

General Relativity and Quantum Cosmology

Gravitational instability of the inner static region of a Reissner-Nordstrom black hole

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Reissner--Nordstr"om black holes have two static regions: $r > r_o$ and $0 < r < r_i$, where $0 < r_i < r_o$ are the inner and outer horizon radii. The stability of the exterior static region has been established long time ago. In this work we prove that the interior static region is unstable under linear gravitational perturbations. This result gives an alternative reason to mass inflation to consider the spacetime extension beyond the Cauchy horizon as physically irrelevant, and thus provides support to the strong cosmic censorship conjecture. Evidence of a linear gravitational instability in the interior region of Kerr black holes has recently been found by the authors.

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