Contribution ID: **39** Type: **Poster**

Ionization degree and magnetic diffusivities in the low-metallicity star formation

Monday, 3 December 2018 10:40 (20 minutes)

Magnetic field changes the angular momentum in a star-forming cloud by magnetic braking and driving an outflow. It affects the formation of binaries and multiple stellar systems. Since the coupling between the gas and magnetic field depends on the ionization degree of a cloud, the accurate calculation of the ionization degree is needed in star-formation. We calculate the thermal and chemical evolution of primordial star-forming clouds by using a chemical network in which reverse reactions are considered for all the forward reactions. Considering reverse reactions only for 1/5 of the forward reactions, previous studies can not calculate the ionization degree in the transition from chemical non-equilibrium to equilibrium. We find that at $\sim 10^{14} - 10^{18}$ cm^{-3}, the ionization degree becomes 10-100 times higher than that obtained in the previous studies. This is due to the lithium photoionization by thermal photons, which is missed in the previous studies. We also calculate the magnetic diffusivities and discuss the implication of our results.

Affiliation

Tohoku University

Talk/Poster

Poster

Primary author: DAISUKE, Nakauchi

Co-authors: KAZU, Omukai; HAJIME, Susa

Presenter: DAISUKE, Nakauchi

Session Classification: Pop III Simulations