

Study of exclusive nonleptonic decay of

$$B_s \rightarrow \psi(\eta_c)(nS)K_s$$

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We analyze the exclusive two-body nonleptonic decays of B_s^0 meson to ground as well as radially excited $2S$ charmonium states and a light meson K_s , induced by the $b \rightarrow c\bar{c}d$ transition. Within the framework of relativistic independent quark (RIQ) model based on a flavor-independent interaction potential in scalar-vector harmonic form, we calculate the weak form factors from the overlapping integrals of meson wave function obtained in this model. Using the factorization approximation, we predict the branching fraction for the $B_s \rightarrow \psi(\eta_c)(nS)K_s$, which can be compared with future theoretical predictions. Branching fraction for $B_s \rightarrow J/\psi K_s$ decay is found to be in good agreement with the data from LHCb Collaboration, whereas for $B_s \rightarrow \psi(2S)K_s$, it is found to be within the detection ability of the CMS Collaboration. We also predict the ratio: $calR\left(\frac{calB(B_s \rightarrow \psi(nS)K_s)}{calB(B_d \rightarrow \psi(nS)K_s)}\right)$ which is in broad agreement with the data from LHCb and CMS Collaborations. These results indicate that the present approach works well in the description of exclusive nonleptonic B_s decays within the framework of the RIQ model.

Track type

Flavour Physics

Author: NAYAK, Lopamudra (NISER Bhubaneswar)

Presenter: NAYAK, Lopamudra (NISER Bhubaneswar)

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