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WITHDRAWN - Exact wormhole solutions in Einstein-Maxwell theory

Tuesday, 30 May 2017 16:30 (15 minutes)

We construct several classes of exact wormhole solutions in 5-dimensional Einstein-Maxwell theory. We demonstrate that without requiring exotic matter, these spacetimes become singularity-free with an appropriate choice of parameters and maybe interpreted as models of charged or uncharged particles and particle-antiparticle pairs. We show that the electric field approaches Coulombic limit for large distances r away from the wormhole throat but has a more complicated structure for very small r and a very small mass parameter. We generalize the solutions to arbitrarily high dimensions and also provide cosmological solutions. Finally, we explore if the intricate combination of electric and gravitational fields near the throat can provide physically realistic models of atomic and subatomic phenomena in general relativity.

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