Group Project prepared by *Takahiro Kudoh*

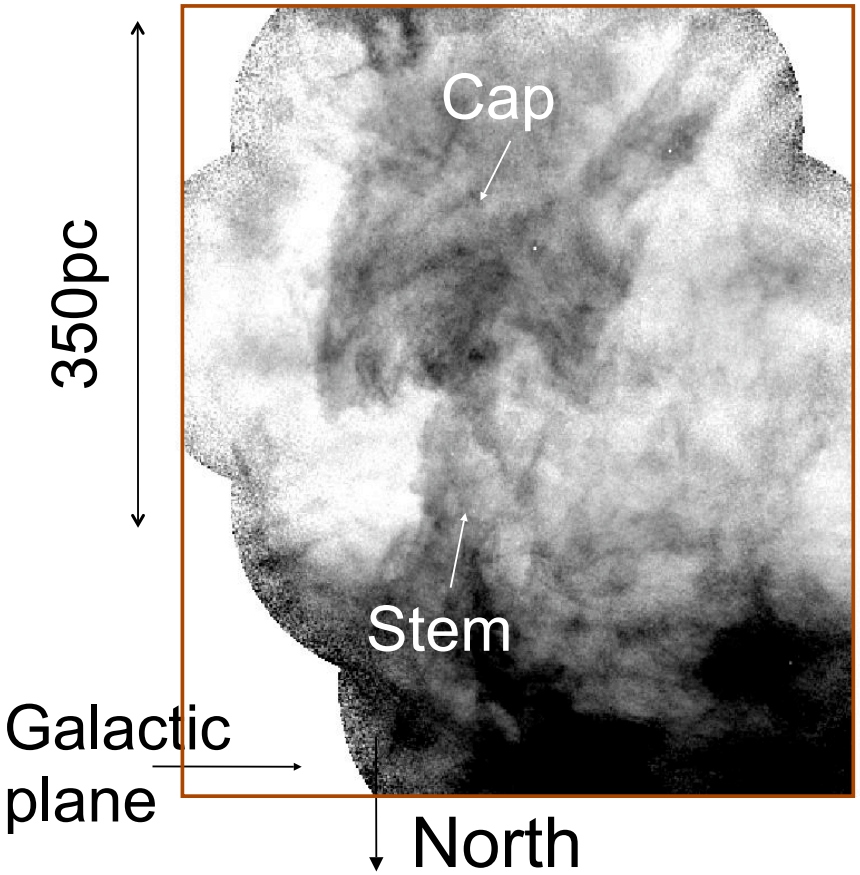
Cloud Collision with the Galactic Gas Disk

Explain the Mushroom-shaped HI cloud

Kudoh & Basu A&A 423, 183-188, 2004

Mushroom-Shaped HI cloud

- English et al. (2000)



The Galactic worm candidate GW 123.4-1.5 was an unusual mushroom-shaped cloud.

