Contribution ID: **137** Type: **Poster**

Distributions of metallicity and gas-to-dust ratio in the Magellanic system

Wednesday 13 June 2018 14:29 (1 minute)

The two Magellanic clouds and our Galaxy are known to have been tidally interacting each other in the past $\sim$ billion years. It is indicated by the elongated distributions of interstellar medium (ISM), known as the Magellanic stream and the Magellanic bridge. Numerical simulations of the dynamical interactions of these galaxies successfully reproduced these features. This dynamical interaction is also suggested to play an important role for triggering the massive star formations in the Magellanic clouds. Because the Small Magellanic Cloud (SMC) has $\sim 1/5$ of metallicity compared to the Large Magellanic Cloud (LMC), one can expect weaker dust emission from the ISM originated from the SMC, which may mix with the ISM from the LMC. We have investigated the dust thermal emission obtained by the Planck satellite and the H I 21 cm data, and discovered large diversity with more than an order of magnitude of the gas-to-dust ratio among the Magellanic system. The distribution of the gas-to-dust ratio clearly indicate that the Magellanic stream is dominated by the metal-poor ISM stretched from the SMC, while the stream of the metal-poor ISM falling onto the LMC. The massive cluster forming regions including 30 Dor in the LMC tend to show mixed ISM properties of the LMC and the SMC, which support the idea of massive star formation triggered by the gas infall and the cloud-cloud collisions.

Consider for a poster?

Yes

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Session Classification: Poster Presentations

Track Classification: Dust as a tool