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Searching for Young Stellar Objects in the Outer Galactic Plane: the l (102-109) field

I will present the results of the study aimed to uncover the population of Young Stellar Objects (YSOs) in the relatively poorly studied star-forming regions in the Outer Galaxy. We use the data from the "Spitzer Mapping of the Outer Galaxy" survey (SMOG) that covered 24 deg^2 region in the Outer Galaxy (dubbed L105), l ~(102-109) and b~(-0.2-3.2), in the IRAC 3.6–8.0 um and MIPS 24 um bands. The SMOG data have been combined with the data from the 2MASS (JHKs) and WISE (3.5-22 μm) all-sky surveys. We have selected YSO candidates based on the color-color selection criteria, and then applied a series of filters to remove contaminating sources (e.g., background galaxies). The resulting list of YSO candidates includes ~1800 Class I and ~3000 Class II sources. We have also performed an additional search for YSO candidates among the Spitzer/SMOG sources with the WISE counterparts by using an automated source identification scheme based on the Machine Learning algorithms. This method identified additional YSO candidates, which were missed by classical color-color based selection criteria.

I will discuss also the results of the analysis of the physical properties and stellar content of the high-mass star forming (HMSF) region IRAS 22147+5948, located in the L105 region. We identified there 7 Class I and 7 Class II YSOs within this HMSF, with one coinciding with the position of the IRAS source. This area hosts two CO molecular clouds with diameters of ~4 pc. The distance to IRAS 22147+5948 of 5.6 kpc was estimated using the CO (J=1–0) data from the Canadian Galactic Plane Survey. Based on the spectral energy distributions, we have estimated YSO candidates' bolometric luminosities and temperatures, which are consistent with them being high-mass sources. Based on the Herschel PACS and SPIRE images (70–500 μm), we estimated the dust temperature and the dust opacity spectral index in the IRAS 22147+5948 star-forming region.

Serdecznie zapraszam,
         Agnieszka Majczyna