^-$	42	1080	1207	2287	1399923
52	$D^{*+} \rightarrow \pi^+ \pi^- K^+$	89	1006	1248	2254	1402177
53	$D^{*+} \rightarrow \pi^0 \pi^0 \pi^+ \gamma \gamma$	32	1037	1105	2142	1404319
54	$D^{*+} \rightarrow e^+ e^- \pi^0 \pi^0 \pi^+ \pi^+ \pi^-$	15	1016	1071	2087	1406406
55	$D^{*+} \rightarrow e^+ e^- \pi^0 \pi^+ \pi^+ \pi^-$	68	1014	1038	2052	1408458
56	$D^{*+} \rightarrow \pi^0 \pi^0 \pi^+ \pi^- K^+$	80	930	1085	2015	1410473
57	$D^{*+} \rightarrow \pi^0 \pi^0 \pi^0 \pi^0 \pi^0 \pi^+$	61	940	1059	1999	1412472
58	$D^{*+} \rightarrow e^+ \nu_e \pi^0 \pi^0 K_L^0$	66	889	1021	1910	1414382
59	$D^{*+} \rightarrow \pi^0 \pi^+ \pi^+ \pi^- K^+ K^-$	26	831	954	1785	1416167
60	$D^{*+} \rightarrow \pi^+ \pi^+ K^- \gamma \gamma$	136	810	951	1761	1417928
61	$D^{*+} \rightarrow \pi^0 \pi^0 K_L^0 K^+$	129	800	875	1675	1419603
62	$D^{*+} \rightarrow \pi^0 \pi^+ \pi^+ K^- \gamma$	78	831	825	1656	1421259
63	$D^{*+} \rightarrow \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^-$	30	716	879	1595	1422854
64	$D^{*+} \rightarrow K_L^0 \pi^+ \pi^+ \pi^+ \pi^- \pi^-$	123	708	879	1587	1424441
65	$D^{*+} \rightarrow K_L^0 \pi^+ K^+ K^-$	31	708	855	1563	1426004
66	$D^{*+} \rightarrow \mu^+ \nu_\mu \pi^0 \pi^0 K_L^0$	189	773	782	1555	1427559
67	$D^{*+} \rightarrow \pi^0 \pi^+ \pi^+ \pi^- \gamma$	135	714	794	1508	1429067
68	$D^{*+} \rightarrow e^+ e^- \pi^0 K_L^0 \pi^+$	20	722	783	1505	1430572

rowNo	decay final state of $D^{*+}$	iDcyFStP	nCase	nCcCase	nAllCase	nCCCase
69	$D^{*+} \rightarrow K_L^0 \pi^+ \pi^+ \pi^- \gamma$	35	641	793	1434	1432006
70	$D^{*+} \rightarrow e^+ \nu_e \pi^+ \pi^-$	177	588	650	1238	1433244
71	$D^{*+} \rightarrow K_L^0 \pi^+ \pi^+ K^-$	54	542	637	1179	1434423
72	$D^{*+} \rightarrow \pi^+ \pi^+ \pi^+ \pi^- \pi^- \gamma$	150	558	619	1177	1435600
73	$D^{*+} \rightarrow e^+ e^- K_L^0 \pi^+ \pi^+ \pi^-$	86	559	609	1168	1436768
74	$D^{*+} \rightarrow \pi^+ \pi^+ \pi^+ \pi^- K^- \gamma$	146	527	636	1163	1437931
75	$D^{*+} \rightarrow \mu^+ \nu_\mu \pi^+ \pi^-$	93	545	613	1158	1439089
76	$D^{*+} \rightarrow e^+ e^- \pi^0 \pi^0 \pi^0 \pi^+ \pi^-$	95	537	603	1140	1440229
77	$D^{*+} \rightarrow \pi^0 \pi^0 \pi^0 \pi^0 \pi^+ \gamma \gamma$	180	560	576	1136	1441365
78	$D^{*+} \rightarrow e^+ e^- \pi^0 \pi^0 K_L^0 \pi^+$	166	511	563	1074	1442439
79	$D^{*+} \rightarrow \pi^+ \pi^+ K^- \gamma$	90	484	589	1073	1443512
80	$D^{*+} \rightarrow \pi^0 K_L^0 \pi^+ \gamma$	45	519	514	1033	1444545
81	$D^{*+} \rightarrow e^+ e^- \pi^0 \pi^0 \pi^0 \pi^+$	120	494	499	993	1445538
82	$D^{*+} \rightarrow \pi^0 \pi^0 \pi^+ \pi^+ \pi^- \gamma$	140	436	548	984	1446522
83	$D^{*+} \rightarrow \pi^0 \pi^0 \pi^0 \pi^0 \pi^0 \pi^0 \pi^+$	200	508	468	976	1447498
84	$D^{*+} \rightarrow \pi^0 \pi^0 \pi^+ \pi^+ \pi^+ \pi^- K^-$	137	437	523	960	1448458
85	$D^{*+} \rightarrow e^+ e^- \pi^+ \pi^+ \pi^+ \pi^- \pi^-$	76	460	475	935	1449393
86	$D^{*+} \rightarrow \pi^+ \pi^+ \pi^- \gamma \gamma$	170	423	495	918	1450311
87	$D^{*+} \rightarrow K_L^0 \pi^+ \pi^- K^+$	65	412	499	911	1451222
88	$D^{*+} \rightarrow e^+ e^- \pi^+ \pi^+ \pi^+ \pi^- K^-$	196	429	472	901	1452123
89	$D^{*+} \rightarrow K_L^0 \pi^+ \gamma \gamma$	48	387	445	832	1452955
90	$D^{*+} \rightarrow e^+ \nu_e \pi^0 \pi^0 \pi^0 \pi^0$	114	378	443	821	1453776
91	$D^{*+} \rightarrow \pi^0 \pi^+ \pi^- K^+$	44	385	433	818	1454594
92	$D^{*+} \rightarrow \pi^+ \pi^+ \pi^- \pi^- K^+$	178	365	443	808	1455402
93	$D^{*+} \rightarrow \pi^0 \pi^0 \pi^0 \pi^+ \pi^+ \pi^+ \pi^- K^-$	64	366	433	799	1456201
94	$D^{*+} \rightarrow \pi^+ \pi^+ \pi^-$	1	357	430	787	1456988
95	$D^{*+} \rightarrow K_L^0 K_L^0 \pi^+ \pi^+ \pi^-$	269	347	402	749	1457737
96	$D^{*+} \rightarrow e^+ e^- \pi^0 K_L^0 \pi^+ \pi^+ \pi^-$	133	335	368	703	1458440
97	$D^{*+} \rightarrow e^+ e^- \pi^0 \pi^0 \pi^0 \pi^0 \pi^+ \pi^+ \pi^-$	273	318	382	700	1459140
98	$D^{*+} \rightarrow \pi^0 K_L^0 K^+$	183	329	361	690	1459830
99	$D^{*+} \rightarrow e^+ e^- \pi^0 \pi^+ \pi^+ \pi^+ \pi^- \pi^-$	41	358	326	684	1460514
100	$D^{*+} \rightarrow K_L^0 \pi^+ \pi^+ \pi^- \gamma \gamma$	292	296	386	682	1461196
rest	$D^{*+} \rightarrow \text{others (1051 in total)}$	—	21934	24994	46928	1508124

Table 14: Decay final states of  $D^{*0}$ .

rowNo	decay final state of $D^{*0}$	iDcyFStP	nCase	nCcCase	nAllCase	nCCase
1	$D^{*0} \rightarrow \pi^0 \pi^+ K^-$	2	297683	275080	572763	572763
2	$D^{*0} \rightarrow \pi^+ K^- \gamma$	30	160713	146952	307665	880428
3	$D^{*0} \rightarrow \pi^0 \pi^0 \pi^+ K^-$	1	33070	35214	68284	948712
4	$D^{*0} \rightarrow \pi^0 \pi^0 \pi^0 \pi^+ K^-$	15	20366	21928	42294	991006
5	$D^{*0} \rightarrow \pi^0 \pi^+ \pi^+ \pi^- K^-$	0	18252	21148	39400	1030406
6	$D^{*0} \rightarrow \pi^0 \pi^+ K^- \gamma$	11	17909	19110	37019	1067425
7	$D^{*0} \rightarrow e^+ e^- \pi^+ K^-$	81	18422	17527	35949	1103374
8	$D^{*0} \rightarrow e^+ \nu_e \pi^0 K^-$	5	13246	13242	26488	1129862
9	$D^{*0} \rightarrow \pi^0 \pi^0 \pi^+ K^- \gamma$	24	11217	12334	23551	1153413
10	$D^{*0} \rightarrow \pi^0 \pi^0 K_L^0 \pi^+ \pi^-$	27	9974	11432	21406	1174819
11	$D^{*0} \rightarrow \pi^+ \pi^+ \pi^- K^- \gamma$	17	9570	11325	20895	1195714
12	$D^{*0} \rightarrow \pi^0 \pi^0 \pi^+ \pi^+ \pi^- \pi^-$	8	8423	9860	18283	1213997
13	$D^{*0} \rightarrow \pi^0 \pi^0 \pi^+ \pi^+ \pi^- K^-$	16	8317	9603	17920	1231917
14	$D^{*0} \rightarrow \mu^+ \nu_\mu \pi^0 K^-$	6	7478	7856	15334	1247251
15	$D^{*0} \rightarrow e^+ \nu_e K^- \gamma$	19	7158	7171	14329	1261580
16	$D^{*0} \rightarrow \pi^0 \pi^0 \pi^0 \pi^+ \pi^-$	4	6691	7372	14063	1275643
17	$D^{*0} \rightarrow \pi^0 K_L^0 \pi^+ \pi^- \gamma$	34	5956	6661	12617	1288260
18	$D^{*0} \rightarrow \pi^0 \pi^+ \pi^+ \pi^- \pi^-$	39	5343	6241	11584	1299844
19	$D^{*0} \rightarrow \pi^0 \pi^0 \pi^0 \pi^+ \pi^-$	70	5231	5912	11143	1310987
20	$D^{*0} \rightarrow \pi^0 \pi^+ \pi^+ \pi^- K^- \gamma$	64	4898	5837	10735	1321722
21	$D^{*0} \rightarrow \pi^0 K_L^0 \pi^+ \pi^-$	41	5053	5661	10714	1332436
22	$D^{*0} \rightarrow \pi^0 \pi^+ \pi^+ \pi^- \pi^- \gamma$	40	4789	5850	10639	1343075
23	$D^{*0} \rightarrow \pi^0 \pi^0 \pi^+ \pi^-$	38	4913	5530	10443	1353518
24	$D^{*0} \rightarrow \mu^+ \nu_\mu K^- \gamma$	20	3941	4333	8274	1361792
25	$D^{*0} \rightarrow \pi^0 \pi^0 \pi^0 \pi^+ \pi^- \gamma$	61	3689	4154	7843	1369635
26	$D^{*0} \rightarrow \pi^0 \pi^0 \pi^0 K_L^0 \pi^+ \pi^-$	89	3280	3740	7020	1376655
27	$D^{*0} \rightarrow \pi^0 \pi^0 \pi^+ \pi^- \gamma$	7	3033	3428	6461	1383116
28	$D^{*0} \rightarrow e^+ e^- \pi^0 \pi^+ K^-$	29	3014	3239	6253	1389369
29	$D^{*0} \rightarrow \pi^0 \pi^0 \pi^0 \pi^+ \pi^+ \pi^- \pi^-$	66	2917	3335	6252	1395621
30	$D^{*0} \rightarrow \pi^+ \pi^+ \pi^- \pi^- \gamma$	35	2784	3359	6143	1401764
31	$D^{*0} \rightarrow K_L^0 \pi^+ \pi^- \gamma$	22	2593	3036	5629	1407393
32	$D^{*0} \rightarrow \pi^0 \pi^+ \pi^- \gamma$	31	2577	2895	5472	1412865
33	$D^{*0} \rightarrow e^+ e^- \pi^0 \pi^+ K^-$	80	2499	2585	5084	1417949

rowNo	decay final state of $D^{*0}$	iDcyFStP	nCase	nCcCase	nAllCase	nCCase
34	$D^{*0} \rightarrow \pi^0 \pi^0 \pi^0 K_L^0$	36	2244	2487	4731	1422680
35	$D^{*0} \rightarrow \pi^0 \pi^0 \pi^0 K_L^0 \pi^+ \pi^-$	14	2089	2393	4482	1427162
36	$D^{*0} \rightarrow e^+ \nu_e \pi^0 \pi^0 K^-$	3	2070	2240	4310	1431472
37	$D^{*0} \rightarrow \pi^0 \pi^0 \pi^0 K_L^0$	58	1991	2177	4168	1435640
38	$D^{*0} \rightarrow \pi^0 \pi^0 \pi^0 \pi^0 \pi^+ \pi^-$	86	1931	2216	4147	1439787
39	$D^{*0} \rightarrow \pi^0 \pi^0 K_L^0 \pi^+ \pi^- \gamma$	65	1779	2036	3815	1443602
40	$D^{*0} \rightarrow \pi^0 \pi^0 \pi^0 \pi^0 \pi^+ \pi^- \pi^-$	77	1759	1983	3742	1447344
41	$D^{*0} \rightarrow \pi^0 \pi^0 \pi^+ \pi^- \pi^- \gamma$	113	1599	1967	3566	1450910
42	$D^{*0} \rightarrow \pi^0 \pi^0 K_L^0$	169	1604	1831	3435	1454345
43	$D^{*0} \rightarrow \pi^0 \pi^0 \pi^0 \pi^+ K^-$	62	1568	1682	3250	1457595
44	$D^{*0} \rightarrow \mu^+ \nu_\mu \pi^0 \pi^0 K^-$	25	1530	1703	3233	1460828
45	$D^{*0} \rightarrow e^+ \nu_e \pi^0 K_L^0 \pi^-$	12	1423	1629	3052	1463880
46	$D^{*0} \rightarrow \mu^+ \nu_\mu \pi^0 K_L^0 \pi^-$	111	1306	1534	2840	1466720
47	$D^{*0} \rightarrow \pi^0 \pi^0 K_L^0 \gamma$	49	1208	1341	2549	1469269
48	$D^{*0} \rightarrow \pi^0 K^+ K^-$	85	1205	1336	2541	1471810
49	$D^{*0} \rightarrow \pi^0 \pi^0 \pi^0 K_L^0 \gamma$	116	1162	1371	2533	1474343
50	$D^{*0} \rightarrow \pi^0 \pi^+ K^- \gamma \gamma$	74	1158	1236	2394	1476737
51	$D^{*0} \rightarrow \pi^0 \pi^0 \pi^0 K_L^0 \pi^+ \pi^- \gamma$	108	1099	1277	2376	1479113
52	$D^{*0} \rightarrow e^+ \nu_e \pi^0 K^- \gamma$	23	1139	1236	2375	1481488
53	$D^{*0} \rightarrow e^+ \nu_e \pi^0 \pi^+ \pi^- \pi^-$	28	1111	1235	2346	1483834
54	$D^{*0} \rightarrow \pi^0 \pi^0 \pi^0 \pi^+ \pi^- \gamma$	71	1065	1234	2299	1486133
55	$D^{*0} \rightarrow \pi^0 \pi^+ \pi^- K^+ K^-$	76	1009	1287	2296	1488429
56	$D^{*0} \rightarrow \mu^+ \nu_\mu \pi^0 \pi^+ \pi^- \pi^-$	87	1048	1191	2239	1490668
57	$D^{*0} \rightarrow \pi^0 \pi^- K^+$	319	1013	1145	2158	1492826
58	$D^{*0} \rightarrow \pi^0 \pi^0 \pi^0 \pi^+ \pi^- \pi^- \gamma$	69	979	1108	2087	1494913
59	$D^{*0} \rightarrow e^+ e^- \pi^0 \pi^0 \pi^+ \pi^-$	175	961	1010	1971	1496884
60	$D^{*0} \rightarrow \pi^0 \pi^0 \pi^0 \pi^0 \pi^0 \pi^+ \pi^-$	106	912	1036	1948	1498832
61	$D^{*0} \rightarrow e^+ e^- \pi^0 \pi^+ K^- \gamma$	44	936	1005	1941	1500773
62	$D^{*0} \rightarrow e^+ e^- \pi^0 K_L^0 \pi^+ \pi^-$	94	907	959	1866	1502639
63	$D^{*0} \rightarrow \pi^0 K_L^0 \gamma$	171	805	961	1766	1504405
64	$D^{*0} \rightarrow \mu^+ \nu_\mu \pi^0 K^- \gamma$	137	817	923	1740	1506145
65	$D^{*0} \rightarrow \pi^0 \pi^0 \pi^0 \pi^0 \pi^0 \pi^0$	93	849	863	1712	1507857
66	$D^{*0} \rightarrow e^+ e^- \pi^+ \pi^- K^-$	21	813	887	1700	1509557
67	$D^{*0} \rightarrow \pi^0 \pi^0 \pi^+ \pi^- \gamma \gamma$	199	752	927	1679	1511236
68	$D^{*0} \rightarrow \pi^0 \pi^0 \pi^+ \pi^- K^+ K^-$	92	789	889	1678	1512914

rowNo	decay final state of $D^{*0}$	iDcyFStP	nCase	nCcCase	nAllCase	nCCase
69	$D^{*0} \rightarrow \pi^0 \pi^0 \pi^0 \pi^+ K^- \gamma$	132	805	873	1678	1514592
70	$D^{*0} \rightarrow e^+ e^- \pi^+ K^- \gamma$	102	784	877	1661	1516253
71	$D^{*0} \rightarrow \pi^0 \pi^0 \pi^0 K^+ K^-$	60	777	874	1651	1517904
72	$D^{*0} \rightarrow e^+ \nu_e K_L^0 \pi^- \gamma$	105	749	837	1586	1519490
73	$D^{*0} \rightarrow \pi^0 \pi^0 K^+ K^-$	10	756	798	1554	1521044
74	$D^{*0} \rightarrow e^+ e^- \pi^0 \pi^+ \pi^+ \pi^- K^-$	148	788	754	1542	1522586
75	$D^{*0} \rightarrow \pi^0 K_L^0 K^+ K^-$	45	740	799	1539	1524125
76	$D^{*0} \rightarrow e^+ e^- \pi^0 \pi^+ \pi^+ \pi^- \pi^-$	90	766	750	1516	1525641
77	$D^{*0} \rightarrow \pi^0 \pi^0 K_L^0 \gamma \gamma$	67	714	791	1505	1527146
78	$D^{*0} \rightarrow \pi^0 \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^-$	147	676	826	1502	1528648
79	$D^{*0} \rightarrow \pi^0 \pi^0 \pi^0 \pi^0$	158	708	787	1495	1530143
80	$D^{*0} \rightarrow \pi^0 \pi^0 \pi^0 \pi^0 \pi^0$	153	751	743	1494	1531637
81	$D^{*0} \rightarrow \mu^+ \nu_\mu K_L^0 \pi^- \gamma$	83	632	836	1468	1533105
82	$D^{*0} \rightarrow \pi^0 K_L^0 \pi^+ \pi^+ \pi^- \pi^-$	157	656	799	1455	1534560
83	$D^{*0} \rightarrow K^+ K^- \gamma$	75	689	716	1405	1535965
84	$D^{*0} \rightarrow \pi^0 \pi^0 \pi^0 \pi^0 K_L^0$	184	660	729	1389	1537354
85	$D^{*0} \rightarrow e^+ \nu_e \pi^+ \pi^- \pi^- \gamma$	59	635	679	1314	1538668
86	$D^{*0} \rightarrow e^+ e^- \pi^0 \pi^+ \pi^-$	135	644	665	1309	1539977
87	$D^{*0} \rightarrow \pi^0 K_L^0 \pi^+ K^-$	78	588	660	1248	1541225
88	$D^{*0} \rightarrow \pi^+ \pi^- K^+ K^- \gamma$	46	561	658	1219	1542444
89	$D^{*0} \rightarrow e^+ \nu_e \pi^0 \pi^-$	54	541	669	1210	1543654
90	$D^{*0} \rightarrow \mu^+ \nu_\mu \pi^+ \pi^- \pi^- \gamma$	190	543	646	1189	1544843
91	$D^{*0} \rightarrow \pi^- K^+ \gamma$	351	575	600	1175	1546018
92	$D^{*0} \rightarrow \pi^0 \pi^+ \pi^- \gamma \gamma$	194	515	542	1057	1547075
93	$D^{*0} \rightarrow \mu^+ \nu_\mu \pi^0 \pi^-$	37	497	558	1055	1548130
94	$D^{*0} \rightarrow \pi^+ K^- \gamma \gamma \gamma$	18	472	549	1021	1549151
95	$D^{*0} \rightarrow e^+ \nu_e \pi^0 \pi^0 \pi^-$	133	447	556	1003	1550154
96	$D^{*0} \rightarrow \pi^0 \pi^0 \pi^0 \pi^0 \pi^+ \pi^- \gamma$	188	497	505	1002	1551156
97	$D^{*0} \rightarrow \mu^+ \nu_\mu \pi^0 \pi^0 \pi^-$	164	454	501	955	1552111
98	$D^{*0} \rightarrow \pi^0 \pi^0 K^+ K^- \gamma$	96	446	500	946	1553057
99	$D^{*0} \rightarrow \pi^0 \pi^0 \pi^0 \pi^0 \gamma$	149	431	512	943	1554000
100	$D^{*0} \rightarrow \pi^0 K_L^0 \gamma \gamma$	101	452	456	908	1554908
rest	$D^{*0} \rightarrow$ others (1173 in total)	—	33533	37822	71355	1626263

