

# Topology Analysis <sup>\*</sup>

(v1.5)

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<sup>\*</sup>This package is implemented with reference to a program called TOPO, which is developed by Prof. Shuxian Du from Zhengzhou University in China and has been widely used by people in BESIII collaboration. Several years ago, when I was a PhD student working on BESIII experiment, I learned the idea of topology analysis and a lot of programming techniques from the TOPO program. So, I really appreciate Prof. Du's original work 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 last year (2017), my co-supervisor, Prof. Chengping Shen reminded me that it could be a useful tool for Belle II experiment as well. So, I revised and extended it, making it more well-rounded and suitable for Belle II experiment. Here, I would like to thank Prof. Du for his original work, Prof. Shen for his suggestion and encouragement, and Wencheng Yan, Sen Jia, Yubo Li, Suxian Li, Longke Li, Guanda Gong, Junhao Yin, Xiaoping Qin, Xiqing Hao, HongPeng Wang, JiaWei Zhang for their efforts in helping me test the program.

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index	event tree (event initial-final states)	iEvtTr	iEvtIFSts	nEvts	nCcEvts	nTotEvts	nCmltEvts
9	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \pi^0 \pi^+ \pi^- \bar{D}^{*-}, \bar{B}^0 \rightarrow \mu^- \bar{\nu}_\mu D^{*+} \gamma^{gFSR}, \bar{D}^{*-} \rightarrow \pi^0 D^-,$ $D^{*+} \rightarrow \pi^+ D^0, D^- \rightarrow \pi^- \omega K^0 \gamma^{gFSR}, D^0 \rightarrow K_L \omega, \omega \rightarrow \pi^0 \pi^+ \pi^-, K^0 \rightarrow K_S,$ $\omega \rightarrow \pi^0 \pi^+ \pi^-, K_S \rightarrow \pi^0 \pi^0$ $(e^+e^- \rightarrow \mu^- \bar{\nu}_\mu K_L \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \gamma^{gFSR} \gamma^{gFSR} \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$	8	8	1	0	1	9
10	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow K^0 D^- D^{*+}, \bar{B}^0 \rightarrow D^{*+} D_s^{*-}, K^0 \rightarrow K_S,$ $D^- \rightarrow \pi^- \pi^- K^+, D^{*+} \rightarrow \pi^0 D^+, D^{*+} \rightarrow \pi^0 D^+, D_s^{*-} \rightarrow D_s^- \gamma, K_S \rightarrow \pi^+ \pi^-,$ $D^+ \rightarrow \mu^+ \nu_\mu \bar{K}^0, D^+ \rightarrow \pi^+ \eta', D_s^- \rightarrow K^* K^{*-}, \bar{K}^0 \rightarrow K_L, \eta' \rightarrow \rho^0 \gamma,$ $K^* \rightarrow \pi^- K^+, K^{*-} \rightarrow \pi^0 K^-, \rho^0 \rightarrow \pi^+ \pi^-$ $(e^+e^- \rightarrow \mu^+ \nu_\mu K_L \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- K^+ K^+ K^- \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$	9	9	1	0	1	10
11	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \mu^+ \nu_\mu \bar{D}^{*-}, \bar{B}^0 \rightarrow \rho^0 K^0 K^{*-} D^+, \bar{D}^{*-} \rightarrow \pi^- \bar{D}^0,$ $\rho^0 \rightarrow \pi^+ \pi^- \gamma^{gFSR}, K^0 \rightarrow K_L, K^{*-} \rightarrow \pi^0 K^-, D^+ \rightarrow \mu^+ \nu_\mu \bar{K}^0, \bar{D}^0 \rightarrow \rho^- K^{*+},$ $\bar{K}^0 \rightarrow K_L, \rho^- \rightarrow \pi^0 \pi^-, K^{*+} \rightarrow \pi^0 K^+$ $(e^+e^- \rightarrow \mu^+ \mu^+ \nu_\mu \nu_\mu K_L K_L \pi^+ \pi^- \pi^- \pi^- K^+ K^- \gamma^{gFSR} \gamma \gamma \gamma \gamma \gamma)$	10	10	1	0	1	11
12	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \rho^- K^+ J/\psi \gamma^{gFSR}, \bar{B}^0 \rightarrow D^+ D_s^{*-}, \rho^- \rightarrow \pi^0 \pi^-,$ $J/\psi \rightarrow e^+ e^- \gamma^{gFSR}, D^+ \rightarrow \pi^0 \pi^+ K_S, D_s^{*-} \rightarrow D_s^- \gamma, K_S \rightarrow \pi^0 \pi^0, D_s^- \rightarrow \tau^- \bar{\nu}_\tau,$ $\tau^- \rightarrow \mu^- \bar{\nu}_\mu \nu_\tau$ $(e^+e^- \rightarrow e^+ e^- \mu^- \bar{\nu}_\mu \nu_\tau \pi^+ \pi^- K^+ \gamma^{gFSR} \gamma^{gFSR} \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$	11	11	1	0	1	12
13	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \pi^+ \pi^- K^0 D^0 \bar{D}^0, \bar{B}^0 \rightarrow \pi^0 \pi^+ \rho^- \rho^- D^+, K^0 \rightarrow K_L,$ $D^0 \rightarrow K_S \eta', \bar{D}^0 \rightarrow \rho^- K^{*+}, \rho^- \rightarrow \pi^0 \pi^-, \rho^- \rightarrow \pi^0 \pi^-, D^+ \rightarrow \mu^+ \nu_\mu \bar{K}^0,$ $K_L \rightarrow \pi^0 \pi^0 \pi^0, K_S \rightarrow \pi^+ \pi^- \gamma^{gFSR}, \eta' \rightarrow \pi^+ \pi^- \eta, \rho^- \rightarrow \pi^0 \pi^-, K^{*+} \rightarrow \pi^0 K^+,$ $\bar{K}^0 \rightarrow K_L, \eta \rightarrow \pi^0 \pi^+ \pi^-$ $(e^+e^- \rightarrow \mu^+ \nu_\mu K_L \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- \pi^- K^+ \gamma^{gFSR} \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$	12	12	1	0	1	13
14	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \pi^+ \eta \bar{D}^{*-}, \bar{B}^0 \rightarrow K^0 K^{*-} D^{*+}, \eta \rightarrow \pi^0 \pi^0 \pi^0,$ $\bar{D}^{*-} \rightarrow \pi^0 D^-, K^0 \rightarrow K_S, K^{*-} \rightarrow \pi^0 K^-, D^{*+} \rightarrow \pi^+ D^0, D^- \rightarrow \mu^- \bar{\nu}_\mu K^0,$ $K_S \rightarrow \pi^+ \pi^-, D^0 \rightarrow \pi^0 \rho^0, K^0 \rightarrow K_L, \rho^0 \rightarrow \pi^+ \pi^-$ $(e^+e^- \rightarrow \mu^- \bar{\nu}_\mu K_L \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- K^- \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$	13	13	1	0	1	14
15	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \rho^+ D^-, \bar{B}^0 \rightarrow \pi^- K^+ K^- D^{*+} \gamma^{gFSR}, \rho^+ \rightarrow \pi^0 \pi^+,$ $D^- \rightarrow K_S a_1^-, D^{*+} \rightarrow \pi^+ D^0, K_S \rightarrow \pi^0 \pi^0, a_1^- \rightarrow \pi^0 \rho^-, D^0 \rightarrow \pi^0 \pi^+ K^-,$ $\rho^- \rightarrow \pi^0 \pi^-$ $(e^+e^- \rightarrow \pi^+ \pi^+ \pi^+ \pi^- \pi^- K^+ K^- K^- \gamma^{gFSR} \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$	14	14	1	0	1	15
16	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \pi^0 \pi^0 \pi^+ \eta \bar{D}^{*-} \gamma^{gFSR}, \bar{B}^0 \rightarrow e^- \bar{\nu}_e D^{*+}, \eta \rightarrow \pi^0 \pi^0 \pi^0,$ $\bar{D}^{*-} \rightarrow \pi^0 D^-, D^{*+} \rightarrow \pi^0 D^+, D^- \rightarrow \pi^+ \pi^- \pi^- \pi^- K^+, D^+ \rightarrow \mu^+ \nu_\mu \bar{K}^*, \bar{K}^* \rightarrow \pi^+ K^- \gamma^{gFSR}$ $(e^+e^- \rightarrow e^- \bar{\nu}_e \mu^+ \nu_\mu \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- K^+ K^- \gamma^{gFSR} \gamma^{gFSR} \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$	15	15	1	0	1	16
17	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow e^+ \nu_e \bar{D}^{*-} \gamma^{gFSR}, \bar{B}^0 \rightarrow \pi^0 \pi^+ K^{*-} D^0 \bar{D}^{*0} \gamma^{gFSR}, \bar{D}^{*-} \rightarrow \pi^- \bar{D}^0,$ $K^{*-} \rightarrow \pi^- \bar{K}^0, D^0 \rightarrow K_L \pi^+ \pi^-, \bar{D}^{*0} \rightarrow \pi^0 \bar{D}^0, \bar{D}^0 \rightarrow \mu^- \bar{\nu}_\mu K^+, \bar{K}^0 \rightarrow K_S,$ $\bar{D}^0 \rightarrow \pi^+ \pi^- K_S K_S, K_S \rightarrow \pi^+ \pi^-, K_S \rightarrow \pi^0 \pi^0, K_S \rightarrow \pi^+ \pi^-$ $(e^+e^- \rightarrow e^+ \nu_e \mu^- \bar{\nu}_\mu K_L \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- K^+ \gamma^{gFSR} \gamma^{gFSR} \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$	16	16	1	0	1	17







