Topology Analysis *†‡§

(v2.12.3)

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[‡]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.

§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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[†]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.

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

rowNo	decay tree (decay initial-final states)	iDcyTr	nEtr	nCEtr
1	$\begin{array}{c} e^{+}e^{-} \rightarrow K^{0}D^{+}D_{s}^{*-}, K^{0} \rightarrow K_{L}^{0}, D^{+} \rightarrow e^{+}\nu_{e}\bar{K}^{0}, D_{s}^{*-} \rightarrow D_{s}^{-}\gamma, \bar{K}^{0} \rightarrow K_{S}^{0}, D_{s}^{-} \rightarrow K^{0}K^{*-}, \\ K_{S}^{0} \rightarrow \pi^{+}\pi^{-}, K^{0} \rightarrow K_{S}^{0}, K^{*-} \rightarrow \pi^{-}\bar{K}^{0}, K_{S}^{0} \rightarrow \pi^{+}\pi^{-}, \bar{K}^{0} \rightarrow K_{L}^{0} \\ (e^{+}e^{-} \dashrightarrow e^{+}\nu_{e}K_{L}^{0}K_{L}^{0}\pi^{+}\pi^{+}\pi^{-}\pi^{-}\pi^{-}\gamma) \end{array}$	40	2	2
2	$(e^{+}e^{-} \to e^{+}\nu_{e}K_{L}^{0}K_{L}^{0}\pi^{+}\pi^{+}\pi^{-}\pi^{-}\pi^{-}\gamma)$ $e^{+}e^{-} \to \pi^{0}\pi^{0}K^{0}K^{-}D^{*+}\bar{D}^{*0}, K^{0} \to K_{L}^{0}, D^{*+} \to \pi^{+}D^{0}, \bar{D}^{*0} \to \pi^{0}\bar{D}^{0}, D^{0} \to e^{+}\nu_{e}K^{-}, \bar{D}^{0} \to \rho^{0}\pi^{-}K^{+},$ $\rho^{0} \to \pi^{+}\pi^{-}$ $(e^{+}e^{-} \to e^{+}\nu_{e}\pi^{0}\pi^{0}\pi^{0}K_{L}^{0}\pi^{+}\pi^{+}\pi^{-}\pi^{-}K^{+}K^{-}K^{-})$	94	2	4
3	$\begin{array}{l} e^{+}e^{-} \rightarrow \pi^{-}\omega D^{+}\bar{D}^{*0}\gamma^{I}, \omega \rightarrow \pi^{0}\pi^{+}\pi^{-}, D^{+} \rightarrow \pi^{+}\bar{K}_{1}^{'0}, \bar{D}^{*0} \rightarrow \pi^{0}\bar{D}^{0}, \bar{K}_{1}^{'0} \rightarrow \rho^{+}K^{-}, \bar{D}^{0} \rightarrow \pi^{0}\pi^{-}K^{+}, \\ \rho^{+} \rightarrow \pi^{0}\pi^{+} \\ (e^{+}e^{-} \dashrightarrow \pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{+}\pi^{+}\pi^{+}\pi^{-}\pi^{-}\pi^{-}K^{+}K^{-}\gamma^{I}) \end{array}$	108	2	6
4	$e^{+}e^{-} \to \rho^{0}\pi^{-}\bar{K}^{*}\bar{D}^{0}D_{s}^{+}\gamma^{I}, \rho^{0} \to \pi^{+}\pi^{-}, \bar{K}^{*} \to \pi^{+}K^{-}, \bar{D}^{0} \to \pi^{0}\pi^{-}K^{+}\gamma^{F}, D_{s}^{+} \to \pi^{+}K^{+}K^{-}$ $(e^{+}e^{-} \dashrightarrow \pi^{0}\pi^{+}\pi^{+}\pi^{+}\pi^{-}\pi^{-}\pi^{-}K^{+}K^{+}K^{-}K^{-}\gamma^{I}\gamma^{F})$	150	2	8
5	$\begin{array}{c} e^{+}e^{-} \to D^{-}\bar{\Delta}^{0}\Sigma_{c}^{*+}\gamma^{I}, D^{-} \to \pi^{-}\pi^{-}K^{+}, \bar{\Delta}^{0} \to \pi^{+}\bar{p}, \Sigma_{c}^{*+} \to \pi^{0}\Lambda_{c}^{+}, \Lambda_{c}^{+} \to \pi^{0}\pi^{+}\Lambda, \Lambda \to \pi^{-}p \\ (e^{+}e^{-} \dashrightarrow \pi^{0}\pi^{0}\pi^{+}\pi^{+}\pi^{-}\pi^{-}\pi^{-}K^{+}p\bar{p}\gamma^{I}) \end{array}$	175	2	10
6	$e^{+}e^{-} \to \pi^{+}D^{*-}D^{0}\gamma^{I}\gamma^{I}, D^{*-} \to \pi^{-}\bar{D}^{0}, D^{0} \to \pi^{0}\pi^{+}\pi^{-}K^{+}K^{-}, \bar{D}^{0} \to \pi^{0}\pi^{-}K^{+}$ $(e^{+}e^{-} \dashrightarrow \pi^{0}\pi^{0}\pi^{+}\pi^{+}\pi^{-}\pi^{-}\pi^{-}K^{+}K^{+}K^{-}\gamma^{I}\gamma^{I})$	199	2	12
7	$\begin{array}{c} e^{+}e^{-} \rightarrow \pi^{+}K^{*-}D^{-}D_{s}^{+}, K^{*-} \rightarrow \pi^{0}K^{-}, D^{-} \rightarrow \pi^{0}\pi^{-}K^{+}K^{-}, D_{s}^{+} \rightarrow \rho^{+}\eta, \rho^{+} \rightarrow \pi^{0}\pi^{+}, \eta \rightarrow \gamma\gamma \\ (e^{+}e^{-} \dashrightarrow \pi^{0}\pi^{0}\pi^{0}\pi^{+}\pi^{+}\pi^{-}K^{+}K^{-}K^{-}\gamma\gamma) \end{array}$	202	2	14
8	$\begin{array}{l} e^{+}e^{-} \rightarrow K^{+}D^{*0}D_{s}^{*-}\gamma^{I}, D^{*0} \rightarrow \pi^{0}D^{0}, D_{s}^{*-} \rightarrow D_{s}^{-}\gamma, D^{0} \rightarrow \pi^{0}\pi^{+}K^{-}, D_{s}^{-} \rightarrow \rho^{-}\phi, \rho^{-} \rightarrow \pi^{0}\pi^{-}, \\ \phi \rightarrow K^{+}K^{-} \\ (e^{+}e^{-} \dashrightarrow \pi^{0}\pi^{0}\pi^{0}\pi^{+}\pi^{-}K^{+}K^{+}K^{-}K^{-}\gamma^{I}\gamma) \end{array}$	212	2	16
9	$e^{+}e^{-} \to \pi^{+}\pi^{-}D^{*0}\bar{D}^{*0}, D^{*0} \to \pi^{0}D^{0}, \bar{D}^{*0} \to \pi^{0}\bar{D}^{0}, D^{0} \to \pi^{+}K^{-}, \bar{D}^{0} \to \pi^{0}\pi^{-}K^{+}$ $(e^{+}e^{-} \dashrightarrow \pi^{0}\pi^{0}\pi^{0}\pi^{+}\pi^{+}\pi^{-}\pi^{-}K^{+}K^{-})$	233	2	18
10	$\begin{array}{l} e^{+}e^{-} \rightarrow \bar{K}^{*}K^{+}K^{-}D^{*-}D_{s}^{*+}, \bar{K}^{*} \rightarrow \pi^{+}K^{-}, D^{*-} \rightarrow \pi^{-}\bar{D}^{0}, D_{s}^{*+} \rightarrow D_{s}^{+}\gamma, \bar{D}^{0} \rightarrow \pi^{0}\pi^{0}\pi^{-}K^{+}, D_{s}^{+} \rightarrow \bar{K}^{*}K^{*+}, \\ \bar{K}^{*} \rightarrow \pi^{0}\bar{K}^{0}, K^{*+} \rightarrow \pi^{0}K^{+}, \bar{K}^{0} \rightarrow K_{L}^{0} \\ (e^{+}e^{-} \dashrightarrow \pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}K_{L}^{0}\pi^{+}\pi^{-}\pi^{-}K^{+}K^{+}K^{-}K^{-}\gamma) \end{array}$	244	2	20
11	$\begin{array}{c} e^{+}e^{-} \rightarrow \rho^{0}\pi^{-}D^{*+}\bar{D}^{*0}, \rho^{0} \rightarrow \pi^{+}\pi^{-}, D^{*+} \rightarrow \pi^{+}D^{0}, \bar{D}^{*0} \rightarrow \pi^{0}\bar{D}^{0}, D^{0} \rightarrow \omega\bar{K}^{*}, \bar{D}^{0} \rightarrow \pi^{0}\pi^{-}K^{+}, \\ \omega \rightarrow \pi^{0}\pi^{+}\pi^{-}, \bar{K}^{*} \rightarrow \pi^{+}K^{-} \\ (e^{+}e^{-} \rightarrow \pi^{0}\pi^{0}\pi^{0}\pi^{+}\pi^{+}\pi^{+}\pi^{+}\pi^{-}\pi^{-}\pi^{-}K^{+}K^{-}) \\ e^{+}e^{-} \rightarrow \pi^{0}\pi^{0}\pi^{+}\pi^{-}D^{*+}D^{*-}\gamma^{I}, D^{*+} \rightarrow \pi^{+}D^{0}, D^{*-} \rightarrow \pi^{-}\bar{D}^{0}, D^{0} \rightarrow \pi^{0}\pi^{+}K^{-}, \bar{D}^{0} \rightarrow \pi^{0}\pi^{-}K^{+} \end{array}$	323	2	22
12	$(e^{+}e^{-} \dashrightarrow \pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{+}\pi^{+}\pi^{+}\pi^{-}\pi^{-}\pi^{-}K^{+}K^{-}\gamma^{I})$	348	2	24
13	$\begin{array}{l} e^{+}e^{-}\rightarrow\pi^{+}\pi^{-}D^{*0}\bar{D}^{*0}\gamma^{I}, D^{*0}\rightarrow\pi^{0}D^{0}, \bar{D}^{*0}\rightarrow\bar{D}^{0}\gamma, D^{0}\rightarrow\pi^{+}\eta K^{-}, \bar{D}^{0}\rightarrow\pi^{0}K_{S}^{0}, \eta\rightarrow\pi^{0}\pi^{+}\pi^{-}, \\ K_{S}^{0}\rightarrow\pi^{0}\pi^{0} \\ (e^{+}e^{-}\rightarrow\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{+}\pi^{+}\pi^{+}\pi^{-}\pi^{-}K^{-}\gamma^{I}\gamma) \end{array}$	372	2	26

