

On Energy Condition Violation for Shifting Negative Mass Black Holes

Authors : Manuel Urueña Palomo

Abstract : In this paper, we introduce the study of a new solution to gravitational singularities by violating the energy conditions of the Penrose Hawking singularity theorems. We consider that a shift to negative energies, and thus, to negative masses, takes place at the event horizon of a black hole, justified by the original, singular and exact Schwarzschild solution. These negative energies are supported by relativistic particle physics considering the negative energy solutions of the Dirac equation, which states that a time transformation shifts to a negative energy particle. In either general relativity or full Newtonian mechanics, these negative masses are predicted to be repulsive. It is demonstrated that the model fits actual observations, and could possibly clarify the size of observed and unexplained supermassive black holes, when considering the inflation that would take place inside the event horizon where massive particles interact antigravitationally. An approximated solution of the model proposed could be simulated in order to compare it with these observations.

Keywords : black holes, CPT symmetry, negative mass, time transformation

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