

Topology Analysis ^{*}

(v1.5)

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November 27, 2018

^{*}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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List of Tables

1	Event trees and their respective initial-final states.	3
2	Event initial-final states.	23
3	Signal particles.	29

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

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index	event tree (event initial-final states)	nEvts	nCmltEvts
11	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \mu^+ \nu_\mu \bar{D}^{*-}, \bar{B}^0 \rightarrow \rho^0 K^0 K^{*-} D^+, \bar{D}^{*-} \rightarrow \pi^- \bar{D}^0, \rho^0 \rightarrow \pi^+ \pi^-,$ $K^0 \rightarrow K_L, K^{*-} \rightarrow \pi^0 K^-, D^+ \rightarrow \mu^+ \nu_\mu \bar{K}^0, \bar{D}^0 \rightarrow \rho^- K^{*+}, \bar{K}^0 \rightarrow K_L, \rho^- \rightarrow \pi^0 \pi^-,$ $K^{*+} \rightarrow \pi^0 K^+$ $(e^+e^- \rightarrow \mu^+ \mu^+ \nu_\mu \nu_\mu K_L K_L \pi^+ \pi^- \pi^- \pi^- K^+ K^- \gamma \gamma \gamma \gamma \gamma)$	1	11
12	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \rho^- K^+ J/\psi, \bar{B}^0 \rightarrow D^+ D_s^{*-}, \rho^- \rightarrow \pi^0 \pi^-, J/\psi \rightarrow e^+ e^-,$ $D^+ \rightarrow \pi^0 \pi^+ K_S, D_s^{*-} \rightarrow D_s^- \gamma, K_S \rightarrow \pi^0 \pi^0, D_s^- \rightarrow \tau^- \bar{\nu}_\tau, \tau^- \rightarrow \mu^- \bar{\nu}_\mu \nu_\tau$ $(e^+e^- \rightarrow e^+ e^- \mu^- \bar{\nu}_\mu \nu_\tau \bar{\nu}_\tau \pi^+ \pi^- K^+ \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$	1	12
13	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \pi^+ \pi^- K^0 \bar{D}^0, \bar{B}^0 \rightarrow \pi^0 \pi^+ \rho^- D^+, K^0 \rightarrow K_L, D^0 \rightarrow K_S \eta',$ $\bar{D}^0 \rightarrow \rho^- K^{*+}, \rho^- \rightarrow \pi^0 \pi^-, \rho^- \rightarrow \pi^0 \pi^-, D^+ \rightarrow \mu^+ \nu_\mu \bar{K}^0, K_L \rightarrow \pi^0 \pi^0 \pi^0, K_S \rightarrow \pi^+ \pi^-,$ $\eta' \rightarrow \pi^+ \pi^- \eta, \rho^- \rightarrow \pi^0 \pi^-, K^{*+} \rightarrow \pi^0 K^+, \bar{K}^0 \rightarrow K_L, \eta \rightarrow \pi^0 \pi^+ \pi^-$ $(e^+e^- \rightarrow \mu^+ \nu_\mu K_L \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- \pi^- \pi^- K^+ \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$	1	13
14	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \pi^+ \eta \bar{D}^{*-}, \bar{B}^0 \rightarrow K^0 K^{*-} D^{*+}, \eta \rightarrow \pi^0 \pi^0 \pi^0, \bar{D}^{*-} \rightarrow \pi^0 D^-,$ $K^0 \rightarrow K_S, K^{*-} \rightarrow \pi^0 K^-, D^{*+} \rightarrow \pi^+ D^0, D^- \rightarrow \mu^- \bar{\nu}_\mu K^0, K_S \rightarrow \pi^+ \pi^-, D^0 \rightarrow \pi^0 \rho^0,$ $K^0 \rightarrow K_L, \rho^0 \rightarrow \pi^+ \pi^-$ $(e^+e^- \rightarrow \mu^- \bar{\nu}_\mu K_L \pi^+ \pi^+ \pi^+ \pi^- \pi^- K^- \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$	1	14
15	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \rho^+ D^-, \bar{B}^0 \rightarrow \pi^- K^+ K^- D^{*+}, \rho^+ \rightarrow \pi^0 \pi^+, D^- \rightarrow K_S a_1^-,$ $D^{*+} \rightarrow \pi^+ D^0, K_S \rightarrow \pi^0 \pi^0, a_1^- \rightarrow \pi^0 \rho^-, D^0 \rightarrow \pi^0 \pi^+ K^-, \rho^- \rightarrow \pi^0 \pi^-$ $(e^+e^- \rightarrow \pi^+ \pi^+ \pi^+ \pi^- \pi^- K^+ K^- K^- \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$	1	15
16	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \pi^0 \pi^0 \pi^+ \eta \bar{D}^{*-}, \bar{B}^0 \rightarrow e^- \bar{\nu}_e D^{*+}, \eta \rightarrow \pi^0 \pi^0 \pi^0, \bar{D}^{*-} \rightarrow \pi^0 D^-,$ $D^{*+} \rightarrow \pi^0 D^+, D^- \rightarrow \pi^+ \pi^- \pi^- \pi^- K^+, D^+ \rightarrow \mu^+ \nu_\mu \bar{K}^*, \bar{K}^* \rightarrow \pi^+ K^-$ $(e^+e^- \rightarrow e^- \bar{\nu}_e \mu^+ \nu_\mu \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- K^+ K^- \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$	1	16
17	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow e^+ \nu_e \bar{D}^{*-}, \bar{B}^0 \rightarrow \pi^0 \pi^+ K^{*-} D^0 \bar{D}^{*0}, \bar{D}^{*-} \rightarrow \pi^- \bar{D}^0, K^{*-} \rightarrow \pi^- \bar{K}^0,$ $D^0 \rightarrow K_L \pi^+ \pi^-, \bar{D}^{*0} \rightarrow \pi^0 \bar{D}^0, \bar{D}^0 \rightarrow \mu^- \bar{\nu}_\mu K^+, \bar{K}^0 \rightarrow K_S, \bar{D}^0 \rightarrow \pi^+ \pi^- K_S K_S, K_S \rightarrow \pi^+ \pi^-,$ $K_S \rightarrow \pi^0 \pi^0, K_S \rightarrow \pi^+ \pi^-$ $(e^+e^- \rightarrow e^+ \nu_e \mu^- \bar{\nu}_\mu K_L \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- \pi^- K^+ \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$	1	17
18	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow K^* D^- \bar{D}^{*+}, \bar{B}^0 \rightarrow \pi^0 \eta K^0 K^- D_s^+, K^* \rightarrow \pi^0 K^0, D^- \rightarrow \pi^- \pi^- K^+,$ $D^{*+} \rightarrow \pi^+ D^0, \eta \rightarrow \gamma \gamma, \bar{K}^0 \rightarrow K_L, D_s^+ \rightarrow \mu^+ \nu_\mu \phi, K^0 \rightarrow K_S, D^0 \rightarrow \pi^0 \pi^+ K^{*-},$ $\phi \rightarrow K^+ K^-, K_S \rightarrow \pi^0 \pi^0, K^{*-} \rightarrow \pi^- \bar{K}^0, \bar{K}^0 \rightarrow K_L$ $(e^+e^- \rightarrow \mu^+ \nu_\mu K_L K_L \pi^+ \pi^+ \pi^- \pi^- \pi^- K^+ K^+ K^- K^- \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$	1	18
19	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \bar{D}^{*-} D_s^{*+}, \bar{B}^0 \rightarrow e^- \bar{\nu}_e D^{*+}, \bar{D}^{*-} \rightarrow \pi^- \bar{D}^0, D_s^{*+} \rightarrow D_s^+ \gamma,$ $D^{*+} \rightarrow \pi^+ D^0, \bar{D}^0 \rightarrow \pi^0 \pi^+ \pi^- K_S, D_s^+ \rightarrow \rho^+ \eta, D^0 \rightarrow \pi^+ \eta K^-, K_S \rightarrow \pi^+ \pi^-, \rho^+ \rightarrow \pi^0 \pi^+,$ $\eta \rightarrow \pi^0 \pi^0 \pi^0, \eta \rightarrow \pi^0 \pi^0 \pi^0$ $(e^+e^- \rightarrow e^- \bar{\nu}_e \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- K^- \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$	1	19
20	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \mu^+ \nu_\mu D_2^{*-}, \bar{B}^0 \rightarrow \pi^0 \pi^+ \pi^+ \pi^- \rho^- D^{*0}, D_2^{*-} \rightarrow \pi^- \bar{D}^{*0}, \rho^- \rightarrow \pi^0 \pi^-,$ $\bar{D}^{*0} \rightarrow \pi^0 \bar{D}^0, \bar{D}^{*0} \rightarrow \pi^0 \bar{D}^0, \bar{D}^0 \rightarrow K^+ a_1^-, \bar{D}^0 \rightarrow \pi^0 K_L \pi^+ \pi^-, a_1^- \rightarrow \rho^0 \pi^-, \rho^0 \rightarrow \pi^+ \pi^-$ $(e^+e^- \rightarrow \mu^+ \nu_\mu K_L \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- \pi^- K^+ \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$	1	20

