



1. Title:	One-watt EUV production by 80cm outer diameter tabletop synchrotron MIRRORCLE-20SX
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3. Abstract body:

“MIRRORCLE-20SX” is an EUV source under development based upon a 20 MeV, 80 cm outer diameter tabletop synchrotron. It uses a thin film target put in the storage ring (SR) electron orbit to generate transition radiation (TR). The electrons, which pass through the target, recalculate. We inject beam at 400 Hz. We accumulate one ampere order current in the orbit [1]. Optimum thickness of one layer of the target, which is defined by the electron beam energy, is about 0.5 micrometer leading to EUV. We have confirmed the EUV power from MIRRORCLE-20SX theoretically as well as experimentally. We have measured the EUV power from the existing tabletop synchrotron MIRRORCLE-6X (6MeV machine). Although the power is lower compared with 20MeV machine, we have observed 3 mW power. We expect one watt power in total from 20 MeV machine. The power is emitted in a ± 25 mrad narrow cone. The TR is coherent radiation. The radiation matches well to the Schwarzsirtz mirror, so it adapts easily to projection lithography. We have already completed MIRRORCLE-20SX and have begun commissioning.

[1] H. Yamada, Jpn. J. Appl. Phys. 35, L182 (1996).

[2] D. Minkov H. Yamada, and N. Toyosugi, J. Synchrotron Radiation, in print.