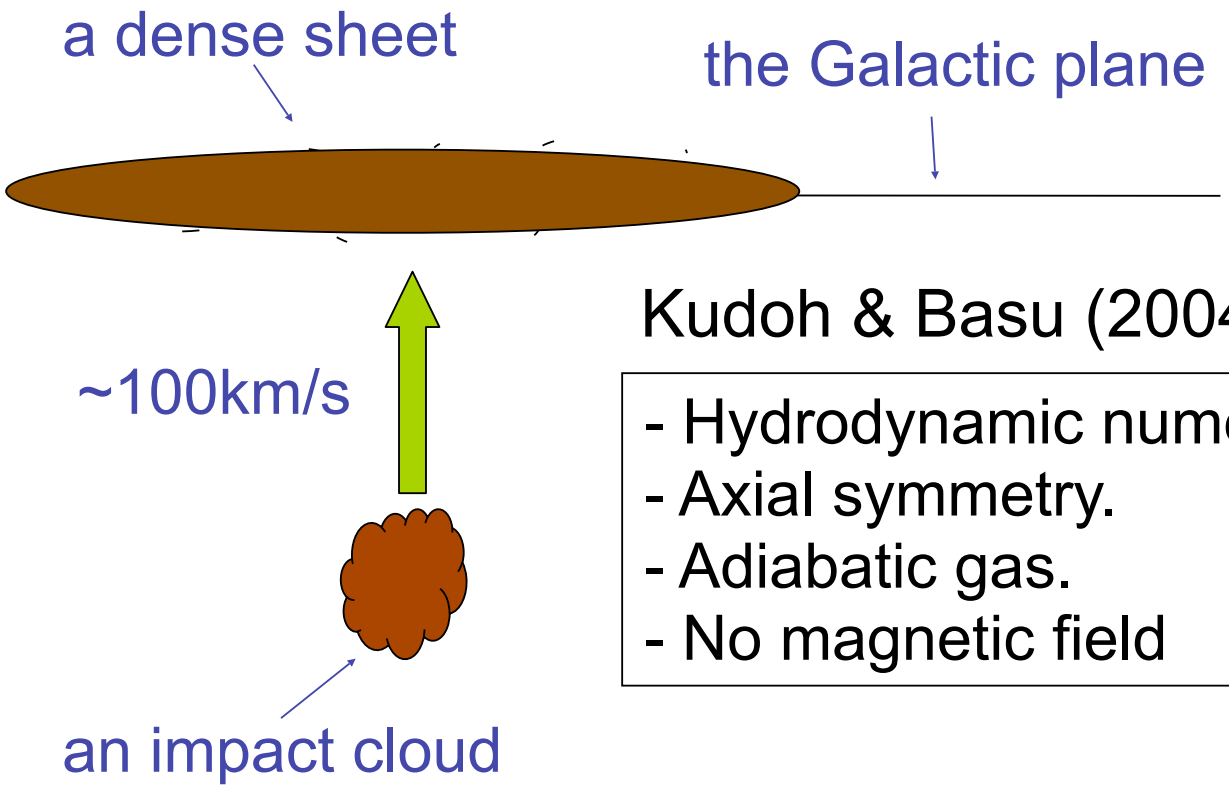
Mass:

Cap : 120 x 10^3 M_{sun}

Stem: 35 x 10^3 M_{sun}

Model

The impact of a high (or intermediate) velocity cloud in the Galactic halo with a dense sheet (cloud) on the Galactic plane.