Table 15: Decay final states of  $D^0$ .

rowNo	decay final state of $D^0$	iDcyFStP	nCase	nCcCase	nAllCase	nCCase
1	$D^0 \rightarrow \pi^+ K^-$	2	1119014	978951	2097965	2097965
2	$D^0 \rightarrow \pi^0 \pi^+ K^-$	1	108406	116345	224751	2322716
3	$D^0 \rightarrow \pi^0 \pi^0 \pi^+ K^-$	4	65964	72567	138531	2461247
4	$D^0 \rightarrow \pi^+ \pi^+ \pi^- K^-$	0	59427	69467	128894	2590141
5	$D^0 \rightarrow e^+ \nu_e K^-$	6	41740	42507	84247	2674388
6	$D^0 \rightarrow \pi^0 K_L^0 \pi^+ \pi^-$	24	32616	37645	70261	2744649
7	$D^0 \rightarrow \pi^0 \pi^+ \pi^+ \pi^- \pi^-$	10	27294	32502	59796	2804445
8	$D^0 \rightarrow \pi^0 \pi^+ \pi^+ \pi^- K^-$	7	27103	31445	58548	2862993
9	$D^0 \rightarrow \mu^+ \nu_\mu K^-$	8	24179	26070	50249	2913242
10	$D^0 \rightarrow \pi^0 \pi^0 \pi^0 \pi^+ \pi^-$	5	21615	24302	45917	2959159
11	$D^0 \rightarrow \pi^+ \pi^+ \pi^- \pi^-$	28	17075	20503	37578	2996737
12	$D^0 \rightarrow \pi^0 \pi^0 \pi^+ \pi^-$	9	17097	19615	36712	3033449
13	$D^0 \rightarrow K_L^0 \pi^+ \pi^-$	27	16178	18641	34819	3068268
14	$D^0 \rightarrow \pi^0 \pi^+ \pi^-$	31	15999	18029	34028	3102296
15	$D^0 \rightarrow \pi^0 \pi^0 K_L^0 \pi^+ \pi^-$	26	10653	12129	22782	3125078
16	$D^0 \rightarrow \pi^0 \pi^0 \pi^+ \pi^+ \pi^- \pi^-$	59	9456	11224	20680	3145758
17	$D^0 \rightarrow \pi^0 \pi^0 \pi^0 K_L^0$	39	7213	8173	15386	3161144
18	$D^0 \rightarrow \pi^0 \pi^0 \pi^0 K_L^0 \pi^+ \pi^-$	20	6813	7838	14651	3175795
19	$D^0 \rightarrow e^+ \nu_e \pi^0 K^-$	3	6863	7214	14077	3189872
20	$D^0 \rightarrow \pi^0 \pi^0 K_L^0$	11	6473	7213	13686	3203558
21	$D^0 \rightarrow \pi^0 \pi^0 \pi^0 \pi^+ \pi^-$	15	6225	7148	13373	3216931
22	$D^0 \rightarrow \pi^0 \pi^0 \pi^0 \pi^+ \pi^+ \pi^- \pi^-$	76	5781	6702	12483	3229414
23	$D^0 \rightarrow \pi^0 K_L^0$	71	5176	6107	11283	3240697
24	$D^0 \rightarrow e^+ e^- \pi^0 \pi^+ K^-$	25	5295	5548	10843	3251540
25	$D^0 \rightarrow \mu^+ \nu_\mu \pi^0 K^-$	14	5106	5614	10720	3262260
26	$D^0 \rightarrow \pi^0 \pi^0 \pi^0 \pi^+ K^-$	62	5059	5470	10529	3272789
27	$D^0 \rightarrow e^+ e^- \pi^+ K^-$	21	4778	5162	9940	3282729
28	$D^0 \rightarrow e^+ \nu_e K_L^0 \pi^-$	17	4648	5269	9917	3292646
29	$D^0 \rightarrow \mu^+ \nu_\mu K_L^0 \pi^-$	22	4222	5074	9296	3301942
30	$D^0 \rightarrow K^+ K^-$	82	4196	4496	8692	3310634
31	$D^0 \rightarrow e^+ \nu_e \pi^+ \pi^- \pi^-$	30	3745	4137	7882	3318516
32	$D^0 \rightarrow \pi^+ \pi^- K^+ K^-$	29	3432	4104	7536	3326052
33	$D^0 \rightarrow \mu^+ \nu_\mu \pi^+ \pi^- \pi^-$	41	3414	3893	7307	3333359

rowNo	decay final state of $D^0$	iDcyFStP	nCase	nCcCase	nAllCase	nCCase
34	$D^0 \rightarrow \pi^- K^+$	155	3313	3819	7132	3340491
35	$D^0 \rightarrow \pi^0 \pi^0 \pi^0 \pi^0 \pi^+ \pi^-$	19	2991	3446	6437	3346928
36	$D^0 \rightarrow \pi^+ K^- \gamma \gamma$	23	2857	3136	5993	3352921
37	$D^0 \rightarrow \pi^0 \pi^0 K^+ K^-$	67	2688	2888	5576	3358497
38	$D^0 \rightarrow \pi^0 \pi^0 \pi^0 \pi^0$	40	2662	2814	5476	3363973
39	$D^0 \rightarrow \pi^0 \pi^+ \pi^- K^+ K^-$	49	2494	2942	5436	3369409
40	$D^0 \rightarrow \pi^0 K^+ K^-$	16	2399	2689	5088	3374497
41	$D^0 \rightarrow K_L^0 K^+ K^-$	36	2331	2691	5022	3379519
42	$D^0 \rightarrow \pi^0 \pi^0 \pi^0 \pi^0$	131	2368	2617	4985	3384504
43	$D^0 \rightarrow \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^-$	75	2229	2746	4975	3389479
44	$D^0 \rightarrow K_L^0 \pi^+ \pi^+ \pi^- \pi^-$	84	2209	2677	4886	3394365
45	$D^0 \rightarrow \pi^0 K_L^0 \gamma \gamma$	70	2313	2561	4874	3399239
46	$D^0 \rightarrow \pi^0 \pi^0 \pi^0$	55	2255	2596	4851	3404090
47	$D^0 \rightarrow \pi^0 \pi^+ \pi^- \gamma \gamma$	47	2216	2542	4758	3408848
48	$D^0 \rightarrow \pi^0 \pi^0 \pi^0 K_L^0$	66	2188	2431	4619	3413467
49	$D^0 \rightarrow e^+ e^- \pi^0 \pi^+ \pi^-$	101	2238	2316	4554	3418021
50	$D^0 \rightarrow e^+ \nu_e \pi^-$	61	1890	2225	4115	3422136
51	$D^0 \rightarrow K_L^0 \pi^+ K^-$	60	1875	2098	3973	3426109
52	$D^0 \rightarrow K_L^0 \pi^+ \pi^- \gamma$	35	1680	1955	3635	3429744
53	$D^0 \rightarrow \mu^+ \nu_\mu \pi^-$	42	1672	1898	3570	3433314
54	$D^0 \rightarrow e^+ \nu_e \pi^0 \pi^0 \pi^-$	80	1581	1824	3405	3436719
55	$D^0 \rightarrow \pi^+ \pi^+ \pi^- K^- \gamma$	38	1512	1780	3292	3440011
56	$D^0 \rightarrow \pi^0 \pi^+ K^- \gamma$	78	1562	1702	3264	3443275
57	$D^0 \rightarrow \mu^+ \nu_\mu \pi^0 \pi^0 \pi^-$	64	1544	1672	3216	3446491
58	$D^0 \rightarrow \pi^+ \pi^+ \pi^- \pi^- \gamma$	54	1398	1522	2920	3449411
59	$D^0 \rightarrow e^+ e^- K_L^0 \pi^+ \pi^-$	147	1405	1512	2917	3452328
60	$D^0 \rightarrow K_L^0 \pi^- K^+$	136	1280	1519	2799	3455127
61	$D^0 \rightarrow \pi^+ \pi^- \gamma \gamma$	72	1269	1431	2700	3457827
62	$D^0 \rightarrow \pi^0 \pi^0 \pi^0 \gamma \gamma$	53	1289	1351	2640	3460467
63	$D^0 \rightarrow e^+ \nu_e \pi^0 \pi^-$	97	1282	1349	2631	3463098
64	$D^0 \rightarrow e^+ e^- \pi^0 \pi^+ \pi^-$	122	1273	1340	2613	3465711
65	$D^0 \rightarrow \pi^+ \pi^- \pi^- K^+$	110	1166	1401	2567	3468278
66	$D^0 \rightarrow \pi^0 \pi^0 \pi^0 \pi^+ \pi^- K^-$	102	1238	1320	2558	3470836
67	$D^0 \rightarrow e^+ e^- \pi^+ \pi^+ \pi^- K^-$	138	1257	1289	2546	3473382
68	$D^0 \rightarrow \mu^+ \nu_\mu \pi^0 \pi^-$	113	1166	1297	2463	3475845

rowNo	decay final state of $D^0$	iDcyFStP	nCase	nCcCase	nAllCase	nCCase
69	$D^0 \rightarrow K_L^0 \gamma \gamma$	99	1147	1303	2450	3478295
70	$D^0 \rightarrow \pi^+ \pi^-$	12	1139	1265	2404	3480699
71	$D^0 \rightarrow K_L^0 K_L^0 \pi^+ \pi^-$	44	1085	1273	2358	3483057
72	$D^0 \rightarrow e^+ e^- \pi^+ \pi^- \pi^- \pi^-$	90	1129	1224	2353	3485410
73	$D^0 \rightarrow \pi^0 \pi^0 \pi^0 \pi^0 \pi^0$	95	1039	1130	2169	3487579
74	$D^0 \rightarrow K_L^0 \pi^+ \pi^- \gamma \gamma$	134	943	1147	2090	3489669
75	$D^0 \rightarrow \pi^+ \pi^+ \pi^- K^- \gamma \gamma$	144	927	1113	2040	3491709
76	$D^0 \rightarrow \pi^0 \pi^0 \pi^+ \pi^- \gamma \gamma$	58	913	995	1908	3493617
77	$D^0 \rightarrow \pi^+ \pi^+ \pi^- \pi^- \gamma \gamma$	149	837	982	1819	3495436
78	$D^0 \rightarrow e^+ e^- \pi^0 \pi^0 K_L^0$	114	853	921	1774	3497210
79	$D^0 \rightarrow \pi^0 \pi^+ \pi^- \gamma$	124	822	905	1727	3498937
80	$D^0 \rightarrow e^+ e^- \pi^0 \pi^0 K_L^0 \pi^+ \pi^-$	105	851	858	1709	3500646
81	$D^0 \rightarrow \pi^+ \pi^+ \pi^+ \pi^- \pi^- K^-$	89	811	876	1687	3502333
82	$D^0 \rightarrow e^+ e^- \pi^0 \pi^0 \pi^+ \pi^-$	179	799	885	1684	3504017
83	$D^0 \rightarrow e^+ e^- \pi^0 K_L^0 \pi^+ \pi^-$	117	809	864	1673	3505690
84	$D^0 \rightarrow e^+ e^- \pi^+ \pi^-$	37	719	752	1471	3507161
85	$D^0 \rightarrow \pi^0 \pi^0 \pi^+ \pi^- \gamma$	68	646	816	1462	3508623
86	$D^0 \rightarrow e^+ e^- \pi^0 \pi^+ \pi^+ \pi^- \pi^-$	92	722	726	1448	3510071
87	$D^0 \rightarrow \pi^0 \pi^0 \pi^+ \pi^+ \pi^- K^-$	172	654	763	1417	3511488
88	$D^0 \rightarrow \pi^0 \pi^0 \pi^- K^+$	146	663	743	1406	3512894
89	$D^0 \rightarrow \pi^0 K_L^0 \pi^+ \pi^+ \pi^- \pi^-$	73	602	786	1388	3514282
90	$D^0 \rightarrow e^+ e^- \pi^0 \pi^0 \pi^+ \pi^+ \pi^- \pi^-$	65	630	664	1294	3515576
91	$D^0 \rightarrow e^+ e^- \pi^0 K_L^0$	83	564	693	1257	3516833
92	$D^0 \rightarrow \pi^0 \pi^+ \pi^+ \pi^+ \pi^- \pi^- K^-$	119	556	690	1246	3518079
93	$D^0 \rightarrow e^+ e^- \pi^0 \pi^0 \pi^+ K^-$	88	593	649	1242	3519321
94	$D^0 \rightarrow \pi^0 K_L^0 K^+ K^-$	33	557	650	1207	3520528
95	$D^0 \rightarrow \pi^0 \pi^0 K_L^0 K_L^0$	130	572	606	1178	3521706
96	$D^0 \rightarrow \pi^0 K_L^0 \gamma$	50	568	605	1173	3522879
97	$D^0 \rightarrow \pi^0 \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^-$	48	464	659	1123	3524002
98	$D^0 \rightarrow \pi^0 \pi^0 K_L^0 \gamma \gamma$	43	502	563	1065	3525067
99	$D^0 \rightarrow \pi^0 \pi^0$	128	443	576	1019	3526086
100	$D^0 \rightarrow \pi^0 \pi^0 \gamma \gamma$	52	470	541	1011	3527097
rest	$D^0 \rightarrow$ others (722 in total)	—	20341	23612	43953	3571050



Table 16: 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	342330	—	342330	342330
2	$\pi^0 \rightarrow e^+ e^+ e^- e^-$	1	1574	—	1574	343904

Table 17: Production branches of  $D_s^+$ .

