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Self-gravitating Disks and Plasma Structures Immersed in Them*

G. BERTIN, Universita' di Milano, Italy, B. COPPI, MIT — When considering axisymmetric differentially rotating plasma structures in the prevalent gravity of a central object these are found to be characterized by a sequence of current filaments and to develop a corresponding ring sequence[1] configuration for the plasma. The same type of structure can be found when the self-gravity of a differentially rotating plasma component is no less important than the gravity of the central object. Then in addition to the vertical and horizontal equilibrium equations to be solved, Poisson's equation for the gravitational potential has to be dealt with. The fact that the vertical equilibrium is ensured by the vertical component of the Lorentz force due to the internal plasma currents ("Lorentz compression") simplifies the problem considerably.

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[1]B. Coppi and F. Rousseau, *Ap. J.* **641** (1), 458 (2006).

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