

ID: 1466 - TUOBNO02 Optical-EUV Pump and Probe Experiments With Variable Polarization on the Newly Open LDM Beamline of FERMI@Elettra

Speaker Paola Finetti (Elettra-Sincrotrone Trieste S.C.p.A., Basovizza)

Authors Paola Finetti, Roberto Borghes, Carlo Callegari, Paolo Cinquegrana, Miltcho B. Danailov, Alexander Demidovich, Claudio Fava, Simone Gerusina, Cesare Grazioli, Rosen Ivanov, Gabor Kurdi, Marco Lonza, Nicola Mahne, Ivaylo Nikolov, Lorenzo Pivetta, Oksana Plekan, Lorenzo Raimondi, Paolo Sigalotti, Cristian Svetina, Dino Zangrando, Marco Zangrando (Elettra-Sincrotrone Trieste S.C.p.A., Basovizza), Lorenzo Avaldi, Paola Bolognesi, Marcello Coreno, Patrick O’Keeffe (CNR - IMIP, Trieste), Kiyoshi Ueda (Tohoku University, Sendai), Giovanni De Ninno (University of Nova Gorica, Nova Gorica), Michele Di Fraia (Università degli Studi di Trieste, Trieste), Markus Ilchen, Tommaso Mazza, Michael Meyer, Amir Jones Rafipoor (XFEL.EU, Hamburg)

Abstract Two color experiments are now available to users at the low-density matter beamline (LDM) operating at the Free Electron Laser (FEL) source FERMI@Elettra [1]. The seeded FEL method used at FERMI allows generation of high power, coherent pulses in the femtosecond regime, with a high level of shot-to-shot stability. Variable polarization is also available. LDM is dedicated to atomic, molecular and cluster physics. The LDM end-station, equipped with a velocity map imaging and a time-of-flight detector [2], is an ideal tool to characterize fast multiphoton processes. LDM was open to users in December 2012 and in February 2013 performed its first pump and probe experiment on photoionization of atomic He and generation of spectral sidebands. The FERMI FEL-1 source, delivered EUV photons with several tens of microjoule per pulse (about 100 fs wide) in a tunable wavelength range from 65 to 20 nm, while the 780 nm, optical pulses were from the same Ti:sapphire laser used to form the FEL seed pulse. This paper gives details about the pump and probe experimental setup and shows the straightforward use of the pump and probe data to measure the FEL pulse width.

Footnotes [1] E. Allaria et al., Nature Photonics, 6, 699 (2012).

[2] V. Lyamayev et al., J. Phys B: At. Mol. Opt. Phys.-B/466820/SPE/12380

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