

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

(v1.5)

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November 19, 2018

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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 and Guanda Gong for their efforts in helping me test the program.

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| index | event tree<br>(event initial-final states)   | iEvtTr | iEvtIFSts | nEvts | nCmltEvts |
|-------|--|--------|-----------|-------|-----------|
| 11    | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \mu^+ \nu_\mu \bar{D}^{*-}, \bar{B}^0 \rightarrow \rho^0 K^0 K^{*-} D^+, \bar{D}^{*-} \rightarrow \pi^- \bar{D}^0, \rho^0 \rightarrow \pi^+ \pi^-,$ $K^0 \rightarrow K_L, K^{*-} \rightarrow \pi^0 K^-, D^+ \rightarrow \mu^+ \nu_\mu \bar{K}^0, \bar{D}^0 \rightarrow \rho^- K^{*+}, \bar{K}^0 \rightarrow K_L, \rho^- \rightarrow \pi^0 \pi^-,$ $K^{*+} \rightarrow \pi^0 K^+$ $(e^+e^- \rightarrow \mu^+ \mu^+ \nu_\mu \nu_\mu K_L K_L \pi^+ \pi^- \pi^- \pi^- K^+ K^- \gamma \gamma \gamma \gamma \gamma)$   | 10     | 10        | 1     | 11        |
| 12    | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \rho^- K^+ J/\psi, \bar{B}^0 \rightarrow D^+ D_s^{*-}, \rho^- \rightarrow \pi^0 \pi^-, J/\psi \rightarrow e^+ e^-,$ $D^+ \rightarrow \pi^0 \pi^+ K_S, D_s^{*-} \rightarrow D_s^- \gamma, K_S \rightarrow \pi^0 \pi^0, D_s^- \rightarrow \tau^- \bar{\nu}_\tau, \tau^- \rightarrow \mu^- \bar{\nu}_\mu \nu_\tau$ $(e^+e^- \rightarrow e^+ e^- \mu^- \bar{\nu}_\mu \nu_\tau \pi^+ \pi^- K^+ \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$   | 11     | 11        | 1     | 12        |
| 13    | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \pi^+ \pi^- K^0 \bar{D}^0, \bar{B}^0 \rightarrow \pi^0 \pi^+ \rho^- \rho^- D^+, K^0 \rightarrow K_L, D^0 \rightarrow K_S \eta',$ $\bar{D}^0 \rightarrow \rho^- K^{*+}, \rho^- \rightarrow \pi^0 \pi^-, \rho^- \rightarrow \pi^0 \pi^-, D^+ \rightarrow \mu^+ \nu_\mu \bar{K}^0, K_L \rightarrow \pi^0 \pi^0 \pi^0, K_S \rightarrow \pi^+ \pi^-,$ $\eta' \rightarrow \pi^+ \pi^- \eta, \rho^- \rightarrow \pi^0 \pi^-, K^{*+} \rightarrow \pi^0 K^+, \bar{K}^0 \rightarrow K_L, \eta \rightarrow \pi^0 \pi^+ \pi^-$ $(e^+e^- \rightarrow \mu^+ \nu_\mu K_L \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- \pi^- \pi^- K^+ \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$ | 12     | 12        | 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     | 14        |
| 15    | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \rho^+ D^-, \bar{B}^0 \rightarrow \pi^- K^+ K^- D^{*+}, \rho^+ \rightarrow \pi^0 \pi^+, D^- \rightarrow K_S a_1^-,$ $D^{*+} \rightarrow \pi^+ D^0, K_S \rightarrow \pi^0 \pi^0, a_1^- \rightarrow \pi^0 \rho^-, D^0 \rightarrow \pi^0 \pi^+ K^-, \rho^- \rightarrow \pi^0 \pi^-$ $(e^+e^- \rightarrow \pi^+ \pi^+ \pi^+ \pi^- \pi^- K^+ K^- K^- \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$  | 14     | 14        | 1     | 15        |
| 16    | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \pi^0 \pi^0 \pi^+ \eta \bar{D}^{*-}, \bar{B}^0 \rightarrow e^- \bar{\nu}_e D^{*+}, \eta \rightarrow \pi^0 \pi^0 \pi^0, \bar{D}^{*-} \rightarrow \pi^0 D^-,$ $D^{*+} \rightarrow \pi^0 D^+, D^- \rightarrow \pi^+ \pi^- \pi^- \pi^- K^+, D^+ \rightarrow \mu^+ \nu_\mu \bar{K}^*, \bar{K}^* \rightarrow \pi^+ K^-$ $(e^+e^- \rightarrow e^- \bar{\nu}_e \mu^+ \nu_\mu \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- K^+ K^- \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$   | 15     | 15        | 1     | 16        |
| 17    | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow e^+ \nu_e \bar{D}^{*-}, \bar{B}^0 \rightarrow \pi^0 \pi^+ K^{*-} D^0 \bar{D}^{*0}, \bar{D}^{*-} \rightarrow \pi^- \bar{D}^0, K^{*-} \rightarrow \pi^- \bar{K}^0,$ $D^0 \rightarrow K_L \pi^+ \pi^-, \bar{D}^{*0} \rightarrow \pi^0 \bar{D}^0, \bar{D}^0 \rightarrow \mu^- \bar{\nu}_\mu K^+, \bar{K}^0 \rightarrow K_S, \bar{D}^0 \rightarrow \pi^+ \pi^- K_S K_S, K_S \rightarrow \pi^+ \pi^-,$ $K_S \rightarrow \pi^0 \pi^0, K_S \rightarrow \pi^+ \pi^-$ $(e^+e^- \rightarrow e^+ \nu_e \mu^- \bar{\nu}_\mu K_L \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- \pi^- K^+ \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$  | 16     | 16        | 1     | 17        |
| 18    | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow K^* D^- D^{*+}, \bar{B}^0 \rightarrow \pi^0 \eta \bar{K}^0 K^- D_s^+, K^* \rightarrow \pi^0 K^0, D^- \rightarrow \pi^- \pi^- K^+,$ $D^{*+} \rightarrow \pi^+ D^0, \eta \rightarrow \gamma \gamma, \bar{K}^0 \rightarrow K_L, D_s^+ \rightarrow \mu^+ \nu_\mu \phi, K^0 \rightarrow K_S, D^0 \rightarrow \pi^0 \pi^+ K^{*-},$ $\phi \rightarrow K^+ K^-, K_S \rightarrow \pi^0 \pi^0, K^{*-} \rightarrow \pi^- \bar{K}^0, \bar{K}^0 \rightarrow K_L$ $(e^+e^- \rightarrow \mu^+ \nu_\mu K_L K_L \pi^+ \pi^+ \pi^- \pi^- \pi^- K^+ K^+ K^- K^- \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$   | 17     | 17        | 1     | 18        |
| 19    | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \bar{D}^{*-} D_s^{*+}, \bar{B}^0 \rightarrow e^- \bar{\nu}_e D^{*+}, \bar{D}^{*-} \rightarrow \pi^- \bar{D}^0, D_s^{*+} \rightarrow D_s^+ \gamma,$ $D^{*+} \rightarrow \pi^+ D^0, \bar{D}^0 \rightarrow \pi^0 \pi^+ \pi^- K_S, D_s^+ \rightarrow \rho^+ \eta, D^0 \rightarrow \pi^+ \eta K^-, K_S \rightarrow \pi^+ \pi^-, \rho^+ \rightarrow \pi^0 \pi^+,$ $\eta \rightarrow \pi^0 \pi^0 \pi^0, \eta \rightarrow \pi^0 \pi^0 \pi^0$ $(e^+e^- \rightarrow e^- \bar{\nu}_e \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- K^- \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$   | 18     | 18        | 1     | 19        |
| 20    | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \mu^+ \nu_\mu D_2^{*-}, \bar{B}^0 \rightarrow \pi^0 \pi^+ \pi^+ \pi^- \rho^- \bar{D}^{*0}, D_2^{*-} \rightarrow \pi^- \bar{D}^{*0}, \rho^- \rightarrow \pi^0 \pi^-,$ $\bar{D}^{*0} \rightarrow \pi^0 \bar{D}^0, \bar{D}^{*0} \rightarrow \pi^0 \bar{D}^0, \bar{D}^0 \rightarrow K^+ a_1^-, \bar{D}^0 \rightarrow \pi^0 K_L \pi^+ \pi^-, a_1^- \rightarrow \rho^0 \pi^-, \rho^0 \rightarrow \pi^+ \pi^-$ $(e^+e^- \rightarrow \mu^+ \nu_\mu K_L \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- \pi^- K^+ \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$   | 19     | 19        | 1     | 20        |





| index | event tree<br>(event initial-final states)  | iEvtTr | iEvtIFSts | nEvts | nCmltEvts |
|-------|---|--------|-----------|-------|-----------|
| 42    | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow \mu^+\nu_\mu\bar{D}^{*-}, \bar{B}^0 \rightarrow \pi^-\omega D^{*+}, \bar{D}^{*-} \rightarrow \pi^-\bar{D}^0, \omega \rightarrow \pi^0\pi^+\pi^-,$<br>$D^{*+} \rightarrow \pi^0 D^+, \bar{D}^0 \rightarrow \pi^0\pi^- K^+, D^+ \rightarrow \pi^+\pi^+ K^-$<br>$(e^+e^- \rightarrow \mu^+\nu_\mu\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^- K^+ K^- \gamma\gamma\gamma\gamma\gamma)$   | 41     | 41        | 1     | 42        |
| 43    | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow \bar{B}^0\bar{B}^0, \bar{B}^0 \rightarrow \pi^+ K^- \eta_c(2S), \bar{B}^0 \rightarrow \pi^0\pi^+\pi^- D^+ \Sigma^- \bar{\Sigma}^0, \eta_c(2S) \rightarrow \pi^0\rho^0\pi^+\pi^-\pi^- \rho^+\eta, D^+ \rightarrow \mu^+\nu_\mu\bar{K}^*,$<br>$\Sigma^- \rightarrow \pi^- n, \bar{\Sigma}^0 \rightarrow \bar{\Lambda}\gamma, \rho^0 \rightarrow \pi^+\pi^-, \rho^+ \rightarrow \pi^0\pi^+, \eta \rightarrow \gamma\gamma, \bar{K}^* \rightarrow \pi^+ K^-,$<br>$\bar{\Lambda} \rightarrow \pi^+\bar{p}$<br>$(e^+e^- \rightarrow \mu^+\nu_\mu\pi^+\pi^+\pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^- K^- K^- n\bar{p}\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma)$  | 42     | 42        | 1     | 43        |
| 44    | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow \eta D^- D_s^+, \bar{B}^0 \rightarrow e^- \bar{\nu}_e D^{*+}, \eta \rightarrow \pi^0\pi^0\pi^0, D^- \rightarrow \rho^- K^*,$<br>$D_s^+ \rightarrow \pi^+\eta', D^{*+} \rightarrow \pi^+ D^0, \rho^- \rightarrow \pi^0\pi^-, K^* \rightarrow \pi^0 K^0, \eta' \rightarrow \pi^0\pi^0\eta, D^0 \rightarrow \pi^0\pi^+ K^-,$<br>$K^0 \rightarrow K_S, \eta \rightarrow \gamma\gamma, K_S \rightarrow \pi^+\pi^-$<br>$(e^+e^- \rightarrow e^- \bar{\nu}_e\pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^- K^- \gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma)$   | 43     | 43        | 1     | 44        |
| 45    | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow \omega K^+ \bar{D}^{*-}, \bar{B}^0 \rightarrow D^{*+} D_s^-, \omega \rightarrow \pi^0\pi^+\pi^-, \bar{D}^{*-} \rightarrow \pi^-\bar{D}^0,$<br>$D^{*+} \rightarrow \pi^0 D^+, D_s^- \rightarrow \pi^- f_0(980), \bar{D}^0 \rightarrow \pi^-\omega K^+, D^+ \rightarrow K_S K^{*+}, f_0(980) \rightarrow \pi^+\pi^-, \omega \rightarrow \pi^0\pi^+\pi^-,$<br>$K_S \rightarrow \pi^+\pi^-, K^{*+} \rightarrow \pi^+ K^0, K^0 \rightarrow K_S, K_S \rightarrow \pi^+\pi^-$<br>$(e^+e^- \rightarrow \pi^+\pi^+\pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^- K^+ K^+ \gamma\gamma\gamma\gamma\gamma)$   | 44     | 44        | 1     | 45        |
| 46    | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow \eta \bar{D}^{*-} D_s^+, B^0 \rightarrow \pi^0\pi^- \rho^+ K^0 K^+ D^-, \eta \rightarrow \gamma\gamma, \bar{D}^{*-} \rightarrow \pi^0 D^-,$<br>$D_s^+ \rightarrow \mu^+\nu_\mu\eta, \rho^+ \rightarrow \pi^0\pi^+, \bar{K}^0 \rightarrow K_S, D^- \rightarrow K_S K^{*-}, D^- \rightarrow \pi^-\pi^- K^+, \eta \rightarrow \pi^0\pi^0\pi^0,$<br>$K_S \rightarrow \pi^0\pi^0, K_S \rightarrow \pi^+\pi^-, K^{*-} \rightarrow \pi^-\bar{K}^0, \pi^0 \rightarrow e^+e^-, \bar{K}^0 \rightarrow K_S, K_S \rightarrow \pi^+\pi^-$<br>$(e^+e^- \rightarrow e^+e^- \mu^+\nu_\mu\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^- K^+ K^+ \gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma)$ | 45     | 45        | 1     | 46        |
| 47    | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow \pi^0\pi^+\pi^-\rho^-\eta\eta K^0 K^+ D^-, B^0 \rightarrow \pi^0\rho^0\pi^- D^{*+}, \rho^- \rightarrow \pi^0\pi^-, \eta \rightarrow \gamma\gamma,$<br>$\eta \rightarrow \pi^0\pi^0\pi^0, \bar{K}^0 \rightarrow K_L, D^- \rightarrow \pi^- K_S, \rho^0 \rightarrow \pi^+\pi^-, D^{*+} \rightarrow \pi^0 D^+, K_S \rightarrow \pi^+\pi^-,$<br>$D^+ \rightarrow \pi^0 K_L \pi^+$<br>$(e^+e^- \rightarrow K_L K_L \pi^+\pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^- K^+ \gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma)$   | 46     | 46        | 1     | 47        |
| 48    | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow \rho^0\rho^+ \bar{D}^{*-}, \bar{B}^0 \rightarrow \pi^+ K^- D^+ D^-, \rho^0 \rightarrow \pi^+\pi^-, \rho^+ \rightarrow \pi^0\pi^+,$<br>$\bar{D}^{*-} \rightarrow \pi^-\bar{D}^0, D^+ \rightarrow \pi^0\pi^+ \bar{K}^*, D^- \rightarrow \mu^- \bar{\nu}_\mu K^0, \bar{D}^0 \rightarrow \mu^- \bar{\nu}_\mu K^+, \bar{K}^* \rightarrow \pi^0 \bar{K}^0, K^0 \rightarrow K_S,$<br>$\bar{K}^0 \rightarrow K_L, K_S \rightarrow \pi^+\pi^-$<br>$(e^+e^- \rightarrow \mu^- \mu^- \bar{\nu}_\mu \bar{\nu}_\mu K_L \pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^- K^+ K^- \gamma\gamma\gamma\gamma\gamma)$   | 47     | 47        | 1     | 48        |
| 49    | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow \rho^0\rho^+ D^-, \bar{B}^0 \rightarrow \mu^- \bar{\nu}_\mu D^+, \rho^0 \rightarrow \pi^+\pi^-, \rho^+ \rightarrow \pi^0\pi^+,$<br>$D^- \rightarrow \mu^- \bar{\nu}_\mu K^*, D^+ \rightarrow e^+ \nu_e \bar{K}^*, K^* \rightarrow \pi^0 K^0, \bar{K}^* \rightarrow \pi^0 \bar{K}^0, K^0 \rightarrow K_L, \bar{K}^0 \rightarrow K_S,$<br>$K_S \rightarrow \pi^0\pi^0$<br>$(e^+e^- \rightarrow e^+ \nu_e \mu^- \mu^- \bar{\nu}_\mu \bar{\nu}_\mu K_L \pi^+\pi^+\pi^-\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma)$   | 48     | 48        | 1     | 49        |
| 50    | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow \pi^+\pi^- \rho^+ \eta D^-, \bar{B}^0 \rightarrow \mu^- \bar{\nu}_\mu D^{*+}, \rho^+ \rightarrow \pi^0\pi^+, \eta \rightarrow \pi^0\pi^0\pi^0,$<br>$D^- \rightarrow K_S K^-, D^{*+} \rightarrow \pi^+ D^0, \pi^0 \rightarrow e^+e^-, K_S \rightarrow \pi^+\pi^-, D^0 \rightarrow \pi^0\pi^+\pi^- \bar{K}^*, \bar{K}^* \rightarrow \pi^0 \bar{K}^0,$<br>$\bar{K}^0 \rightarrow K_L$<br>$(e^+e^- \rightarrow e^+e^- \mu^- \bar{\nu}_\mu K_L \pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^- K^- \gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma)$   | 49     | 49        | 1     | 50        |





