

Workshop on Geometric Evolution Equations
Atelier sur les équations géométriques d'évolution
16–27 April/*Avril*, 2008

Hamiltonian formulation of general relativity and quasilocal mass

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Abstract

Isometric embeddings of surfaces into the Minkowski space are used as references to derive a quasilocal mass expression from the Hamiltonian formulation of Einstein's equation. This involves an existence and uniqueness theorem of isometric embeddings and a canonical choice of time gauges. We also prove the quasilocal mass is positive under the dominant energy condition and is zero for surfaces in the Minkowski space. This talk is based on a jointwork with Shing-Tung Yau at Harvard.