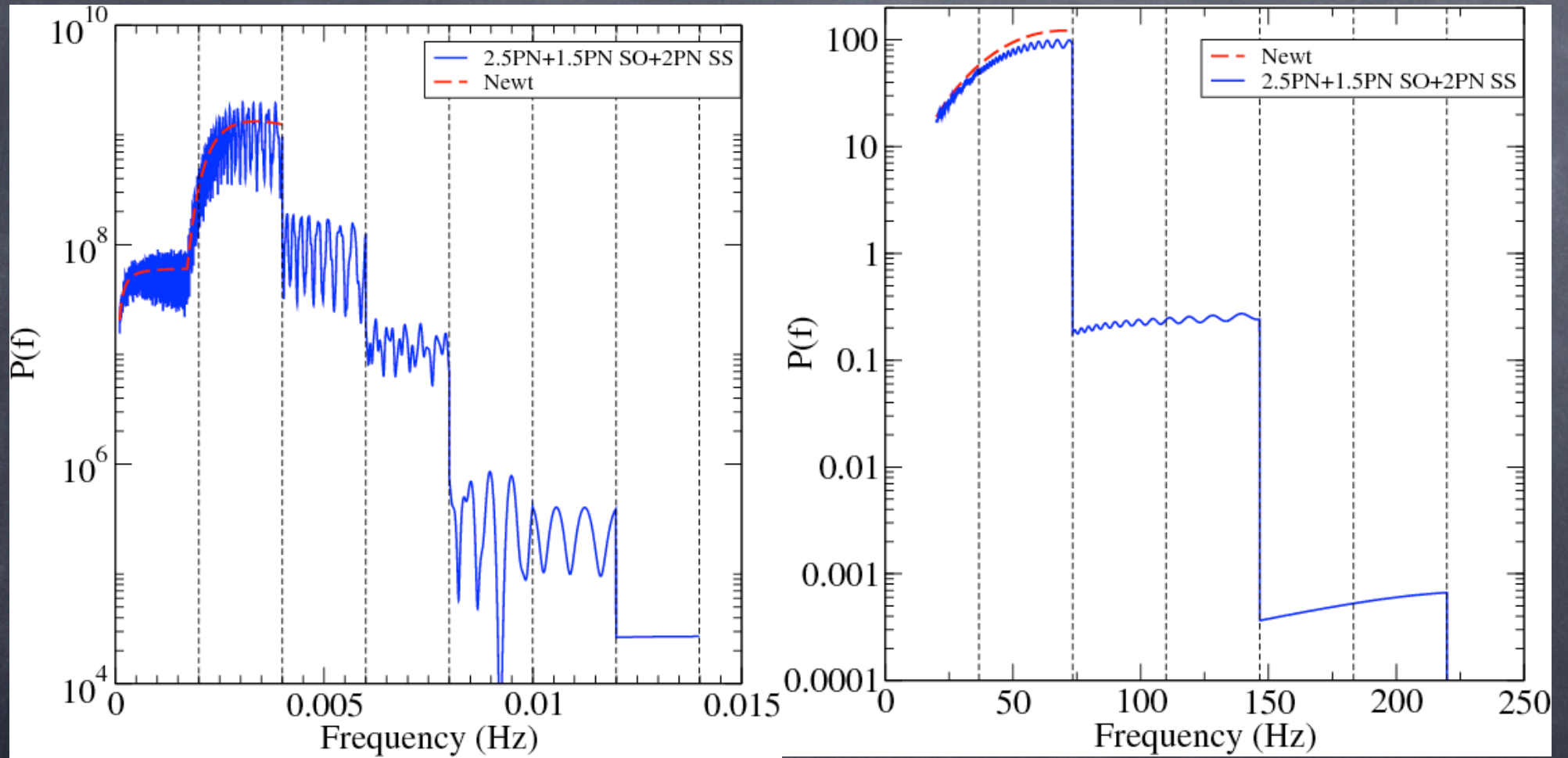


Challenges of searching for gravitational waves from spinning compact binaries