rowNo	production branch of $D_s^+$	iProdBrP	nCase	nCcCase	nAllCase	nCCCase
1	$D_s^{*+} \rightarrow D_s^+ \gamma$	0	87938	99279	187217	187217
2	$D_{s0}^{*+} \rightarrow \pi^0 D_s^+$	1	5887	6594	12481	199698
3	$D_s^{*+} \rightarrow \pi^0 D_s^+$	5	5820	6537	12357	212055
4	$D_{s1}^{\prime+} \rightarrow D_s^+ \gamma$	17	967	1164	2131	214186
5	$B^+ \rightarrow \bar{D}^0 D_s^+$	2	206	216	422	214608
6	$e^- \rightarrow e^+ \bar{K}^0 D^{*-} D_s^+ \gamma^I$	246	0	399	399	215007
7	$e^+ e^- \rightarrow K^- \bar{D}^{*0} D_s^+ \gamma^I$	307	392	0	392	215399
8	$e^- \rightarrow e^+ K^- \bar{D}^{*0} D_s^+ \gamma^I$	236	0	368	368	215767
9	$e^- \rightarrow e^+ \pi^+ K^- D^{*-} D_s^+ \gamma^I$	1035	0	368	368	216135
10	$B^+ \rightarrow \bar{D}^{*0} D_s^+$	3	166	199	365	216500
11	$e^+ e^- \rightarrow \bar{K}^0 D^{*-} D_s^+ \gamma^I$	544	320	0	320	216820
12	$e^- \rightarrow e^+ \pi^- \bar{K}^0 \bar{D}^{*0} D_s^+$	361	0	316	316	217136
13	$e^- \rightarrow e^+ \pi^- \bar{K}^0 \bar{D}^{*0} D_s^+ \gamma^I$	312	0	314	314	217450
14	$e^- \rightarrow e^+ \pi^+ K^- D^{*-} D_s^+$	284	0	311	311	217761
15	$e^+ e^- \rightarrow \pi^+ K^- D^{*-} D_s^+$	222	308	0	308	218069
16	$e^+ e^- \rightarrow \pi^+ K^- D^{*-} D_s^+ \gamma^I$	290	308	0	308	218377
17	$e^+ e^- \rightarrow \pi^- \bar{K}^0 \bar{D}^{*0} D_s^+$	323	308	0	308	218685
18	$e^- \rightarrow e^+ \bar{K}^0 D^{*-} D_s^+$	291	0	293	293	218978
19	$e^+ e^- \rightarrow \pi^- \bar{K}^0 \bar{D}^{*0} D_s^+ \gamma^I$	404	284	0	284	219262
20	$e^+ e^- \rightarrow K^- \bar{D}^{*0} D_s^+$	438	280	0	280	219542
21	$e^- \rightarrow e^+ K^- \bar{D}^{*0} D_s^+$	833	0	249	249	219791
22	$e^+ e^- \rightarrow \bar{K}^0 D^{*-} D_s^+$	463	247	0	247	220038
23	$e^- \rightarrow e^+ \pi^0 K^- \bar{D}^{*0} D_s^+ \gamma^I$	652	0	221	221	220259
24	$e^- \rightarrow e^+ \bar{K}^0 D^{*-} D_s^+ \gamma^I \gamma^I$	541	0	217	217	220476
25	$e^- \rightarrow e^+ \pi^0 \bar{K}^0 D^{*-} D_s^+ \gamma^I$	348	0	216	216	220692
26	$e^- \rightarrow e^+ K^- \bar{D}^{*0} D_s^+ \gamma^I \gamma^I$	760	0	208	208	220900
27	$e^- \rightarrow e^+ \pi^0 \pi^+ K^- D^{*-} D_s^+$	354	0	204	204	221104
28	$e^- \rightarrow e^+ \pi^0 \bar{K}^0 D^{*-} D_s^+$	523	0	204	204	221308
29	$e^+ e^- \rightarrow K^- \bar{D}^{*0} D_s^+ \gamma^I \gamma^I$	267	198	0	198	221506
30	$e^- \rightarrow e^+ \pi^0 K^- \bar{D}^{*0} D_s^+$	827	0	195	195	221701
31	$B^0 \rightarrow D^{*-} D_s^+$	33	84	109	193	221894
32	$e^- \rightarrow e^+ \pi^0 \pi^+ K^- D^{*-} D_s^+ \gamma^I$	645	0	192	192	222086

rowNo	production branch of $D_s^+$	iProdBrP	nCase	nCcCase	nAllCase	nCCase
33	$e^+e^- \rightarrow \pi^0 K^- \bar{D}^{*0} D_s^+ \gamma^I$	744	191	0	191	222277
34	$e^- \rightarrow e^+ \pi^+ K^- D^{*-} D_s^+ \gamma^I \gamma^I$	758	0	190	190	222467
35	$e^+e^- \rightarrow \pi^0 K^- \bar{D}^{*0} D_s^+$	230	185	0	185	222652
36	$e^+e^- \rightarrow \pi^0 \bar{K}^0 D^{*-} D_s^+$	714	185	0	185	222837
37	$e^- \rightarrow e^+ \pi^0 \pi^- \bar{K}^0 \bar{D}^{*0} D_s^+$	381	0	184	184	223021
38	$e^- \rightarrow e^+ \pi^0 \pi^- \bar{K}^0 \bar{D}^{*0} D_s^+ \gamma^I$	276	0	178	178	223199
39	$e^+e^- \rightarrow \pi^0 \pi^+ K^- D^{*-} D_s^+$	686	175	0	175	223374
40	$e^+e^- \rightarrow \pi^0 \pi^+ K^- D^{*-} D_s^+ \gamma^I$	365	174	0	174	223548
41	$e^+e^- \rightarrow \bar{K}^0 D^{*-} D_s^+ \gamma^I \gamma^I$	380	174	0	174	223722
42	$e^- \rightarrow e^+ \pi^+ \pi^- K^- \bar{D}^{*0} D_s^+$	854	0	173	173	223895
43	$e^+e^- \rightarrow \pi^0 \pi^- \bar{K}^0 \bar{D}^{*0} D_s^+$	1021	171	0	171	224066
44	$e^- \rightarrow e^+ \pi^+ K^{*-} D^{*-} D_s^+$	688	0	170	170	224236
45	$e^+e^- \rightarrow \pi^0 \bar{K}^0 D^{*-} D_s^+ \gamma^I$	719	169	0	169	224405
46	$e^+e^- \rightarrow \pi^0 \pi^- \bar{K}^0 \bar{D}^{*0} D_s^+ \gamma^I$	226	166	0	166	224571
47	$e^+e^- \rightarrow \pi^- \bar{K}^0 \bar{D}^{*0} D_s^+ \gamma^I \gamma^I$	713	161	0	161	224732
48	$e^+e^- \rightarrow \pi^+ \pi^- K^- \bar{D}^{*0} D_s^+$	581	158	0	158	224890
49	$e^- \rightarrow e^+ \pi^+ \pi^- \bar{K}^0 D^{*-} D_s^+$	1290	0	158	158	225048
50	$e^- \rightarrow e^+ \pi^+ K^{*-} D^{*-} D_s^+ \gamma^I$	220	0	157	157	225205
51	$e^+e^- \rightarrow \pi^- \bar{K}^* \bar{D}^{*0} D_s^+ \gamma^I$	406	157	0	157	225362
52	$e^- \rightarrow e^+ \pi^- \bar{K}^* \bar{D}^{*0} D_s^+$	218	0	155	155	225517
53	$e^- \rightarrow e^+ \pi^- \bar{K}^* \bar{D}^{*0} D_s^+ \gamma^I$	586	0	155	155	225672
54	$e^- \rightarrow e^+ \pi^- \bar{K}^0 \bar{D}^{*0} D_s^+ \gamma^I \gamma^I$	510	0	150	150	225822
55	$e^- \rightarrow e^+ \pi^+ \pi^- K^- \bar{D}^{*0} D_s^+ \gamma^I$	1014	0	150	150	225972
56	$e^+e^- \rightarrow \pi^+ K^{*-} D^{*-} D_s^+ \gamma^I$	451	148	0	148	226120
57	$B^0 \rightarrow D^- D_s^+$	37	60	87	147	226267
58	$e^- \rightarrow e^+ \pi^+ \pi^- \bar{K}^0 D^{*-} D_s^+ \gamma^I$	410	0	147	147	226414
59	$e^+e^- \rightarrow \pi^- \bar{K}^* \bar{D}^{*0} D_s^+$	1049	146	0	146	226560
60	$e^+e^- \rightarrow \pi^+ K^- D^{*-} D_s^+ \gamma^I \gamma^I$	717	145	0	145	226705
61	$e^- \rightarrow e^+ \rho^+ K^- D^{*-} D_s^+$	399	0	142	142	226847
62	$e^- \rightarrow e^+ \rho^+ K^- D^{*-} D_s^+ \gamma^I$	803	0	139	139	226986
63	$e^+e^- \rightarrow K^{*-} \bar{D}^{*0} D_s^+ \gamma^I$	1095	132	0	132	227118
64	$e^+e^- \rightarrow \pi^+ \pi^- K^- \bar{D}^{*0} D_s^+ \gamma^I$	599	128	0	128	227246
65	$e^+e^- \rightarrow \pi^+ \pi^- \bar{K}^0 D^{*-} D_s^+$	602	128	0	128	227374
66	$e^+e^- \rightarrow \pi^+ K^{*-} D^{*-} D_s^+$	260	127	0	127	227501

rowNo	production branch of $D_s^+$	iProdBrP	nCase	nCcCase	nAllCase	nCCase
67	$e^+e^- \rightarrow \pi^+\pi^-\bar{K}^0 D^{*-} D_s^+ \gamma^I$	1259	125	0	125	227626
68	$B^+ \rightarrow \bar{D}_2^{*0} D_s^+$	6	66	56	122	227748
69	$e^- \rightarrow e^+\pi^0\pi^-\bar{K}^* \bar{D}^{*0} D_s^+$	432	0	122	122	227870
70	$e^+e^- \rightarrow \rho^+ K^- D^{*-} D_s^+$	506	121	0	121	227991
71	$e^- \rightarrow e^+\rho^-\bar{K}^0 \bar{D}^{*0} D_s^+ \gamma^I$	1015	0	121	121	228112
72	$e^- \rightarrow e^+\pi^0 K^- \bar{D}^{*0} D_s^+ \gamma^I \gamma^I$	723	0	120	120	228232
73	$e^- \rightarrow e^+\bar{K}^* D^{*-} D_s^+$	746	0	118	118	228350
74	$e^+e^- \rightarrow \rho^-\bar{K}^0 \bar{D}^{*0} D_s^+ \gamma^I$	1388	117	0	117	228467
75	$e^- \rightarrow e^+\bar{K}^* D^{*-} D_s^+ \gamma^I$	925	0	115	115	228582
76	$e^+e^- \rightarrow \bar{K}^* D^{*-} D_s^+ \gamma^I$	459	109	0	109	228691
77	$e^- \rightarrow e^+\rho^-\bar{K}^0 \bar{D}^{*0} D_s^+$	342	0	108	108	228799
78	$e^+e^- \rightarrow K^-\bar{D}^0 D_s^+ \gamma^I$	683	107	0	107	228906
79	$e^+e^- \rightarrow \rho^+ K^- D^{*-} D_s^+ \gamma^I$	649	106	0	106	229012
80	$e^- \rightarrow e^+\pi^0 \bar{K}^0 D^{*-} D_s^+ \gamma^I \gamma^I$	752	0	106	106	229118
81	$e^- \rightarrow e^+ K^{*-} \bar{D}^{*0} D_s^+ \gamma^I$	642	0	105	105	229223
82	$e^+e^- \rightarrow \pi^0\pi^-\bar{K}^* \bar{D}^{*0} D_s^+ \gamma^I$	770	103	0	103	229326
83	$e^- \rightarrow e^+\omega \bar{K}^0 D^{*-} D_s^+ \gamma^I$	262	0	102	102	229428
84	$e^- \rightarrow e^+\pi^-\bar{K}^0 \bar{D}^0 D_s^+ \gamma^I$	443	0	102	102	229530
85	$e^+e^- \rightarrow \pi^0\pi^-\bar{K}^* \bar{D}^{*0} D_s^+$	590	102	0	102	229632
86	$e^- \rightarrow e^+\pi^0\pi^+ K^{*-} D^{*-} D_s^+$	636	0	102	102	229734
87	$e^- \rightarrow e^+\pi^0 K^{*-} \bar{D}^{*0} D_s^+ \gamma^I$	1836	0	99	99	229833
88	$e^+e^- \rightarrow \rho^-\bar{K}^0 \bar{D}^{*0} D_s^+$	593	98	0	98	229931
89	$e^- \rightarrow e^+\pi^0\pi^+ K^{*-} D^{*-} D_s^+ \gamma^I$	1765	0	98	98	230029
90	$e^- \rightarrow e^+\pi^-\omega \bar{K}^0 \bar{D}^{*0} D_s^+ \gamma^I$	805	0	97	97	230126
91	$e^- \rightarrow e^+\pi^0 \bar{K}^* D^{*-} D_s^+ \gamma^I$	266	0	96	96	230222
92	$e^- \rightarrow e^+\pi^0 K^{*-} \bar{D}^{*0} D_s^+$	350	0	96	96	230318
93	$e^- \rightarrow e^+ K^{*-} \bar{D}^{*0} D_s^+$	626	0	96	96	230414
94	$e^+e^- \rightarrow K^{*-} \bar{D}^{*0} D_s^+$	314	95	0	95	230509
95	$e^- \rightarrow e^+\omega K^-\bar{D}^{*0} D_s^+ \gamma^I$	300	0	94	94	230603
96	$e^- \rightarrow e^+ K^-\bar{D}^0 D_s^+ \gamma^I$	594	0	94	94	230697
97	$e^- \rightarrow e^+\pi^+\pi^-\bar{K}^* D^{*-} D_s^+ \gamma^I$	906	0	93	93	230790
98	$e^+e^- \rightarrow \pi^0 K^-\bar{D}^{*0} D_s^+ \gamma^I \gamma^I$	1154	91	0	91	230881
99	$e^+e^- \rightarrow \bar{K}^* D^{*-} D_s^+$	628	88	0	88	230969
100	$e^- \rightarrow e^+\pi^0\pi^-\bar{K}^* \bar{D}^{*0} D_s^+ \gamma^I$	1059	0	88	88	231057

rowNo	production branch of $D_s^+$			iProdBrP	nCase	nCcCase	nAllCase	nCCase
rest	others	(13183	in total)	—	26032	29281	55313	286370

Table 18: Production branches of  $D^{*+}$ .

rowNo	production branch of $D^{*+}$	iProdBrP	nCase	nCcCase	nAllCase	nCCase
1	$D_1^0 \rightarrow \pi^- D^{*+}$	7	21711	21004	42715	42715
2	$D_1^+ \rightarrow \pi^0 D^{*+}$	73	11622	10911	22533	65248
3	$D_2^{*0} \rightarrow \pi^- D^{*+}$	2	9305	8921	18226	83474
4	$D_2^{*+} \rightarrow \pi^0 D^{*+}$	51	5042	4890	9932	93406
5	$D_1^0 \rightarrow \pi^- D^{*+}$	8	4804	4640	9444	102850
6	$e^+e^- \rightarrow \pi^0 \pi^- D^{*+} \bar{D}^{*0} \gamma^I$	1356	6816	0	6816	109666
7	$e^- \rightarrow e^+ \pi^0 \pi^- D^{*+} \bar{D}^{*0} \gamma^I$	1126	0	6666	6666	116332
8	$e^+e^- \rightarrow \pi^0 \pi^- D^{*+} \bar{D}^{*0}$	1292	6432	0	6432	122764
9	$e^- \rightarrow e^+ \pi^0 \pi^- D^{*+} \bar{D}^{*0}$	1093	0	6091	6091	128855
10	$e^+e^- \rightarrow \pi^+ \pi^- D^{*+} D^{*-} \gamma^I$	1432	5401	0	5401	134256
11	$e^- \rightarrow e^+ \pi^+ \pi^- D^{*+} D^{*-} \gamma^I$	1433	0	5401	5401	139657
12	$e^- \rightarrow e^+ \pi^- D^{*+} \bar{D}^{*0} \gamma^I$	1161	0	5221	5221	144878
13	$e^+e^- \rightarrow \pi^- D^{*+} \bar{D}^{*0} \gamma^I$	1113	5158	0	5158	150036
14	$D_1^+ \rightarrow \pi^0 D^{*+}$	57	2527	2471	4998	155034
15	$e^+e^- \rightarrow \pi^+ \pi^- D^{*+} D^{*-}$	1225	4790	0	4790	159824
16	$e^- \rightarrow e^+ \pi^+ \pi^- D^{*+} D^{*-}$	1226	0	4790	4790	164614
17	$e^+e^- \rightarrow \pi^0 \pi^+ \pi^- D^{*+} D^{*-} \gamma^I$	1797	4459	0	4459	169073
18	$e^- \rightarrow e^+ \pi^0 \pi^+ \pi^- D^{*+} D^{*-} \gamma^I$	1798	0	4459	4459	173532
19	$e^+e^- \rightarrow \pi^0 \pi^+ \pi^- D^{*+} D^{*-}$	1197	4397	0	4397	177929
20	$e^- \rightarrow e^+ \pi^0 \pi^+ \pi^- D^{*+} D^{*-}$	1198	0	4397	4397	182326
21	$e^+e^- \rightarrow \pi^- D^{*+} \bar{D}^{*0}$	1012	3566	0	3566	185892
22	$e^+e^- \rightarrow \pi^0 \pi^- D^{*+} \bar{D}^{*0} \gamma^I \gamma^I$	1326	3527	0	3527	189419
23	$e^- \rightarrow e^+ \pi^- D^{*+} \bar{D}^{*0}$	1061	0	3523	3523	192942
24	$e^- \rightarrow e^+ \pi^0 \pi^- D^{*+} \bar{D}^{*0} \gamma^I \gamma^I$	1769	0	3424	3424	196366
25	$e^+e^- \rightarrow \pi^- D^{*+} \bar{D}^{*0} \gamma^I \gamma^I$	936	3391	0	3391	199757
26	$e^- \rightarrow e^+ \pi^- D^{*+} \bar{D}^{*0} \gamma^I \gamma^I$	1199	0	3266	3266	203023
27	$e^+e^- \rightarrow \pi^0 D^{*+} D^{*-} \gamma^I$	1188	3185	0	3185	206208
28	$e^- \rightarrow e^+ \pi^0 D^{*+} D^{*-} \gamma^I$	1189	0	3185	3185	209393
29	$D_{s1}^+ \rightarrow K^0 D^{*+}$	45	1597	1363	2960	212353
30	$e^+e^- \rightarrow \pi^0 \pi^0 \pi^- D^{*+} \bar{D}^{*0}$	1482	2955	0	2955	215308
31	$e^+e^- \rightarrow \pi^0 \pi^- \omega D^{*+} \bar{D}^{*0}$	1184	2781	0	2781	218089
32	$e^+e^- \rightarrow \pi^0 \pi^0 \pi^- D^{*+} \bar{D}^{*0} \gamma^I$	1224	2774	0	2774	220863

