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**Geometrothermodynamics as a singular conformal thermodynamic geometry.** (English)

Zbl 1430.83092

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**Summary:** In this letter, we first redefine our formalism of the thermodynamic geometry introduced in [the first and the last authors, “Correspondence of phase transition points and singularities of thermodynamic geometry of black holes”, *Eur. Phys. J. C* 74, No. 1, Paper No. 2681, 10 p. (2014; doi: 10.1140/epjc/s10052-013-2681-6); the first author et al., “Hessian matrix, specific heats, Nambu brackets, and thermodynamic geometry”, *J. High Energy Phys.* 2015, No. 4, Paper No. 115, 24 p. (2015; doi: 10.1007/jhep04(2015)115)] by changing coordinates of the thermodynamic space by means of Jacobian matrices. We then show that the geometrothermodynamics (GTD) is conformally related to this new formalism of the thermodynamic geometry. This conformal transformation is singular at unphysical points were generated in GTD metric. Therefore, working with our metric neatly excludes all unphysical points without imposing any constraints.

**MSC:**

83E05 Geometrodynamics and the holographic principle

**Full Text:** DOI

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