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Two-photon transitions of charmonia on the light front

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We investigate the two-photon transitions $c\bar{c} \rightarrow \gamma^* \gamma$ of the charmonium system in light-front dynamics. The light-front wave functions were obtained from solving the effective Hamiltonian based on light-front holography and one-gluon exchange interaction within the basis light-front quantization approach. We compute the two-photon transition form factors as well as the two-photon decay widths for S- and P-wave charmonia η_c and χ_{cJ} . Without introducing any free parameters, our predictions are in good agreement with the recent experimental measurements by BaBar and Belle, shedding lights on the relativistic nature of charmonium.

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