

Comparison of eccentric waveform models on a HTC cluster

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In this study, we rigorously compare two advanced numerical models, CBWaves and SEOBNRE, which utilize the post-Newtonian and effective one-body frameworks to simulate eccentric binary systems. To thoroughly investigate the discrepancies between these models, we conducted an extensive series of 260,000 simulations—20,000 for non-spinning binaries and 240,000 for spinning configurations—across a finely tuned parameter space. The grid points, defined by the mass ratio $\nu \equiv m_1/m_2 \in [0.1, 1]$, gravitational mass $m_i \in [10M_\odot, 100M_\odot]$, spin magnitude $S_i \in [0, 0.6]$, and constant initial eccentricity e_0 , allow for a comprehensive exploration of these systems. In my presentation, I will unveil the key insights derived from this detailed analysis, revealing the critical differences in the waveforms produced by these two models.

Author: KACSKOVICS, Balazs (HUN-REN Wigner Research Centre for Physics (HU))

Co-author: Dr BARTA, Dániel (HUN-REN Wigner RCP)

Presenter: KACSKOVICS, Balazs (HUN-REN Wigner Research Centre for Physics (HU))