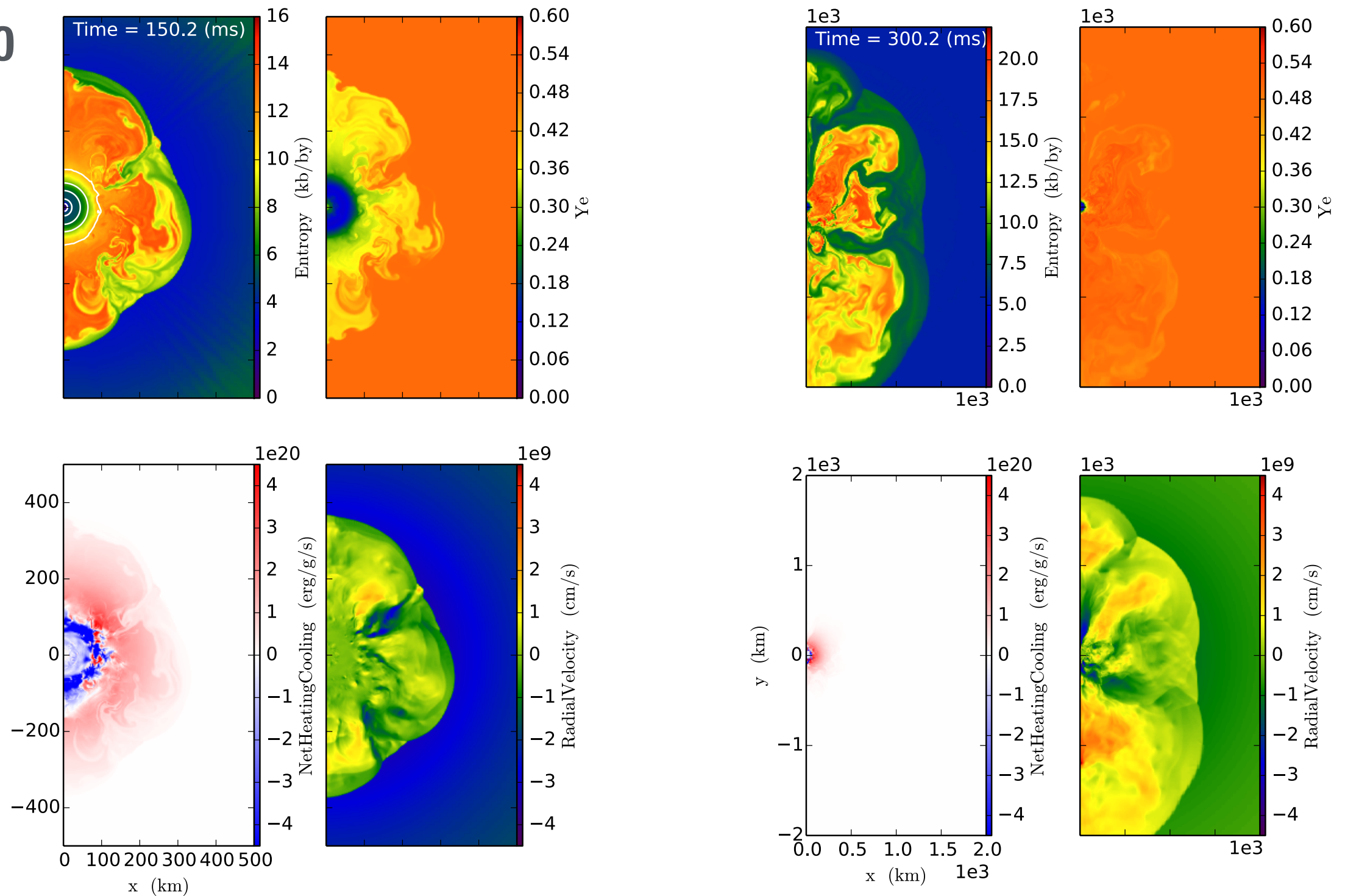


CCSN Simulations with IDSA (FLASH+IDSA)