rowNo	decay tree (decay initial-final states)	iDcyTr	nEtr	nCEtr
14	$e^{+}e^{-} \to K^{+}D^{*0}D_{s}^{-}\gamma^{I}, D^{*0} \to \pi^{0}D^{0}, D_{s}^{-} \to \pi^{0}\pi^{0}\pi^{-}\omega, D^{0} \to K^{-}a_{1}^{+}, \omega \to \pi^{0}\pi^{+}\pi^{-}, a_{1}^{+} \to \pi^{+}f_{0}(600),$ $f_{0}(600) \to \pi^{+}\pi^{-}$ $(e^{+}e^{-} \dashrightarrow \pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{+}\pi^{+}\pi^{+}\pi^{-}\pi^{-}\pi^{-}K^{+}K^{-}\gamma^{I})$	397	2	28
15	$\begin{array}{c} e^{+}e^{-}\rightarrow\pi^{+}\eta K^{-}D^{*-}D^{+}_{s}\gamma^{I}\gamma^{I}\gamma^{I},\eta\rightarrow\pi^{0}\pi^{+}\pi^{-},D^{*-}\rightarrow\pi^{-}\bar{D}^{0},D^{+}_{s}\rightarrow\pi^{0}\pi^{+}K^{*},\bar{D}^{0}\rightarrow\pi^{0}\pi^{-}K^{+},K^{*}\rightarrow\pi^{0}K^{0},\\ K^{0}\rightarrow K^{0}_{S},K^{0}_{S}\rightarrow\pi^{+}\pi^{-}\\ (e^{+}e^{-}\dashrightarrow\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{+}\pi^{+}\pi^{+}\pi^{-}\pi^{-}\pi^{-}\pi^{-}K^{+}K^{-}\gamma^{I}\gamma^{I}\gamma^{I}) \end{array}$	548	2	30
16	$\begin{array}{c} e^{+}e^{-}\rightarrow\pi^{-}K^{+}K^{+}K^{-}D^{*+}D_{s}^{*-}, D^{*+}\rightarrow\pi^{0}D^{+}, D_{s}^{*-}\rightarrow\pi^{0}D_{s}^{-}, D^{+}\rightarrow\pi^{0}\pi^{+}K_{S}^{0}, D_{s}^{-}\rightarrow\pi^{-}K^{+}K^{-}, K_{S}^{0}\rightarrow\pi^{+}\pi^{-}K^{-}K^{0}, C^{-}K^{0}, C^{-}K^{0}$	596	2	32
17	$\begin{array}{l} e^{+}e^{-} \rightarrow \omega K^{+}D^{*0}D_{s}^{*-}\gamma^{I}\gamma^{I}, \omega \rightarrow \pi^{0}\pi^{+}\pi^{-}, D^{*0} \rightarrow \pi^{0}D^{0}, D_{s}^{*-} \rightarrow \pi^{0}D_{s}^{-}, \pi^{0} \rightarrow e^{+}e^{-}\gamma^{F}, D^{0} \rightarrow \pi^{0}\pi^{+}\pi^{-}, \\ D_{s}^{-} \rightarrow \pi^{0}\pi^{-}\phi, \phi \rightarrow K^{+}K^{-} \\ (e^{+}e^{-} \dashrightarrow e^{+}e^{-}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{+}\pi^{+}\pi^{-}\pi^{-}\pi^{-}K^{+}K^{+}K^{-}\gamma^{I}\gamma^{I}\gamma^{F}) \end{array}$	598	2	34
18	$e^{+}e^{-} \to K^{*-}D_{s}^{*+}p\bar{\Lambda}_{c}^{-}\gamma^{I}, K^{*-} \to \pi^{-}\bar{K}^{0}, D_{s}^{*+} \to D_{s}^{+}\gamma, \bar{\Lambda}_{c}^{-} \to \pi^{+}\pi^{-}\bar{\Sigma}^{*-}, \bar{K}^{0} \to K_{S}^{0}, D_{s}^{+} \to \rho^{+}\phi, \\ \bar{\Sigma}^{*-} \to \pi^{-}\bar{\Lambda}, K_{S}^{0} \to \pi^{+}\pi^{-}, \rho^{+} \to \pi^{0}\pi^{+}, \phi \to K^{+}K^{-}, \bar{\Lambda} \to \pi^{0}\bar{n} \\ (e^{+}e^{-} \dashrightarrow \pi^{0}\pi^{0}\pi^{+}\pi^{+}\pi^{+}\pi^{-}\pi^{-}\pi^{-}\pi^{-}K^{+}K^{-}\bar{n}p\gamma^{I}\gamma)$	638	2	36
19	$e^{+}e^{-} \to K^{0}\bar{K}^{*}D_{s}^{+}D_{s}^{*-}\gamma^{I}, K^{0} \to K_{S}^{0}, \bar{K}^{*} \to \pi^{+}K^{-}, D_{s}^{+} \to \pi^{+}K^{+}K^{-}, D_{s}^{*-} \to D_{s}^{-}\gamma, K_{S}^{0} \to \pi^{0}\pi^{0},$ $D_{s}^{-} \to \tau^{-}\bar{\nu}_{\tau}, \tau^{-} \to \nu_{\tau}\pi^{0}\pi^{-}\gamma^{F}$ $(e^{+}e^{-} \dashrightarrow \nu_{\tau}\bar{\nu}_{\tau}\pi^{0}\pi^{0}\pi^{0}\pi^{+}\pi^{+}\pi^{-}K^{+}K^{-}K^{-}\gamma^{I}\gamma^{F}\gamma)$	673	2	38
20	$e^{+}e^{-} \to \bar{K}^{*}K^{+}K^{-}K^{*+}D^{*-}D^{*0}, \bar{K}^{*} \to \pi^{+}K^{-}, K^{*+} \to \pi^{0}K^{+}, D^{*-} \to \pi^{-}\bar{D}^{0}, D^{*0} \to \pi^{0}D^{0}, \bar{D}^{0} \to \pi^{0}K_{L}^{0},$ $D^{0} \to \pi^{0}\pi^{+}\pi^{-}$ $(e^{+}e^{-} \dashrightarrow \pi^{0}\pi^{0}\pi^{0}\pi^{0}K_{L}^{0}\pi^{+}\pi^{+}\pi^{-}\pi^{-}K^{+}K^{+}K^{-}K^{-})$	676	2	40
21	$\begin{array}{l} e^{+}e^{-}\rightarrow\pi^{0}\pi^{-}K^{+}D^{+}D_{s}^{-}\gamma^{I}, D^{+}\rightarrow\mu^{+}\nu_{\mu}\bar{K}^{0}, D_{s}^{-}\rightarrow K^{*}K^{*-}, \bar{K}^{0}\rightarrow K_{S}^{0}, K^{*}\rightarrow\pi^{-}K^{+}, K^{*-}\rightarrow\pi^{0}K^{-}, \\ K_{S}^{0}\rightarrow\pi^{0}\pi^{0} \\ (e^{+}e^{-}\rightarrow\mu^{+}\nu_{\mu}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{-}\pi^{-}K^{+}K^{+}K^{-}\gamma^{I}) \end{array}$	706	2	42
22	$e^{+}e^{-} \to \bar{K}^{0}K^{*+}D^{-}D^{*0}\gamma^{I}\gamma^{I}, \bar{K}^{0} \to K_{S}^{0}, K^{*+} \to \pi^{+}K^{0}, D^{-} \to K_{L}^{0}\pi^{-}, D^{*0} \to \pi^{0}D^{0}, K_{S}^{0} \to \pi^{+}\pi^{-}, K^{0} \to K_{S}^{0}, D^{0} \to \pi^{0}\pi^{+}\pi^{-}K^{+}K^{-}, K_{S}^{0} \to \pi^{+}\pi^{-}\gamma^{F}$ $(e^{+}e^{-} \dashrightarrow \pi^{0}\pi^{0}K_{L}^{0}\pi^{+}\pi^{+}\pi^{+}\pi^{+}\pi^{-}\pi^{-}\pi^{-}\pi^{-}K^{+}K^{-}\gamma^{I}\gamma^{I}\gamma^{F})$	718	2	44
23	$ \begin{array}{l} (e^{+}e^{-} \xrightarrow{-\rightarrow} \pi^{0}\pi^{0}K_{L}^{0}\pi^{+}\pi^{+}\pi^{+}\pi^{+}\pi^{-}\pi^{-}\pi^{-}\pi^{-}K^{+}K^{-}\gamma^{I}\gamma^{I}\gamma^{I}\gamma^{F}) \\ e^{+}e^{-} \pi^{0}\pi^{0}\pi^{-}D_{2}^{*+}\bar{D}^{*0}, D_{2}^{*+} \pi^{+}D^{0}, \bar{D}^{*0} \pi^{0}\bar{D}^{0}, D^{0} K^{+}K^{-}, \bar{D}^{0} \pi^{0}\pi^{0}\pi^{0}K_{L}^{0} \\ (e^{+}e^{-} \xrightarrow{-\rightarrow} \pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}K_{L}^{0}\pi^{+}\pi^{-}K^{+}K^{-}) \end{array} $	768	2	46
24	$e^{+}e^{-} \to \pi^{-}K^{+}D_{2}^{*+}D_{s}^{*-}, D_{2}^{*+} \to \pi^{0}D^{+}, D_{s}^{*-} \to D_{s}^{-}\gamma, D^{+} \to e^{+}\nu_{e}\bar{K}^{*}, D_{s}^{-} \to \bar{K}^{*}K^{-}, \bar{K}^{*} \to \pi^{+}K^{-}, \bar{K}^{*} \to \pi^{0}\bar{K}^{0}, \bar{K}^{0} \to K_{S}^{0}, K_{S}^{0} \to \pi^{0}\pi^{0} \to K_{S}^{0}, K_{S}^{0} \to \pi^{0}\pi^{0} \to K_{S}^{0}, K_{S}^{0} \to K_{S}^{0}, K_{$	776	2	48
25	$\begin{array}{c} e^{+}e^{-} \rightarrow \pi^{0}\Sigma_{c}^{*++}\bar{\Sigma}_{c}^{*}, \Sigma_{c}^{*++} \rightarrow \pi^{+}\Lambda_{c}^{+}, \bar{\Sigma}_{c}^{*} \rightarrow \pi^{-}\bar{\Lambda}_{c}^{-}, \Lambda_{c}^{+} \rightarrow \pi^{0}\pi^{+}K^{-}p, \bar{\Lambda}_{c}^{-} \rightarrow K^{+}\bar{\Delta}^{}, \bar{\Delta}^{} \rightarrow \pi^{-}\bar{p} \\ (e^{+}e^{-} \dashrightarrow \pi^{0}\pi^{0}\pi^{+}\pi^{+}\pi^{-}\pi^{-}K^{+}K^{-}p\bar{p}) \end{array}$	841	2	50