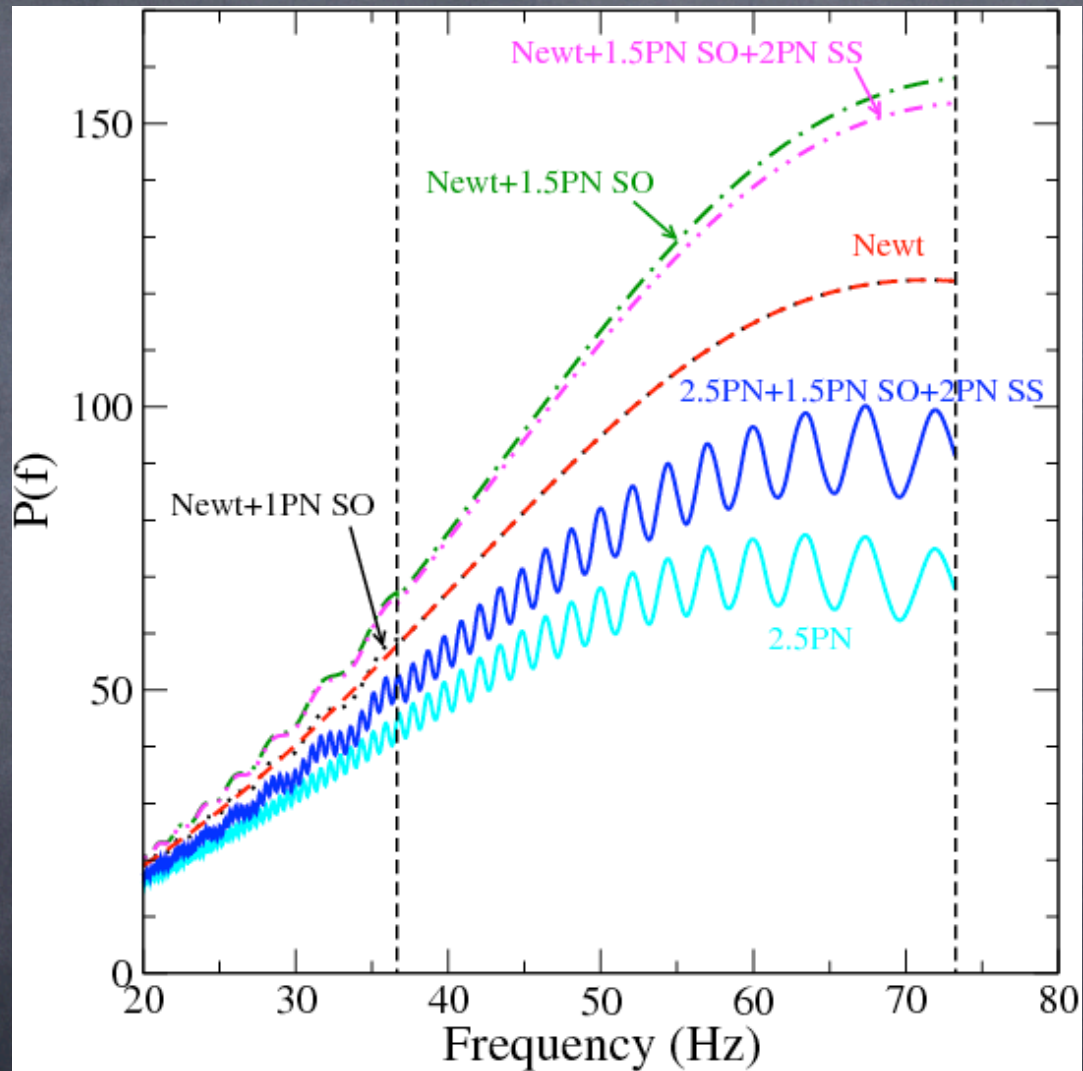
Supplementary slides

Evan Ochsner (Univ. of Wisconsin–Milwaukee)
Chirps, Mergers and Explosions, Sept. 14, 2012 KITP