index	event tree (event initial-final states)	iEvtTr	iEvtIFSts	nEvts	nCcEvts	nTotEvts	nCmltEvts
47	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow \pi^0\pi^+\pi^-\rho^-\eta\eta\bar{K}^0K^+D^-, \bar{B}^0 \rightarrow \pi^0\rho^0\pi^-D^{*+}, \rho^- \rightarrow \pi^0\pi^-,$ $\eta \rightarrow \gamma\gamma, \eta \rightarrow \pi^0\pi^0\pi^0, \bar{K}^0 \rightarrow K_L, D^- \rightarrow \pi^-K_S, \rho^0 \rightarrow \pi^+\pi^-,$ $D^{*+} \rightarrow \pi^0D^+, K_S \rightarrow \pi^+\pi^-, D^+ \rightarrow \pi^0K_L\pi^+$ $(e^+e^- \rightarrow K_LK_L\pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-\pi^-K^+\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma)$	46	46	1	0	1	47
48	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow \rho^0\rho^+D^{*-}, \bar{B}^0 \rightarrow \pi^+K^-D^+D^-, \rho^0 \rightarrow \pi^+\pi^-,$ $\rho^+ \rightarrow \pi^0\pi^+, \bar{D}^{*-} \rightarrow \pi^-\bar{D}^0, D^+ \rightarrow \pi^0\pi^+\bar{K}^*, D^- \rightarrow \mu^-\bar{\nu}_\mu K^0, \bar{D}^0 \rightarrow \mu^-\bar{\nu}_\mu K^+,$ $\bar{K}^* \rightarrow \pi^0\bar{K}^0, K^0 \rightarrow K_S, \bar{K}^0 \rightarrow K_L, K_S \rightarrow \pi^+\pi^-$ $(e^+e^- \rightarrow \mu^-\mu^-\bar{\nu}_\mu\bar{\nu}_\mu K_L\pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-K^+K^-\gamma\gamma\gamma\gamma\gamma)$	47	47	1	0	1	48
49	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow \rho^0\rho^+D^-, \bar{B}^0 \rightarrow \mu^-\bar{\nu}_\mu D^+, \rho^0 \rightarrow \pi^+\pi^-,$ $\rho^+ \rightarrow \pi^0\pi^+, D^- \rightarrow \mu^-\bar{\nu}_\mu K^*, D^+ \rightarrow e^+\nu_e\bar{K}^*, K^* \rightarrow \pi^0K^0, \bar{K}^* \rightarrow \pi^0\bar{K}^0,$ $K^0 \rightarrow K_L, \bar{K}^0 \rightarrow K_S, K_S \rightarrow \pi^0\pi^0$ $(e^+e^- \rightarrow e^+\nu_e\mu^-\mu^-\bar{\nu}_\mu\bar{\nu}_\mu K_L\pi^+\pi^+\pi^-\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma)$	48	48	1	0	1	49
50	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow \pi^+\pi^-\rho^+\eta D^-, \bar{B}^0 \rightarrow \mu^-\bar{\nu}_\mu D^{*+}, \rho^+ \rightarrow \pi^0\pi^+,$ $\eta \rightarrow \pi^0\pi^0\pi^0, D^- \rightarrow K_S K^-, D^{*+} \rightarrow \pi^+D^0, \pi^0 \rightarrow e^+e^-\gamma^{FSR}, K_S \rightarrow \pi^+\pi^-,$ $D^0 \rightarrow \pi^0\pi^+\pi^-\bar{K}^*, \bar{K}^* \rightarrow \pi^0\bar{K}^0, \bar{K}^0 \rightarrow K_L$ $(e^+e^- \rightarrow e^+e^-\mu^-\bar{\nu}_\mu K_L\pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-K^-\gamma^{FSR}\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma)$	49	49	1	0	1	50
51	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0B^0, B^0 \rightarrow e^+\nu_e\eta D^-\gamma^{FSR}, B^0 \rightarrow \pi^0\pi^+\pi^+\pi^-\bar{D}^{*-}, \eta \rightarrow \pi^+\pi^-\gamma^{FSR},$ $D^- \rightarrow K_L a_1^-, \bar{D}^{*-} \rightarrow \pi^-\bar{D}^0, a_1^- \rightarrow \pi^-f_0(600), \bar{D}^0 \rightarrow \mu^-\bar{\nu}_\mu K^+$ $(e^+e^- \rightarrow e^+\nu_e\mu^-\bar{\nu}_\mu K_L\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-K^+f_0(600)\gamma^{FSR}\gamma^{FSR}\gamma\gamma)$	50	50	1	0	1	51
52	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow \pi^0\pi^+\pi^+\rho^-D^-, \bar{B}^0 \rightarrow e^-\bar{\nu}_e D^+, \rho^- \rightarrow \pi^0\pi^-,$ $D^- \rightarrow \pi^0\pi^+\pi^-\pi^-K^0, D^+ \rightarrow \pi^+\pi^+K^-, K^0 \rightarrow K_L$ $(e^+e^- \rightarrow e^-\bar{\nu}_e K_L\pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-K^-\gamma\gamma\gamma\gamma\gamma)$	51	51	1	0	1	52
53	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow \rho^0\pi^+\pi^+\pi^-\omega D^-, \bar{B}^0 \rightarrow \rho^+\rho^-D^{*0}, \rho^0 \rightarrow \pi^+\pi^-,$ $\omega \rightarrow \pi^0\pi^+\pi^-\gamma^{FSR}, D^- \rightarrow \pi^-K_1^{'0}, \rho^+ \rightarrow \pi^0\pi^+, \rho^- \rightarrow \pi^0\pi^-, D^{*0} \rightarrow D^0\gamma,$ $K_1^{'0} \rightarrow \pi^-K^{*+}, D^0 \rightarrow e^+\nu_e K^{*-}, K^{*+} \rightarrow \pi^0K^+, K^{*-} \rightarrow \pi^-\bar{K}^0, \bar{K}^0 \rightarrow K_L$ $(e^+e^- \rightarrow e^+\nu_e K_L\pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-\pi^-K^+\gamma^{FSR}\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma)$	52	52	1	0	1	53
54	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow \pi^-\bar{D}^0 D_s^+, \bar{B}^0 \rightarrow D^{*+} D_s^{*-}, \bar{D}^0 \rightarrow \rho^- K^{*+},$ $D_s^+ \rightarrow \rho^+\eta, D^{*+} \rightarrow \pi^+D^0, D_s^{*-} \rightarrow D_s^-\gamma, \rho^- \rightarrow \pi^0\pi^-, K^{*+} \rightarrow \pi^0K^+,$ $\rho^+ \rightarrow \pi^0\pi^+, \eta \rightarrow \gamma\gamma, D^0 \rightarrow K_S K^+ K^-, D_s^- \rightarrow \pi^-\eta', K_S \rightarrow \pi^0\pi^0,$ $\eta' \rightarrow \pi^+\pi^-\eta, \eta \rightarrow \pi^0\pi^+\pi^-$ $(e^+e^- \rightarrow \pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-\pi^-K^+K^+K^-\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma)$	53	53	1	0	1	54
55	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow \bar{D}^{*-} a_1^+, \bar{B}^0 \rightarrow \pi^0\rho^0\rho^0\rho^-D^+, \bar{D}^{*-} \rightarrow \pi^-\bar{D}^0,$ $a_1^+ \rightarrow \pi^+K^0\bar{K}^0, \rho^0 \rightarrow \pi^+\pi^-, \rho^0 \rightarrow \pi^+\pi^-, \rho^- \rightarrow \pi^0\pi^-, D^+ \rightarrow \pi^0\pi^+K_S,$ $\bar{D}^0 \rightarrow K^+ a_1^-, K^0 \rightarrow K_S, \bar{K}^0 \rightarrow K_S, K_S \rightarrow \pi^0\pi^0, a_1^- \rightarrow \rho^0\pi^-,$ $K_S \rightarrow \pi^+\pi^-, K_S \rightarrow \pi^0\pi^0, \rho^0 \rightarrow \pi^+\pi^-$ $(e^+e^- \rightarrow \pi^+\pi^+\pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-\pi^-\pi^-\pi^-K^+\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma)$	54	54	1	0	1	55







