

Charged particle dynamics in the surrounding of Schwarzschild anti-de Sitter black hole with topological defect immersed in an external magnetic field

The geodesic motion of the charged particles in the vicinity of the event horizon of weakly magnetized Schwarzschild anti-de-Sitter black hole (BH) with topological defects has been investigated. The effect of dark energy on the size of the event horizon, the mass of the BH, and the stability of the orbits of the particles have also been explored in detail. We discussed, if the BH mass increases and the future universe is dominated by phantom DE, then the BH-apparent horizon (AH) and the cosmic-AH will eventually coincide, after which both horizons disappear and the singularity becomes naked. It happens in finite co-moving time before the Big Rip occurs, violating the Cosmic Censorship Conjecture. Furthermore, DE is not constant rather growing density and hence stronger over cosmic time.

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