

General Relativity and Quantum Cosmology

Particle Accelerators inside Spinning Black Holes

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On the basis of the Kerr metric as a model for a spinning black hole accreting test particles from rest at infinity, I show that the center-of-mass energy for a pair of colliding particles is generically divergent at the inner horizon. This shows that not only are classical black holes internally unstable, but also that Planck-scale physics is a characteristic feature within black holes at scales much larger than the Planck length. The novel feature of the divergence discussed here is that the phenomenon is present only for black holes with rotation and in this sense it is distinct from the well known Cauchy horizon instability.

Comments: 4 pages, 3 figures, revtex4, much expanded presentation

Subjects: **General Relativity and Quantum Cosmology (gr-qc)**; High Energy Astrophysical Phenomena (astro-ph.HE); High Energy Physics - Theory (hep-th)

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