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Radiation from relativistic particles accelerated at shear layers in relativistic jets

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The supermassive black holes in the centers of some active galaxies (AGN) eject powerful relativistic jets which propagate over kpc scales, showing no significant momentum loss. Both observational evidence as well as theoretical considerations from MHD simulations of jets suggests that they are radially stratified, with a fast inner spine surrounded by a slower-moving outer sheath. The resulting relativistic shear layers are a prime candidate for the site of relativistic particle acceleration in the jets of AGN and gamma-ray bursts (GRBs). In this talk, we will present results of particle-in-cell simulations of magnetic-field generation and particle acceleration in the relativistic shear boundary layers of jets in AGN and GRBs including the self-consistent calculation of radiation spectrum produced by inverse Compton scattering of relativistic electrons in the isotropic soft photon field. We outline future plans to include self-consistent calculation of angle-dependent radiation produced by the particles accelerated at these shear boundary layers.

Abstract field

Author: CHAND, Tej (North-West university, Centre for Space Research)

Co-author: BOETTCHER, Markus (North-West University)

Presenter: CHAND, Tej (North-West university, Centre for Space Research)

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