index	event tree (event initial-final states)	iEvtTr	iEvtIFSts	nEvts	nCcEvts	nTotEvts	nCmltEvts
75	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow K^{*+}\bar{D}^{*-}D^0, \bar{B}^0 \rightarrow D^{*+}D_{s0}^-, K^{*+} \rightarrow \pi^+K^0,$ $\bar{D}^{*-} \rightarrow \pi^-\bar{D}^0, D^0 \rightarrow \pi^0\pi^+K^-, D^{*+} \rightarrow \pi^0D^+, D_{s0}^0 \rightarrow \pi^0D_s^-, K^0 \rightarrow K_L,$ $\bar{D}^0 \rightarrow \rho^-K^{*+}, D^+ \rightarrow \mu^+\nu_\mu\pi^+K^-, D_s^- \rightarrow K^*K^-, \rho^- \rightarrow \pi^0\pi^-, K^{*+} \rightarrow \pi^0K^+,$ $K^* \rightarrow \pi^0K^0, K^0 \rightarrow K_L$ $(e^+e^- \rightarrow \mu^+\nu_\mu K_L K_L \pi^+ \pi^+ \pi^+ \pi^- \pi^- K^+ K^- K^- K^- \gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma)$	74	74	1	0	1	75
76	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow \mu^+\nu_\mu\bar{D}^{*-}, \bar{B}^0 \rightarrow \pi^0\pi^+\pi^-\rho^+\bar{D}^{*-}D^{*0}, \bar{D}^{*-} \rightarrow \pi^0\bar{D}^-,$ $\rho^+ \rightarrow \pi^0\pi^+, \bar{D}^{*-} \rightarrow \pi^0D^-, D^{*0} \rightarrow \pi^0D^0, D^- \rightarrow K_L\pi^-K^+K^-, D^- \rightarrow \pi^0\pi^-\pi^-K^+\gamma^{gFSR},$ $D^0 \rightarrow \pi^0\pi^+K^-$ $(e^+e^- \rightarrow \mu^+\nu_\mu K_L K_L \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- K^+ K^- K^- K^- \gamma^{gFSR} \gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma)$	75	75	1	0	1	76
77	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow \pi^0\rho^+\omega\omega D^-, \bar{B}^0 \rightarrow K^-D^{*+}\bar{D}^{*0}, \rho^+ \rightarrow \pi^0\pi^+,$ $\omega \rightarrow \pi^+\pi^-, \omega \rightarrow \pi^0\pi^+\pi^-, D^- \rightarrow \pi^0K_L\pi^-, D^{*+} \rightarrow \pi^0D^+, \bar{D}^{*0} \rightarrow \pi^0\bar{D}^0,$ $D^+ \rightarrow \pi^+\bar{K}_1^0, \bar{D}^0 \rightarrow \rho^-K^{*+}, \bar{K}_1^0 \rightarrow \pi^+K^{*-}, \rho^- \rightarrow \pi^0\pi^-, K^{*+} \rightarrow \pi^+K^0,$ $K^{*-} \rightarrow \pi^-\bar{K}^0, K^0 \rightarrow K_L, \bar{K}^0 \rightarrow K_S, K_S \rightarrow \pi^0\pi^0$ $(e^+e^- \rightarrow K_L K_L \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- K^+ \gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma)$	76	46	1	0	1	77
78	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow e^-\bar{\nu}_e D^{*+}, \bar{B}^0 \rightarrow \pi^0\pi^+\pi^-\rho^-\omega\bar{K}^0 D^{*+}, D^{*+} \rightarrow \pi^+D^0,$ $\rho^- \rightarrow \pi^0\pi^-, \omega \rightarrow \pi^0\pi^+\pi^-, \bar{K}^0 \rightarrow K_S, D^{*+} \rightarrow \pi^+D^0, D^0 \rightarrow \pi^0\eta K_S,$ $D^0 \rightarrow \mu^+\nu_\mu K^{*-}, \eta \rightarrow \gamma\gamma, K_S \rightarrow \pi^+\pi^-, K^{*-} \rightarrow \pi^-\bar{K}^0, \bar{K}^0 \rightarrow K_S,$ $K_S \rightarrow \pi^+\pi^-$ $(e^+e^- \rightarrow e^-\bar{\nu}_e \mu^+ \nu_\mu \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- K_S \gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma)$	77	76	1	0	1	78
79	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow e^+\nu_e\eta D^-, \bar{B}^0 \rightarrow \rho^0\pi^-\bar{D}^{*+}, \eta \rightarrow \pi^0\pi^+\pi^-,$ $D^- \rightarrow e^-\bar{\nu}_e K_1^0, \rho^0 \rightarrow \pi^+\pi^-, D^{*+} \rightarrow \pi^+D^0, K_1^0 \rightarrow \pi^0\pi^-K^+, D^0 \rightarrow e^+\nu_e K^-\gamma^{gFSR}$ $(e^+e^- \rightarrow e^+e^+e^-\nu_e\bar{\nu}_e\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-\pi^+K^-K^-\gamma^{gFSR}\gamma\gamma\gamma\gamma)$	78	77	1	0	1	79
80	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow \rho^0\pi^+\pi^-\rho^+\eta\bar{D}^{*-}, \bar{B}^0 \rightarrow \mu^-\bar{\nu}_\mu D^{*+}, \rho^0 \rightarrow \pi^+\pi^-,$ $\rho^+ \rightarrow \pi^0\pi^+, \eta \rightarrow \pi^0\pi^+\pi^-, \eta \rightarrow \pi^0\pi^+\pi^-, \bar{D}^{*-} \rightarrow \pi^-\bar{D}^0, D^{*+} \rightarrow \pi^0D^+,$ $\bar{D}^0 \rightarrow \pi^-K^+, D^+ \rightarrow e^+\nu_e\bar{K}^*, \bar{K}^* \rightarrow \pi^+K^-$ $(e^+e^- \rightarrow e^+\nu_e \mu^-\bar{\nu}_\mu \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- \pi^- K^+ K^- \gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma)$	79	78	1	0	1	80
81	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow \tau^+\nu_\tau D_0^{*-}, \bar{B}^0 \rightarrow \pi^0\pi^-\omega K^0\bar{K}^*D^{*+}, \tau^+ \rightarrow \mu^+\nu_\mu\bar{\nu}_\tau,$ $D_0^{*-} \rightarrow \pi^-\bar{D}^0, \omega \rightarrow \pi^0\pi^+\pi^-, K^0 \rightarrow K_S, \bar{K}^0 \rightarrow K_L, \bar{K}^* \rightarrow \pi^+K^-,$ $D^{*+} \rightarrow \pi^0D^+, \bar{D}^0 \rightarrow \pi^+\pi^-\pi^-K^+, K_S \rightarrow \pi^+\pi^-, D^+ \rightarrow \pi^0\pi^+K_S, K_S \rightarrow \pi^+\pi^-$ $(e^+e^- \rightarrow \mu^+\nu_\mu\nu_\tau\bar{\nu}_\tau K_L \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- \pi^- K^+ K^- \gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma)$	80	79	1	0	1	81
82	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow D^-a_1^+, \bar{B}^0 \rightarrow \pi^+\pi^-D^+D_s^*, D^- \rightarrow \mu^-\bar{\nu}_\mu\omega,$ $a_1^+ \rightarrow \rho^0\pi^+, D^+ \rightarrow \pi^+\pi^+K^-, D_s^{*-} \rightarrow D_s^-\gamma, \omega \rightarrow \pi^0\pi^+\pi^-, \rho^0 \rightarrow \pi^+\pi^-,$ $D_s^- \rightarrow \rho^-\phi, \rho^- \rightarrow \pi^0\pi^-, \phi \rightarrow K^+K^-$ $(e^+e^- \rightarrow \mu^-\bar{\nu}_\mu \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- K^+ K^- K^- \gamma\gamma\gamma\gamma\gamma)$	81	80	1	0	1	82
83	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow \rho^+\eta\omega D^-, \bar{B}^0 \rightarrow \pi^+D^0D_s^-, \rho^+ \rightarrow \pi^0\pi^+,$ $\eta \rightarrow \pi^+\pi^-\gamma^{gFSR}, \omega \rightarrow \pi^0\gamma, D^- \rightarrow \mu^-\bar{\nu}_\mu K^*, D^0 \rightarrow K_S K^+ K^-, D_s^- \rightarrow \rho^-\phi,$ $K^* \rightarrow \pi^-K^+, K_S \rightarrow \pi^+\pi^-, \rho^- \rightarrow \pi^0\pi^-, \phi \rightarrow \pi^-\rho^+, \rho^+ \rightarrow \pi^0\pi^+$ $(e^+e^- \rightarrow \mu^-\bar{\nu}_\mu \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- K^+ K^- K^- \gamma^{gFSR} \gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma)$	82	81	1	0	1	83

