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# Limits of detection in debris disks around young stars with NaCo/Sparse Aperture Masking observations

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## Abstract

To understand the formation and evolution of solar systems and planets formations in the stars neighbourhood, we need to obtain information of their state at different time of their evolution. Here, we focus on debris disks around young stars aged of ten to few tens of Myr, we analyze NaCo/Sparse Aperture Masking (SAM) observations in the L' band (3.8  $\mu\text{m}$ ) of eight objects (beta Pictoris, AU Mic, 49 Ceti, eta Tel, Fomalhaut, G Lupi, HD182327 and HR8799). The aim is to get limits of detection about the mass of the debris orbiting around their stars.

The SAM technique consists in transforming a single telescope into a Fizeau interferometer using a non redundant mask inserted in a pupil plane of the instrument.

The analysis of the observations was completed with the sparse aperture mode pipeline. Interference fringes are fitted to obtain complex visibilities of the object, then the closure phases are calibrated and evaluated. Finally, a map of the detection limits is obtained as it is related to the closure phases previously estimated.

In order to obtain an estimation of the mass corresponding to the luminosity measured with the reduction pipeline we are using theoretical isochrones interpolated into synthetic color tables. The results are maps of detection limits in unit of Jupiter Mass in a range of up to 450 mas around the stars.

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