index	event tree (event initial-final states)	nEvts	nCmltEvts
71	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow \pi^- K^+ D^0 \bar{D}^0, \bar{B}^0 \rightarrow K^{*-} D^+, D^0 \rightarrow \rho^+ K^{*-}, \bar{D}^0 \rightarrow \rho^0 \rho^0,$ $K^{*-} \rightarrow \pi^- \bar{K}^0, D^+ \rightarrow e^+ \nu_e \bar{K}^*, \rho^+ \rightarrow \pi^0 \pi^+, K^{*-} \rightarrow \pi^- \bar{K}^0, \rho^0 \rightarrow \pi^+ \pi^-, \rho^0 \rightarrow \pi^+ \pi^-,$ $\bar{K}^0 \rightarrow K_L, \bar{K}^* \rightarrow \pi^+ K^-, \bar{K}^0 \rightarrow K_L$ $(e^+e^- \rightarrow e^+ \nu_e K_L K_L \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- K^+ K^- \gamma \gamma)$	1	71
72	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow \pi^0 \pi^0 \pi^+ \rho^+ \rho^- D^-, \bar{B}^0 \rightarrow e^- \bar{\nu}_e D^+, \rho^+ \rightarrow \pi^0 \pi^+, \rho^- \rightarrow \pi^0 \pi^-,$ $D^- \rightarrow e^- \bar{\nu}_e \pi^- K^+, D^+ \rightarrow \pi^0 \pi^+ \pi^+ K^-$ $(e^+e^- \rightarrow e^- e^- \bar{\nu}_e \bar{\nu}_e \pi^+ \pi^+ \pi^+ \pi^- \pi^- K^+ K^- \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$	1	72
73	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow K^* n \bar{\Sigma}_c^{*0}, \bar{B}^0 \rightarrow \pi^- D^+, K^* \rightarrow \pi^- K^+, \bar{\Sigma}_c^{*0} \rightarrow \pi^+ \bar{\Lambda}_c^-,$ $D^+ \rightarrow \pi^0 \pi^+ \bar{K}^*, \bar{\Lambda}_c^- \rightarrow \pi^0 \pi^- K^+ \bar{p}, \bar{K}^* \rightarrow \pi^+ K^-$ $(e^+e^- \rightarrow \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- K^+ K^+ K^- n \bar{p} \gamma \gamma \gamma)$	1	73
74	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow e^+ \nu_e \bar{D}^{*-}, \bar{B}^0 \rightarrow \pi^- \pi^- D^{*+} \bar{n} \Delta^+, D^{*-} \rightarrow \pi^- \bar{D}^0, D^{*+} \rightarrow \pi^+ D^0,$ $\Delta^+ \rightarrow \pi^0 p, \bar{D}^0 \rightarrow e^- \bar{\nu}_e \pi^+ K^0, D^0 \rightarrow K^- a_1^+, K^0 \rightarrow K_L, a_1^+ \rightarrow \pi^+ f_0(600)$ $(e^+e^- \rightarrow e^+ e^- \nu_e \bar{\nu}_e K_L \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- K^- \bar{n} p f_0(600) \gamma \gamma)$	1	74
75	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow K^{*+} \bar{D}^{*-} \bar{D}^0, \bar{B}^0 \rightarrow D^{*+} D_{s0}^{*-}, K^{*+} \rightarrow \pi^+ K^0, \bar{D}^{*-} \rightarrow \pi^- \bar{D}^0,$ $D^0 \rightarrow \pi^0 \pi^+ K^-, D^{*+} \rightarrow \pi^0 D^+, D_{s0}^{*-} \rightarrow \pi^0 D_s^-, K^0 \rightarrow K_L, \bar{D}^0 \rightarrow \rho^- K^{*+}, D^+ \rightarrow \mu^+ \nu_\mu \pi^+ K^-,$ $D_s^- \rightarrow K^* K^-, \rho^- \rightarrow \pi^0 \pi^-, K^{*+} \rightarrow \pi^0 K^+, K^* \rightarrow \pi^0 K^0, K^0 \rightarrow K_L$ $(e^+e^- \rightarrow \mu^+ \nu_\mu K_L K_L \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- K^+ K^- K^- K^- \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$	1	75
76	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow \mu^+ \nu_\mu \bar{D}^{*-}, \bar{B}^0 \rightarrow \pi^0 \pi^+ \pi^- \rho^+ \bar{D}^{*-} D^{*0}, \bar{D}^{*-} \rightarrow \pi^0 D^-, \rho^+ \rightarrow \pi^0 \pi^+,$ $\bar{D}^{*-} \rightarrow \pi^0 D^-, D^{*0} \rightarrow \pi^0 D^0, D^- \rightarrow K_L \pi^- K^+ K^-, D^- \rightarrow \pi^0 \pi^- \pi^- K^+, D^0 \rightarrow \pi^0 \pi^+ K^-$ $(e^+e^- \rightarrow \mu^+ \nu_\mu K_L \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- K^+ K^+ K^- K^- \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$	1	76
77	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow \pi^0 \rho^+ \omega D^-, \bar{B}^0 \rightarrow K^- D^{*+} D^{*0}, \rho^+ \rightarrow \pi^0 \pi^+, \omega \rightarrow \pi^+ \pi^-,$ $\omega \rightarrow \pi^0 \pi^+ \pi^-, D^- \rightarrow \pi^0 K_L \pi^-, D^{*+} \rightarrow \pi^0 D^+, \bar{D}^{*0} \rightarrow \pi^0 \bar{D}^0, D^+ \rightarrow \pi^+ \bar{K}_1^{*0}, \bar{D}^0 \rightarrow \rho^- K^{*+},$ $\bar{K}_1^{*0} \rightarrow \pi^+ K^{*-}, \rho^- \rightarrow \pi^0 \pi^-, K^{*+} \rightarrow \pi^+ K^0, K^{*-} \rightarrow \pi^- \bar{K}^0, K^0 \rightarrow K_L, \bar{K}^0 \rightarrow K_S,$ $K_S \rightarrow \pi^0 \pi^0$ $(e^+e^- \rightarrow K_L K_L \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- K^- \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$	1	77
78	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow e^- \bar{\nu}_e D^{*+}, \bar{B}^0 \rightarrow \pi^0 \pi^+ \pi^- \rho^- \omega K^0 D^{*+}, D^{*+} \rightarrow \pi^+ D^0, \rho^- \rightarrow \pi^0 \pi^-,$ $\omega \rightarrow \pi^0 \pi^+ \pi^-, \bar{K}^0 \rightarrow K_S, D^{*+} \rightarrow \pi^+ D^0, D^0 \rightarrow \pi^0 \eta K_S, D^0 \rightarrow \mu^+ \nu_\mu K^{*-}, \eta \rightarrow \gamma \gamma,$ $K_S \rightarrow \pi^+ \pi^-, K^{*-} \rightarrow \pi^- \bar{K}^0, \bar{K}^0 \rightarrow K_S, K_S \rightarrow \pi^+ \pi^-$ $(e^+e^- \rightarrow e^- \bar{\nu}_e \mu^+ \nu_\mu \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- K_S \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$	1	78
79	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow e^+ \nu_e \eta D^-, \bar{B}^0 \rightarrow \rho^0 \pi^- D^{*+}, \eta \rightarrow \pi^0 \pi^+ \pi^-, D^- \rightarrow e^- \bar{\nu}_e K_1^0,$ $\rho^0 \rightarrow \pi^+ \pi^-, D^{*+} \rightarrow \pi^+ D^0, K_1^0 \rightarrow \pi^0 \pi^- K^+, D^0 \rightarrow e^+ \nu_e K^-$ $(e^+e^- \rightarrow e^+ e^+ e^- \nu_e \bar{\nu}_e \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- K^+ K^- \gamma \gamma \gamma \gamma)$	1	79
80	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow \rho^0 \pi^+ \pi^- \rho^+ \eta \bar{D}^{*-}, \bar{B}^0 \rightarrow \mu^- \bar{\nu}_\mu D^{*+}, \rho^0 \rightarrow \pi^+ \pi^-, \rho^+ \rightarrow \pi^0 \pi^+,$ $\eta \rightarrow \pi^0 \pi^+ \pi^-, \eta \rightarrow \pi^0 \pi^+ \pi^-, \bar{D}^{*-} \rightarrow \pi^- \bar{D}^0, D^{*+} \rightarrow \pi^0 D^+, \bar{D}^0 \rightarrow \pi^- K^+, D^+ \rightarrow e^+ \nu_e \bar{K}^*,$ $\bar{K}^* \rightarrow \pi^+ K^-$ $(e^+e^- \rightarrow e^+ \nu_e \mu^- \bar{\nu}_\mu \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- K^+ K^- \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$	1	80

