

Horizon closeness bounds for static black hole mimickers

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Abstract

We consider the question whether a wormhole can be converted into a nonextremal quasiblack hole by a continuous change of parameters. In other words, we ask whether "black" wormholes can exist as end points of families of static wormhole geometries. The answer is negative since the corresponding limit is singular. Similar conclusions are valid also for other types of black hole mimickers. Our treatment is model independent and applies to any static geometries. We also find an asymptotic expression for the Kretschmann scalar for wormholes on the threshold of horizon formation. We point out complementarity between the ability of wormholes to mimic black holes and their ability to be traversable "in practice." © 2009 The American Physical Society.

<http://dx.doi.org/10.1103/PhysRevD.79.067502>
