

Revisiting semileptonic B decays with tensor mesons in the final state

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We revisit the production of tensor mesons in semileptonic B decays within the framework of the nonrelativistic quark model of Isgur-Scora-Grinstein-Wise and the QCD factorization approach (QCDF). At tree level, we obtain the branching ratios of these decays in both frameworks and analyze the contribution of each form factor. We also present the Dalitz plot for these processes and calculate the relation:

$$R(D_2^*) = \frac{Br(B \rightarrow D_2^* \tau \nu_\tau) Br(B \rightarrow D_2^* l \nu_\tau)}{Br(B \rightarrow T \tau \nu_\tau)}, \quad l = e, \mu$$

In addition, we compare the $B \rightarrow T \tau \nu_\tau$ with the adronic $B \rightarrow TM$ decays, where M denotes a pseudoscalar or vector meson.

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