index	event tree (event initial-final states)	nEvts	nCmltEvts
91	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \pi^0 \pi^+ \pi^- \rho^+ D^-, \bar{B}^0 \rightarrow \mu^- \bar{\nu}_\mu D^{*+}, \rho^+ \rightarrow \pi^0 \pi^+, D^- \rightarrow \mu^- \bar{\nu}_\mu \pi^- K^+,$ $D^{*+} \rightarrow \pi^0 D^+, D^+ \rightarrow \pi^+ \pi^+ K^-$ $(e^+e^- \rightarrow \mu^- \mu^- \bar{\nu}_\mu \bar{\nu}_\mu \pi^+ \pi^+ \pi^+ \pi^- \pi^- K^+ K^- \gamma \gamma \gamma \gamma \gamma)$	1	91
92	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \pi^- K^{*+} J/\psi, \bar{B}^0 \rightarrow \pi^0 \pi^+ K^- \eta_c(2S), K^{*+} \rightarrow \pi^0 K^+, J/\psi \rightarrow e^+e^-,$ $\pi^0 \rightarrow e^+e^-, \eta_c(2S) \rightarrow \eta \Sigma^+ \bar{\Sigma}^-, \eta \rightarrow \pi^0 \pi^0 \pi^0, \Sigma^+ \rightarrow \pi^+ n, \bar{\Sigma}^- \rightarrow \pi^0 \bar{p}$ $(e^+e^- \rightarrow e^+e^+e^-e^- \pi^+ \pi^+ \pi^- K^+ K^- n \bar{p} \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$	1	92
93	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow K^0 \psi', \bar{B}^0 \rightarrow \pi^- \rho^+ \rho^- D^+, K^0 \rightarrow K_S, \psi' \rightarrow \pi^0 \pi^0 J/\psi,$ $\rho^+ \rightarrow \pi^0 \pi^+, \rho^- \rightarrow \pi^0 \pi^-, D^+ \rightarrow \bar{K}^* a_1^+, K_S \rightarrow \pi^+ \pi^-, J/\psi \rightarrow \mu^+ \mu^-, \bar{K}^* \rightarrow \pi^+ K^-,$ $a_1^+ \rightarrow \pi^+ f_0(600)$ $(e^+e^- \rightarrow \mu^+ \mu^- \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- K^- f_0(600) \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$	1	93
94	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \rho^0 \rho^+ \bar{D}^{*-}, \bar{B}^0 \rightarrow \pi^- K^0 D^+, \rho^0 \rightarrow \pi^+ \pi^-, \rho^+ \rightarrow \pi^0 \pi^+,$ $\bar{D}^{*-} \rightarrow \pi^- \bar{D}^0, K^0 \rightarrow K_L, D^+ \rightarrow K_L a_1^+, \bar{D}^0 \rightarrow \pi^- K^+, a_1^+ \rightarrow \pi^+ f_0(600)$ $(e^+e^- \rightarrow K_L K_L \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- K^+ f_0(600) \gamma \gamma)$	1	94
95	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \rho^+ \omega D^-, \bar{B}^0 \rightarrow \pi^0 \omega K^0 K^- D^+, \rho^+ \rightarrow \pi^0 \pi^+, \omega \rightarrow \pi^0 \pi^+ \pi^-,$ $D^- \rightarrow \pi^- \pi^- K^+, \pi^0 \rightarrow e^+e^-, \omega \rightarrow \pi^0 \pi^+ \pi^-, K^0 \rightarrow K_S, D^+ \rightarrow \mu^+ \nu_\mu \bar{K}^*, K_S \rightarrow \pi^+ \pi^-,$ $\bar{K}^* \rightarrow \pi^+ K^-$ $(e^+e^- \rightarrow e^+e^- \mu^+ \nu_\mu \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- K^+ K^- K^- \gamma \gamma \gamma \gamma \gamma)$	1	95
96	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow e^+ \nu_e \bar{D}^{*-}, \bar{B}^0 \rightarrow e^- \bar{\nu}_e D^{*+}, \bar{D}^{*-} \rightarrow \pi^- \bar{D}^0, D^{*+} \rightarrow \pi^+ D^0,$ $\bar{D}^0 \rightarrow K^+ a_1^-, D^0 \rightarrow \pi^0 \pi^+ K^-, a_1^- \rightarrow \pi^- f_0(600)$ $(e^+e^- \rightarrow e^+e^- \nu_e \bar{\nu}_e \pi^+ \pi^+ \pi^- \pi^- K^+ K^- f_0(600) \gamma \gamma)$	1	96
97	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow K^{*+} \bar{D}^{*-}, \bar{B}^0 \rightarrow \pi^0 \pi^- D^{*+} \Delta^+ \Delta^+, K^{*+} \rightarrow \pi^+ K^0, \bar{D}^{*-} \rightarrow \pi^- \bar{D}^0,$ $D^{*+} \rightarrow \pi^+ D^0, \Delta^+ \rightarrow \pi^+ n, \bar{\Delta}^+ \rightarrow \pi^0 \bar{p}, K^0 \rightarrow K_L, \bar{D}^0 \rightarrow \pi^0 \pi^- K^+, D^0 \rightarrow \pi^+ \pi^- K_S,$ $K_S \rightarrow \pi^+ \pi^-$ $(e^+e^- \rightarrow K_L \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- K^+ n \bar{p} \gamma \gamma \gamma \gamma \gamma)$	1	97
98	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow D_2^{*-} D^{*+}, \bar{B}^0 \rightarrow \pi^+ \pi^- D^+ D_s^-, D_2^{*-} \rightarrow \pi^0 \bar{D}^{*-}, D_s^{*+} \rightarrow D_s^+ \gamma,$ $D^+ \rightarrow \pi^+ \bar{K}_1^0, D_s^- \rightarrow e^- \bar{\nu}_e \eta', \bar{D}^{*-} \rightarrow \pi^- \bar{D}^0, D_s^+ \rightarrow \pi^+ \phi, \bar{K}_1^0 \rightarrow \pi^+ K^{*-}, \eta' \rightarrow \pi^0 \pi^0 \eta,$ $\bar{D}^0 \rightarrow \pi^- \omega K^+, \phi \rightarrow \pi^- \rho^+, K^{*-} \rightarrow \pi^- \bar{K}^0, \eta \rightarrow \pi^0 \pi^+ \pi^-, \omega \rightarrow \pi^0 \pi^+ \pi^-, \rho^+ \rightarrow \pi^0 \pi^+,$ $\bar{K}^0 \rightarrow K_S, K_S \rightarrow \pi^0 \pi^0$ $(e^+e^- \rightarrow e^- \bar{\nu}_e \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- \pi^- K^+ \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$	1	98
99	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow K_L \eta_c, \bar{B}^0 \rightarrow \pi^- \pi^- \rho^+ D^{*+}, \eta_c \rightarrow \pi^0 K^0 \bar{K}^0 K^*, \rho^+ \rightarrow \pi^0 \pi^+,$ $D^{*+} \rightarrow \pi^0 D^+, K^0 \rightarrow K_S, \bar{K}^0 \rightarrow K_L, \bar{K}^0 \rightarrow K_S, K^* \rightarrow \pi^- K^+, D^+ \rightarrow \pi^0 \pi^+ K_S,$ $K_S \rightarrow \pi^0 \pi^0, K_S \rightarrow \pi^+ \pi^-, K_S \rightarrow \pi^+ \pi^-$ $(e^+e^- \rightarrow K_L K_L \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- K^+ \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$	1	99
100	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \pi^0 \pi^0 \rho^+ \pi^+ \bar{D}^{*-}, \bar{B}^0 \rightarrow K^* K^- D^+, \rho^0 \rightarrow \pi^+ \pi^-, \bar{D}^{*-} \rightarrow \pi^- \bar{D}^0,$ $K^* \rightarrow \pi^0 K^0, D^+ \rightarrow \pi^+ \pi^+ K^-, \bar{D}^0 \rightarrow \pi^- \rho^+, K^0 \rightarrow K_S, \rho^+ \rightarrow \pi^0 \pi^+, K_S \rightarrow \pi^0 \pi^0$ $(e^+e^- \rightarrow \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- K^- K^- \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$	1	100