rowNo	production branch of $D^{*+}$	iProdBrP	nCase	nCcCase	nAllCase	nCCase
33	$e^+e^- \rightarrow \pi^+\pi^- D^{*+} D^{*-} \gamma^I \gamma^I$	1026	2697	0	2697	223560
34	$e^- \rightarrow e^+\pi^+\pi^- D^{*+} D^{*-} \gamma^I \gamma^I$	1027	0	2697	2697	226257
35	$e^- \rightarrow e^+\pi^0\pi^-\omega D^{*+} \bar{D}^{*0}$	1901	0	2684	2684	228941
36	$e^+e^- \rightarrow \pi^-\omega D^{*+} \bar{D}^{*0} \gamma^I$	1105	2676	0	2676	231617
37	$e^- \rightarrow e^+\pi^-\omega D^{*+} \bar{D}^{*0} \gamma^I$	1205	0	2669	2669	234286
38	$e^- \rightarrow e^+\pi^-\omega D^{*+} \bar{D}^{*0}$	947	0	2631	2631	236917
39	$e^- \rightarrow e^+\pi^0\pi^0\pi^- D^{*+} \bar{D}^{*0}$	1025	0	2629	2629	239546
40	$e^- \rightarrow e^+\pi^0\pi^0\pi^- D^{*+} \bar{D}^{*0} \gamma^I$	1440	0	2614	2614	242160
41	$e^+e^- \rightarrow \pi^0\pi^-\omega D^{*+} \bar{D}^{*0} \gamma^I$	1670	2578	0	2578	244738
42	$e^+e^- \rightarrow \pi^+\pi^-\rho^- D^{*+} \bar{D}^{*0}$	1888	2575	0	2575	247313
43	$e^+e^- \rightarrow \pi^+\pi^-\pi^- D^{*+} \bar{D}^{*0}$	1764	2572	0	2572	249885
44	$e^+e^- \rightarrow \pi^0\rho^- D^{*+} \bar{D}^{*0} \gamma^I$	1444	2559	0	2559	252444
45	$e^+e^- \rightarrow \pi^-\omega D^{*+} \bar{D}^{*0}$	1454	2559	0	2559	255003
46	$e^+e^- \rightarrow \pi^+\pi^-\pi^- D^{*+} \bar{D}^{*0} \gamma^I$	1413	2532	0	2532	257535
47	$e^- \rightarrow e^+\pi^+\pi^-\rho^- D^{*+} \bar{D}^{*0}$	1204	0	2478	2478	260013
48	$e^+e^- \rightarrow \pi^0\rho^- D^{*+} \bar{D}^{*0}$	972	2453	0	2453	262466
49	$e^- \rightarrow e^+\pi^0\pi^-\omega D^{*+} \bar{D}^{*0} \gamma^I$	1207	0	2426	2426	264892
50	$e^- \rightarrow e^+\pi^+\pi^-\pi^- D^{*+} \bar{D}^{*0}$	1330	0	2414	2414	267306
51	$e^- \rightarrow e^+\pi^+\pi^-\pi^- D^{*+} \bar{D}^{*0} \gamma^I$	1726	0	2379	2379	269685
52	$e^- \rightarrow e^+\pi^0\rho^- D^{*+} \bar{D}^{*0} \gamma^I$	1509	0	2356	2356	272041
53	$e^- \rightarrow e^+\pi^0\rho^- D^{*+} \bar{D}^{*0}$	1153	0	2354	2354	274395
54	$e^+e^- \rightarrow \pi^+\pi^-\rho^- D^{*+} \bar{D}^{*0} \gamma^I$	1464	2346	0	2346	276741
55	$e^+e^- \rightarrow \pi^0 D^{*+} D^{*-}$	1544	2310	0	2310	279051
56	$e^- \rightarrow e^+\pi^0 D^{*+} D^{*-}$	1545	0	2310	2310	281361
57	$e^- \rightarrow e^+\pi^+\pi^-\rho^- D^{*+} \bar{D}^{*0} \gamma^I$	1582	0	2264	2264	283625
58	$e^+e^- \rightarrow \pi^0\rho^0\pi^- D^{*+} \bar{D}^{*0}$	1409	2199	0	2199	285824
59	$e^+e^- \rightarrow \pi^+\pi^-\omega D^{*+} D^{*-}$	2471	2155	0	2155	287979
60	$e^- \rightarrow e^+\pi^+\pi^-\omega D^{*+} D^{*-}$	2472	0	2155	2155	290134
61	$e^- \rightarrow e^+\pi^0\rho^0\pi^- D^{*+} \bar{D}^{*0}$	1291	0	2113	2113	292247
62	$e^+e^- \rightarrow \rho^0\pi^- D^{*+} \bar{D}^{*0} \gamma^I$	1309	2107	0	2107	294354
63	$e^+e^- \rightarrow \pi^0\pi^+\pi^- D^{*+} D^{*-} \gamma^I \gamma^I$	2623	2082	0	2082	296436
64	$e^- \rightarrow e^+\pi^0\pi^+\pi^- D^{*+} D^{*-} \gamma^I \gamma^I$	2624	0	2082	2082	298518
65	$e^+e^- \rightarrow \pi^0\pi^0 D^{*+} D^{*-} \gamma^I$	1200	2044	0	2044	300562
66	$e^- \rightarrow e^+\pi^0\pi^0 D^{*+} D^{*-} \gamma^I$	1201	0	2044	2044	302606

rowNo	production branch of $D^{*+}$	iProdBrP	nCase	nCcCase	nAllCase	nCCase
67	$e^+e^- \rightarrow \pi^0 D^{*+} D^{*-} \gamma^I \gamma^I$	1260	2034	0	2034	304640
68	$e^- \rightarrow e^+ \pi^0 D^{*+} D^{*-} \gamma^I \gamma^I$	1261	0	2034	2034	306674
69	$e^- \rightarrow e^+ \rho^0 \pi^- D^{*+} \bar{D}^{*0} \gamma^I$	967	0	2033	2033	308707
70	$e^+e^- \rightarrow \pi^0 \pi^- \rho^+ D^{*+} D^{*-}$	1276	2013	0	2013	310720
71	$e^- \rightarrow e^+ \pi^0 \pi^+ \rho^- D^{*+} D^{*-}$	1277	0	2013	2013	312733
72	$e^- \rightarrow e^+ \rho^0 \pi^- D^{*+} \bar{D}^{*0}$	1063	0	1987	1987	314720
73	$e^+e^- \rightarrow \rho^0 \pi^- D^{*+} \bar{D}^{*0}$	1024	1982	0	1982	316702
74	$e^+e^- \rightarrow \pi^0 \pi^+ \rho^- D^{*+} D^{*-}$	1958	1979	0	1979	318681
75	$e^- \rightarrow e^+ \pi^0 \pi^- \rho^+ D^{*+} D^{*-}$	1959	0	1979	1979	320660
76	$e^+e^- \rightarrow \pi^+ \pi^- \omega D^{*+} D^{*-} \gamma^I$	1418	1974	0	1974	322634
77	$e^- \rightarrow e^+ \pi^+ \pi^- \omega D^{*+} D^{*-} \gamma^I$	1419	0	1974	1974	324608
78	$e^+e^- \rightarrow \pi^0 \pi^0 D^{*+} D^{*-}$	1449	1967	0	1967	326575
79	$e^- \rightarrow e^+ \pi^0 \pi^0 D^{*+} D^{*-}$	1450	0	1967	1967	328542
80	$e^+e^- \rightarrow \pi^0 \rho^0 \pi^- D^{*+} \bar{D}^{*0} \gamma^I$	1430	1945	0	1945	330487
81	$e^+e^- \rightarrow \pi^- \rho^+ D^{*+} D^{*-}$	1533	1928	0	1928	332415
82	$e^- \rightarrow e^+ \pi^+ \rho^- D^{*+} D^{*-}$	1534	0	1928	1928	334343
83	$e^+e^- \rightarrow \pi^- \rho^+ D^{*+} D^{*-} \gamma^I$	2089	1922	0	1922	336265
84	$e^- \rightarrow e^+ \pi^+ \rho^- D^{*+} D^{*-} \gamma^I$	2090	0	1922	1922	338187
85	$e^+e^- \rightarrow \pi^0 \pi^- D^{*+} \bar{D}^0 \gamma^I$	1238	1905	0	1905	340092
86	$e^+e^- \rightarrow \pi^0 \pi^- \rho^+ D^{*+} D^{*-} \gamma^I$	969	1901	0	1901	341993
87	$e^- \rightarrow e^+ \pi^0 \pi^+ \rho^- D^{*+} D^{*-} \gamma^I$	970	0	1901	1901	343894
88	$e^+e^- \rightarrow \pi^0 \pi^+ \rho^- D^{*+} D^{*-} \gamma^I$	1346	1896	0	1896	345790
89	$e^- \rightarrow e^+ \pi^0 \pi^- \rho^+ D^{*+} D^{*-} \gamma^I$	1347	0	1896	1896	347686
90	$e^+e^- \rightarrow \pi^0 \pi^+ \pi^- \pi^- D^{*+} \bar{D}^{*0}$	1302	1893	0	1893	349579
91	$e^- \rightarrow e^+ \pi^0 \pi^- D^{*+} \bar{D}^0 \gamma^I$	1350	0	1893	1893	351472
92	$e^+e^- \rightarrow \pi^+ \rho^- D^{*+} D^{*-} \gamma^I$	1168	1867	0	1867	353339
93	$e^- \rightarrow e^+ \pi^- \rho^+ D^{*+} D^{*-} \gamma^I$	1169	0	1867	1867	355206
94	$e^- \rightarrow e^+ \pi^0 \rho^0 \pi^- D^{*+} \bar{D}^{*0} \gamma^I$	1354	0	1858	1858	357064
95	$e^+e^- \rightarrow \pi^+ \rho^- D^{*+} D^{*-}$	1977	1843	0	1843	358907
96	$e^- \rightarrow e^+ \pi^- \rho^+ D^{*+} D^{*-}$	1978	0	1843	1843	360750
97	$e^+e^- \rightarrow K^0 K^- D^{*+} \bar{D}^{*0} \gamma^I$	1319	1800	0	1800	362550
98	$e^- \rightarrow e^+ \pi^0 \pi^+ \pi^- \pi^- D^{*+} \bar{D}^{*0}$	2133	0	1795	1795	364345
99	$e^+e^- \rightarrow K^0 K^- D^{*+} \bar{D}^{*0}$	1274	1761	0	1761	366106
100	$e^+e^- \rightarrow \pi^0 \pi^- D^{*+} \bar{D}^0$	1408	1760	0	1760	367866



rowNo	production branch of $D^{*+}$		iProdBrP	nCase	nCcCase	nAllCase	nCCase
rest	others	(69942 in total)	—	586704	553554	1140258	1508124

Table 19: Production branches of  $D^{*0}$ .

rowNo	production branch of $D^{*0}$	iProdBrP	nCase	nCcCase	nAllCase	nCCase
1	$D_1'^+ \rightarrow \pi^+ D^{*0}$	171	24098	23404	47502	47502
2	$D_1'^0 \rightarrow \pi^0 D^{*0}$	20	12170	12055	24225	71727
3	$D_2^{*+} \rightarrow \pi^+ D^{*0}$	193	10594	10356	20950	92677
4	$D_2^{*0} \rightarrow \pi^0 D^{*0}$	54	5368	5524	10892	103569
5	$D_1^+ \rightarrow \pi^+ D^{*0}$	182	5480	5223	10703	114272
6	$e^- \rightarrow e^+ \pi^0 \pi^+ D^{*-} D^{*0} \gamma^I$	1681	0	6816	6816	121088
7	$e^+ e^- \rightarrow \pi^0 \pi^+ D^{*-} D^{*0} \gamma^I$	1450	6666	0	6666	127754
8	$e^- \rightarrow e^+ \pi^0 \pi^+ D^{*-} D^{*0}$	1617	0	6432	6432	134186
9	$e^+ e^- \rightarrow \pi^0 \pi^+ D^{*-} D^{*0}$	1423	6091	0	6091	140277
10	$D_1^0 \rightarrow \pi^0 D^{*0}$	14	2802	2719	5521	145798
11	$e^+ e^- \rightarrow \pi^+ \pi^- D^{*0} \bar{D}^{*0} \gamma^I$	1298	5373	0	5373	151171
12	$e^- \rightarrow e^+ \pi^+ \pi^- D^{*0} \bar{D}^{*0} \gamma^I$	1299	0	5373	5373	156544
13	$e^+ e^- \rightarrow \pi^+ D^{*-} D^{*0} \gamma^I$	1482	5221	0	5221	161765
14	$e^- \rightarrow e^+ \pi^+ D^{*-} D^{*0} \gamma^I$	1440	0	5158	5158	166923
15	$e^+ e^- \rightarrow \pi^0 \pi^+ \pi^- D^{*0} \bar{D}^{*0}$	1310	4953	0	4953	171876
16	$e^- \rightarrow e^+ \pi^0 \pi^+ \pi^- D^{*0} \bar{D}^{*0}$	1311	0	4953	4953	176829
17	$e^+ e^- \rightarrow \pi^+ \pi^- D^{*0} \bar{D}^{*0}$	1487	4863	0	4863	181692
18	$e^- \rightarrow e^+ \pi^+ \pi^- D^{*0} \bar{D}^{*0}$	1488	0	4863	4863	186555
19	$e^+ e^- \rightarrow \pi^0 \pi^+ \pi^- D^{*0} \bar{D}^{*0} \gamma^I$	1366	4711	0	4711	191266
20	$e^- \rightarrow e^+ \pi^0 \pi^+ \pi^- D^{*0} \bar{D}^{*0} \gamma^I$	1367	0	4711	4711	195977
21	$D_{s1}^+ \rightarrow K^+ D^{*0}$	90	1788	1878	3666	199643
22	$B^- \rightarrow \pi^- D^{*0}$	0	1694	1950	3644	203287
23	$e^- \rightarrow e^+ \pi^+ D^{*-} D^{*0}$	1324	0	3566	3566	206853
24	$e^- \rightarrow e^+ \pi^0 \pi^+ D^{*-} D^{*0} \gamma^I \gamma^I$	1658	0	3527	3527	210380
25	$e^+ e^- \rightarrow \pi^+ D^{*-} D^{*0}$	1379	3523	0	3523	213903
26	$e^+ e^- \rightarrow \pi^0 \pi^+ D^{*-} D^{*0} \gamma^I \gamma^I$	2103	3424	0	3424	217327
27	$e^- \rightarrow e^+ \pi^+ D^{*-} D^{*0} \gamma^I \gamma^I$	1217	0	3391	3391	220718
28	$e^+ e^- \rightarrow \pi^+ D^{*-} D^{*0} \gamma^I \gamma^I$	1520	3266	0	3266	223984
29	$e^+ e^- \rightarrow \pi^0 D^{*0} \bar{D}^{*0} \gamma^I$	1510	3143	0	3143	227127
30	$e^- \rightarrow e^+ \pi^0 D^{*0} \bar{D}^{*0} \gamma^I$	1511	0	3143	3143	230270
31	$e^- \rightarrow e^+ \pi^0 \pi^0 \pi^+ D^{*-} D^{*0}$	1820	0	2955	2955	233225
32	$e^+ e^- \rightarrow \pi^+ \pi^- D^{*0} \bar{D}^{*0} \gamma^I \gamma^I$	1527	2783	0	2783	236008

rowNo	production branch of $D^{*0}$	iProdBrP	nCase	nCcCase	nAllCase	nCCase
33	$e^- \rightarrow e^+ \pi^+ \pi^- D^{*0} \bar{D}^{*0} \gamma^I \gamma^I$	1528	0	2783	2783	238791
34	$e^- \rightarrow e^+ \pi^0 \pi^+ \omega D^{*-} D^{*0}$	1506	0	2781	2781	241572
35	$e^- \rightarrow e^+ \pi^0 \pi^0 \pi^+ D^{*-} D^{*0} \gamma^I$	1545	0	2774	2774	244346
36	$e^+ e^- \rightarrow \pi^0 \pi^+ \omega D^{*-} D^{*0}$	2249	2684	0	2684	247030
37	$e^- \rightarrow e^+ \pi^+ \omega D^{*-} D^{*0} \gamma^I$	1435	0	2676	2676	249706
38	$e^+ e^- \rightarrow \pi^+ \omega D^{*-} D^{*0} \gamma^I$	1523	2669	0	2669	252375
39	$e^+ e^- \rightarrow \pi^+ \omega D^{*-} D^{*0}$	1241	2631	0	2631	255006
40	$e^+ e^- \rightarrow \pi^0 \pi^0 \pi^+ D^{*-} D^{*0}$	1343	2629	0	2629	257635
41	$e^+ e^- \rightarrow \pi^0 \pi^0 \pi^+ D^{*-} D^{*0} \gamma^I$	1756	2614	0	2614	260249
42	$e^- \rightarrow e^+ \pi^0 \pi^+ \omega D^{*-} D^{*0} \gamma^I$	2000	0	2578	2578	262827
43	$e^- \rightarrow e^+ \pi^+ \pi^- \rho^+ D^{*-} D^{*0}$	2233	0	2575	2575	265402
44	$e^- \rightarrow e^+ \pi^+ \pi^+ \pi^- D^{*-} D^{*0}$	2092	0	2572	2572	267974
45	$e^- \rightarrow e^+ \pi^0 \rho^+ D^{*-} D^{*0} \gamma^I$	1764	0	2559	2559	270533
46	$e^- \rightarrow e^+ \pi^+ \omega D^{*-} D^{*0}$	1778	0	2559	2559	273092
47	$e^- \rightarrow e^+ \pi^+ \pi^+ \pi^- D^{*-} D^{*0} \gamma^I$	1745	0	2532	2532	275624
48	$e^+ e^- \rightarrow \pi^+ \pi^- \rho^+ D^{*-} D^{*0}$	1522	2478	0	2478	278102
49	$e^- \rightarrow e^+ \pi^0 \rho^+ D^{*-} D^{*0}$	1264	0	2453	2453	280555
50	$e^+ e^- \rightarrow \pi^0 \pi^+ \omega D^{*-} D^{*0} \gamma^I$	1524	2426	0	2426	282981
51	$e^+ e^- \rightarrow \pi^+ \pi^- \omega D^{*0} \bar{D}^{*0}$	1214	2423	0	2423	285404
52	$e^- \rightarrow e^+ \pi^+ \pi^- \omega D^{*0} \bar{D}^{*0}$	1215	0	2423	2423	287827
53	$e^+ e^- \rightarrow \pi^+ \pi^+ \pi^- D^{*-} D^{*0}$	1664	2414	0	2414	290241
54	$e^+ e^- \rightarrow \pi^+ \pi^+ \pi^- D^{*-} D^{*0} \gamma^I$	2052	2379	0	2379	292620
55	$e^+ e^- \rightarrow \pi^0 \rho^+ D^{*-} D^{*0} \gamma^I$	1841	2356	0	2356	294976
56	$e^+ e^- \rightarrow \pi^0 \rho^+ D^{*-} D^{*0}$	1475	2354	0	2354	297330
57	$e^- \rightarrow e^+ \pi^+ \pi^- \rho^+ D^{*-} D^{*0} \gamma^I$	1794	0	2346	2346	299676
58	$e^+ e^- \rightarrow \pi^0 \pi^- \rho^+ D^{*0} \bar{D}^{*0}$	1261	2318	0	2318	301994
59	$e^- \rightarrow e^+ \pi^0 \pi^+ \rho^- D^{*0} \bar{D}^{*0}$	1262	0	2318	2318	304312
60	$e^+ e^- \rightarrow \pi^+ \pi^- \rho^+ D^{*-} D^{*0} \gamma^I$	1909	2264	0	2264	306576
61	$e^+ e^- \rightarrow \pi^0 \pi^+ \rho^- D^{*0} \bar{D}^{*0}$	1796	2250	0	2250	308826
62	$e^- \rightarrow e^+ \pi^0 \pi^- \rho^+ D^{*0} \bar{D}^{*0}$	1797	0	2250	2250	311076
63	$e^+ e^- \rightarrow \pi^+ \pi^- \omega D^{*0} \bar{D}^{*0} \gamma^I$	2026	2249	0	2249	313325
64	$e^- \rightarrow e^+ \pi^+ \pi^- \omega D^{*0} \bar{D}^{*0} \gamma^I$	2027	0	2249	2249	315574
65	$e^- \rightarrow e^+ \pi^0 \rho^0 \pi^+ D^{*-} D^{*0}$	1742	0	2199	2199	317773
66	$e^+ e^- \rightarrow \pi^0 \pi^+ \pi^- D^{*0} \bar{D}^{*0} \gamma^I \gamma^I$	1703	2191	0	2191	319964