26	$e^{+}e^{-} \to \pi^{0}\rho^{-}K^{*+}D^{*+}D_{s}^{-}\gamma^{I}, \rho^{-} \to \pi^{0}\pi^{-}, K^{*+} \to \pi^{0}K^{+}, D^{*+} \to \pi^{+}D^{0}, D_{s}^{-} \to \rho^{-}\eta, D^{0} \to K_{L}^{0}\pi^{+}\pi^{-}, \rho^{-} \to \pi^{0}\pi^{-}, \eta \to \pi^{0}\pi^{+}\pi^{-} = (e^{+}e^{-} \dashrightarrow \pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}K_{L}^{0}\pi^{+}\pi^{+}\pi^{+}\pi^{-}\pi^{-}\pi^{-}K^{+}\gamma^{I})$	856	2	52

rowNo	decay tree (decay initial-final states)	iDcyTr	nEtr	nCEtı
27	$e^{+}e^{-} \to \pi^{0}K^{+}D^{*0}D_{s}^{*-}, D^{*0} \to D^{0}\gamma, D_{s}^{*-} \to D_{s}^{-}\gamma, D^{0} \to \pi^{0}\pi^{0}\pi^{0}K_{S}^{0}, D_{s}^{-} \to \pi^{0}\pi^{-}\omega, K_{S}^{0} \to \pi^{0}\pi^{0}, \omega \to \pi^{0}\gamma $ $(e^{+}e^{-} \dashrightarrow \pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}$	1083	2	54
28	$e^{+}e^{-} \to \pi^{0}\pi^{+}\pi^{-}D^{0}\bar{D}^{0}\gamma^{I}, D^{0} \to \mu^{+}\nu_{\mu}K^{-}, \bar{D}^{0} \to \pi^{+}\pi^{-}K^{+}K^{-}$ $(e^{+}e^{-} \dashrightarrow \mu^{+}\nu_{\mu}\pi^{0}\pi^{+}\pi^{+}\pi^{-}\pi^{-}K^{+}K^{-}K^{-}\gamma^{I})$	1092	2	56
29	$\begin{array}{c} e^{+}e^{-} \rightarrow K^{+}K^{-}\bar{D}^{*0}D_{0}^{*0}\gamma^{I}, \bar{D}^{*0} \rightarrow \bar{D}^{0}\gamma, D_{0}^{*0} \rightarrow \pi^{0}D^{0}, \bar{D}^{0} \rightarrow K^{+}a_{1}^{-}, D^{0} \rightarrow K^{-}a_{1}^{+}, a_{1}^{-} \rightarrow \pi^{0}\rho^{-}, \\ a_{1}^{+} \rightarrow \pi^{0}\rho^{+}, \rho^{-} \rightarrow \pi^{0}\pi^{-}, \rho^{+} \rightarrow \pi^{0}\pi^{+}, \pi^{0} \rightarrow e^{+}e^{-}\gamma^{F} \\ (e^{+}e^{-} \dashrightarrow e^{+}e^{-}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{+}\pi^{-}K^{+}K^{+}K^{-}K^{-}\gamma^{I}\gamma^{F}\gamma) \end{array}$	1131	2	58
30	$\begin{array}{l} e^{+}e^{-}\rightarrow\pi^{-}D^{*+}\bar{D}^{*0}\gamma^{I}, D^{*+}\rightarrow\pi^{+}D^{0}, \bar{D}^{*0}\rightarrow\pi^{0}\bar{D}^{0}, D^{0}\rightarrow\pi^{+}K_{1}^{-}, \bar{D}^{0}\rightarrow\pi^{0}\pi^{-}K^{+}, K_{1}^{-}\rightarrow\pi^{-}\bar{K}^{*}, \\ \bar{K}^{*}\rightarrow\pi^{+}K^{-} \\ (e^{+}e^{-}\dashrightarrow\pi^{0}\pi^{0}\pi^{+}\pi^{+}\pi^{+}\pi^{-}\pi^{-}\pi^{-}K^{+}K^{-}\gamma^{I}) \end{array}$	1145	2	60
31	$e^{+}e^{-} \to \bar{K}^{0}K^{*}D^{*+}D^{*-}\gamma^{I}, \bar{K}^{0} \to K_{S}^{0}, K^{*} \to \pi^{-}K^{+}, D^{*+} \to \pi^{+}D^{0}, D^{*-} \to \pi^{0}D^{-}, K_{S}^{0} \to \pi^{0}\pi^{0}, D^{0} \to \eta K_{S}^{0}, D^{-} \to \pi^{-}\pi^{-}K^{+}, \eta \to \gamma\gamma, K_{S}^{0} \to \pi^{+}\pi^{-} (e^{+}e^{-} \dashrightarrow \pi^{0}\pi^{0}\pi^{0}\pi^{+}\pi^{+}\pi^{-}\pi^{-}\pi^{-}K^{+}K^{+}\gamma^{I}\gamma\gamma)$	1213	2	62
32	$\begin{array}{l} e^{+}e^{-}\rightarrow\pi^{0}\pi^{-}D^{*+}\bar{D}_{2}^{*0}, D^{*+}\rightarrow\pi^{+}D^{0}, \bar{D}_{2}^{*0}\rightarrow\pi^{0}\bar{D}^{*0}, D^{0}\rightarrow\pi^{0}K_{L}^{0}, \bar{D}^{*0}\rightarrow\bar{D}^{0}\gamma, K_{L}^{0}\rightarrow\pi^{0}\pi^{0}\pi^{0}, \\ \bar{D}^{0}\rightarrow\pi^{0}\pi^{-}K^{+}\\ (e^{+}e^{-}\dashrightarrow\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}$	1279	2	64
33	$\begin{array}{l} e^{+}e^{-}\rightarrow\pi^{+}\pi^{-}K^{+}K^{-}D^{*0}\bar{D}^{*0}, D^{*0}\rightarrow\pi^{0}D^{0}, \bar{D}^{*0}\rightarrow\pi^{0}\bar{D}^{0}, D^{0}\rightarrow\rho^{0}\bar{K}^{*}, \bar{D}^{0}\rightarrow\pi^{0}\pi^{0}\pi^{+}\pi^{-}, \rho^{0}\rightarrow\pi^{+}\pi^{-}, \rho^{0}\rightarrow\pi^{-}, \rho^{0}\rightarrow\pi^$	1334	2	66
34	$ \begin{array}{c} (e^{+}e^{-} \dashrightarrow \pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{+}\pi^{+}\pi^{+}\pi^{+}\pi^{-}\pi^{-}\pi^{-}K^{+}K^{-}K^{-}\gamma^{F}) \\ e^{+}e^{-} \rightarrowtail \pi^{+}K^{*}D^{*0}D^{*-}_{s}, K^{*} \rightarrowtail \pi^{0}K^{0}, D^{*0} \rightarrowtail \pi^{0}D^{0}, D^{*-}_{s} \rightarrowtail D^{-}_{s}\gamma, K^{0} \rightarrowtail K^{0}_{L}, D^{0} \rightarrowtail \rho^{0}\pi^{+}K^{-}, \\ D^{-}_{s} \rightarrowtail \rho^{-}\eta, K^{0}_{L} \rightarrowtail \mu^{+}\nu_{\mu}\pi^{-}, \rho^{0} \rightarrowtail \pi^{+}\pi^{-}, \rho^{-} \rightarrowtail \pi^{0}\pi^{-}, \eta \rightarrowtail \pi^{0}\pi^{0}\pi^{0} \\ (e^{+}e^{-} \dashrightarrow \mu^{+}\nu_{\mu}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{+}\pi^{+}\pi^{+}\pi^{-}\pi^{-}\pi^{-}K^{-}\gamma) \\ e^{+}e^{-} \rightarrowtail \rho^{-}\bar{K}^{0}K^{+}D^{*+}D^{*-}\gamma^{I}, \rho^{-} \rightarrowtail \pi^{0}\pi^{-}, \bar{K}^{0} \rightarrowtail K^{0}_{S}, D^{*+} \rightarrowtail \pi^{+}D^{0}, D^{*-} \rightarrowtail \pi^{-}\bar{D}^{0}, K^{0}_{S} \rightarrowtail \pi^{0}\pi^{0}, \end{array} $	1369	2	68
35	$\begin{array}{c} e^{+}e^{-} \rightarrow \rho^{-}\bar{K}^{0}K^{+}D^{*+}D^{*-}\gamma^{I}, \rho^{-} \rightarrow \pi^{0}\pi^{-}, \bar{K}^{0} \rightarrow K_{S}^{0}, D^{*+} \rightarrow \pi^{+}D^{0}, D^{*-} \rightarrow \pi^{-}\bar{D}^{0}, K_{S}^{0} \rightarrow \pi^{0}\pi^{0}, \\ D^{0} \rightarrow \pi^{0}\pi^{0}K^{+}K^{-}, \bar{D}^{0} \rightarrow \pi^{0}\pi^{-}K^{+}, \pi^{0} \rightarrow e^{+}e^{-}\gamma^{F} \\ (e^{+}e^{-} - \rightarrow e^{+}e^{-}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{+}\pi^{-}\pi^{-}\pi^{-}K^{+}K^{+}K^{-}\chi^{I}\gamma^{F}) \\ e^{+}e^{-} \rightarrow \pi^{+}\omega K^{+}K^{-}D^{-}D^{0}, \omega \rightarrow \pi^{0}\pi^{+}\pi^{-}, D^{-} \rightarrow \pi^{0}K_{L}^{0}\pi^{-}, D^{0} \rightarrow \pi^{0}\pi^{+}K^{*-}, K^{*-} \rightarrow \pi^{0}K^{-} \end{array}$	1408	2	70
36	$(e^+e^- \dashrightarrow \pi^0\pi^0\pi^0\pi^0K_L^0\pi^+\pi^+\pi^-\pi^-K^+K^-K^-)$	1425	2	72
37	$\begin{array}{c} e^{+}e^{-} \rightarrow K^{+}K^{-}D^{0}\bar{D}^{*0}, D^{0} \rightarrow \pi^{0}\bar{K}^{*}, \bar{D}^{*0} \rightarrow \pi^{0}\bar{D}^{0}, \bar{K}^{*} \rightarrow \pi^{0}\bar{K}^{0}, \bar{D}^{0} \rightarrow \pi^{0}\pi^{-}K^{+}, \bar{K}^{0} \rightarrow K_{S}^{0}, \\ K_{S}^{0} \rightarrow \pi^{+}\pi^{-} \\ (e^{+}e^{-} \dashrightarrow \pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{+}\pi^{-}\pi^{-}K^{+}K^{+}K^{-}) \end{array}$	1443	2	74
