

Signatures for tetraquark mixing from experimental partial widths of the two light-meson nonets

Thursday, 22 June 2023 17:30 (20 minutes)

Tetraquark mixing model has been proposed recently as a possible structure for the two nonets in the $J^P = 0^+$ channel, the light nonet composed of $a_0(980)$, $K_0^*(700)$, $f_0(500)$, $f_0(980)$, and the heavy nonet of $a_0(1450)$, $K_0^*(1430)$, $f_0(1370)$, $f_0(1500)$. Two tetraquark types are introduced in this model, and their mixtures that diagonalize the color-spin interaction are realized by the two nonets. Among various signatures, we report in this talk that the experimental partial decay widths collected from Particle Data Group (PDG) support this mixing model clearly. Specifically, we demonstrate that the coupling strengths of the light nonet to two pseudoscalar mesons estimated from the experimental partial widths are consistently larger than those of the heavy nonet. This feature agrees qualitatively well with the predictions from the tetraquark mixing model and, therefore, provides supporting evidence for the tetraquark mixing.

Reference: Hungchong Kim and K. S. Kim, "Tetraquark mixing supported by the partial decay widths of two light-meson nonets", Eur. Phys. J. C 82, no.12, 1113 (2022)

Collaboration

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Session Classification: Parallel session B2