

GEOMETRIC EVOLUTION EQUATIONS AND MARGINALLY OUTER TRAPPED SURFACES

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ABSTRACT. We introduce a new evolution equation for hypersurfaces in asymptotically flat Riemannian manifolds which unites the theory of inverse mean curvature flow developed by Huisken and Ilmanen with that of marginally outer trapped surfaces (MOTS) in Lorentzian spacetimes. MOTS are the Lorentzian analogue of minimal surfaces and play the role of apparent horizons in general relativity. We discuss existence, uniqueness and applications of solutions to this evolution equation and outline their relevance to open problems in general relativity.