Abstract Submitted
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High Energy Particle Populations and Relevant Plasma Processes Associated with Shining Black Holes* BRUNO COPPI, MIT — Shining Black Holes are identified as collapsed objects surrounded by plasmas whose radiation emission can be associated, in most cases, with non-thermal high energy particle populations. When this feature can be represented by a non-isotropic pressure tensor in a fluid-like description of the relevant plasmas, new collective modes [1,2] whose excitation depend on the plasma pressure anisotropy have been found. By the same kind of theory new plasma and field stationary configurations (e.g. "solitary rings") associated with the plasma pressure anisotropy have been identified. This is a first step toward dealing with the plasmas surrounding black holes by theories involving phase space that do not have to rely on having nearly isotropic Maxwellian particle distributions in momentum space. The considered collective modes and the equilibrium configurations, that do not require the presence of a seed magnetic field for their derivation and where the magnetic energy density is of the order of the gravitationally confined plasma pressure, provide a clear theoretical framework to describe how magnetic field can be generated and amplified around black holes [1]. *Sponsored in part by the U.S. D.O.E.

[1] B. Coppi, A&A 548, A84 (2012)
[2] B. Coppi, Phys. Plasmas 18, 032901 (2011)

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