Signal Power

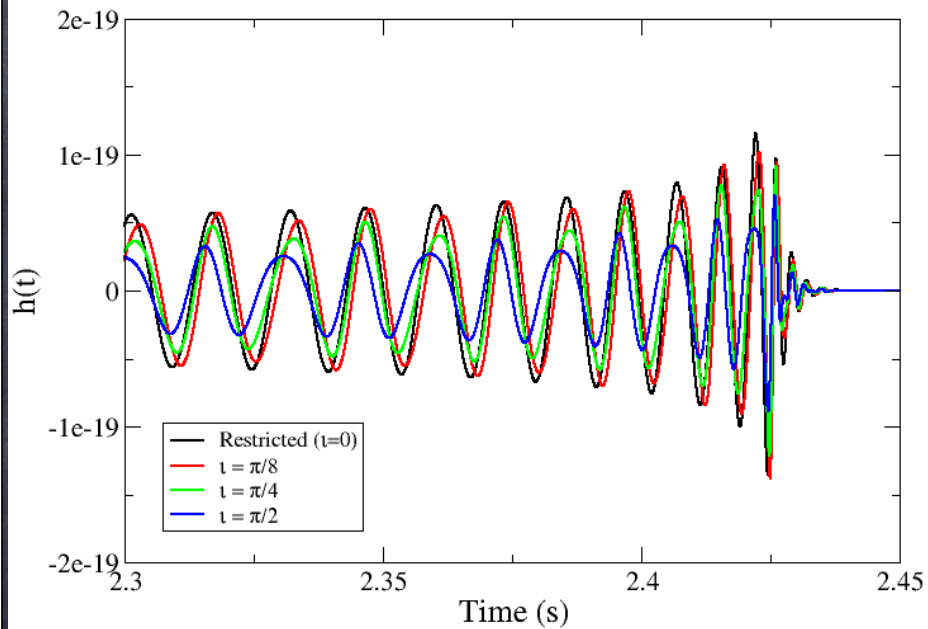


A Closer Look

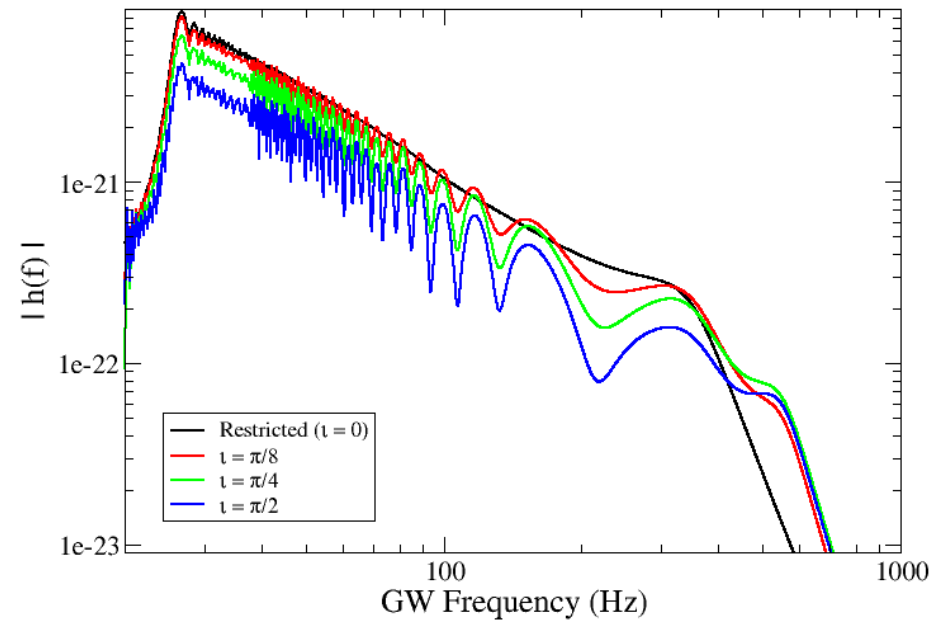


Amplitude-Corrected EOB

$M = 40 M_{\text{sun}}, \nu = 0.09$ EOB Waveforms

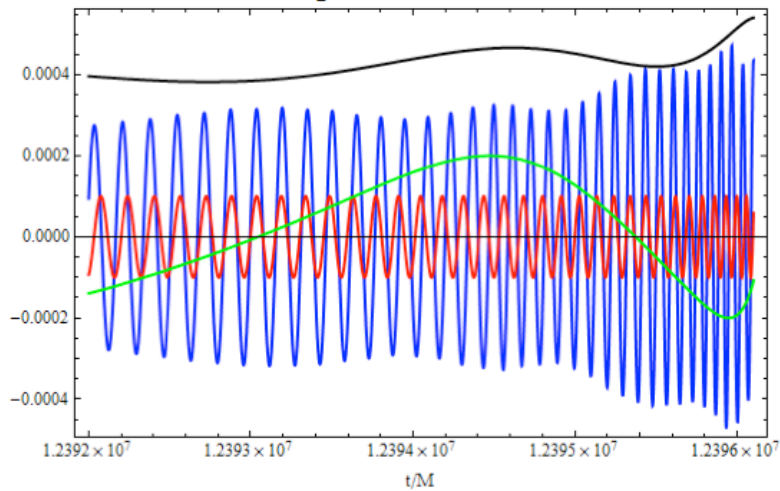


