Contribution ID: **11** Type: **not specified**

Study of twist-2 distribution amplitudes and the decay constants of pseudoscalar and vector heavy mesons in light-front quark model

Monday 16 September 2019 15:35 (25 minutes)

We study the twist-2 distribution amplitudes (DAs) and the decay constants of pseudoscalar as well as the longitudinally and transversely polarized vector heavy (D, D_s, B and B_s) mesons in the light-front quark model with the Coulomb plus exponential-type confining potential $V_{\rm exp} = a + be^{\alpha r}$ in addition to the hyperfine interaction. We first compute the mass spectra of ground state pseudoscalar and vector heavy mesons and fix the model parameters necessary for the analysis, applying the variational principle with the trial wave function up to the first three lowest order harmonic oscillator (HO) wave functions $\Phi(x, \mathbf{k}_\perp) = \sum_{n=1}^{3} c_n \phi_{nS}$. We then obtain the numerical results for the corresponding decay constants. We analyze the variation of DAs as a function of momentum fraction. We also compare our results with the available experimental data as well as with the other theoretical model predictions.

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Session Classification: Parallel 2

Track Classification: Phenomenological models