

1056-83-1577

Didier A. Solis* (didier.solis@uady.mx), Periferico Norte, Tablaje 13615, Col. Chuburna de Hidalgo Inn, 97219 Merida, Yucatan, Mexico, and **Luis A. Farfan** (farfanluis15@hotmail.com), Periferico Norte, Tablaje 13615, Col. Chuburna de Hidalgo Inn, Merida, Yucatan 97219. *Local uniqueness of Minkowski space.*

According to the rigidity philosophy, the existence of a length extremizing geodesic in a semi-riemannian manifold is incompatible with certain curvature inequalities, except under very special circumstances. In the context of asymptotically simple spacetimes, it has been shown that the Null Energy Condition (i.e. $Ricc(X, X) \geq 0, \forall X$ null) prevents the occurrence of a null line (i.e. a globally achronal null geodesic) in a vacuum solution of the Einstein equations, except in the case of Minkowski space (when $\Lambda = 0$) or de Sitter space (when $\Lambda > 0$). In this talk we prove the local uniqueness of Minkowski space in the broader context of globally hyperbolic and asymptotically simple spacetimes. More specifically, under mild causal assumptions on the conformal boundary \mathcal{I} we show that any globally hyperbolic and asymptotically simple spacetime having a null line with endpoints in \mathcal{I} and obeying the vacuum Einstein equations must be locally isometric to Minkowski space. (Received September 22, 2009)