| index | event tree<br>(event initial-final states)   | iEvtTr | iEvtIFSts | nEvts | nCmltEvts |
|-------|--|--------|-----------|-------|-----------|
| 61    | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow \pi^0\pi^+\omega\bar{D}^{*-}, \bar{B}^0 \rightarrow \pi^-K^0D^+\bar{D}^{*0}, \omega \rightarrow \pi^0\pi^+\pi^-, \bar{D}^{*-} \rightarrow \pi^0D^-,$ $\bar{K}^0 \rightarrow K_S, D^+ \rightarrow \pi^0\pi^+\bar{K}^*, \bar{D}^{*0} \rightarrow \bar{D}^0\gamma, D^- \rightarrow e^-\bar{\nu}_eK^0, K_S \rightarrow \pi^+\pi^-, \bar{K}^* \rightarrow \pi^+K^-,$ $\bar{D}^0 \rightarrow \pi^0\pi^0\pi^0\pi^+\pi^-, K^0 \rightarrow K_S, K_S \rightarrow \pi^0\pi^0$ $(e^+e^- \rightarrow e^-\bar{\nu}_e\pi^+\pi^+\pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-K^-\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma)$ | 60     | 60        | 1     | 61        |
| 62    | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow e^+\nu_e\bar{D}^{*-}, \bar{B}^0 \rightarrow \pi^+K^*\bar{D}^{*-}D^0, \bar{D}^{*-} \rightarrow \pi^-\bar{D}^0, K^* \rightarrow \pi^0\bar{K}^0,$ $\bar{D}^{*-} \rightarrow \pi^-\bar{D}^0, D^0 \rightarrow \rho^+K^{*-}, \bar{D}^0 \rightarrow K^+a_1^-, \bar{K}^0 \rightarrow K_L, \bar{D}^0 \rightarrow \pi^-K^+, \rho^+ \rightarrow \pi^0\pi^+,$ $K^{*-} \rightarrow \pi^-\bar{K}^0, a_1^- \rightarrow \pi^-f_0(600), \bar{K}^0 \rightarrow K_L$ $(e^+e^- \rightarrow e^+\nu_eK_LK_L\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-K^+K^+f_0(600)\gamma\gamma\gamma\gamma)$   | 61     | 61        | 1     | 62        |
| 63    | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow \bar{D}^{*-}a_1^+, B^0 \rightarrow \pi^+\pi^+\pi^+\pi^-\pi^-\pi^-D^-\Delta^+\bar{\Delta}^+, \bar{D}^{*-} \rightarrow \pi^-\bar{D}^0, a_1^+ \rightarrow \rho^0\pi^+,$ $D^- \rightarrow e^-\bar{\nu}_e\pi^-K^+, \Delta^+ \rightarrow \pi^0p, \bar{\Delta}^+ \rightarrow \pi^0\bar{p}, \bar{D}^0 \rightarrow \mu^-\bar{\nu}_\mu K^{*+}, \rho^0 \rightarrow \pi^+\pi^-, K^{*+} \rightarrow \pi^+K^0,$ $K^0 \rightarrow K_S, K_S \rightarrow \pi^+\pi^-$ $(e^+e^- \rightarrow e^-\bar{\nu}_e\mu^-\bar{\nu}_\mu\pi^+\pi^+\pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-K^+p\bar{p}\gamma\gamma\gamma\gamma)$  | 62     | 62        | 1     | 63        |
| 64    | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow \pi^+\pi^-\eta\bar{D}^0, \bar{B}^0 \rightarrow \pi^-\pi^-\pi^-\rho^+\rho^+\omega\bar{D}^{*+}, \eta \rightarrow \pi^0\pi^0\pi^0, \bar{D}^0 \rightarrow \pi^0\pi^-\bar{K}^+,$ $\rho^+ \rightarrow \pi^0\pi^+, \rho^+ \rightarrow \pi^0\pi^+, \omega \rightarrow \pi^0\pi^+\pi^-, D^{*+} \rightarrow \pi^+D^0, D^0 \rightarrow e^+\nu_e\pi^0K^-$ $(e^+e^- \rightarrow e^+\nu_e\pi^+\pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-K^+K^-\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma)$  | 63     | 63        | 1     | 64        |
| 65    | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow \rho^0\pi^+K^-K^{*+}\bar{D}^{*-}, \bar{B}^0 \rightarrow \pi^0\pi^0\rho^0\rho^0\pi^-D^+, \rho^0 \rightarrow \pi^+\pi^-, K^{*+} \rightarrow \pi^+K^0,$ $\bar{D}^{*-} \rightarrow \pi^-\bar{D}^0, \rho^0 \rightarrow \pi^+\pi^-, \rho^0 \rightarrow \pi^+\pi^-, D^+ \rightarrow e^+\nu_e\bar{K}^0, K^0 \rightarrow K_S, \bar{D}^0 \rightarrow K_L\eta',$ $\bar{K}^0 \rightarrow K_S, K_S \rightarrow \pi^+\pi^-, \eta' \rightarrow \pi^+\pi^-\eta, K_S \rightarrow \pi^+\pi^-, \eta \rightarrow \gamma\gamma$ $(e^+e^- \rightarrow e^+\nu_eK_LK_L\pi^+\pi^+\pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-K^-\gamma\gamma\gamma\gamma\gamma\gamma)$   | 64     | 64        | 1     | 65        |
| 66    | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow e^+\nu_eD^-, \bar{B}^0 \rightarrow \pi^0\pi^0\pi^+\pi^-\pi^-D^{*+}p\bar{p}, D^- \rightarrow \pi^+\pi^-\pi^-K_S, D^{*+} \rightarrow \pi^+D^0,$ $K_S \rightarrow \pi^0\pi^0, D^0 \rightarrow \pi^0\pi^+\pi^-\bar{K}^*, \bar{K}^* \rightarrow \pi^+K^-$ $(e^+e^- \rightarrow e^+\nu_e\pi^+\pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-K^-p\bar{p}\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma)$  | 65     | 65        | 1     | 66        |
| 67    | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow \mu^+\nu_\mu D_0^{*-}, \bar{B}^0 \rightarrow \tau^-\bar{\nu}_\tau D^{*+}, D_0^{*-} \rightarrow \pi^-\bar{D}^0, \tau^- \rightarrow \nu_\tau\pi^0\pi^-,$ $D^{*+} \rightarrow \pi^+D^0, \bar{D}^0 \rightarrow \pi^+\pi^-K^*, D^0 \rightarrow \pi^0\pi^0\bar{K}^*, K^* \rightarrow \pi^-K^+, \bar{K}^* \rightarrow \pi^+K^-$ $(e^+e^- \rightarrow \mu^+\nu_\mu\nu_\tau\bar{\nu}_\tau\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-K^+K^-\gamma\gamma\gamma\gamma\gamma\gamma)$   | 66     | 66        | 1     | 67        |
| 68    | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow \pi^+\omega\omega\bar{D}^{*-}, \bar{B}^0 \rightarrow \eta D^+D_s^{*-}, \omega \rightarrow \pi^0\gamma, \omega \rightarrow \pi^0\pi^+\pi^-,$ $\bar{D}^{*-} \rightarrow \pi^-\bar{D}^0, \eta \rightarrow \gamma\gamma, D^+ \rightarrow K_L\pi^+, D_s^{*-} \rightarrow D_s^-\gamma, \bar{D}^0 \rightarrow \pi^-\eta K^+, D_s^- \rightarrow K^0K^{*-},$ $\eta \rightarrow \pi^0\pi^0\pi^0, K^0 \rightarrow K_L, K^{*-} \rightarrow \pi^0K^-$ $(e^+e^- \rightarrow K_LK_L\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-K^+K^-\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma)$  | 67     | 67        | 1     | 68        |
| 69    | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow \bar{B}^0\bar{B}^0, B^0 \rightarrow e^-\bar{\nu}_eD^+, \bar{B}^0 \rightarrow \rho^0\rho^-\eta D^{*+}, D^+ \rightarrow \pi^0\pi^+K_S, \rho^0 \rightarrow \pi^+\pi^-,$ $\rho^- \rightarrow \pi^0\pi^-, \eta \rightarrow \gamma\gamma, D^{*+} \rightarrow \pi^+D^0, K_S \rightarrow \pi^+\pi^-, D^0 \rightarrow \omega\bar{K}^*, \omega \rightarrow \pi^+\pi^-,$ $\bar{K}^* \rightarrow \pi^+K^-$ $(e^+e^- \rightarrow e^-\bar{\nu}_e\pi^+\pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-K^-\gamma\gamma\gamma\gamma\gamma\gamma)$   | 68     | 68        | 1     | 69        |
| 70    | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow \rho^+D^-, \bar{B}^0 \rightarrow \rho^-D^{*+}, \rho^+ \rightarrow \pi^0\pi^+, D^- \rightarrow \pi^0\pi^-\phi,$ $\rho^- \rightarrow \pi^0\pi^-, D^{*+} \rightarrow \pi^+D^0, \phi \rightarrow K^+K^-, D^0 \rightarrow e^+\nu_e\pi^-$ $(e^+e^- \rightarrow e^+\nu_e\pi^+\pi^+\pi^-\pi^-\pi^-K^+K^-\gamma\gamma\gamma\gamma\gamma\gamma)$  | 69     | 69        | 1     | 70        |

