Hydrodynamic interaction of a shock wave with an interstellar cloud

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The interstellar medium (ISM) is inhomogeneous in general, with clouds of various density and temperature. Evidently, shock waves interact with clouds, and sweep up or capture them when they are propagating into the ISM. This is an effective dissipation mechanism of shock waves, and also a mass-loading process into rarefied ambient media. Furthermore, turbulence is generated behind clouds by the help of Rayleigh-Taylor and Kelvin-Helmholtz instabilities. To study the interaction of a shock wave with a dense cloud in details, numerical simulations have been performed using a Godunov-type Particle Hydrodynamics (GPH) code. The results are described, and compared with those of a Smoothed Particle Hydrodynamics (SPH) code.