Title: Poster Advertisement Session 1

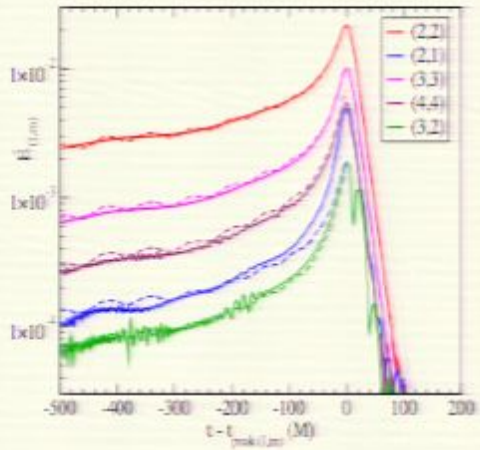
Date: Jun 24, 2010 02:30 PM

URL: http://pirsa.org/10060090

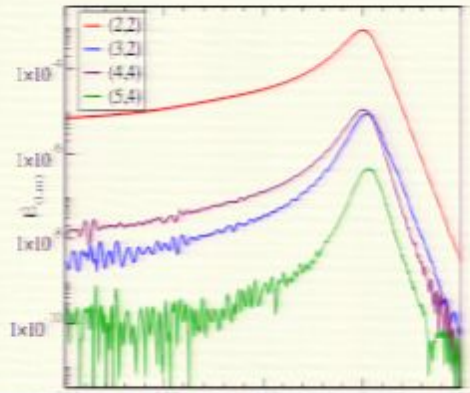
Abstract: N/A

Importance of Subdominant Modes

The figures below show the power distribution across modes approaching merger for a 4:1 binary:

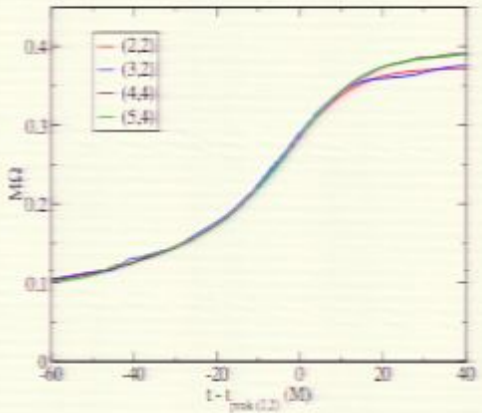


...and for a highly spinning "up-up" binary:



Late-Merger Frequency Shape

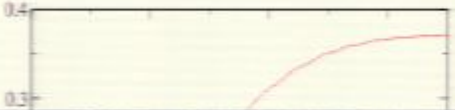
Toward the end of nonspinning mergers, each mode's "rotational frequency" has a smoothed "step function" shape:

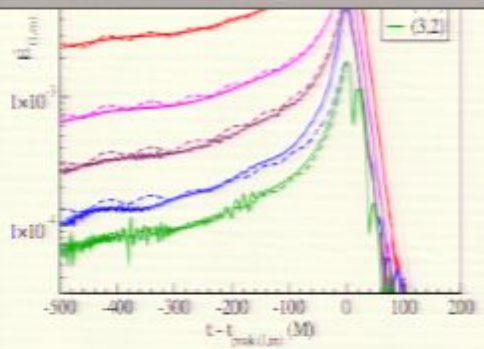


...can be approximated by a hyperbolic tangent function:

$$\Omega(t) = \Omega_i + (\Omega_f - \Omega_i)\left(\frac{1+\tanh\left[\ln\sqrt{\kappa} + (t-t_0)/b\right]}{2}\right)^{\kappa}.$$

Two different binaries can end up with the same final Kerr state; indistinguishable in the ringdown portion alone. However, the ramping up to the final frequency may contain more information, leading to better distinction between parameter sets:





