

SAM: The promising AMI/friend of the JWST

After its successful launch and commissioning, the James Webb Space Telescope (JWST) inherited the mantle of being the world's pre-eminent infrared observatory. In the shadow of the already famous NIRCAM or MIRI, JWST flies an Aperture Masking Interferometer (AMI) as one of the supported operating modes of the NIRISS instrument. The Sparse Aperture Masking (SAM) interferometry introduces a mask with well-selected holes into the pupil plane of a telescope to enable interferometric capabilities. Aboard such a powerful platform, the AMI mode will deliver the most advanced and capable interferometer ever launched into space, exceeding anything that has gone before in both sensitivity, accuracy and stability. The primary advantage of the AMI mode is its ability to probe the core of the point spread function, where coronagraphic techniques on JWST are blind. Thus AMI complements other high-contrast JWST imaging on NIRCAM and MIRI in the range of inner working angles between $0.5\lambda/D$ and $4\lambda/D$. This opens the search for companions down to roughly 1 AU for the closest star systems. As a non-exhaustive list, AMI/NIRISS will be particularly interested in -the zodiacal dust around young stars, -large scales feedbacks around Active Galactic Nuclei, -evolved transition disk, etc. All these science cases are covered by many GTO programs and will highlight the AMI expectations and performances. Today, we propose to introduce key aspects of the design, commissioning, data reduction and performance of this facility. The simulation and analysis tools are fully available to the community and encourage all potential users to apply for this mode. Moreover, our team leads the ERS program dedicated to the Wolf-Rayet dust producer science case. We will present the world premiere AMI image of the WR137 system, demonstrating the AMI-NIRISS ability to deliver trustable images with a spatial resolution better than the λ/D limit. SAM and AMI are definitely two friendly words for the french community and should get new regard considering the new facilities equipped with this mode (JWST, SPHERE, and soon ERIS or METIS on the ELT).