Sixteenth Marcel Grossmann Meeting



Contribution ID: 508

Type: Talk in the parallel session

Adiabatic Solutions in General Relativity and Boundary Symmetries

Thursday, 8 July 2021 17:50 (20 minutes)

We use Weinberg's trick for adiabatic modes in a Manton approximation for general relativity on manifolds with spatial boundary. This results in a description of the time dependent solutions as null geodesics on the space of boundary diffeomorphisms, with respect to a metric we prove to be composed solely of the boundary data. We show how the solutions in the bulk space is determined with the constraints of general relativity. We also rephrase our description in the language of geometric continuum mechanics (see e.g. [1]). We show for the solutions we propose, the Hamiltonian constraint becomes the real homogeneous Monge-Ampere equation in the special case of two spatial dimensions.

[1]D. D. Holm, J. E. Marsden, and T. S. Ratiu, "The Euler-Poincare equations and semidirect products with applications to continuum theories", Advances in Mathematics 137 no. 1, (1998) 1-81.

Primary authors: Dr KUTLUK, Emine Şeyma (METU); Prof. VAN DEN BLEEKEN, Dieter; Dr SERAJ, Ali

Presenter: Dr KUTLUK, Emine Şeyma (METU)

Session Classification: Mathematical Problems of Relativistic Physics: Classical and Quantum

Track Classification: Alternative Theories: Mathematical Problems of Relativistic Physics: Classical and Quantum