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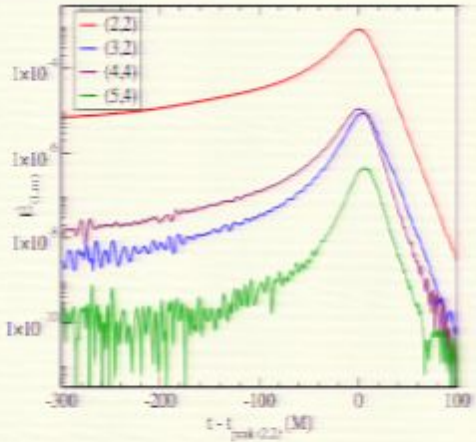
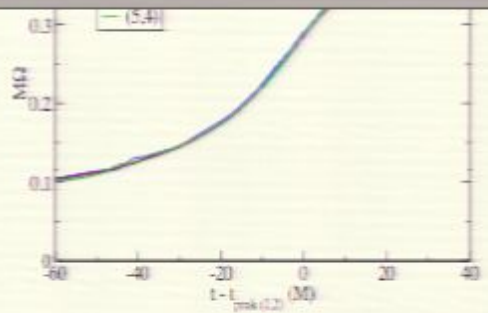


Merging Binary as Rigid Rotator

Baker *et al.* [Phys. Rev. D 78, 044046 (2008)] developed an "implicit rotating source" (IRS) picture to describe common phase evolution for dominant modes in nonspinning binaries.

They used this picture to develop the IRS-EOB template for the complete waveform from nonspinning mergers (alternative to attaching sums of quasinormal modes (QNMs) to post-Newtonian inspiral waveforms).



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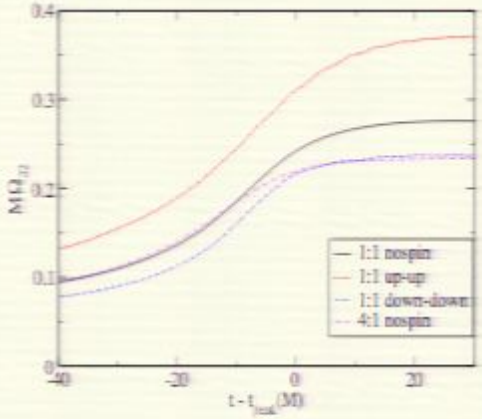

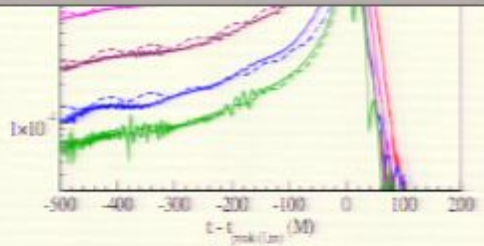

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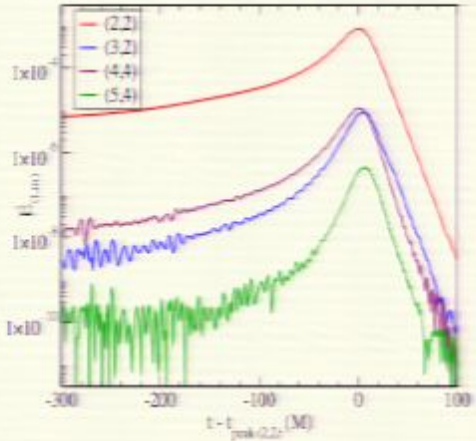

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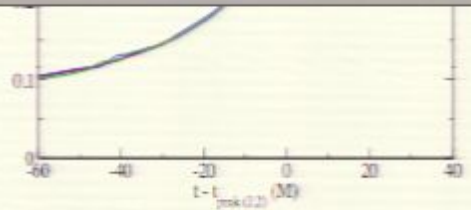

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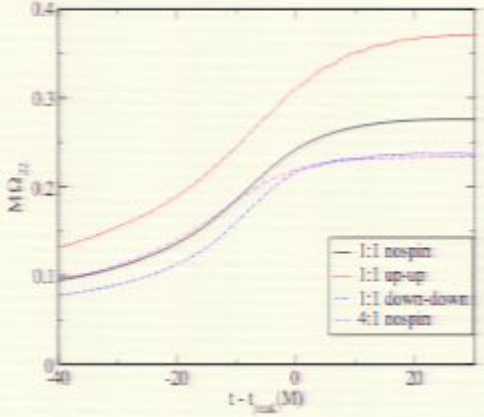