index	event tree (event initial-final states)	nEvts	nCmltEvts
142	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow D^- D_s^{*+} \gamma, \bar{B}^0 \rightarrow \pi^+ \pi^- \rho^- D^+, D^- \rightarrow \pi^0 \pi^- K^+ K^-, D_s^{*+} \rightarrow D_s^+ \gamma,$ $\rho^- \rightarrow \pi^0 \pi^-, D^+ \rightarrow \mu^+ \nu_\mu \bar{K}^*, D_s^+ \rightarrow \bar{K}^* K^{*+}, \bar{K}^* \rightarrow \pi^+ K^-, \bar{K}^* \rightarrow \pi^+ K^-, K^{*+} \rightarrow \pi^0 K^+$ $(e^+e^- \rightarrow \mu^+ \nu_\mu \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- K^+ K^+ K^- K^- \gamma \gamma \gamma \gamma \gamma \gamma)$	1	142
143	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \rho^+ n \bar{\Sigma}_c^-, \bar{B}^0 \rightarrow D^{*+} D_{s1}^{\prime-}, \rho^+ \rightarrow \pi^0 \pi^+, \bar{\Sigma}_c^- \rightarrow \pi^0 \bar{\Lambda}_c^-,$ $D^{*+} \rightarrow \pi^+ D^0, D_{s1}^{\prime-} \rightarrow \pi^0 D_s^{*-}, \bar{\Lambda}_c^- \rightarrow \bar{K}^* \bar{\Sigma}^-, D^0 \rightarrow \pi^0 \pi^+ K^-, D_s^{*-} \rightarrow D_s^- \gamma, \bar{K}^* \rightarrow \pi^+ K^-,$ $\bar{\Sigma}^- \rightarrow \pi^- \bar{n}, D_s^- \rightarrow K^* K^-, K^* \rightarrow \pi^- K^+$ $(e^+e^- \rightarrow \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- K^+ K^- K^- K^- n \bar{n} \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$	1	143
144	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, \bar{B}^0 \rightarrow \mu^- \bar{\nu}_\mu D^+, \bar{B}^0 \rightarrow \bar{K}^* K^- D^{*+}, D^+ \rightarrow K_S K^{*+}, \bar{K}^* \rightarrow \pi^+ K^-,$ $D^{*+} \rightarrow \pi^0 D^0, K_S \rightarrow \pi^+ \pi^-, K^{*+} \rightarrow \pi^0 K^+, D^+ \rightarrow \pi^0 \pi^0 \pi^+$ $(e^+e^- \rightarrow \mu^- \bar{\nu}_\mu \pi^+ \pi^+ \pi^+ \pi^- K^+ K^- K^- \gamma \gamma \gamma \gamma \gamma \gamma)$	1	144
145	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \pi^+ \pi^+ \pi^- \omega \bar{D}^{*-}, \bar{B}^0 \rightarrow \pi^0 \pi^+ \pi^- \pi^- D^{*+}, \omega \rightarrow \pi^0 \pi^+ \pi^-, \bar{D}^{*-} \rightarrow \pi^- \bar{D}^0,$ $D^{*+} \rightarrow \pi^+ D^0, \bar{D}^0 \rightarrow e^- \bar{\nu}_e \pi^+ K^0, D^0 \rightarrow \rho^+ K^{*-}, K^0 \rightarrow K_S, \rho^+ \rightarrow \pi^0 \pi^+, K^{*-} \rightarrow \pi^- \bar{K}^0,$ $K_S \rightarrow \pi^+ \pi^-, \bar{K}^0 \rightarrow K_L$ $(e^+e^- \rightarrow e^- \bar{\nu}_e K_L \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- \pi^- \gamma \gamma \gamma \gamma \gamma \gamma)$	1	145
146	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \pi^+ K^0 \bar{K}^* D^{*-}, \bar{B}^0 \rightarrow \pi^+ K^- D^- D^{*+}, K^0 \rightarrow K_L, \bar{K}^* \rightarrow \pi^+ K^-,$ $\bar{D}^{*-} \rightarrow \pi^- \bar{D}^0, D^- \rightarrow K_S a_1^-, D^{*+} \rightarrow \pi^+ D^0, \bar{D}^0 \rightarrow K_S \eta', K_S \rightarrow \pi^+ \pi^-, a_1^- \rightarrow \rho^0 \pi^-,$ $D^0 \rightarrow \pi^0 \pi^0 \pi^+ \pi^-, K_S \rightarrow \pi^+ \pi^-, \eta' \rightarrow \rho^0 \gamma, \rho^0 \rightarrow \pi^+ \pi^-, \rho^0 \rightarrow \pi^+ \pi^-$ $(e^+e^- \rightarrow K_L \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- \pi^- K^- K^- \gamma \gamma \gamma \gamma \gamma)$	1	146
147	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow \bar{B}^0 \bar{B}^0, \bar{B}^0 \rightarrow \rho^- D_2^{*+}, \bar{B}^0 \rightarrow \rho^0 \pi^+ K^{*-} \eta_c, \rho^- \rightarrow \pi^0 \pi^-, D_2^{*+} \rightarrow \pi^+ D^0,$ $\rho^0 \rightarrow \pi^+ \pi^-, K^{*-} \rightarrow \pi^- \bar{K}^0, \eta_c \rightarrow \pi^0 \pi^+ \pi^- \omega, D^0 \rightarrow \pi^+ \omega K^-, \bar{K}^0 \rightarrow K_L, \omega \rightarrow \pi^0 \pi^+ \pi^-,$ $\omega \rightarrow \pi^0 \pi^+ \pi^-$ $(e^+e^- \rightarrow K_L \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- \pi^- K^- \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$	1	147
148	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \rho^0 \pi^+ \pi^+ \rho^- D^-, \bar{B}^0 \rightarrow D_s^{*-} D_1^+, \rho^0 \rightarrow \pi^+ \pi^-, \rho^- \rightarrow \pi^0 \pi^-,$ $D^- \rightarrow \mu^- \bar{\nu}_\mu K^0, D_s^{*-} \rightarrow D_s^- \gamma, D_1^+ \rightarrow \pi^+ D^{*0}, K^0 \rightarrow K_S, D_s^- \rightarrow \pi^+ \pi^- K_S K^-, D^{*0} \rightarrow D^0 \gamma,$ $K_S \rightarrow \pi^+ \pi^-, K_S \rightarrow \pi^+ \pi^-, D^0 \rightarrow \pi^+ \omega K^-, \omega \rightarrow \pi^0 \pi^+ \pi^-$ $(e^+e^- \rightarrow \mu^- \bar{\nu}_\mu \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- \pi^- K^- K^- \gamma \gamma \gamma \gamma \gamma \gamma)$	1	148
149	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \pi^0 \rho^0 \pi^+ D^-, \bar{B}^0 \rightarrow \pi^+ \pi^- \pi^- D^+, \rho^0 \rightarrow \pi^+ \pi^-, D^- \rightarrow \pi^- K_1^{\prime 0},$ $D^+ \rightarrow K_S a_1^+, K_1^{\prime 0} \rightarrow \pi^- K^{*+}, K_S \rightarrow \pi^+ \pi^-, a_1^+ \rightarrow \pi^0 \rho^+, K^{*+} \rightarrow \pi^0 K^+, \rho^+ \rightarrow \pi^0 \pi^+$ $(e^+e^- \rightarrow \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- \pi^- K^+ \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$	1	149
150	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, \bar{B}^0 \rightarrow \tau^+ \nu_\tau D_0^{*-}, \bar{B}^0 \rightarrow \pi^0 \omega K^* K^- D^+, \tau^+ \rightarrow \mu^+ \nu_\mu \bar{\nu}_\tau, D_0^{*-} \rightarrow \pi^- \bar{D}^0,$ $\omega \rightarrow \pi^0 \pi^+ \pi^-, K^* \rightarrow \pi^0 K^0, D^+ \rightarrow \pi^+ \pi^+ K^-, \bar{D}^0 \rightarrow \pi^0 \pi^- K^+, K^0 \rightarrow K_L$ $(e^+e^- \rightarrow \mu^+ \nu_\mu \nu_\tau \bar{\nu}_\tau K_L \pi^+ \pi^+ \pi^- \pi^- \pi^- K^+ K^- K^- \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$	1	150
151	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow e^+ \nu_e \pi^+ \pi^- D^{*-}, \bar{B}^0 \rightarrow e^- \bar{\nu}_e D^{*+}, D^{*-} \rightarrow \pi^- \bar{D}^0, D^{*+} \rightarrow \pi^0 D^+,$ $\bar{D}^0 \rightarrow \pi^- K^+, D^+ \rightarrow \mu^+ \nu_\mu \pi^+ K^-$ $(e^+e^- \rightarrow e^+ e^- \nu_e \bar{\nu}_e \mu^+ \nu_\mu \pi^+ \pi^+ \pi^- \pi^- \pi^- K^+ K^- \gamma \gamma)$	1	151

