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Anisotropic mechanics

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Abstract content

Summary

In this work we implement scale anisotropic transformations in the space-time in classical mechanics. The resulting system is consistent with the dispersion relation of gravity at a Lifshitz point recently considered in arXiv:0901.3775. Also, we show that our model is a generalization of the conformal mechanics of Alfaro, Fubini and Furlan. For arbitrary z we construct the dynamical symmetries that correspond to the Schroedinger algebra. Furthermore, we obtain the Boltzman distribution for a gas of free particles compatible with anisotropic scaling transformations and compare our result with the corresponding thermodynamics of the recent anisotropic black branes proposed in arXiv:0907.4755.

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