rowNo	production branch of $D^{*0}$	iProdBrP	nCase	nCcCase	nAllCase	nCCase
67	$e^- \rightarrow e^+ \pi^0 \pi^+ \pi^- D^{*0} \bar{D}^{*0} \gamma^I \gamma^I$	1704	0	2191	2191	322155
68	$e^+ e^- \rightarrow \pi^0 \rho^0 \pi^+ D^{*-} D^{*0}$	1613	2113	0	2113	324268
69	$e^+ e^- \rightarrow \pi^0 \pi^- \rho^+ D^{*0} \bar{D}^{*0} \gamma^I$	1622	2111	0	2111	326379
70	$e^- \rightarrow e^+ \pi^0 \pi^+ \rho^- D^{*0} \bar{D}^{*0} \gamma^I$	1623	0	2111	2111	328490
71	$e^- \rightarrow e^+ \rho^0 \pi^+ D^{*-} D^{*0} \gamma^I$	1644	0	2107	2107	330597
72	$e^+ e^- \rightarrow \pi^0 \pi^+ \rho^- D^{*0} \bar{D}^{*0} \gamma^I$	1515	2090	0	2090	332687
73	$e^- \rightarrow e^+ \pi^0 \pi^- \rho^+ D^{*0} \bar{D}^{*0} \gamma^I$	1516	0	2090	2090	334777
74	$e^+ e^- \rightarrow \pi^- \rho^+ D^{*0} \bar{D}^{*0} \gamma^I$	1395	2064	0	2064	336841
75	$e^- \rightarrow e^+ \pi^+ \rho^- D^{*0} \bar{D}^{*0} \gamma^I$	1396	0	2064	2064	338905
76	$e^+ e^- \rightarrow \pi^+ \rho^- D^{*0} \bar{D}^{*0} \gamma^I$	1480	2049	0	2049	340954
77	$e^- \rightarrow e^+ \pi^- \rho^+ D^{*0} \bar{D}^{*0} \gamma^I$	1481	0	2049	2049	343003
78	$e^+ e^- \rightarrow \rho^0 \pi^+ D^{*-} D^{*0} \gamma^I$	1257	2033	0	2033	345036
79	$e^+ e^- \rightarrow \pi^+ \rho^- D^{*0} \bar{D}^{*0}$	1287	2022	0	2022	347058
80	$e^- \rightarrow e^+ \pi^- \rho^+ D^{*0} \bar{D}^{*0}$	1288	0	2022	2022	349080
81	$e^+ e^- \rightarrow \rho^0 \pi^+ D^{*-} D^{*0}$	1394	1987	0	1987	351067
82	$e^+ e^- \rightarrow \pi^0 D^{*0} \bar{D}^{*0}$	2215	1984	0	1984	353051
83	$e^- \rightarrow e^+ \pi^0 D^{*0} \bar{D}^{*0}$	2216	0	1984	1984	355035
84	$e^- \rightarrow e^+ \rho^0 \pi^+ D^{*-} D^{*0}$	1342	0	1982	1982	357017
85	$e^+ e^- \rightarrow \pi^- \rho^+ D^{*0} \bar{D}^{*0}$	1798	1974	0	1974	358991
86	$e^- \rightarrow e^+ \pi^+ \rho^- D^{*0} \bar{D}^{*0}$	1799	0	1974	1974	360965
87	$e^+ e^- \rightarrow \pi^0 \pi^0 D^{*0} \bar{D}^{*0}$	1452	1951	0	1951	362916
88	$e^- \rightarrow e^+ \pi^0 \pi^0 D^{*0} \bar{D}^{*0}$	1453	0	1951	1951	364867
89	$e^- \rightarrow e^+ \pi^0 \rho^0 \pi^+ D^{*-} D^{*0} \gamma^I$	1751	0	1945	1945	366812
90	$e^+ e^- \rightarrow \pi^0 D^{*0} \bar{D}^{*0} \gamma^I \gamma^I$	1238	1943	0	1943	368755
91	$e^- \rightarrow e^+ \pi^0 D^{*0} \bar{D}^{*0} \gamma^I \gamma^I$	1239	0	1943	1943	370698
92	$e^+ e^- \rightarrow \pi^0 \pi^0 D^{*0} \bar{D}^{*0} \gamma^I$	2135	1942	0	1942	372640
93	$e^- \rightarrow e^+ \pi^0 \pi^0 D^{*0} \bar{D}^{*0} \gamma^I$	2136	0	1942	1942	374582
94	$e^- \rightarrow e^+ \pi^0 \pi^+ \pi^- D^{*-} D^{*0}$	1632	0	1893	1893	376475
95	$e^+ e^- \rightarrow \pi^0 \rho^0 \pi^+ D^{*-} D^{*0} \gamma^I$	1679	1858	0	1858	378333
96	$e^+ e^- \rightarrow \rho^0 \pi^+ \pi^- D^{*0} \bar{D}^{*0}$	1567	1801	0	1801	380134
97	$e^- \rightarrow e^+ \rho^0 \pi^+ \pi^- D^{*0} \bar{D}^{*0}$	1568	0	1801	1801	381935
98	$e^- \rightarrow e^+ \bar{K}^0 K^+ D^{*-} D^{*0} \gamma^I$	1650	0	1800	1800	383735
99	$e^+ e^- \rightarrow \pi^0 \pi^+ \pi^+ \pi^- D^{*-} D^{*0}$	2503	1795	0	1795	385530
100	$e^+ e^- \rightarrow K^+ K^- D^{*0} \bar{D}^{*0}$	1888	1787	0	1787	387317

rowNo	production branch of $D^{*0}$	iProdBrP	nCase	nCcCase	nAllCase	nCCase
rest	others (75376 in total)	—	620267	618679	1238946	1626263

Table 20: Production branches of  $D^0$ .

rowNo	production branch of $D^0$	iProdBrP	nCase	nCcCase	nAllCase	nCCase
1	$D^{*+} \rightarrow \pi^+ D^0$	10	669433	613499	1282932	1282932
2	$D^{*0} \rightarrow \pi^0 D^0$	0	539150	538801	1077951	2360883
3	$D^{*0} \rightarrow D^0 \gamma$	12	273961	274351	548312	2909195
4	$D_0^{*+} \rightarrow \pi^+ D^0$	224	23099	22437	45536	2954731
5	$D_2^{*+} \rightarrow \pi^+ D^0$	244	11985	12404	24389	2979120
6	$D_0^{*0} \rightarrow \pi^0 D^0$	7	12079	12291	24370	3003490
7	$D_2^{*0} \rightarrow \pi^0 D^0$	53	7421	7519	14940	3018430
8	$D_{s2}^*(2573)^+ \rightarrow K^+ D^0$	1441	4054	4261	8315	3026745
9	$D_1^0 \rightarrow \pi^+ \pi^- D^0$	106	2373	2413	4786	3031531
10	$B^- \rightarrow \pi^- D^0$	3	1886	2167	4053	3035584
11	$D_1^0 \rightarrow \pi^0 \pi^0 D^0$	64	1650	1667	3317	3038901
12	$D_1^+ \rightarrow \pi^0 \pi^+ D^0$	264	1676	1626	3302	3042203
13	$B^- \rightarrow \rho^- D^0$	17	1357	1466	2823	3045026
14	$e^- \rightarrow e^+ \pi^0 \pi^+ D^{*-} D^0 \gamma^I$	1538	0	1905	1905	3046931
15	$e^+ e^- \rightarrow \pi^0 \pi^+ D^{*-} D^0 \gamma^I$	1582	1893	0	1893	3048824
16	$e^- \rightarrow e^+ \pi^0 \pi^+ D^{*-} D^0$	1599	0	1760	1760	3050584
17	$e^+ e^- \rightarrow \pi^0 \pi^+ D^{*-} D^0$	1595	1733	0	1733	3052317
18	$e^- \rightarrow e^+ \pi^+ D^{*-} D^0 \gamma^I$	1744	0	1661	1661	3053978
19	$e^+ e^- \rightarrow \pi^+ D^{*-} D^0 \gamma^I$	1765	1619	0	1619	3055597
20	$e^+ e^- \rightarrow \pi^+ \pi^- D^0 \bar{D}^{*0} \gamma^I$	1711	1546	0	1546	3057143
21	$e^- \rightarrow e^+ \pi^+ \pi^- D^0 \bar{D}^{*0} \gamma^I$	1451	0	1534	1534	3058677
22	$e^+ e^- \rightarrow \pi^0 \pi^+ \pi^- D^0 \bar{D}^{*0} \gamma^I$	1475	1501	0	1501	3060178
23	$e^- \rightarrow e^+ \pi^0 \pi^+ \pi^- D^0 \bar{D}^{*0}$	2022	0	1476	1476	3061654
24	$e^+ e^- \rightarrow \pi^0 \pi^+ \pi^- D^0 \bar{D}^{*0}$	1446	1425	0	1425	3063079
25	$e^- \rightarrow e^+ \pi^0 \pi^+ \pi^- D^0 \bar{D}^{*0} \gamma^I$	1746	0	1347	1347	3064426
26	$e^+ e^- \rightarrow \pi^+ \pi^- D^0 \bar{D}^{*0}$	1462	1332	0	1332	3065758
27	$e^- \rightarrow e^+ \pi^+ \pi^- D^0 \bar{D}^{*0}$	1541	0	1283	1283	3067041
28	$e^- \rightarrow e^+ \pi^0 \pi^+ D^{*-} D^0 \gamma^I \gamma^I$	1626	0	1085	1085	3068126
29	$e^- \rightarrow e^+ \pi^+ D^{*-} D^0$	1689	0	1054	1054	3069180
30	$e^- \rightarrow e^+ \pi^+ D^{*-} D^0 \gamma^I \gamma^I$	1484	0	1043	1043	3070223
31	$e^+ e^- \rightarrow \pi^+ D^{*-} D^0 \gamma^I \gamma^I$	1766	1039	0	1039	3071262
32	$e^+ e^- \rightarrow \pi^0 \pi^+ D^{*-} D^0 \gamma^I \gamma^I$	1894	1034	0	1034	3072296
33	$e^- \rightarrow e^+ \pi^0 D^0 \bar{D}^{*0} \gamma^I$	2056	0	989	989	3073285

rowNo	production branch of $D^0$	iProdBrP	nCase	nCcCase	nAllCase	nCCCase
34	$e^+e^- \rightarrow \pi^0 D^0 \bar{D}^{*0} \gamma^I$	1460	979	0	979	3074264
35	$e^+e^- \rightarrow \pi^+ D^{*-} D^0$	1876	978	0	978	3075242
36	$e^- \rightarrow e^+ \pi^0 \pi^+ \omega D^{*-} D^0$	2217	0	897	897	3076139
37	$e^- \rightarrow e^+ \pi^+ \omega D^{*-} D^0 \gamma^I$	2102	0	885	885	3077024
38	$e^- \rightarrow e^+ \pi^0 \pi^0 \pi^+ D^{*-} D^0$	1440	0	875	875	3077899
39	$B^- \rightarrow \mu^- \bar{\nu}_\mu D^0$	11	446	426	872	3078771
40	$e^+e^- \rightarrow \pi^0 \pi^0 \pi^+ D^{*-} D^0$	2556	869	0	869	3079640
41	$e^- \rightarrow e^+ \pi^0 \pi^0 \pi^+ D^{*-} D^0 \gamma^I$	2488	0	866	866	3080506
42	$e^+e^- \rightarrow \pi^0 \pi^+ \omega D^{*-} D^0$	1657	855	0	855	3081361
43	$e^- \rightarrow e^+ \pi^0 \pi^+ \omega D^{*-} D^0 \gamma^I$	1467	0	840	840	3082201
44	$e^+e^- \rightarrow \pi^0 \pi^+ \omega D^{*-} D^0 \gamma^I$	2871	838	0	838	3083039
45	$e^- \rightarrow e^+ \pi^+ \pi^- \rho^+ D^{*-} D^0$	1697	0	830	830	3083869
46	$e^+e^- \rightarrow \pi^+ \omega D^{*-} D^0 \gamma^I$	1759	829	0	829	3084698
47	$e^+e^- \rightarrow \pi^+ \pi^- D^0 \bar{D}^{*0} \gamma^I \gamma^I$	1559	828	0	828	3085526
48	$e^- \rightarrow e^+ \pi^+ \pi^- \rho^+ D^{*-} D^0 \gamma^I$	3341	0	822	822	3086348
49	$e^- \rightarrow e^+ \pi^0 \rho^+ D^{*-} D^0 \gamma^I$	2082	0	807	807	3087155
50	$e^+e^- \rightarrow \pi^+ \pi^- \rho^+ D^{*-} D^0$	1688	802	0	802	3087957
51	$e^- \rightarrow e^+ \pi^+ \pi^+ \pi^- D^{*-} D^0$	1588	0	800	800	3088757
52	$B^- \rightarrow e^- \bar{\nu}_e D^0$	2	417	379	796	3089553
53	$e^+e^- \rightarrow \pi^+ \pi^- \omega D^0 \bar{D}^{*0}$	1616	796	0	796	3090349
54	$e^- \rightarrow e^+ \pi^+ \pi^- \omega D^0 \bar{D}^{*0}$	2598	0	796	796	3091145
55	$e^- \rightarrow e^+ \pi^+ \pi^- D^0 \bar{D}^{*0} \gamma^I \gamma^I$	1728	0	795	795	3091940
56	$e^+e^- \rightarrow \pi^0 \pi^0 \pi^+ D^{*-} D^0 \gamma^I$	1771	792	0	792	3092732
57	$e^+e^- \rightarrow \pi^+ \omega D^{*-} D^0$	2251	789	0	789	3093521
58	$e^- \rightarrow e^+ \pi^0 \rho^+ D^{*-} D^0$	2965	0	775	775	3094296
59	$e^+e^- \rightarrow \pi^0 \pi^+ \rho^- D^0 \bar{D}^{*0}$	1508	764	0	764	3095060
60	$e^+e^- \rightarrow \pi^0 \rho^+ D^{*-} D^0 \gamma^I$	1737	763	0	763	3095823
61	$e^- \rightarrow e^+ \pi^0 \pi^- \rho^+ D^0 \bar{D}^{*0}$	4086	0	763	763	3096586
62	$e^- \rightarrow e^+ \pi^+ \omega D^{*-} D^0$	1458	0	758	758	3097344
63	$e^+e^- \rightarrow \pi^0 \pi^- \rho^+ D^0 \bar{D}^{*0}$	1713	745	0	745	3098089
64	$e^- \rightarrow e^+ \pi^+ \pi^- \omega D^0 \bar{D}^{*0} \gamma^I$	2648	0	742	742	3098831
65	$e^+e^- \rightarrow \pi^+ \pi^- \omega D^0 \bar{D}^{*0} \gamma^I$	1687	740	0	740	3099571
66	$e^- \rightarrow e^+ \pi^0 \pi^+ \rho^- D^0 \bar{D}^{*0}$	1594	0	719	719	3100290
67	$e^- \rightarrow e^+ \pi^+ \pi^+ \pi^- D^{*-} D^0 \gamma^I$	1910	0	716	716	3101006

rowNo	production branch of $D^0$	iProdBrP	nCase	nCcCase	nAllCase	nCCCase
68	$e^- \rightarrow e^+ \pi^0 \pi^+ \rho^- D^0 \bar{D}^{*0} \gamma^I$	1887	0	710	710	3101716
69	$e^+ e^- \rightarrow \pi^+ \pi^+ \pi^- D^{*-} D^0 \gamma^I$	2374	709	0	709	3102425
70	$e^- \rightarrow e^+ \pi^0 \rho^0 \pi^+ D^{*-} D^0$	1496	0	696	696	3103121
71	$e^+ e^- \rightarrow \pi^0 \pi^+ \rho^- D^0 \bar{D}^{*0} \gamma^I$	2637	695	0	695	3103816
72	$e^+ e^- \rightarrow \pi^+ \pi^- \rho^+ D^{*-} D^0 \gamma^I$	1732	693	0	693	3104509
73	$e^- \rightarrow e^+ \pi^0 \rho^0 \pi^+ D^{*-} D^0 \gamma^I$	2674	0	692	692	3105201
74	$e^- \rightarrow e^+ \pi^0 \pi^- \rho^+ D^0 \bar{D}^{*0} \gamma^I$	2054	0	689	689	3105890
75	$e^+ e^- \rightarrow \pi^+ \pi^+ \pi^- D^{*-} D^0$	2586	688	0	688	3106578
76	$e^+ e^- \rightarrow \pi^0 D^0 \bar{D}^{*0} \gamma^I \gamma^I$	2222	687	0	687	3107265
77	$e^+ e^- \rightarrow \pi^0 \pi^- \rho^+ D^0 \bar{D}^{*0} \gamma^I$	1845	685	0	685	3107950
78	$e^+ e^- \rightarrow \pi^0 \rho^+ D^{*-} D^0$	1755	683	0	683	3108633
79	$e^- \rightarrow e^+ \pi^+ \rho^- D^0 \bar{D}^{*0} \gamma^I$	1733	0	682	682	3109315
80	$e^+ e^- \rightarrow \pi^+ \rho^- D^0 \bar{D}^{*0} \gamma^I$	1962	680	0	680	3109995
81	$e^- \rightarrow e^+ \pi^0 \pi^+ \pi^- D^0 \bar{D}^{*0} \gamma^I \gamma^I$	2227	0	678	678	3110673
82	$e^+ e^- \rightarrow \pi^0 \pi^+ \pi^- D^0 \bar{D}^{*0} \gamma^I \gamma^I$	1824	668	0	668	3111341
83	$e^+ e^- \rightarrow \pi^0 \rho^0 \pi^+ D^{*-} D^0$	2301	655	0	655	3111996
84	$e^- \rightarrow e^+ \pi^+ \rho^- D^0 \bar{D}^{*0}$	2105	0	636	636	3112632
85	$e^- \rightarrow e^+ \pi^0 \pi^0 D^0 \bar{D}^{*0} \gamma^I$	1494	0	633	633	3113265
86	$e^+ e^- \rightarrow \rho^0 \pi^+ D^{*-} D^0 \gamma^I$	1702	631	0	631	3113896
87	$e^+ e^- \rightarrow \pi^0 \pi^+ \pi^+ \pi^- D^{*-} D^0$	1499	629	0	629	3114525
88	$e^- \rightarrow e^+ \pi^0 D^0 \bar{D}^{*0}$	3932	0	625	625	3115150
89	$e^- \rightarrow e^+ \rho^0 \pi^+ D^{*-} D^0$	2257	0	621	621	3115771
90	$e^- \rightarrow e^+ \pi^0 D^0 \bar{D}^{*0} \gamma^I \gamma^I$	1478	0	619	619	3116390
91	$e^- \rightarrow e^+ \pi^- \rho^+ D^0 \bar{D}^{*0} \gamma^I$	2883	0	617	617	3117007
92	$e^+ e^- \rightarrow \pi^0 \pi^0 D^0 \bar{D}^{*0} \gamma^I$	1479	610	0	610	3117617
93	$e^+ e^- \rightarrow \pi^0 \rho^0 \pi^+ D^{*-} D^0 \gamma^I$	2055	606	0	606	3118223
94	$e^- \rightarrow e^+ \pi^0 \pi^+ \pi^+ \pi^- D^{*-} D^0$	2704	0	606	606	3118829
95	$e^- \rightarrow e^+ \rho^0 \pi^+ D^{*-} D^0 \gamma^I$	1653	0	590	590	3119419
96	$e^+ e^- \rightarrow \pi^- \rho^+ D^0 \bar{D}^{*0} \gamma^I$	1815	588	0	588	3120007
97	$e^+ e^- \rightarrow \pi^+ \rho^- D^0 \bar{D}^{*0}$	2349	586	0	586	3120593
98	$e^+ e^- \rightarrow \pi^0 \pi^0 \pi^+ \pi^- D^0 \bar{D}^{*0} \gamma^I$	3010	584	0	584	3121177
99	$e^- \rightarrow e^+ \bar{K}^0 K^+ D^{*-} D^0 \gamma^I$	1560	0	579	579	3121756
100	$e^- \rightarrow e^+ \rho^0 \pi^+ \pi^- D^0 \bar{D}^{*0}$	1802	0	576	576	3122332
rest	others (55049 in total)	—	226162	222558	448720	3571052