index	event tree (event initial-final states)	nEvts	nCmltEvts
152	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \rho^0 \bar{D}^{*-} \Sigma^0 \Sigma^+, \bar{B}^0 \rightarrow \eta \bar{K}^0 J/\psi, \rho^0 \rightarrow \pi^+ \pi^-, \bar{D}^{*-} \rightarrow \pi^0 D^-,$ $\Sigma^0 \rightarrow \bar{\Lambda} \gamma, \Sigma^+ \rightarrow \pi^+ n, \eta \rightarrow \pi^0 \pi^0 \pi^0, \bar{K}^0 \rightarrow K_L, J/\psi \rightarrow \pi^- \eta K_S K^+, D^- \rightarrow \mu^- \bar{\nu}_\mu K^0,$ $\bar{\Lambda} \rightarrow \pi^+ \bar{p}, K_L \rightarrow e^- \nu_e \pi^+, \eta \rightarrow \pi^0 \pi^+ \pi^-, K_S \rightarrow \pi^+ \pi^-, K^0 \rightarrow K_S, K_S \rightarrow \pi^0 \pi^0$ $(e^+e^- \rightarrow e^- \nu_e \mu^- \bar{\nu}_\mu \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- K^+ n \bar{p} \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$	1	152
153	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \rho^0 \rho^0 \rho^0 \rho^+ \bar{D}^{*-}, \bar{B}^0 \rightarrow e^- \bar{\nu}_e D^{*+}, \rho^0 \rightarrow \pi^+ \pi^-, \rho^0 \rightarrow \pi^+ \pi^-,$ $\rho^0 \rightarrow \pi^+ \pi^-, \rho^+ \rightarrow \pi^0 \pi^+, \bar{D}^{*-} \rightarrow \pi^- \bar{D}^0, D^{*+} \rightarrow D^+ \gamma, \bar{D}^0 \rightarrow \rho^- K^{*+}, D^+ \rightarrow K_S K^{*+},$ $\rho^- \rightarrow \pi^0 \pi^-, K^{*+} \rightarrow \pi^0 K^+, K_S \rightarrow \pi^+ \pi^-, K^{*+} \rightarrow \pi^+ K^0, K^0 \rightarrow K_L, K_L \rightarrow \mu^- \nu_\mu \pi^+$ $(e^+e^- \rightarrow e^- \bar{\nu}_e \mu^- \nu_\mu \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- K^+ \gamma \gamma \gamma \gamma \gamma \gamma)$	1	153
154	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow K^{*+} D^-, \bar{B}^0 \rightarrow \pi^+ K^- \chi_{c1}, K^{*+} \rightarrow \pi^0 K^+, D^- \rightarrow \pi^- K_1'^0,$ $\chi_{c1} \rightarrow \pi^- \eta \eta \bar{K}^0 K^+, K_1'^0 \rightarrow \pi^- K^{*+}, \eta \rightarrow \gamma \gamma, \eta \rightarrow \pi^0 \pi^0 \pi^0, \bar{K}^0 \rightarrow K_S, K^{*+} \rightarrow \pi^0 K^+,$ $K_S \rightarrow \pi^+ \pi^-$ $(e^+e^- \rightarrow \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- K^+ K^+ K^+ K^- \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$	1	154
155	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow K^{*+} D^- \bar{D}^0, \bar{B}^0 \rightarrow e^- \bar{\nu}_e D_2^{*+}, K^{*+} \rightarrow \pi^0 K^+, D^- \rightarrow \pi^0 \pi^- K_S,$ $D^0 \rightarrow \pi^0 \pi^0 \pi^+ \pi^-, D_2^{*+} \rightarrow \pi^+ D^0, K_S \rightarrow \pi^+ \pi^-, D^0 \rightarrow \pi^0 \pi^+ K^{*-}, K^{*-} \rightarrow \pi^0 K^-$ $(e^+e^- \rightarrow e^- \bar{\nu}_e \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- K^+ K^- \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$	1	155
156	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \rho^+ D^-, \bar{B}^0 \rightarrow \pi^- \pi^- \rho^+ D^{*+}, \rho^+ \rightarrow \pi^0 \pi^+, D^- \rightarrow \rho^- K^*,$ $\rho^+ \rightarrow \pi^0 \pi^+, D^{*+} \rightarrow \pi^+ D^0, \rho^- \rightarrow \pi^0 \pi^-, K^* \rightarrow \pi^- K^+, D^0 \rightarrow \pi^0 \pi^0 \bar{K}^*, \bar{K}^* \rightarrow \pi^+ K^-$ $(e^+e^- \rightarrow \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- K^+ K^- \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$	1	156
157	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow e^+ \nu_e \bar{D}^{*-}, \bar{B}^0 \rightarrow \pi^0 \rho^0 \rho^- D^{*+} \gamma, \bar{D}^{*-} \rightarrow \pi^- \bar{D}^0, \rho^0 \rightarrow \pi^+ \pi^-,$ $\rho^- \rightarrow \pi^0 \pi^-, D^{*+} \rightarrow \pi^+ D^0, \bar{D}^0 \rightarrow \pi^0 \pi^- K^+, D^0 \rightarrow e^+ \nu_e \rho^-, \rho^- \rightarrow \pi^0 \pi^-$ $(e^+e^- \rightarrow e^+ e^+ \nu_e \nu_e \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- K^+ \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$	1	157
158	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \pi^+ \bar{D}^{*-}, \bar{B}^0 \rightarrow \pi^0 \rho^0 \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \eta \omega D^-, \bar{D}^{*-} \rightarrow \pi^- \bar{D}^0, \rho^0 \rightarrow \pi^+ \pi^-,$ $\eta \rightarrow \pi^0 \pi^+ \pi^-, \omega \rightarrow \pi^0 \pi^+ \pi^-, D^- \rightarrow \mu^- \bar{\nu}_\mu \pi^- K^+, \bar{D}^0 \rightarrow \pi^0 \pi^- K^+$ $(e^+e^- \rightarrow \mu^- \bar{\nu}_\mu \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- \pi^- K^+ K^+ \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$	1	158
159	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \pi^- K^0 D^+ \bar{D}^{*0}, \bar{B}^0 \rightarrow e^- \bar{\nu}_e D^+, K^0 \rightarrow K_S, D^+ \rightarrow K_S a_1^+,$ $\bar{D}^{*0} \rightarrow \bar{D}^0 \gamma, D^+ \rightarrow \mu^+ \nu_\mu \bar{K}^*, K_S \rightarrow \pi^+ \pi^-, K_S \rightarrow \pi^+ \pi^-, a_1^+ \rightarrow \pi^+ f_0(600), \bar{D}^0 \rightarrow \pi^0 \pi^- K^+,$ $\bar{K}^* \rightarrow \pi^0 \bar{K}^0, \bar{K}^0 \rightarrow K_S, K_S \rightarrow \pi^+ \pi^-$ $(e^+e^- \rightarrow e^- \bar{\nu}_e \mu^+ \nu_\mu \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- K^+ f_0(600) \gamma \gamma \gamma \gamma \gamma \gamma)$	1	159
160	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \mu^+ \nu_\mu D_1^-, \bar{B}^0 \rightarrow e^- \bar{\nu}_e D^{*+}, D_1^- \rightarrow \pi^- \bar{D}^{*0}, D^{*+} \rightarrow \pi^0 D^+,$ $\bar{D}^{*0} \rightarrow \pi^0 \bar{D}^0, D^+ \rightarrow e^+ \nu_e \pi^0, \bar{D}^0 \rightarrow \pi^0 K_S, K_S \rightarrow \pi^+ \pi^-$ $(e^+e^- \rightarrow e^+ e^- \nu_e \bar{\nu}_e \mu^+ \nu_\mu \pi^+ \pi^- \pi^- \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$	1	160
161	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow K^0 K^+ D^-, \bar{B}^0 \rightarrow \rho^0 \pi^- D^{*+}, K^0 \rightarrow K_L, D^- \rightarrow K^* a_1^-,$ $\rho^0 \rightarrow \pi^+ \pi^-, D^{*+} \rightarrow \pi^+ D^0, K^* \rightarrow \pi^- K^+, a_1^- \rightarrow \pi^- f_0(600), D^0 \rightarrow \pi^+ \omega K^-, \omega \rightarrow \pi^0 \pi^+ \pi^-$ $(e^+e^- \rightarrow K_L \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- K^+ K^+ K^- f_0(600) \gamma \gamma \gamma \gamma \gamma \gamma)$	1	161
162	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow \bar{B}^0 \bar{B}^0, \bar{B}^0 \rightarrow D^{*+} D_s^-, \bar{B}^0 \rightarrow \pi^0 \pi^0 \pi^- \omega D^+, D^{*+} \rightarrow \pi^+ D^0, D_s^- \rightarrow \mu^- \bar{\nu}_\mu \eta,$ $\omega \rightarrow \pi^+ \pi^-, D^+ \rightarrow \mu^+ \nu_\mu \bar{K}^*, D^0 \rightarrow \pi^0 \pi^+ K^-, \eta \rightarrow \pi^0 \pi^0 \pi^0, \bar{K}^* \rightarrow \pi^+ K^-$ $(e^+e^- \rightarrow \mu^+ \mu^- \nu_\mu \bar{\nu}_\mu \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- K^- K^- \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$	1	162

