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Studying scalar mesons with SU(3) flavor symmetry in J/psi decays

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The scalar mesons are established for a long time, but their nature is still an open question. In this slide, we investigate the potential of categorizing their SU(3)f representations via J/ψ ⟶ SV and γS, offering a criterion that may illuminate this issue. Here, S (V) denotes scalar (vector) mesons. Using the SU(3)f symmetry with the current data, we find that f0(500) and f0(980) are mostly made of singlet and octet SU(3)f representations, respectively, with the singlet-octet mixing angle of θ = (82.9 ± 4.4)◦. This conclusion is consistent with the caculations of the quarkantiquark (qq) hypothesis. For the scalar mesons in the range of 1-2 GeV, we discuss the mixings between qq and glueballs. Our numerical results suggest that f0(1710) is likely composed of the scalar glueball. We urge our experimental colleagues to measure J/ψ ⟶ ρ a0(980, 1450, 1710), K∗(892)ˆ± K∗(700, 1430, 1950)ˆ∓ and ω f0(500), which provide useful information in the SU(3)f analysis.

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