Isoscalar scattering: flavor tagging of decays

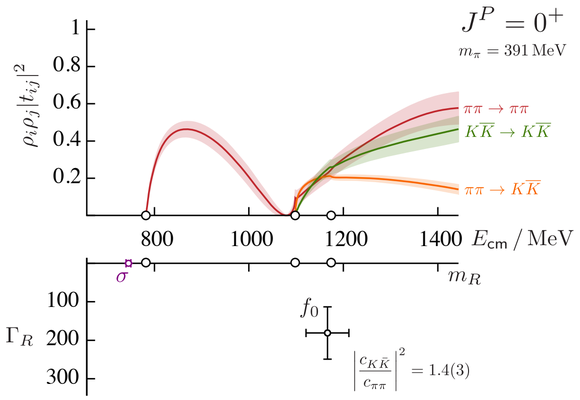
Objectives

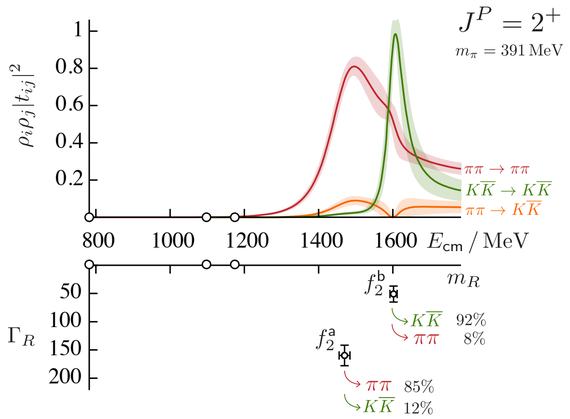
- Searches for exotic hadrons a major focus of the $350M upgrade of JLab and the new Hall D
- Composition of lightest hadrons with scalar quantum numbers a long mystery
- Use new LQCD methods to establish nature of scalar resonances

Impact

- Established strong theory and analytical/numerical support for spectroscopy programs worldwide
- Improved algorithms and software support for contractions essential to progress.
- Demonstrates flavor tagging as a viable method of identifying compositions of states

Accomplishments





- First LQCD study of coupled isoscalar S&D-wave scattering
- Found analogues of experimental σ and f_0 states manifesting as dip in $\pi\,\pi$ cross sections
- Extracted resonance parameters an established branching fractions indicating flavor content of spin-2 states
- Published R.Briceno, J.Dudek, R.Edwards, W.WIlson, Phys.Rev.D97(2018) 054513

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