| index | event tree<br>(event initial-final states)   | iEvtTr | iEvtIFSts | nEvts | nCmltEvts |
|-------|--|--------|-----------|-------|-----------|
| 71    | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow \pi^-K^+D^0\bar{D}^0, \bar{B}^0 \rightarrow K^{*-}D^+, D^0 \rightarrow \rho^+K^{*-}, \bar{D}^0 \rightarrow \rho^0\rho^0,$<br>$K^{*-} \rightarrow \pi^-\bar{K}^0, D^+ \rightarrow e^+\nu_e\bar{K}^*, \rho^+ \rightarrow \pi^0\pi^+, K^{*-} \rightarrow \pi^-\bar{K}^0, \rho^0 \rightarrow \pi^+\pi^-, \rho^0 \rightarrow \pi^+\pi^-,$<br>$\bar{K}^0 \rightarrow K_L, \bar{K}^* \rightarrow \pi^+K^-, \bar{K}^0 \rightarrow K_L$<br>$(e^+e^- \rightarrow e^+\nu_e K_L K_L \pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-\pi^-\pi^+K^-K^-\gamma\gamma)$   | 70     | 70        | 1     | 71        |
| 72    | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow \pi^0\pi^0\pi^+\rho^+\rho^-D^-, \bar{B}^0 \rightarrow e^-\bar{\nu}_e D^+, \rho^+ \rightarrow \pi^0\pi^+, \rho^- \rightarrow \pi^0\pi^-,$<br>$D^- \rightarrow e^-\bar{\nu}_e\pi^-K^+, D^+ \rightarrow \pi^0\pi^+\pi^+K^-$<br>$(e^+e^- \rightarrow e^+e^-\bar{\nu}_e\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-\pi^+K^-K^-\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma)$  | 71     | 71        | 1     | 72        |
| 73    | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow K^*n\Sigma_c^{*0}, \bar{B}^0 \rightarrow \pi^-D^+, K^* \rightarrow \pi^-K^+, \Sigma_c^{*0} \rightarrow \pi^+\bar{\Lambda}_c^-,$<br>$D^+ \rightarrow \pi^0\pi^+\bar{K}^*, \bar{\Lambda}_c^- \rightarrow \pi^0\pi^-K^+\bar{p}, \bar{K}^* \rightarrow \pi^+K^-$<br>$(e^+e^- \rightarrow \pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^+K^+K^+K^-n\bar{p}\gamma\gamma\gamma\gamma)$   | 72     | 72        | 1     | 73        |
| 74    | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow e^+\nu_e D^{*-}, \bar{B}^0 \rightarrow \pi^-\pi^-D^{*+}\bar{n}\Delta^+, D^{*-} \rightarrow \pi^-\bar{D}^0, D^{*+} \rightarrow \pi^+D^0,$<br>$\Delta^+ \rightarrow \pi^0p, \bar{D}^0 \rightarrow e^-\bar{\nu}_e\pi^+K^0, D^0 \rightarrow K^-a_1^+, K^0 \rightarrow K_L, a_1^+ \rightarrow \pi^+f_0(600)$<br>$(e^+e^- \rightarrow e^+e^-\nu_e\bar{\nu}_e K_L \pi^+\pi^+\pi^-\pi^-\pi^-\pi^-K^-\bar{n}pf_0(600)\gamma\gamma)$  | 73     | 73        | 1     | 74        |
| 75    | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow K^{*+}\bar{D}^{*-}D^0, \bar{B}^0 \rightarrow D^{*+}D_{s0}^-, K^{*+} \rightarrow \pi^+K^0, \bar{D}^{*-} \rightarrow \pi^-\bar{D}^0,$<br>$D^0 \rightarrow \pi^0\pi^+K^-, D^{*+} \rightarrow \pi^0D^+, D_{s0}^- \rightarrow \pi^0D_s^-, K^0 \rightarrow K_L, \bar{D}^0 \rightarrow \rho^-K^{*+}, D^+ \rightarrow \mu^+\nu_\mu\pi^+K^-,$<br>$D_s^- \rightarrow K^*K^-, \rho^- \rightarrow \pi^0\pi^-, K^{*+} \rightarrow \pi^0K^+, K^* \rightarrow \pi^0K^0, K^0 \rightarrow K_L$<br>$(e^+e^- \rightarrow \mu^+\nu_\mu K_L K_L \pi^+\pi^+\pi^-\pi^-\pi^-K^+K^-K^-K^-\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma)$  | 74     | 74        | 1     | 75        |
| 76    | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow \mu^+\nu_\mu\bar{D}^{*-}, \bar{B}^0 \rightarrow \pi^0\pi^+\pi^-\rho^+\bar{D}^{*-}D^{*0}, \bar{D}^{*-} \rightarrow \pi^0D^-, \rho^+ \rightarrow \pi^0\pi^+,$<br>$\bar{D}^{*-} \rightarrow \pi^0D^-, D^{*0} \rightarrow \pi^0D^0, D^- \rightarrow K_L\pi^-K^+K^-, D^- \rightarrow \pi^0\pi^-\pi^-K^+, D^0 \rightarrow \pi^0\pi^+K^-$<br>$(e^+e^- \rightarrow \mu^+\nu_\mu K_L \pi^+\pi^+\pi^-\pi^-\pi^-\pi^-K^+K^+K^-K^-\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma)$  | 75     | 75        | 1     | 76        |
| 77    | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow \pi^0\rho^+\omega\omega D^-, \bar{B}^0 \rightarrow K^-D^{*+}\bar{D}^{*0}, \rho^+ \rightarrow \pi^0\pi^+, \omega \rightarrow \pi^+\pi^-,$<br>$\omega \rightarrow \pi^0\pi^+\pi^-, D^- \rightarrow \pi^0K_L\pi^-, D^{*+} \rightarrow \pi^0D^+, \bar{D}^{*0} \rightarrow \pi^0\bar{D}^0, D^+ \rightarrow \pi^+\bar{K}_1'^0, \bar{D}^0 \rightarrow \rho^-K^{*+},$<br>$\bar{K}_1'^0 \rightarrow \pi^+K^{*-}, \rho^- \rightarrow \pi^0\pi^-, K^{*+} \rightarrow \pi^+K^0, K^{*-} \rightarrow \pi^-\bar{K}^0, K^0 \rightarrow K_L, \bar{K}^0 \rightarrow K_S,$<br>$K_S \rightarrow \pi^0\pi^0$<br>$(e^+e^- \rightarrow K_L K_L \pi^+\pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-\pi^-K^-\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma)$ | 76     | 76        | 1     | 77        |
| 78    | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow \bar{B}^0\bar{B}^0, \bar{B}^0 \rightarrow e^-\bar{\nu}_e D^{*+}, \bar{B}^0 \rightarrow \pi^0\pi^+\pi^-\rho^-\omega K^0 D^{*+}, D^{*+} \rightarrow \pi^+D^0, \rho^- \rightarrow \pi^0\pi^-,$<br>$\omega \rightarrow \pi^0\pi^+\pi^-, \bar{K}^0 \rightarrow K_S, D^{*+} \rightarrow \pi^+D^0, D^0 \rightarrow \pi^0\eta K_S, D^0 \rightarrow \mu^+\nu_\mu K^{*-}, \eta \rightarrow \gamma\gamma,$<br>$K_S \rightarrow \pi^+\pi^-, K^{*-} \rightarrow \pi^-\bar{K}^0, \bar{K}^0 \rightarrow K_S, K_S \rightarrow \pi^+\pi^-$<br>$(e^+e^- \rightarrow e^-\bar{\nu}_e\mu^+\nu_\mu\pi^+\pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-\pi^-\pi^-K_S\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma)$  | 77     | 77        | 1     | 78        |
| 79    | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow e^+\nu_e\eta D^-, \bar{B}^0 \rightarrow \rho^0\pi^-D^{*+}, \eta \rightarrow \pi^0\pi^+\pi^-, D^- \rightarrow e^-\bar{\nu}_e K_1^0,$<br>$\rho^0 \rightarrow \pi^+\pi^-, D^{*+} \rightarrow \pi^+D^0, K_1^0 \rightarrow \pi^0\pi^-K^+, D^0 \rightarrow e^+\nu_e K^-$<br>$(e^+e^- \rightarrow e^+e^+e^-\nu_e\bar{\nu}_e\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-K^+K^-\gamma\gamma\gamma\gamma)$   | 78     | 78        | 1     | 79        |
| 80    | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow \rho^0\pi^+\pi^-\rho^+\eta\bar{D}^{*-}, \bar{B}^0 \rightarrow \mu^-\bar{\nu}_\mu D^{*+}, \rho^0 \rightarrow \pi^+\pi^-, \rho^+ \rightarrow \pi^0\pi^+,$<br>$\eta \rightarrow \pi^0\pi^+\pi^-, \eta \rightarrow \pi^0\pi^+\pi^-, \bar{D}^{*-} \rightarrow \pi^-\bar{D}^0, D^{*+} \rightarrow \pi^0D^+, \bar{D}^0 \rightarrow \pi^-K^+, D^+ \rightarrow e^+\nu_e\bar{K}^*,$<br>$\bar{K}^* \rightarrow \pi^+K^-$<br>$(e^+e^- \rightarrow e^+\nu_e\mu^-\bar{\nu}_\mu\pi^+\pi^+\pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-\pi^-\pi^-K^+K^-\gamma\gamma\gamma\gamma\gamma\gamma\gamma)$  | 79     | 79        | 1     | 80        |



| index | event tree<br>(event initial-final states)  | iEvtTr | iEvtIFSts | nEvts | nCmltEvts |
|-------|---|--------|-----------|-------|-----------|
| 91    | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow \pi^0\pi^+\pi^-\rho^+D^-, \bar{B}^0 \rightarrow \mu^-\bar{\nu}_\mu D^{*+}, \rho^+ \rightarrow \pi^0\pi^+, D^- \rightarrow \mu^-\bar{\nu}_\mu\pi^-K^+,$<br>$D^{*+} \rightarrow \pi^0D^+, D^+ \rightarrow \pi^+\pi^+K^-$<br>$(e^+e^- \rightarrow \mu^-\mu^-\bar{\nu}_\mu\pi^+\pi^+\pi^+\pi^-\pi^-K^+K^-\gamma\gamma\gamma\gamma\gamma)$  | 90     | 90        | 1     | 91        |
| 92    | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow \pi^-K^{*+}J/\psi, \bar{B}^0 \rightarrow \pi^0\pi^+K^-\eta_c(2S), K^{*+} \rightarrow \pi^0K^+, J/\psi \rightarrow e^+e^-,$<br>$\pi^0 \rightarrow e^+e^-, \eta_c(2S) \rightarrow \eta\Sigma^+\bar{\Sigma}^-, \eta \rightarrow \pi^0\pi^0\pi^0, \Sigma^+ \rightarrow \pi^+n, \bar{\Sigma}^- \rightarrow \pi^0\bar{p}$<br>$(e^+e^- \rightarrow e^+e^+e^-e^-\pi^+\pi^+\pi^-K^+K^-n\bar{p}\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma)$  | 91     | 91        | 1     | 92        |
| 93    | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, \bar{B}^0 \rightarrow K^0\psi', B^0 \rightarrow \pi^-\rho^+D^+, K^0 \rightarrow K_S, \psi' \rightarrow \pi^0\pi^0J/\psi,$<br>$\rho^+ \rightarrow \pi^0\pi^+, \rho^- \rightarrow \pi^0\pi^-, D^+ \rightarrow \bar{K}^*a_1^+, K_S \rightarrow \pi^+\pi^-, J/\psi \rightarrow \mu^+\mu^-, \bar{K}^* \rightarrow \pi^+K^-,$<br>$a_1^+ \rightarrow \pi^+f_0(600)$<br>$(e^+e^- \rightarrow \mu^+\mu^-\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-K^-f_0(600)\gamma\gamma\gamma\gamma\gamma\gamma\gamma)$   | 92     | 92        | 1     | 93        |
| 94    | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow \rho^0\rho^+\bar{D}^{*-}, \bar{B}^0 \rightarrow \pi^-K^0D^+, \rho^0 \rightarrow \pi^+\pi^-, \rho^+ \rightarrow \pi^0\pi^+,$<br>$\bar{D}^{*-} \rightarrow \pi^-\bar{D}^0, K^0 \rightarrow K_L, D^+ \rightarrow K_La_1^+, \bar{D}^0 \rightarrow \pi^-K^+, a_1^+ \rightarrow \pi^+f_0(600)$<br>$(e^+e^- \rightarrow K_LK_L\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-K^+f_0(600)\gamma\gamma)$   | 93     | 93        | 1     | 94        |
| 95    | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow \rho^+\omega D^-, \bar{B}^0 \rightarrow \pi^0\omega K^0K^-D^+, \rho^+ \rightarrow \pi^0\pi^+, \omega \rightarrow \pi^0\pi^+\pi^-,$<br>$D^- \rightarrow \pi^-\pi^-K^+, \pi^0 \rightarrow e^+e^-, \omega \rightarrow \pi^0\pi^+\pi^-, K^0 \rightarrow K_S, D^+ \rightarrow \mu^+\nu_\mu\bar{K}^*, K_S \rightarrow \pi^+\pi^-,$<br>$\bar{K}^* \rightarrow \pi^+K^-$<br>$(e^+e^- \rightarrow e^+e^-\mu^+\nu_\mu\pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-K^+K^-K^-\gamma\gamma\gamma\gamma\gamma)$   | 94     | 94        | 1     | 95        |
| 96    | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow e^+\nu_e\bar{D}^{*-}, \bar{B}^0 \rightarrow e^-\bar{\nu}_eD^{*+}, \bar{D}^{*-} \rightarrow \pi^-\bar{D}^0, D^{*+} \rightarrow \pi^+D^0,$<br>$\bar{D}^0 \rightarrow K^+a_1^-, D^0 \rightarrow \pi^0\pi^+K^-, a_1^- \rightarrow \pi^-f_0(600)$<br>$(e^+e^- \rightarrow e^+e^-\nu_e\bar{\nu}_e\pi^+\pi^+\pi^-\pi^-K^+K^-f_0(600)\gamma\gamma)$  | 95     | 95        | 1     | 96        |
| 97    | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow K^{*+}\bar{D}^{*-}, \bar{B}^0 \rightarrow \pi^0\pi^-\bar{D}^{*+}\Delta^+\Delta^+, K^{*+} \rightarrow \pi^+K^0, \bar{D}^{*-} \rightarrow \pi^-\bar{D}^0,$<br>$D^{*+} \rightarrow \pi^+D^0, \Delta^+ \rightarrow \pi^+n, \bar{\Delta}^+ \rightarrow \pi^0\bar{p}, K^0 \rightarrow K_L, \bar{D}^0 \rightarrow \pi^0\pi^-K^+, D^0 \rightarrow \pi^+\pi^-K_S,$<br>$K_S \rightarrow \pi^+\pi^-$<br>$(e^+e^- \rightarrow K_L\pi^+\pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-K^+n\bar{p}\gamma\gamma\gamma\gamma\gamma)$  | 96     | 96        | 1     | 97        |
| 98    | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow D_2^{*-}D_s^{*+}, \bar{B}^0 \rightarrow \pi^+\pi^-D^+D_s^-, D_2^{*-} \rightarrow \pi^0\bar{D}^{*-}, D_s^{*+} \rightarrow D_s^+\gamma,$<br>$D^+ \rightarrow \pi^+\bar{K}_1'^0, D_s^- \rightarrow e^-\bar{\nu}_e\eta', \bar{D}^{*-} \rightarrow \pi^-\bar{D}^0, D_s^+ \rightarrow \pi^+\phi, \bar{K}_1'^0 \rightarrow \pi^+K^{*-}, \eta' \rightarrow \pi^0\pi^0\eta,$<br>$\bar{D}^0 \rightarrow \pi^-\omega K^+, \phi \rightarrow \pi^-\rho^+, K^{*-} \rightarrow \pi^-\bar{K}^0, \eta \rightarrow \pi^0\pi^+\pi^-, \omega \rightarrow \pi^0\pi^+\pi^-, \rho^+ \rightarrow \pi^0\pi^+,$<br>$\bar{K}^0 \rightarrow K_S, K_S \rightarrow \pi^0\pi^0$<br>$(e^+e^- \rightarrow e^-\bar{\nu}_e\pi^+\pi^+\pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-\pi^-\pi^-K^+\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma)$ | 97     | 97        | 1     | 98        |
| 99    | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow K_L\eta_c, \bar{B}^0 \rightarrow \pi^-\pi^-\rho^+D^{*+}, \eta_c \rightarrow \pi^0K^0\bar{K}^0\bar{K}^*K^*, \rho^+ \rightarrow \pi^0\pi^+,$<br>$D^{*+} \rightarrow \pi^0D^+, K^0 \rightarrow K_S, \bar{K}^0 \rightarrow K_L, \bar{K}^0 \rightarrow K_S, K^* \rightarrow \pi^-K^+, D^+ \rightarrow \pi^0\pi^+K_S,$<br>$K_S \rightarrow \pi^0\pi^0, K_S \rightarrow \pi^+\pi^-, K_S \rightarrow \pi^+\pi^-$<br>$(e^+e^- \rightarrow K_LK_L\pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-\pi^-K^+\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma)$  | 98     | 98        | 1     | 99        |
| 100   | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow \pi^0\pi^0\rho^0\pi^+\bar{D}^{*-}, \bar{B}^0 \rightarrow K^*K^-D^+, \rho^0 \rightarrow \pi^+\pi^-, \bar{D}^{*-} \rightarrow \pi^-\bar{D}^0,$<br>$K^* \rightarrow \pi^0K^0, D^+ \rightarrow \pi^+\pi^+K^-, \bar{D}^0 \rightarrow \pi^-\rho^+, K^0 \rightarrow K_S, \rho^+ \rightarrow \pi^0\pi^+, K_S \rightarrow \pi^0\pi^0$<br>$(e^+e^- \rightarrow \pi^+\pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-K^-K^-\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma)$   | 99     | 99        | 1     | 100       |







