

## $\eta_c$ Diffractive Production in the Direct Photon Process

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**Abstract:** Based on the factorization theorem for lepton induced hard diffractive scattering and color octet heavy quarkonium production mechanism,  $\eta_c$  diffractive production in the direct photon process is studied. The results show that this process can be measured at DESY HERA, and  $\eta_c$  production has different features from  $J/\psi$  production, which is weakly affected by the initial and final state gluon radiation. Therefore,  $\eta_c$  photoproduction can be viewed as reliable estimate. The experimental study of this process can give valuable insight in the color octet heavy quarkonium production mechanism.

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Key words: diffractive, factorization, color-octet

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