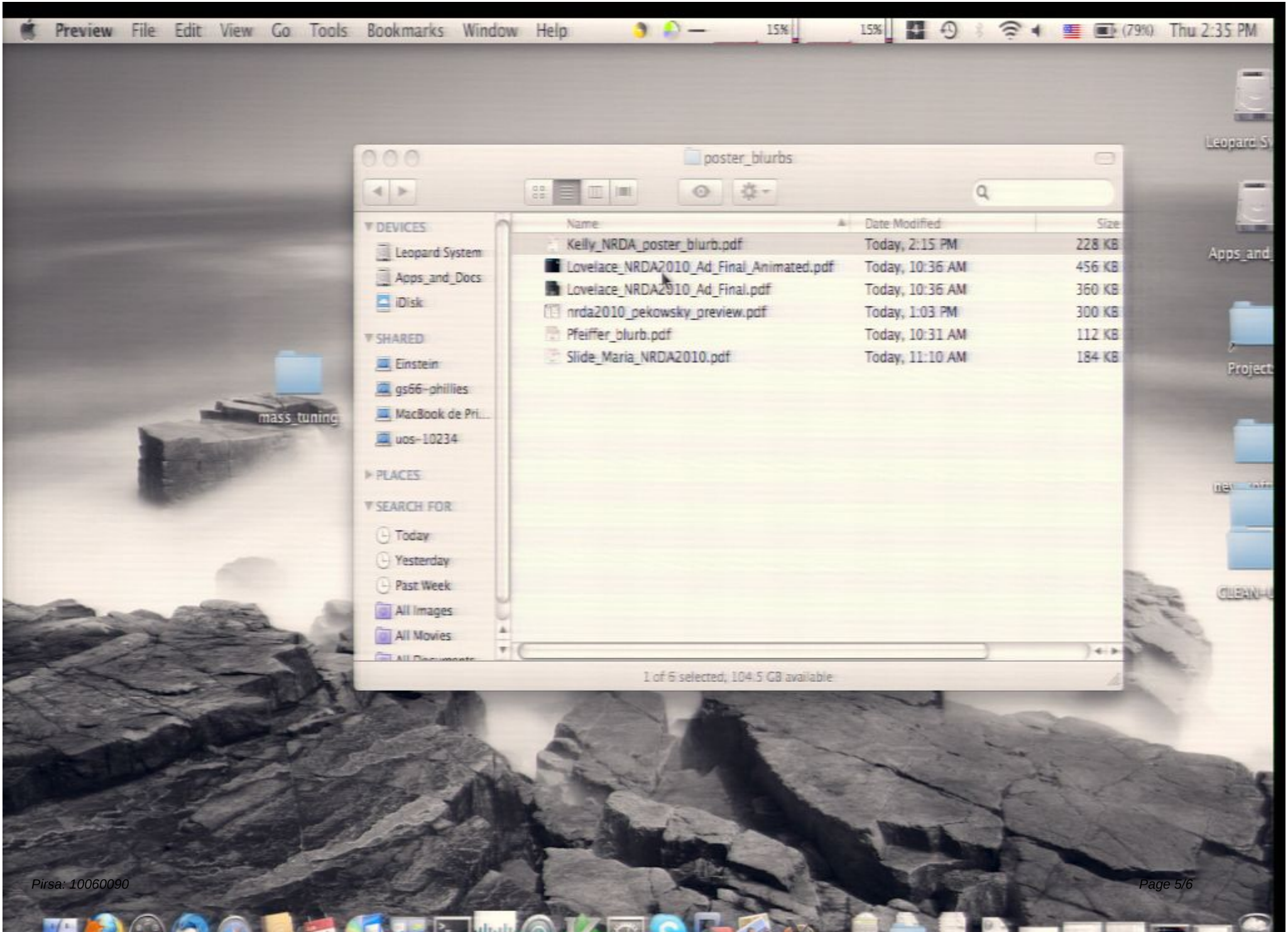
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Lovelace_NRDA2010_Ad_Final.pdf (1 page)

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Numerical simulations of binary black holes (BBH) with nearly extremal spins

Geoffrey Lovelace, Mark Scheel, and Béla Szilágyi

- Black holes may have (spin~1) via accretion
  - BBH simulations predict waves, spacetime
- Initial data
  - Typically: spin $\chi := S/M^2 \lesssim 0.93$
  - Higher spins: ID based on superposed BH
- Simulations (in progress)