

2D Neutrino Spectra README

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1 Data Format

We provide angle-averaged neutrino data as hdf5 files in the form of “**lum_spec_M_r_dat.h5**” (e.g. lum_spec_12M_r10000_dat.h5”) for our long-term 2D simulations (from 12-27 M_{\odot} carried out to ~ 4.5 seconds post-bounce presented in Nature, Burrows and Vartanyan 2021).

For each of the three neutrino species (groups nu0, nu1, nu2) and for each time, we provide neutrino luminosity spectra (in 10^{50} erg/s/MeV) as well as energy bin centers and widths (both in MeV) at 10,000 km for each of our 12 energy bins (datasets labeled g0...g11). The post-bounce time (in ms) is included as an attribute. The energy bin centers and widths are arrays of length (time \times 12).

The energy bin width (degrou) allows one to independently calculate the bin-integrated luminosity for the luminosity spectra, and together with the energy bin centers (egroup) allow the calculation of the mean neutrino energies. The energy bin centers and widths included both the velocity and gravitational redshifts, as does the luminosity spectra.

2 Sample Script

We also provide a sample python script to illustrate how to read, process, and visualize the data.

To execute:

```
python long_2D_reader.py --mass {} --neutrino
```

e.g., for a 12- M_{\odot} progenitor and for the electron-type neutrinos

```
python long_2D_reader.py -- mass 12 --neutrino 0
```

For help, contact David Vartanyan: dvardany@berkeley.edu