



1. Title:	Monitoring optics contamination
2. Full names of all authors:	M.H.L. van der Velden Y.V. Sidelnikov J.H.J. Moors V.Y. Banine J.J.A.M. van der Mullen

### 3. Abstract body:

For the throughput of EUVL tools it is desirable that the reflectivity of the multilayer coated optical components remains as high as possible during the lifetime of these devices. In the past, quasi-continuous EUV exposures at synchrotrons have shown that mirror reflectivity is adversely affected by two mechanisms: carbon deposition as a result of radiation induced cracking of physisorbed hydrocarbons, and oxidation as a result of the radiation induced dissociation of adsorbed water molecules.

Our aim is to study these mechanisms under pulsed conditions, i.e. when the time between pulses is much longer than the duration of the pulses. Hereto, mirrors are irradiated with EUV pulses from a xenon fueled GDP source. The EUV reflectivity of the mirror is monitored in-situ, within an accuracy of 0.3% relative to the EUV reflectivity of an unexposed reference mirror. Simultaneously, the secondary electron emission is recorded. The sign of the change in secondary electron current provides information on which process is dominant: carbon growth or oxidation. The balance between these processes depends on the background gas composition during the exposure.