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Conservative Transformation Group: Geometry of the Quantum?
EDWARD GREEN, University of North Georgia — An enlargement of the covariance group of general relativity which may unify the known forces has been developed by Pandres. Using tetrads on a four-dimensional space, this new transformation group, called the conservation group, contains the group of diffeomorphisms as a proper subgroup. The fundamental geometric object of the new geometry is the curvature vector, C_μ and the corresponding Lagrangian density is $C^\mu C_\mu \sqrt{-g}$. We find that the field equations are covariant under the larger group. A source Lagrangian term which produces a stress-energy tensor which is also covariant under the conservation group is given and means for fixing the gauge in a covariant way are discussed. Thus, one may find a solution of the field equations which satisfies given boundary conditions, and this determines a family of manifolds. As this family preserves the stress-energy of the source, but not the associated stress-energy of the free field, an energy condition is needed to determine the classical manifold. We conjecture that the required energy condition involves the scalar curvature, R.

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