

Thermodynamics of FRW Universe in Einstein-Gauss-Bonnet Theory

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Abstract

We have investigated the laws of thermodynamics of the universe filled with (i) perfect fluid having equation of state $p = \omega\rho$, (ω is variable) and (ii) non-interacting two fluid system - one of the constituent matter is the holographic dark energy and the other is the limiting case of dust in Einstein-Gauss-Bonnet (EGB) gravity. We have found that the first and second laws of thermodynamics are valid if the physically relevant part of the universe is bounded by the dynamical apparent horizon. On the other hand, if the boundary is chosen at the event horizon the thermodynamical description apparently breaks down.

Keywords : Gauss-Bonnet gravity, Thermodynamics, FRW Universe, Horizons.

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