

Gas Temperature Demography in the Magellanic Clouds

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A galaxy's star formation rate is partially determined by how quickly gas converts from diffuse atomic (HI) state to molecular (H₂). This HI-H₂ conversion is affected by the amount of metals in the gas and the strength of interstellar radiation fields. We have conducted an Australia Telescope Compact Array (ATCA) observation project that uses HI absorption to probe the HI-H₂ conversion within disparate environments in two local laboratories: the nearby Large and Small Magellanic Clouds. This project will complement the ASKAP survey, GASKAP and help us understand the gas processes that lead to star formation and how these impact galaxy evolution throughout the Universe.

Our project observed 48 sightlines in LMC and 31 in SMC with 6A configuration of ATCA telescope, which doubled the total number of sampling. By May 2017 we have completed all the ~800 hours observation and derived the preliminary results for the temperature distribution of atomic gas in the Magellanic Clouds. We'll show the results and its implications for our knowledge of ISM evolution and galaxy formation.