Topology Analysis *
(v1.6.0)

Xingyu Zhou †
Beihang University

November 29, 2018

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

†Email: zhouxy@buaa.edu.cn

List of Tables

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

index	event tree (event initial-final states)	iEvtTr	iEvtIFSts	nEvts	nCcEvts	nTotEvts	nCmltEvts
1	$e^+e^- \to \Upsilon(4S), \Upsilon(4S) \to B^0\bar{B}^0$ $(e^+e^- \to B^0\bar{B}^0)$	0	0	158	—	158	158
2	$e^+e^- \to \Upsilon(4S), \Upsilon(4S) \to B^0B^0$ $(e^+e^- \to B^0B^0)$	1	1	19	23	42	200

Table 2: Event initial-final states.

index	event initial-final states	iEvtIFSts	nEvts	nCcEvts	nTotEvts	nCmltEvts
1	$e^+e^- \to B^0\bar{B}^0$	0	158	—	158	158
2	$e^+e^- \to B^0B^0$	1	19	23	42	200

Table 3: Signal event trees and their respective initial-final states.

index	signal event tree (signal event initial-final states)	iSigEvtTr	iSigEvtIFSts	iEvtTr	iEvtIFSts	nEvts	nCcEvts	nTotEvts	nCmltEvts
1	$e^+e^- \to \Upsilon(4S), \Upsilon(4S) \to B^0\bar{B}^0$ $(e^+e^- \to B^0\bar{B}^0)$	0	0	0	0	158	—	158	158
2	$e^+e^- \to \Upsilon(4S), \Upsilon(4S) \to \bar{B}^0\bar{B}^0$ $(e^+e^- \to \bar{B}^0\bar{B}^0)$	1	1	1_{cc}	1_{cc}	23	19	42	200

Table 4: Signal event initial-final states corresponding to signal event trees.

index	signal event initial-final states	iSigEvtIFSts	iEvtIFSts	nEvts	nCcEvts	nTotEvts	nCmltEvts
1	$e^+e^- \to B^0\bar{B}^0$	0	0	158	—	158	158
2	$e^+e^- \to \bar{B}^0\bar{B}^0$	1	1_{cc}	23	19	42	200

Table 5: Signal event initial-final states.

index	signal event initial-final states	iSigEvtIFSts2	iEvtIFSts	nEvts	nCcEvts	nTotEvts	nCmltEvts
1	$e^+e^- \to B^0\bar{B}^0$	0	0	158	—	158	158
2	$e^+e^- \to B^0B^0$	1	1	19	23	42	200