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Study light scalar mesons from heavy quark decays

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It is a difficult task to probe internal structures of the scalar mesons below or near 1GeV. In the SU(3) symmetry limit, the semileptonic Dˆ+ −> Slˆ+ nu and Bˆ+ Slnubar decays, with S=a_0, f_0 and sigma, are found to obey very different sum rules in the two scenarios for scalar mesons. Thus it can uniquely distinguish the qqbar and the tentraquark descriptions for light scalar mesons model-independently. This also applies to the Bˆ0 −> J/psi(eta_c) S decays. The SU(3) symmetry breaking effect is found to be under control, which will not spoil our method. The branching fractions of the Dˆ+ −> Slˆ+nu, Bˆ+ −> Sl nubar and Bˆ0 −> J/psi(eta_c) S decays roughly have the order 10ˆ-4, 10ˆ-5 and 10ˆ-6, respectively. The ongoing BES-III and the forthcoming Super B experiments are able to measure these channels and accordingly to provide the detailed information of scalar meson inner structure.

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