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Rotating black strings in Einsteinian cubic gravity with Born-Infeld electrostatics

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Abstract

In this paper we examine asymptotically anti-de Sitter rotating black string solutions of four-dimensional Einsteinian cubic gravity in the presence of nonlinear Born-Infeld electrostatics. By assuming that the solutions are completely regular at the horizon and studying the asymptotic and near-horizon behavior of the solutions, we compute independently the Hawking temperature, the Wald entropy, the mass, the angular momentum, the charge and the electrostatic potential, and show that the first law of thermodynamics for rotating black strings with non-linear Born-Infeld source holds exactly in Einsteinian cubic gravity. We also show that when the nonlinear parameter goes to infinity, the solutions tend to those obtained from Maxwell's electrostatics.

Keywords: rotating black string, Einsteinian cubic gravity, born-infeld electrostatics.

For full article, refer to the Persian section