$M = 40 M_{\text{sun}}, \nu = 0.09$ EOB Waveforms

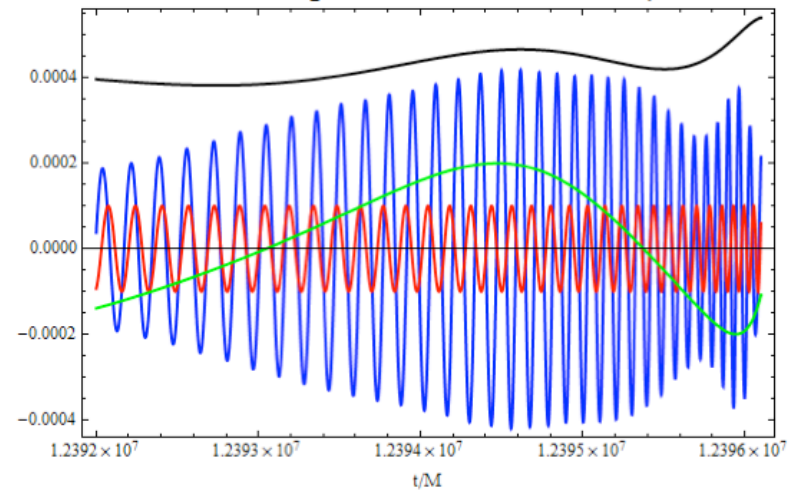


Precessing Waveforms

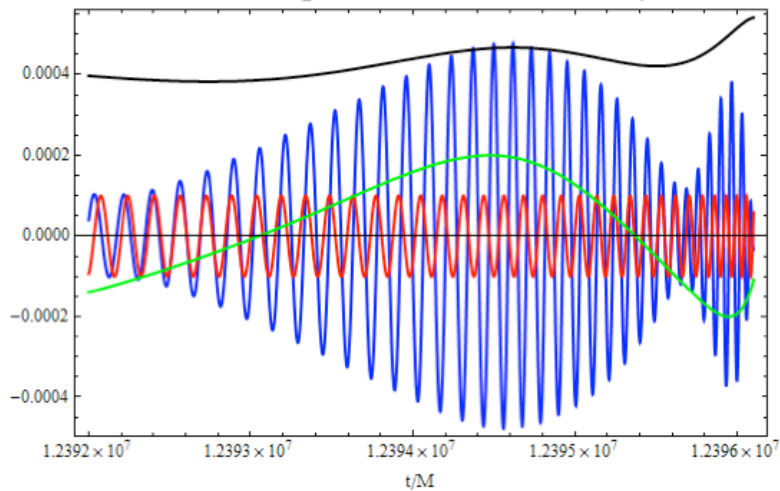
Precessing h_+ Polarization - $\theta = 0$



