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Measurement of the relative phase between strong and EM decays of charmonium

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The strong and electromagnetic interactions are two main decay mechanisms in charmonium decays. The relative phase between them is a basic parameter in understanding the decay dynamics, especially for the precise measurements. Based on indirect studies on J/ψ two body decay modes: $1-0^-$, $0-0^-$, $1-1^-$, and $3-3^-$, the relative phase is around 90 degrees. There is also some results from $\psi(3686)$ which do not veto the 90 degrees possibility. From the theoretical point of view, both sub-amplitudes in perturbative QCD and QED should be real which means the relative phase should be 0 degree which is conflict with the indirect results. In this talk, we present the direct measurement with resonance scan method. By introducing the EM amplitude from continuum decay, the interference between EM and strong mechanism is measured in J/ψ decays to 5π final state.

session

D. Hadron Decays

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