

General Relativity and Quantum Cosmology

Topological geon black holes in Einstein-Yang-Mills theory

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We construct topological geon quotients of two families of Einstein-Yang-Mills black holes. For Kuenzle's static, spherically symmetric $SU(n)$ black holes with $n > 2$, a geon quotient exists but generically requires promoting charge conjugation into a gauge symmetry. For Kleihaus and Kunz's static, axially symmetric $SU(2)$ black holes a geon quotient exists without gauging charge conjugation, and the parity of the gauge field winding number determines whether the geon gauge bundle is trivial. The geon's gauge bundle structure is expected to have an imprint in the Hawking-Unruh effect for quantum fields that couple to the background gauge field.

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