| index | event tree<br>(event initial-final states)   | iEvtTr | iEvtIFSts | nEvts | nCmltEvts |
|-------|--|--------|-----------|-------|-----------|
| 132   | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow \bar{B}^0 \bar{B}^0, \bar{B}^0 \rightarrow \rho^- D^+, \bar{B}^0 \rightarrow \rho^0 \pi^- \omega D^+, \rho^- \rightarrow \pi^0 \pi^-, D^+ \rightarrow e^+ \nu_e \pi^+ K^-,$<br>$\rho^0 \rightarrow \pi^+ \pi^-, \omega \rightarrow \pi^0 \pi^+ \pi^-, D^+ \rightarrow \pi^+ \pi^+ K^-$<br>$(e^+e^- \rightarrow e^+ \nu_e \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- K^- K^- \gamma \gamma \gamma \gamma)$  | 131    | 131       | 1     | 132       |
| 133   | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \bar{D}^{*-} D_s^+, B^0 \rightarrow e^+ \nu_e D_2^{*-}, \bar{D}^{*-} \rightarrow \pi^0 D^-, D_s^+ \rightarrow \mu^+ \nu_\mu \phi,$<br>$D_2^{*-} \rightarrow \pi^- \bar{D}^{*0}, D^- \rightarrow e^- \bar{\nu}_e \pi^- K^+, \phi \rightarrow K^+ K^-, \bar{D}^{*0} \rightarrow \bar{D}^0 \gamma, \bar{D}^0 \rightarrow K^+ a_1^-, a_1^- \rightarrow \rho^0 \pi^-,$<br>$\rho^0 \rightarrow \pi^+ \pi^-$<br>$(e^+e^- \rightarrow e^+ e^- \nu_e \bar{\nu}_e \mu^+ \nu_\mu \pi^+ \pi^- \pi^- \pi^- K^+ K^+ K^+ K^- \gamma \gamma \gamma)$   | 132    | 132       | 1     | 133       |
| 134   | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \pi^+ \pi^- \rho^+ \bar{D}^{*-}, \bar{B}^0 \rightarrow D_2^{*+} D_s^-, \rho^+ \rightarrow \pi^0 \pi^+, \bar{D}^{*-} \rightarrow \pi^- \bar{D}^0,$<br>$D_2^{*+} \rightarrow \pi^+ D^0, D_s^- \rightarrow \tau^- \bar{\nu}_\tau, \bar{D}^0 \rightarrow \pi^0 K_L \pi^+ \pi^-, D^0 \rightarrow \rho^+ K^{*-}, \tau^- \rightarrow \nu_\tau \pi^0 \pi^-, \rho^+ \rightarrow \pi^0 \pi^+,$<br>$K^{*-} \rightarrow \pi^- \bar{K}^0, \bar{K}^0 \rightarrow K_L$<br>$(e^+e^- \rightarrow \nu_\tau \bar{\nu}_\tau K_L K_L \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$   | 133    | 133       | 1     | 134       |
| 135   | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \pi^0 \omega K^+ D_s^-, B^0 \rightarrow \mu^- \bar{\nu}_\mu D^{*+}, \omega \rightarrow \pi^0 \pi^+ \pi^-, D_s^- \rightarrow D_s^- \gamma,$<br>$D^{*+} \rightarrow \pi^+ D^0, D_s^- \rightarrow \rho^- \eta', D^0 \rightarrow \pi^+ \pi^+ \pi^- K^-, \rho^- \rightarrow \pi^0 \pi^-, \eta' \rightarrow \rho^0 \gamma, \rho^0 \rightarrow \pi^+ \pi^-$<br>$(e^+e^- \rightarrow \mu^- \bar{\nu}_\mu \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- K^+ K^- \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$  | 134    | 134       | 1     | 135       |
| 136   | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow D_s^{*+} D_1'^-, \bar{B}^0 \rightarrow \rho^0 \pi^- D^{*+}, D_s^{*+} \rightarrow D_s^+ \gamma, D_1'^- \rightarrow \pi^- \bar{D}^{*0},$<br>$\rho^0 \rightarrow \pi^+ \pi^-, D^{*+} \rightarrow \pi^+ D^0, D_s^+ \rightarrow K_L \pi^+ \pi^- K^+, \bar{D}^{*0} \rightarrow \bar{D}^0 \gamma, D^0 \rightarrow K^- a_1^+, \bar{D}^0 \rightarrow \pi^0 \pi^+ \pi^- K^*,$<br>$a_1^+ \rightarrow \pi^+ f_0(600), K^* \rightarrow \pi^- K^+$<br>$(e^+e^- \rightarrow K_L \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- K^+ K^+ K^- f_0(600) \gamma \gamma \gamma \gamma)$  | 135    | 135       | 1     | 136       |
| 137   | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \rho^0 \pi^- \rho^+ \rho^+ K^0 D^-, \bar{B}^0 \rightarrow \pi^0 \rho^0 \pi^- \eta \omega D^+, \rho^0 \rightarrow \pi^+ \pi^-, \rho^+ \rightarrow \pi^0 \pi^+,$<br>$\rho^+ \rightarrow \pi^0 \pi^+, K^0 \rightarrow K_S, D^- \rightarrow K_L \pi^+ \pi^- K^-, \pi^0 \rightarrow e^+ e^-, \rho^0 \rightarrow \pi^+ \pi^-, \eta \rightarrow \pi^+ \pi^-,$<br>$\omega \rightarrow \pi^0 \pi^+ \pi^-, D^+ \rightarrow K_L a_1^+, K_S \rightarrow \pi^+ \pi^-, a_1^+ \rightarrow \pi^0 \rho^+, \rho^+ \rightarrow \pi^0 \pi^+$<br>$(e^+e^- \rightarrow e^+ e^- K_L K_L \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- \pi^- \pi^- K^- \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$                                  | 136    | 136       | 1     | 137       |
| 138   | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \pi^0 \pi^0 K^+ D_s^{*-}, \bar{B}^0 \rightarrow D^{*0} n \bar{n}, D_s^{*-} \rightarrow D_s^- \gamma, D^{*0} \rightarrow \pi^0 D^0,$<br>$D_s^- \rightarrow \rho^- \eta', D^0 \rightarrow \pi^+ K^-, \rho^- \rightarrow \pi^0 \pi^-, \eta' \rightarrow \rho^0 \gamma, \rho^0 \rightarrow \pi^+ \pi^-$<br>$(e^+e^- \rightarrow \pi^+ \pi^+ \pi^- \pi^- K^+ K^- n \bar{n} \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$   | 137    | 137       | 1     | 138       |
| 139   | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow e^+ \nu_e D^-, \bar{B}^0 \rightarrow K^+ \Delta^+ \bar{\Sigma}_c^{*-}, D^- \rightarrow K_L \pi^+ \pi^- K^-, \Delta^+ \rightarrow \pi^0 p,$<br>$\bar{\Sigma}_c^{*-} \rightarrow \pi^- \bar{\Lambda}_c^-, \bar{\Lambda}_c^- \rightarrow \pi^0 \pi^- \bar{\Delta}^0, \bar{\Delta}^0 \rightarrow \pi^+ \bar{p}$<br>$(e^+e^- \rightarrow e^+ \nu_e K_L \pi^+ \pi^+ \pi^- \pi^- \pi^- K^+ K^- p \bar{p} \gamma \gamma \gamma \gamma)$  | 138    | 138       | 1     | 139       |
| 140   | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \rho^+ \rho^+ \rho^- \eta \bar{D}^{*-}, \bar{B}^0 \rightarrow \pi^0 \pi^+ \pi^+ \pi^- \pi^- \bar{K}^0 K^+ K^+ K^{*-}, \rho^+ \rightarrow \pi^0 \pi^+, \rho^+ \rightarrow \pi^0 \pi^+,$<br>$\rho^- \rightarrow \pi^0 \pi^-, \eta \rightarrow \pi^0 \pi^+ \pi^-, \bar{D}^{*-} \rightarrow \pi^0 D^-, \bar{K}^0 \rightarrow K_S, K^* \rightarrow \pi^- K^+, K^{*-} \rightarrow \pi^- \bar{K}^0,$<br>$D^- \rightarrow e^- \bar{\nu}_e K^*, K_S \rightarrow \pi^+ \pi^-, \bar{K}^0 \rightarrow K_S, K^* \rightarrow \pi^- K^+, K_S \rightarrow \pi^+ \pi^-$<br>$(e^+e^- \rightarrow e^- \bar{\nu}_e \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- \pi^- \pi^- K^+ K^+ K^+ \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$ | 139    | 139       | 1     | 140       |
| 141   | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \mu^+ \nu_\mu \bar{D}^{*-}, \bar{B}^0 \rightarrow \pi^0 \rho^0 \pi^- D^+, \bar{D}^{*-} \rightarrow \pi^- \bar{D}^0, \rho^0 \rightarrow \pi^+ \pi^-,$<br>$D^+ \rightarrow \pi^0 \pi^+ \bar{K}^*, \bar{D}^0 \rightarrow e^- \bar{\nu}_e K^+, \bar{K}^* \rightarrow \pi^0 \bar{K}^0, \bar{K}^0 \rightarrow K_S, K_S \rightarrow \pi^+ \pi^-$<br>$(e^+e^- \rightarrow e^- \bar{\nu}_e \mu^+ \nu_\mu \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- K^+ \gamma \gamma \gamma \gamma \gamma \gamma)$  | 140    | 140       | 1     | 141       |



| index | event tree<br>(event initial-final states)   | iEvtTr | iEvtIFSts | nEvts | nCmltEvts |
|-------|--|--------|-----------|-------|-----------|
| 142   | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow D^-D_s^{*+}\gamma, \bar{B}^0 \rightarrow \pi^+\pi^-\rho^-D^+, D^- \rightarrow \pi^0\pi^-K^+K^-, D_s^{*+} \rightarrow D_s^+\gamma,$<br>$\rho^- \rightarrow \pi^0\pi^-, D^+ \rightarrow \mu^+\nu_\mu\bar{K}^*, D_s^+ \rightarrow \bar{K}^*K^{*+}, \bar{K}^* \rightarrow \pi^+K^-, \bar{K}^* \rightarrow \pi^+K^-, K^{*+} \rightarrow \pi^0K^+$<br>$(e^+e^- \rightarrow \mu^+\nu_\mu\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-K^+K^+K^-K^-K^-\gamma\gamma\gamma\gamma\gamma\gamma)$  | 141    | 141       | 1     | 142       |
| 143   | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow \rho^+n\bar{\Sigma}_c^-, \bar{B}^0 \rightarrow D^{*+}D_{s1}^{\prime-}, \rho^+ \rightarrow \pi^0\pi^+, \bar{\Sigma}_c^- \rightarrow \pi^0\bar{\Lambda}_c^-,$<br>$D^{*+} \rightarrow \pi^+D^0, D_{s1}^{\prime-} \rightarrow \pi^0D_s^{*-}, \bar{\Lambda}_c^- \rightarrow \bar{K}^*\bar{\Sigma}^-, D^0 \rightarrow \pi^0\pi^+K^-, D_s^{*-} \rightarrow D_s^-\gamma, \bar{K}^* \rightarrow \pi^+K^-,$<br>$\bar{\Sigma}^- \rightarrow \pi^-\bar{n}, D_s^- \rightarrow K^*K^-, K^* \rightarrow \pi^-K^+$<br>$(e^+e^- \rightarrow \pi^+\pi^+\pi^+\pi^+\pi^-\pi^-K^+K^-K^-K^-n\bar{n}\gamma\gamma\gamma\gamma\gamma\gamma\gamma)$       | 142    | 142       | 1     | 143       |
| 144   | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow \bar{B}^0\bar{B}^0, \bar{B}^0 \rightarrow \mu^-\bar{\nu}_\mu D^+, \bar{B}^0 \rightarrow \bar{K}^*K^-D^{*+}, D^+ \rightarrow K_S K^{*+}, \bar{K}^* \rightarrow \pi^+K^-,$<br>$D^{*+} \rightarrow \pi^0D^+, K_S \rightarrow \pi^+\pi^-, K^{*+} \rightarrow \pi^0K^+, D^+ \rightarrow \pi^0\pi^0\pi^+$<br>$(e^+e^- \rightarrow \mu^-\bar{\nu}_\mu\pi^+\pi^+\pi^+\pi^-K^+K^-K^-\gamma\gamma\gamma\gamma\gamma\gamma)$   | 143    | 143       | 1     | 144       |
| 145   | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow \pi^+\pi^+\pi^-\omega\bar{D}^{*-}, \bar{B}^0 \rightarrow \pi^0\pi^+\pi^-\pi^-D^{*+}, \omega \rightarrow \pi^0\pi^+\pi^-, \bar{D}^{*-} \rightarrow \pi^-\bar{D}^0,$<br>$D^{*+} \rightarrow \pi^+D^0, \bar{D}^0 \rightarrow e^-\bar{\nu}_e\pi^+K^0, D^0 \rightarrow \rho^+K^{*-}, K^0 \rightarrow K_S, \rho^+ \rightarrow \pi^0\pi^+, K^{*-} \rightarrow \pi^-\bar{K}^0,$<br>$K_S \rightarrow \pi^+\pi^-, \bar{K}^0 \rightarrow K_L$<br>$(e^+e^- \rightarrow e^-\bar{\nu}_eK_L\pi^+\pi^+\pi^+\pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-\pi^-\pi^-\gamma\gamma\gamma\gamma\gamma)$   | 144    | 144       | 1     | 145       |
| 146   | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow \pi^+K^0\bar{K}^*D^{*-}, \bar{B}^0 \rightarrow \pi^+K^-D^-D^{*+}, K^0 \rightarrow K_L, \bar{K}^* \rightarrow \pi^+K^-,$<br>$\bar{D}^{*-} \rightarrow \pi^-\bar{D}^0, D^- \rightarrow K_S a_1^-, D^{*+} \rightarrow \pi^+D^0, \bar{D}^0 \rightarrow K_S\eta', K_S \rightarrow \pi^+\pi^-, a_1^- \rightarrow \rho^0\pi^-,$<br>$D^0 \rightarrow \pi^0\pi^0\pi^+\pi^-, K_S \rightarrow \pi^+\pi^-, \eta' \rightarrow \rho^0\gamma, \rho^0 \rightarrow \pi^+\pi^-, \rho^0 \rightarrow \pi^+\pi^-$<br>$(e^+e^- \rightarrow K_L\pi^+\pi^+\pi^+\pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-\pi^-\pi^-K^-K^-\gamma\gamma\gamma\gamma\gamma)$ | 145    | 145       | 1     | 146       |
| 147   | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, \bar{B}^0 \rightarrow \rho^-D_2^{*+}, \bar{B}^0 \rightarrow \rho^0\pi^+K^{*-}\eta_c, \rho^- \rightarrow \pi^0\pi^-, D_2^{*+} \rightarrow \pi^+D^0,$<br>$\rho^0 \rightarrow \pi^+\pi^-, K^{*-} \rightarrow \pi^-\bar{K}^0, \eta_c \rightarrow \pi^0\pi^+\pi^-\omega, D^0 \rightarrow \pi^+\omega K^-, \bar{K}^0 \rightarrow K_L, \omega \rightarrow \pi^0\pi^+\pi^-,$<br>$\omega \rightarrow \pi^0\pi^+\pi^-$<br>$(e^+e^- \rightarrow K_L\pi^+\pi^+\pi^+\pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-\pi^-\pi^-K^-\gamma\gamma\gamma\gamma\gamma\gamma\gamma)$  | 146    | 146       | 1     | 147       |
| 148   | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow \rho^0\pi^+\pi^+\rho^-D^-, \bar{B}^0 \rightarrow D_s^{*-}D_1^+, \rho^0 \rightarrow \pi^+\pi^-, \rho^- \rightarrow \pi^0\pi^-,$<br>$D^- \rightarrow \mu^-\bar{\nu}_\mu K^0, D_s^{*-} \rightarrow D_s^-\gamma, D_1^+ \rightarrow \pi^+D^{*0}, K^0 \rightarrow K_S, D_s^- \rightarrow \pi^+\pi^-K_S K^-, D^{*0} \rightarrow D^0\gamma,$<br>$K_S \rightarrow \pi^+\pi^-, K_S \rightarrow \pi^+\pi^-, D^0 \rightarrow \pi^+\omega K^-, \omega \rightarrow \pi^0\pi^+\pi^-$<br>$(e^+e^- \rightarrow \mu^-\bar{\nu}_\mu\pi^+\pi^+\pi^+\pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-\pi^-\pi^-K^-K^-\gamma\gamma\gamma\gamma\gamma)$         | 147    | 147       | 1     | 148       |
| 149   | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow \pi^0\rho^0\pi^+D^-, \bar{B}^0 \rightarrow \pi^+\pi^-\pi^-D^+, \rho^0 \rightarrow \pi^+\pi^-, D^- \rightarrow \pi^-K_1^{\prime 0},$<br>$D^+ \rightarrow K_S a_1^+, K_1^{\prime 0} \rightarrow \pi^-K^{*+}, K_S \rightarrow \pi^+\pi^-, a_1^+ \rightarrow \pi^0\rho^+, K^{*+} \rightarrow \pi^0K^+, \rho^+ \rightarrow \pi^0\pi^+$<br>$(e^+e^- \rightarrow \pi^+\pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-\pi^-\pi^-K^+\gamma\gamma\gamma\gamma\gamma\gamma\gamma)$  | 148    | 148       | 1     | 149       |
| 150   | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow \tau^+\nu_\tau D_0^{*-}, \bar{B}^0 \rightarrow \pi^0\omega K^*K^-D^+, \tau^+ \rightarrow \mu^+\nu_\mu\bar{\nu}_\tau, D_0^{*-} \rightarrow \pi^-\bar{D}^0,$<br>$\omega \rightarrow \pi^0\pi^+\pi^-, K^* \rightarrow \pi^0K^0, D^+ \rightarrow \pi^+\pi^+K^-, \bar{D}^0 \rightarrow \pi^0\pi^-K^+, K^0 \rightarrow K_L$<br>$(e^+e^- \rightarrow \mu^+\nu_\mu\bar{\nu}_\tau K_L\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-\pi^-K^+K^-K^-\gamma\gamma\gamma\gamma\gamma\gamma\gamma)$   | 149    | 149       | 1     | 150       |
| 151   | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow e^+\nu_e\pi^+\pi^-\bar{D}^{*-}, \bar{B}^0 \rightarrow e^-\bar{\nu}_e D^{*+}, \bar{D}^{*-} \rightarrow \pi^-\bar{D}^0, D^{*+} \rightarrow \pi^0D^+,$<br>$\bar{D}^0 \rightarrow \pi^-K^+, D^+ \rightarrow \mu^+\nu_\mu\pi^+K^-$<br>$(e^+e^- \rightarrow e^+e^-\nu_e\bar{\nu}_e\mu^+\nu_\mu\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-K^+K^-\gamma\gamma)$  | 150    | 150       | 1     | 151       |



