Abstract Submitted
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Line Shapes of Exotic $c\bar{c}$ Mesons[1] MENG LU, ERIC BRAATEN, Ohio State University — The B-factory experiments have discovered a series of charmonium-like mesons, including the $X(3872)$ and the first manifestly exotic meson $Z^+(4430)$. The proximity of the masses of these two mesons to thresholds for pairs of charm mesons has motivated their interpretations as charm meson molecules. Given these interpretations, we investigate the invariant mass distributions (line shapes) of $X(3872)$ and $Z^+(4430)$ by taking advantage of the universality of S-wave bound states with small binding energies and by including the effects from the nonzero widths of their constituents. We isolate the dependence of the line shapes on the details of QCD into constant factors. We make quantitative predictions of the line shapes for the $X(3872)$ and the $Z^+(4430)$ with an emphasis on the difference between the line shapes in decay modes containing a charmonium and those containing two charm mesons.

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