

Abstract Submitted
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Fields and Plasma Structures Around “Shining” Black Holes: Solitary Rings and Tri-dimensional Topologies¹ B. COPPI, MIT — Field and plasma configurations that can be the distinguishing feature of and surround “shining” black holes have been identified. Considering the observation of the Quasi Periodic Oscillations that can be associated with inhomogeneous rotating plasmas, tri-dimensional rotating configurations have been looked for and found under special conditions. One is that these configurations are radially localized, such as narrow plasma ring pairs. Another is that the rotation frequency is nearly constant over the rings. Only axisymmetric local configurations consisting of solitary plasma rings or periodic sequences of rings are found when the gradient of the rotation frequency is (locally) significant. Assuming that the plasma pressure is scalar the problem is reduced to the solution of two coupled non-linear differential equations. One, the “Master Equation” [1], relates the magnetic surface function to the plasma rotation frequency that is connected to the gravity field. The other, the Vertical Equilibrium Equation, relates the plasma pressure gradient to both the Lorentz force and to the plasma density profile through the gravitational force.

[1] B. Coppi, *Phys.Plasmas* **18**, 032901 (2011).

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B. Coppi
MIT

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