Pursuing the YSO surveys in a panchromatic approach. Context of the GRAVITY+ infrastructure upgrades and of the MATISSE Wide capability

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Abstract

Protoplanetary disks around young stars as well as debris disks around Main Sequence stars constitute two major scientific cases of the VLTI/MATISSE instrument at the interface with planetology. Our contribution to the foreseen workshop is based on the 3 first years of operation of MATISSE. A survey of a hundred young stars has been undertaken with MATISSE in the mid-IR, in parallel to the surveys carried out in the near IR with PIONIER and GRAVITY, and in the millimeter domain with ALMA. With a milliarcsecond angular resolution and an access to the gas and dust spectral signatures of the mid-IR, MATISSE makes it possible to study the inner regions of the discs (_˜ 0.5 - 10 au) along 2 main axes: 1) detection and study of fine structures (gaps, spirals, dust concentrations) unattainable until now and 2) characterization of the composition and physical properties of the primordial planet building blocks. We will present the current status of the MATISSE GTO survey on young stellar objects and debris disks, and give a view of the achieved first results. Moreover, we will propose to exploit the GRAVITY+ infrastructure upgrades and the MATISSE Wide capability under preparation : a) to extend the YSO observations to faint and embbeded sources and b) to carry out a joint YSO survey with the GRAVITY+ and PIONIER teams & instruments. Such a joint survey program will allow a better synchronization of observations, important for variable sources, and the establishment of a multi-spectral database required nowadays for performing fine radiative transfer modellings and interpretation.

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