

Advanced wave extraction algorithms in numerical relativity

ANDREA NEROZZI

*Centro Multidisciplinar de Astrofísica - CENTRA, Departamento de Física,
Instituto Superior Técnico - IST, Universidade de Lisboa - UL, Avenida Rovisco
Pais 1, 1049-001 Lisboa, Portugal
andrea.nerozzi@ist.utl.pt*

May 10, 2017

ABSTRACT

With the recent detection of gravitational waves and the expected improvements in accuracy of current and future experiments, it is of primary importance that numerical simulations achieve higher degrees of accuracy as well. In particular, the process of extracting gravitational waveforms from numerical simulations can be still subject by possible systematic errors, mostly because of the gauge freedom that is encountered along the way. I will present recent results in the field of wave extraction using the Newman-Penrose (NP) formalism, specifically aiming to remove all gauge ambiguities in the calculation of the NP quantities at finite radius. I will also discuss possible extensions of this methodology to obtain a gauge fixed signal at null infinity.