Contribution ID : **786** Type : **Poster**

TeV Gamma-Rays from Particles Accelerated in the Magnetosphere of Supermassive Black Holes

Abstract content

In this contribution we discuss models of the X-rays and TeV gamma-ray emission from BL Lac objects based on parallel electron-positron or electron-proton beams that form close to the central black hole owing to the strong electric fields generated by the accretion disk and possibly also by the black hole itself. Fitting the energy spectrum of the BL Lac object Mrk 501, we obtain tight constrains on the beam properties. Launching a sufficiently energetic beam requires rather strong magnetic fields close to the black hole 100-1000 G. However, the model fits imply that the magnetic field in the emission region is only 0.02 G. Thus, the particles are accelerated close to the black hole and propagate a considerable distance before instabilities trigger the dissipation of energy through synchrotron and self-Compton emission. We discuss various approaches to generate enough power to drive the jet and, at the same time, to accelerate particles to 20 TeV energies. Although the parallel beam model has its own problems, it explains some of the long-standing problems that plague models based on Fermi type particle acceleration, like the presence of a very high minimum Lorentz factor of accelerated particles. We conclude with a brief discussion of the implications of the model for the difference between the processes of jet formation in BL Lac type objects and in quasars.

If this papers is presented for a collaboration, please specify the collaboration

Summary

Reference

Primary author(s) : Prof. KRAWCZYNSKI, Henric (Washington University in St. Louis)

Presenter(s) : Prof. KRAWCZYNSKI, Henric (Washington University in St. Louis)

Session Classification : Posters 2 + Coffee

Track Classification : OG.2.3