

Decays of an exotic 1^{-+} hybrid meson resonance in QCD

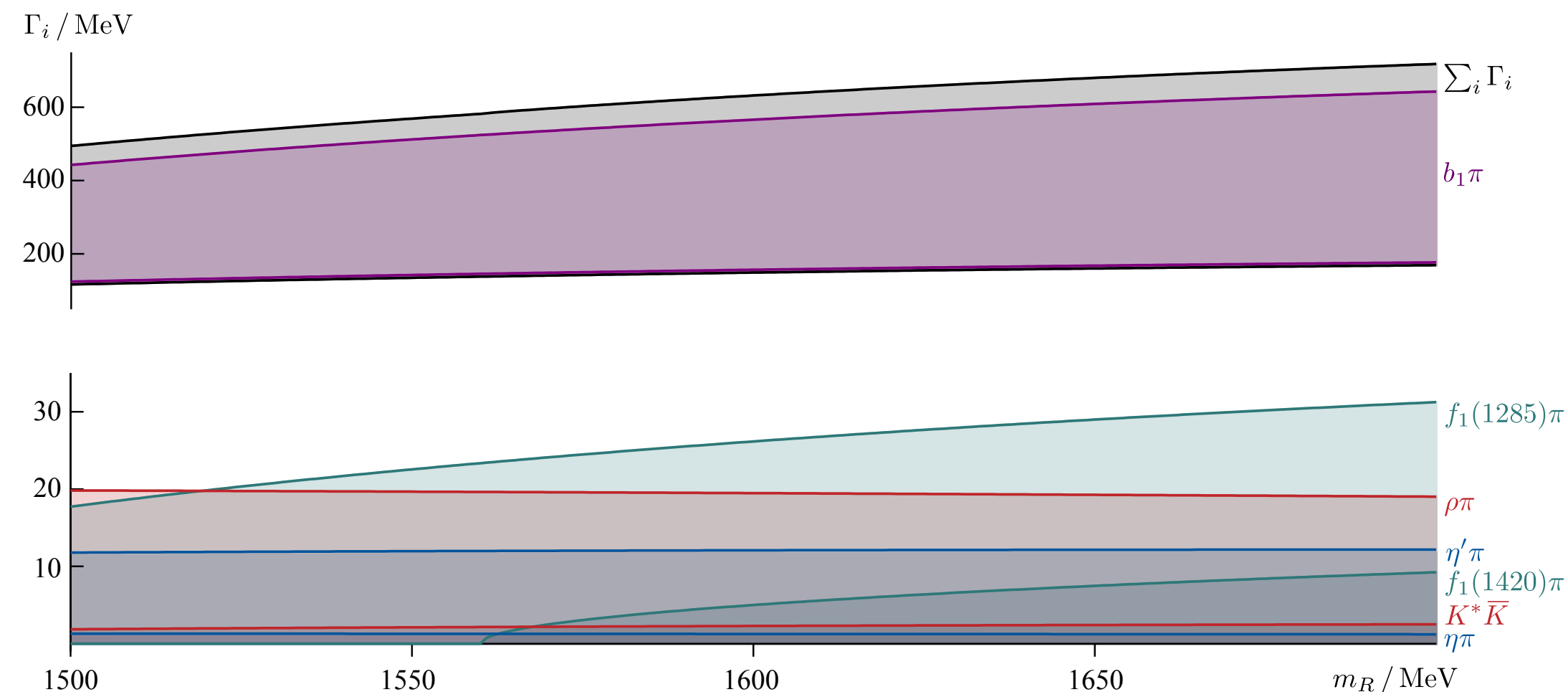
Objectives

- A major goal of the GlueX@JLab, CLAS12@JLab, COMPASS@CERN experiments is to discover exotic resonances of quarks and gluons
- Use lattice QCD methods to compute resonance properties, and should such states exist, provide information on their decay properties to guide experimental searches

Impact

- First QCD prediction for exotic meson decay channels
- As opposed to experimental searches, lattice QCD determinations must determine all decay modes.
- Predicted branching fractions for decays inform experimental searches are optimal search channels

Resonance width decomposed into dominant decay channels



Accomplishments

- Major milestone in meson spectroscopy
- Provides first evidence from QCD that exotic resonances do exist
- Branching fractions for decays suggest that current search channels in the GlueX and COMPASS experiments are highly suppressed. Dominant decay channel is $b_1\pi$
- Calculations suggest only one resonance pole in isovector 1^{-+} , effectively ruling out some initial experimental searches.