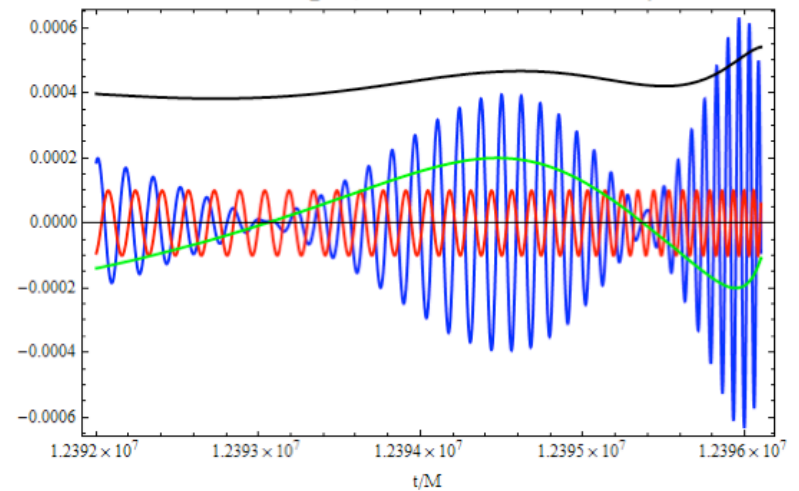
Precessing h_+ Polarization - $\theta = \pi/8$



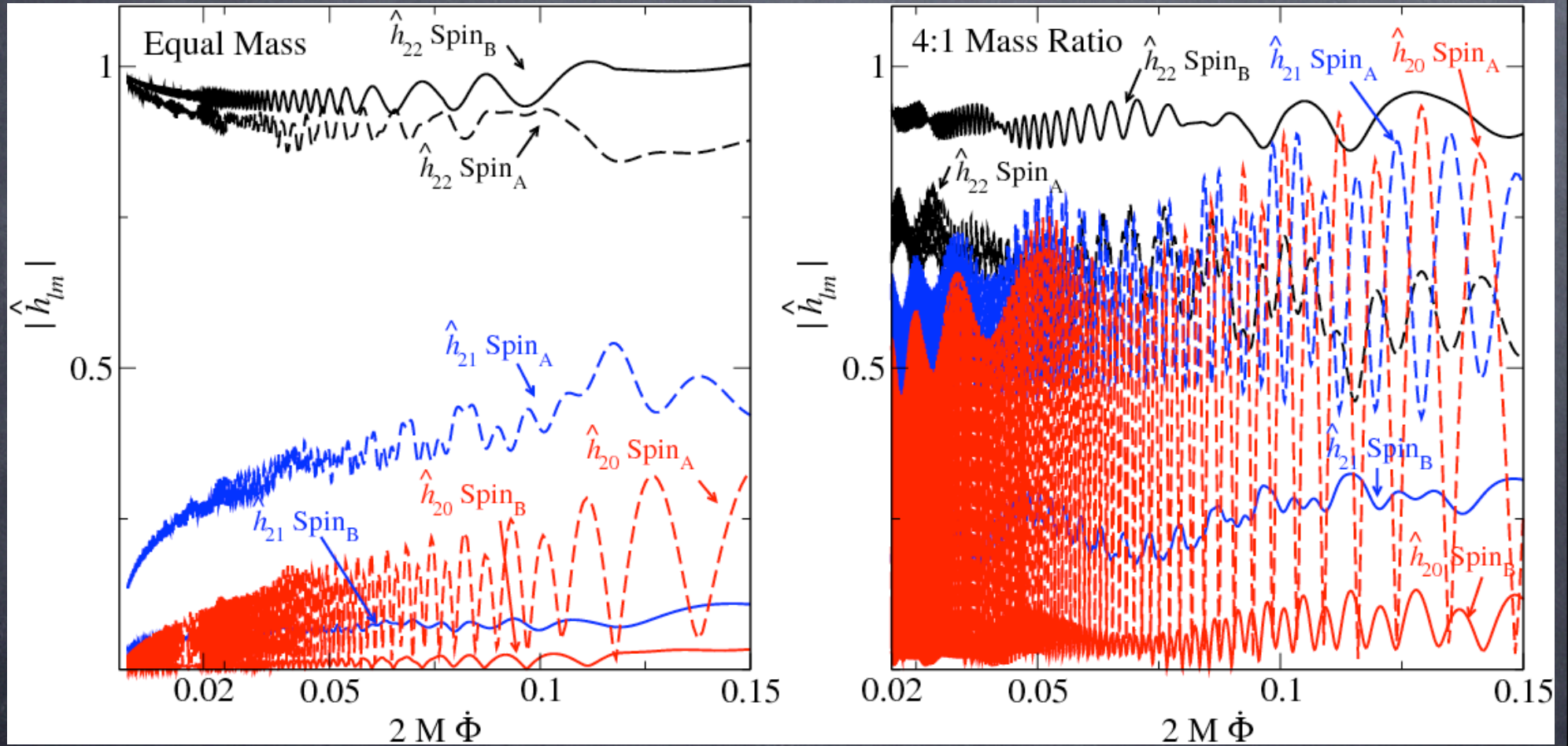
Precessing h_+ Polarization - $\theta = \pi/4$