Table 21: Production branches of  $\pi^0$ .

rowNo	production branch of $\pi^0$	iProdBrP	nCase	nCcCase	nAllCase	nCCase
1	$\omega \rightarrow \pi^0 \pi^+ \pi^-$	25	616211	—	616211	616211
2	$K_S^0 \rightarrow \pi^0 \pi^0$	12	607334	—	607334	1223545
3	$\eta \rightarrow \pi^0 \pi^0 \pi^0$	15	577425	—	577425	1800970
4	$\rho^- \rightarrow \pi^0 \pi^-$	29	571462	0	571462	2372432
5	$\rho^+ \rightarrow \pi^0 \pi^+$	4	559950	0	559950	2932382
6	$D^{*0} \rightarrow \pi^0 D^0$	5	539150	0	539150	3471532
7	$\bar{D}^{*0} \rightarrow \pi^0 \bar{D}^0$	0	538801	0	538801	4010333
8	$\eta \rightarrow \pi^0 \pi^+ \pi^-$	34	132915	—	132915	4143248
9	$\bar{D}^0 \rightarrow \pi^0 \pi^- K^+$	36	121373	156	121529	4264777
10	$D^{*-} \rightarrow \pi^0 D^-$	52	113260	0	113260	4378037
11	$D^0 \rightarrow \pi^0 \pi^+ K^-$	6	113046	146	113192	4491229
12	$D^{*+} \rightarrow \pi^0 D^+$	50	101478	0	101478	4592707
13	$K^{*+} \rightarrow \pi^0 K^+$	11	94777	0	94777	4687484
14	$K^{*-} \rightarrow \pi^0 K^-$	8	93514	0	93514	4780998
15	$K^* \rightarrow \pi^0 K^0$	7	90798	0	90798	4871796
16	$\bar{K}^* \rightarrow \pi^0 \bar{K}^0$	31	83166	0	83166	4954962
17	$\eta' \rightarrow \pi^0 \pi^0 \eta$	73	66786	—	66786	5021748
18	$\omega \rightarrow \pi^0 \gamma$	104	47522	—	47522	5069270
19	$\bar{D}^0 \rightarrow \pi^0 \pi^0 \pi^- K^+$	75	40590	546	41136	5110406
20	$K_L^0 \rightarrow \pi^0 \pi^0 \pi^0$	9	40977	—	40977	5151383
21	$D^0 \rightarrow \pi^0 \pi^0 \pi^+ K^-$	37	37230	502	37732	5189115
22	$a_1^- \rightarrow \pi^0 \rho^-$	51	25168	0	25168	5214283
23	$\bar{D}^0 \rightarrow \pi^0 \pi^0 \pi^0 \pi^+ \pi^- K_S^0$	221	24669	—	24669	5238952
24	$\bar{D}^0 \rightarrow \pi^0 \pi^0 \pi^0 K_L^0 \pi^+ \pi^-$	187	23025	—	23025	5261977
25	$a_1^+ \rightarrow \pi^0 \rho^+$	16	22667	0	22667	5284644
26	$D^0 \rightarrow \pi^0 \pi^0 \pi^0 \pi^+ \pi^- K_S^0$	140	21699	—	21699	5306343
27	$\bar{D}^0 \rightarrow \pi^0 \pi^0 \pi^0 K_S^0$	128	21339	—	21339	5327682
28	$\bar{\Lambda} \rightarrow \pi^0 \bar{n}$	127	21041	0	21041	5348723
29	$\Lambda \rightarrow \pi^0 n$	240	20861	0	20861	5369584
30	$D^0 \rightarrow \pi^0 \pi^0 \pi^0 K_L^0 \pi^+ \pi^-$	46	20430	—	20430	5390014
31	$D^- \rightarrow \pi^0 \pi^- K_S^0$	150	20249	0	20249	5410263
32	$\bar{D}^0 \rightarrow \pi^0 \pi^0 \pi^0 K_L^0$	340	20127	—	20127	5430390
33	$D^0 \rightarrow \pi^0 \pi^0 \pi^0 K_S^0$	86	19665	—	19665	5450055

rowNo	production branch of $\pi^0$	iProdBrP	nCase	nCcCase	nAllCase	nCCase
34	$D^- \rightarrow \pi^0 K_L^0 \pi^-$	60	18807	0	18807	5468862
35	$D^+ \rightarrow \pi^0 \pi^+ K_S^0$	95	17959	0	17959	5486821
36	$D^0 \rightarrow \pi^0 \pi^0 \pi^0 K_L^0$	115	17841	—	17841	5504662
37	$\bar{D}^0 \rightarrow \pi^0 \pi^0 K^*$	129	17146	0	17146	5521808
38	$f_0(600) \rightarrow \pi^0 \pi^0$	43	16988	—	16988	5538796
39	$D^+ \rightarrow \pi^0 K_L^0 \pi^+$	39	16783	0	16783	5555579
40	$D^0 \rightarrow \pi^0 \pi^0 \bar{K}^*$	10	15644	0	15644	5571223
41	$\bar{D}^0 \rightarrow \pi^0 \pi^+ \pi^- K^*$	89	15634	0	15634	5586857
42	$\bar{D}^0 \rightarrow \pi^0 \pi^0 \pi^+ \pi^-$	48	15440	—	15440	5602297
43	$\bar{D}^0 \rightarrow \pi^0 \pi^0 \pi^+ \pi^- K_S^0$	125	14696	—	14696	5616993
44	$\bar{D}^0 \rightarrow \pi^0 \pi^0 \pi^0 \pi^+ \pi^-$	63	14511	—	14511	5631504
45	$\bar{D}^0 \rightarrow \pi^0 \pi^0 K_L^0 \pi^+ \pi^-$	137	14138	—	14138	5645642
46	$D^0 \rightarrow \pi^0 \pi^0 \pi^+ \pi^-$	174	13804	—	13804	5659446
47	$D^0 \rightarrow \pi^0 \pi^+ \pi^- \bar{K}^*$	21	13562	0	13562	5673008
48	$D^0 \rightarrow \pi^0 \pi^0 \pi^0 \pi^+ \pi^-$	119	13293	—	13293	5686301
49	$D^- \rightarrow \pi^0 \pi^- K^*$	118	12922	0	12922	5699223
50	$\bar{D}^0 \rightarrow \pi^0 \pi^0 K_S^0$	197	12842	—	12842	5712065
51	$D^0 \rightarrow \pi^0 \pi^0 \pi^+ \pi^- K_S^0$	168	12770	—	12770	5724835
52	$D^0 \rightarrow \pi^0 \pi^0 K_L^0 \pi^+ \pi^-$	54	12580	—	12580	5737415
53	$\bar{D}^0 \rightarrow \pi^0 \pi^+ \pi^-$	77	12497	—	12497	5749912
54	$\bar{D}_0^{*0} \rightarrow \pi^0 \bar{D}^0$	276	12291	0	12291	5762203
55	$D_1^{*0} \rightarrow \pi^0 D^{*0}$	56	12170	0	12170	5774373
56	$D_0^{*0} \rightarrow \pi^0 D^0$	20	12079	0	12079	5786452
57	$\bar{D}_1^{*0} \rightarrow \pi^0 \bar{D}^{*0}$	165	12055	0	12055	5798507
58	$\bar{D}^0 \rightarrow \pi^0 \pi^0 K_L^0$	205	11790	—	11790	5810297
59	$D^+ \rightarrow \pi^0 \pi^+ \bar{K}^*$	117	11741	0	11741	5822038
60	$D_1^{*+} \rightarrow \pi^0 D^{*+}$	494	11622	0	11622	5833660
61	$\bar{\Delta}^- \rightarrow \pi^0 \bar{p}$	158	11545	0	11545	5845205
62	$\Delta^+ \rightarrow \pi^0 p$	195	11322	0	11322	5856527
63	$D^0 \rightarrow \pi^0 \pi^0 K_S^0$	235	11246	—	11246	5867773
64	$D^0 \rightarrow \pi^0 \pi^+ \pi^-$	155	11222	—	11222	5878995
65	$D_1^{*-} \rightarrow \pi^0 D^{*-}$	554	10911	0	10911	5889906
66	$D^0 \rightarrow \pi^0 \pi^0 K_L^0$	111	10638	—	10638	5900544
67	$\bar{\Sigma}^- \rightarrow \pi^0 \bar{p}$	361	10564	0	10564	5911108
68	$D^- \rightarrow \pi^0 \pi^0 \pi^0 \pi^- \eta$	760	10251	0	10251	5921359

rowNo	production branch of $\pi^0$	iProdBrP	nCase	nCcCase	nAllCase	nCCCase
69	$\Sigma^+ \rightarrow \pi^0 p$	251	9779	0	9779	5931138
70	$D^+ \rightarrow \pi^0 \pi^0 \pi^0 \pi^+ \eta$	249	9645	0	9645	5940783
71	$\Delta^0 \rightarrow \pi^0 n$	157	9434	0	9434	5950217
72	$\bar{D}^0 \rightarrow \pi^0 \pi^0 \pi^0 \pi^- K^+$	370	9288	0	9288	5959505
73	$K_L^0 \rightarrow \pi^0 \pi^+ \pi^-$	27	8934	—	8934	5968439
74	$\bar{D}^0 \rightarrow \pi^0 K_S^0$	87	8912	—	8912	5977351
75	$\bar{\Delta}^0 \rightarrow \pi^0 \bar{n}$	284	8687	0	8687	5986038
76	$\bar{D}^0 \rightarrow \pi^0 \eta K_S^0$	26	8569	—	8569	5994607
77	$D^0 \rightarrow \pi^0 \pi^0 \pi^0 \pi^+ K^-$	156	8214	0	8214	6002821
78	$\bar{D}^0 \rightarrow \pi^0 K_L^0 \eta$	141	8036	—	8036	6010857
79	$D^0 \rightarrow \pi^0 K_S^0$	106	7792	—	7792	6018649
80	$D^0 \rightarrow \pi^0 \eta K_S^0$	100	7644	—	7644	6026293
81	$\bar{D}_2^{*0} \rightarrow \pi^0 \bar{D}^0$	226	7519	0	7519	6033812
82	$D_s^- \rightarrow \pi^0 \pi^+ \pi^- \pi^- \pi^-$	236	7441	0	7441	6041253
83	$D_2^{*0} \rightarrow \pi^0 D^0$	130	7421	0	7421	6048674
84	$\bar{D}^0 \rightarrow \pi^0 \pi^- K^{*+}$	144	7226	0	7226	6055900
85	$D^0 \rightarrow \pi^0 K_L^0 \eta$	248	7207	—	7207	6063107
86	$D^- \rightarrow \pi^0 \pi^+ \pi^- \pi^- \eta$	132	6822	0	6822	6069929
87	$e^+ e^- \rightarrow \pi^0 \pi^- D^{*+} \bar{D}^{*0} \gamma^I$	3727	6816	0	6816	6076745
88	$e^+ e^- \rightarrow \pi^0 \pi^+ D^{*-} D^{*0} \gamma^I$	3569	6666	0	6666	6083411
89	$D^- \rightarrow \pi^0 \pi^0 \pi^- \eta$	182	6664	0	6664	6090075
90	$\bar{D}^0 \rightarrow \pi^0 K_L^0$	172	6631	—	6631	6096706
91	$D_{s0}^{*-} \rightarrow \pi^0 D_s^-$	24	6594	0	6594	6103300
92	$D_s^{*-} \rightarrow \pi^0 D_s^-$	83	6537	0	6537	6109837
93	$e^+ e^- \rightarrow \pi^0 \pi^- D^{*+} \bar{D}^{*0}$	3688	6432	0	6432	6116269
94	$D^0 \rightarrow \pi^0 \pi^+ K^{*-}$	108	6284	0	6284	6122553
95	$\bar{\Sigma}_c^{*-} \rightarrow \pi^0 \bar{\Lambda}_c^-$	1004	6172	0	6172	6128725
96	$D_s^+ \rightarrow \pi^0 \pi^+ \pi^+ \pi^- \pi^-$	122	6127	0	6127	6134852
97	$e^+ e^- \rightarrow \pi^0 \pi^+ D^{*-} D^{*0}$	3547	6091	0	6091	6140943
98	$e^+ e^- \rightarrow \pi^0 \pi^0 \pi^- D^{*+} \bar{D}^{*0}$	3828	5910	0	5910	6146853
99	$D_{s0}^{*+} \rightarrow \pi^0 D_s^+$	66	5887	0	5887	6152740
100	$D^+ \rightarrow \pi^0 \pi^+ \pi^+ \pi^- \eta$	53	5846	0	5846	6158586
rest	others (136822 in total)	—	—	—	1997090	8155676

Table 22: Production branches of  $\pi^+$ .

rowNo	production branch of $\pi^+$	iProdBrP	nCase	nCcCase	nAllCase	nCCase
1	$D^0 \rightarrow \pi^+ K^-$	13	1119014	978951	2097965	2097965
2	$K_S^0 \rightarrow \pi^+ \pi^-$	14	677670	677670	1355340	3453305
3	$D^{*+} \rightarrow \pi^+ D^0$	38	669433	613499	1282932	4736237
4	$\omega \rightarrow \pi^0 \pi^+ \pi^-$	30	616211	616211	1232422	5968659
5	$\rho^0 \rightarrow \pi^+ \pi^-$	7	580102	580102	1160204	7128863
6	$\rho^+ \rightarrow \pi^0 \pi^+$	8	559950	571462	1131412	8260275
7	$\bar{K}^* \rightarrow \pi^+ K^-$	12	165386	173736	339122	8599397
8	$K^{*+} \rightarrow \pi^+ K^0$	21	164453	151009	315462	8914859
9	$\eta \rightarrow \pi^0 \pi^+ \pi^-$	49	132915	132915	265830	9180689
10	$D^0 \rightarrow \pi^0 \pi^+ K^-$	9	113046	121373	234419	9415108
11	$\eta' \rightarrow \pi^+ \pi^- \eta$	17	65816	65816	131632	9546740
12	$D^+ \rightarrow \pi^+ \pi^+ K^-$	142	44974	49794	94768	9641508
13	$\bar{\Lambda} \rightarrow \pi^+ \bar{p}$	171	40449	38132	78581	9720089
14	$\eta \rightarrow \pi^+ \pi^-$	33	25195	25195	50390	9770479
15	$D_1'^+ \rightarrow \pi^+ D^{*0}$	693	24098	23404	47502	9817981
16	$D_0^{*+} \rightarrow \pi^+ D^0$	706	23099	22437	45536	9863517
17	$a_1^+ \rightarrow \rho^0 \pi^+$	29	19815	23158	42973	9906490
18	$\bar{D}_1'^0 \rightarrow \pi^+ D^{*-}$	108	21004	21711	42715	9949205
19	$a_1^+ \rightarrow \pi^+ \pi^+ \pi^-$	47	19192	22508	41700	9990905
20	$D_s^+ \rightarrow \pi^0 \pi^+ \pi^+ \pi^+ \pi^- \pi^-$	175	18381	22323	40704	10031609
21	$D^0 \rightarrow \pi^0 \pi^0 \pi^+ K^-$	52	18615	20295	38910	10070519
22	$D^0 \rightarrow \pi^+ \pi^- K_S^0$	42	17666	21055	38721	10109240
23	$\bar{D}^0 \rightarrow \pi^+ \pi^- K_S^0$	41	21055	17666	38721	10147961
24	$D^+ \rightarrow \pi^0 \pi^+ K_S^0$	140	17959	20249	38208	10186169
25	$\Delta^{++} \rightarrow \pi^+ p$	1	18579	18748	37327	10223496
26	$\bar{D}^0 \rightarrow K_L^0 \pi^+ \pi^-$	80	19594	17047	36641	10260137
27	$D^0 \rightarrow K_L^0 \pi^+ \pi^-$	81	17047	19594	36641	10296778
28	$D^+ \rightarrow \pi^0 K_L^0 \pi^+$	54	16783	18807	35590	10332368
29	$D^0 \rightarrow \pi^+ \pi^- \bar{K}^*$	11	15681	18124	33805	10366173
30	$\bar{D}^0 \rightarrow \pi^+ \pi^- K^*$	10	18124	15681	33805	10399978
31	$f_0(600) \rightarrow \pi^+ \pi^-$	4	15361	15361	30722	10430700
32	$D^0 \rightarrow \pi^0 \pi^+ \pi^- \bar{K}^*$	25	13562	15634	29196	10459896
33	$\bar{D}^0 \rightarrow \pi^0 \pi^+ \pi^- K^*$	26	15634	13562	29196	10489092