38	$e^{+}e^{-} \to \pi^{+}\pi^{-}\omega K^{+}D^{*0}D_{s}^{*-}, \omega \to \pi^{0}\pi^{+}\pi^{-}, D^{*0} \to \pi^{0}D^{0}, D_{s}^{*-} \to D_{s}^{-}\gamma, D^{0} \to \pi^{0}K_{L}^{0}, D_{s}^{-} \to \pi^{-}K^{+}K^{-}\gamma^{F}$ $(e^{+}e^{-} \to \pi^{0}\pi^{0}\pi^{0}K_{L}^{0}\pi^{+}\pi^{+}\pi^{-}\pi^{-}\pi^{-}K^{+}K^{+}K^{-}\gamma^{F}\gamma)$ $e^{+}e^{-} \to \pi^{0}\pi^{0}K^{+}K^{-}D^{0}\bar{D}^{*0}\gamma^{I}, D^{0} \to \rho^{+}K^{*-}, \bar{D}^{*0} \to \bar{D}^{0}\gamma, \rho^{+} \to \pi^{0}\pi^{+}, K^{*-} \to \pi^{0}K^{-}, \bar{D}^{0} \to \pi^{0}\pi^{0}K_{S}^{0},$	1472	2	76
39	$\begin{array}{c} e^{+}e^{-} \rightarrow \pi^{0}\pi^{0}K^{+}K^{-}D^{0}\bar{D}^{*0}\gamma^{I}, D^{0} \rightarrow \rho^{+}K^{*-}, \bar{D}^{*0} \rightarrow \bar{D}^{0}\gamma, \rho^{+} \rightarrow \pi^{0}\pi^{+}, K^{*-} \rightarrow \pi^{0}K^{-}, \bar{D}^{0} \rightarrow \pi^{0}\pi^{0}K^{0}_{S}, \\ K^{0}_{S} \rightarrow \pi^{+}\pi^{-} \\ (e^{+}e^{-} \rightarrow \pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{+}\pi^{+}\pi^{-}K^{+}K^{-}K^{-}\gamma^{I}\gamma) \end{array}$	1473	2	78

rowNo	decay tree (decay initial-final states)	iDcyTr	nEtr	nCEtr
40	$\begin{array}{l} e^{+}e^{-} \rightarrow K^{0}K^{*-}D^{*+}\bar{D}^{*0}\gamma^{I}, K^{0} \rightarrow K_{L}^{0}, K^{*-} \rightarrow \pi^{0}K^{-}, D^{*+} \rightarrow \pi^{+}D^{0}, \bar{D}^{*0} \rightarrow \pi^{0}\bar{D}^{0}, D^{0} \rightarrow e^{+}\nu_{e}K^{-}, \\ \bar{D}^{0} \rightarrow \pi^{+}\pi^{-}K^{+}K^{-} \\ (e^{+}e^{-} \dashrightarrow e^{+}\nu_{e}\pi^{0}\pi^{0}K_{L}^{0}\pi^{+}\pi^{+}\pi^{-}K^{+}K^{-}K^{-}Y^{I}) \end{array}$	1488	2	80
41	$\begin{array}{l} e^{+}e^{-} \rightarrow \pi^{0}\pi^{0}\pi^{+}D^{*-}D^{*0}\gamma^{I}, D^{*-} \rightarrow \pi^{-}\bar{D}^{0}, D^{*0} \rightarrow \pi^{0}D^{0}, \bar{D}^{0} \rightarrow K_{L}^{0}K^{+}K^{-}, D^{0} \rightarrow \rho^{+}K^{*-}, K_{L}^{0} \rightarrow \pi^{0}\pi^{0}\pi^{0}, \\ \rho^{+} \rightarrow \pi^{0}\pi^{+}, K^{*-} \rightarrow \pi^{0}K^{-} \\ (e^{+}e^{-} \dashrightarrow \pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}$	1570	2	82
42	$e^{+}e^{-} \to \pi^{0}\rho^{-}D^{*+}\bar{D}^{*0}, \rho^{-} \to \pi^{0}\pi^{-}, D^{*+} \to \pi^{+}D^{0}, \bar{D}^{*0} \to \pi^{0}\bar{D}^{0}, D^{0} \to \pi^{0}\pi^{+}K^{-}, \bar{D}^{0} \to \rho^{-}K^{*+}\gamma,$ $\rho^{-} \to \pi^{0}\pi^{-}, K^{*+} \to \pi^{0}K^{+}$ $(e^{+}e^{-} - \to \pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}$	1574	2	84
43	$\begin{array}{c} e^{+}e^{-} \to \bar{K}^{0}D^{*-}D^{*+}_{s}, \bar{K}^{0} \to K^{0}_{S}, D^{*-} \to \pi^{0}D^{-}, D^{*+}_{s} \to D^{+}_{s}\gamma, K^{0}_{S} \to \pi^{+}\pi^{-}\gamma^{F}, D^{-} \to K^{*}a^{-}_{1}, \\ D^{+}_{s} \to \pi^{0}\pi^{0}\pi^{+}\eta, K^{*} \to \pi^{-}K^{+}, a^{-}_{1} \to \pi^{-}\rho^{0}(1450), \eta \to \gamma\gamma, \rho^{0}(1450) \to \pi^{+}\pi^{-} \\ (e^{+}e^{-} \dashrightarrow \pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{+}\pi^{+}\pi^{+}\pi^{-}\pi^{-}\pi^{-}\pi^{-}K^{+}\gamma^{F}\gamma\gamma) \\ \hline e^{+}e^{-} \to \pi^{+}\pi^{-}D^{+}D^{*-}\gamma^{I}\gamma^{I}\gamma^{I}, D^{+} \to \pi^{0}\pi^{+}\bar{K}^{*}, D^{*-} \to \pi^{-}\bar{D}^{0}, \bar{K}^{*} \to \pi^{+}K^{-}, \bar{D}^{0} \to \rho^{0}K^{*}, \rho^{0} \to \pi^{+}\pi^{-}, \end{array}$	1593	2	86
44	$K^* \to \pi^- K^+ \ (e^+ e^- \dashrightarrow \pi^0 \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- K^+ K^- \gamma^I \gamma^I \gamma^I)$	1642	2	88
45	$\begin{array}{c} e^{+}e^{-} \rightarrow \pi^{-}\bar{K}^{*}\bar{D}^{*0}D_{s}^{*+}\gamma^{I}, \bar{K}^{*} \rightarrow \pi^{+}K^{-}\gamma^{F}, \bar{D}^{*0} \rightarrow \pi^{0}\bar{D}^{0}, D_{s}^{*+} \rightarrow D_{s}^{+}\gamma, \bar{D}^{0} \rightarrow \pi^{0}\pi^{0}K_{S}^{0}, D_{s}^{+} \rightarrow \bar{K}^{*}K^{*+}, \\ K_{S}^{0} \rightarrow \pi^{+}\pi^{-}, \bar{K}^{*} \rightarrow \pi^{+}K^{-}, K^{*+} \rightarrow \pi^{0}K^{+} \\ (e^{+}e^{-} \dashrightarrow \pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{+}\pi^{+}\pi^{+}\pi^{-}\pi^{-}K^{+}K^{-}K^{-}\gamma^{I}\gamma^{F}\gamma) \end{array}$	1664	2	90
46	$e^{+}e^{-} \to \pi^{+}\omega K^{-}D_{s}^{+}D_{1}^{\prime-}, \omega \to \pi^{0}\pi^{+}\pi^{-}, D_{s}^{+} \to \rho^{+}\phi, D_{1}^{\prime-} \to \pi^{-}\bar{D}^{*0}, \rho^{+} \to \pi^{0}\pi^{+}, \phi \to K^{+}K^{-}, \bar{D}^{*0} \to \pi^{0}\bar{D}^{0}, \bar{D}^{0} \to \pi^{-}K^{+} $ $(e^{+}e^{-} \dashrightarrow \pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{+}\pi^{+}\pi^{+}\pi^{-}\pi^{-}\pi^{-}K^{+}K^{+}K^{-}K^{-})$	1795	2	92
47	$e^{+}e^{-} \to \pi^{+}\pi^{-}\bar{K}^{0}D_{s}^{*+}D_{1}^{'-}, \bar{K}^{0} \to K_{L}^{0}, D_{s}^{*+} \to D_{s}^{+}\gamma, D_{1}^{'-} \to \pi^{-}\bar{D}^{*0}, K_{L}^{0} \to e^{-}\nu_{e}\pi^{+}\gamma^{F}, D_{s}^{+} \to \tau^{+}\nu_{\tau}, \bar{D}^{*0} \to \pi^{0}\bar{D}^{0}, \tau^{+} \to \bar{\nu}_{\tau}\pi^{+}, \bar{D}^{0} \to \pi^{0}\pi^{-}K^{+} $ $(e^{+}e^{-} \dashrightarrow e^{-}\nu_{e}\nu_{\tau}\bar{\nu}_{\tau}\pi^{0}\pi^{0}\pi^{+}\pi^{+}\pi^{+}\pi^{-}\pi^{-}\pi^{-}K^{+}\gamma^{F}\gamma)$	1822	2	94
48	$e^{+}e^{-} \to K^{+}K^{-}D^{0}\bar{D}^{*0}\gamma^{I}, D^{0} \to e^{+}\nu_{e}K^{-}, \bar{D}^{*0} \to \pi^{0}\bar{D}^{0}, \bar{D}^{0} \to \pi^{0}\pi^{0}\pi^{-}K^{+}$ $(e^{+}e^{-} \dashrightarrow e^{+}\nu_{e}\pi^{0}\pi^{0}\pi^{0}\pi^{-}K^{+}K^{+}K^{-}K^{-}\gamma^{I})$	2	1	95
49	$\begin{array}{l} e^{+}e^{-} \rightarrow \pi^{0}\pi^{-}D^{*+}\bar{D}^{0}, D^{*+} \rightarrow \pi^{+}D^{0}, \bar{D}^{0} \rightarrow \pi^{0}\eta K_{S}^{0}, D^{0} \rightarrow K^{-}a_{1}^{+}, \eta \rightarrow \gamma\gamma, K_{S}^{0} \rightarrow \pi^{+}\pi^{-}, \\ a_{1}^{+} \rightarrow \pi^{0}\rho^{+}, \rho^{+} \rightarrow \pi^{0}\pi^{+} \\ (e^{+}e^{-} \dashrightarrow \pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{+}\pi^{+}\pi^{+}\pi^{-}\pi^{-}K^{-}\gamma\gamma) \end{array}$	3	1	96
