Abstract

Generalized relativistic field equations have been derived for dynamics in a non-inertial reference frame interpreted as a Finsler space where events are specified by both spacetime coordinates and corresponding velocities (tangent vectors). The field equations follow in two alternative forms from exact general conservation laws derived through application of Cartan covariant differentiation within the framework of Finsler geometry. Velocity-dependent (curvature) terms in the field equations can account for the anisotropy of the gravitational field, together with the associated acceleration and expansion of the universe.