

Abstract Submitted  
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**Influence of Local Angular Momentum Transport and Ring Configurations in the Strong Gravity of a Central Object\*** F. ROUSSEAU, B. COPPI, M.I.T. — Differentially rotating plasma structures in the prevalent gravity of a central object (e.g. black hole) can acquire a configuration characterized by a radial sequence of rings<sup>1</sup> in the presence of a “seed” vertical magnetic field, rather than one typical of a gaseous disk. A sequence of pairs of counter-streaming toroidal current channels is associated with these rings and no poloidal currents are produced if a torque is absent. When a local transport process of angular momentum is present, loops of poloidal currents associated with the resulting torque are formed.<sup>2</sup> In particular, the vertical current densities are up- down antisymmetric. A jet that could emerge from the innermost ring would, in fact, have antisymmetric vertical current densities relative to the equatorial plane. When a small radial velocity, resulting for instance from accretion, is present we argue that matter will flow along the X-lines and the O-lines of a weakly spiraling ring configuration that is envisioned instead of the strictly axisymmetric<sup>1</sup> configuration found when only a toroidal velocity is present. \*Sponsored in part by the U.S. Department of Energy.

<sup>1</sup>B. Coppi and F. Rousseau, *Ap. J.* **641** (1), 458 (2006)

<sup>2</sup>B. Coppi, MIT-LNS Report 06/05 (Cambridge, MA, 2006)

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