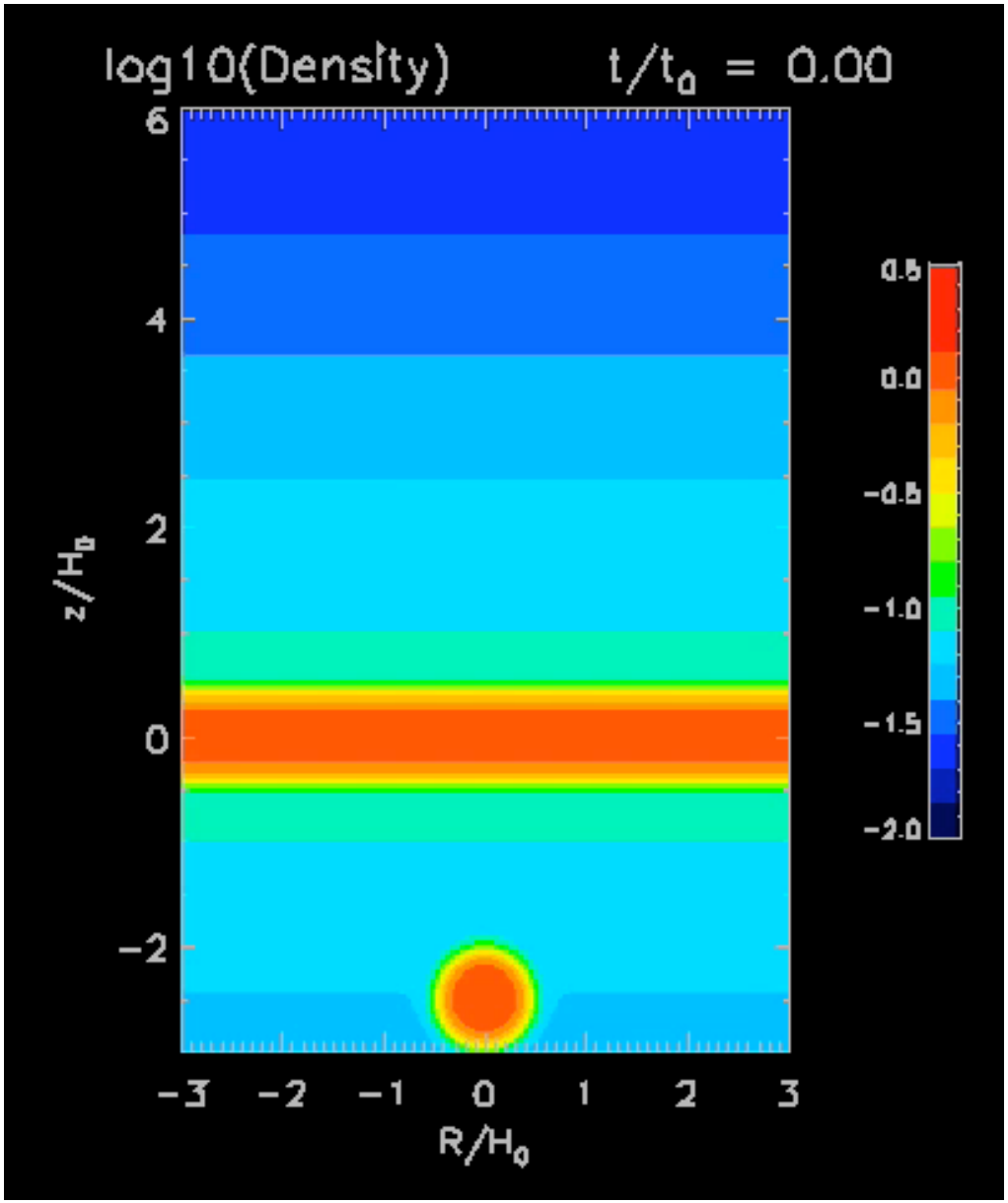


Kudoh & Basu (2004)

- Hydrodynamic numerical simulation.
- Axial symmetry.
- Adiabatic gas.
- No magnetic field

