

Light cone wave functions in the context of space like transition formfactors and prompt hadroproduction of $\eta_c(1S, 2S)$

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We review results of pseudoscalar S-wave $\eta_c(1S, 2S)$ quarkonia electromagnetic form factors for the $(\gamma^* \gamma^* \rightarrow \eta_c)$ couplings as well as their hadroproduction observables in kt-factorisation using the light-cone (LC) potential approach for the quarkonium wave function. The electromagnetic form factors are presented as functions of both photon virtualities. The light cone quarkonium wave functions are obtained in two steps. Firstly, the radial part of the wave function is obtained as a solution of the Schrödinger equation for five different cc potential models, then using Terentev prescription, they are translated to light-cone “radial” wave functions. We investigate the effects of the so-obtained form factors in the context of proton-proton collision, by taking into account the proper color factors and coupling constants for the off-shell gluon-gluon fusion to the meson. We have collated our findings with LHCb data for prompt production of at 7 TeV, 8 TeV and 13 TeV.

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