

Are BL Lac jets weakly magnetised?

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The Spectral Energy Distribution (SED) of BL Lacs is usually modelled assuming that the momentum distribution of the non-thermal particles is isotropic. The modelling of the SED typically suggests the presence of strongly sub-equipartition magnetic fields in the emission region, which contradicts the paradigm of dynamically important magnetic fields in AGN jets. I will argue that the non-thermal electrons responsible for producing the observed radiation are instead primarily accelerated in the direction of the background magnetic field. The key point is that gyroresonant pitch angle scattering, which might isotropize the electron momentum distribution, can be effective only out to some electron energy that is typically smaller than the spectral break due to efficient cooling. I will present a simple phenomenological model that takes this effect into account. Using the new model, the physical properties of the emission region that are inferred from the observed SED change dramatically. In particular, allowing for an anisotropic electron distribution removes the need for strongly sub-equipartition magnetic fields in the emission region.

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