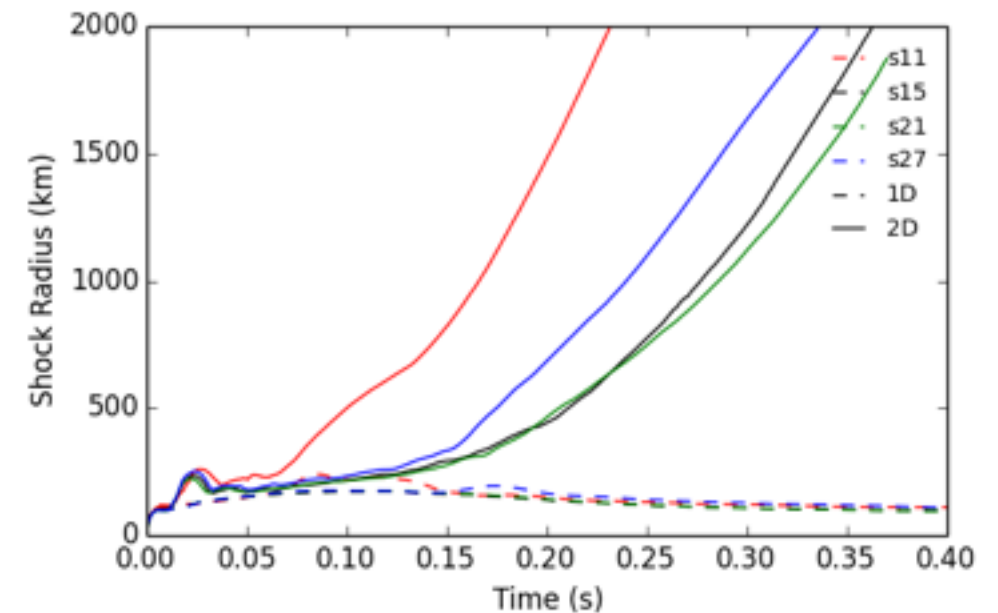
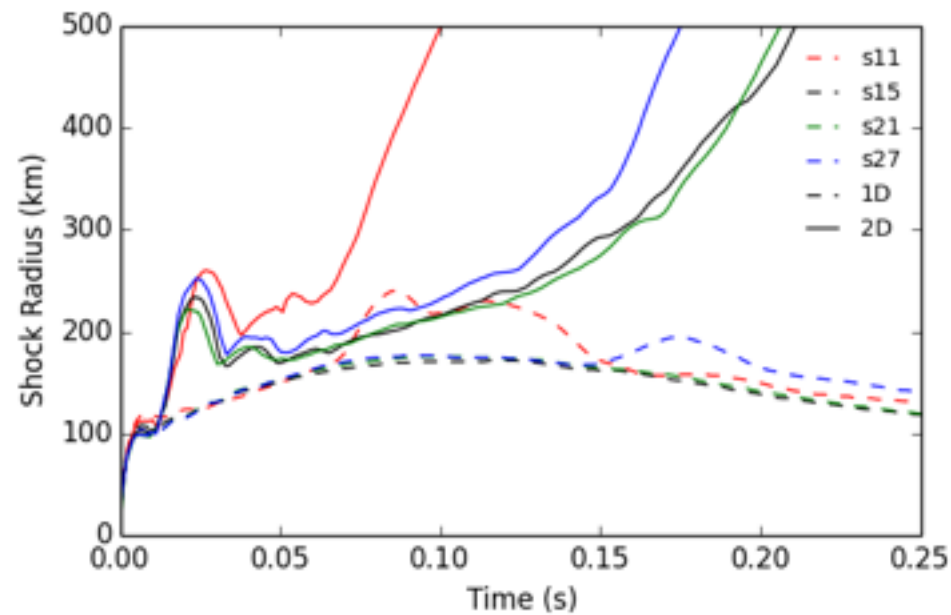
- ➔ **Geometry**: 1D spherical, 2D cylindrical, and 3D cartesian coordinates with Adaptive Mesh Refinement (AMR)
- ➔ **Hydrodynamics**: 3rd PPM with HLLC Riemann solver
- ➔ **Resolution**: 0.5 km resolutions up to $r=100$ km. Beyond 100 km, angular resolution of 0.43 degrees
- ➔ **Simulation box**: $r = 0$ to $r = 10,000$ km
- ➔ **Gravity**: The new improved multi-pole gravity solver (Couch+13)
- ➔ **General Relativity**: None
- ➔ **EOS**: Lattimer & Swesty (LS220) and Hempel & Schaffner-Bielich (DD2)
- ➔ **Neutrino Transport**: The Isotropic Diffusion Source Approximation (IDSA)
- ➔ **Progenitors**: s11.0, s15.0, s21.0, and s27.0 from WHW2002

