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J– meson resonances in QCD

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Our theoretical and experimental understanding of the spectrum of meson resonances with $J^{PC} = (1, 2, 3)^{--}$ heavier than the $\phi(1020)$ is relatively weak. While there is strong evidence for fairly narrow isovector and isoscalar 3^{--} states, there are no good 2^{--} candidates, and the 1^{--} sector, where resonances may be broad and are expected to overlap, is rather confused. The corresponding excited kaon spectrum, which is also not as definitive as we would like, is mainly based upon the LASS dataset from the 1980s.

Associations of states in the isoscalar sector with particular flavor structure as 'ω' or 'ϕ' typically follow from assumptions based in OZI phenomenology, and it is not clear that these assumptions have been tested as throughly as they should be away from the lowest $\omega(782)$, $\phi(1020)$ states.

These observations motivate lattice QCD calculations of the J^{--} sector. To avoid the complication of explicit three-body decays, a first round of calculations have been performed at the SU(3) flavor point where the light quarks have the same mass as the strange quarks, considering both the octet case and the singlet case. I will show some results on the resonance content of QCD, explore some limited tests of OZI assumptions, and propose some plausible extrapolations to the physical light quark mass.

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