

成果に関連して出版、もしくは印刷、投稿中の論文リスト

このプロジェクト（同様の過去のプロジェクトも含む）での成果

1. Chang Hyun Baek, Takahiro Kudoh and Kohji Tomisaka 'How was GW 123.4-1.5 Formed in the Galactic Disk?' in astro-ph (2008arXiv0801.3186B) - Accepted for publication in ApJ August 10, 2008, v683n

2. Chang Hyun Baek, Takahiro Kudoh and Kohji Tomisaka '3D Numerical Simulations of Impact of a High-Velocity Cloud with the Galactic Disk' in Proceedings of the Autumn Meeting of Korean Astronomical Society (2007)

項目の説明の文章などは消去して報告内容を記述しても構いません。

成果の概要

The unusual mushroom-shaped HI cloud, GW 123.4–1.5, is hundreds of parsecs in size but does not show any correlations to HI shells or chimney structures. To investigate the origin and velocity structure of GW 123.4–1.5, we perform three-dimensional hydrodynamical simulations of the collision of a high-velocity cloud with the Galactic disk. We also perform a parameter study of the density, radius, and incident angle of the impact cloud. The numerical experiments indicate that we reproduce the mushroom-shaped structure which resembles GW 123.4–1.5 in shape, size, position-velocity across the cap of the mushroom, and the density ratio between the mushroom and surrounding gas. GW 123.4–1.5 is expected to be formed by the almost head-on collision of a HVC with velocity $\sim 100\text{km/s}$ and mass $\sim 10^5 M_{\text{sun}}$ about $5 \times 10^7\text{yr}$ ago. A mushroom-shaped structure like GW 123.4–1.5 must be infrequent on the Galactic plane, because the head-on collision which explains the mushroom structure seems rare for observed HVCs. HVC-disk collision explains not only the origin of the mushroom-shaped structure but also the formation of a variety of structures like shells, loops, and vertical structures in our Galaxy.