| index | event tree<br>(event initial-final states)   | iEvtTr | iEvtIFSts | nEvts | nCmltEvts |
|-------|--|--------|-----------|-------|-----------|
| 163   | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \pi^+ \omega D^{*-}, \bar{B}^0 \rightarrow D^{*+} D_s^-, \omega \rightarrow \pi^0 \pi^+ \pi^-, \bar{D}^{*-} \rightarrow \pi^- \bar{D}^0,$<br>$D^{*+} \rightarrow \pi^0 D^+, D_s^- \rightarrow \mu^- \bar{\nu}_\mu \eta', \bar{D}^0 \rightarrow \pi^0 \pi^+ \pi^- K_S, D^+ \rightarrow \pi^+ \pi^+ K^-, \eta' \rightarrow \rho^0 \gamma, K_S \rightarrow \pi^+ \pi^-,$<br>$\rho^0 \rightarrow \pi^+ \pi^-$<br>$(e^+e^- \rightarrow \mu^- \bar{\nu}_\mu \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- K^- \gamma \gamma \gamma \gamma \gamma \gamma)$  | 162    | 162       | 1     | 163       |
| 164   | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \pi^0 \Sigma^0 \Xi_c^0, \bar{B}^0 \rightarrow D^+ D_{s1}^-, \Sigma^0 \rightarrow \Lambda \gamma, \Xi_c^0 \rightarrow \pi^- K^+ \Sigma^0,$<br>$D^+ \rightarrow \mu^+ \nu_\mu \bar{K}^*, D_{s1}^- \rightarrow \pi^0 D_s^{*-}, \Lambda \rightarrow \pi^- p, \bar{\Sigma}^0 \rightarrow \bar{\Lambda} \gamma, \bar{K}^* \rightarrow \pi^+ K^-, D_s^{*-} \rightarrow D_s^- \gamma,$<br>$\bar{\Lambda} \rightarrow \pi^+ \bar{p}, D_s^- \rightarrow \rho^- \eta', \rho^- \rightarrow \pi^0 \pi^-, \eta' \rightarrow \pi^+ \pi^- \eta, \eta \rightarrow \gamma \gamma$<br>$(e^+e^- \rightarrow \mu^+ \nu_\mu \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- K^+ K^- p \bar{p} \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$ | 163    | 163       | 1     | 164       |
| 165   | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \rho^0 \eta \omega D^{*0}, \bar{B}^0 \rightarrow \pi^0 \rho^- \omega D^{*+}, \rho^0 \rightarrow \pi^+ \pi^-, \eta \rightarrow \pi^0 \pi^+ \pi^-,$<br>$\omega \rightarrow \pi^0 \pi^+ \pi^-, \bar{D}^{*0} \rightarrow \pi^0 \bar{D}^0, \rho^- \rightarrow \pi^0 \pi^-, \omega \rightarrow \pi^0 \pi^+ \pi^-, D^{*+} \rightarrow \pi^+ D^0, \bar{D}^0 \rightarrow \pi^0 \pi^- K^+,$<br>$D^0 \rightarrow e^+ \nu_e K^{*-}, K^{*-} \rightarrow \pi^- \bar{K}^0, \bar{K}^0 \rightarrow K_S, K_S \rightarrow \pi^+ \pi^-$<br>$(e^+e^- \rightarrow e^+ \nu_e \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- \pi^- K^+ \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$                                | 164    | 164       | 1     | 165       |
| 166   | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \bar{D}^{*-} \Delta^- \Delta^0, \bar{B}^0 \rightarrow \rho^- D^+, \bar{D}^{*-} \rightarrow \pi^0 D^-, \Delta^- \rightarrow \pi^+ \bar{n},$<br>$\Delta^0 \rightarrow \pi^0 n, \rho^- \rightarrow \pi^0 \pi^-, D^+ \rightarrow \mu^+ \nu_\mu \pi^+ K^-, D^- \rightarrow \mu^- \bar{\nu}_\mu K^0, K^0 \rightarrow K_L$<br>$(e^+e^- \rightarrow \mu^+ \mu^- \nu_\mu \bar{\nu}_\mu K_L \pi^+ \pi^+ \pi^- K^- n \bar{n} \gamma \gamma \gamma \gamma \gamma)$   | 165    | 165       | 1     | 166       |
| 167   | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \rho^- p \Sigma_c^0, \bar{B}^0 \rightarrow \tau^- \bar{\nu}_\tau D^{*+}, \rho^- \rightarrow \pi^0 \pi^-, \bar{\Sigma}_c^0 \rightarrow \pi^+ \bar{\Lambda}_c^-,$<br>$\tau^- \rightarrow \nu_\tau \pi^0 \pi^-, D^{*+} \rightarrow \pi^+ D^0, \bar{\Lambda}_c^- \rightarrow \pi^- \eta \bar{\Lambda}, D^0 \rightarrow K_S \phi, \eta \rightarrow e^+ e^-, \bar{\Lambda} \rightarrow \pi^0 \bar{n},$<br>$K_S \rightarrow \pi^+ \pi^-, \phi \rightarrow K^+ K^-$<br>$(e^+e^- \rightarrow e^+ e^- \nu_\tau \bar{\nu}_\tau \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- K^+ K^- \bar{n} p \gamma \gamma \gamma \gamma \gamma)$   | 166    | 166       | 1     | 167       |
| 168   | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \pi^+ K^{*-} J/\psi, \bar{B}^0 \rightarrow \bar{K}^0 D^{*0} \bar{D}^{*0}, K^{*-} \rightarrow \pi^- \bar{K}^0, J/\psi \rightarrow K^* \bar{K}^* \gamma,$<br>$\bar{K}^0 \rightarrow K_L, D^{*0} \rightarrow D^0 \gamma, \bar{D}^{*0} \rightarrow \bar{D}^0 \gamma, \bar{K}^0 \rightarrow K_L, K^* \rightarrow \pi^- K^+, \bar{K}^* \rightarrow \pi^+ K^-,$<br>$D^0 \rightarrow \pi^0 \pi^+ K^-, \bar{D}^0 \rightarrow \pi^0 \pi^+ \pi^- K^*, K^* \rightarrow \pi^- K^+$<br>$(e^+e^- \rightarrow K_L K_L \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- K^+ K^+ K^- K^- \gamma \gamma \gamma \gamma \gamma \gamma)$  | 167    | 167       | 1     | 168       |
| 169   | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \pi^- K^{*+} \bar{D}^0 \bar{D}^{*0}, \bar{B}^0 \rightarrow \pi^0 \pi^+ \pi^- \pi^- D^{*+}, K^{*+} \rightarrow \pi^+ K^0, \bar{D}^0 \rightarrow K^- a_1^+,$<br>$\bar{D}^{*0} \rightarrow \pi^0 \bar{D}^0, D^{*+} \rightarrow \pi^+ D^0, K^0 \rightarrow K_S, a_1^+ \rightarrow \pi^+ \pi^+ \pi^-, \bar{D}^0 \rightarrow \rho^- K^{*+}, D^0 \rightarrow \pi^+ K^-,$<br>$K_S \rightarrow \pi^+ \pi^-, \rho^- \rightarrow \pi^0 \pi^-, K^{*+} \rightarrow \pi^0 K^+$<br>$(e^+e^- \rightarrow \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- \pi^- K^+ K^- K^- \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$  | 168    | 168       | 1     | 169       |
| 170   | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \mu^+ \nu_\mu D^-, \bar{B}^0 \rightarrow \pi^+ \pi^+ \pi^- \pi^- \pi^- \eta K^+ K^+ D_s^{*-}, D^- \rightarrow \mu^- \bar{\nu}_\mu K^0, \eta \rightarrow \pi^0 \pi^+ \pi^-,$<br>$D_s^{*-} \rightarrow D_s^- \gamma, K^0 \rightarrow K_L, D_s^- \rightarrow \pi^0 \pi^+ \pi^+ \pi^- \pi^- \pi^-$<br>$(e^+e^- \rightarrow \mu^+ \mu^- \nu_\mu \bar{\nu}_\mu K_L \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- \pi^- K^+ K^+ \gamma \gamma \gamma \gamma \gamma)$  | 169    | 169       | 1     | 170       |
| 171   | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \pi^0 \bar{K}^0 D^- \Delta^0 \bar{\Sigma}^+, \bar{B}^0 \rightarrow \pi^0 \pi^+ \pi^+ \pi^- \rho^- \bar{D}^0, \bar{K}^0 \rightarrow K_L, D^- \rightarrow \pi^0 \pi^- K_S,$<br>$\Delta^0 \rightarrow \pi^0 n, \bar{\Sigma}^+ \rightarrow \pi^+ \bar{n}, \rho^- \rightarrow \pi^0 \pi^-, \bar{D}^0 \rightarrow \pi^- \rho^+, K_S \rightarrow \pi^0 \pi^0, \rho^+ \rightarrow \pi^0 \pi^+$<br>$(e^+e^- \rightarrow K_L \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- n \bar{n} \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$  | 170    | 170       | 1     | 171       |
| 172   | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0 \bar{B}^0, B^0 \rightarrow \mu^+ \nu_\mu \bar{D}^{*-}, \bar{B}^0 \rightarrow \pi^+ \rho^- \rho^- \omega D^{*+}, \bar{D}^{*-} \rightarrow \pi^- \bar{D}^0, \rho^- \rightarrow \pi^0 \pi^-,$<br>$\rho^- \rightarrow \pi^0 \pi^-, \omega \rightarrow \pi^0 \pi^+ \pi^-, D^{*+} \rightarrow \pi^0 D^+, \bar{D}^0 \rightarrow \pi^0 \pi^+ \pi^- K_S, D^+ \rightarrow K_S K^{*+}, K_S \rightarrow \pi^+ \pi^-,$<br>$K_S \rightarrow \pi^0 \pi^0, K^{*+} \rightarrow \pi^0 K^+$<br>$(e^+e^- \rightarrow \mu^+ \nu_\mu \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- \pi^- K^+ \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$   | 171    | 171       | 1     | 172       |





