

# Thin-shell toroidal $T^2$ -wormhole

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A topologically nontrivial thin-shell wormhole with a throat in the form of a  $T^2$  torus is considered. It is shown that: (i) such a wormhole is stable with respect to excitations of the throat; (ii) not all energy conditions are violated for such wormholes; (iii) if any of the energy conditions is violated, this violation occurs only partially in some region on the throat, and in other regions the violation is absent. The differences between spherical  $S^2$  wormholes and toroidal  $T^2$  wormholes under investigation are considered.

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