50	$e^{+}e^{-} \to \pi^{-}D^{+}\bar{D}^{0}n\bar{n}\gamma^{I}\gamma^{I}, D^{+} \to \pi^{0}\pi^{+}K_{S}^{0}, \bar{D}^{0} \to K_{S}^{0}K^{+}K^{-}, K_{S}^{0} \to \pi^{+}\pi^{-}, K_{S}^{0} \to \pi^{+}\pi^{-}$ $(e^{+}e^{-} \dashrightarrow \pi^{0}\pi^{+}\pi^{+}\pi^{+}\pi^{-}\pi^{-}\pi^{-}K^{+}K^{-}n\bar{n}\gamma^{I}\gamma^{I})$	4	1	97
51	$\begin{array}{c} e^{+}e^{-} \rightarrow \pi^{+}\pi^{-}\pi^{-}D^{*+}\bar{D}^{0}, D^{*+} \rightarrow \pi^{+}D^{0}, \bar{D}^{0} \rightarrow K^{+}a_{1}^{-}, D^{0} \rightarrow \pi^{+}K^{-}, a_{1}^{-} \rightarrow \pi^{0}\rho^{-}(1450), \rho^{-}(1450) \rightarrow \pi^{0}\pi^{-}\\ (e^{+}e^{-} \dashrightarrow \pi^{0}\pi^{0}\pi^{+}\pi^{+}\pi^{+}\pi^{-}\pi^{-}\pi^{-}K^{+}K^{-}) \end{array}$	5	1	98
52	$\begin{array}{l} e^{+}e^{-} \rightarrow \pi^{0}\pi^{-}\rho^{+}\rho^{-}D^{*+}\bar{D}^{*0}\gamma^{I}\gamma^{I}, \rho^{+} \rightarrow \pi^{0}\pi^{+}, \rho^{-} \rightarrow \pi^{0}\pi^{-}, D^{*+} \rightarrow \pi^{+}D^{0}, \bar{D}^{*0} \rightarrow \pi^{0}\bar{D}^{0}, D^{0} \rightarrow \pi^{0}\pi^{+}\pi^{-}, \\ \bar{D}^{0} \rightarrow \pi^{-}K^{+} \\ (e^{+}e^{-} - \rightarrow \pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{+}\pi^{+}\pi^{+}\pi^{-}\pi^{-}\pi^{-}K^{+}\gamma^{I}\gamma^{I}) \end{array}$	6	1	99

rowNo	decay tree (decay initial-final states)	iDcyTr	nEtr	nCEtr
53	$e^{+}e^{-} \to \pi^{0}\pi^{-}\bar{K}^{0}K^{+}D^{0}\bar{D}^{*0}\gamma^{I}, \bar{K}^{0} \to K_{S}^{0}, D^{0} \to K^{-}a_{1}^{+}, \bar{D}^{*0} \to \pi^{0}\bar{D}^{0}, K_{S}^{0} \to \pi^{+}\pi^{-}, a_{1}^{+} \to \pi^{+}f_{0}(600),$ $\bar{D}^{0} \to \pi^{0}\pi^{-}K^{+}, f_{0}(600) \to \pi^{0}\pi^{0}$ $(e^{+}e^{-} \dashrightarrow \pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{+}\pi^{+}\pi^{-}\pi^{-}\pi^{-}K^{+}K^{+}K^{-}\gamma^{I})$	7	1	100
54	$\begin{array}{c} e^{+}e^{-} \rightarrow \pi^{+}\rho^{-}\omega K^{+}D^{*0}D_{s}^{-}\gamma^{I}\gamma^{I}, \rho^{-} \rightarrow \pi^{0}\pi^{-}, \omega \rightarrow \pi^{0}\pi^{+}\pi^{-}, D^{*0} \rightarrow \pi^{0}D^{0}, D_{s}^{-} \rightarrow e^{-}\bar{\nu}_{e}\phi\gamma^{F}\gamma^{F}\gamma^{F}, D^{0} \rightarrow \pi^{0}\pi^{0}\eta, \\ \phi \rightarrow K^{+}K^{-}, \eta \rightarrow \pi^{0}\pi^{0}\pi^{0} \\ (e^{+}e^{-} \dashrightarrow e^{-}\bar{\nu}_{e}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0$	8	1	101
55	$\begin{array}{l} e^{+}e^{-} \rightarrow K^{0}\bar{K}^{0}D^{-}D^{*+}\gamma^{I}\gamma^{I}, K^{0} \rightarrow K_{S}^{0}, \bar{K}^{0} \rightarrow K_{S}^{0}, D^{-} \rightarrow \pi^{0}K_{L}^{0}\pi^{-}, D^{*+} \rightarrow \pi^{+}D^{0}, K_{S}^{0} \rightarrow \pi^{+}\pi^{-}, \\ K_{S}^{0} \rightarrow \pi^{+}\pi^{-}\gamma^{F}, D^{0} \rightarrow K_{S}^{0}K^{+}K^{-}, K_{S}^{0} \rightarrow \pi^{0}\pi^{0} \\ (e^{+}e^{-} \dashrightarrow \pi^{0}\pi^{0}\pi^{0}K_{L}^{0}\pi^{+}\pi^{+}\pi^{+}\pi^{-}\pi^{-}\pi^{-}K^{+}K^{-}\gamma^{I}\gamma^{I}\gamma^{F}) \end{array}$	9	1	102
56	$e^{+}e^{-} \rightarrow \pi^{0}\pi^{-}\rho^{+}D^{*-}D_{2}^{*+}\gamma^{I}, \rho^{+} \rightarrow \pi^{0}\pi^{+}, D^{*-} \rightarrow \pi^{0}D^{-}, D_{2}^{*+} \rightarrow \pi^{0}D^{+}, D^{-} \rightarrow \pi^{0}K_{L}^{0}\pi^{-}, D^{+} \rightarrow \pi^{+}K^{+}K^{-}$ $(e^{+}e^{-} \dashrightarrow \pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}K_{L}^{0}\pi^{+}\pi^{+}\pi^{-}\pi^{-}K^{+}K^{-}\gamma^{I})$	10	1	103
57	$\begin{array}{c} e^{+}e^{-}\rightarrow\pi^{+}\rho^{-}\bar{D}^{0}D^{*0},\rho^{-}\rightarrow\pi^{0}\pi^{-},\bar{D}^{0}\rightarrow K_{S}^{0}\eta',D^{*0}\rightarrow\pi^{0}D^{0},K_{S}^{0}\rightarrow\pi^{+}\pi^{-},\eta'\rightarrow\rho^{0}\gamma,\\ D^{0}\rightarrow K^{-}a_{1}^{+},\rho^{0}\rightarrow\pi^{+}\pi^{-},a_{1}^{+}\rightarrow\pi^{+}\pi^{+}\pi^{-}\\ (e^{+}e^{-}\rightarrow\pi^{0}\pi^{0}\pi^{+}\pi^{+}\pi^{+}\pi^{+}\pi^{-}\pi^{-}\pi^{-}\pi^{-}K^{-}\gamma) \end{array}$	11	1	104
58	$(e^{+}e^{-} \pi^{0}\pi^{0}\pi^{+}\pi^{+}\pi^{+}\pi^{+}\pi^{-}\pi^{-}\pi^{-}K^{-}\gamma)$ $e^{+}e^{-} \rho^{0}\pi^{+}D_{2}^{*-}D^{0}, \rho^{0} \pi^{+}\pi^{-}, D_{2}^{*-} \pi^{0}D^{-}, D^{0} \pi^{+}K^{+}K^{-}K^{-}, D^{-} e^{-}\bar{\nu}_{e}K^{0}, K^{0} K_{L}^{0}$ $(e^{+}e^{-} e^{-}\bar{\nu}_{e}\pi^{0}K_{L}^{0}\pi^{+}\pi^{+}\pi^{+}\pi^{-}K^{+}K^{-}K^{-})$	12	1	105
59	$\begin{array}{c} e^{+}e^{-} \rightarrow K^{0}K^{-}\phi D^{*+}\bar{D}^{*0}\gamma^{I}, K^{0} \rightarrow K^{0}_{S}, \phi \rightarrow K^{+}K^{-}, D^{*+} \rightarrow \pi^{+}D^{0}, \bar{D}^{*0} \rightarrow \pi^{0}\bar{D}^{0}, K^{0}_{S} \rightarrow \pi^{+}\pi^{-}, \\ D^{0} \rightarrow \pi^{0}K^{0}_{S}, \bar{D}^{0} \rightarrow \pi^{-}K^{+}, K^{0}_{S} \rightarrow \pi^{+}\pi^{-} \\ (e^{+}e^{-} \dashrightarrow \pi^{0}\pi^{0}\pi^{+}\pi^{+}\pi^{+}\pi^{-}\pi^{-}\pi^{-}K^{+}K^{+}K^{-}K^{-}\gamma^{I}) \end{array}$	13	1	106
60	$e^{+}e^{-} \to \rho^{-}K^{*+}D^{+}D_{s}^{*-}\gamma^{I}, \rho^{-} \to \pi^{0}\pi^{-}, K^{*+} \to \pi^{+}K^{0}, D^{+} \to \pi^{0}\pi^{+}K_{S}^{0}, D_{s}^{*-} \to D_{s}^{-}\gamma, K^{0} \to K_{S}^{0}, K_{S}^{0} \to \pi^{0}\pi^{0}, D_{s}^{-} \to \pi^{-}K^{+}K^{-}, K_{S}^{0} \to \pi^{+}\pi^{-} = (e^{+}e^{-} \dashrightarrow \pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{+}\pi^{+}\pi^{+}\pi^{-}\pi^{-}\pi^{-}K^{+}K^{-}\gamma^{I}\gamma)$	14	1	107
61	$e^{+}e^{-} \to \pi^{+}\pi^{-}D^{*+}D^{*-}\gamma^{I}\gamma^{I}, D^{*+} \to \pi^{+}D^{0}, D^{*-} \to \pi^{0}D^{-}, D^{0} \to K_{L}^{0}K^{+}K^{-}, D^{-} \to \pi^{0}K_{L}^{0}\pi^{-}$ $(e^{+}e^{-} \to \pi^{0}\pi^{0}K_{L}^{0}K_{L}^{0}\pi^{+}\pi^{+}\pi^{-}\pi^{-}K^{+}K^{-}\gamma^{I}\gamma^{I})$	15	1	108
62	$e^{+}e^{-} \to \pi^{0}\pi^{+}\rho^{-}D^{*0}\bar{D}^{*0}\gamma^{I}, \rho^{-} \to \pi^{0}\pi^{-}, D^{*0} \to \pi^{0}D^{0}, \bar{D}^{*0} \to \pi^{0}\bar{D}^{0}, D^{0} \to \rho^{0}\bar{K}^{*}, \pi^{0} \to e^{+}e^{-}\gamma^{F},$ $\bar{D}^{0} \to e^{-}\bar{\nu}_{e}K^{*+}\gamma^{F}\gamma^{F}, \rho^{0} \to \pi^{+}\pi^{-}, \bar{K}^{*} \to \pi^{+}K^{-}, K^{*+} \to \pi^{0}K^{+}$ $(e^{+}e^{-} \dashrightarrow e^{+}e^{-}e^{-}\bar{\nu}_{e}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{+}\pi^{+}\pi^{+}\pi^{-}\pi^{-}K^{+}K^{-}\gamma^{I}\gamma^{F}\gamma^{F})$	16	1	109
