

Disruption of Plasma Disks Around Black Holes, Magnetic Field Amplification and Angular Momentum Transport

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Plasma disk configurations may not persist around black holes but be replaced by sequence of current rings configurations or solitary current rings. The presented analysis starts from observing that the radiation emission from Shining Black Holes is most frequently seen as having nonthermal features. It is therefore appropriate to consider relevant collective processes in plasmas surrounding black holes that contain high energy particles with nonthermal distributions in momentum space [1]. A fluid description with significant temperature anisotropies is the simplest relevant approach. These anisotropies are shown to have a critical influence on: (a) the existence and characteristics of stationary plasma and field ring configurations, (b) the excitation of “thermo-gravitational modes” driven by temperature anisotropies and gradients that involve gravity and rotation, (c) the generation of magnetic fields over macroscopic scale distances, and (d) the transport of angular momentum. Sponsored in part by the U.S. DOE.

[1] Coppi, B. *Plasma Phys. Rep.* (2017). doi:10.1134/S1063780X17030059.