| index | event tree<br>(event initial-final states)   | iEvtTr | iEvtIFSts | nEvts | nCmltEvts |
|-------|--|--------|-----------|-------|-----------|
| 194   | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow e^+\nu_e D^-, \bar{B}^0 \rightarrow K^{*-}D^{*+}\bar{D}^0, D^- \rightarrow K^*K^-, K^{*-} \rightarrow \pi^- \bar{K}^0,$<br>$D^{*+} \rightarrow \pi^+ D^0, \bar{D}^0 \rightarrow \pi^0 \pi^- K^+, K^* \rightarrow \pi^- K^+, \bar{K}^0 \rightarrow K_L, D^0 \rightarrow \pi^+ \pi^-, K_L \rightarrow \pi^0 \pi^0 \pi^0$<br>$(e^+e^- \rightarrow e^+\nu_e \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- K^+ K^+ K^- \gamma \gamma \gamma \gamma \gamma \gamma)$   | 193    | 193       | 1     | 194       |
| 195   | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow J/\psi K_1^0, \bar{B}^0 \rightarrow \pi^0 D^+ D_s^{*-}, J/\psi \rightarrow \pi^0 \eta \eta, K_1^0 \rightarrow \pi^+ \pi^- K^0,$<br>$D^+ \rightarrow e^+\nu_e \bar{K}^0, D_s^{*-} \rightarrow D_s^- \gamma, \eta \rightarrow \gamma \gamma, \eta \rightarrow \gamma \gamma, K^0 \rightarrow K_S, \bar{K}^0 \rightarrow K_S,$<br>$D_s^- \rightarrow \rho^- \eta, K_S \rightarrow \pi^0 \pi^0, K_S \rightarrow \pi^+ \pi^-, \rho^- \rightarrow \pi^0 \pi^-, \eta \rightarrow \pi^0 \pi^0 \pi^0$<br>$(e^+e^- \rightarrow e^+\nu_e \pi^+ \pi^+ \pi^- \pi^- \pi^- \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$  | 194    | 194       | 1     | 195       |
| 196   | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow K^* D^+ D^-, \bar{B}^0 \rightarrow \bar{D}^{*-} \bar{\Delta}^- \Delta^0, K^* \rightarrow \pi^0 K^0, D^+ \rightarrow \pi^+ \bar{K}_1^{\prime 0},$<br>$D^- \rightarrow e^- \bar{\nu}_e K_2^{*0}, \bar{D}^{*-} \rightarrow \pi^- \bar{D}^0, \bar{\Delta}^- \rightarrow \pi^+ \bar{n}, \Delta^0 \rightarrow \pi^0 n, K^0 \rightarrow K_L, \bar{K}_1^{\prime 0} \rightarrow \pi^+ K^{*-},$<br>$K_2^{*0} \rightarrow \pi^0 K^0, \bar{D}^0 \rightarrow e^- \bar{\nu}_e \pi^+ K^0, K^{*-} \rightarrow \pi^0 K^-, K^0 \rightarrow K_S, K^0 \rightarrow K_L, K_S \rightarrow \pi^+ \pi^-$<br>$(e^+e^- \rightarrow e^- e^- \bar{\nu}_e \bar{\nu}_e K_L K_L \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- K^- n \bar{n} \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$ | 195    | 195       | 1     | 196       |
| 197   | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow \pi^0 \pi^- \eta \bar{D}^{*0} D_s^{*+}, \bar{B}^0 \rightarrow D^{*0} \Delta^0 \bar{\Delta}^0, \eta \rightarrow \gamma \gamma, \bar{D}^{*0} \rightarrow \bar{D}^0 \gamma,$<br>$D_s^{*+} \rightarrow D_s^+ \gamma, D^{*0} \rightarrow \pi^0 D^0, \Delta^0 \rightarrow \pi^0 n, \bar{\Delta}^0 \rightarrow \pi^0 \bar{n}, \bar{D}^0 \rightarrow \pi^0 \pi^- K^+, D_s^+ \rightarrow \mu^+ \nu_\mu,$<br>$D^0 \rightarrow e^+ \nu_e \pi^- \bar{K}^0, \pi^0 \rightarrow e^+ e^-, \bar{K}^0 \rightarrow K_S, K_S \rightarrow \pi^0 \pi^0$<br>$(e^+e^- \rightarrow e^+ e^+ e^- \nu_e \mu^+ \nu_\mu \pi^- \pi^- \pi^- K^+ n \bar{n} \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$   | 196    | 196       | 1     | 197       |
| 198   | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow \rho^0 \pi^+ \omega \bar{D}^{*-}, \bar{B}^0 \rightarrow D^0 n \bar{n}, \rho^0 \rightarrow \pi^+ \pi^-, \omega \rightarrow \pi^0 \pi^+ \pi^-,$<br>$\bar{D}^{*-} \rightarrow \pi^- \bar{D}^0, D^0 \rightarrow K_L \eta, \bar{D}^0 \rightarrow \pi^0 \pi^- K^+, \eta \rightarrow \gamma \gamma$<br>$(e^+e^- \rightarrow K_L \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- K^+ n \bar{n} \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$  | 197    | 197       | 1     | 198       |
| 199   | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow \mu^+ \nu_\mu \bar{D}^{*-}, \bar{B}^0 \rightarrow \rho^0 \pi^+ \pi^- \rho^+ \omega \bar{D}^{*-}, \bar{D}^{*-} \rightarrow \pi^0 D^-, \rho^0 \rightarrow \pi^+ \pi^-,$<br>$\rho^+ \rightarrow \pi^0 \pi^+, \omega \rightarrow \pi^0 \pi^+ \pi^-, \bar{D}^{*-} \rightarrow \pi^0 D^-, D^- \rightarrow e^- \bar{\nu}_e \pi^- K^+, D^- \rightarrow \pi^0 \pi^- K^*, K^* \rightarrow \pi^- K^+$<br>$(e^+e^- \rightarrow e^- \bar{\nu}_e \mu^+ \nu_\mu \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- \pi^- K^+ K^+ \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma)$  | 198    | 198       | 1     | 199       |
| 200   | $e^+e^- \rightarrow \Upsilon(4S), \Upsilon(4S) \rightarrow B^0\bar{B}^0, B^0 \rightarrow \pi^+ \pi^+ \pi^+ \pi^- \pi^- D^-, \bar{B}^0 \rightarrow e^- \bar{\nu}_e \pi^+ D^0, D^- \rightarrow \mu^- \bar{\nu}_\mu K_1^0, D^0 \rightarrow \pi^+ \pi^- K_S,$<br>$K_1^0 \rightarrow \pi^+ \pi^- K^0, K_S \rightarrow \pi^+ \pi^-, K^0 \rightarrow K_S, K_S \rightarrow \pi^+ \pi^-$<br>$(e^+e^- \rightarrow e^- \bar{\nu}_e \mu^- \bar{\nu}_\mu \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^-)$  | 199    | 199       | 1     | 200       |

Table 2: Event initial-final states.

[illegible]







| index | event initial-final states   | iEvtIFSts | nEvts | nCmltEvts |
|-------|--|-----------|-------|-----------|
| 121   | $e^+e^- \rightarrow e^-\bar{\nu}_e\mu^-\bar{\nu}_\mu K_L\pi^+\pi^+\pi^+\pi^-\pi^-K^-\gamma\gamma\gamma\gamma$  | 120       | 1     | 121       |
| 122   | $e^+e^- \rightarrow \mu^+\nu_\mu K_L\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-\pi^-K^+\gamma\gamma\gamma\gamma\gamma$   | 121       | 1     | 122       |
| 123   | $e^+e^- \rightarrow e^-e^-\bar{\nu}_e\bar{\nu}_e\mu^+\nu_\mu\pi^+\pi^+K^+K^-\gamma\gamma\gamma\gamma$  | 122       | 1     | 123       |
| 124   | $e^+e^- \rightarrow e^-\bar{\nu}_e\nu_\tau\bar{\nu}_\tau K_L\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-\gamma\gamma\gamma\gamma\gamma\gamma\gamma$   | 123       | 1     | 124       |
| 125   | $e^+e^- \rightarrow e^+e^-\mu^-\bar{\nu}_\mu K_L K_L\pi^+\pi^+\pi^-\pi^-K^+\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma$   | 124       | 1     | 125       |
| 126   | $e^+e^- \rightarrow e^+\nu_e\mu^+\mu^-\nu_\mu\bar{\nu}_\mu\pi^+\pi^+\pi^-\pi^-K^-\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma$   | 125       | 1     | 126       |
| 127   | $e^+e^- \rightarrow e^+e^-\pi^+\pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-\pi^-K^+\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma$   | 126       | 1     | 127       |
| 128   | $e^+e^- \rightarrow e^+e^-e^-\nu_e\bar{\nu}_e K_L\pi^+\pi^+\pi^+\pi^-\pi^-K^-K^-\gamma\gamma\gamma\gamma$  | 127       | 1     | 128       |
| 129   | $e^+e^- \rightarrow e^+e^-\nu_e\bar{\nu}_e\nu_\tau\bar{\nu}_\tau\pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-\gamma\gamma\gamma\gamma$  | 128       | 1     | 129       |
| 130   | $e^+e^- \rightarrow e^+e^-e^-\nu_e\nu_e\bar{\nu}_e\pi^+\pi^+\pi^-\pi^-K^+\gamma\gamma\gamma\gamma\gamma\gamma\gamma$   | 129       | 1     | 130       |
| 131   | $e^+e^- \rightarrow K_L\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-K^+\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma$   | 130       | 1     | 131       |
| 132   | $e^+e^- \rightarrow e^+\nu_e\pi^+\pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-K^-K^-\gamma\gamma\gamma\gamma$   | 131       | 1     | 132       |
| 133   | $e^+e^- \rightarrow e^+e^-\nu_e\bar{\nu}_e\mu^+\nu_\mu\pi^+\pi^-\pi^-\pi^-K^+K^+K^+K^-\gamma\gamma\gamma$  | 132       | 1     | 133       |
| 134   | $e^+e^- \rightarrow \nu_\tau\bar{\nu}_\tau K_L K_L\pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-\pi^-\gamma\gamma\gamma\gamma\gamma\gamma\gamma$   | 133       | 1     | 134       |
| 135   | $e^+e^- \rightarrow \mu^-\bar{\nu}_\mu\pi^+\pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-K^+K^-\gamma\gamma\gamma\gamma\gamma\gamma\gamma$   | 134       | 1     | 135       |
| 136   | $e^+e^- \rightarrow K_L\pi^+\pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-\pi^-K^+K^+K^-f_0(600)\gamma\gamma\gamma\gamma$  | 135       | 1     | 136       |
| 137   | $e^+e^- \rightarrow e^+e^-K_L K_L\pi^+\pi^+\pi^+\pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-\pi^-\pi^-\pi^-K^-\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma$                    | 136       | 1     | 137       |
| 138   | $e^+e^- \rightarrow \pi^+\pi^+\pi^-\pi^-K^+K^-n\bar{n}\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma$  | 137       | 1     | 138       |
| 139   | $e^+e^- \rightarrow e^+\nu_e K_L\pi^+\pi^+\pi^-\pi^-K^+K^-p\bar{p}\gamma\gamma\gamma\gamma$  | 138       | 1     | 139       |
| 140   | $e^+e^- \rightarrow e^-\bar{\nu}_e\pi^+\pi^+\pi^+\pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-\pi^-\pi^-\pi^-K^+K^+K^+\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma$       | 139       | 1     | 140       |
| 141   | $e^+e^- \rightarrow e^-\bar{\nu}_e\mu^+\nu_\mu\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-K^+\gamma\gamma\gamma\gamma\gamma\gamma$  | 140       | 1     | 141       |
| 142   | $e^+e^- \rightarrow \mu^+\nu_\mu\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-K^+K^+K^-K^-K^-\gamma\gamma\gamma\gamma\gamma\gamma\gamma$   | 141       | 1     | 142       |
| 143   | $e^+e^- \rightarrow \pi^+\pi^+\pi^+\pi^+\pi^-\pi^-K^+K^-K^-K^-n\bar{n}\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma$  | 142       | 1     | 143       |
| 144   | $e^+e^- \rightarrow \mu^-\bar{\nu}_\mu\pi^+\pi^+\pi^+\pi^-K^+K^-K^-\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma$   | 143       | 1     | 144       |
| 145   | $e^+e^- \rightarrow e^-\bar{\nu}_e K_L\pi^+\pi^+\pi^+\pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-\pi^-\pi^-\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma$                                   | 144       | 1     | 145       |
| 146   | $e^+e^- \rightarrow K_L\pi^+\pi^+\pi^+\pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-\pi^-\pi^-K^-K^-\gamma\gamma\gamma\gamma\gamma$  | 145       | 1     | 146       |
| 147   | $e^+e^- \rightarrow K_L\pi^+\pi^+\pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-\pi^-\pi^-K^-\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma$  | 146       | 1     | 147       |
| 148   | $e^+e^- \rightarrow \mu^-\bar{\nu}_\mu\pi^+\pi^+\pi^+\pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-\pi^-\pi^-K^-K^-\gamma\gamma\gamma\gamma\gamma\gamma\gamma$                                   | 147       | 1     | 148       |
| 149   | $e^+e^- \rightarrow \pi^+\pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-\pi^-K^+\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma$   | 148       | 1     | 149       |
| 150   | $e^+e^- \rightarrow \mu^+\nu_\mu\nu_\tau\bar{\nu}_\tau K_L\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-K^+K^-K^-\gamma\gamma\gamma\gamma\gamma\gamma\gamma$   | 149       | 1     | 150       |
| 151   | $e^+e^- \rightarrow e^+e^-\nu_e\bar{\nu}_e\mu^+\nu_\mu\pi^+\pi^+\pi^-\pi^-K^+K^-\gamma\gamma$  | 150       | 1     | 151       |
| 152   | $e^+e^- \rightarrow e^-\nu_e\mu^-\bar{\nu}_\mu\pi^+\pi^+\pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-K^+n\bar{p}\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma$ | 151       | 1     | 152       |
| 153   | $e^+e^- \rightarrow e^-\bar{\nu}_e\mu^+\nu_\mu\pi^+\pi^+\pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-\pi^-\pi^-\pi^-K^+\gamma\gamma\gamma\gamma\gamma\gamma\gamma$                              | 152       | 1     | 153       |
| 154   | $e^+e^- \rightarrow \pi^+\pi^+\pi^-\pi^-\pi^-\pi^-K^+K^+K^+K^-\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma$  | 153       | 1     | 154       |
| 155   | $e^+e^- \rightarrow e^-\bar{\nu}_e\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-K^+K^-\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma$                                      | 154       | 1     | 155       |
| 156   | $e^+e^- \rightarrow \pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-K^+K^-\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma$  | 155       | 1     | 156       |
| 157   | $e^+e^- \rightarrow e^+e^+\nu_e\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-\pi^-K^+\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma$                                       | 156       | 1     | 157       |
| 158   | $e^+e^- \rightarrow \mu^-\bar{\nu}_\mu\pi^+\pi^+\pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-\pi^-\pi^-\pi^-K^+K^+\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma$                             | 157       | 1     | 158       |
| 159   | $e^+e^- \rightarrow e^-\bar{\nu}_e\mu^+\nu_\mu\pi^+\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^-\pi^-K^+f_0(600)\gamma\gamma\gamma\gamma\gamma\gamma\gamma$  | 158       | 1     | 159       |
| 160   | $e^+e^- \rightarrow e^+e^-\nu_e\bar{\nu}_e\mu^+\nu_\mu\pi^+\pi^-\pi^-\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma\gamma$                                       | 159       | 1     | 160       |