63	$e^{+}e^{-} \rightarrow \pi^{0}\pi^{+}K^{*}D^{*0}D_{s2}^{*}(2573)^{-}, K^{*} \rightarrow \pi^{-}K^{+}, D^{*0} \rightarrow \pi^{0}D^{0}, D_{s2}^{*}(2573)^{-} \rightarrow K^{-}\bar{D}^{0}, D^{0} \rightarrow \pi^{0}\pi^{+}\pi^{-}\gamma^{F}, \bar{D}^{0} \rightarrow \mu^{-}\bar{\nu}_{\mu}\pi^{+}, \pi^{0} \rightarrow e^{+}e^{-}\gamma^{F} $ $(e^{+}e^{-} \rightarrow e^{+}e^{-}\mu^{-}\bar{\nu}_{\mu}\pi^{0}\pi^{0}\pi^{+}\pi^{+}\pi^{+}\pi^{-}\pi^{-}K^{+}K^{-}\gamma^{F}\gamma^{F})$	17	1	110
64	$e^{+}e^{-} \to \pi^{+}\rho^{-}K^{+}\phi D^{*0}D_{s}^{-}\gamma^{I}, \rho^{-} \to \pi^{0}\pi^{-}, \phi \to K_{L}^{0}K_{S}^{0}, D^{*0} \to \pi^{0}D^{0}, D_{s}^{-} \to \tau^{-}\bar{\nu}_{\tau}, K_{S}^{0} \to \pi^{+}\pi^{-}, D^{0} \to \pi^{0}\pi^{+}\pi^{-}, \tau^{-} \to \nu_{\tau}\pi^{0}K^{-}$ $(e^{+}e^{-} \dashrightarrow \nu_{\tau}\bar{\nu}_{\tau}\pi^{0}\pi^{0}\pi^{0}\pi^{0}K_{L}^{0}\pi^{+}\pi^{+}\pi^{+}\pi^{-}\pi^{-}\pi^{-}K^{+}K^{-}\gamma^{I})$	18	1	111
65	$e^{+}e^{-} \to \pi^{+}\pi^{-}D^{*0}\bar{D}^{*0}\gamma^{I}, D^{*0} \to \pi^{0}D^{0}, \bar{D}^{*0} \to \pi^{0}\bar{D}^{0}, D^{0} \to \pi^{0}\pi^{+}K^{-}, \bar{D}^{0} \to K^{+}a_{1}^{-}, a_{1}^{-} \to \pi^{0}\rho^{-}, \\ \rho^{-} \to \pi^{0}\pi^{-} \\ (e^{+}e^{-} \dashrightarrow \pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{+}\pi^{+}\pi^{-}\pi^{-}K^{+}K^{-}\gamma^{I})$	19	1	112

rowNo	decay tree (decay initial-final states)	iDcyTr	nEtr	nCEtr
66	$e^{+}e^{-} \to \pi^{0}\bar{K}^{*}D^{*-}D_{s0}^{*+}, \bar{K}^{*} \to \pi^{+}K^{-}, D^{*-} \to \pi^{-}\bar{D}^{0}, D_{s0}^{*+} \to \pi^{0}D_{s}^{+}, \bar{D}^{0} \to \pi^{-}\omega K^{+}, D_{s}^{+} \to e^{+}\nu_{e}\phi,$ $\omega \to \pi^{0}\pi^{+}\pi^{-}, \phi \to K^{+}K^{-}$ $(e^{+}e^{-} \dashrightarrow e^{+}\nu_{e}\pi^{0}\pi^{0}\pi^{0}\pi^{+}\pi^{+}\pi^{-}\pi^{-}\pi^{-}K^{+}K^{+}K^{-}K^{-})$	20	1	113
67	$\begin{array}{l} e^{+}e^{-} \rightarrow \pi^{0}\pi^{-}D^{*+}\bar{D}^{*0}, D^{*+} \rightarrow \pi^{+}D^{0}, \bar{D}^{*0} \rightarrow \pi^{0}\bar{D}^{0}, D^{0} \rightarrow K^{-}a_{1}^{+}, \bar{D}^{0} \rightarrow \rho^{-}K^{*+}, a_{1}^{+} \rightarrow \pi^{0}\rho^{+}, \\ \rho^{-} \rightarrow \pi^{0}\pi^{-}, K^{*+} \rightarrow \pi^{0}K^{+}, \rho^{+} \rightarrow \pi^{0}\pi^{+} \\ (e^{+}e^{-} \dashrightarrow \pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}$	21	1	114
68	$e^{+}e^{-} \rightarrow K^{*-}\bar{D}^{*0}D_{s}^{*+}, K^{*-} \rightarrow \pi^{0}K^{-}, \bar{D}^{*0} \rightarrow \pi^{0}\bar{D}^{0}, D_{s}^{*+} \rightarrow D_{s}^{+}\gamma, \bar{D}^{0} \rightarrow \pi^{0}\pi^{-}K^{+}, D_{s}^{+} \rightarrow \pi^{+}K^{+}K^{-}(e^{+}e^{-} \dashrightarrow \pi^{0}\pi^{0}\pi^{0}\pi^{+}\pi^{-}K^{+}K^{+}K^{-}K^{-}\gamma)$	22	1	115
69	$\begin{array}{c} e^{+}e^{-} \rightarrow \rho^{0}\pi^{-}\rho^{+}D^{*+}D^{*-}, \rho^{0} \rightarrow \pi^{+}\pi^{-}, \rho^{+} \rightarrow \pi^{0}\pi^{+}, D^{*+} \rightarrow \pi^{+}D^{0}, D^{*-} \rightarrow \pi^{-}\bar{D}^{0}, D^{0} \rightarrow \pi^{0}\pi^{0}\pi^{+}K^{-}, \\ \bar{D}^{0} \rightarrow \pi^{-}K^{+} \\ (e^{+}e^{-} \dashrightarrow \pi^{0}\pi^{0}\pi^{0}\pi^{+}\pi^{+}\pi^{+}\pi^{+}\pi^{-}\pi^{-}\pi^{-}K^{+}K^{-}) \end{array}$	23	1	116
70	$e^{+}e^{-} \to \pi^{-}\omega D^{+}\bar{D}^{*0}, \omega \to \pi^{0}\pi^{+}\pi^{-}, D^{+} \to \pi^{0}K_{L}^{0}\pi^{+}, \bar{D}^{*0} \to \pi^{0}\bar{D}^{0}, \bar{D}^{0} \to \pi^{-}\omega K^{+}, \omega \to \pi^{0}\pi^{+}\pi^{-}$ $(e^{+}e^{-} \dashrightarrow \pi^{0}\pi^{0}\pi^{0}\pi^{0}K_{L}^{0}\pi^{+}\pi^{+}\pi^{+}\pi^{-}\pi^{-}\pi^{-}\pi^{-}K^{+})$	24	1	117
71	$\begin{array}{c} e^{+}e^{-} \rightarrow K^{-}K^{*+}D^{*0}\bar{D}^{*0}, K^{*+} \rightarrow \pi^{0}K^{+}, D^{*0} \rightarrow \pi^{0}D^{0}, \bar{D}^{*0} \rightarrow \pi^{0}\bar{D}^{0}, D^{0} \rightarrow \mu^{+}\nu_{\mu}K^{*-}, \bar{D}^{0} \rightarrow \pi^{0}\pi^{-}K^{+}, \\ K^{*-} \rightarrow \pi^{-}\bar{K}^{0}, \bar{K}^{0} \rightarrow K_{L}^{0} \\ (e^{+}e^{-} \dashrightarrow \mu^{+}\nu_{\mu}\pi^{0}\pi^{0}\pi^{0}\pi^{0}K_{L}^{0}\pi^{-}\pi^{-}K^{+}K^{+}K^{-}) \end{array}$	25	1	118
72	$e^{+}e^{-} \to \pi^{+}\pi^{-}\eta \bar{K}^{*}D^{*-}D_{s}^{*+}, \eta \to \gamma\gamma, \bar{K}^{*} \to \pi^{+}K^{-}, D^{*-} \to \pi^{-}\bar{D}^{0}, D_{s}^{*+} \to D_{s}^{+}\gamma, \bar{D}^{0} \to e^{-}\bar{\nu}_{e}\pi^{0}K^{+}, D_{s}^{+} \to \rho^{+}\eta, \rho^{+} \to \pi^{0}\pi^{+}, \eta \to \gamma\gamma \\ (e^{+}e^{-} \dashrightarrow e^{-}\bar{\nu}_{e}\pi^{0}\pi^{0}\pi^{+}\pi^{+}\pi^{+}\pi^{-}\pi^{-}K^{+}K^{-}\gamma\gamma\gamma\gamma\gamma)$	26	1	119
73	$\begin{array}{l} e^{+}e^{-}\rightarrow\pi^{0}\rho^{-}D^{+}\bar{D}^{0}, \rho^{-}\rightarrow\pi^{0}\pi^{-}, D^{+}\rightarrow\pi^{+}\pi^{+}K^{-}, \bar{D}^{0}\rightarrow\pi^{+}\pi^{-}K^{*}, K^{*}\rightarrow\pi^{0}K^{0}, K^{0}\rightarrow K^{0}_{S}, \\ K^{0}_{S}\rightarrow\pi^{+}\pi^{-} \\ (e^{+}e^{-}\dashrightarrow\pi^{0}\pi^{0}\pi^{0}\pi^{+}\pi^{+}\pi^{+}\pi^{-}\pi^{-}\pi^{-}K^{-}) \end{array}$	27	1	120
74	$\begin{array}{c} e^{+}e^{-} \rightarrow \pi^{0}\pi^{0}D^{0}\bar{D}^{*0}, D^{0} \rightarrow \pi^{+}K^{+}K^{-}K^{-}, \bar{D}^{*0} \rightarrow \pi^{0}\bar{D}^{0}, \bar{D}^{0} \rightarrow \pi^{0}\pi^{0}\pi^{0}K^{0}_{S}, K^{0}_{S} \rightarrow \pi^{0}\pi^{0}\\ (e^{+}e^{-} \dashrightarrow \pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}$	28	1	121
75	$\begin{array}{c} e^{+}e^{-} \rightarrow \pi^{0}K^{0}D^{*+}D_{s}^{*-}, K^{0} \rightarrow K_{S}^{0}, D^{*+} \rightarrow \pi^{+}D^{0}, D_{s}^{*-} \rightarrow D_{s}^{-}\gamma, K_{S}^{0} \rightarrow \pi^{+}\pi^{-}, D^{0} \rightarrow \pi^{0}\pi^{+}K^{-}, \\ D_{s}^{-} \rightarrow K^{*}K^{*-}, K^{*} \rightarrow \pi^{-}K^{+}\gamma^{F}, K^{*-} \rightarrow \pi^{0}K^{-} \\ (e^{+}e^{-} \dashrightarrow \pi^{0}\pi^{0}\pi^{0}\pi^{+}\pi^{+}\pi^{+}\pi^{-}\pi^{-}K^{+}K^{-}K^{-}\gamma^{F}\gamma) \end{array}$	29	1	122