index	event tree (event initial-final states)	iEvtTr	iEvtIFSts	nEvts	nCcEvts	nTotEvts	nCmltEvts
84	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \pi^+ K^0 D^-, \bar{B}^0 \rightarrow \pi^+ \pi^+ \pi^- \pi^- \pi^- D^{*-}, K^0 \rightarrow K_S,$ $D^- \rightarrow \pi^- K^+ K^-, D^{*-} \rightarrow \pi^+ D^0, K_S \rightarrow \pi^0 \pi^0, D^0 \rightarrow \rho^+ K^{*-}, \rho^+ \rightarrow \pi^0 \pi^+,$ $K^{*-} \rightarrow \pi^0 K^-$ $(e^+e^- \rightarrow \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- K^+ K^- K^- \gamma \gamma \gamma \gamma \gamma \gamma)$	83	82	1	0	1	84
85	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \pi^0 \pi^+ \rho^- \bar{D}^{*0}, \bar{B}^0 \rightarrow e^- \bar{\nu}_e \eta D^+, \rho^- \rightarrow \pi^0 \pi^-,$ $\bar{D}^{*0} \rightarrow \pi^0 \bar{D}^0, \eta \rightarrow \pi^0 \pi^+ \pi^-, D^+ \rightarrow \mu^+ \nu_\mu \bar{K}^0, \bar{D}^0 \rightarrow K_S \eta', \bar{K}^0 \rightarrow K_L,$ $K_S \rightarrow \pi^0 \pi^0, \eta' \rightarrow \pi^+ \pi^- \eta, \eta \rightarrow \pi^0 \pi^0 \pi^0$ $(e^+e^- \rightarrow e^- \bar{\nu}_e \mu^+ \nu_\mu K_L \pi^+ \pi^+ \pi^- \pi^- \pi^- \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$	84	83	1	0	1	85
86	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \eta' D^+ \bar{D}^{*-}, \bar{B}^0 \rightarrow \omega \bar{D}^{*-} \bar{n} p, \eta' \rightarrow \pi^0 \pi^0 \eta,$ $D^+ \rightarrow \pi^+ \phi, \bar{D}^{*-} \rightarrow \pi^- \bar{D}^0, \omega \rightarrow \pi^0 \pi^+ \pi^-, \bar{D}^{*-} \rightarrow \pi^- \bar{D}^0, \eta \rightarrow \pi^0 \pi^+ \pi^-,$ $\phi \rightarrow K^+ K^-, \bar{D}^0 \rightarrow e^- \bar{\nu}_e \rho^+, \bar{D}^0 \rightarrow e^- \bar{\nu}_e K^+ \gamma^{gFSR} \gamma^{gFSR}, \rho^+ \rightarrow \pi^0 \pi^+ \gamma^{gFSR}$ $(e^+e^- \rightarrow e^- \bar{\nu}_e \bar{\nu}_e \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- K^+ K^+ K^- \bar{n} p \gamma^{gFSR} \gamma^{gFSR} \gamma^{gFSR} \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$	85	84	1	0	1	86
87	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \pi^+ \pi^- \rho^+ D^-, \bar{B}^0 \rightarrow e^- \bar{\nu}_e D_2^{*+}, \rho^+ \rightarrow \pi^0 \pi^+,$ $D^- \rightarrow \mu^- \bar{\nu}_\mu K^*, D_2^{*+} \rightarrow \pi^+ D^0, K^* \rightarrow \pi^- K^+, D^0 \rightarrow K_L \omega, \omega \rightarrow \pi^0 \pi^+ \pi^-$ $(e^+e^- \rightarrow e^- \bar{\nu}_e \mu^- \bar{\nu}_\mu K_L \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- K^+ \gamma \gamma \gamma)$	86	85	1	0	1	87
88	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \rho^0 \pi^+ \eta D^-, \bar{B}^0 \rightarrow \pi^- \rho^+ K^0 K^{*-} D^+, \rho^0 \rightarrow \pi^+ \pi^-,$ $\eta \rightarrow \gamma \gamma, D^- \rightarrow \pi^- \pi^- K^+, \rho^+ \rightarrow \pi^0 \pi^+, K^0 \rightarrow K_L, K^{*-} \rightarrow \pi^0 K^-,$ $D^+ \rightarrow \rho^0 \pi^+, K_L \rightarrow \mu^+ \nu_\mu \pi^-, \rho^0 \rightarrow \pi^+ \pi^-$ $(e^+e^- \rightarrow \mu^+ \nu_\mu \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- \pi^- K^+ K^- \gamma \gamma \gamma \gamma \gamma)$	87	86	1	0	1	88
89	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \rho^0 p \bar{\Sigma}_c^{*-}, \bar{B}^0 \rightarrow \mu^- \bar{\nu}_\mu D_0^{*+}, \rho^0 \rightarrow \pi^+ \pi^-,$ $\bar{\Sigma}_c^{*-} \rightarrow \pi^0 \bar{\Lambda}_c^-, D_0^{*+} \rightarrow \pi^+ D^0, \bar{\Lambda}_c^- \rightarrow K^+ \bar{\Delta}^{++}, D^0 \rightarrow \pi^+ \pi^- \bar{K}^*, \bar{\Delta}^{++} \rightarrow \pi^- \bar{p},$ $\bar{K}^* \rightarrow \pi^+ K^-$ $(e^+e^- \rightarrow \mu^- \bar{\nu}_\mu \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- K^+ K^- p \bar{p} \gamma \gamma)$	88	87	1	0	1	89
90	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \mu^+ \nu_\mu \bar{D}^{*-}, \bar{B}^0 \rightarrow \pi^- \pi^- D^+ \bar{n} p \gamma^{gFSR}, \bar{D}^{*-} \rightarrow \pi^0 D^-,$ $D^+ \rightarrow K_S a_1^+, D^- \rightarrow \pi^0 \pi^0 \pi^- \pi^- K^+, K_S \rightarrow \pi^0 \pi^0, a_1^+ \rightarrow \pi^+ f_0(600)$ $(e^+e^- \rightarrow \mu^+ \nu_\mu \pi^+ \pi^- \pi^- \pi^- \pi^- K^+ \bar{n} p f_0(600) \gamma^{gFSR} \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$	89	88	1	0	1	90
91	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \pi^0 \pi^+ \pi^- \rho^+ D^-, \bar{B}^0 \rightarrow \mu^- \bar{\nu}_\mu D^{*+}, \rho^+ \rightarrow \pi^0 \pi^+,$ $D^- \rightarrow \mu^- \bar{\nu}_\mu \pi^- K^+, D^{*+} \rightarrow \pi^0 D^+, D^+ \rightarrow \pi^+ \pi^+ K^-$ $(e^+e^- \rightarrow \mu^- \bar{\nu}_\mu \bar{\nu}_\mu \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- K^+ K^- \gamma \gamma \gamma \gamma \gamma)$	90	89	1	0	1	91
92	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \pi^- K^{*+} J/\psi, \bar{B}^0 \rightarrow \pi^0 \pi^+ K^- \eta_c(2S), K^{*+} \rightarrow \pi^0 K^+,$ $J/\psi \rightarrow e^+ e^- \gamma^{gFSR}, \pi^0 \rightarrow e^+ e^- \gamma^{gFSR}, \eta_c(2S) \rightarrow \eta \Sigma^+ \bar{\Sigma}^-, \eta \rightarrow \pi^0 \pi^0 \pi^0, \Sigma^+ \rightarrow \pi^+ n,$ $\bar{\Sigma}^- \rightarrow \pi^0 \bar{p}$ $(e^+e^- \rightarrow e^+ e^+ e^- e^- \pi^+ \pi^+ \pi^- K^+ K^- n \bar{p} \gamma^{gFSR} \gamma^{gFSR} \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$	91	90	1	0	1	92
93	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, \bar{B}^0 \rightarrow K^0 \psi', \bar{B}^0 \rightarrow \pi^- \rho^+ \rho^- D^+, K^0 \rightarrow K_S,$ $\psi' \rightarrow \pi^0 \pi^0 J/\psi, \rho^+ \rightarrow \pi^0 \pi^+, \rho^- \rightarrow \pi^0 \pi^-, D^+ \rightarrow \bar{K}^* a_1^+, K_S \rightarrow \pi^+ \pi^-,$ $J/\psi \rightarrow \mu^+ \mu^-, \bar{K}^* \rightarrow \pi^+ K^-, a_1^+ \rightarrow \pi^+ f_0(600)$ $(e^+e^- \rightarrow \mu^+ \mu^- \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- K^- f_0(600) \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$	92	91	1	0	1	93

