

# HI clouds in the Large Magellanic Cloud

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**Abstract.** We discuss the results of HI survey of the LMC and a catalog of HI clouds.

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## 1. Analysis of HI observations

A 21 cm neutral hydrogen interferometric survey of the Large Magellanic Cloud (LMC) (Kim *et al.* 2003) combined with the Parkes multi-beam HI single-dish survey (Staveley-Smith *et al.* 2003) clearly shows that the HI gas is distributed in the form of clumps or clouds. These features are also well demonstrated in the ATCA survey alone (Kim *et al.* 1998). A cloud or a clump can be identified as an object composed of all pixels in longitude, latitude, and velocity that are simply connected and that lie above some threshold intensity. Ideally, one would like to define clouds with a zero threshold intensity. However, low threshold intensities are impractical in view of the noise level in the spectra and more importantly because of the blending of adjacent clouds which often occur in crowded regions. On the other hand, with too high a threshold intensity, regions are severely truncated, and it is impossible to obtain a reliable estimate of the sizes and velocity dispersions, thus the related parameters of the clouds identified (Scoville *et al.* 1987). Identification of the clouds are conducted within IRAF using a modified code of Lee *et al.* (1997)'s. The HI clouds and clumps have been identified and cataloged with a brightness temperature threshold ( $T_b$ ) from a 21-cm neutral hydrogen gas survey of the LMC. The catalog of HI cloud candidates and the power law relationship between the sizes and the velocity dispersions of the HI cloud candidates proves that the identified HI cloud candidates follow Larson's linewidth-size relation with a slope of  $0.55 \pm 0.07$ . The close match of the clouds and line of virial equilibrium indicates that self-gravity is important in the dynamics of HI clouds even though most of clouds are not gravitationally bound.

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