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3D hydrodynamical simulation of the clumpy supernova ejecta

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We present a 3D hydrodynamical simulation of expanding ejecta of supernova. The code is written in C language. It uses the MUSCL-Hancock finite volume scheme. The ejecta is initialized as expanding density profile with kinetic energy far exceeding the internal energy. The integrated mass and total energy of the ejecta are 1.4 Ms and 10^51 erg. For the purpose of obtaining the Rayleigh-Taylor instabilities at the contact discontinuity, the density of ejecta is initially perturbed from cell to cell. In one case the perturbations were distributed all over the volume of the ejecta, and in the other they were present only in the outer shell near the edge of the ejecta. It is showed that the code reproduces Rayleigh-Taylor instabilities as expected.