

YOUNG STARS IN THE LMC PERIPHERY

C. Moni Bidin¹, D.I. Casetti-Dinescu², T.M. Girard³, L. Zhang^{4,5}, R.A. Méndez⁶, K. Vieira⁷, V.I. Korchagin⁸, and W.F. van Altena⁹

We report the discovery of six young (10–50 Myr) main-sequence stars projected between 7° and 13° from the center of the Large Magellanic Cloud (LMC). These stars have low to moderate velocity differences with the predictions of a LMC disk model, indicating that they were formed *in situ*. Our study demonstrates that recent star formation occurred in the far periphery of the LMC, where thus far only old objects were known. The spatial configuration of these newly-formed stars appears ring-like.

Despite their close proximity, the complex interplay between the two Magellanic Clouds, the Milky Way, and the resulting tidal features, is still poorly understood. Recent studies have shown that the LMC has a very extended disk strikingly perturbed in its outskirts, although only intermediate-age/old stars are known at large distance from the center (e.g., Mackey et al. 2016; Saha et al. 2010).

We are performing an extensive study to find young stars in the Magellanic System (Moni Bidin et al. 2015), as tracers of recent star formation induced by tidal interactions (Casetti-Dinescu et al. 2014). We collected intermediate-resolution spectra of 31 candidates from the Casetti-Dinescu et al. (2012) list, projected on the LMC disk out to 30° from the center, with IMACS at the 6.5m Baade telescope at LCO. We identified six main-sequence young stars out of this sample, whose distance and radial velocity is compatible with membership to the

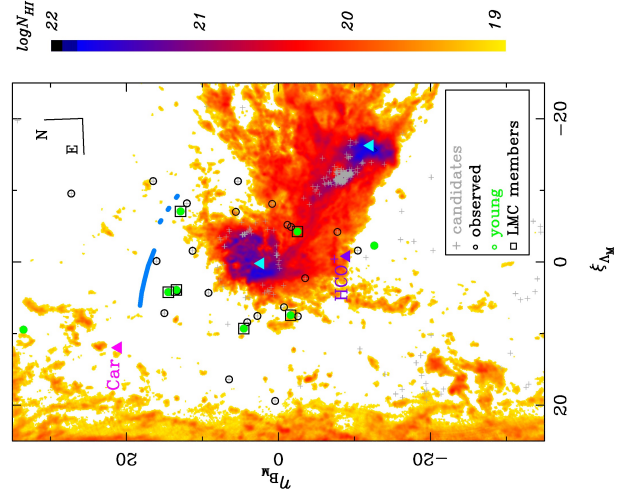


Fig. 1. Map of the H I column density from the GASS survey with $V_{lsr}=100\text{--}450\text{ km s}^{-1}$. The centers of the Clouds are shown with light blue triangles. Grey crosses, empty and filled green circles, and squares represent the candidates from Casetti-Dinescu et al. (2012), our observed targets, the detected young stars, and six young members of the LMC. The thick blue curve indicates the tidal feature found by Mackey et al. (2016), and the dotted curve shows its western extension.

LMC disk (see Fig. 1). One of them is found in the young ICA76 stellar association in the Magellanic Bridge (Irwin et al. 1990). The other five objects trace a ring structure around the LMC, with radius ~ 12 kpc off-center by 2.6 ± 0.3 kpc. Our statistical analysis suggests that this feature is very likely real ($\sim 1.3\%$ probability due to chance), but caution is still required. This structure might have formed during a recent close encounter between the two Clouds at a modest 4-kpc impact parameter.

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¹Instituto de Astronomía, Universidad Católica del Norte, Av. Angamos 0610, Antofagasta, Chile (cmoni@ucn.cl).

²Department of Physics, Southern Connecticut State University, 501 Crescent Street, New Haven, CT 06515, USA.

³14 Dunn Rd, Hamden, CT 06518, USA.

⁴CAS South America Center for Astronomy, Camino El observatorio 1515, Las Condes, Santiago, Chile.

⁵Key Lab of Optical Astronomy, National Astronomical Observatories, CAS, 20A Datun Road, Chaoyang District, 100012 Beijing, China.

⁶Departamento de Astronomía, Universidad de Chile, Casilla 36-D, Santiago, Chile.

⁷Centro de Investigaciones de Astronomía, Apartado Postal 264, Mérida 5101-A, Venezuela.

⁸Institute of Physics, Southern Federal University, Stachki Street 124, 344090, Rostov-on-Don, Russia.

⁹Astronomy Department, Yale University, P.O. Box 208101, New Haven, CT 06520-8101, USA.