All-sky selection of YSO candidates from the ALLWISE catalog

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The amount of data collected by infrared satellites and observatories has been continuously increasing over the past two decades. The evolution of the detectors allowed us to explore the ISM and the encapsulated objects in more and more details. Recently, Wide-field Infrared Survey Explorer (WISE, Wright et al., 2010) catalogued >700 million sources with 5σ accuracy above >1 mJy. The amount of data and the complexity of the observed properties makes the object classification a fundamental and challenging problem. However, the commonly used schemes do not take advantage of all the available data. We identified >1.1 million Young Stellar Object (YSO) candidates in the ALLWISE catalogue of WISE mission by using a sophisticated statistical method, namely Support Vector Machine. The new all-sky selection of YSO candidates is based on 2MASS and WISE photometric data. The fraction of contaminating sources was found well below 1% based on the cross-match identification with the SIMBAD database. We present our selection and describe the selection method as well as the basic properties of the selected YSO candidates. We compare our results to existing methods and catalogs and take advantage to describe star formation in various environments.

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