

MAGMA-SMC: The Molecular Cloud Survey of the SMC

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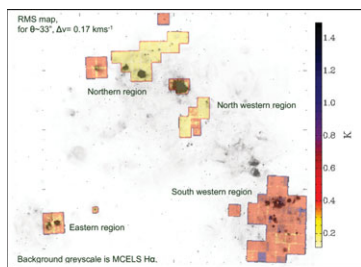
Abstract. We present a brief summary and description of the upcoming ¹²CO(1-0) Magellanic Mopra Assessment (MAGMA) SMC survey data release[‡]. The MAGMA-SMC survey has sampled 100% of the known CO in the SMC (at $\sim 33''$ resolution; 12 pc at $D = 60$ kpc). Having explored 522×10^3 square parsecs throughout the SMC with 69 $5' \times 5'$ fields, to a sensitivity of ~ 150 mK, we apply the CLOUDPROPS (Rosolowsky & Leroy 2006) cloud-search algorithm optimized for low S/N data, to detect more than 30 CO clouds with virial masses between 10^3 – $10^4 M_{\odot}$, mean radii ~ 5 pc and 0.3 – 0.9 km s⁻¹ velocity width. Typical brightness temperatures are ~ 1 K T_{mb} . All detected molecular regions are associated with at least one 24 μ m compact emission source. Smoothing rarely increases the total detected CO flux, implying the CO emission is typically confined to small spatial scales. As recent dust maps of the SMC imply extended H₂ mass, the apparent compact nature of the CO population indicates some departures from the canonical Galactic X_{CO} -factor in the low-metallicity and relatively un-evolved ISM of the SMC.

Keywords. ISM: molecules — ISM: clouds — Magellanic Clouds

References

- Bolatto, A. D., Simon, J. D., Stanimirović, S., *et al.* 2007, *ApJ*, 655, 212
Rosolowsky, E. & Leroy, A. 2006, *PASP*, 118, 590

[‡] <http://alma.mtk.nao.ac.jp/~erik/MAGMA-SMC>



(Left) RMS map of sampled regions, overlaid on H α (MCELS; priv. comm. F. Winkler). (Below) Three panels showing detected CO emission associated with four prominent nebulae: N76, N36, N12 and N22, overlaid as contours on 3-color images (RGB: 24 μ m (S³MC), H α (MCELS), 160 μ m (S³MC; Bolatto *et al.* 2007). The left-most image shows integrated CO as identified by CLOUDPROPS, after smoothing to a 98'' beam. The two right images are at the nominal resolution of 33''.