index	event tree (event initial-final states)	iEvtTr	iEvtIFSts	nEvts	nCcEvts	nTotEvts	nCmltEvts
94	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow \rho^0\rho^+D^{*-}, \bar{B}^0 \rightarrow \pi^-K^0D^+, \rho^0 \rightarrow \pi^+\pi^-,$ $\rho^+ \rightarrow \pi^0\pi^+\gamma^{gFSR}, \bar{D}^{*-} \rightarrow \pi^-\bar{D}^0, K^0 \rightarrow K_L, D^+ \rightarrow K_L a_1^+, \bar{D}^0 \rightarrow \pi^-K^+,$ $a_1^+ \rightarrow \pi^+f_0(600)$ $(e^+e^- \rightarrow K_L K_L \pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-K^+f_0(600)\gamma^{gFSR}\gamma\gamma)$	93	92	1	0	1	94
95	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow \rho^+\omega D^-, \bar{B}^0 \rightarrow \pi^0\omega K^0K^-D^+, \rho^+ \rightarrow \pi^0\pi^+,$ $\omega \rightarrow \pi^0\pi^+\pi^-, D^- \rightarrow \pi^-\pi^-K^+, \pi^0 \rightarrow e^+e^-\gamma^{gFSR}, \omega \rightarrow \pi^0\pi^+\pi^-, K^0 \rightarrow K_S,$ $D^+ \rightarrow \mu^+\nu_\mu\bar{K}^*, K_S \rightarrow \pi^+\pi^-, \bar{K}^* \rightarrow \pi^+K^-$ $(e^+e^- \rightarrow e^+e^-\mu^+\nu_\mu\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-K^+K^-K^-\gamma^{gFSR}\gamma\gamma\gamma\gamma\gamma\gamma)$	94	93	1	0	1	95
96	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow e^+\nu_e D^{*-}, \bar{B}^0 \rightarrow e^-\bar{\nu}_e D^{*+}, \bar{D}^{*-} \rightarrow \pi^-\bar{D}^0,$ $D^{*+} \rightarrow \pi^+D^0, \bar{D}^0 \rightarrow K^+a_1^-, D^0 \rightarrow \pi^0\pi^+K^-, a_1^- \rightarrow \pi^-f_0(600)$ $(e^+e^- \rightarrow e^+e^-\nu_e\bar{\nu}_e\pi^+\pi^+\pi^-\pi^-K^+K^-f_0(600)\gamma\gamma)$	95	94	1	0	1	96
97	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow K^{*+}D^{*-}, \bar{B}^0 \rightarrow \pi^0\pi^-D^{*+}\Delta^+\Delta^+, K^{*+} \rightarrow \pi^+K^0,$ $\bar{D}^{*-} \rightarrow \pi^-\bar{D}^0, D^{*+} \rightarrow \pi^+D^0, \Delta^+ \rightarrow \pi^+n, \bar{\Delta}^+ \rightarrow \pi^0\bar{p}, K^0 \rightarrow K_L,$ $\bar{D}^0 \rightarrow \pi^0\pi^-K^+, D^0 \rightarrow \pi^+\pi^-K_S, K_S \rightarrow \pi^+\pi^-$ $(e^+e^- \rightarrow K_L\pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-K^+n\bar{p}\gamma\gamma\gamma\gamma\gamma\gamma)$	96	95	1	0	1	97
98	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow D_2^{*-}D_s^{*+}, \bar{B}^0 \rightarrow \pi^+\pi^-D^+D_s^-, D_2^{*-} \rightarrow \pi^0\bar{D}^{*-},$ $D_s^{*+} \rightarrow D_s^+\gamma, D^+ \rightarrow \pi^+\bar{K}_1^{\prime 0}, D_s^- \rightarrow e^-\bar{\nu}_e\eta', \bar{D}^{*-} \rightarrow \pi^-\bar{D}^0, D_s^+ \rightarrow \pi^+\phi,$ $\bar{K}_1^{\prime 0} \rightarrow \pi^+K^{*-}, \eta' \rightarrow \pi^0\pi^0\eta, \bar{D}^0 \rightarrow \pi^-\omega K^+, \phi \rightarrow \pi^-\rho^+, K^{*-} \rightarrow \pi^-\bar{K}^0,$ $\eta \rightarrow \pi^0\pi^+\pi^-, \omega \rightarrow \pi^0\pi^+\pi^-, \rho^+ \rightarrow \pi^0\pi^+, \bar{K}^0 \rightarrow K_S, K_S \rightarrow \pi^0\pi^0$ $(e^+e^- \rightarrow e^-\bar{\nu}_e\pi^+\pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-\pi^-\pi^-\pi^-K^+\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma)$	97	96	1	0	1	98
99	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow K_L\eta_c, \bar{B}^0 \rightarrow \pi^-\pi^-\rho^+D^{*+}, \eta_c \rightarrow \pi^0K^0K^0\bar{K}^0K^*,$ $\rho^+ \rightarrow \pi^0\pi^+, D^{*+} \rightarrow \pi^0D^+, K^0 \rightarrow K_S, \bar{K}^0 \rightarrow K_L, \bar{K}^0 \rightarrow K_S,$ $K^* \rightarrow \pi^-K^+, D^+ \rightarrow \pi^0\pi^+K_S, K_S \rightarrow \pi^0\pi^0, K_S \rightarrow \pi^+\pi^-, K_S \rightarrow \pi^+\pi^-\gamma^{gFSR}$ $(e^+e^- \rightarrow K_L K_L \pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-\pi^-K^+\gamma^{gFSR}\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma)$	98	97	1	0	1	99
100	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow \pi^0\pi^0\rho^0\pi^+\bar{D}^{*-}, \bar{B}^0 \rightarrow K^*K^-D^+, \rho^0 \rightarrow \pi^+\pi^-\gamma^{gFSR},$ $\bar{D}^{*-} \rightarrow \pi^-\bar{D}^0, K^* \rightarrow \pi^0K^0, D^+ \rightarrow \pi^+\pi^+K^-, \bar{D}^0 \rightarrow \pi^-\rho^+, K^0 \rightarrow K_S,$ $\rho^+ \rightarrow \pi^0\pi^+, K_S \rightarrow \pi^0\pi^0$ $(e^+e^- \rightarrow \pi^+\pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-\pi^-K^-K^-\gamma^{gFSR}\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma)$	99	98	1	0	1	100
101	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow \pi^0\pi^+\rho^-\eta\bar{D}^0, \bar{B}^0 \rightarrow \pi^-\rho^+\rho^-D^+, \rho^- \rightarrow \pi^0\pi^-,$ $\eta \rightarrow \pi^0\pi^+\pi^-, \bar{D}^0 \rightarrow \pi^0\pi^+\pi^-K_S\gamma^{gFSR}, \rho^+ \rightarrow \pi^0\pi^+\gamma^{gFSR}, \rho^- \rightarrow \pi^0\pi^-, D^+ \rightarrow e^+\nu_e\bar{K}^0\gamma^{gFSR},$ $\pi^0 \rightarrow e^+e^-\gamma^{gFSR}, K_S \rightarrow \pi^+\pi^-\gamma^{gFSR}, \bar{K}^0 \rightarrow K_S, K_S \rightarrow \pi^0\pi^0$ $(e^+e^- \rightarrow e^+e^+e^-\nu_e\pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-\pi^-\pi^-\gamma^{gFSR}\gamma^{gFSR}\gamma^{gFSR}\gamma^{gFSR}\gamma^{gFSR}\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma)$	100	99	1	0	1	101
102	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow \pi^0\pi^0\eta\omega\bar{D}^0, \bar{B}^0 \rightarrow \pi^+\pi^-D^+D_s^-, \eta \rightarrow \pi^+\pi^-\gamma^{gFSR},$ $\omega \rightarrow \pi^0\pi^+\pi^-, \bar{D}^0 \rightarrow \pi^0\pi^-K^+\gamma^{gFSR}, D^+ \rightarrow \pi^0\pi^+K_S, D_s^- \rightarrow e^-\bar{\nu}_e\eta, K_S \rightarrow \pi^+\pi^-\gamma^{gFSR},$ $\eta \rightarrow \pi^+\pi^-\gamma^{gFSR}$ $(e^+e^- \rightarrow e^-\bar{\nu}_e\pi^+\pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-\pi^-\pi^-K^+\gamma^{gFSR}\gamma^{gFSR}\gamma^{gFSR}\gamma^{gFSR}\gamma^{gFSR}\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma)$	101	100	1	0	1	102



