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LCSR application to radiative tau decay

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The non-perturbative QCD effects involved in radiative tau decay ($\tau^- \rightarrow \pi^- \nu_\tau \gamma$) are encoded in two form factors; the vector (F_V) and the axial vector (F_A) form factors. We present the computation of these form factors using light cone sum rules. The form factors involved in this decay are same as involved in radiative pion decay with the crucial difference that the momentum transfer squared, t , between the pion-photon system is positive, which makes these form factors timelike and also as t can now take values up to m_τ^2 , it can produce real hadronic resonances. We calculate the analytical form for these form factors using the method of light cone sum rules and present the decay width and the invariant mass spectrum in the $\pi - \gamma$ system. We found that the structure dependent parameter, γ , i.e. the ratio of the axial vector to vector form factor at zero momentum transfer to be in good agreement with the experimental determination.

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