

Studies of type 2 AGNs below spatially resolved scales: the case for UV polarimetry.

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Polarimetry (and ultraviolet – UV – polarimetry in particular) has proven to be one of the most resourceful observational method to constrain the multi-scale geometry and composition of Active Galactic Nuclei (AGNs). Because of its vectorial nature, the polarisation of the emitted, scattered or absorbed light is independent of the size of the source region. It allows us to study objects that remains spatially unresolved to modern telescopes or can be hidden behind absorbing material. UV polarimetry was at its peak in the 90's, but it ended in the early 2000s when the last space-based far-UV polarimeter instrument was decommissioned. All that is left is archival data from WUPPE that flew 2 times onboard space shuttles, and the Faint Object Camera (FOC) and the Faint Object Spectrometer (FOS) that equipped HST until 2002 and 1997 respectively. In this talk, I will present how we can use the polarisation of AGNs to determine the geometry and composition of its innermost components, with a particular focus on the UV band, where host starlight dilution is at its lowest. I will show how polarimetry – even with +20 years old archival data – along with multi-wavelength analysis allows us precisely study the physical process occurring in the (sub)parsec-scale regions of these complex sources. This work, based on archival data from the HST/FOC remain state of the art 20 years later and pave the way for future polarimetric instruments in the UV band.

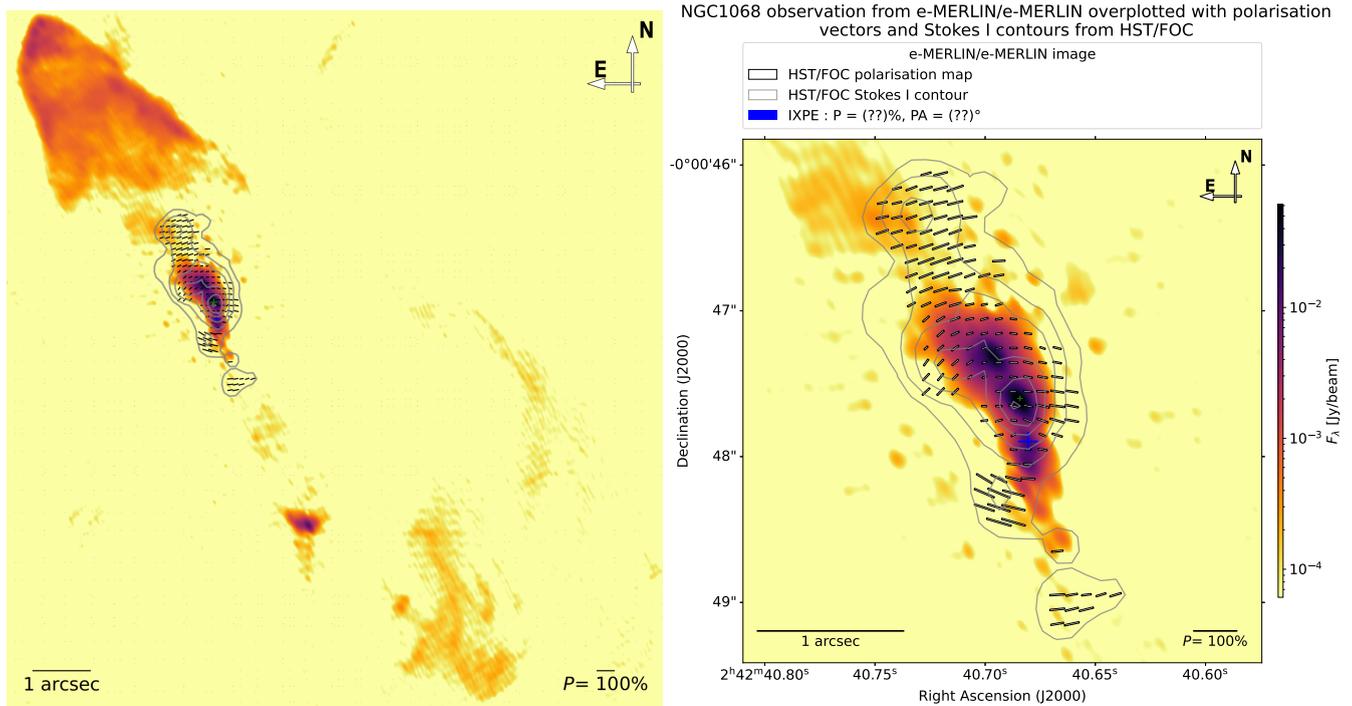


Figure 1: Combined VLA and e-MERLIN Radio maps at 5GHz of NGC 1068 overplotted with the polarisation map obtained in near-UV by the HST/FOC. The IXPE analysis results remain to be published. Left: the original image. Right: a zoom at the center of the AGN.