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Aspects of Gravitational Field and Cosmological Consequences Based on Finsler and Finsler-like Geometries.

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Abstract: We present the gravitational dynamics with generalized field equations in Finsler and Finsler-like geometries. In this approach, the gravitational field is considered in the framework of extra dimensions with more degrees of freedom. The Einstein-Finsler-like gravity theories can be considered as natural candidates for the investigation of Lorentz violation, local anisotropies and provide a geometrical background for the emergence of dark matter and dark energy. In addition, modified gravity theories are extended in the framework of a geometry of an enriched spacetime with extra degrees of freedom. Friedmann equations are derived in a locally-anisotropic form of spacetime. In such theories, the concept of nonlinear connection, which connect the external and internal structures of spacetime, plays a crucial role. Some cosmological consequences are shown for the Finsler-Randers, Schwarzschild-Finsler-Randers models and generalized scalar-tensor theories.

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