

An overview about Finsler spacetimes and Penrose's Singularity Theorem

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ABSTRACT

Finsler Geometry comes into play whenever there is anisotropy, which means that locally not all the directions are indistinguishable. The lack of anisotropy of the universe has been recently conjectured in the frame of the Extended Standard Model [3], which motivates the study of Finsler spacetimes. We will first discuss the different definitions of Finsler spacetimes and how they have been used throughout the years (see for example [2, Section 3]). Then we will show how it is possible to generalize Penrose's Singularity Theorem to a very general class of Finsler spacetimes [1].

References

- [1] A. AAZAMI AND M. A. JAVALOYES, *Penrose's singularity theorem in a Finsler spacetime*, Classical Quantum Gravity, 33 (2016), 025003 (22 pages).
- [2] M. A. JAVALOYES AND M. SÁNCHEZ, *Finsler metrics and relativistic spacetimes*, Int. J. Geom. Methods Mod. Phys., 11 (2014), p. 1460032 (15 pages).
- [3] V. A. KOSTELECKÝ, *Riemann–Finsler geometry and Lorentz-violating kinematics*, Physics Letters B, 701 (2011), pp. 137–143.