index	event tree (event initial-final states)	iEvtTr	iEvtIFSts	nEvts	nCcEvts	nTotEvts	nCmltEvts
113	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow e^+ \nu_e D^- \gamma^{gFSR} \gamma^{gFSR}, \bar{B}^0 \rightarrow D_s^{*+} \bar{\Delta}^+ \Lambda, D^- \rightarrow \pi^- \pi^- K^+,$ $D_s^{*+} \rightarrow D_s^+ \gamma, \bar{\Delta}^+ \rightarrow \pi^- \bar{n}, \Lambda \rightarrow \pi^0 n, D_s^+ \rightarrow \pi^+ \eta, \eta \rightarrow \pi^0 \pi^+ \pi^-$ $(e^+e^- \rightarrow e^+ \nu_e \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- K^+ n \bar{n} \gamma^{gFSR} \gamma^{gFSR} \gamma \gamma \gamma \gamma)$	112	111	1	0	1	113
114	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \pi^0 \pi^+ \pi^+ \pi^- \bar{D}^{*-} \gamma^{gFSR}, \bar{B}^0 \rightarrow K^- D^{*+} \bar{D}^{*0}, \bar{D}^{*-} \rightarrow \pi^0 D^-,$ $D^{*+} \rightarrow \pi^+ D^0, \bar{D}^{*0} \rightarrow \pi^0 \bar{D}^0, D^- \rightarrow K_L \pi^+ \pi^- K^- \gamma^{gFSR}, D^0 \rightarrow \pi^- \rho^+, \bar{D}^0 \rightarrow \pi^0 \pi^- K^+,$ $\rho^+ \rightarrow \pi^0 \pi^+$ $(e^+e^- \rightarrow K_L \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- K^+ K^- K^- \gamma^{gFSR} \gamma^{gFSR} \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$	113	112	1	0	1	114
115	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \bar{D}^{*-} D_{s1}^{'+}, \bar{B}^0 \rightarrow e^- \bar{\nu}_e D^{*+} \gamma^{gFSR}, \bar{D}^{*-} \rightarrow \pi^- \bar{D}^0,$ $D_{s1}^{'+} \rightarrow \pi^0 D_s^{*+}, D^{*+} \rightarrow \pi^+ D^0, \bar{D}^0 \rightarrow \pi^- \eta K^+, D_s^{*+} \rightarrow D_s^+ \gamma, D^0 \rightarrow K_L K^+ K^-,$ $\eta \rightarrow \pi^0 \pi^+ \pi^- \gamma^{gFSR}, D_s^+ \rightarrow \pi^0 \pi^+ \pi^+ \pi^- \pi^-$ $(e^+e^- \rightarrow e^- \bar{\nu}_e K_L \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- K^+ K^+ K^- \gamma^{gFSR} \gamma^{gFSR} \gamma \gamma \gamma \gamma \gamma \gamma)$	114	113	1	0	1	115
116	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow D^{*+} D_s^{*-}, \bar{B}^0 \rightarrow \mu^- \bar{\nu}_\mu D_1^{'+}, D^{*+} \rightarrow \pi^+ D^0,$ $D_s^{*-} \rightarrow D_s^- \gamma, D_1^{'+} \rightarrow \pi^0 D^{*+}, D^0 \rightarrow \pi^0 \pi^+ K^-, D_s^- \rightarrow \rho^- \eta, D^{*+} \rightarrow \pi^+ D^0,$ $\rho^- \rightarrow \pi^0 \pi^-, \eta \rightarrow \pi^0 \pi^+ \pi^-, D^0 \rightarrow \pi^0 \pi^+ \pi^- K_S, K_S \rightarrow \pi^+ \pi^- \gamma^{gFSR}$ $(e^+e^- \rightarrow \mu^- \bar{\nu}_\mu \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- K^- \gamma^{gFSR} \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$	115	114	1	0	1	116
117	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \pi^0 \pi^+ \eta \bar{K}^0 K^* D^-, \bar{B}^0 \rightarrow D^{*+} D_s^{*-}, \eta \rightarrow \pi^+ \pi^- \gamma^{gFSR},$ $\bar{K}^0 \rightarrow K_L, K^* \rightarrow \pi^- K^+, D^- \rightarrow \pi^0 \pi^- K^* \gamma^{gFSR}, D^{*+} \rightarrow \pi^+ D^0, D_s^{*-} \rightarrow D_s^- \gamma,$ $K^* \rightarrow \pi^- K^+, D^0 \rightarrow e^+ \nu_e K^{*-}, D_s^- \rightarrow \rho^- \eta', K^{*-} \rightarrow \pi^0 K^-, \rho^- \rightarrow \pi^0 \pi^-,$ $\eta' \rightarrow \pi^+ \pi^- \eta, \eta \rightarrow \gamma \gamma$ $(e^+e^- \rightarrow e^+ \nu_e K_L \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- K^+ K^+ K^- \gamma^{gFSR} \gamma^{gFSR} \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$	116	115	1	0	1	117
118	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \rho^- \eta \bar{K}^0 K^+ \bar{D}^{*0}, \bar{B}^0 \rightarrow \pi^- \eta D^{*+} \gamma^{gFSR}, \rho^- \rightarrow \pi^0 \pi^-,$ $\eta \rightarrow \pi^0 \pi^0 \pi^0, \bar{K}^0 \rightarrow K_S, \bar{D}^{*0} \rightarrow \bar{D}^0 \gamma, \eta \rightarrow \pi^0 \pi^0 \pi^0, D^{*+} \rightarrow \pi^+ D^0,$ $K_S \rightarrow \pi^0 \pi^0, \bar{D}^0 \rightarrow \pi^0 \pi^- K^+, D^0 \rightarrow e^+ \nu_e K^- \gamma^{gFSR}$ $(e^+e^- \rightarrow e^+ \nu_e \pi^+ \pi^- \pi^- \pi^- K^+ K^+ K^- \gamma^{gFSR} \gamma^{gFSR} \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$	117	116	1	0	1	118
119	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \pi^0 \pi^0 \bar{D}^0, \bar{B}^0 \rightarrow \pi^0 \rho^0 \rho^+ \omega D^-, \bar{D}^0 \rightarrow \rho^0 \pi^- K^+,$ $\rho^0 \rightarrow \pi^+ \pi^-, \rho^+ \rightarrow \pi^0 \pi^+, \omega \rightarrow \pi^0 \pi^+ \pi^-, D^- \rightarrow e^- \bar{\nu}_e \pi^- K^+ \gamma^{gFSR}, \rho^0 \rightarrow \pi^+ \pi^-$ $(e^+e^- \rightarrow e^- \bar{\nu}_e \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- K^+ K^+ \gamma^{gFSR} \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$	118	117	1	0	1	119
120	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow K^0 D^{*+} \bar{D}^{*-}, \bar{B}^0 \rightarrow \mu^- \bar{\nu}_\mu D^{*+}, K^0 \rightarrow K_S,$ $D^{*+} \rightarrow \pi^0 D^+, \bar{D}^{*-} \rightarrow \pi^- \bar{D}^0, D^{*+} \rightarrow \pi^+ D^0, K_S \rightarrow \pi^+ \pi^-, D^+ \rightarrow \pi^+ \pi^+ K^-,$ $\bar{D}^0 \rightarrow \pi^- K_S K^+, D^0 \rightarrow K_L \pi^- K^+, K_S \rightarrow \pi^+ \pi^-$ $(e^+e^- \rightarrow \mu^- \bar{\nu}_\mu K_L \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- K^+ K^+ K^- \gamma \gamma)$	119	118	1	0	1	120
121	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow e^- \bar{\nu}_e D^{*+}, \bar{B}^0 \rightarrow \mu^- \bar{\nu}_\mu D^{*+}, D^{*+} \rightarrow \pi^+ D^0,$ $D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow \pi^0 \pi^+ K^-, D^0 \rightarrow \rho^+ K^{*-}, \rho^+ \rightarrow \pi^0 \pi^+, K^{*-} \rightarrow \pi^- \bar{K}^0 \gamma^{gFSR},$ $\bar{K}^0 \rightarrow K_L$ $(e^+e^- \rightarrow e^- \bar{\nu}_e \mu^- \bar{\nu}_\mu K_L \pi^+ \pi^+ \pi^+ \pi^+ \pi^- K^- \gamma^{gFSR} \gamma \gamma \gamma \gamma)$	120	119	1	0	1	121





