

**R12c Mushroom Structure from a Cloud-Disk Collision**

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The Canadian Galactic Plane Survey revealed that the Galactic worm candidate GW 123.4–1.5 was an unusual mushroom-shaped cloud (English et al. 2000, ApJ 533, L25). It is hundreds of parsecs in size and unrelated to conventional shell or chimney structure. The mass of the cap is about 4 times greater than that of the stem and the total mass is estimated to be about  $1.55 \times 10^5 M_{\odot}$ , although such an estimate depends strongly on the distance in which there is some ambiguity.

We propose that the mushroom-shaped structure GW 123.4–1.5 is created by a cloud collision with the Galactic gas disk (Kudoh & Basu 2004, A&A 423, 183). A hydrodynamic simulation shows that a mushroom-shaped structure is created after the cloud crosses the Galactic midplane.

The simulation shows that the lifetime of the mushroom-shaped structure is of order the dynamical time scale of the disk,  $\sim 10^7$  years. We find that the velocities across the cap of the mushroom-shaped structure in the simulation are consistent with the observed values. The simulation also predicts a structure on the opposite side of the Galactic plane which is created by the Kelvin-Helmholtz instability after the cloud passes through the disk. However, mushroom-shaped structures may not be commonly observed unless the densities of the impact cloud are comparable to the density of the Galactic plane and the frequency of the impacts is high.