

Table 1: Decay trees and their respective final states.

rowNo	decay tree	decay final state	iDcyTr	nEtr	nCEtr
1	$J/\psi \rightarrow \eta' \gamma, \eta' \rightarrow \pi^0 \pi^0 \eta, \eta \rightarrow \pi^0 \pi^0 \pi^0$	$\pi^0 \pi^0 \pi^0 \pi^0 \pi^0 \gamma$	0	1655	1655
2	$J/\psi \rightarrow K_S^0 K_S^0 \gamma, K_S^0 \rightarrow \pi^0 \pi^0, K_S^0 \rightarrow \pi^0 \pi^0$	$\pi^0 \pi^0 \pi^0 \pi^0 \gamma$	5	269	1924
3	$J/\psi \rightarrow f_2(1270) \gamma, f_2(1270) \rightarrow \pi^0 \pi^0 \pi^0 \pi^0$	$\pi^0 \pi^0 \pi^0 \pi^0 \gamma$	1	51	1975
4	$J/\psi \rightarrow f_0(2100) \gamma, f_0(2100) \rightarrow \eta \eta, \eta \rightarrow \gamma \gamma, \eta \rightarrow \pi^0 \pi^0 \pi^0$	$\pi^0 \pi^0 \pi^0 \gamma \gamma \gamma$	7	40	2015
5	$J/\psi \rightarrow \eta \omega, \eta \rightarrow \pi^0 \pi^0 \pi^0, \omega \rightarrow \pi^0 \gamma$	$\pi^0 \pi^0 \pi^0 \pi^0 \gamma$	2	27	2042
6	$J/\psi \rightarrow f_1(1285) \gamma, f_1(1285) \rightarrow \pi^0 a_0^0, a_0^0 \rightarrow \pi^0 \eta, \eta \rightarrow \pi^0 \pi^0 \pi^0$	$\pi^0 \pi^0 \pi^0 \pi^0 \pi^0 \gamma$	3	18	2060
7	$J/\psi \rightarrow \eta' \gamma, \eta' \rightarrow \pi^0 \pi^0 \eta, \eta \rightarrow \pi^0 \pi^0 \pi^0, \pi^0 \rightarrow e^+ e^- \gamma^F$	$e^+ e^- \pi^0 \pi^0 \pi^0 \pi^0 \gamma^F \gamma$	4	12	2072
8	$J/\psi \rightarrow \eta_c \gamma, \eta_c \rightarrow \pi^0 \pi^0 \eta, \eta \rightarrow \pi^0 \pi^0 \pi^0$	$\pi^0 \pi^0 \pi^0 \pi^0 \pi^0 \gamma$	8	11	2083
9	$J/\psi \rightarrow \pi^0 \rho(2S)^0, \rho(2S)^0 \rightarrow \pi^0 \pi^0 \pi^0 \pi^0$	$\pi^0 \pi^0 \pi^0 \pi^0 \pi^0$	14	11	2094
10	$J/\psi \rightarrow f_1(1285) \gamma, f_1(1285) \rightarrow \pi^0 \pi^0 \eta, \eta \rightarrow \pi^0 \pi^0 \pi^0$	$\pi^0 \pi^0 \pi^0 \pi^0 \pi^0 \gamma$	19	10	2104
11	$J/\psi \rightarrow \eta' \gamma, \eta' \rightarrow \pi^0 \pi^0 \eta, \eta \rightarrow \gamma \gamma$	$\pi^0 \pi^0 \gamma \gamma \gamma$	15	9	2113
12	$J/\psi \rightarrow \eta' \gamma, \eta' \rightarrow \pi^0 \pi^0 \eta, \eta \rightarrow \pi^0 \gamma \gamma$	$\pi^0 \pi^0 \pi^0 \gamma \gamma \gamma$	11	9	2122
13	$J/\psi \rightarrow \pi^0 \eta \gamma, \eta \rightarrow \pi^0 \pi^0 \pi^0$	$\pi^0 \pi^0 \pi^0 \pi^0 \gamma$	18	8	2130
14	$J/\psi \rightarrow f_0' \gamma, f_0' \rightarrow K_S^0 K_S^0, K_S^0 \rightarrow \pi^0 \pi^0, K_S^0 \rightarrow \pi^0 \pi^0$	$\pi^0 \pi^0 \pi^0 \pi^0 \gamma$	6	7	2137
15	$J/\psi \rightarrow \eta' \gamma, \eta' \rightarrow \pi^0 \pi^0 \eta, \pi^0 \rightarrow e^+ e^- \gamma^F, \eta \rightarrow \pi^0 \pi^0 \pi^0$	$e^+ e^- \pi^0 \pi^0 \pi^0 \pi^0 \gamma^F \gamma$	17	7	2144



