

Semileptonic Decays of B_c Meson to a P-Wave Charmonium State χ_c or h_c

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Abstract: The semileptonic decays of meson B_c to a P-wave charmonium state $\chi_c(^3P_J)$ or $h_c(^1P_1)$ are computed. The results show that the decays are sizable so they are accessible in Tevatron and LHC, especially, with the detectors LHCb and BTeV in the foreseeable future, and of them, the one to the 1P_1 charmonium state potentially offers us a novel window to see the unconfirmed h_c particle. In addition, it is pointed out that since the two charmonium radiative decays $\chi_c(^3P_{1,2}) \rightarrow J/\psi + \gamma$ have sizable branching ratios, the cascade decays of the concerned decays and the charmonium radiative decays may affect the result of observing B_c meson through the semileptonic decays $B_c \rightarrow J/\psi + l + \nu_l$ substantially.

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