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New equations for relativistic cosmology

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We propose a model where, in the Einstein equations, the right-hand side is modified by the addition of a term proportional to the symmetrized partial contraction of the Ricci tensor with the energy-momentum tensor. Bearing in mind the existence of a natural length scale given by the Planck length, dimensional analysis shows that such a term yields a correction linear in \hbar to the classical term that is instead just proportional to the energy-momentum tensor. One then obtains an effective energy-momentum tensor that consists of three contributions: pure energy part, mechanical stress, and thermal part. The pure energy part has the appropriate property for dealing with the dark sector of modern relativistic cosmology. Such a theory coincides with general relativity in vacuum, and the resulting field equations are here solved for a Dunn and Tupper metric, for departures from an interior Schwarzschild solution as well as for a Friedmann-Lemaitre-Robertson-Walker universe.

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