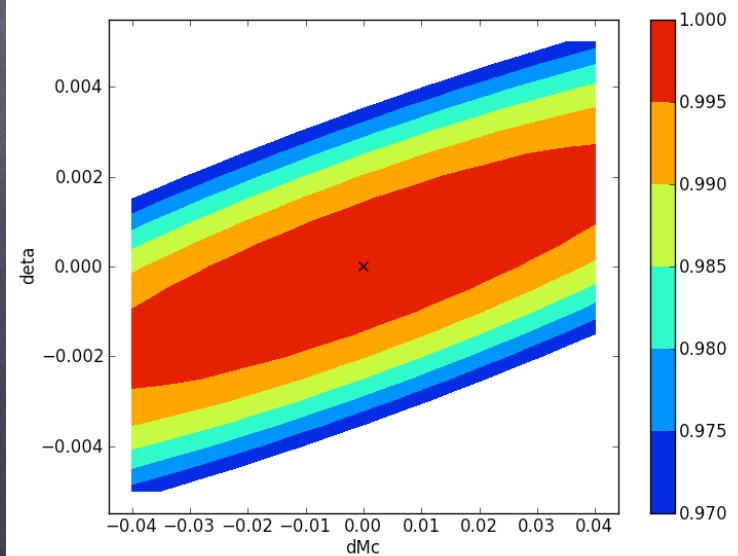
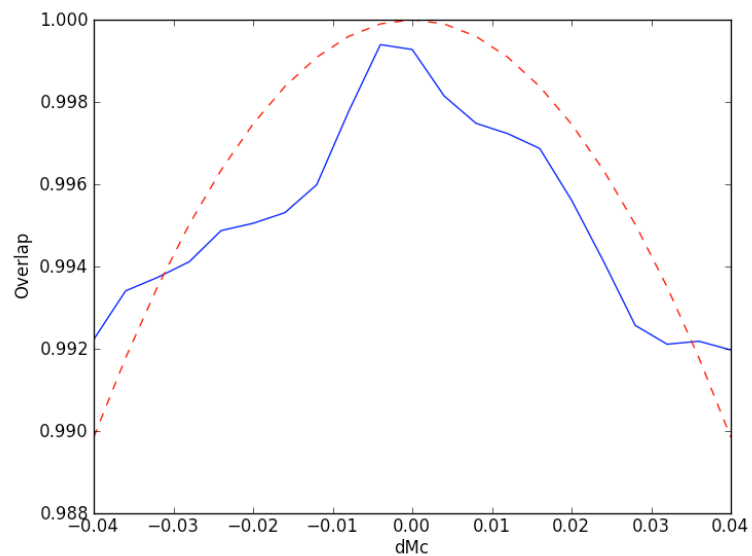
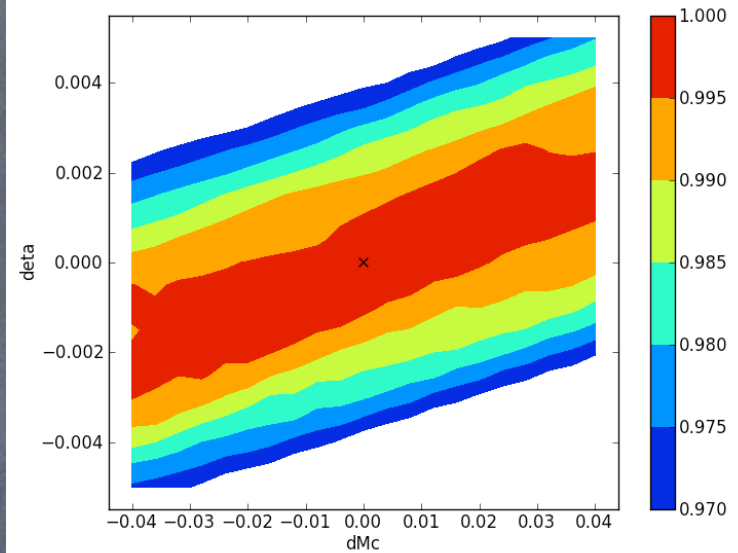
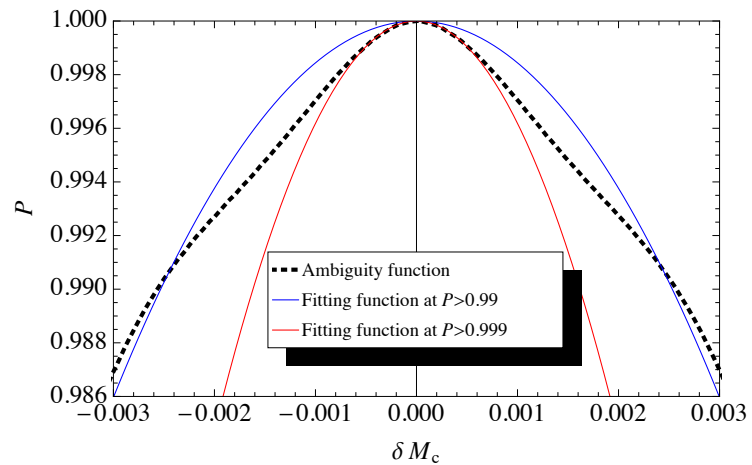
Precessing h_+ Polarization - $\theta = \pi/2$



