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The launching mechanism of protostellar winds via water masers

The formation of astrophysical objects of different nature, from black holes to gaseous giant planets, involves a disk-jet system, where the disk drives the mass accretion onto a central compact object and the jet is a fast collimated ejection along the disk rotation axis. Magnetohydrodynamic disk winds can provide the link between mass accretion and ejection, which is essential to ensure that the excess angular momentum is removed and accretion can proceed. Through sensitive Global Very Long Baseline Interferometry observations of the polarized emission of the 22 GHz water masers, we have traced individual streamlines of the magnetohydrodynamic (MHD) disk wind associated with the intermediate-mass YSO IRAS 21078+5211. Our resistive-radiative-gravito-MHD simulations of a jet around a forming massive star are able to closely reproduce both the observed maser kinematics and magnetic field configuration in the inner jet cavity. By recent multi-epoch Very Long Baseline Array observations, we have determined the maser 3D velocity field, too. This talk discusses the results of these new observations and their contribution to better characterize the disk wind physics.

Primary author: MOSCADELLI, Luca (Istituto Nazionale di Astrofisica (INAF))

Presenter: MOSCADELLI, Luca (Istituto Nazionale di Astrofisica (INAF))

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