

1061-53-107

**Lan-Hsuan Huang\*** (lhhuang@math.columbia.edu), Department of Mathematics, Columbia University, 2990 Broadway, New York, NY 10027. *Center of mass and constant mean curvature foliations for isolated systems in general relativity.*

Initial data sets in general relativity are Riemannian manifolds satisfying the constraint equations. An important class of initial data sets which model the isolated systems is the class of asymptotically flat manifolds.

I will discuss the existence and uniqueness of constant mean curvature foliations near infinity for asymptotically flat manifolds which satisfy the Regge–Teitelboim condition. It is known that the (Hamiltonian) center of mass is well-defined under this condition. To construct the surfaces with constant mean curvature, we first identify an integral quantity of the mean curvature with the center of the sphere and the center of mass. By applying the normal perturbations on spheres of large radius twice carefully, we can find a constant mean curvature surface near the sphere centered correctly. Moreover, from our construction, the foliation is asymptotically concentric, and its geometric center is the center of mass. (Received April 09, 2010)