rowNo	production branch of $\pi^+$	iProdBrP	nCase	nCcCase	nAllCase	nCCase
34	$D^0 \rightarrow \pi^+ \omega K^-$	35	13030	15272	28302	10517394
35	$D_s^- \rightarrow \pi^0 \pi^+ \pi^+ \pi^- \pi^- \pi^-$	176	14882	12254	27136	10544530
36	$D^+ \rightarrow \pi^0 \pi^+ \pi^+ \pi^- \eta$	74	11692	13644	25336	10569866
37	$D^+ \rightarrow \pi^0 \pi^+ \bar{K}^*$	172	11741	12922	24663	10594529
38	$D^0 \rightarrow \pi^+ \pi^+ \pi^- K^-$	72	11502	13100	24602	10619131
39	$D_2^{*+} \rightarrow \pi^+ D^0$	828	11985	12404	24389	10643520
40	$a_1^+ \rightarrow \pi^+ f_0(600)$	3	11049	12806	23855	10667375
41	$\bar{D}^0 \rightarrow \pi^0 \pi^+ \pi^-$	116	12497	11222	23719	10691094
42	$D^0 \rightarrow \pi^0 \pi^+ \pi^-$	117	11222	12497	23719	10714813
43	$D^0 \rightarrow \pi^+ K_1^-$	22	10632	12276	22908	10737721
44	$D^+ \rightarrow \pi^+ \pi^+ \pi^- \eta$	138	10364	12314	22678	10760399
45	$\bar{\Delta}^+ \rightarrow \pi^+ \bar{n}$	123	9986	10993	20979	10781378
46	$D_2^{*+} \rightarrow \pi^+ D^{*0}$	800	10594	10356	20950	10802328
47	$a_1^- \rightarrow \pi^+ \pi^- \pi^-$	46	11254	9596	20850	10823178
48	$\bar{D}_0^{*0} \rightarrow \pi^+ D^-$	115	11040	9417	20457	10843635
49	$\bar{D}_2^{*0} \rightarrow \pi^+ D^{*-}$	59	8921	9305	18226	10861861
50	$\omega \rightarrow \pi^+ \pi^-$	321	9028	9028	18056	10879917
51	$\Sigma^+ \rightarrow \pi^+ n$	170	8763	9197	17960	10897877
52	$K_L^0 \rightarrow \pi^0 \pi^+ \pi^-$	36	8934	8934	17868	10915745
53	$\bar{D}^0 \rightarrow \pi^+ \pi^+ \pi^- \pi^-$	87	8728	7398	16126	10931871
54	$D^0 \rightarrow \pi^+ \pi^+ \pi^- \pi^-$	88	7398	8728	16126	10947997
55	$D^0 \rightarrow \pi^0 \pi^0 \pi^0 \pi^+ \pi^- K_S^0$	196	7233	8223	15456	10963453
56	$\bar{D}^0 \rightarrow \pi^0 \pi^0 \pi^0 \pi^+ \pi^- K_S^0$	197	8223	7233	15456	10978909
57	$K_L^0 \rightarrow e^- \nu_e \pi^+$	60	15000	0	15000	10993909
58	$D_s^+ \rightarrow \pi^+ K^+ K^-$	94	7011	7916	14927	11008836
59	$K_L^0 \rightarrow e^- \bar{\nu}_e \pi^+$	24	0	14910	14910	11023746
60	$D^0 \rightarrow \pi^0 \pi^0 \pi^+ \pi^-$	67	6902	7720	14622	11038368
61	$\bar{D}^0 \rightarrow \pi^0 \pi^0 \pi^+ \pi^-$	66	7720	6902	14622	11052990
62	$D^0 \rightarrow \pi^+ \eta K^-$	70	7045	7549	14594	11067584
63	$\bar{\Sigma}^+ \rightarrow \pi^+ \bar{n}$	164	7067	7510	14577	11082161
64	$D^0 \rightarrow \pi^0 \pi^0 \pi^0 K_L^0 \pi^+ \pi^-$	63	6810	7675	14485	11096646
65	$\bar{D}^0 \rightarrow \pi^0 \pi^0 \pi^0 K_L^0 \pi^+ \pi^-$	64	7675	6810	14485	11111131
66	$D^+ \rightarrow \pi^+ \bar{K}_1^0$	202	6405	7351	13756	11124887
67	$\bar{D}^0 \rightarrow \pi^0 \pi^0 \pi^+ \pi^- K_S^0$	180	7348	6385	13733	11138620
68	$D^0 \rightarrow \pi^0 \pi^0 \pi^+ \pi^- K_S^0$	181	6385	7348	13733	11152353

rowNo	production branch of $\pi^+$	iProdBrP	nCase	nCcCase	nAllCase	nCCase
69	$D^0 \rightarrow \pi^0 \pi^+ K^{*-}$	163	6284	7226	13510	11165863
70	$\bar{D}^0 \rightarrow \pi^0 \pi^0 K_L^0 \pi^+ \pi^-$	77	7069	6290	13359	11179222
71	$D^0 \rightarrow \pi^0 \pi^0 K_L^0 \pi^+ \pi^-$	76	6290	7069	13359	11192581
72	$D_s^+ \rightarrow \pi^+ \eta'$	125	6213	7058	13271	11205852
73	$D^- \rightarrow \pi^0 \pi^+ \pi^- \pi^- \eta$	75	6822	5846	12668	11218520
74	$\bar{D}^0 \rightarrow \pi^+ \pi^- \pi^- K^+$	71	6550	5751	12301	11230821
75	$\bar{D}_2^{*0} \rightarrow \pi^+ D^-$	137	6548	5749	12297	11243118
76	$D^+ \rightarrow \pi^0 \pi^+ \pi^+ \pi^-$	687	5630	6380	12010	11255128
77	$\Sigma^{*+} \rightarrow \pi^+ \Lambda$	241	5792	6061	11853	11266981
78	$D^0 \rightarrow \pi^+ K^- \eta'$	124	5585	6255	11840	11278821
79	$\Sigma_c^{*++} \rightarrow \pi^+ \Lambda_c^+$	848	5550	6004	11554	11290375
80	$\phi \rightarrow \pi^+ \rho^-$	205	5758	5620	11378	11301753
81	$D^- \rightarrow \pi^+ \pi^- \pi^- \eta$	139	6157	5182	11339	11313092
82	$\Delta^+ \rightarrow \pi^+ n$	281	5755	5166	10921	11324013
83	$D_1^+ \rightarrow \pi^+ D^{*0}$	734	5480	5223	10703	11334716
84	$\bar{\Sigma}_c^{*0} \rightarrow \pi^+ \bar{\Lambda}_c^-$	523	5760	4878	10638	11345354
85	$D_s^+ \rightarrow \pi^+ \pi^+ \pi^+ \pi^- \pi^- \eta$	155	4401	5562	9963	11355317
86	$K_L^0 \rightarrow \mu^- \bar{\nu}_\mu \pi^+$	397	0	9625	9625	11364942
87	$\bar{\Delta}^0 \rightarrow \pi^+ \bar{p}$	362	4830	4773	9603	11374545
88	$K_L^0 \rightarrow \mu^- \nu_\mu \pi^+$	310	9457	0	9457	11384002
89	$D_s^+ \rightarrow \pi^+ \pi^+ \pi^- \omega$	28	4240	5206	9446	11393448
90	$\bar{D}_1^0 \rightarrow \pi^+ D^{*-}$	122	4640	4804	9444	11402892
91	$D^0 \rightarrow \pi^0 \pi^0 \pi^0 \pi^+ \pi^-$	91	4431	4837	9268	11412160
92	$\bar{D}^0 \rightarrow \pi^0 \pi^0 \pi^0 \pi^+ \pi^-$	90	4837	4431	9268	11421428
93	$D^+ \rightarrow \pi^+ \pi^+ K^{*-}$	102	4356	4906	9262	11430690
94	$D^0 \rightarrow \pi^0 \pi^+ \pi^- K_S^0$	243	4144	4865	9009	11439699
95	$\bar{D}^0 \rightarrow \pi^0 \pi^+ \pi^- K_S^0$	244	4865	4144	9009	11448708
96	$\bar{K}_1^{*0} \rightarrow \pi^+ K^{*-}$	203	3982	4642	8624	11457332
97	$D^0 \rightarrow \pi^+ \pi^+ \pi^- \pi^- K_S^0$	475	3840	4732	8572	11465904
98	$\bar{D}^0 \rightarrow \pi^+ \pi^+ \pi^- \pi^- K_S^0$	476	4732	3840	8572	11474476
99	$D_s^+ \rightarrow \pi^0 \pi^+ \omega$	133	3907	4507	8414	11482890
100	$\bar{D}^0 \rightarrow \pi^0 K_L^0 \pi^+ \pi^-$	216	4421	3959	8380	11491270
rest	others (276554 in total)	—	1787667	1798374	3586041	15077311

Table 23: Production branches of  $e^+$ .

rowNo	production branch of $e^+$	iProdBrP	nCase	nCcCase	nAllCase	nCCase
1	$\pi^0 \rightarrow e^+e^-$	0	342330	342330	684660	684660
2	$D^0 \rightarrow e^+\nu_e K^-$	3	41740	42507	84247	768907
3	$D^+ \rightarrow e^+\nu_e \bar{K}^0$	9	18460	21288	39748	808655
4	$D^0 \rightarrow e^+\nu_e K^{*-}$	1	15485	17223	32708	841363
5	$D^+ \rightarrow e^+\nu_e \bar{K}^*$	12	14104	15597	29701	871064
6	$\eta \rightarrow e^+e^-$	22	11559	11559	23118	894182
7	$K_L^0 \rightarrow e^+\bar{\nu}_e \pi^-$	5	0	15000	15000	909182
8	$K_L^0 \rightarrow e^+\nu_e \pi^-$	4	14910	0	14910	924092
9	$D_s^+ \rightarrow e^+\nu_e \eta$	14	2938	3387	6325	930417
10	$\pi^0 \rightarrow e^+e^+e^-e^-$	45	3148	3148	6296	936713
11	$D_s^+ \rightarrow e^+\nu_e \phi$	32	2810	3102	5912	942625
12	$D^+ \rightarrow e^+\nu_e \pi^+ K^-$	23	2073	2267	4340	946965
13	$D^0 \rightarrow e^+\nu_e \pi^-$	18	1890	2225	4115	951080
14	$\omega \rightarrow e^+e^- \pi^0$	37	1754	1754	3508	954588
15	$D^0 \rightarrow e^+\nu_e \rho^-$	36	1274	1389	2663	957251
16	$\Lambda_c^+ \rightarrow e^+\nu_e \Lambda$	70	1237	1260	2497	959748
17	$\tau^+ \rightarrow e^+\nu_e \bar{\nu}_\tau$	6	1165	1330	2495	962243
18	$D_s^+ \rightarrow e^+\nu_e \eta'$	39	1140	1192	2332	964575
19	$D^0 \rightarrow e^+\nu_e \pi^- \bar{K}^0$	33	1035	1219	2254	966829
20	$\eta' \rightarrow e^+e^- \pi^+ \pi^-$	59	1056	1056	2112	968941
21	$D^+ \rightarrow e^+\nu_e \pi^0 \bar{K}^0$	55	873	884	1757	970698
22	$D^+ \rightarrow e^+\nu_e \pi^0$	65	811	940	1751	972449
23	$D^0 \rightarrow e^+\nu_e \pi^0 K^-$	10	712	780	1492	973941
24	$B^+ \rightarrow e^+\nu_e \bar{D}^{*0}$	7	700	662	1362	975303
25	$D^0 \rightarrow e^+\nu_e K_1^-$	13	580	655	1235	976538
26	$D^+ \rightarrow e^+\nu_e \rho^0$	27	590	606	1196	977734
27	$\Xi_c^+ \rightarrow e^+\nu_e \Xi^0$	38	526	598	1124	978858
28	$D_s^+ \rightarrow e^+\nu_e K^0$	30	435	516	951	979809
29	$D^+ \rightarrow e^+\nu_e \omega$	16	471	479	950	980759
30	$\eta \rightarrow e^+e^- \pi^+ \pi^-$	25	428	428	856	981615
31	$B^+ \rightarrow e^+\nu_e \bar{D}^0$	2	379	417	796	982411
32	$\Lambda_c^+ \rightarrow e^+\nu_e \pi^- p$	69	354	437	791	983202
33	$\Lambda_c^+ \rightarrow e^+\nu_e \pi^0 n$	89	347	377	724	983926

rowNo	production branch of $e^+$	iProdBrP	nCase	nCcCase	nAllCase	nCCase
34	$\Lambda_c^+ \rightarrow e^+ \nu_e \Sigma^{*0}$	91	358	349	707	984633
35	$B^0 \rightarrow e^+ \nu_e D^{*-}$	53	300	362	662	985295
36	$\bar{\Sigma}^0 \rightarrow e^+ e^- \bar{\Lambda}$	86	310	335	645	985940
37	$\Sigma^0 \rightarrow e^+ e^- \Lambda$	87	335	310	645	986585
38	$\Lambda_c^+ \rightarrow e^+ \nu_e \Sigma^0$	88	310	315	625	987210
39	$K_S^0 \rightarrow e^+ \nu_e \pi^-$	20	598	0	598	987808
40	$D^+ \rightarrow e^+ \nu_e \eta$	66	271	278	549	988357
41	$K_S^0 \rightarrow e^+ \bar{\nu}_e \pi^-$	77	0	526	526	988883
42	$D_s^+ \rightarrow e^+ \nu_e K^*$	46	210	276	486	989369
43	$D_s^+ \rightarrow e^+ \nu_e \omega$	26	188	227	415	989784
44	$\Lambda_c^+ \rightarrow e^+ \nu_e n$	92	158	196	354	990138
45	$B^0 \rightarrow e^+ \nu_e D^-$	51	116	144	260	990398
46	$\Lambda_c^+ \rightarrow e^+ \nu_e \Delta^0$	34	115	127	242	990640
47	$\omega \rightarrow e^+ e^-$	84	110	110	220	990860
48	$K_S^0 \rightarrow e^+ e^- \pi^+ \pi^-$	82	105	105	210	991070
49	$B^+ \rightarrow e^+ \nu_e \bar{D}_1^{*0}$	15	100	94	194	991264
50	$\bar{\Lambda} \rightarrow e^+ \nu_e \bar{p}$	95	84	91	175	991439
51	$\rho^0 \rightarrow e^+ e^-$	93	81	81	162	991601
52	$B^+ \rightarrow e^+ \nu_e \bar{D}_1^0$	19	63	72	135	991736
53	$B^+ \rightarrow e^+ \nu_e \bar{D}_0^{*0}$	41	67	65	132	991868
54	$\Xi_c^0 \rightarrow e^+ \nu_e \Xi^-$	98	38	74	112	991980
55	$D^+ \rightarrow e^+ \nu_e \eta'$	83	54	51	105	992085
56	$J/\psi \rightarrow e^+ e^-$	44	42	42	84	992169
57	$B^0 \rightarrow e^+ \nu_e D_1^-$	58	45	39	84	992253
58	$\phi \rightarrow e^+ e^- \eta$	96	41	41	82	992335
59	$\phi \rightarrow e^+ e^-$	94	37	37	74	992409
60	$B^0 \rightarrow e^+ \nu_e D_1'^-$	63	29	42	71	992480
61	$B^+ \rightarrow e^+ \nu_e \bar{D}_2^{*0}$	28	37	28	65	992545
62	$B^+ \rightarrow e^+ \nu_e X_u^0$	40	33	30	63	992608
63	$B^0 \rightarrow e^+ \nu_e D_0^{*-}$	52	22	30	52	992660
64	$B^+ \rightarrow e^+ \nu_e \eta \bar{D}^0$	24	22	23	45	992705
65	$B^+ \rightarrow e^+ \nu_e \eta \bar{D}^{*0}$	21	17	28	45	992750
66	$B^0 \rightarrow e^+ \nu_e X_u^-$	60	30	13	43	992793
67	$\Xi_c^0 \rightarrow e^+ \nu_e \Xi^{*-}$	100	19	22	41	992834
68	$B^+ \rightarrow e^+ \nu_e \pi^+ \pi^- \bar{D}^{*0}$	35	21	19	40	992874



rowNo	production branch of $e^+$	iProdBrP	nCase	nCcCase	nAllCase	nCCase
69	$\bar{\Sigma}^+ \rightarrow e^+ \nu_e \bar{n}$	97	14	22	36	992910
70	$B^+ \rightarrow e^+ \nu_e \pi^+ D^{*-}$	8	18	17	35	992945
71	$B^0 \rightarrow e^+ \nu_e D_2^{*-}$	50	17	17	34	992979
72	$B^+ \rightarrow e^+ \nu_e \pi^0 \pi^+ D^{*-}$	17	17	16	33	993012
73	$B^+ \rightarrow e^+ \nu_e \pi^+ D^-$	48	13	13	26	993038
74	$B^0 \rightarrow e^+ \nu_e \eta D^{*-}$	61	9	14	23	993061
75	$B^+ \rightarrow e^+ \nu_e \pi^0 \bar{D}^{*0}$	49	9	7	16	993077
76	$B^+ \rightarrow e^+ \nu_e \rho^0$	11	7	8	15	993092
77	$B^+ \rightarrow e^+ \nu_e K^+ D_s^{*-}$	29	7	7	14	993106
78	$B^0 \rightarrow e^+ \nu_e \eta D^-$	56	5	9	14	993120
79	$B^0 \rightarrow e^+ \nu_e \pi^+ \pi^- D^{*-}$	54	9	5	14	993134
80	$B^0 \rightarrow e^+ \nu_e \pi^-$	62	8	5	13	993147
81	$B^+ \rightarrow e^+ \nu_e \pi^+ \pi^- \bar{D}^0$	74	6	6	12	993159
82	$B^0 \rightarrow e^+ \nu_e \pi^0 \pi^- \bar{D}^{*0}$	71	3	8	11	993170
83	$B^0 \rightarrow e^+ \nu_e \pi^- \bar{D}^{*0}$	72	3	8	11	993181
84	$B^+ \rightarrow e^+ \nu_e K^+ D_s^-$	31	6	5	11	993192
85	$B^0 \rightarrow e^+ \nu_e \rho^-$	67	5	6	11	993203
86	$B^+ \rightarrow e^+ \nu_e \pi^0 \pi^0 \bar{D}^{*0}$	81	4	7	11	993214
87	$B^0 \rightarrow e^+ \nu_e \pi^- \bar{D}^0$	57	6	4	10	993224
88	$B^+ \rightarrow e^+ \nu_e \pi^0 \bar{D}^0$	42	5	4	9	993233
89	$\Xi_c^+ \rightarrow e^+ \nu_e \Xi^{*0}$	99	5	4	9	993242
90	$\bar{\Xi}^+ \rightarrow e^+ \nu_e \bar{\Lambda}$	102	5	4	9	993251
91	$B^+ \rightarrow e^+ \nu_e \pi^0 \pi^+ D^-$	43	3	5	8	993259
92	$B^+ \rightarrow e^+ \nu_e \omega$	73	4	1	5	993264
93	$\bar{\Xi}^0 \rightarrow e^+ \nu_e \bar{\Sigma}^-$	104	3	2	5	993269
94	$B^0 \rightarrow e^+ \nu_e \pi^0 D^{*-}$	78	1	3	4	993273
95	$B^0 \rightarrow e^+ \nu_e \pi^0 D^-$	76	1	3	4	993277
96	$B^+ \rightarrow e^+ \nu_e \pi^0$	47	3	1	4	993281
97	$B^0 \rightarrow e^+ \nu_e \pi^0 \pi^0 D^{*-}$	64	0	3	3	993284
98	$B^+ \rightarrow e^+ \nu_e \pi^0 \pi^0 \bar{D}^0$	75	0	3	3	993287
99	$K_L^0 \rightarrow e^+ \nu_e \pi^0 \pi^-$	103	3	0	3	993290
100	$\psi' \rightarrow e^+ e^-$	68	1	1	2	993292
rest	others (9 in total)	—	3	8	11	993303

Table 24: Mothers of  $D_s^+$ .

