Contribution ID: **57**   Type: **Oral presentation**

FEL beam diagnostics and source metrology

Tuesday 27 October 2020 13:30 (30 minutes)

After the first decade of operability, the strong quest for results around the Free Electron Laser (FEL) facilities has been positively filled, giving the opportunity to make one step back from the sample-level and to focus on subtle, still open topics concerning the FEL source metrology and coherence characterization. Because of the complexity of the emission process, important parameters such as the effective source position and dimension may be a-priori not known and depend on the required machine optimization, or can be adjusted to meet the experiment needs. The idea of using wavefront sensing techniques, usually employed for optics tuning, is captivating because of their shot-to-shot operability and accuracy, which make them robust and suitable as a feedback for FEL machine-tuning operations. Here we review the results of source metrology measurements at the FERMI seeded-FEL performed at distinct machine configurations, by means of Hartmann wavefront sensing. The effects of the transport optics, which may introduce curvature alterations, are discussed as well, with particular attention to the case in which shot-to-shot properties of the source are investigated (e.g. source position fluctuations) and local curvature effects of the optics come into play.

Primary authors: Dr RAIMONDI, Lorenzo; Dr MAHNE, Nicola (IOM-CNR); ZANGRANDO, Marco (Elettra Sincrotrone Trieste and IOM-CNR); Dr SIMONCIG, Alberto (Elettra Sincrotrone Trieste); CAPOTONDI, Flavio (Elettra Sincrotrone Trieste); Dr FOGLIA, Laura (Elettra Sincrotrone Trieste S.C.p.A.); Dr ALLARIA, Enrico (Elettra Sincrotrone Trieste S.C.p.A.); Dr PEDERSOLI, Emanuele (Elettra Sincrotrone Trieste S.C.p.A.); Prof. DE NINNO, Giovanni (Elettra Sincrotrone Trieste S.C.p.A.); Dr MANFREDDA, Michele (Elettra Sincrotrone Trieste S.C.p.A.)

Presenter: Dr MANFREDDA, Michele (Elettra Sincrotrone Trieste S.C.p.A.)

Session Classification: Coherence, Profile and Position Measurements

Track Classification: Coherence, profile, and position measurements