Mirror reflections of a black hole

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Abstract

An exact correspondence between a black hole and an accelerating mirror is demonstrated. It is shown that for a massless minimally coupled scalar field, the same Bogolubov coefficients connecting the "in" and "out" states occur for a (1+1)-dimensional flat spacetime with a particular perfectly reflecting accelerating boundary trajectory and a (1+1)-dimensional curved spacetime in which a null shell collapses to form a black hole. Generalization of the latter to the (3+1)-dimensional case is discussed. The spectral dynamics is computed in both (1+1)-dimensional spacetimes along with the energy flux in the spacetime with a mirror. It is shown that the approach to equilibrium is monotonic, asymmetric in terms of the rate, and there is a specific time which characterizes the system when it is the most out of equilibrium.

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