

INFRARED STUDY OF NEW STAR CLUSTER CANDIDATES ASSOCIATED TO DUSTY GLOBULES

P. Soto King¹, R. Barbá¹, A. Roman-Lopes¹, M. Jaque^{1,2}, V. Firpo^{1,3}, J. L. Nilo¹, M. Soto^{1,4}, and D. Minniti⁵

We present results from a study of a sample of small star clusters associated to dusty globules and bright-rimmed clouds that have been observed under ESO/Chile public infrared survey *Vista Variables in the Vía Láctea* (VVV). In this short communication, we analyse the near-infrared properties of a set of four small clusters candidates associated to dark clouds. This sample of clusters associated to dusty globules are selected from the new VVV stellar cluster candidates developed by members of La Serena VVV Group (Barbá et al. 2014). Firstly, we are producing color-color and color-magnitude diagrams for both, cluster candidates and surrounding areas for comparison through PSF photometry. The cluster positions are determined from the morphology on the images and also from the comparison of the observed luminosity function for the cluster candidates and the surrounding star fields. Now, we are working in the procedures to establish the full sample of clusters to be analyzed and methods for subtraction of the star field contamination. These clusters associated to dusty globules are simple laboratories to study the star formation relatively free of the influence of large star-forming regions and populous clusters, and they will be compared with those clusters associated to bright-rimmed globules, which are influenced by the energetic action of nearby O and B massive stars.

¹ Departamento de Física, Universidad de La Serena, Av. Cisternas 1200, La Serena, Chile (piera@dfuls.cl).

² ICATE-CONICET (Argentina).

³ IALP-CONICET (Argentina).

⁴ Space Telescope Science Institute (USA).

⁵ P. Universidad Católica (Chile).

THE INNER DISKS OF CLASSICAL T TAURI STARS IN NGC 2264

A. P. Sousa¹, P. T. McGinnis¹, S. H. P. Alencar¹, J. Bouvier², P. Teixeira³, and J. Stauffer⁴

NGC 2264 is a young (~ 3 Myr) stellar cluster that was observed twice by the CoRoT satellite, the first time for 23 days in 2008 and the second during 40 days in 2011. Simultaneous with the 2011 CoRoT

observations, a multi-wavelength campaign was organized that included 30 days of Spitzer observations at 3.6 and 4.5 microns, 3.5 days of Chandra data, VLT FLAMES spectroscopy and U band photometry from Megacam (CFHT). We obtained simultaneous high precision light curves in the optical and near IR for more than 500 cluster members, about 200 of which are classical T Tauri stars. As shown in the first CoRoT campaign, a fraction of the accreting systems exhibit optical light curves with deep minima that vary substantially in width and depth in a rotational timescale. These light curves are interpreted as due to an inner disk warp that eclipses the star as the system rotates, like observed in AA Tau, a well studied CTTS seen at high inclination. This warp is thought to be created by the star-disk interaction mediated by a stellar magnetic field inclined with respect to the stellar rotation axis. The observed variability indicates the star-disk interaction is dynamic and the occulting material is inhomogeneous and located close to the co-rotation radius of the star-disk system. We present the photometric and spectroscopic analysis of the AA Tau-like CTTSs observed in NGC 2264. Initial light curve model results indicate that an inner disk warp located near the co-rotation radius can indeed explain the observed variability and that, if the variability is attributed to extinction alone, the properties of the dust in the inner disk are substantially different from the ISM.

¹ Universidade de Federal de Minas Gerais Av. Antônio Carlos, 6627 - 31270-901 Belo Horizonte, MG - Brasil (alana@fisica.ufmg.br).

² Institut de Planétologie et d'Astrophysique de Grenoble - IPAG.

³ Institut für Astrophysik Universität Wien.

⁴ Spitzer Science Center - Caltech.

MILLIMETER AND FAR-IR OBSERVATIONS OF THE IRDC G341.24-0.27

J. Vasquez^{1,2}, C. Cappa^{1,2}, G. Romero², and M. Rubio³

Infrared Dark Clouds (IRDCs) are the cold $T < 25$ K) and dense ($> 10^5 \text{ cm}^{-3}$) regions, with a scale of 1 – 10 pc and a mass of $10 \times 2^{-5} M_{\odot}$. Cores within the IRDCs may be in different phases, from a quiescent to an active one. Quiescent cores represent the earliest protostellar (starless) core phase without infrared signatures of star formation, commonly observed at