RevMexAA (Serie de Conferencias), **44**, 46–46 (2014)

OVERVIEW OF STELLAR INTERFEROMETRY AND ITS CONTRIBUTION TO THE STUDY OF MASSIVE STARS

S. Kanaan[1], A. Meilland[2], F. Millour[2], M. Cure[1], O. Chesneau[2], Ph. Stee[2], M. Borges [3], L. S. Cidale [4], and C. Arcos[1]

XIV Latin American Regional IAU Meeting (Florianópolis/SC, Brazil, 25-30 November 2013)
Editors: A. Mateus, J. Gregorio-Hetem & R. Cid Fernandes

Hot active stars are an important source of UV photons that are ionizing the circumstellar and interstellar environment up to a few hundred of parsecs. Thus, they are playing an important role in the heating of the gas in the arms of galaxies as well as the formation of radiative shocks in the interstellar medium.

These stars are very bright and over luminous compared to B "normal" stars due to the presence of their circumstellar envelope. Thus, in young clusters, with many Be stars, the luminosity function may seem to contain too massive stars, leading to an artificially top-heavy Initial Mass Function (IMF).

The lack of angular resolution in observations limited the study of these objects and their modelling was based only on fitting the SED or line profiles. To discriminate between the various physical processes describing the mass loss and the distribution of matter in the circumstellar medium, the geometry and the kinematics of these envelopes have to be fully constrained. This cannot be done by a single telescope and long-baseline interferometry is the only available technique to reach the spatial resolution necessary to resolve most of the envelopes. The VLTI instruments AMBER and MIDI and the upcoming instruments such as MATISSE and GRAVITY are perfectly adapted to the study of these gaseous and dusty environments as their flux is generally dominated by circumstellar emission beyond 1 μm. Using interferometry with high resolution spectra allow us to use the differential visibility and differential phase. In fact disks in rotation or in expansion have the same spectroscopic profile which make it impossible to discriminate between these two scenarios. On the other hand these scenarios have their own signature in the differential visibility and phase. Performing many interferometric observations, with different baselines lengths and position angle, will allow us to reconstruct images with software such as MIRA. The advantage of the image reconstruction lies in the fact that it is independent from any model. Moreover using image reconstruction could reveal the flattening of the envelope, asymmetries in the disk such as spiral arm, clumpiness or binarity.

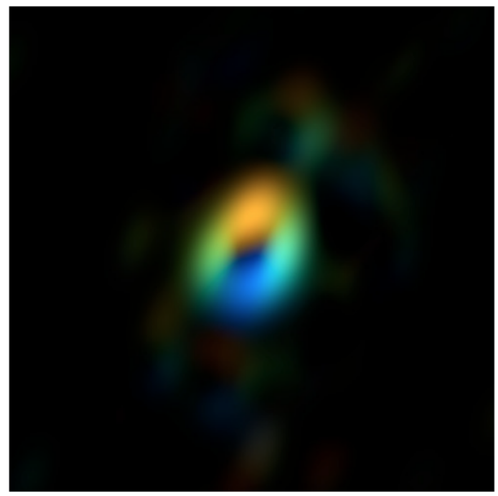

Fig. 1. Image reconstruction of the A[e] star HD62623 showing the size and shape af Brγ emission of the circumstellar gas, as well as its kinematics, in this case a Keplerian rotation.

[1]Universidad de Valparaiso. Av. Gran Bretana 1111, Valparaiso, Chile. (samer.kanaan@uv.cl).

[2]Laboratoire Lagrange, UMR7293, Univ. Nice Sophia-Antipolis, CNRS, Observatoire de la Cote d'Azur, 06300 Nice, France.

[3]Observatorio Nacional, Rio de Janeiro.

[4]Instituto de Astrofisica de La Plata.