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Thermodynamic Curvature of AdS Black Holes with Dark Energy in the Grand Canonical Ensemble.

Thursday 15 December 2022 14:00 (1 hour)

Phenomenologically, from the sign of the Ruppeiner scalar curvature, one can predict the nature of dominant interactions among black hole microstructures. In the extended phase space, thermodynamic geometry has been of special interest for black holes as the singularities of Ruppeiner scalar curvature of the metric signal critical behaviors. Initially, we constructed the thermodynamic properties of AdS black holes with dark energy in the form of quintessence and investigated the P-V criticality. We encounter the presence of an extra term in the critical temperature expression arising due to the presence of dark energy or quintessence. In the grand canonical ensemble, we computed the corresponding normalised scalar curvature taking (T,V) as the fluctuation coordinates for fixed values of electric potential. For lower values of electric potential, the dominance of attractive interaction is observed while for higher values of electric potential, repulsive interaction dominates. Further, the interaction remains constant at the phase transition where the black hole microstate change.

Session

Formal Theory

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