index	event tree (event initial-final states)	iEvtTr	iEvtIFSts	nEvts	nCcEvts	nTotEvts	nCmltEvts
131	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \eta K^0 K^+ \bar{D}^{*-}, \bar{B}^0 \rightarrow \rho^- \eta D^+, \eta \rightarrow \pi^0 \pi^+ \pi^-,$ $\bar{K}^0 \rightarrow K_S, \bar{D}^{*-} \rightarrow \pi^0 D^-, \rho^- \rightarrow \pi^0 \pi^-, \eta \rightarrow \gamma \gamma, D^+ \rightarrow \pi^0 \pi^0 \pi^+,$ $K_S \rightarrow \pi^0 \pi^0, D^- \rightarrow K_L a_1^-, a_1^- \rightarrow \rho^0 \pi^-, \rho^0 \rightarrow \pi^+ \pi^-$ $(e^+e^- \rightarrow K_L \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- K^+ \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$	130	129	1	0	1	131
132	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow \bar{B}^0 \bar{B}^0, \bar{B}^0 \rightarrow \rho^- D^+, \bar{B}^0 \rightarrow \rho^0 \pi^- \omega D^+, \rho^- \rightarrow \pi^0 \pi^-,$ $D^+ \rightarrow e^+ \nu_e \pi^+ K^- \gamma^{gFSR}, \rho^0 \rightarrow \pi^+ \pi^-, \omega \rightarrow \pi^0 \pi^+ \pi^-, D^+ \rightarrow \pi^+ \pi^+ K^-$ $(e^+e^- \rightarrow e^+ \nu_e \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- K^- K^- \gamma^{gFSR} \gamma \gamma \gamma)$	131	130	1	0	1	132
133	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \bar{D}^{*-} D_s^+, \bar{B}^0 \rightarrow e^+ \nu_e D_2^{*-}, \bar{D}^{*-} \rightarrow \pi^0 D^-,$ $D_s^+ \rightarrow \mu^+ \nu_\mu \phi, D_2^{*-} \rightarrow \pi^- \bar{D}^{*0}, D^- \rightarrow e^- \bar{\nu}_e \pi^- K^+ \gamma^{gFSR}, \phi \rightarrow K^+ K^-, \bar{D}^{*0} \rightarrow \bar{D}^0 \gamma,$ $\bar{D}^0 \rightarrow K^+ a_1^-, a_1^- \rightarrow \rho^0 \pi^-, \rho^0 \rightarrow \pi^+ \pi^-$ $(e^+e^- \rightarrow e^+ e^- \nu_e \bar{\nu}_e \mu^+ \nu_\mu \pi^+ \pi^- \pi^- \pi^- \pi^- K^+ K^+ K^+ K^- \gamma^{gFSR} \gamma \gamma \gamma)$	132	131	1	0	1	133
134	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \pi^+ \pi^- \rho^+ \bar{D}^{*-}, \bar{B}^0 \rightarrow D_2^{*+} D_s^-, \rho^+ \rightarrow \pi^0 \pi^+ \gamma^{gFSR},$ $\bar{D}^{*-} \rightarrow \pi^- \bar{D}^0, D_2^{*+} \rightarrow \pi^+ D^0, D_s^- \rightarrow \tau^- \bar{\nu}_\tau, \bar{D}^0 \rightarrow \pi^0 K_L \pi^+ \pi^-, D^0 \rightarrow \rho^+ K^{*-},$ $\tau^- \rightarrow \nu_\tau \pi^0 \pi^- \gamma^{gFSR}, \rho^+ \rightarrow \pi^0 \pi^+, K^{*-} \rightarrow \pi^- \bar{K}^0 \gamma^{gFSR}, \bar{K}^0 \rightarrow K_L$ $(e^+e^- \rightarrow \nu_\tau \bar{\nu}_\tau K_L K_L \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- \gamma^{gFSR} \gamma^{gFSR} \gamma^{gFSR} \gamma \gamma \gamma \gamma \gamma \gamma)$	133	132	1	0	1	134
135	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \pi^0 \omega K^+ D_s^{*-}, \bar{B}^0 \rightarrow \mu^- \bar{\nu}_\mu D^{*+}, \omega \rightarrow \pi^0 \pi^+ \pi^-,$ $D_s^{*-} \rightarrow D_s^- \gamma, D^{*+} \rightarrow \pi^+ D^0, D_s^- \rightarrow \rho^- \eta', D^0 \rightarrow \pi^+ \pi^+ \pi^- K^-, \rho^- \rightarrow \pi^0 \pi^-,$ $\eta' \rightarrow \rho^0 \gamma, \rho^0 \rightarrow \pi^+ \pi^-$ $(e^+e^- \rightarrow \mu^- \bar{\nu}_\mu \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- K^+ K^- \gamma \gamma \gamma \gamma \gamma \gamma)$	134	133	1	0	1	135
136	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow D_s^{*+} D_1'^-, \bar{B}^0 \rightarrow \rho^0 \pi^- D^{*+}, D_s^{*+} \rightarrow D_s^+ \gamma,$ $D_1'^- \rightarrow \pi^- \bar{D}^{*0}, \rho^0 \rightarrow \pi^+ \pi^-, D^{*+} \rightarrow \pi^+ D^0, D_s^+ \rightarrow K_L \pi^+ \pi^- K^+, \bar{D}^{*0} \rightarrow \bar{D}^0 \gamma,$ $D^0 \rightarrow K^- a_1^+, \bar{D}^0 \rightarrow \pi^0 \pi^+ \pi^- K^*, a_1^+ \rightarrow \pi^+ f_0(600), K^* \rightarrow \pi^- K^+$ $(e^+e^- \rightarrow K_L \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- K^+ K^+ K^- f_0(600) \gamma \gamma \gamma \gamma)$	135	134	1	0	1	136
137	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \rho^0 \pi^- \rho^+ K^0 D^-, \bar{B}^0 \rightarrow \pi^0 \rho^0 \pi^- \eta \omega D^+, \rho^0 \rightarrow \pi^+ \pi^-,$ $\rho^+ \rightarrow \pi^0 \pi^+, \rho^+ \rightarrow \pi^0 \pi^+, K^0 \rightarrow K_S, D^- \rightarrow K_L \pi^+ \pi^- K^-, \pi^0 \rightarrow e^+ e^- \gamma^{gFSR},$ $\rho^0 \rightarrow \pi^+ \pi^-, \eta \rightarrow \pi^+ \pi^- \gamma^{gFSR}, \omega \rightarrow \pi^0 \pi^+ \pi^-, D^+ \rightarrow K_L a_1^+, K_S \rightarrow \pi^+ \pi^-,$ $a_1^+ \rightarrow \pi^0 \rho^+, \rho^+ \rightarrow \pi^0 \pi^+$ $(e^+e^- \rightarrow e^+ e^- K_L K_L \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- K^- \gamma^{gFSR} \gamma^{gFSR} \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$	136	135	1	0	1	137
138	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \pi^0 \pi^0 K^+ D_s^{*-}, \bar{B}^0 \rightarrow D^{*0} n \bar{n}, D_s^{*-} \rightarrow D_s^- \gamma,$ $D^{*0} \rightarrow \pi^0 D^0, D_s^- \rightarrow \rho^- \eta', D^0 \rightarrow \pi^+ K^-, \rho^- \rightarrow \pi^0 \pi^-, \eta' \rightarrow \rho^0 \gamma,$ $\rho^0 \rightarrow \pi^+ \pi^-$ $(e^+e^- \rightarrow \pi^+ \pi^+ \pi^- \pi^- K^+ K^- n \bar{n} \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$	137	136	1	0	1	138
139	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow K^+ \Delta^+ \bar{\Sigma}_c^{*-}, \bar{B}^0 \rightarrow e^+ \nu_e D^- \gamma^{gFSR}, \Delta^+ \rightarrow \pi^0 p,$ $\bar{\Sigma}_c^{*-} \rightarrow \pi^- \bar{\Lambda}_c^-, D^- \rightarrow K_L \pi^+ \pi^- K^-, \bar{\Lambda}_c^- \rightarrow \pi^0 \pi^- \bar{D}^0, \bar{D}^0 \rightarrow \pi^+ \bar{p}$ $(e^+e^- \rightarrow e^+ \nu_e K_L \pi^+ \pi^+ \pi^- \pi^- \pi^- K^+ K^- p \bar{p} \gamma^{gFSR} \gamma \gamma \gamma \gamma)$	138	137	1	0	1	139



