I. DATA STRUCTURE

We here provide brief instructions on how to read the data files. All data are provided in a coordinate frame that moves with the matter fluid.

A. Radial neutrino properties

The files named as "radial-neutrino-properties-time-SNmass.dat" list the angle-integrated neutrino emission properties as a function of the radius (r_i). The first column lists the radius. The luminosity $L(r_i)$ of ν_e, $\bar{\nu}_e$ and ν_x are stored respectively in the second, third and fourth columns. The first energy moment, defined as

$$\langle E(r_i)\rangle = \frac{\sum_{k=1}^{N_E}\sum_{j=1}^{N_\mu}\Delta\mu_{ij}\mu_{ij}I_{ijk}}{\sum_{k=1}^{N_E}\sum_{j=1}^{N_\mu}\Delta\mu_{ij}\mu_{ij}\tilde{I}_{ijk}}\ , \tag{1}$$

for ν_e, $\bar{\nu}_e$ and ν_x is stored in the fifth, sixth and seventh columns. The second energy moment for these flavors is stored in the eighth, ninth and tenth columns and it has been defined as

$$\langle E^2(r_i)\rangle = \frac{\sum_{k=1}^{N_E}\sum_{j=1}^{N_\mu}\Delta\mu_{ij}\mu_{ij}I_{ijk}E_k}{\sum_{k=1}^{N_E}\sum_{j=1}^{N_\mu}\Delta\mu_{ij}\mu_{ij}\tilde{I}_{ijk}}\ . \tag{2}$$

For each studied progenitor and post-bounce time, we also provide data on the matter density profile in g/cm^3 ("density-time-SNmass.dat"), the velocity profile in cm/s ("velocity-time-SNmass.dat"), central values E_k of the energy bins ("energy-bin-centers-time-SNmass.dat") as well as boundary values $[E_{k,\min}, E_{k,\max}]$ of the energy bins ("energy-bin-boundaries-time-SNmass.dat"), central values of the radial grid r_i ("radial-grid-centers-time-SNmass.dat"), and the electron abundance ("Ye-time-SNmass.dat").

B. Angular neutrino properties

The files named as "angular-quantities-nualpha-time-SNmass.dat" list the angle- and radius-dependent neutrino emission properties for each flavor ν_α and for each selected post-bounce time and progenitor mass. The radius r_i is listed in the first column, μ_{ij} is reported in the second column. Note as the binning in μ_{ij} is not uniform as a function of r_i because of the tangent-ray discretization of the Boltzmann transport equation. Moreover, degenerate angular zones of measure zero may be present around $\theta = \pi/2$ due to the peculiar angular-grid formulation.

The third column of the file "angular-quantities-nualpha-time-SNmass.dat" lists the local neutrino number flux (0-th moment, in units of s^{-1}) defined as

$$\tilde{L}(r_i,\mu_{ij}) = 4\pi r_i^2 \sum_{k=1}^{N_E} 2\pi \tilde{I}_{ijk}\ , \tag{3}$$

with $\tilde{I}_{ijk} = I_{ijk}/E$. We recover the neutrino number flux by integrating over μ_{ij}. The fourth column represents the first energy moment (in units of MeV s^{-1}):

$$L(r_i) = 4\pi r_i^2 \sum_{k=1}^{N_E} 2\pi I_{ijk}\ , \tag{4}$$

while the second energy moment (in units of MeV^2 s^{-1}) is reported in fifth column and it is defined as

$$S(r_i) = 4\pi r_i^2 \sum_{k=1}^{N_E} 2\pi I_{ijk}E_k\ . \tag{5}$$

The local neutrino density is stored in the sixth column (in units of cm^{-3}) and it is defined as

$$\frac{\tilde{I}(r_i,\mu_{ij})}{c} = 2\pi c^{-1} \sum_{k=1}^{N_E} \tilde{I}_{ijk}\ . \tag{6}$$

For all SN models, we used 21 nearly geometrically spaced energy bins up to 380 MeV and a number tangent rays and radial steps variable as a function of the post-bounce time: $N_\mu = 510, N_r = 235$ for $t = 61$ ms, $N_\mu = 836, N_r = 398$ for $t = 256$ ms and $N_\mu = 838, N_r = 399$ for $t = 550$ ms for the $11.2 M_\odot$ model; $N_\mu = 672, N_r = 316$ for $t = 150$ ms, $N_\mu = 824, N_r = 392$ for $t = 280$ ms and $N_\mu = 914, N_r = 437$ for $t = 500$ ms for the $15 M_\odot$ SN progenitor; $N_\mu = 510, N_r = 235$ for $t = 63$ ms, $N_\mu = 780, N_r = 370$ for $t = 252$ ms and $N_\mu = 784, N_r = 372$ for $t = 352$ ms for the $25 M_\odot$ SN progenitor.