that for isothermal shocks the CL or B viscosities can be used although the CL underestimates the velocity, and with an important smoothing for the B, while for adiabatic shocks the GM leads to better results.

3D Extension

It is straightforward to extend the method in three dimensions, but this will be done at the expense of memory and time. This is mainly due to the necessary increase of the number N of particles, to keep a performant spatial resolution. Within the same N, we can, however, estimate the necessary increase of memory for
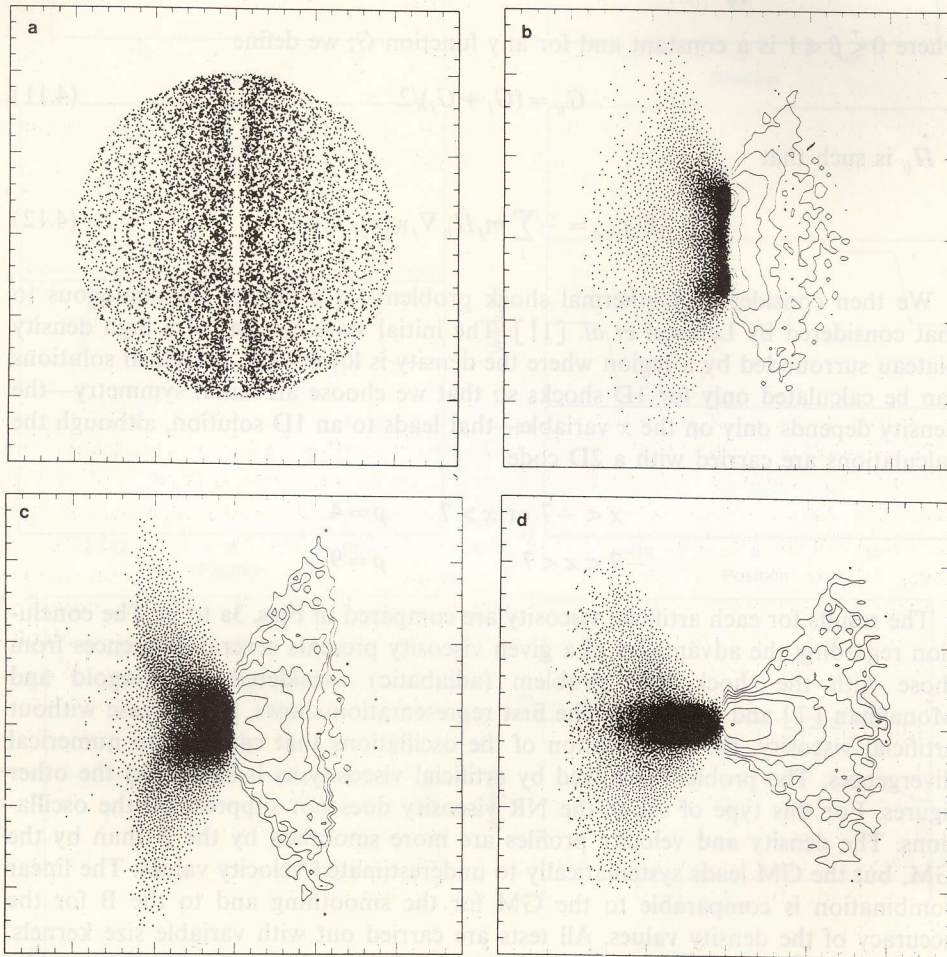

FIG. 4. (a–d) Non-rotating cylindrical cloud [10]. (a) shows the initial distribution of particles. Figures 4b–d on the left side show the positions of the fluid particles and, on the right side, the integrated density levels (i.e., $2\pi\rho R$) with 5000 particles, at time $t = 2.3 \times 10^{12}$ s and for temperatures equal respectively to 7.5K, 10K, and 13.5K.