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Dispersive analysis of $\eta(1405/1475)$ on the recent BESIII $J/\psi \rightarrow \gamma K_0^S K_0^S \pi^0$ decay

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Motivated by the recent BESIII report on $J/\psi \rightarrow \gamma K_0^S K_0^S \pi^0$ decay, we firstly perform a dispersive analysis to study the final-state-interactions (FSIs) in the three-body unitarity and try to gain some insights into the nature of long-standing puzzles of isoscalar pseudo-scalar $\eta(1405/1475)$ which is related the radially excited states of $\eta - \eta'$ and pseudo-scalar glueballs. The two-body FSIs are established from the low-energy meson-meson scattering data within the Muskhelishvili-Omnès framework and then the generic three-body FSIs below 1.6GeV are learned by the Khuri-Trieman framework. The experimental data are described and the pole structure of $\eta(1405/1475)$ by analytical continuation will also be reported.

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