

Vacuum stress-energy tensor of a massive scalar field in a wormhole spacetime

Bezerra V., Bezerra De Mello E., Khusnutdinov N., Sushkov S.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

The vacuum average value of the stress-energy tensor of a massive scalar field with nonminimal coupling ξ to the curvature on the short-throat flat-space wormhole background is calculated. The final analysis is made numerically. It was shown that the energy-momentum tensor does not violate the null energy condition near the throat. Therefore, the vacuum polarization cannot self-consistently support the wormhole. © 2010 The American Physical Society.

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