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Magnetic field measurements around massive young stellar objects with the EVN.

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Although the observational and theoretical progresses of the last years, the formation process of high-mass stars (M>8 M_sun) is still unclear. This is mainly due to their fast evolution and large distances that make difficult to observe, with large details, a sufficient amount of massive young stellar objects (YSOs) at each evolutionary stages. However, in the last 10 years some pieces of information regarding the gas motion and the magnetic field close to the YSOs have been gathered by observing and analyzing the maser emission of mainly water and methanol molecules. In particular, we have performed full polarization observations of 6.7 GHz methanol masers and/or 22 GHz water maser with the European VLBI Network (EVN) towards a large number of sources in order to provide measurements of magnetic fields orientation and strength at milliarcsecond resolution around massive protostars. These pieces of information can be obtained at this high angular resolution only by observing and analyzing the polarized emission of masers. From the linearly and circularly polarized emissions we can determine the orientation and the strength of the magnetic fields, respectively.
In my talk I will present the updated statistics about the alignment of the magnetic fields with the bipolar outflows ejected from the massive protostars obtained by observing the linearly polarized emission of 6.7 GHz methanol maser. In addition, and for the first time, we will provide the magnetic field strength measured from the Zeeman-splitting of methanol maser by using the very recent determination of the Landé g-factors for the methanol maser transitions (Lankhaar et al. 2018, Nature Astronomy, 2, 145). Furthermore, I will briefly show the up-to-date results of the monitoring project (still ongoing) of the kinematics of the 22 GHz water masers, and its link with the magnetic field, detected in the massive star-forming region W75N(B).