

Abstract Submitted  
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**Gravity as Nonmetricity** ALEXANDER POLTORAK, General Patent Corporation — It is shown that in the presence of an arbitrary affine connection, the gravitational field is described as nonmetricity of the affine connection. An affine connection can be interpreted as induced by a frame of reference (FR), in which the gravitational field is considered. This leads to an alternative geometrical interpretation of GR wherein gravity is a nonmetricity of space-time. Although the gravitational field equations are identical to Einstein's equations of GR, this formulation leads to a covariant tensor (instead of the pseudotensor) of energy-momentum of the gravitational field and covariant conservation laws. We further develop a geometric representation of FR as a metric-affine space  $(L_4, g)$ , with transition between FR represented as affine deformation of the connection. We show that the affine connection of a NIFR has curvature and may have torsion. We calculate the curvature for the uniformly accelerated FR. Finally, we show that GR is inadequate to describe gravitational field in a NIFR. We propose a generalization of GR, which describes gravity as nonmetricity of the affine connection induced in a FR. This generalization contains GR as a special case of the inertial FR.

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