

## Electromagnetic transitions in the $(b\bar{c})$ binding system

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**Abstract.** We study the electromagnetic decay:  $B_c^* \rightarrow B_c e^+ e^-$  with  $B_c$ -meson in its ground state  $B_c$ -meson in the relativistic independent quark model based on a flavor independent potential in the scalar-vector harmonic form. The transition form factor  $F_{B_c^* B_c}(q^2)$  obtained in this model is found to increase linearly with  $q^2$  in the allowed kinematic range of  $(2m_e)^2 \leq q^2 \leq (m_{B_c^*} - m_{B_c})^2$ . Our predictions for decay width  $\Gamma(B_c^* \rightarrow B_c e^+ e^-) = 0.7112 \times 10^{-5} \text{ KeV}$  is compatible with the result of other model calculation based on Bethe-Salpeter approach. The model predictions in this sector would not only yield necessary information about members of  $B_c$  family but would provide clue for experimental determination of the unmeasured mass of  $B_c^*$  meson which is expected at LHC b and the  $Z^0$  factory in near future.

**Keywords:** Transition form factor, mass-splitting, decay width, Relativistic independent quark model.

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