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Accretion-ejection in massive YSOs

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Abstract. We sketch the progress made using optical interferometry in understanding the au-scale environment of young luminous stars by high-lighting the well-studied object IRAS +13481-6124.

Optical interferometry (OI) is one technique that provides access to phenomena occurring on milli-arcsecond scales. In young stars, OI can probe structures and kinematics of the accretion flow within an au. In practice, this is realized in young systems along the mass sequence. The universality of the accretion-ejection paradigm can be addressed in this way. An extended overview and analysis of the accretion environment in young luminous stars at high angular resolution in the (sub-)mm and IR is presented in Beltrán & de Wit (2016).

ESO continues to provide new opportunities at the VLT-I. New instruments promise in higher sensitivities and improved precision. The most recent arrival, GRAVITY (2017) and its dedicated near-IR adaptive optics system CIAO, deliver new capacities to be used in the field of MYSOs. In 2017, MATISSE operating in the L, M and N bands will join the 2nd generation VLT-I instrument suite.

IRAS +13481-6124 is a luminous embedded YSO with a mass of $\sim 20\,M_{\odot}$. It drives a parsec-scale H_2 flow (Fig. 1A). A relatively well filled (u,v)-plane allowed near-IR synthesis imaging. The hot, 1500 K dust surrounding the central object displays an elongated and flattened structure for the inner 20 au (Fig. 1B). The structure is oriented roughly perpendicular to the direction of the main jet/outflow. Spectrally resolved data covering the Brγ transition traces the velocity resolved ionized flow at au scales (Fig. 1C). At ten times lower resolution, mid-IR interferometry delivers signals arising from both the dusty outflow-cavity walls and the warm disk region (Fig. 1D).

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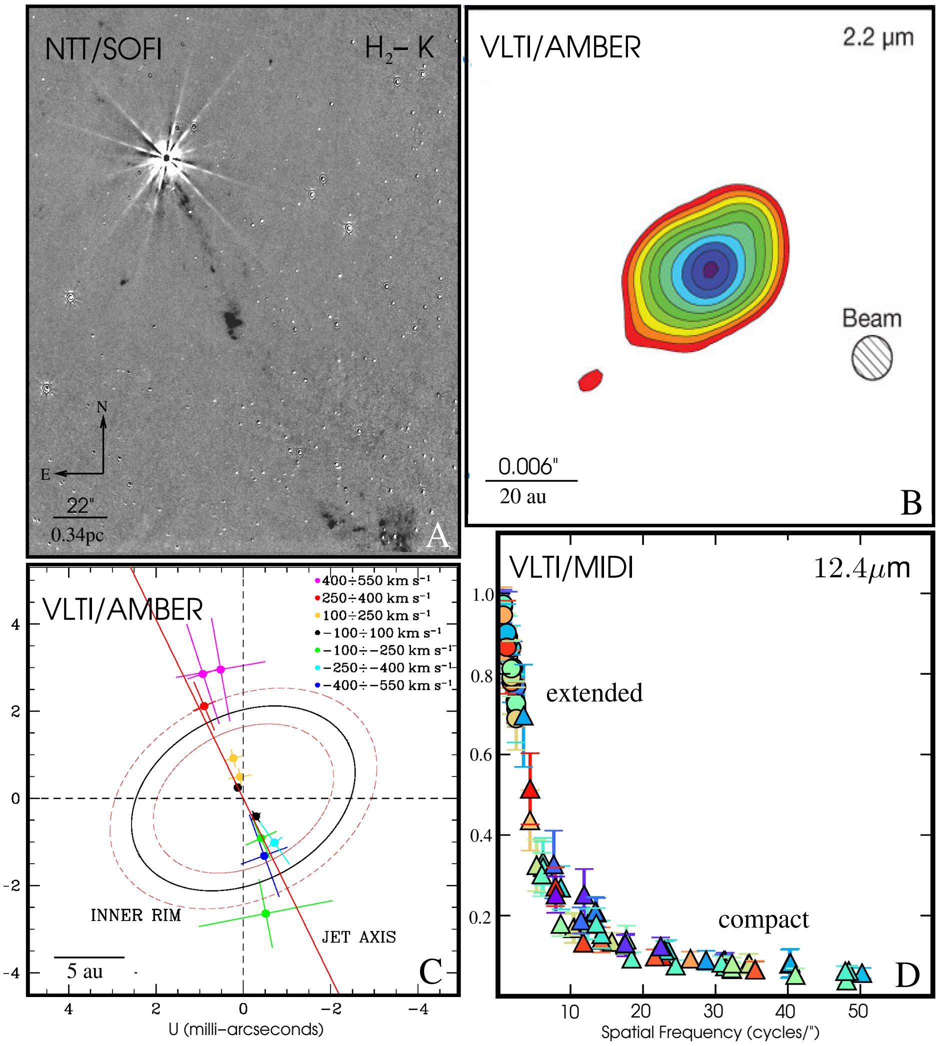

Fig. 1. *Panel A:* An H_2 – K subtracted image showing the SW-NE orientation of the jet (Caratti o Garatti et al. 2015). *Panel B:* A 2.2 μm aperture synthesis reconstructed image of the disk-like structure perpendicular to the outflow direction (Kraus et al. 2010). *Panel C:* Velocity resolved Brγ photocentroids as derived from the differential phase (Caratti o Garatti et al. 2016). *Panel D:* Visibility function signaling an extended and compact component on scales of tens of milli-arcsecond (Boley et al. 2016).

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