
MAGIC

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Magnetic Fields and Electromagnetic Outflows in Rotating Wormhole Spacetime

The Blandford–Znajek mechanism has been proposed to explain the outflows of particles and fields from rotating black holes. The key ingredients of this mechanism are the presence of an ergosphere and a magnetic field. Although rotating wormholes are hypothetical objects, they can also produce an outward electromagnetic flux via the Blandford–Znajek process.

In this work, we investigate the Blandford–Znajek mechanism in a Kerr-like wormhole spacetime. For the first time, we derive analytical expressions for the magnetic field in the wormhole geometry by solving the stream equation. We compute the corresponding Poynting flux and confirm previous findings: the less a wormhole resembles a black hole, the weaker its Poynting flux.

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