R&D Status on Two-mirror In-Line Projector for OIST EUV lithography

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<Abstract>

At OIST, we have started R&D on a highly energy-efficient two-mirror in-line projector with a simplified illumination system. The EUV source power can be reduced by 1/10 compared to the current six mirror EUV projector system. The required EUV power is 20 watts for a process speed of more than 100 wafers per hour. The proposed projector achieves 0.3 NA (13 mm field) and can be mounted in a cylindrical tube configuration similar to a DUV projector, providing superior mechanical stability, easier assembly/maintenance and low cost.

The EUV light is directed in front of the mask by two narrow cylindrical mirrors on either side of the diffraction cone, called the dual line field, which provides average normal illumination and reduces the mask 3D effect. The theoretical resolution limit is 16 nm (0.3 NA), image reduction factor x4 and object image distance (OID) 1500 mm.

<Biography>

Born in 1955, 10 years after the war in a country side of Kobayashi City, Miyazaki Prefecture, enjoying all the hand-made electric circuits, now finally working on the development of EUV exposure devices.

1982 Graduated from the Faculty of Engineering, Kyushu University, Doctor of Engineering.

1991 At Stanford University, developed a nano-meter measuring device using laser interference, which came in handy. (They called it the Shintake Monitor).

2000 Developed the X-ray free electron laser (SACLA) at RIKEN, which started operating in 2011.

2011 Professor at Stanford University

2011 Nov.~ OIST Okinawa Japan, to present.