Two-dimensional results

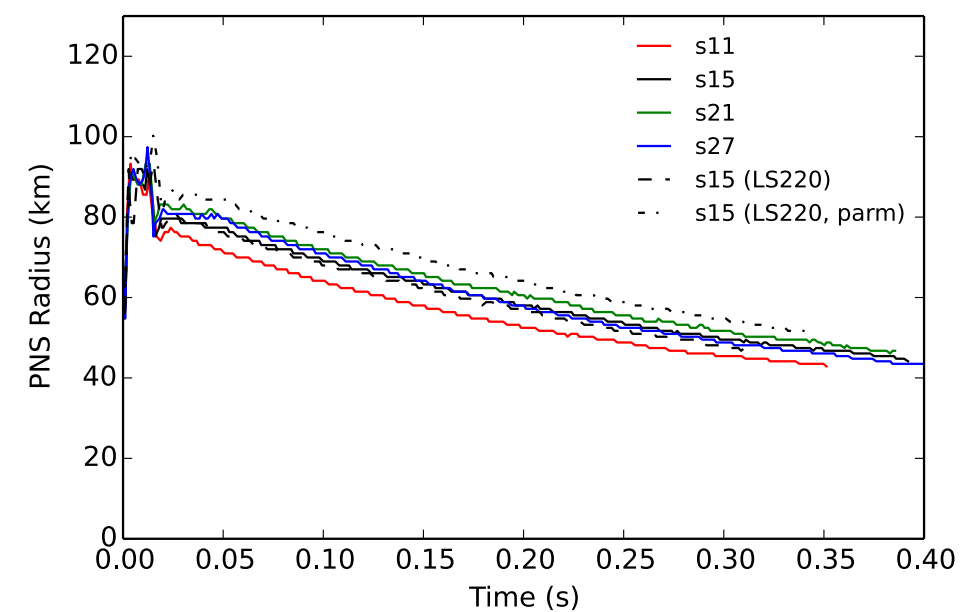
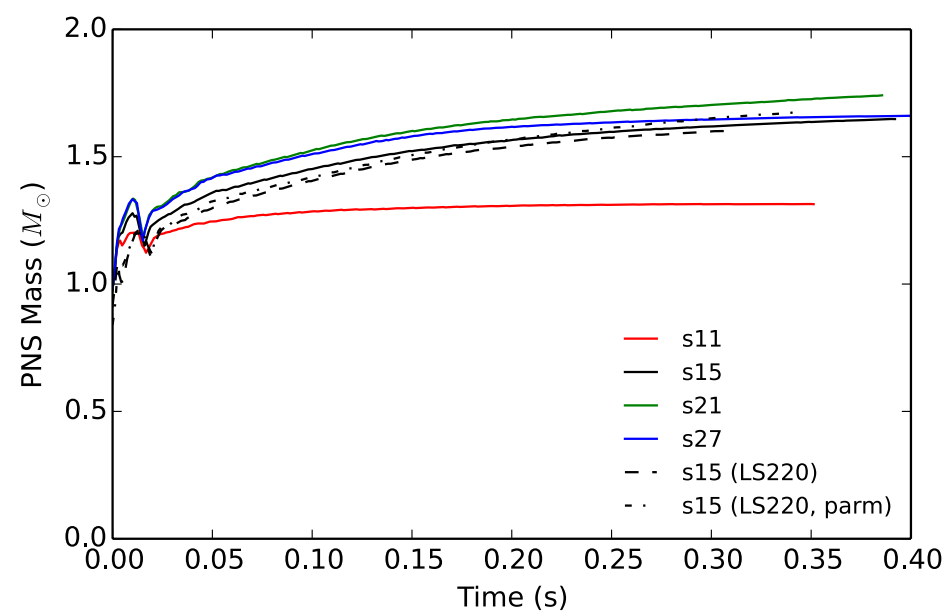
s27.0



