

Workshop

Stellar End Products: The Low Mass - High Mass Connection

ESO Garching, 6-10 July, 2015

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Title:

Analytical morphological models and an application to the CW Leo ALMA data

Abstract:

Observations of stellar winds have shown that these outflows are non-homogeneous and might harbour structural complexities on macro- and microscales. Here, we focus on spiral structures with the aim to expand our understanding on the manifestation of such structures in the (one- and three-dimensional) observables of a stellar wind. For this we have developed fully parametrised analytical models. The emission produced by these models is simulated via 3D radiative transfer. We present the results for two different models of an optically thin spiral in an optically thin outflow. The two considered spiral geometries are identical, but for their opening angle, which are respectively low and high. We demonstrate that the low excitation rotational spectral lines of CO hardly reflect this more complex geometry, but that spatial information, in the form of Position-Velocity diagrams, does carry all the fundamental geometrical information. Finally, we briefly present a comparison with the ALMA data of CW Leo. If time permits, we will briefly introduce a similar work on disk morphologies.