rowNo	mother of $D_s^+$	PDGMoth	nCase	nCcCase	nAllCase	nCCase
1	$D_s^{*+}$	433	93761	105829	199590	199590
2	$e^+e^-$	99999999	32503	37444	69947	269537
3	$D_{s0}^{*+}$	10431	5887	6594	12481	282018
4	$D_{s1}^{' +}$	20433	967	1166	2133	284151
5	$B^+$	521	643	702	1345	285496
6	$B^0$	511	274	372	646	286142
7	$B^-$	-521	86	71	157	286299
8	$\bar{B}^0$	-511	30	37	67	286366
9	$\psi(4160)$	9010443	2	2	4	286370

Table 25: Mothers of  $D^{*+}$ .

rowNo	mother of $D^{*+}$	PDGMoth	nCase	nCcCase	nAllCase	nCCase
1	$e^+e^-$	99999999	712840	672156	1384996	1384996
2	$D_1^0$	20423	21711	21004	42715	1427711
3	$D_1'^+$	20413	11622	10911	22533	1450244
4	$D_2^{*0}$	425	9305	8921	18226	1468470
5	$D_2^{*+}$	415	5042	4890	9932	1478402
6	$D_1^0$	10423	4804	4640	9444	1487846
7	$\bar{B}^0$	-511	4435	4152	8587	1496433
8	$D_1^+$	10413	2527	2471	4998	1501431
9	$D_{s1}^+$	10433	1597	1363	2960	1504391
10	$B^-$	-521	1013	985	1998	1506389
11	$D_{s2}^*(2573)^+$	435	398	439	837	1507226
12	$B^+$	521	308	304	612	1507838
13	$B^0$	511	145	121	266	1508104
14	$\psi(4160)$	9010443	11	9	20	1508124

Table 26: Mothers of  $D^{*0}$ .

rowNo	mother of $D^{*0}$	PDGMoth	nCase	nCcCase	nAllCase	nCCase
1	$e^+e^-$	99999999	740652	741861	1482513	1482513
2	$D_1'^+$	20413	24098	23404	47502	1530015
3	$D_1'^0$	20423	12170	12055	24225	1554240
4	$D_2^{*+}$	415	10594	10356	20950	1575190
5	$B^-$	-521	8662	8562	17224	1592414
6	$D_2^{*0}$	425	5368	5524	10892	1603306
7	$D_1^+$	10413	5480	5223	10703	1614009
8	$D_1^0$	10423	2802	2719	5521	1619530
9	$D_{s1}^+$	10433	1788	1878	3666	1623196
10	$D_{s2}^*(2573)^+$	435	497	509	1006	1624202
11	$B^+$	521	458	497	955	1625157
12	$\bar{B}^0$	-511	296	268	564	1625721
13	$B^0$	511	239	289	528	1626249
14	$\psi(4160)$	9010443	7	7	14	1626263

Table 27: Mothers of  $D^0$ .

rowNo	mother of $D^0$	PDGMoth	nCase	nCcCase	nAllCase	nCCase
1	$D^{*0}$	423	813111	813152	1626263	1626263
2	$D^{*+}$	413	669433	613499	1282932	2909195
3	$e^+e^-$	99999999	257710	256903	514613	3423808
4	$D_0^{*+}$	10411	23099	22437	45536	3469344
5	$D_2^{*+}$	415	11985	12404	24389	3493733
6	$D_0^{*0}$	10421	12079	12291	24370	3518103
7	$B^-$	-521	8359	8340	16699	3534802
8	$D_2^{*0}$	425	7421	7519	14940	3549742
9	$D_{s2}^*(2573)^+$	435	4054	4261	8315	3558057
10	$D_1^0$	10423	4023	4080	8103	3566160
11	$D_1^+$	10413	1676	1626	3302	3569462
12	$\bar{B}^0$	-511	401	410	811	3570273
13	$B^+$	521	181	230	411	3570684
14	$B^0$	511	142	144	286	3570970
15	$\psi(3770)$	30443	38	38	76	3571046
16	$\psi(4160)$	9010443	3	3	6	3571052

Table 28: Mothers of  $\pi^0$ .

rowNo	mother of $\pi^0$	PDGMoth	nCase	nCcCase	nAllCase	nCCase
1	$e^+e^-$	99999999	1618494	—	1618494	1618494
2	$\rho^+$	213	559950	571462	1131412	2749906
3	$\bar{D}^{*0}$	−423	538801	539150	1077951	3827857
4	$D^0$	421	425460	471374	896834	4724691
5	$\eta$	221	710490	—	710490	5435181
6	$\omega$	223	665670	—	665670	6100851
7	$K_S^0$	310	607334	—	607334	6708185
8	$D^{*+}$	413	101478	113260	214738	6922923
9	$D^+$	411	96539	107421	203960	7126883
10	$K^{*-}$	−323	93514	94777	188291	7315174
11	$K^*$	313	90813	83170	173983	7489157
12	$\eta'$	331	67945	—	67945	7557102
13	$D_s^+$	431	28153	32443	60596	7617698
14	$a_1^+$	20213	25365	28247	53612	7671310
15	$K_L^0$	130	49915	—	49915	7721225
16	$\Lambda_c^+$	4122	20441	22286	42727	7763952
17	$\bar{\Lambda}$	−3122	21041	20861	41902	7805854
18	$D_2^{*0}$	425	12789	13043	25832	7831686
19	$D_0^{*0}$	10421	12079	12291	24370	7856056
20	$D_1^{*0}$	20423	12170	12055	24225	7880281
21	$\bar{\Delta}^-$	−2214	11545	11322	22867	7903148
22	$D_1^{' +}$	20413	11622	10911	22533	7925681
23	$\Sigma^+$	3222	9779	10564	20343	7946024
24	$\Delta^0$	2114	9434	8687	18121	7964145
25	$f_0(600)$	9000221	16988	—	16988	7981133
26	$D_2^{*+}$	415	8086	8561	16647	7997780
27	$\bar{D}_1^0$	−10423	6771	6788	13559	8011339
28	$D_{s0}^{*-}$	−10431	6594	5887	12481	8023820
29	$D_s^{*-}$	−433	6537	5820	12357	8036177
30	$\Sigma_c^{*+}$	4214	5433	6172	11605	8047782
31	$D_1^-$	−10413	5531	5479	11010	8058792
32	$D_0^{*+}$	10411	5149	5704	10853	8069645
33	$\Sigma^{*0}$	3214	4811	5036	9847	8079492

rowNo	mother of $\pi^0$	PDGMoth	nCase	nCcCase	nAllCase	nCCase
34	$D_{s1}^{'+}$	20433	4562	5021	9583	8089075
35	$\Xi^0$	-3322	4741	4409	9150	8098225
36	$\tau^-$	15	4332	3879	8211	8106436
37	$\phi$	333	6756	—	6756	8113192
38	$K_1^+$	10323	3592	3143	6735	8119927
39	$B^+$	521	3254	3455	6709	8126636
40	$\Sigma_c^+$	4212	3068	3165	6233	8132869
41	$K_1'^0$	20313	2402	2108	4510	8137379
42	$B^0$	511	1686	1719	3405	8140784
43	$\rho^+(1450)$	100213	1545	1599	3144	8143928
44	$\bar{K}_1^0$	-10313	1184	1347	2531	8146459
45	$\rho^0(1450)$	100113	1576	—	1576	8148035
46	$\Xi_c^-$	-4232	692	710	1402	8149437
47	$\Xi_c^0$	-4132	580	561	1141	8150578
48	$\Sigma^{*+}$	3224	379	424	803	8151381
49	$\Xi^{*0}$	-3324	291	290	581	8151962
50	$\Xi_c^{*+}$	4324	271	290	561	8152523
51	$\Xi_c^{*0}$	-4314	249	269	518	8153041
52	$\rho^0$	113	372	—	372	8153413
53	$\eta_c$	441	349	—	349	8153762
54	$f_2(1270)$	225	322	—	322	8154084
55	$J/\psi$	443	302	—	302	8154386
56	$f_0(980)$	9010221	258	—	258	8154644
57	$\Xi^{*+}$	-3314	135	123	258	8154902
58	$\bar{\Sigma}^{*+}$	-3114	84	105	189	8155091
59	$\chi_{c1}$	20443	67	—	67	8155158
60	$X_u^-$	-44	32	26	58	8155216
61	$\eta_c(2S)$	100441	47	—	47	8155263
62	$a_1^0$	20113	40	—	40	8155303
63	$\psi'$	100443	37	—	37	8155340
64	$\chi_{c0}$	10441	33	—	33	8155373
65	$b_1^0$	10113	28	—	28	8155401
66	$K_0^0$	10311	13	15	28	8155429
67	$X_u^0$	43	28	—	28	8155457
68	$K_0^{*+}$	10321	13	14	27	8155484
69	$\bar{K}_1'^-$	-20323	9	14	23	8155507

rowNo	mother of $\pi^0$	PDGMoth	nCase	nCcCase	nAllCase	nCCase
70	$f'_0$	30221	20	—	20	8155527
71	$K^*(1410)^+$	100323	11	7	18	8155545
72	$\chi_{c2}$	445	16	—	16	8155561
73	$K^*(1410)^0$	100313	4	11	15	8155576
74	$\bar{\Omega}^+$	−3334	7	6	13	8155589
75	$\Omega_c^0$	4332	8	5	13	8155602
76	$a_2^-$	−215	8	3	11	8155613
77	$K_2^{*+}$	325	6	5	11	8155624
78	$a_0^0$	9000111	11	—	11	8155635
79	$K_2^{*0}$	−315	2	7	9	8155644
80	$\bar{X}_{su}$	−30353	3	5	8	8155652
81	$f_1(1285)$	20223	6	—	6	8155658
82	$\psi(3770)$	30443	5	—	5	8155663
83	$h_1(1170)$	10223	4	—	4	8155667
84	$K^*(1680)^-$	−30323	2	2	4	8155671
85	$K^*(1680)^0$	−30313	1	1	2	8155673
86	$a_2^0$	115	2	—	2	8155675
87	$\rho(1700)^0$	30113	1	—	1	8155676



Table 29: Mothers of  $\pi^+$ .

rowNo	mother of $\pi^+$	PDGMoth	nCase	nCcCase	nAllCase	nCCase
1	$e^+e^-$	99999999	1471164	1471069	2942233	2942233
2	$D^0$	421	1461861	1363517	2825378	5767611
3	$K_S^0$	310	678301	678373	1356674	7124285
4	$D^{*+}$	413	669433	613499	1282932	8407217
5	$\omega$	223	625985	625985	1251970	9659187
6	$\rho^0$	113	580102	580102	1160204	10819391
7	$\rho^+$	213	560174	571711	1131885	11951276
8	$D^+$	411	191538	217180	408718	12359994
9	$\bar{D}^0$	-421	192461	166765	359226	12719220
10	$\bar{K}^*$	-313	165386	173736	339122	13058342
11	$\eta$	221	158538	158538	317076	13375418
12	$K^{*+}$	323	164453	151009	315462	13690880
13	$D_s^+$	431	82340	96231	178571	13869451
14	$\eta'$	331	67353	67353	134706	14004157
15	$a_1^+$	20213	52503	61340	113843	14118000
16	$\bar{\Lambda}$	-3122	40449	38132	78581	14196581
17	$K_L^0$	130	33394	33474	66868	14263449
18	$D_s^-$	-431	35895	30100	65995	14329444
19	$\Lambda_c^+$	4122	29376	33242	62618	14392062
20	$D^-$	-411	26685	22791	49476	14441538
21	$D_1'^+$	20413	24098	23404	47502	14489040
22	$D_0^{*+}$	10411	23099	22437	45536	14534576
23	$D_2^{*+}$	415	22579	22760	45339	14579915
24	$\bar{D}_1'^0$	-20423	21004	21711	42715	14622630
25	$\Delta^{++}$	2224	18579	18748	37327	14659957
26	$f_0(600)$	9000221	15361	15361	30722	14690679
27	$\bar{D}_2^{*0}$	-425	15469	15054	30523	14721202
28	$\bar{\Lambda}_c^-$	-4122	13804	11823	25627	14746829
29	$B^+$	521	11666	11199	22865	14769694
30	$\bar{\Delta}^+$	-1114	9986	10993	20979	14790673
31	$a_1^-$	-20213	11254	9596	20850	14811523
32	$\bar{D}_0^{*0}$	-10421	11040	9417	20457	14831980
33	$\Sigma^+$	3222	8763	9197	17960	14849940

rowNo	mother of $\pi^+$	PDGMoth	nCase	nCcCase	nAllCase	nCCase
34	$D_1^+$	10413	8038	7891	15929	14865869
35	$\bar{D}_1^0$	-10423	7771	7863	15634	14881503
36	$\bar{\Sigma}^+$	-3112	7067	7510	14577	14896080
37	$\phi$	333	6785	6647	13432	14909512
38	$\Sigma^{*+}$	3224	6201	6496	12697	14922209
39	$\tau^+$	-15	5837	6596	12433	14934642
40	$\Sigma_c^{*++}$	4224	5550	6004	11554	14946196
41	$\Delta^+$	2214	5755	5166	10921	14957117
42	$\bar{\Sigma}_c^{*0}$	-4114	5760	4878	10638	14967755
43	$\bar{\Delta}^0$	-2114	4830	4773	9603	14977358
44	$K_1^+$	10323	5131	4415	9546	14986904
45	$\bar{K}_1^0$	-20313	4077	4726	8803	14995707
46	$B^0$	511	4386	4103	8489	15004196
47	$\Xi^+$	-3312	3367	3103	6470	15010666
48	$\Sigma_c^{++}$	4222	2958	3240	6198	15016864
49	$\Xi_c^+$	4232	2912	3262	6174	15023038
50	$\bar{\Sigma}_c^0$	-4112	3272	2719	5991	15029029
51	$\rho^0(1450)$	100113	2510	2510	5020	15034049
52	$D_1^0$	10423	2373	2413	4786	15038835
53	$\bar{K}_1^0$	-10313	1697	2022	3719	15042554
54	$B^-$	-521	1840	1752	3592	15046146
55	$K_1^-$	-10323	1656	1922	3578	15049724
56	$\bar{\Sigma}^{*+}$	-3114	1784	1708	3492	15053216
57	$\rho^+(1450)$	100213	1492	1576	3068	15056284
58	$\bar{B}^0$	-511	1556	1479	3035	15059319
59	$\Xi_c^0$	4132	1055	1267	2322	15061641
60	$\tau^-$	15	1205	1038	2243	15063884
61	$D_1^-$	-10413	1042	882	1924	15065808
62	$K_1^0$	10313	772	656	1428	15067236
63	$\Xi_c^-$	-4232	730	587	1317	15068553
64	$\Xi^{*0}$	3324	533	599	1132	15069685
65	$\eta_c$	441	482	494	976	15070661
66	$\rho^-(1450)$	-100213	465	431	896	15071557
67	$\bar{\Xi}_c^0$	-4132	482	399	881	15072438
68	$J/\psi$	443	442	409	851	15073289

rowNo	mother of $\pi^+$	PDGMoth	nCase	nCcCase	nAllCase	nCCase
69	$\bar{\Sigma}^{*0}$	-3214	342	333	675	15073964
70	$\Sigma^{*0}$	3214	288	294	582	15074546
71	$\bar{\Xi}^{*+}$	-3314	269	229	498	15075044
72	$f_0(980)$	9010221	246	246	492	15075536
73	$K_1'^0$	20313	84	95	179	15075715
74	$f_2(1270)$	225	89	89	178	15075893
75	$\chi_{c1}$	20443	87	90	177	15076070
76	$X_u^0$	43	87	88	175	15076245
77	$\eta_c(2S)$	100441	60	68	128	15076373
78	$\psi'$	100443	56	51	107	15076480
79	$\bar{K}_0^{*0}$	-10311	33	45	78	15076558
80	$X_u^+$	44	26	48	74	15076632
81	$\chi_{c0}$	10441	38	36	74	15076706
82	$a_1^0$	20113	34	27	61	15076767
83	$\Omega_c^0$	4332	30	28	58	15076825
84	$f'_0$	30221	26	26	52	15076877
85	$K^*(1410)^+$	100323	22	21	43	15076920
86	$K_1'^+$	20323	21	20	41	15076961
87	$\bar{\Omega}^+$	-3334	22	17	39	15077000
88	$\chi_{c2}$	445	20	15	35	15077035
89	$K^*(1410)^0$	-100313	15	16	31	15077066
90	$K_0^{*+}$	10321	16	11	27	15077093
91	$a_0^+$	9000211	11	14	25	15077118
92	$b_1^+$	10213	8	16	24	15077142
93	$K_2^{*0}$	-315	10	12	22	15077164
94	$f_0(1500)$	9030221	8	8	16	15077180
95	$\bar{X}_{sd}$	-30343	11	4	15	15077195
96	$a_2^+$	215	5	9	14	15077209
97	$\psi(3770)$	30443	7	7	14	15077223
98	$K_2^{*+}$	325	8	6	14	15077237
99	$a_2^0$	115	8	4	12	15077249
100	$K^*(1680)^0$	-30313	6	5	11	15077260
rest	others (11 in total)	—	23	28	51	15077311

Table 30: Mothers of  $e^+$ .

rowNo	mother of $e^+$	PDGMoth	nCase	nCcCase	nAllCase	nCCase
1	$\pi^0$	111	345478	345478	690956	690956
2	$D^0$	421	62716	65998	128714	819670
3	$D^+$	411	37707	42390	80097	899767
4	$K_L^0$	130	14913	15001	29914	929681
5	$\eta$	221	11987	11987	23974	953655
6	$D_s^+$	431	7721	8700	16421	970076
7	$\Lambda_c^+$	4122	2879	3061	5940	976016
8	$\omega$	223	1864	1864	3728	979744
9	$B^+$	521	1541	1539	3080	982824
10	$\tau^+$	-15	1165	1330	2495	985319
11	$\eta'$	331	1056	1056	2112	987431
12	$K_S^0$	310	703	631	1334	988765
13	$B^0$	511	610	717	1327	990092
14	$\Xi_c^+$	4232	531	602	1133	991225
15	$\bar{\Sigma}^0$	-3212	310	335	645	991870
16	$\Sigma^0$	3212	335	310	645	992515
17	$\bar{\Lambda}$	-3122	84	91	175	992690
18	$\rho^0$	113	81	81	162	992852
19	$\phi$	333	79	79	158	993010
20	$\Xi_c^0$	4132	57	96	153	993163
21	$J/\psi$	443	42	42	84	993247
22	$\bar{\Sigma}^+$	-3112	15	23	38	993285
23	$\bar{\Xi}^+$	-3312	5	5	10	993295
24	$\bar{\Xi}^0$	-3322	3	2	5	993300
25	$\psi'$	100443	1	1	2	993302
26	$\Omega_c^0$	4332	0	1	1	993303