Numerical simulations of photoevaporating molecular clumps

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Abstract

I present 3D numerical simulations of dense molecular clumps exposed to an external FUV radiation field, featuring radiative transfer coupled with hydrodynamics and an accurate chemistry model, including formation and destruction of molecular hydrogen. Simulations are carried out with the code RAMSES, with the RT module coupled with the astrochemistry package KROME. Molecular clumps are shown to undergo a shock-contraction phase, which could possibly trigger the formation of stars, followed by a stationary phase where the molecules are progressively dissociated and flow away from the edge of the clump. The results show photoevaporation timescales of around 1 Myr for clumps with mass of 50 Msun, with an impinging flux G0=10^3 in Habing units.

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