index	event tree (event initial-final states)	nEvts	nCmltEvts
163	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \pi^+ \omega \bar{D}^{*-}, \bar{B}^0 \rightarrow D^{*+} D_s^-, \omega \rightarrow \pi^0 \pi^+ \pi^-, \bar{D}^{*-} \rightarrow \pi^- \bar{D}^0,$ $D^{*+} \rightarrow \pi^0 D^+, D_s^- \rightarrow \mu^- \bar{\nu}_\mu \eta', \bar{D}^0 \rightarrow \pi^0 \pi^+ \pi^- K_S, D^+ \rightarrow \pi^+ \pi^+ K^-, \eta' \rightarrow \rho^0 \gamma, K_S \rightarrow \pi^+ \pi^-,$ $\rho^0 \rightarrow \pi^+ \pi^-$ $(e^+e^- \rightarrow \mu^- \bar{\nu}_\mu \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- K^- \gamma \gamma \gamma \gamma \gamma \gamma)$	1	163
164	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \pi^0 \Sigma^0 \Xi_c^0, \bar{B}^0 \rightarrow D^+ D_{s1}^-, \Sigma^0 \rightarrow \Lambda \gamma, \Xi_c^0 \rightarrow \pi^- K^+ \Sigma^0,$ $D^+ \rightarrow \mu^+ \nu_\mu \bar{K}^*, D_{s1}^- \rightarrow \pi^0 D_s^{*-}, \Lambda \rightarrow \pi^- p, \Sigma^0 \rightarrow \bar{\Lambda} \gamma, \bar{K}^* \rightarrow \pi^+ K^-, D_s^{*-} \rightarrow D_s^- \gamma,$ $\bar{\Lambda} \rightarrow \pi^+ \bar{p}, D_s^- \rightarrow \rho^- \eta', \rho^- \rightarrow \pi^0 \pi^-, \eta' \rightarrow \pi^+ \pi^- \eta, \eta \rightarrow \gamma \gamma$ $(e^+e^- \rightarrow \mu^+ \nu_\mu \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- K^+ K^- p \bar{p} \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$	1	164
165	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \rho^0 \eta \omega \bar{D}^{*0}, \bar{B}^0 \rightarrow \pi^0 \rho^- \omega D^{*+}, \rho^0 \rightarrow \pi^+ \pi^-, \eta \rightarrow \pi^0 \pi^+ \pi^-,$ $\omega \rightarrow \pi^0 \pi^+ \pi^-, \bar{D}^{*0} \rightarrow \pi^0 \bar{D}^0, \rho^- \rightarrow \pi^0 \pi^-, \omega \rightarrow \pi^0 \pi^+ \pi^-, D^{*+} \rightarrow \pi^+ D^0, \bar{D}^0 \rightarrow \pi^0 \pi^- K^+,$ $D^0 \rightarrow e^+ \nu_e K^{*-}, K^{*-} \rightarrow \pi^- \bar{K}^0, \bar{K}^0 \rightarrow K_S, K_S \rightarrow \pi^+ \pi^-$ $(e^+e^- \rightarrow e^+ \nu_e \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- \pi^- \pi^- K^+ \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$	1	165
166	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \bar{D}^{*-} \Delta^- \Delta^0, \bar{B}^0 \rightarrow \rho^- D^+, \bar{D}^{*-} \rightarrow \pi^0 D^-, \Delta^- \rightarrow \pi^+ \bar{n},$ $\Delta^0 \rightarrow \pi^0 n, \rho^- \rightarrow \pi^0 \pi^-, D^+ \rightarrow \mu^+ \nu_\mu \pi^+ K^-, D^- \rightarrow \mu^- \bar{\nu}_\mu K^0, K^0 \rightarrow K_L$ $(e^+e^- \rightarrow \mu^+ \mu^- \nu_\mu \bar{\nu}_\mu K_L \pi^+ \pi^+ \pi^- K^- n \bar{n} \gamma \gamma \gamma \gamma \gamma)$	1	166
167	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \rho^- p \Sigma_c^0, \bar{B}^0 \rightarrow \tau^- \bar{\nu}_\tau D^{*+}, \rho^- \rightarrow \pi^0 \pi^-, \Sigma_c^0 \rightarrow \pi^+ \bar{\Lambda}_c^-,$ $\tau^- \rightarrow \nu_\tau \pi^0 \pi^-, D^{*+} \rightarrow \pi^+ D^0, \bar{\Lambda}_c^- \rightarrow \pi^- \eta \bar{\Lambda}, D^0 \rightarrow K_S \phi, \eta \rightarrow e^+ e^-, \bar{\Lambda} \rightarrow \pi^0 \bar{n},$ $K_S \rightarrow \pi^+ \pi^-, \phi \rightarrow K^+ K^-$ $(e^+e^- \rightarrow e^+ e^- \nu_\tau \bar{\nu}_\tau \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- K^+ K^- \bar{n} p \gamma \gamma \gamma \gamma \gamma)$	1	167
168	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \pi^+ K^{*-} J/\psi, \bar{B}^0 \rightarrow \bar{K}^0 D^{*0} \bar{D}^{*0}, K^{*-} \rightarrow \pi^- \bar{K}^0, J/\psi \rightarrow K^* \bar{K}^* \gamma,$ $\bar{K}^0 \rightarrow K_L, D^{*0} \rightarrow D^0 \gamma, \bar{D}^{*0} \rightarrow D^0 \gamma, \bar{K}^0 \rightarrow K_L, K^* \rightarrow \pi^- K^+, \bar{K}^* \rightarrow \pi^+ K^-,$ $D^0 \rightarrow \pi^0 \pi^+ K^-, \bar{D}^0 \rightarrow \pi^0 \pi^+ \pi^- K^*, K^* \rightarrow \pi^- K^+$ $(e^+e^- \rightarrow K_L K_L \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- K^+ K^+ K^- K^- \gamma \gamma \gamma \gamma \gamma \gamma)$	1	168
169	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \pi^- K^{*+} D^0 \bar{D}^{*0}, \bar{B}^0 \rightarrow \pi^0 \pi^+ \pi^- \pi^- D^{*+}, K^{*+} \rightarrow \pi^+ K^0, D^0 \rightarrow K^- a_1^+,$ $\bar{D}^{*0} \rightarrow \pi^0 \bar{D}^0, D^{*+} \rightarrow \pi^+ D^0, K^0 \rightarrow K_S, a_1^+ \rightarrow \pi^+ \pi^+ \pi^-, \bar{D}^0 \rightarrow \rho^- K^{*+}, D^0 \rightarrow \pi^+ K^-,$ $K_S \rightarrow \pi^+ \pi^-, \rho^- \rightarrow \pi^0 \pi^-, K^{*+} \rightarrow \pi^0 K^+$ $(e^+e^- \rightarrow \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- \pi^- K^+ K^- K^- \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$	1	169
170	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \mu^+ \nu_\mu D^-, \bar{B}^0 \rightarrow \pi^+ \pi^+ \pi^- \pi^- \pi^- \eta K^+ K^+ D_s^{*-}, D^- \rightarrow \mu^- \bar{\nu}_\mu K^0, \eta \rightarrow \pi^0 \pi^+ \pi^-,$ $D_s^{*-} \rightarrow D_s^- \gamma, K^0 \rightarrow K_L, D_s^- \rightarrow \pi^0 \pi^+ \pi^+ \pi^- \pi^- \pi^-$ $(e^+e^- \rightarrow \mu^+ \mu^- \nu_\mu \bar{\nu}_\mu K_L \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- \pi^- K^+ K^+ \gamma \gamma \gamma \gamma \gamma)$	1	170
171	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \pi^0 \bar{K}^0 D^- \Delta^0 \Sigma^+, \bar{B}^0 \rightarrow \pi^0 \pi^+ \pi^+ \pi^- \rho^- \bar{D}^0, \bar{K}^0 \rightarrow K_L, D^- \rightarrow \pi^0 \pi^- K_S,$ $\Delta^0 \rightarrow \pi^0 n, \Sigma^+ \rightarrow \pi^+ \bar{n}, \rho^- \rightarrow \pi^0 \pi^-, \bar{D}^0 \rightarrow \pi^- \rho^+, K_S \rightarrow \pi^0 \pi^0, \rho^+ \rightarrow \pi^0 \pi^+$ $(e^+e^- \rightarrow K_L \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- n \bar{n} \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$	1	171
172	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \mu^+ \nu_\mu \bar{D}^{*-}, \bar{B}^0 \rightarrow \pi^+ \rho^- \rho^- \omega D^{*+}, \bar{D}^{*-} \rightarrow \pi^- \bar{D}^0, \rho^- \rightarrow \pi^0 \pi^-,$ $\rho^- \rightarrow \pi^0 \pi^-, \omega \rightarrow \pi^0 \pi^+ \pi^-, D^{*+} \rightarrow \pi^0 D^+, \bar{D}^0 \rightarrow \pi^0 \pi^+ \pi^- K_S, D^+ \rightarrow K_S K^{*+}, K_S \rightarrow \pi^+ \pi^-,$ $K_S \rightarrow \pi^0 \pi^0, K^{*+} \rightarrow \pi^0 K^+$ $(e^+e^- \rightarrow \mu^+ \nu_\mu \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- \pi^- K^+ \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$	1	172

