

Review of: "Einstein-AdS gravity coupled to nonlinear electrodynamics, magnetic black holes, thermodynamics in an extended phase space and Joule—Thomson expansion"

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Potential competing interests: No potential competing interests to declare.

This paper studies magnetic black holes in Einstein-Anti-de Sitter (AdS) gravity theory coupled to nonlinear electrodynamics. The author obtains a new magnetically charged black hole solution, gives the metric function, mass function, and corrections to the Reissner-Nordström solution. Black hole thermodynamics is studied in the extended phase space, where the thermodynamic magnetic potential and vacuum polarization are obtained. The generalized Smarr relation is proven to hold. By analyzing the Gibbs free energy and heat capacity, phase transition behaviors are demonstrated. The Joule-Thomson adiabatic expansion is studied and the inversion temperature is given. This is a high-quality paper with a systematic study of the thermodynamics and phase behavior of nonlinear electrodynamics black holes. The content is novel, the arguments are clear, and the calculations and analysis are meticulous.