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

Zahra Amirabi[1]

1 Eastern Mediterranean University

Potential competing interests: No potential competing interests to declare.

In this manuscript, the author further studies a previously proposed model of nonlinear electrodynamics coupled minimally to Einstein's R gravity with a cosmological constant. In particular, a black hole solution is introduced which is sourced by a magnetic monopole sitting at the center of the black hole which is also its singular point.

The author continues to investigate the thermodynamic properties of the black hole. In particular, the first law of black hole thermodynamics and the modified Smarr formula of the black hole are introduced. Furthermore, the black hole thermodynamics in an extended phase space with a negative cosmological constant is studied. In all cases, the effect of the nonlinear electrodynamics parameter is assessed through analytical or numerical/graphical calculations.

The paper is interesting and definitely deserves to be published. However, there is one point that has to be addressed. Right after Eq. (13), the author claims that the spacetime is regular because f(0)=1. The finiteness of the metric function is necessary but not sufficient in order to have the spacetime regular. In fact, the author should obtain the scalars of the spacetime and then conclude whether the spacetime is regular or singular. In fact, in this specific case since the energy-momentum tensor is singular the black hole is also singular.