

エクストリームフォトンクスセミナー

Extreme Photonics Seminar

日時: 平成20年4月24日(木)

16:00 ~ 18:00, Apr. 24 (Thu.), 2008

場所: 研究交流棟5階会議室 W524

Cooperation Center, 5F Meeting Room, W524

題目: Measurement and control of laser frequency
using an optical comb

講師: **Dr. Feng-Lei HONG**

(National Institute of Advanced Industrial Science and Technology (AIST))

要旨: Recently, the research field of optical frequency metrology is developing rapidly due the invention of the "optical comb" with its carrier-envelope phase controlled. I will introduce the history and recent activities of optical frequency standards and optical combs. Some examples of laser frequency measurement are described. Optical combs based on mode-locked fiber lasers have attracted great attentions due to their capability for long-term and easy operation. The absolute frequency measurement of a Sr optical lattice clock has a great impact on the discussion of the redefinition of the second.

題目: CO₂ laser-produced Sn-plasma source
for high-volume manufacturing EUV lithography

講師: **Dr. Akira SUMITANI**

(EUVA, Research Department, Hiratsuka Laboratory)

要旨: The development of a reliable high power EUV light source is one of the major technical challenges for the implementation of EUV lithography. A review is given on the development of a laser produced plasma light source for high volume manufacturing (HVM) EUV lithography. An LPP EUV source is the most promising approach to generate the required in-band EUV power level of more than 200W. Our source is based on a high power, high repetition rate CO₂ laser system, a tin target and magnetic plasma guiding for collector mirror lifetime enhancement and tin processing. The laser system is a master oscillator power amplifier (MOPA) configuration. We have achieved an average laser output power of 12 kW at 100 kHz by a single laser beam with good beam quality. The corresponding EUV in-band power is equivalent to 120 W at the intermediate focus. The collector mirror lifetime is extended by using a minimum mass droplet target combined with the magnetic plasma guiding. The effectiveness of this approach is demonstrated by monitoring the Sn plasma beam in a large vacuum chamber along the magnetic field lines.

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