SphericalNR: Towards BNS simulations in spherical coordinates

Vassilios Mewes
Scientific Computing Group, NCCS, and Physics Division
Mentor: Bronson Messer
ORNL

Collaborators:
M. Campanelli, Y. Zlochower, F. G. Lopez Armengol, F. Cipolletta (CCRG-RIT)
Z. B. Etienne (WVU)
T. Baumgarte (Bowdoin)

TCAN workshop
July 07 2020
SphericalNR: Numerical relativity in spherical coordinates with the Einstein Toolkit: A quick overview


Filtering to ameliorate severe CFL restrictions for high resolution 3D evolutions in spherical coordinates using FFT filters in both theta and phi. [Zlochower et al 2020: in prep.]
Rotating NS model Bu2, misaligned rotation axis and initial magnetic dipole, azimuthal FFT in spacetime and GRMHD evolution
Magnetised model U11, bar mode instability, filtering theta and phi
4 M$_{\text{sun}}$ BNS merger (initial data from Lorene webpage, Gamma=2.5, co-rotating BNS, filtering theta and phi)