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Theoretical models to explain the TeV gamma-ray and X-ray correlations exhibited in Blazars.

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The broadband spectral energy distribution (SED) of blazars has two well-separated bumps, one of low energy, peaking at soft X-rays and the other of high energy, peaking at hundreds of GeVs. The SED in most of blazars is well understood through the standard one-zone Self-Synchroton Compton (SSC) emission. However, if that is the case, a strong correlation between X-ray and TeV-emission is expected. During the last decade, several correlations among X-ray and TeV bands have been searched but they have not undoubtedly confirmed. Some studies have suggested serious deviations from the expected leptonic correlation. In this work, we propose a theoretical model to study the correlation between the TeV gamma-ray and X-ray emission in different time scales and levels of activities of blazars. This leptonic model depends basically on the bulk Lorentz factor, the size of emitting region, the electron number density and the strength of the magnetic field. In the particular case, we apply this model to describe the TeV gamma-ray and X-ray correlation reported in Mrk421. We explore regions of the parameter space where the current model can describe a unique correlation for different time scales and levels of activities.

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