Abstract Submitted
for the APR15 Meeting of
The American Physical Society

Binary Neutron Star Mergers with Initial Spin WOLFGANG KASTAUN, University of Trento, FILIPPO GALEAZZI, Goethe University, Frankfurt — Recently, we performed simulations of binary neutron star mergers which included both nuclear physics equations of state and stars with initial spin for the first time. The focus was on systems resulting in hyper-massive neutron stars. I will discuss the influence of realistic amounts of spin on the outcome, in particular regarding the gravitational wave signal. We also investigated the structure and dynamics of the remnant in detail, revealing some interesting new aspects. For example, we observe rotational profiles not fitting the standard notion of a rapidly rotating core, and show that strong quasi-radial oscillations in the post merger phase have an impact on the gravitational wave spectrum via a modulation of the m=2 mode frequency, offering an alternative to recent interpretations of high frequency side-peaks as non-linear combination frequencies. Finally, we discuss a possible mechanism in which the initial neutron star spins can influence the amount of ejected matter in some cases.

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Date submitted: 07 Jan 2015 Electronic form version 1.4