

Abstract Submitted
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Sequence of Rotating Plasma Rings Configurations in the Prevalent Gravitational Field of a Central Object B. COPPI, M.I.T., F. ROUSSEAU, Ecole Normale Superieure — The search for the axisymmetric equilibrium configurations of thin differentially rotating plasma structures in the prevalent gravitational field of a central object has led to identify a new kind of configuration consisting of a sequence of pairs of plasma rings corresponding to pairs of oppositely directed current channels. The plasma pressure is of the order of the magnetic energy density associated with the currents flowing within the rings, but larger than that of the field in which the rings are immersed. The magnetic configuration has a “crystal structure” of the type found first for accretion disks¹ with relatively low magnetic energy densities. The “sequence of plasma rings” solution² of the relevant equilibrium equations may in fact be extended to dusty plasmas, and be of interest in planetary physics³. A necessary condition is that the plasma rotation frequency is constant on magnetic surfaces requiring relatively large electrical conductivity. Moreover, accretion structures for which the magnetic configuration has a dominant effect are suitable to represent those from which jets can emerge. Sponsored in part by the U.S. Department of Energy.

¹B. Coppi, *Phys. of Plasmas* **12**, 057302 (2005).

²B. Coppi and F. Rousseau, M.I.T. LNS Report HEP 05/01,(2005).

³C.K. Goertz and G. Morfill, *Icarus* **53**, 219 (1983)

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