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The indirect production of semi-inclusive doubly heavy baryons via Higgs boson and top quark decay

Within the framework of non-relativistic QCD, the indirect production of semi-inclusive doubly heavy baryons (Ξ_{cc} , Ξ_{bc} and Ξ_{bb}) via four main Higgs decay channels and one main top quark decay channel are presented. The contributions from the intermediate diquark states, $\langle bc \rangle [^3S_1]_{\bar{3}/6}$, $\langle bc \rangle [^1S_0]_{\bar{3}/6}$, $\langle cc \rangle [^3S_1]_{\bar{3}}$, $\langle cc \rangle [^1S_0]_6$, $\langle bb \rangle [^3S_1]_{\bar{3}}$, $\langle bb \rangle [^1S_0]_6$, have been taken into consideration. Besides, we also discussed the three main source of the theoretical uncertainties, heavy quark masses, the renormalization scale μ_r , and the nonperturbative transition probability and the corresponding differential distributions. There will be a considerable number of events of Ξ_{cc} , Ξ_{bc} and Ξ_{bb} produced per year at the High Luminosity Large Hadron Collider.

Primary author: Dr NIU, juanjuan (Guangxi normal university)

Co-authors: Dr MA, Hong-Hao (Sao Paulo state university); Prof. GUO, Lei (Chongqing University); Prof. WU, Xing-Gang (Chongqing University)

Presenter: Dr NIU, juanjuan (Guangxi normal university)

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