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Development of EUV / DUV Source for Semiconductor Manufacturing and its Application

Tuesday, 4 February 2025 15:45 (30 minutes)

In this conference, we will report about new EUV research activities in Kyushu-Univ. in Japan.

1st topic is new EUV exposure research center: named "EUV Photon Co.. This organization will support material development of material industry of EUV lithography, for example photo-resist, and photo mask and so on. We prepare EUV light source and exposure optical system and vacuum chamber system for this exposure. In this presentation we will report latest preparation of this organization.

2nd topic is new high power EUV source research program which has been preparing in Kyushu-University. Since 2003 we corroborate EUV source research with Gigaphoton. We are pioneer of combination of pulsed CO₂ laser and Sn droplets, dual wavelength pico second laser pulses for shooting and debris mitigation by magnetic field have been applied. We have demonstrated high average power >300W EUV power with CO₂ laser more than 27kW at output power in cooperation with Gigaphoton and Mitsubishi Electric up to now 2). Also we are thinking about the Sn plasma dynamics which dominate the EUV emission by using Thomson Scattering (TS) measurement. Last year our group announced possibility of 10% conversion efficiency with simulation and experiment (fig.3)3). These results mention that there is still sufficient potential to increase EUV output power and conversion efficiency in near future.

At the conference, we will report latest update of above two topics.

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