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Semiclassical wormholes

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Abstract

Smooth-throat wormholes are treated as possessing quantum fluctuation energy with a scalar massive field as its source. The heat kernel coefficients of the Laplace operator are calculated in the background of the arbitrary-profile throat wormhole with the help of the zeta-function approach. Two specific profiles are considered. Some arguments are given that wormholes may exist. It serves as a solution of semiclassical Einstein equations in the range of specific values of the length, a certain radius of the wormhole's throat, and a constant of nonminimal connection.

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