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X and Z_{cs} in $B^+ \to J/\psi\phi K^+$ as s-wave threshold cusps and alternative spin-parity assignments to $X(4274)$ and $X(4500)$

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Recent LHCb's amplitude analysis on $B^+ \to J/\psi\phi K^+$ suggests the existence of exotic X and Z_{cs} hadrons, based on an assumption that Breit-Wigner resonances describe all the peak structures. However, all the peaks and also dips in the spectra are located at relevant meson-meson thresholds where threshold kinematical cusps might cause such structures. This points to the importance of an independent amplitude analysis with due consideration of the kinematical effects, and this is what we do in this work. Our model fits well $J/\psi\phi$, $J/\psi K^+$, and $K^+\phi$ invariant mass distributions simultaneously, demonstrating that all the X, Z_{cs}, and dip structures can be well described with the ordinary s-wave threshold cusps. Spin-parity of the $X(4274)$ and $X(4500)$ structures are respectively 0^- and 1^- from our model, as opposed to 1^+ and 0^+ from the LHCb's. With all relevant threshold cusps considered, the number of fitting parameters seems to be significantly reduced. The LHCb data requires $D_s^{(*)}\bar{D}^*$ scattering lengths in our model to be consistent with zero, disfavoring $D_s^{(*)}\bar{D}^*$ molecule interpretations of $Z_{cs}(4000)$ and $Z_{cs}(4220)$ and, via the SU(3) relation, being consistent with previous lattice QCD results. This contribution is based on Phys.Rev.D 107 (2023) L011504.

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