| index | event initial-final states   | iEvtIFSts | nEvts | nCmltEvts |
|-------|--|-----------|-------|-----------|
| 161   | $e^+e^- \rightarrow K_L \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- K^+ K^+ K^- f_0(600) \gamma \gamma$  | 160       | 1     | 161       |
| 162   | $e^+e^- \rightarrow \mu^+ \mu^- \nu_\mu \bar{\nu}_\mu \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- K^- K^- \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma$   | 161       | 1     | 162       |
| 163   | $e^+e^- \rightarrow \mu^- \bar{\nu}_\mu \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- K^- \gamma \gamma \gamma \gamma \gamma$  | 162       | 1     | 163       |
| 164   | $e^+e^- \rightarrow \mu^+ \nu_\mu \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- K^+ K^- p \bar{p} \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma$   | 163       | 1     | 164       |
| 165   | $e^+e^- \rightarrow e^+ \nu_e \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- \pi^- \pi^- K^+ \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma$                                       | 164       | 1     | 165       |
| 166   | $e^+e^- \rightarrow \mu^+ \mu^- \nu_\mu \bar{\nu}_\mu K_L \pi^+ \pi^+ \pi^- K^- n \bar{n} \gamma \gamma \gamma \gamma \gamma$  | 165       | 1     | 166       |
| 167   | $e^+e^- \rightarrow e^+ e^- \nu_\tau \bar{\nu}_\tau \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- K^+ K^- \bar{n} p \gamma \gamma \gamma \gamma \gamma$  | 166       | 1     | 167       |
| 168   | $e^+e^- \rightarrow K_L K_L \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- K^+ K^+ K^- K^- \gamma \gamma \gamma \gamma \gamma \gamma$   | 167       | 1     | 168       |
| 169   | $e^+e^- \rightarrow \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- K^+ K^- K^- \gamma \gamma \gamma \gamma \gamma \gamma \gamma$  | 168       | 1     | 169       |
| 170   | $e^+e^- \rightarrow \mu^+ \mu^- \nu_\mu \bar{\nu}_\mu K_L \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- \pi^- K^+ K^+ \gamma \gamma \gamma \gamma \gamma$  | 169       | 1     | 170       |
| 171   | $e^+e^- \rightarrow K_L \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- n \bar{n} \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma$   | 170       | 1     | 171       |
| 172   | $e^+e^- \rightarrow \mu^+ \nu_\mu \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- K^+ \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma$   | 171       | 1     | 172       |
| 173   | $e^+e^- \rightarrow \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- K^+ K^- K^- \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma$   | 172       | 1     | 173       |
| 174   | $e^+e^- \rightarrow \mu^- \bar{\nu}_\mu \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- K^+ K^- \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma$                 | 173       | 1     | 174       |
| 175   | $e^+e^- \rightarrow K_L K_L \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- K^- K^- K^- \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma$                               | 174       | 1     | 175       |
| 176   | $e^+e^- \rightarrow \nu_\tau \bar{\nu}_\tau \pi^+ \pi^+ \pi^- \pi^- \pi^- K^+ K^- \bar{n} p \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma$                                       | 175       | 1     | 176       |
| 177   | $e^+e^- \rightarrow e^- \bar{\nu}_e K_L K_L K_L \pi^+ \pi^+ \pi^- K^- \bar{n} p \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma$   | 176       | 1     | 177       |
| 178   | $e^+e^- \rightarrow K_L \pi^+ \pi^- K^+ K^- K^- \bar{n} p \gamma$   | 177       | 1     | 178       |
| 179   | $e^+e^- \rightarrow e^+ \nu_e \mu^- \bar{\nu}_\mu \pi^+ \pi^+ \pi^+ \pi^- K^- K^- n \bar{n} \gamma \gamma$   | 178       | 1     | 179       |
| 180   | $e^+e^- \rightarrow e^+ \nu_e \mu^+ \nu_\mu \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma$                                       | 179       | 1     | 180       |
| 181   | $e^+e^- \rightarrow \mu^+ \nu_\mu \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- K^- p \bar{p} \gamma \gamma \gamma \gamma \gamma \gamma \gamma$  | 180       | 1     | 181       |
| 182   | $e^+e^- \rightarrow \mu^+ \nu_\mu \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- \pi^- K^+ K^- \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma$   | 181       | 1     | 182       |
| 183   | $e^+e^- \rightarrow e^+ \nu_e K_L \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- K^- K^- \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma$   | 182       | 1     | 183       |
| 184   | $e^+e^- \rightarrow \mu^+ \nu_\mu \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- K^+ \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma$               | 183       | 1     | 184       |
| 185   | $e^+e^- \rightarrow e^- \bar{\nu}_e \mu^+ \nu_\mu \pi^+ \pi^+ \pi^- \pi^- n \bar{n} \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma$     | 184       | 1     | 185       |
| 186   | $e^+e^- \rightarrow e^+ \nu_e K_L K_L \pi^+ \pi^- \pi^- \pi^- \pi^- K^+ K^+ \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma$   | 185       | 1     | 186       |
| 187   | $e^+e^- \rightarrow \mu^+ \mu^+ \mu^- \nu_\mu \bar{\nu}_\mu K_L \pi^+ \pi^+ \pi^- \pi^- \pi^- \gamma \gamma \gamma \gamma \gamma$  | 186       | 1     | 187       |
| 188   | $e^+e^- \rightarrow e^+ \nu_e \mu^- \bar{\nu}_\mu \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- K^+ K^- \gamma \gamma \gamma \gamma \gamma \gamma \gamma$  | 187       | 1     | 188       |
| 189   | $e^+e^- \rightarrow e^- \bar{\nu}_e K_L K_L \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- K^+ K^- \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma$   | 188       | 1     | 189       |
| 190   | $e^+e^- \rightarrow K_L \pi^+ \pi^+ \pi^+ \pi^- \pi^- K^- \gamma$   | 189       | 1     | 190       |
| 191   | $e^+e^- \rightarrow e^+ \nu_e K_L \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- \pi^- K^+ p \bar{p} \gamma \gamma \gamma \gamma \gamma \gamma \gamma$  | 190       | 1     | 191       |
| 192   | $e^+e^- \rightarrow e^+ e^- \nu_e \bar{\nu}_e K_L \pi^+ \pi^+ \pi^+ \pi^- \pi^- K^- \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma$   | 191       | 1     | 192       |
| 193   | $e^+e^- \rightarrow K_L K_L \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- \pi^- K^- \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma$   | 192       | 1     | 193       |
| 194   | $e^+e^- \rightarrow e^+ \nu_e \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- K^+ K^+ K^- \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma$   | 193       | 1     | 194       |
| 195   | $e^+e^- \rightarrow e^+ \nu_e \pi^+ \pi^+ \pi^- \pi^- \pi^- \gamma$ | 194       | 1     | 195       |
| 196   | $e^+e^- \rightarrow e^- e^- \bar{\nu}_e \bar{\nu}_e K_L K_L \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- K^- n \bar{n} \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma$                     | 195       | 1     | 196       |
| 197   | $e^+e^- \rightarrow e^+ e^+ e^- \nu_e \mu^+ \nu_\mu \pi^- \pi^- \pi^- K^+ n \bar{n} \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma$     | 196       | 1     | 197       |
| 198   | $e^+e^- \rightarrow K_L \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- K^+ n \bar{n} \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma$   | 197       | 1     | 198       |
| 199   | $e^+e^- \rightarrow e^- \bar{\nu}_e \mu^+ \nu_\mu \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- \pi^- K^+ K^+ \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma \gamma$             | 198       | 1     | 199       |
| 200   | $e^+e^- \rightarrow e^- \bar{\nu}_e \mu^- \bar{\nu}_\mu \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- \pi^-$   | 199       | 1     | 200       |

| index | event initial-final states | iEvtIFSts | nEvts | nCmltEvts |
|-------|----------------------------|-----------|-------|-----------|
|-------|----------------------------|-----------|-------|-----------|

Table 3: Event branches of  $B^0$ .

| index | event branch of $B^0$  | iEvtBrOfP1 | nEtrs | nCmltEtrs |
|-------|--|------------|-------|-----------|
| 1     | $B^0 \rightarrow \mu^+ \nu_\mu \bar{D}^{*-}$                 | 12         | 11    | 11        |
| 2     | $B^0 \rightarrow e^+ \nu_e \bar{D}^{*-}$                     | 6          | 9     | 20        |
| 3     | $B^0 \rightarrow \pi^0 \pi^+ \pi^- \bar{D}^{*-}$             | 10         | 5     | 25        |
| 4     | $B^0 \rightarrow e^+ \nu_e D^-$                              | 54         | 5     | 30        |
| 5     | $B^0 \rightarrow \tau^+ \nu_\tau \bar{D}^{*-}$               | 8          | 4     | 34        |
| 6     | $B^0 \rightarrow \bar{D}^{*-} a_1^+$                         | 3          | 4     | 38        |
| 7     | $B^0 \rightarrow \mu^+ \nu_\mu D^-$                          | 27         | 3     | 41        |
| 8     | $B^0 \rightarrow \tau^+ \nu_\tau D_0^{*-}$                   | 31         | 3     | 44        |
| 9     | $B^0 \rightarrow \rho^+ D^-$                                 | 16         | 3     | 47        |
| 10    | $B^0 \rightarrow \bar{D}^{*-} D_{s1}^+$                      | 86         | 3     | 50        |
| 11    | $B^0 \rightarrow \mu^+ \nu_\mu \bar{D}_2^{*-}$               | 20         | 2     | 52        |
| 12    | $B^0 \rightarrow \pi^0 \pi^0 \rho^+ \bar{D}^{*-}$            | 0          | 2     | 54        |
| 13    | $B^0 \rightarrow \mu^+ \nu_\mu D_1^-$                        | 28         | 2     | 56        |
| 14    | $B^0 \rightarrow \pi^- K^{*+} J/\psi$                        | 1          | 2     | 58        |
| 15    | $B^0 \rightarrow \rho^0 \rho^+ \bar{D}^{*-}$                 | 41         | 2     | 60        |
| 16    | $B^0 \rightarrow e^+ \nu_e \eta D^-$                         | 44         | 2     | 62        |
| 17    | $B^0 \rightarrow K^* D^- D^{*+}$                             | 18         | 2     | 64        |
| 18    | $B^0 \rightarrow \pi^0 \rho^+ \omega D^-$                    | 61         | 2     | 66        |
| 19    | $B^0 \rightarrow e^+ \nu_e \bar{D}_2^{*-}$                   | 85         | 2     | 68        |
| 20    | $B^0 \rightarrow \bar{D}^{*-} D_s^{*+}$                      | 19         | 2     | 70        |
| 21    | $B^0 \rightarrow \mu^+ \nu_\mu D_1'^-$                       | 94         | 2     | 72        |
| 22    | $B^0 \rightarrow \bar{D}^{*-} \Delta^- \Delta^0$             | 123        | 2     | 74        |
| 23    | $B^0 \rightarrow \pi^+ \pi^+ \omega K^0 K^{*-} \bar{D}^{*-}$ | 22         | 1     | 75        |
| 24    | $B^0 \rightarrow K^* D^+ \bar{D}^{*-}$                       | 23         | 1     | 76        |
| 25    | $B^0 \rightarrow \pi^+ \pi^- \rho^- \omega K^{*+}$           | 24         | 1     | 77        |
| 26    | $B^0 \rightarrow \pi^0 \rho^0 \pi^- \rho^+ \rho^+ \eta D^-$  | 25         | 1     | 78        |
| 27    | $B^0 \rightarrow K^0 \bar{D}^0 D^{*0}$                       | 26         | 1     | 79        |
| 28    | $B^0 \rightarrow K^0 D^- D^{*+}$                             | 11         | 1     | 80        |
| 29    | $B^0 \rightarrow K^{*+} \bar{D}^{*-} D^{*0}$                 | 2          | 1     | 81        |
| 30    | $B^0 \rightarrow \pi^- K^+ D^{*+} \bar{D}^{*-}$              | 29         | 1     | 82        |
| 31    | $B^0 \rightarrow D^- D_s^+$                                  | 30         | 1     | 83        |
| 32    | $B^0 \rightarrow \rho^- K^+ J/\psi$                          | 13         | 1     | 84        |
| 33    | $B^0 \rightarrow \rho^+ \eta \omega \bar{D}^{*-}$            | 32         | 1     | 85        |
| 34    | $B^0 \rightarrow \bar{D}^{*-} \Delta^0 \Delta^+$             | 33         | 1     | 86        |
| 35    | $B^0 \rightarrow \bar{D}^0 \bar{p} \Delta^+$                 | 34         | 1     | 87        |
| 36    | $B^0 \rightarrow \rho^0 \pi^+ \bar{D}^{*-}$                  | 35         | 1     | 88        |
| 37    | $B^0 \rightarrow \eta D^- D_s^+$                             | 36         | 1     | 89        |
| 38    | $B^0 \rightarrow \omega K^+ \bar{D}^{*-}$                    | 37         | 1     | 90        |
| 39    | $B^0 \rightarrow \eta \bar{D}^{*-} D_s^+$                    | 38         | 1     | 91        |
| 40    | $B^0 \rightarrow \pi^0 \pi^- \rho^+ \bar{K}^0 K^+ D^-$       | 39         | 1     | 92        |

