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Installation and initial operation of the Suss Advanced Lithography Model 4 X-ray Stepper

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A Suss Advanced Lithography X-ray Stepper designed as a production tool for high throughput in the sub-quarter micron device range has been installed and is being commissioned at the University of Wisconsin's Center for X-ray Lithography. Illumination for the stepper is provided by a scanning beamline designed and constructed at CXrL. The beamline optical components are a gold coated plane mirror, a 1 micron thick silicon carbide window and a 25 micron thick beryllium exit window. Beamline features include synchronized scanning of the mirror and exit window, variable scan velocity to compensate for reflectivity changes as a function of incident angle and a horizontal oscillation of the beryllium window during vertical scanning to average the effects of non-uniform beryllium window transmission. A helium purged snout transports the x-rays from the beamline exit window to the exposure plane in the stepper. This snout is retractable to allow for the loading and unloading of masks into the stepper. The motions of the mirror, exit window and snout are computer controlled by a LABVIEW program which communicates with the stepper control software. The design of the beamline and initial of operating experiences with the beamline and stepper will be discussed.