$B^0 \to \overline{D}^0 f_2(1270)$ DECAY IN QCD FACTORIZATION

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In this paper, the hadronic decay $B^0 \to \overline{D}^0 f_2(1270)$ has been analyzed in naive and QCD factorization methods. Recent experimental results obtained by BABAR, Belle and CLEO have opened an interesting area of research about production of tensor mesons in B decays. The simplest approach to obtain the amplitude of the hadronic B decays is naive factorization, where the matrix elements have been parameterized into products of decay constant and form factors. And in QCD factorization approach, the nonfactorizable effects such as vertex corrections, hard spectator interactions are calculable in hard scattering approach. Hence, we have been calculated the factorizable amplitudes and nonfactorizable contributions corresponding to the vertex corrections and the hard spectator interactions in this research for $B^0 \to \overline{D}^0 f_2(1270)$. This method works well for the case with two light mesons in which the final-state mesons carry large momenta. As we have a heavy quark in the final state, this method still works when a spectator quark of B meson is absorbed by D meson. However, when the spectator quark is absorbed by a light quark, nonfactorizable contributions are infrared divergent, and the factorization breaks down[1, 2, 3]. In this research, we treat the charm quark as light compared to the large scale provided by the mass of the decaying b quark ($m_c \ll m_b$ and m_c fixed as $m_b \to \infty$). Our obtained branching ratio of $B^0 \to \overline{D}^0 f_2(1270)$ is $(1.36 \pm 0.02) \times 10^{-5}$ in naive factorization which is smaller than the experimental data: $(1.2 \pm 0.4) \times 10^{-4}$ [4]. In other hand, by considering QCD corrections in QCDF, we have been obtained $(2.57 \pm 0.01) \times 10^{-5}$ which have been tried to decrease the discrepancy between theory and experiment data.

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