index	event tree (event initial-final states)	nEvts	nCmltEvts
194	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow e^+ \nu_e D^-, \bar{B}^0 \rightarrow K^{*-} D^{*+} \bar{D}^0, D^- \rightarrow K^* K^-, K^{*-} \rightarrow \pi^- \bar{K}^0,$ $D^{*+} \rightarrow \pi^+ D^0, \bar{D}^0 \rightarrow \pi^0 \pi^- K^+, K^* \rightarrow \pi^- K^+, \bar{K}^0 \rightarrow K_L, D^0 \rightarrow \pi^+ \pi^-, K_L \rightarrow \pi^0 \pi^0 \pi^0$ $(e^+e^- \rightarrow e^+ \nu_e \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- K^+ K^+ K^- \gamma \gamma \gamma \gamma \gamma \gamma)$	1	194
195	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow J/\psi K_1^0, \bar{B}^0 \rightarrow \pi^0 D^+ D_s^{*-}, J/\psi \rightarrow \pi^0 \eta \eta, K_1^0 \rightarrow \pi^+ \pi^- K^0,$ $D^+ \rightarrow e^+ \nu_e \bar{K}^0, D_s^{*-} \rightarrow D_s^- \gamma, \eta \rightarrow \gamma \gamma, \eta \rightarrow \gamma \gamma, K^0 \rightarrow K_S, \bar{K}^0 \rightarrow K_S,$ $D_s^- \rightarrow \rho^- \eta, K_S \rightarrow \pi^0 \pi^0, K_S \rightarrow \pi^+ \pi^-, \rho^- \rightarrow \pi^0 \pi^-, \eta \rightarrow \pi^0 \pi^0 \pi^0$ $(e^+e^- \rightarrow e^+ \nu_e \pi^+ \pi^+ \pi^- \pi^- \pi^- \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$	1	195
196	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow K^* D^+ D^-, B^0 \rightarrow \bar{D}^{*-} \bar{\Delta}^- \Delta^0, K^* \rightarrow \pi^0 K^0, D^+ \rightarrow \pi^+ \bar{K}_1^{'0},$ $D^- \rightarrow e^- \bar{\nu}_e K_2^{*0}, \bar{D}^{*-} \rightarrow \pi^- \bar{D}^0, \bar{\Delta}^- \rightarrow \pi^+ \bar{n}, \Delta^0 \rightarrow \pi^0 n, K^0 \rightarrow K_L, \bar{K}_1^{'0} \rightarrow \pi^+ K^{*-},$ $K_2^{*0} \rightarrow \pi^0 K^0, \bar{D}^0 \rightarrow e^- \bar{\nu}_e \pi^+ K^0, K^{*-} \rightarrow \pi^0 K^-, K^0 \rightarrow K_S, K^0 \rightarrow K_L, K_S \rightarrow \pi^+ \pi^-$ $(e^+e^- \rightarrow e^- e^- \bar{\nu}_e \bar{\nu}_e K_L K_L \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- K^- n \bar{n} \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$	1	196
197	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \pi^0 \pi^- \eta D^{*0} D_s^{*+}, \bar{B}^0 \rightarrow D^{*0} \Delta^0 \bar{D}^0, \eta \rightarrow \gamma \gamma, \bar{D}^{*0} \rightarrow \bar{D}^0 \gamma,$ $D_s^{*+} \rightarrow D_s^+ \gamma, D^{*0} \rightarrow \pi^0 D^0, \Delta^0 \rightarrow \pi^0 n, \bar{\Delta}^0 \rightarrow \pi^0 \bar{n}, \bar{D}^0 \rightarrow \pi^0 \pi^- K^+, D_s^+ \rightarrow \mu^+ \nu_\mu,$ $D^0 \rightarrow e^+ \nu_e \pi^- \bar{K}^0, \pi^0 \rightarrow e^+ e^-, \bar{K}^0 \rightarrow K_S, K_S \rightarrow \pi^0 \pi^0$ $(e^+e^- \rightarrow e^+ e^+ e^- \nu_e \mu^+ \nu_\mu \pi^- \pi^- \pi^- K^+ n \bar{n} \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$	1	197
198	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \rho^0 \pi^+ \omega \bar{D}^{*-}, \bar{B}^0 \rightarrow D^0 n \bar{n}, \rho^0 \rightarrow \pi^+ \pi^-, \omega \rightarrow \pi^0 \pi^+ \pi^-,$ $\bar{D}^{*-} \rightarrow \pi^- \bar{D}^0, D^0 \rightarrow K_L \eta, \bar{D}^0 \rightarrow \pi^0 \pi^- K^+, \eta \rightarrow \gamma \gamma$ $(e^+e^- \rightarrow K_L \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- K^+ n \bar{n} \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$	1	198
199	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \mu^+ \nu_\mu \bar{D}^{*-}, B^0 \rightarrow \rho^0 \pi^+ \pi^- \rho^+ \omega \bar{D}^{*-}, \bar{D}^{*-} \rightarrow \pi^0 D^-, \rho^0 \rightarrow \pi^+ \pi^-,$ $\rho^+ \rightarrow \pi^0 \pi^+, \omega \rightarrow \pi^0 \pi^+ \pi^-, \bar{D}^{*-} \rightarrow \pi^0 D^-, D^- \rightarrow e^- \bar{\nu}_e \pi^- K^+, D^- \rightarrow \pi^0 \pi^- K^*, K^* \rightarrow \pi^- K^+$ $(e^+e^- \rightarrow e^- \bar{\nu}_e \mu^+ \nu_\mu \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- \pi^- K^+ K^+ \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$	1	199
200	$e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \pi^+ \pi^+ \pi^+ \pi^- \pi^- D^-, \bar{B}^0 \rightarrow e^- \bar{\nu}_e \pi^+ D^0, D^- \rightarrow \mu^- \bar{\nu}_\mu K_1^0, D^0 \rightarrow \pi^+ \pi^- K_S,$ $K_1^0 \rightarrow \pi^+ \pi^- K^0, K_S \rightarrow \pi^+ \pi^-, K^0 \rightarrow K_S, K_S \rightarrow \pi^+ \pi^-$ $(e^+e^- \rightarrow e^- \bar{\nu}_e \mu^- \bar{\nu}_\mu \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- \pi^-)$	1	200