76	$e^{+}e^{-} \rightarrow \bar{K}^{0}K^{*}D_{s}^{-}D_{s}^{*+}\gamma^{I}\gamma^{I}, \bar{K}^{0} \rightarrow K_{L}^{0}, K^{*} \rightarrow \pi^{-}K^{+}, D_{s}^{-} \rightarrow \pi^{0}\pi^{-}K_{S}^{0}, D_{s}^{*+} \rightarrow \pi^{0}D_{s}^{+}, K_{S}^{0} \rightarrow \pi^{0}\pi^{0}, D_{s}^{+} \rightarrow \pi^{+}K^{+}K^{-} (e^{+}e^{-} \dashrightarrow \pi^{0}\pi^{0}\pi^{0}\pi^{0}K_{L}^{0}\pi^{+}\pi^{-}\pi^{-}K^{+}K^{+}K^{-}\gamma^{I}\gamma^{I})$	30	1	123
77	$e^{+}e^{-} \to \pi^{+}D^{0}D_{1}^{\prime-}, D^{0} \to \pi^{0}\pi^{+}K^{-}, D_{1}^{\prime-} \to \pi^{-}\bar{D}^{*0}, \bar{D}^{*0} \to \pi^{0}\bar{D}^{0}, \bar{D}^{0} \to \rho^{0}\rho^{0}, \rho^{0} \to \pi^{+}\pi^{-}, \rho^{0} \to \pi^{+}\pi^{-} $ $(e^{+}e^{-} \dashrightarrow \pi^{0}\pi^{0}\pi^{+}\pi^{+}\pi^{+}\pi^{+}\pi^{-}\pi^{-}\pi^{-}K^{-})$	31	1	124
78	$e^{+}e^{-} \rightarrow \pi^{0}\pi^{-}K^{+}K^{-}D^{*+}\bar{D}^{*0}\gamma^{I}, D^{*+} \rightarrow \pi^{0}D^{+}, \bar{D}^{*0} \rightarrow \bar{D}^{0}\gamma, D^{+} \rightarrow \pi^{+}K^{-}K^{*+}, \bar{D}^{0} \rightarrow \pi^{0}\pi^{-}K^{+}, K^{*+} \rightarrow \pi^{0}K^{+}$ $(e^{+}e^{-} \dashrightarrow \pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{+}\pi^{-}\pi^{-}K^{+}K^{+}K^{-}K^{-}\gamma^{I}\gamma)$	32	1	125

rowNo	decay tree (decay initial-final states)	iDcyTr	nEtr	nCEtr
79	$\begin{array}{c} e^{+}e^{-}\rightarrow\pi^{0}\pi^{0}\pi^{+}\rho^{-}\bar{D}^{0}D^{*0}, \rho^{-}\rightarrow\pi^{0}\pi^{-}, \bar{D}^{0}\rightarrow K^{+}a_{1}^{-}, D^{*0}\rightarrow D^{0}\gamma, a_{1}^{-}\rightarrow\pi^{-}f_{0}(600), D^{0}\rightarrow\pi^{0}\pi^{+}K^{-}, \\ f_{0}(600)\rightarrow\pi^{0}\pi^{0} \\ (e^{+}e^{-}\rightarrow\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}$	33	1	126
80	$\begin{array}{c} e^{+}e^{-} \rightarrow \pi^{0}\pi^{-}\eta D^{*+}\bar{D}^{*0}\gamma^{I}\gamma^{I}, \eta \rightarrow \pi^{0}\pi^{0}\pi^{0}, D^{*+} \rightarrow \pi^{+}D^{0}, \bar{D}^{*0} \rightarrow \pi^{0}\bar{D}^{0}, D^{0} \rightarrow \pi^{0}\pi^{+}K^{-}, \bar{D}^{0} \rightarrow \pi^{0}\pi^{0}K^{+}K^{-} \\ (e^{+}e^{-} \dashrightarrow \pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}$	34	1	127
81	$\begin{array}{l} e^{+}e^{-} \rightarrow D^{*0}\bar{D}^{*0}p\bar{p}\gamma^{I}, D^{*0} \rightarrow D^{0}\gamma, \bar{D}^{*0} \rightarrow \pi^{0}\bar{D}^{0}, D^{0} \rightarrow K_{L}^{0}K^{+}K^{-}, \bar{D}^{0} \rightarrow \pi^{0}\pi^{0}\\ (e^{+}e^{-} \dashrightarrow \pi^{0}\pi^{0}K_{L}^{0}K^{+}K^{-}p\bar{p}\gamma^{I}\gamma) \end{array}$	35	1	128
82	$\begin{array}{c} e^{+}e^{-} \rightarrow \pi^{0}K^{+}K^{-}D^{*0}\bar{D}^{*0}, D^{*0} \rightarrow \pi^{0}D^{0}, \bar{D}^{*0} \rightarrow \pi^{0}\bar{D}^{0}, D^{0} \rightarrow \pi^{+}\omega K^{-}, \bar{D}^{0} \rightarrow \pi^{0}\pi^{-}K^{+}, \omega \rightarrow \pi^{0}\pi^{+}\pi^{-} \\ (e^{+}e^{-} \dashrightarrow \pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{+}\pi^{+}\pi^{-}\pi^{-}K^{+}K^{+}K^{-}K^{-}) \end{array}$	36	1	129
83	$e^{+}e^{-} \to \bar{K}^{0}K^{+}D^{-}D^{*0}\gamma^{I}, \bar{K}^{0} \to K_{L}^{0}, D^{-} \to K_{L}^{0}\pi^{-}\eta', D^{*0} \to \pi^{0}D^{0}, K_{L}^{0} \to \mu^{+}\nu_{\mu}\pi^{-}, \eta' \to \rho^{0}\gamma,$ $D^{0} \to \pi^{+}\eta K^{-}, \rho^{0} \to \pi^{+}\pi^{-}, \eta \to \pi^{0}\pi^{+}\pi^{-}$ $(e^{+}e^{-} \dashrightarrow \mu^{+}\nu_{\mu}\pi^{0}\pi^{0}K_{L}^{0}\pi^{+}\pi^{+}\pi^{+}\pi^{-}\pi^{-}\pi^{-}K^{+}K^{-}\gamma^{I}\gamma)$	37	1	130
84	$e^{+}e^{-} \to \rho^{-}K^{+}D^{*-}D^{*-}_{s}, \rho^{-} \to \pi^{0}\pi^{-}, D^{*+} \to \pi^{0}D^{+}, D^{*-}_{s} \to D^{-}_{s}\gamma, D^{+} \to e^{+}\nu_{e}\bar{K}^{*}\gamma^{F}, D^{-}_{s} \to e^{-}\bar{\nu}_{e}\eta\gamma^{F},$ $\bar{K}^{*} \to \pi^{+}K^{-}, \eta \to \pi^{0}\pi^{0}\pi^{0}$ $(e^{+}e^{-} - \to e^{+}e^{-}\nu_{e}\bar{\nu}_{e}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{+}\pi^{-}K^{+}K^{-}\gamma^{F}\gamma^{F}\gamma)$ $e^{+}e^{-} \to \pi^{+}\omega D^{*-}D^{*0}, \omega \to \pi^{0}\pi^{+}\pi^{-}, D^{*-} \to \pi^{-}\bar{D}^{0}, D^{*0} \to \pi^{0}D^{0}, \bar{D}^{0} \to \pi^{+}\pi^{-}K^{*}, D^{0} \to \pi^{0}\pi^{0}\pi^{+}\pi^{-},$	38	1	131
85	$e^{+}e^{-} \to \pi^{+}\omega D^{*-}D^{*0}, \omega \to \pi^{0}\pi^{+}\pi^{-}, D^{*-} \to \pi^{-}\bar{D}^{0}, D^{*0} \to \pi^{0}D^{0}, \bar{D}^{0} \to \pi^{+}\pi^{-}K^{*}, D^{0} \to \pi^{0}\pi^{0}\pi^{+}\pi^{-}, K^{*} \to \pi^{-}K^{+}\gamma^{F} $ $(e^{+}e^{-} \dashrightarrow \pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{+}\pi^{+}\pi^{+}\pi^{+}\pi^{-}\pi^{-}\pi^{-}\pi^{-}\pi^{-}K^{+}\gamma^{F})$	39	1	132
86	$e^{+}e^{-} \to \pi^{+}K^{0}D_{s}^{*-}D_{0}^{*0}, K^{0} \to K_{L}^{0}, D_{s}^{*-} \to D_{s}^{-}\gamma, D_{0}^{*0} \to \pi^{-}D^{+}, D_{s}^{-} \to \pi^{-}K^{+}K^{-}, D^{+} \to K_{L}^{0}\pi^{+}\eta, K_{L}^{0} \to \mu^{-}\nu_{\mu}\pi^{+}, \eta \to \gamma\gamma $ $(e^{+}e^{-} \dashrightarrow \mu^{-}\nu_{\mu}K_{L}^{0}\pi^{+}\pi^{+}\pi^{+}\pi^{-}\pi^{-}K^{+}K^{-}\gamma\gamma\gamma)$	0	1	133
87	$\begin{array}{c} e^{+}e^{-} \rightarrow \pi^{0}\pi^{+}\pi^{-}D^{*0}\bar{D}_{2}^{*0}\gamma^{I}, D^{*0} \rightarrow \pi^{0}D^{0}, \bar{D}_{2}^{*0} \rightarrow \pi^{+}D^{-}, D^{0} \rightarrow \pi^{0}\pi^{+}K^{-}, D^{-} \rightarrow \pi^{0}\pi^{-}\eta, \eta \rightarrow \gamma\gamma \\ (e^{+}e^{-} \dashrightarrow \pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{+}\pi^{+}\pi^{+}\pi^{-}\pi^{-}K^{-}\gamma^{I}\gamma\gamma) \end{array}$	41	1	134
88	$\begin{array}{c} e^{+}e^{-}\rightarrow\pi^{0}\pi^{0}\pi^{-}D^{+}\bar{D}^{*0}\gamma^{I}, D^{+}\rightarrow\mu^{+}\nu_{\mu}\bar{K}^{*}, \bar{D}^{*0}\rightarrow\bar{D}^{0}\gamma, \bar{K}^{*}\rightarrow\pi^{+}K^{-}, \bar{D}^{0}\rightarrow\pi^{0}\pi^{0}K_{L}^{0}, K_{L}^{0}\rightarrow e^{+}\nu_{e}\pi^{-}\\ (e^{+}e^{-}\dashrightarrow e^{+}\nu_{e}\mu^{+}\nu_{\mu}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{+}\pi^{-}\pi^{-}K^{-}\gamma^{I}\gamma) \end{array}$	42	1	135