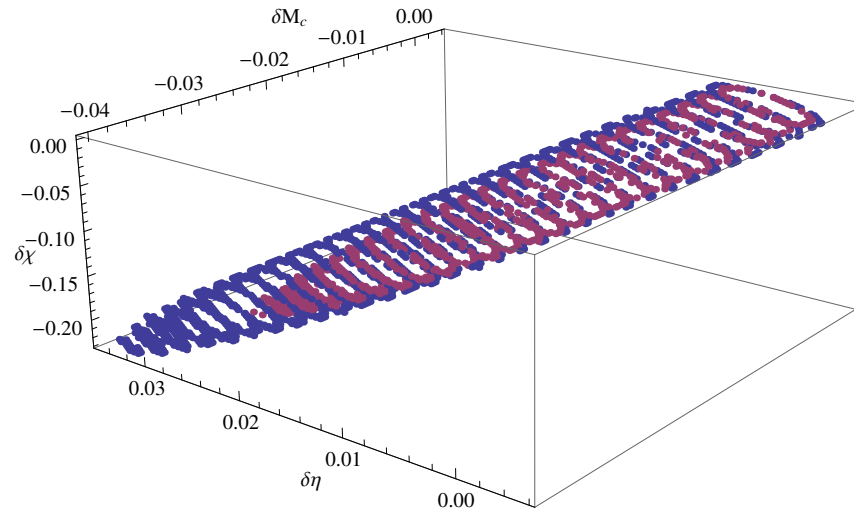
Precessing Modes



Effective Fisher matrix smooths out undetectable/unphysical small-scale features



Spin-aligned Effective Fisher Matrix



amp. order	0PN	1.5PN
$\Delta M_c / M_c$	1.08%	.795%
$\Delta \eta / \eta$	18.7%	12.7%
$\Delta \chi$	0.149	0.108
$\Delta \iota_{LN}$	—	0.282
$\Delta \phi_{\text{ref}}$	—	0.821

Preprocessing Effective Fisher Matrix

amp. order	0PN	1.5PN
$\Delta M_c/M_c$.208%	.195%
$\Delta \eta/\eta$	6.14%	4.91%
$\Delta \chi$	0.0495	0.0421
$\Delta \beta_{JL}$	0.0241	0.0210
$\Delta \theta_{JN}$	0.117	0.113
$\Delta \alpha_{JL}$	0.187	0.191
$\Delta \phi_{\text{ref}}$	—	—