

Molecular hydrogen emission in diffuse regions of LMC

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We investigate gas and dust physical properties and chemistry of diffuse interstellar medium in the Large Magellanic Cloud (LMC). Most of the interstellar gas inhabit in photo dissociation regions (PDR) in galaxies, where FUV radiation from hot stars creates a layered structure. This includes, a layer of predominantly neutral gas residing outside HII regions and a layer of HI/C+/Si+, H₂, and neutral oxygen. As part of these studies, the spectral maps of 12 diffuse regions in the LMC were taken over a region 1'X1' size using the Spitzer Infrared Spectrograph (IRS) with SAGE-spec. These IRS spectra shows emission lines due to pure rotational transitions of H₂ (0-0) S(1) through 0-0 S(7) along with ionic atomic emission lines Ar II, Ar III, S III, Si II and PAH features. We determined column density, excitation temperature and mass of H₂ gas using a two temperature model fit. The measurements show that H₂ gas temperature in the range 100 K to 1000K. Our main goal is the detailed understanding of chemical structure and dust to gas mass ratio of ISM in the LMC.