

## An expanding one-zone model for studying blazars emission

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Blazars have their jet pointing towards us and are known for their emission that covers practically all electromagnetic spectrum frequencies. These sources, in some cases, exhibit a correlation between  $\gamma$ -ray and radio emission, especially during flaring episodes. Adopting the hypothesis that high-energy photon emission by relativistic electrons occurs close to the central black hole, we study the evolution of this population of particles as they move along the jet and lose energy by radiation and adiabatic expansion. In this scenario,  $\gamma$ -rays are produced early on, when the electrons are still very energetic, while radio emission at a later time when the emission region becomes optically thin to synchrotron self-absorption due to expansion. We develop an expanding one-zone code to calculate the emitted spectrum by simultaneously solving the kinetic equations of particles and photons. We will discuss the parameters entering our calculations, like the magnetic field strength, the density of relativistic electrons, etc., in connection to the observational data by applying our results to the case of Mrk421.

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