89	$e^{+}e^{-} \to K^{-}\phi \bar{D}^{*0}D_{s}^{*+}\gamma^{I}, \phi \to K_{L}^{0}K_{S}^{0}, \bar{D}^{*0} \to \bar{D}^{0}\gamma, D_{s}^{*+} \to D_{s}^{+}\gamma, K_{L}^{0} \to e^{-}\nu_{e}\pi^{+}\gamma^{F}, K_{S}^{0} \to \pi^{0}\pi^{0}, \\ \bar{D}^{0} \to \pi^{+}\pi^{+}\pi^{-}\pi^{-}\gamma^{F}, D_{s}^{+} \to \rho^{+}n, \rho^{+} \to \pi^{0}\pi^{+}, n \to \gamma\gamma$	43	1	136
90	$(e^{+}e^{-} e^{-}\nu_{e}\pi^{0}\pi^{0}\pi^{0}\pi^{+}\pi^{+}\pi^{+}\pi^{-}\pi^{-}K^{-}\gamma^{I}\gamma^{F}\gamma^{F}\gamma\gamma\gamma\gamma)$ $e^{+}e^{-} \pi^{+}D^{*-}D^{*0}p\bar{p}\gamma^{I}, D^{*-} \pi^{-}\bar{D}^{0}, D^{*0} \pi^{0}D^{0}, \bar{D}^{0} \rho^{0}\pi^{-}K^{+}, D^{0} \pi^{0}\pi^{+}K^{-}, \rho^{0} \pi^{+}\pi^{-}$ $(e^{+}e^{-} \pi^{0}\pi^{0}\pi^{+}\pi^{+}\pi^{+}\pi^{-}\pi^{-}\pi^{-}K^{+}K^{-}p\bar{p}\gamma^{I})$	44	1	137
91	$e^{+}e^{-} \rightarrow \pi^{0}\pi^{0}\omega D^{*0}\bar{D}^{*0}\gamma^{I}, \omega \rightarrow \pi^{0}\pi^{+}\pi^{-}, D^{*0} \rightarrow \pi^{0}D^{0}, \bar{D}^{*0} \rightarrow \pi^{0}\bar{D}^{0}, D^{0} \rightarrow \pi^{0}\pi^{+}K^{-}\gamma^{F}, \bar{D}^{0} \rightarrow \pi^{0}\pi^{-}K^{+}$ $(e^{+}e^{-} \dashrightarrow \pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}$	45	1	138
92	$e^{+}e^{-} \to K^{0}\bar{K}^{0}D_{s}^{*+}D_{s}^{*-}, K^{0} \to K_{S}^{0}, \bar{K}^{0} \to K_{S}^{0}, D_{s}^{*+} \to D_{s}^{+}\gamma, D_{s}^{*-} \to D_{s}^{-}\gamma, K_{S}^{0} \to \pi^{+}\pi^{-}, K_{S}^{0} \to \pi^{0}\pi^{0}, D_{s}^{+} \to \bar{K}^{*}K^{*+}, D_{s}^{-} \to \rho^{-}\eta', \bar{K}^{*} \to \pi^{+}K^{-}, K^{*+} \to \pi^{0}K^{+}, \rho^{-} \to \pi^{0}\pi^{-}, \eta' \to \pi^{+}\pi^{-}\eta, \eta \to \pi^{0}\pi^{+}\pi^{-} (e^{+}e^{-} \dashrightarrow \pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{+}\pi^{+}\pi^{+}\pi^{+}\pi^{-}\pi^{-}\pi^{-}K^{+}K^{-}\gamma\gamma)$	46	1	139

rowNo	decay tree (decay initial-final states)	iDcyTr	nEtr	nCEtr
93	$\begin{array}{c} e^{+}e^{-} \rightarrow \eta D_{2}^{*-} \bar{n} \Lambda_{c}^{+}, \eta \rightarrow \pi^{0} \pi^{0} \pi^{0}, D_{2}^{*-} \rightarrow \pi^{0} D^{-}, \Lambda_{c}^{+} \rightarrow \pi^{+} K^{-} p, D^{-} \rightarrow e^{-} \bar{\nu}_{e} K^{*}, K^{*} \rightarrow \pi^{-} K^{+} \gamma^{F} \\ (e^{+}e^{-} \dashrightarrow e^{-} \bar{\nu}_{e} \pi^{0} \pi^{0} \pi^{0} \pi^{0} \pi^{0} \pi^{0} \pi^{+} \pi^{-} K^{+} K^{-} \bar{n} p \gamma^{F}) \end{array}$	47	1	140
94	$\begin{array}{l} e^{+}e^{-} \rightarrow \pi^{+}\pi^{-}D^{0}\bar{D}^{*0}\gamma^{I}\gamma^{I}, D^{0} \rightarrow \pi^{0}K_{S}^{0}, \bar{D}^{*0} \rightarrow \bar{D}^{0}\gamma, K_{S}^{0} \rightarrow \pi^{+}\pi^{-}, \bar{D}^{0} \rightarrow \pi^{-}K_{1}^{+}, K_{1}^{+} \rightarrow \pi^{+}K^{*}\gamma^{F}, \\ K^{*} \rightarrow \pi^{-}K^{+} \\ (e^{+}e^{-} \dashrightarrow \pi^{0}\pi^{+}\pi^{+}\pi^{+}\pi^{-}\pi^{-}\pi^{-}\pi^{-}K^{+}\gamma^{I}\gamma^{I}\gamma^{F}\gamma) \end{array}$	48	1	141
95	$\begin{array}{c} e^{+}e^{-} \rightarrow K^{+}D^{0}D_{s}^{*-}\gamma^{I}, D^{0} \rightarrow \mu^{+}\nu_{\mu}K^{-}, D_{s}^{*-} \rightarrow D_{s}^{-}\gamma, D_{s}^{-} \rightarrow \rho^{-}\eta', \rho^{-} \rightarrow \pi^{0}\pi^{-}, \eta' \rightarrow \rho^{0}\gamma, \\ \rho^{0} \rightarrow \pi^{+}\pi^{-} \\ (e^{+}e^{-} \dashrightarrow \mu^{+}\nu_{\mu}\pi^{0}\pi^{+}\pi^{-}\pi^{-}K^{+}K^{-}\gamma^{I}\gamma\gamma) \end{array}$	49	1	142
96	$\begin{array}{l} e^{+}e^{-} \rightarrow \eta \bar{K}^{0} D^{*-} D_{s}^{+} \gamma^{I} \gamma^{I} \gamma^{I}, \eta \rightarrow \pi^{0} \pi^{0} \pi^{0}, \bar{K}^{0} \rightarrow K_{L}^{0}, D^{*-} \rightarrow \pi^{-} \bar{D}^{0}, D_{s}^{+} \rightarrow \pi^{+} \eta \omega, \bar{D}^{0} \rightarrow \pi^{0} \pi^{+} \pi^{-} K^{+} K^{-}, \\ \eta \rightarrow \gamma \gamma, \omega \rightarrow \pi^{+} \pi^{-} \\ (e^{+}e^{-} \dashrightarrow \pi^{0} \pi^{0} \pi^{0} \pi^{0} K_{L}^{0} \pi^{+} \pi^{+} \pi^{+} \pi^{-} \pi^{-} \pi^{-} K^{+} K^{-} \gamma^{I} \gamma^{I} \gamma^{I} \gamma) \end{array}$	50	1	143
97	$e^{+}e^{-} \rightarrow \pi^{-}\bar{K}^{0}K^{+}\bar{D}^{0}D^{*0}\gamma^{I}\gamma^{I}, \bar{K}^{0} \rightarrow K_{L}^{0}, \bar{D}^{0} \rightarrow \pi^{0}\pi^{0}K_{L}^{0}, D^{*0} \rightarrow D^{0}\gamma, D^{0} \rightarrow K^{-}a_{1}^{+}, a_{1}^{+} \rightarrow \pi^{+}\pi^{+}\pi^{-}(e^{+}e^{-} \rightarrow \pi^{0}\pi^{0}K_{L}^{0}K_{L}^{0}\pi^{+}\pi^{+}\pi^{-}\pi^{-}K^{+}K^{-}\gamma^{I}\gamma^{I}\gamma)$	51	1	144
98	$\begin{array}{c} e^{+}e^{-} \to \bar{K}^{0}K^{+}D^{*0}n\bar{\Lambda}_{c}^{-}, \bar{K}^{0} \to K_{L}^{0}, D^{*0} \to D^{0}\gamma, \bar{\Lambda}_{c}^{-} \to e^{-}\bar{\nu}_{e}\bar{\Lambda}, D^{0} \to \pi^{0}\pi^{+}K^{-}, \bar{\Lambda} \to \pi^{0}\bar{n} \\ (e^{+}e^{-} \dashrightarrow e^{-}\bar{\nu}_{e}\pi^{0}\pi^{0}K_{L}^{0}\pi^{+}K^{+}K^{-}n\bar{n}\gamma) \end{array}$	52	1	145
99	$e^{+}e^{-} \to K^{-}K^{-}K^{*+}\bar{D}^{*0}D_{s}^{*+}\gamma^{I}, K^{*+} \to \pi^{+}K^{0}, \bar{D}^{*0} \to \pi^{0}\bar{D}^{0}, D_{s}^{*+} \to D_{s}^{+}\gamma, K^{0} \to K_{L}^{0}, \bar{D}^{0} \to \pi^{0}\pi^{-}K^{+},$ $D_{s}^{+} \to \rho^{+}\eta, \rho^{+} \to \pi^{0}\pi^{+}, \eta \to \gamma\gamma$ $(e^{+}e^{-} \dashrightarrow \pi^{0}\pi^{0}K_{L}^{0}\pi^{+}\pi^{+}\pi^{-}K^{+}K^{-}K^{-}\gamma^{I}\gamma\gamma\gamma)$	53	1	146
100	$\begin{array}{l} e^{+}e^{-}\rightarrow\pi^{0}\omega\bar{D}^{*0}D_{2}^{*0},\omega\rightarrow\pi^{0}\pi^{+}\pi^{-},\bar{D}^{*0}\rightarrow\pi^{0}\bar{D}^{0},D_{2}^{*0}\rightarrow\pi^{0}D^{0},\bar{D}^{0}\rightarrow K_{L}^{0}K^{+}K^{-},D^{0}\rightarrow\pi^{0}\pi^{+}K^{-}\\ (e^{+}e^{-}\dashrightarrow\pi^{0}\pi^{0}\pi^{0}\pi^{0}\pi^{0}K_{L}^{0}\pi^{+}\pi^{+}\pi^{-}K^{+}K^{-}K^{-}) \end{array}$	54	1	147
rest	$e^+e^- \to \text{others (1758 in total)}$ $(e^+e^ \to \text{corresponding to others)}$	_	1758	1905