event initial-final states

23

index	event initial-final states	nEvts	nCmltEvts
121	$e^+e^- \rightarrow e^- \bar{\nu}_e \mu^- \bar{\nu}_\mu K_L \pi^+ \pi^+ \pi^+ \pi^- K^- \gamma \gamma \gamma$	1	121
122	$e^+e^- \rightarrow \mu^+ \nu_\mu K_L \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- K^+ \gamma \gamma \gamma \gamma$	1	122
123	$e^+e^- \rightarrow e^- e^- \bar{\nu}_e \bar{\nu}_e \mu^+ \nu_\mu \pi^+ \pi^+ \pi^- K^+ K^- \gamma \gamma \gamma$	1	123
124	$e^+e^- \rightarrow e^- \bar{\nu}_e \nu_\tau \bar{\nu}_\tau K_L \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \gamma \gamma \gamma \gamma \gamma \gamma$	1	124
125	$e^+e^- \rightarrow e^+ e^- \mu^- \bar{\nu}_\mu K_L K_L \pi^+ \pi^+ \pi^- \pi^- K^+ \gamma \gamma \gamma \gamma \gamma \gamma \gamma$	1	125
126	$e^+e^- \rightarrow e^+ \nu_e \mu^+ \mu^- \nu_\mu \bar{\nu}_\mu \pi^+ \pi^+ \pi^- \pi^- K^- \gamma \gamma \gamma \gamma \gamma \gamma \gamma$	1	126
127	$e^+e^- \rightarrow e^+ e^- \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- K^+ \gamma \gamma \gamma \gamma \gamma \gamma \gamma$	1	127
128	$e^+e^- \rightarrow e^+ e^- e^- \nu_e \bar{\nu}_e K_L \pi^+ \pi^+ \pi^+ \pi^- K^- K^- \gamma \gamma \gamma$	1	128
129	$e^+e^- \rightarrow e^+ e^- \nu_e \bar{\nu}_e \nu_\tau \bar{\nu}_\tau \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \gamma \gamma \gamma$	1	129
130	$e^+e^- \rightarrow e^+ e^- e^- \nu_e \bar{\nu}_e \pi^+ \pi^+ \pi^- \pi^- K^+ \gamma \gamma \gamma \gamma \gamma \gamma$	1	130
131	$e^+e^- \rightarrow K_L \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- K^+ \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma$	1	131
132	$e^+e^- \rightarrow e^+ \nu_e \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- K^- K^- \gamma \gamma \gamma$	1	132
133	$e^+e^- \rightarrow e^+ e^- \nu_e \bar{\nu}_e \mu^+ \nu_\mu \pi^+ \pi^- \pi^- \pi^- K^+ K^+ K^- \gamma \gamma$	1	133
134	$e^+e^- \rightarrow \nu_\tau \bar{\nu}_\tau K_L K_L \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \gamma \gamma \gamma \gamma \gamma \gamma$	1	134
135	$e^+e^- \rightarrow \mu^- \bar{\nu}_\mu \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- K^+ K^- \gamma \gamma \gamma \gamma \gamma \gamma$	1	135
136	$e^+e^- \rightarrow K_L \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- K^+ K^+ K^- f_0(600) \gamma \gamma \gamma$	1	136
137	$e^+e^- \rightarrow e^+ e^- K_L K_L \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- \pi^- K^- \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma$	1	137
138	$e^+e^- \rightarrow \pi^+ \pi^+ \pi^- \pi^- K^+ K^- n \bar{n} \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma$	1	138
139	$e^+e^- \rightarrow e^+ \nu_e K_L \pi^+ \pi^+ \pi^- \pi^- \pi^- K^+ K^- p \bar{p} \gamma \gamma \gamma$	1	139
140	$e^+e^- \rightarrow e^- \bar{\nu}_e \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- \pi^- \pi^- K^+ K^+ K^+ \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma$	1	140
141	$e^+e^- \rightarrow e^- \bar{\nu}_e \mu^+ \nu_\mu \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- K^+ \gamma \gamma \gamma \gamma$	1	141
142	$e^+e^- \rightarrow \mu^+ \nu_\mu \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- K^+ K^+ K^- K^- \gamma \gamma \gamma \gamma \gamma$	1	142
143	$e^+e^- \rightarrow \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- K^+ K^- K^- K^- n \bar{n} \gamma \gamma \gamma \gamma \gamma \gamma \gamma$	1	143
144	$e^+e^- \rightarrow \mu^- \bar{\nu}_\mu \pi^+ \pi^+ \pi^+ \pi^- K^+ K^- K^- \gamma \gamma \gamma \gamma \gamma \gamma$	1	144
145	$e^+e^- \rightarrow e^- \bar{\nu}_e K_L \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- \pi^- \gamma \gamma \gamma \gamma \gamma$	1	145
146	$e^+e^- \rightarrow K_L \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- \pi^- K^- K^- \gamma \gamma \gamma \gamma$	1	146
147	$e^+e^- \rightarrow K_L \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- K^- \gamma \gamma \gamma \gamma \gamma \gamma$	1	147
148	$e^+e^- \rightarrow \mu^- \bar{\nu}_\mu \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- K^- K^- \gamma \gamma \gamma \gamma \gamma$	1	148
149	$e^+e^- \rightarrow \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- K^+ \gamma \gamma \gamma \gamma \gamma \gamma$	1	149
150	$e^+e^- \rightarrow \mu^+ \nu_\mu \nu_\tau \bar{\nu}_\tau K_L \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- K^+ K^- K^- \gamma \gamma \gamma \gamma \gamma \gamma$	1	150
151	$e^+e^- \rightarrow e^+ e^- \nu_e \bar{\nu}_e \mu^+ \nu_\mu \pi^+ \pi^+ \pi^- \pi^- K^+ K^- \gamma \gamma$	1	151
152	$e^+e^- \rightarrow e^- \bar{\nu}_e \mu^- \bar{\nu}_\mu \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- K^+ n \bar{p} \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma$	1	152
153	$e^+e^- \rightarrow e^- \bar{\nu}_e \mu^- \nu_\mu \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- K^+ \gamma \gamma \gamma \gamma \gamma$	1	153
154	$e^+e^- \rightarrow \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- K^+ K^+ K^+ K^- \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma$	1	154
155	$e^+e^- \rightarrow e^- \bar{\nu}_e \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- K^+ K^- \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma$	1	155
156	$e^+e^- \rightarrow \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- K^+ K^- \gamma \gamma \gamma \gamma \gamma \gamma \gamma$	1	156
157	$e^+e^- \rightarrow e^+ e^+ \nu_e \nu_e \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- K^+ \gamma \gamma \gamma \gamma \gamma \gamma \gamma$	1	157
158	$e^+e^- \rightarrow \mu^- \bar{\nu}_\mu \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- \pi^- K^+ K^+ \gamma \gamma \gamma \gamma \gamma \gamma \gamma$	1	158
159	$e^+e^- \rightarrow e^- \bar{\nu}_e \mu^+ \nu_\mu \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- K^+ f_0(600) \gamma \gamma \gamma \gamma$	1	159
160	$e^+e^- \rightarrow e^+ e^- \nu_e \bar{\nu}_e \mu^+ \nu_\mu \pi^+ \pi^- \gamma \gamma \gamma \gamma \gamma \gamma \gamma$	1	160

index	event initial-final states	nEvts	nCmltEvts
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Table 3: Signal particles.

index	signal particle	nPs	nCmltPs
1	J/ψ	8	8
2	ψ'	1	9