Contribution ID: **29** Type: **Talk**

Three-body unitary coupled-channel analysis on (1405 / 1475)

Monday, 16 October 2023 17:50 (20 minutes)

The recent BESIII data on Jpsi-> gamma eta(1405/1475) -> gamma KKbar pi
, which is significantly more precise than earlier eta(1405/1475)-related data, enables quantitative discussions on eta(1405/1475) at the previously unreachable level. We conduct a three-body unitary coupled-channel analysis of experimental Monte Carlo outputs for Jpsi-> gamma eta(1405/1475) -> gamma KKbar pi. The KKbar pi Dalitz plot distributions from the BESIII, and branching ratios of "gamma pi pi eta" and "gamma gamma pi pi" final states relative to that of "gamma KKbar pi". Our model systematically considers (multi)loop diagrams and an associated triangle singularity, which is critical for making excellent predictions on eta(1405/1475) -> pi pi pi line shapes and branching ratios. The eta(1405/1475) pole locations are revealed for the first time. Two poles for eta(1405) are found on different Riemann sheets of the K*Kbar channel, while one pole is found for eta(1475). The eta(1405/1475) states are described by two bare states dressed with continuum states. The lower bare state would be an excited eta' state, while the higher one could be an excited eta('), hybrid, glueball, or a mixture of these. This work presents the first-ever pole determination based on a manifestly three-body unitary coupled-channel framework applied to experimental three-body final state distributions (Dalitz plots).

Parallel Session

Hadron Spectroscopy

Primary authors: Prof. NAKAMURA, Satoshi (Shandong University); Dr HUANG, Qi (Nanjing normal University); Prof. PENG, Haiping (University of Science and Technology of China); Prof. ZHU, Yinchun (University of Science and Technology of China); Dr ZHANG, Yan (University of Science and Technology of China)

Presenter: WU, Jia-Jun (UCAS, School of Physical Sciences)

Session Classification: Hadron spectroscopy