General Relativity and Quantum Cosmology

Critical phenomena and information geometry in black hole physics

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(Submitted on 13 Jan 2010)

We discuss the use of information geometry in black hole physics and present the outcomes. The type of information geometry we utilize in this approach is the thermodynamic (Ruppeiner) geometry defined on the state space of a given thermodynamic system in equilibrium. The Ruppeiner geometry can be used to analyze stability and critical phenomena in black hole physics with results consistent with those from the Poincare stability analysis for black holes and black rings. Furthermore other physical phenomena are well encoded in the Ruppeiner metric such as the sign of specific heat and the extremality of the solutions. The black hole families we discuss in particular in this manuscript are the Myers-Perry black holes.

Comments:	Contribution to ERE2009, 5 pages
Subjects:	**General Relativity and Quantum Cosmology (gr-qc)**
Cite as:	**arXiv:1001.2220v1 [gr-qc]**

Submission history

From: Narit Pidokrajt [view email]

[v1] Wed, 13 Jan 2010 16:19:40 GMT (29kb)

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