2D-axial symmetry

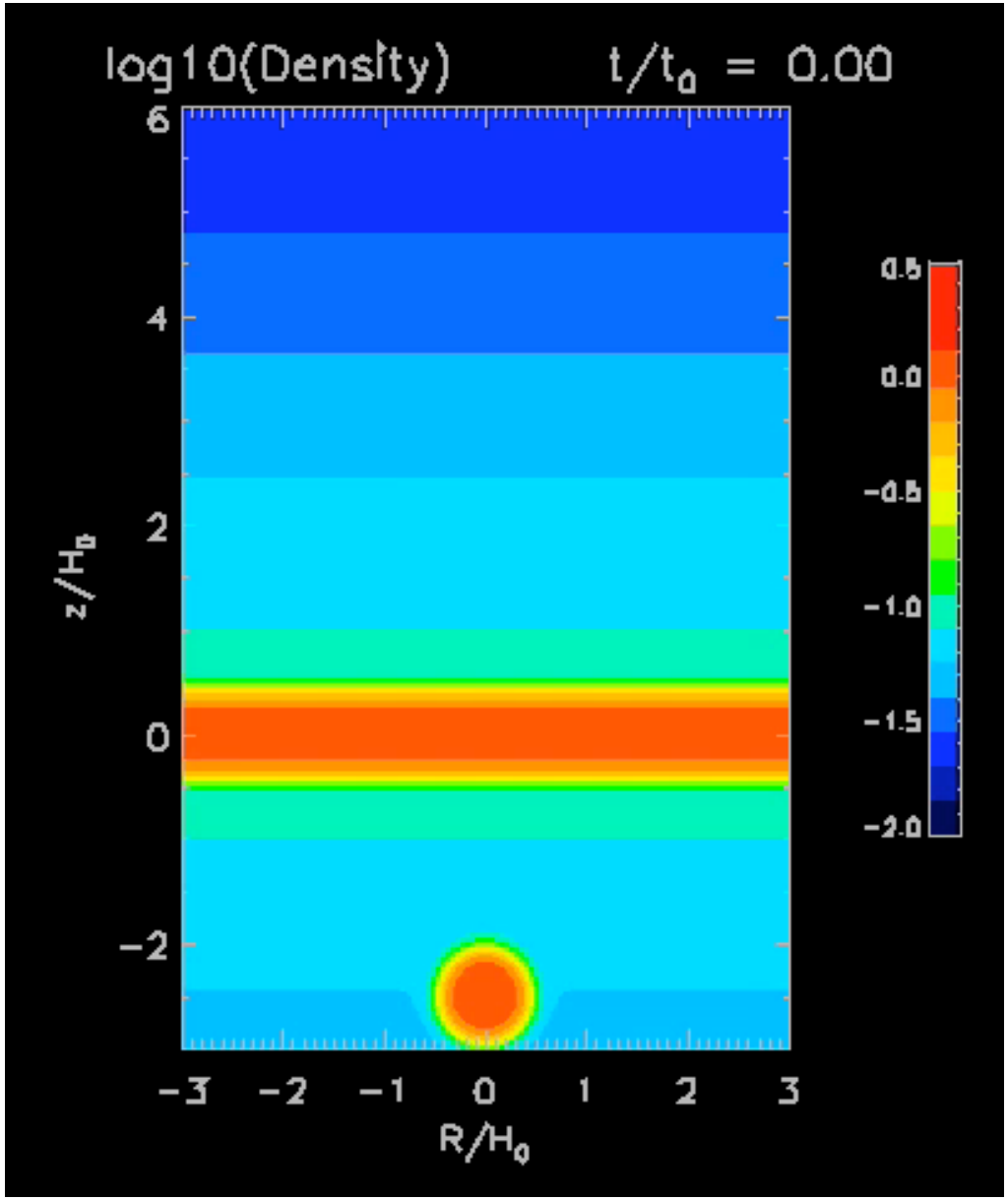
CIP method



density

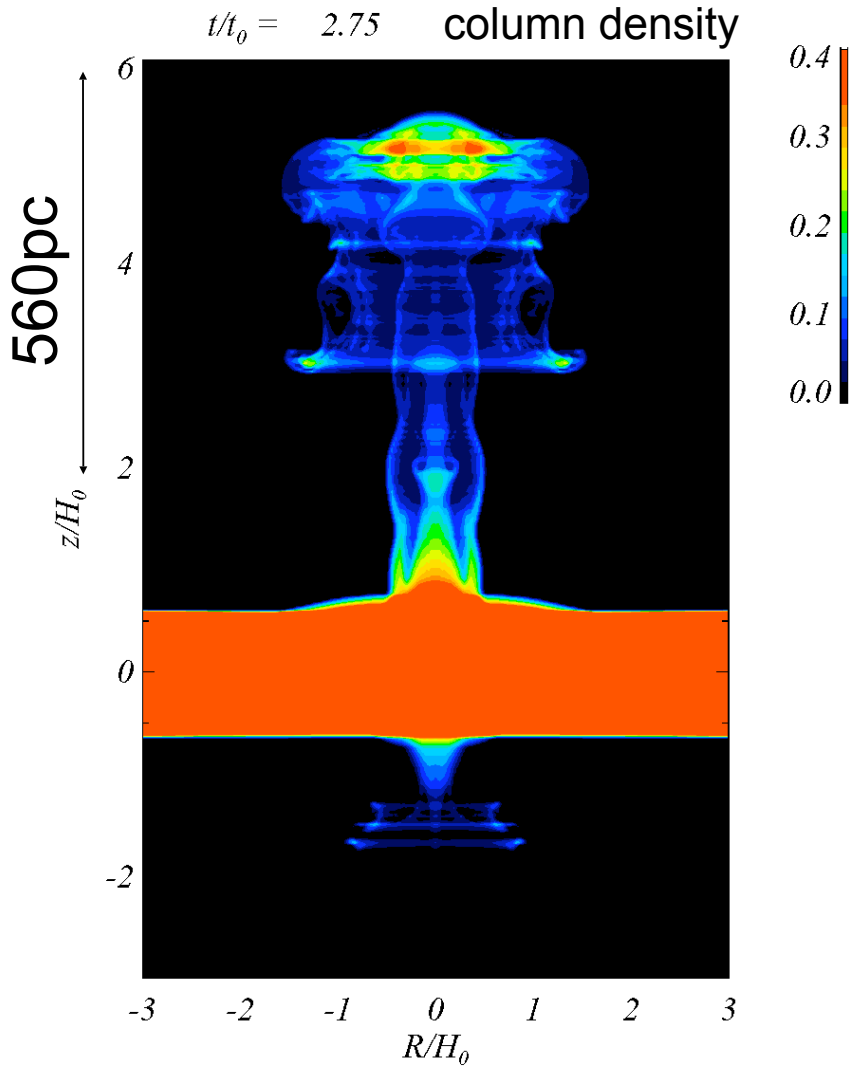
2D-axial symmetry

CIP method

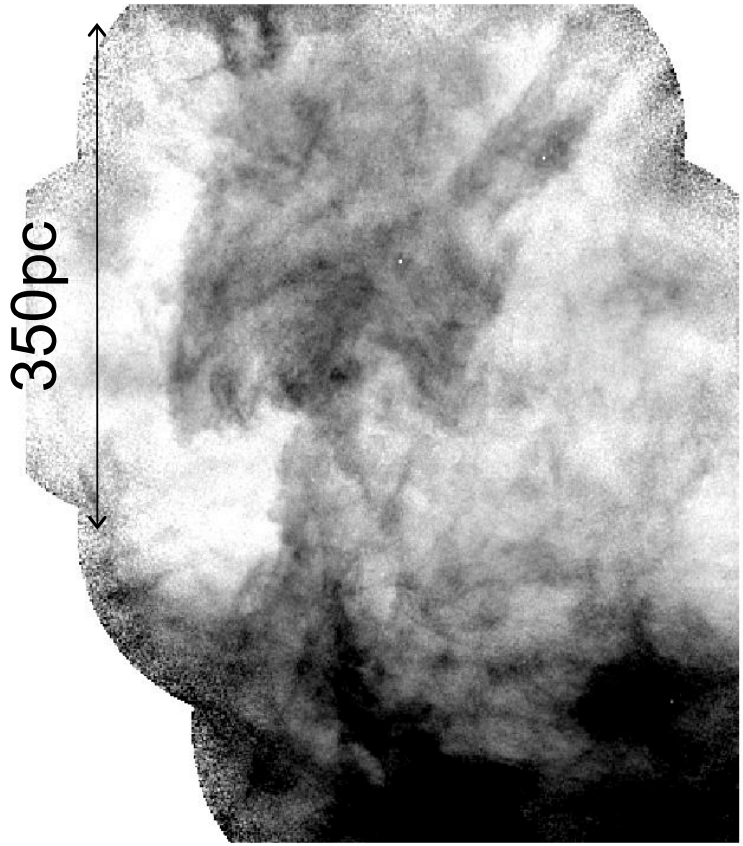


density

Simulation:

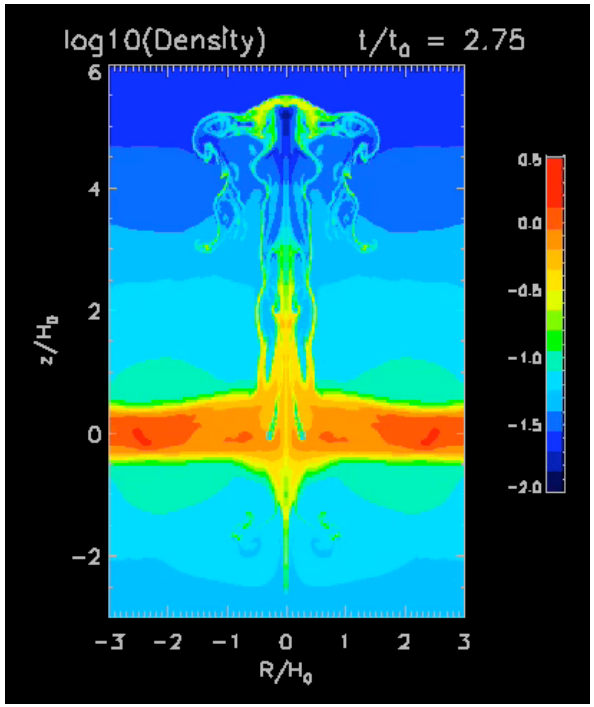


Observation:



Our project: Extend the model

The Modified Lax-Wendroff program is ready in CANS.



Basic Course

- Include vertical magnetic field.
- Include effective cooling (use smaller specific heat ratio).

Advanced Course

- Develop the Roe scheme.
- Do the same simulation in the Cartesian coordinate.
- Think about more realistic models for the Mushroom!