| index | event branch of $B^0$  | iEvtBrOfP1 | nEtrs | nCmltEtrs |
|-------|--|------------|-------|-----------|
| 41    | $B^0 \rightarrow \pi^0 \pi^+ \pi^+ \pi^- \rho^- \eta \eta K^0 K^+ D^-$ | 40         | 1     | 93        |
| 42    | $B^0 \rightarrow \pi^+ \pi^- K^0 \bar{D}^0 \bar{D}^0$                  | 14         | 1     | 94        |
| 43    | $B^0 \rightarrow \rho^0 \rho^+ D^-$                                    | 42         | 1     | 95        |
| 44    | $B^0 \rightarrow \pi^+ \pi^- \rho^+ \eta D^-$                          | 43         | 1     | 96        |
| 45    | $B^0 \rightarrow \pi^+ \eta \bar{D}^{*-}$                              | 15         | 1     | 97        |
| 46    | $B^0 \rightarrow \pi^0 \pi^+ \pi^+ \rho^- D^-$                         | 45         | 1     | 98        |
| 47    | $B^0 \rightarrow \rho^0 \pi^+ \pi^+ \pi^- \omega D^-$                  | 46         | 1     | 99        |
| 48    | $B^0 \rightarrow \pi^- \bar{D}^0 D_s^+$                                | 47         | 1     | 100       |
| 49    | $B^0 \rightarrow \pi^0 \Delta^+ \Xi_c^{*-}$                            | 48         | 1     | 101       |
| 50    | $B^0 \rightarrow \rho^0 \pi^+ \pi^- \bar{D}^{*0}$                      | 49         | 1     | 102       |
| 51    | $B^0 \rightarrow \pi^0 \pi^+ \omega \bar{D}^{*-}$                      | 50         | 1     | 103       |
| 52    | $B^0 \rightarrow \pi^+ \pi^+ \pi^+ \pi^- \pi^- D^- \Delta^+ \Delta^+$  | 51         | 1     | 104       |
| 53    | $B^0 \rightarrow \pi^+ \pi^- \eta \bar{D}^0$                           | 52         | 1     | 105       |
| 54    | $B^0 \rightarrow \rho^0 \pi^+ K^- K^{*+} \bar{D}^{*-}$                 | 53         | 1     | 106       |
| 55    | $B^0 \rightarrow \pi^0 \pi^0 \pi^+ \bar{D}^{*-}$                       | 7          | 1     | 107       |
| 56    | $B^0 \rightarrow \mu^+ \nu_\mu D_0^{*-}$                               | 55         | 1     | 108       |
| 57    | $B^0 \rightarrow \pi^+ \omega \omega \bar{D}^{*-}$                     | 56         | 1     | 109       |
| 58    | $B^0 \rightarrow \pi^- K^+ \bar{D}^0 \bar{D}^0$                        | 57         | 1     | 110       |
| 59    | $B^0 \rightarrow \pi^0 \pi^0 \pi^+ \rho^- D^-$                         | 58         | 1     | 111       |
| 60    | $B^0 \rightarrow K^* n \Sigma_c^{*0}$                                  | 59         | 1     | 112       |
| 61    | $B^0 \rightarrow K^{*+} \bar{D}^{*-} D^0$                              | 60         | 1     | 113       |
| 62    | $B^0 \rightarrow \pi^0 \pi^0 \pi^+ \eta \bar{D}^{*-}$                  | 17         | 1     | 114       |
| 63    | $B^0 \rightarrow \rho^0 \pi^+ \pi^- \rho^+ \eta \eta \bar{D}^{*-}$     | 62         | 1     | 115       |
| 64    | $B^0 \rightarrow D^- a_1^+$  | 63         | 1     | 116       |
| 65    | $B^0 \rightarrow \rho^+ \eta \omega D^-$                               | 64         | 1     | 117       |
| 66    | $B^0 \rightarrow \pi^+ K^0 D^-$  | 65         | 1     | 118       |
| 67    | $B^0 \rightarrow \pi^0 \pi^+ \rho^- \bar{D}^{*0}$                      | 66         | 1     | 119       |
| 68    | $B^0 \rightarrow \eta' D^+ \bar{D}^{*-}$                               | 67         | 1     | 120       |
| 69    | $B^0 \rightarrow \omega D^{*-} \bar{n} p$                              | 68         | 1     | 121       |
| 70    | $B^0 \rightarrow \pi^+ \pi^- \rho^+ D^-$                               | 69         | 1     | 122       |
| 71    | $B^0 \rightarrow \rho^0 \pi^+ \eta D^-$                                | 70         | 1     | 123       |
| 72    | $B^0 \rightarrow \rho^0 p \Sigma_c^{*-}$                               | 71         | 1     | 124       |
| 73    | $B^0 \rightarrow \pi^0 \pi^+ \pi^- \rho^+ D^-$                         | 72         | 1     | 125       |
| 74    | $B^0 \rightarrow \rho^+ \omega D^-$                                    | 73         | 1     | 126       |
| 75    | $B^0 \rightarrow K^{*+} \bar{D}^{*-}$                                  | 74         | 1     | 127       |
| 76    | $B^0 \rightarrow D_2^{*-} D_s^{*+}$                                    | 75         | 1     | 128       |
| 77    | $B^0 \rightarrow K_L \eta_c$   | 76         | 1     | 129       |
| 78    | $B^0 \rightarrow \pi^0 \pi^+ \rho^- \eta \bar{D}^0$                    | 77         | 1     | 130       |
| 79    | $B^0 \rightarrow \pi^0 \pi^0 \eta \omega \bar{D}^0$                    | 78         | 1     | 131       |
| 80    | $B^0 \rightarrow D^- D_s^{*+}$   | 79         | 1     | 132       |

| index | event branch of $B^0$  | iEvtBrOfP1 | nEtrs | nCmltEtrs |
|-------|--|------------|-------|-----------|
| 81    | $B^0 \rightarrow \pi^0 \rho^0 \pi^+ \pi^- \pi^- \omega D^-$            | 80         | 1     | 133       |
| 82    | $B^0 \rightarrow \rho^+ K^+ K^- \bar{D}^{*-}$                          | 81         | 1     | 134       |
| 83    | $B^0 \rightarrow K^0 J/\psi$   | 82         | 1     | 135       |
| 84    | $B^0 \rightarrow \pi^0 \pi^0 \pi^+ \rho^- \bar{D}^{*0}$                | 83         | 1     | 136       |
| 85    | $B^0 \rightarrow \pi^+ \pi^- \bar{D}^{*0}$                             | 84         | 1     | 137       |
| 86    | $B^0 \rightarrow D^- D_{s1}^{*+}$                                      | 4          | 1     | 138       |
| 87    | $B^0 \rightarrow \pi^0 \pi^+ \eta \eta D^-$                            | 9          | 1     | 139       |
| 88    | $B^0 \rightarrow \pi^0 \pi^+ \eta K^0 K^* D^-$                         | 87         | 1     | 140       |
| 89    | $B^0 \rightarrow \rho^- \eta K^0 K^+ \bar{D}^{*0}$                     | 88         | 1     | 141       |
| 90    | $B^0 \rightarrow \pi^0 \pi^0 \bar{D}^0$                                | 89         | 1     | 142       |
| 91    | $B^0 \rightarrow \pi^0 \rho^0 \rho^+ \omega D^-$                       | 90         | 1     | 143       |
| 92    | $B^0 \rightarrow K^0 D^{*+} \bar{D}^{*-}$                              | 91         | 1     | 144       |
| 93    | $B^0 \rightarrow \pi^0 \pi^+ \bar{D}^{*-}$                             | 92         | 1     | 145       |
| 94    | $B^0 \rightarrow \pi^- \bar{K}^0 K^+ \bar{D}^{*0}$                     | 93         | 1     | 146       |
| 95    | $B^0 \rightarrow \pi^0 \rho^+ \omega \bar{D}^{*-}$                     | 5          | 1     | 147       |
| 96    | $B^0 \rightarrow e^+ \nu_e D_1^{\prime -}$                             | 95         | 1     | 148       |
| 97    | $B^0 \rightarrow \eta K^0 K^+ \bar{D}^{*-}$                            | 96         | 1     | 149       |
| 98    | $B^0 \rightarrow \bar{D}^{*-} D_s^+$                                   | 97         | 1     | 150       |
| 99    | $B^0 \rightarrow \pi^+ \pi^- \rho^+ \bar{D}^{*-}$                      | 98         | 1     | 151       |
| 100   | $B^0 \rightarrow \pi^0 \omega K^+ D_s^{*-}$                            | 99         | 1     | 152       |
| 101   | $B^0 \rightarrow D_s^{*+} D_1^{\prime -}$                              | 100        | 1     | 153       |
| 102   | $B^0 \rightarrow \rho^0 \pi^- \rho^+ \rho^+ K^0 D^-$                   | 101        | 1     | 154       |
| 103   | $B^0 \rightarrow \pi^0 \pi^0 K^+ D_s^{*-}$                             | 102        | 1     | 155       |
| 104   | $B^0 \rightarrow K^+ \Delta^+ \bar{\Sigma}_c^{*-}$                     | 103        | 1     | 156       |
| 105   | $B^0 \rightarrow \rho^+ \rho^+ \rho^- \eta D^{*-}$                     | 104        | 1     | 157       |
| 106   | $B^0 \rightarrow D^- D_s^{*+} \gamma$                                  | 105        | 1     | 158       |
| 107   | $B^0 \rightarrow \rho^+ n \bar{\Sigma}_c^-$                            | 106        | 1     | 159       |
| 108   | $B^0 \rightarrow \pi^+ \pi^+ \pi^- \omega \bar{D}^{*-}$                | 107        | 1     | 160       |
| 109   | $B^0 \rightarrow \pi^+ K^0 K^* \bar{D}^{*-}$                           | 108        | 1     | 161       |
| 110   | $B^0 \rightarrow \rho^0 \pi^+ \pi^+ \rho^- D^-$                        | 109        | 1     | 162       |
| 111   | $B^0 \rightarrow \pi^0 \rho^0 \pi^+ D^-$                               | 110        | 1     | 163       |
| 112   | $B^0 \rightarrow e^+ \nu_e \pi^+ \pi^- \bar{D}^{*-}$                   | 111        | 1     | 164       |
| 113   | $B^0 \rightarrow \rho^0 \bar{D}^{*-} \bar{\Sigma}^0 \Sigma^+$          | 112        | 1     | 165       |
| 114   | $B^0 \rightarrow \rho^0 \rho^0 \rho^+ \bar{D}^{*-}$                    | 113        | 1     | 166       |
| 115   | $B^0 \rightarrow K^{*+} D^-$   | 114        | 1     | 167       |
| 116   | $B^0 \rightarrow K^{*+} D^- D^0$                                       | 115        | 1     | 168       |
| 117   | $B^0 \rightarrow \pi^+ \bar{D}^{*-}$                                   | 116        | 1     | 169       |
| 118   | $B^0 \rightarrow \pi^0 \rho^0 \pi^+ \pi^+ \pi^- \pi^- \eta \omega D^-$ | 117        | 1     | 170       |
| 119   | $B^0 \rightarrow \pi^- K^0 D^+ \bar{D}^{*0}$                           | 118        | 1     | 171       |
| 120   | $B^0 \rightarrow \bar{K}^0 K^+ D^-$                                    | 119        | 1     | 172       |

| index | event branch of $B^0$   | iEvtBrOfP1 | nEtrs | nCmltEtrs |
|-------|---|------------|-------|-----------|
| 121   | $B^0 \rightarrow \pi^+ \omega \bar{D}^{*-}$                           | 120        | 1     | 173       |
| 122   | $B^0 \rightarrow \pi^0 \Sigma^0 \Xi_c^0$                              | 121        | 1     | 174       |
| 123   | $B^0 \rightarrow \rho^0 \eta \omega \bar{D}^{*0}$                     | 122        | 1     | 175       |
| 124   | $B^0 \rightarrow \pi^0 \pi^+ \pi^+ \pi^- \rho^- \bar{D}^{*0}$         | 21         | 1     | 176       |
| 125   | $B^0 \rightarrow \rho^- p \Sigma_c^0$                                 | 124        | 1     | 177       |
| 126   | $B^0 \rightarrow \pi^- K^{*+} D^0 \bar{D}^{*0}$                       | 125        | 1     | 178       |
| 127   | $B^0 \rightarrow \pi^+ \pi^+ \pi^- \pi^- \pi^- \eta K^+ K^+ D_s^{*-}$ | 126        | 1     | 179       |
| 128   | $B^0 \rightarrow \pi^0 \bar{K}^0 D^- \Delta^0 \Sigma^+$               | 127        | 1     | 180       |
| 129   | $B^0 \rightarrow \pi^0 \pi^+ \pi^+ \pi^- \rho^- D^0$                  | 128        | 1     | 181       |
| 130   | $B^0 \rightarrow \rho^- D^- \Delta^0 \Delta^{++}$                     | 129        | 1     | 182       |
| 131   | $B^0 \rightarrow \pi^0 D^- \bar{n} p$                                 | 130        | 1     | 183       |
| 132   | $B^0 \rightarrow \mu^+ \nu_\mu X_u^-$                                 | 131        | 1     | 184       |
| 133   | $B^0 \rightarrow \pi^0 \rho^0 \pi^+ \omega \bar{D}^{*-}$              | 132        | 1     | 185       |
| 134   | $B^0 \rightarrow \pi^0 \omega D^- \Delta^- \Delta^0$                  | 133        | 1     | 186       |
| 135   | $B^0 \rightarrow \pi^+ \pi^- \rho^+ \rho^- \bar{D}^0$                 | 134        | 1     | 187       |
| 136   | $B^0 \rightarrow \rho^+ \eta \eta \bar{D}^{*-}$                       | 135        | 1     | 188       |
| 137   | $B^0 \rightarrow \pi^+ \Delta^+ \Sigma_c^{*-}$                        | 136        | 1     | 189       |
| 138   | $B^0 \rightarrow \rho^+ \bar{D}^{*-}$                                 | 137        | 1     | 190       |
| 139   | $B^0 \rightarrow J/\psi K_1^0$  | 138        | 1     | 191       |
| 140   | $B^0 \rightarrow K^* D^+ D^-$   | 139        | 1     | 192       |
| 141   | $B^0 \rightarrow \pi^0 \pi^- \eta \bar{D}^{*0} D_s^{*+}$              | 140        | 1     | 193       |
| 142   | $B^0 \rightarrow \rho^0 \pi^+ \omega \bar{D}^{*-}$                    | 141        | 1     | 194       |
| 143   | $B^0 \rightarrow \rho^0 \pi^+ \pi^- \rho^+ \omega \bar{D}^{*-}$       | 142        | 1     | 195       |
| 144   | $B^0 \rightarrow \pi^+ \pi^+ \pi^+ \pi^- \pi^- D^-$                   | 143        | 1     | 196       |



Table 4: Event branches of  $\bar{B}^0$ .

| index | event branch of $B^0$                              | iEvtBrOfP2 | nEtrs | nCmltEtrs |
|-------|--|------------|-------|-----------|
| 1     | $\bar{B}^0 \rightarrow e^- \bar{\nu}_e D^{*+}$     | 13         | 16    | 16        |
| 2     | $\bar{B}^0 \rightarrow \mu^- \bar{\nu}_\mu D^{*+}$ | 6          | 14    | 30        |
| 3     | $\bar{B}^0 \rightarrow D^{*+} D_s^{*-}$            | 7          | 5     | 35        |
| 4     | $\bar{B}^0 \rightarrow e^- \bar{\nu}_e D^+$        | 42         | 4     | 39        |
| 5     | $\bar{B}^0 \rightarrow \rho^0 \pi^- D^{*+}$        | 64         | 4     | 43        |
| 6     | $\bar{B}^0 \rightarrow \pi^+ \pi^- \rho^- D^+$     | 22         | 3     | 46        |
| 7     | $\bar{B}^0 \rightarrow D^{*+} D_s^-$               | 38         | 3     | 49        |
| 8     | $\bar{B}^0 \rightarrow \mu^- \bar{\nu}_\mu D^+$    | 41         | 3     | 52        |
| 9     | $\bar{B}^0 \rightarrow \pi^+ \pi^- D^+ D_s^-$      | 4          | 3     | 55        |
| 10    | $\bar{B}^0 \rightarrow \rho^- D^+$                 | 21         | 3     | 58        |
| rest  | $\bar{B}^0 \rightarrow \text{others}$              | —          | 146   | 204       |