

Abstract Submitted  
for the APR15 Meeting of  
The American Physical Society

**Numerical Study of the Gravitational and Electromagnetic Waves on the Null Cone** MARIA BABIUC, Marshall UNiversity — The numerical calculation of the Einstein-Maxwell equations in a characteristic framework has not been done numerically before and is expected to shed new light on nonlinear phenomena like null memory. The main objective of this study is the analytical and numerical modeling of the of gravitational and electromagnetic radiation in a fully general relativistic framework, as it propagates on the null cone to null infinity, with no simplifications due to assumed symmetries. Moreover, the global interaction between the gravitational and electromagnetic radiation will be closely monitored, in order to reveal the electromagnetic radiation memory induced by the gravitational field. The numerical approach used, called the “Cauchy-characteristic extraction” method, is the most precise method for the computation of gravitational waveforms at infinite distance from a world-tube that encloses the source. The analytical and numerical models presented here will be implemented in the PittNull code, and the experience gained will be disseminated, in order to facilitate new standalone characteristic codes. This will lead to more insight on the interaction between gravitational and electromagnetic fields, and even point to new effects.

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Date submitted: 09 Jan 2015

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