

# PhotonMEADOW 2023

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## New Achievements in OAM beam characterization using Hartmann wavefront sensor and KAOS

Light beams carrying Orbital Angular Momentum (OAM) are sparking new developments in several fields like the excitation of chiral magnetic phenomena, both in the static and dynamic regime, enhanced imaging and novel light-matter interaction. The creation and characterization of OAM beams is by itself a challenging task and thus a separate field of study.

At FERMI we can create an OAM beam either by tailoring the emission process on the undulator side, or, in most cases, by coupling a spiral zone plate in tandem with the KAOS active optic system. To provide a robust and reproducible workflow to our users we leverage on the use of a Hartmann wfs both for optics tuning and beam characterization. In particular, to operate KAOS in the so-called near-collimation mode and to provide an independent characterization of beam helicity and topological charge characterization after the creation of a structured beam. In this poster, we will present our latest achievements in operating the KAOS system out of nominal configuration and in the beam characterization workflow while powering up the OAM research community.

### Journal of Synchrotron Radiation Special Issue: will you submit your contribution?

yes

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