

Causal structure of black holes in generalized scalar-tensor theories

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A modified causal structure of black holes in theories beyond general relativity might have implications for the stability of such solutions. In this talk, we explore the horizon structure of black holes as perceived by scalar fields for generalized scalar-tensor theories, which exhibit derivative self-interactions. This means that the propagation of perturbations on nontrivial field configurations can be superluminal and that the matter fields and gravitational perturbations do not necessarily experience the same causal structure.

Upon linearization, and imposing stationarity of the metric and of the scalar field, we prove that Killing horizons of the background metric are always Killing horizons of the effective metric as well.

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