

MooNpics – A European wide metrology round-robin test

Saturday, 7 November 2020 14:00 (1 hour)

With new light sources, like free electron lasers and ultimate storage rings, diffraction limited X-ray radiation will become available for new classes of scientific and technological applications.

These light sources are characterised by very low wavelengths, high brilliance and full coherence of the beam. To preserve these properties along the beam propagation path, highly precise diffraction limited optics are needed, leading to ambitious requirements for the X-ray mirrors used in such a machine and therefore generating high demands on the manufacturers as well as on the metrology.

To face these questions, the “MooNpics –Metrology On One-Nanometer-Precise Optics” has been established as a work package of the CALIPSOplus European project. Within the MooNpics project 12 partners collaborate to improve mirror metrology and mirror manufacturing techniques. The goal is to push the frontiers in mirror metrology in Europe to a single-nanometre figure error precision, thus fulfilling the new requirements.

Part of the MooNpics project is a European wide round-robin test started in October 2018. Three X-ray mirrors are sent to 11 metrology laboratories all over Europe and measured with different measurement techniques in order to improve existing metrology methods and manufacturing techniques. All partners contribute with excellent know-how in nanometre precise metrology and with superior equipped metrology laboratories. With the final results it will be possible to establish standards for metrology measurement methods and mirror mountings. Furthermore, calibrated test mirrors can be created. Methods for spatial characterisation with wavefront metrology are optimised, in order to provide fast and accurate beam profile characterisation and optics alignment.

Contact details: silja.schmidtchen@xfel.eu

Primary author: Dr SCHMIDTCHEN, Silja (European X-Ray Free-Electron Laser Facility GmbH)

Co-authors: FREIJO MARTIN, Idoia (European X-Ray Free-Electron Laser Facility GmbH); VANNONI, Maurizio (European X-Ray Free-Electron Laser Facility GmbH); Dr PLÖNJES, Elke (Deutsches Elektronen-Synchrotron); Dr SINN, Harald (European X-Ray Free-Electron Laser Facility GmbH)

Presenter: Dr SCHMIDTCHEN, Silja (European X-Ray Free-Electron Laser Facility GmbH)

Session Classification: Postersession