index	event tree (event initial-final states)	iEvtTr	iEvtIFSts	nEvts	nCcEvts	nTotEvts	nCmltEvts
149	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow \pi^0\rho^0\pi^+D^-, \bar{B}^0 \rightarrow \pi^+\pi^-\pi^-D^+, \rho^0 \rightarrow \pi^+\pi^-,$ $D^- \rightarrow \pi^-K_1^0, D^+ \rightarrow K_S a_1^+, K_1^0 \rightarrow \pi^-K^{*+}, K_S \rightarrow \pi^+\pi^-, a_1^+ \rightarrow \pi^0\rho^+,$ $K^{*+} \rightarrow \pi^0K^+, \rho^+ \rightarrow \pi^0\pi^+$ $(e^+e^- \rightarrow \pi^+\pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-\pi^-K^+\gamma\gamma\gamma\gamma\gamma\gamma\gamma)$	148	147	1	0	1	149
150	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow \tau^+\nu_\tau D_0^{*-}, \bar{B}^0 \rightarrow \pi^0\omega K^*K^-D^+, \tau^+ \rightarrow \mu^+\nu_\mu\bar{\nu}_\tau,$ $D_0^{*-} \rightarrow \pi^-\bar{D}^0, \omega \rightarrow \pi^0\pi^+\pi^-, K^* \rightarrow \pi^0K^0, D^+ \rightarrow \pi^+\pi^+K^-, \bar{D}^0 \rightarrow \pi^0\pi^-K^+\gamma^{FSR},$ $K^0 \rightarrow K_L$ $(e^+e^- \rightarrow \mu^+\nu_\mu\bar{\nu}_\tau K_L\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-K^+K^-K^-\gamma^{FSR}\gamma\gamma\gamma\gamma\gamma\gamma\gamma)$	149	148	1	0	1	150
151	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow e^+\nu_e\pi^+\pi^-\bar{D}^{*-}, \bar{B}^0 \rightarrow e^-\bar{\nu}_eD^{*+}\gamma^{FSR}, \bar{D}^{*-} \rightarrow \pi^-\bar{D}^0,$ $D^{*+} \rightarrow \pi^0D^+, \bar{D}^0 \rightarrow \pi^-K^+, D^+ \rightarrow \mu^+\nu_\mu\pi^+K^-\gamma^{FSR}$ $(e^+e^- \rightarrow e^+e^-\nu_e\bar{\nu}_e\mu^+\nu_\mu\pi^+\pi^+\pi^-\pi^-\pi^-K^+K^-\gamma^{FSR}\gamma^{FSR}\gamma\gamma)$	150	149	1	0	1	151
152	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow \rho^0\bar{D}^{*-}\Sigma^0\Sigma^+, \bar{B}^0 \rightarrow \eta\bar{K}^0J/\psi, \rho^0 \rightarrow \pi^+\pi^-,$ $\bar{D}^{*-} \rightarrow \pi^0D^-, \bar{\Sigma}^0 \rightarrow \bar{\Lambda}\gamma, \Sigma^+ \rightarrow \pi^+n, \eta \rightarrow \pi^0\pi^0\pi^0, \bar{K}^0 \rightarrow K_L,$ $J/\psi \rightarrow \pi^-\eta K_S K^+, D^- \rightarrow \mu^-\bar{\nu}_\mu K^0, \bar{\Lambda} \rightarrow \pi^+\bar{p}, K_L \rightarrow e^-\nu_e\pi^+\gamma^{FSR}, \eta \rightarrow \pi^0\pi^+\pi^-,$ $K_S \rightarrow \pi^+\pi^-, K^0 \rightarrow K_S, K_S \rightarrow \pi^0\pi^0$ $(e^+e^- \rightarrow e^-\nu_e\mu^-\bar{\nu}_\mu\pi^+\pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-K^+n\bar{p}\gamma^{FSR}\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma)$	151	150	1	0	1	152
153	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow \rho^0\rho^0\rho^0\rho^+D^{*-}, \bar{B}^0 \rightarrow e^-\bar{\nu}_eD^{*+}, \rho^0 \rightarrow \pi^+\pi^-,$ $\rho^0 \rightarrow \pi^+\pi^-, \rho^0 \rightarrow \pi^+\pi^-, \rho^+ \rightarrow \pi^0\pi^+, \bar{D}^{*-} \rightarrow \pi^-\bar{D}^0, D^{*+} \rightarrow D^+\gamma,$ $\bar{D}^0 \rightarrow \rho^-K^{*+}, D^+ \rightarrow K_S K^{*+}, \rho^- \rightarrow \pi^0\pi^-, K^{*+} \rightarrow \pi^0K^+, K_S \rightarrow \pi^+\pi^-,$ $K^{*+} \rightarrow \pi^+K^0, K^0 \rightarrow K_L, K_L \rightarrow \mu^-\nu_\mu\pi^+$ $(e^+e^- \rightarrow e^-\bar{\nu}_e\mu^-\nu_\mu\pi^+\pi^+\pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-K^+\gamma\gamma\gamma\gamma\gamma\gamma\gamma)$	152	151	1	0	1	153
154	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow K^{*+}D^-, \bar{B}^0 \rightarrow \pi^+K^-\chi_{c1}, K^{*+} \rightarrow \pi^0K^+,$ $D^- \rightarrow \pi^-K_1^{'0}\gamma^{FSR}, \chi_{c1} \rightarrow \pi^-\eta\eta\bar{K}^0K^+, K_1^{'0} \rightarrow \pi^-K^{*+}, \eta \rightarrow \gamma\gamma, \eta \rightarrow \pi^0\pi^0\pi^0,$ $\bar{K}^0 \rightarrow K_S, K^{*+} \rightarrow \pi^0K^+, K_S \rightarrow \pi^+\pi^-$ $(e^+e^- \rightarrow \pi^+\pi^+\pi^-\pi^-\pi^-\pi^-\pi^-\pi^-\pi^-\pi^-K^+K^+K^+K^-\gamma^{FSR}\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma)$	153	152	1	0	1	154
155	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow K^{*+}D^-D^0, \bar{B}^0 \rightarrow e^-\bar{\nu}_eD_2^{*+}\gamma^{FSR}, K^{*+} \rightarrow \pi^0K^+,$ $D^- \rightarrow \pi^0\pi^-K_S, D^0 \rightarrow \pi^0\pi^0\pi^+\pi^-, D_2^{*+} \rightarrow \pi^+D^0, K_S \rightarrow \pi^+\pi^-, D^0 \rightarrow \pi^0\pi^+K^{*-},$ $K^{*-} \rightarrow \pi^0K^-$ $(e^+e^- \rightarrow e^-\bar{\nu}_e\pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-K^+K^-\gamma^{FSR}\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma)$	154	153	1	0	1	155
156	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow \rho^+D^-, \bar{B}^0 \rightarrow \pi^-\pi^-\rho^+D^{*+}\gamma^{FSR}, \rho^+ \rightarrow \pi^0\pi^+,$ $D^- \rightarrow \rho^-K^*, \rho^+ \rightarrow \pi^0\pi^+, D^{*+} \rightarrow \pi^+D^0, \rho^- \rightarrow \pi^0\pi^-, K^* \rightarrow \pi^-K^+,$ $D^0 \rightarrow \pi^0\pi^0\bar{K}^*, \bar{K}^* \rightarrow \pi^+K^-\gamma^{FSR}$ $(e^+e^- \rightarrow \pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-K^+K^-\gamma^{FSR}\gamma^{FSR}\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma)$	155	154	1	0	1	156
157	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow e^+\nu_e\bar{D}^{*-}, \bar{B}^0 \rightarrow \pi^0\rho^0\rho^-D^{*+}\gamma, \bar{D}^{*-} \rightarrow \pi^-\bar{D}^0,$ $\rho^0 \rightarrow \pi^+\pi^-, \rho^- \rightarrow \pi^0\pi^-, D^{*+} \rightarrow \pi^+D^0, \bar{D}^0 \rightarrow \pi^0\pi^-K^+, D^0 \rightarrow e^+\nu_e\rho^-\gamma^{FSR}\gamma^{FSR},$ $\rho^- \rightarrow \pi^0\pi^-$ $(e^+e^- \rightarrow e^+e^+\nu_e\nu_e\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-\pi^-K^+\gamma^{FSR}\gamma^{FSR}\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma)$	156	155	1	0	1	157













Table 2: Event initial-final states.

[illegible]









Table 3: Signal particle final states.

index	signal particle final states	iSigPFSts	nEtrs	nCcEtrs	nTotEtrs	nCmltEtrs
1	$D^0 \rightarrow \pi^0 \pi^+ K^-$	0	13	20	33	33
2	$D^0 \rightarrow \pi^+ K^-$	1	2	6	8	41