Shock radius evolutions



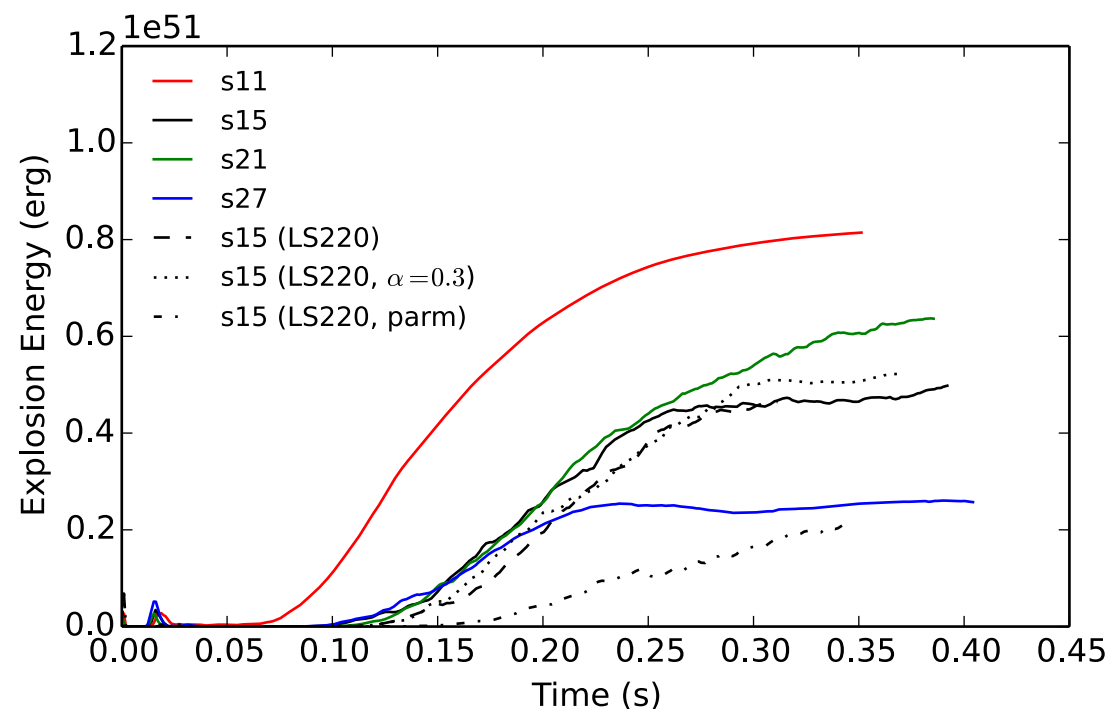
Evolution of Proto-Neutron Star (PNS)



Explosion Energies

- ➔ The diagnostic energy is defined by the integral of the sum of the specific internal, kinetic and potential energy with positive values
- ➔ Note that our calculations are newtonian and ignore the neutrino-electron scattering

This work



Mezzacappa+14

