

Expanding Lorentzian manifolds: geometric equivalence between inhomogeneity and acceleration

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Moving references in embedded lorentzian manifolds $R^{(1, 3)}$ lead to inhomogeneous metrics with positive curvature. If Arnowitt–Deser–Misner (ADM) equations are considered, the metric solution is unique, and taking comoving paths as solutions of the Euler–Lagrange equations, stationary linear expansion is deduced. Finally, results on symmetry properties imply that only the angular momenta are global symmetries. The radial inhomogeneity of the metric is interpreted as an apparent radial acceleration, which breaks all the non-rotational local symmetries at large distances. In fact, the results are isomorphic to our 'flat universe' with acceleration.