HC-free big reflectometer for metrology applications and EUV inspectometer for spatialy resolved reflectivity at the EUVR beamline of the MLS

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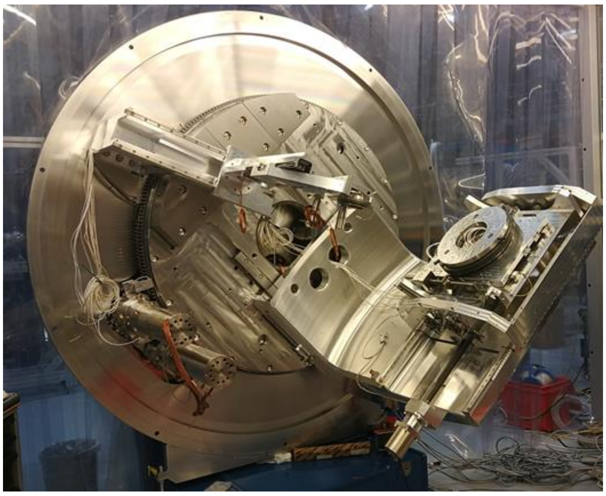
Since 2002 the EUV radiometry group of PTB is operating a big reflectometer to support its national and international cooperation partners with measurements on optical components and detectors for EUV Lithography [1]. For almost two decades, this instrument supported the development of measurement techniques for the ever-expanding variety of questions and samples from our partners.

The concept of 2002 with vacuum-capable lubricants no longer fulfills the requirements for EUV measurements as even slight hydrocarbon contamination may deteriorate measurement results. Therefore, PTB built up a new reflectometer that works hydrocarbon-free without any lubricants. This reflectometer will allow measuring samples up to collector size and a sample weight of about 150 kg. Emphasis is put on polarization-dependent reflection measurements to improve the versatility of the instrument.

We present the capabilities of the new reflectometer in connection with our inspectometer tool [2] for imaging reflectometry as well as application examples.



View of the goniometer before mounting into the vacuum vessel

[1] C. Laubis, A. Barboutis, C. Buchholz, A. Fischer, A. Haase, F. Knorr, H. Mentzel, J. Puls, A. Schönstedt, M. Sintschuk, V. Soltwisch, C. Stadelhoff, F. Scholze, Update on EUV radiometry at PTB, Proc. SPIE **9776**, 977627 (2016)

[2] Frank Scholze, Andreas Fischer, Claudia Tagbo, Christian Buchholz, Victor Soltwisch, Christian Laubis, Spatially resolved reflectometry for EUV optical components Proc. SPIE **10809**, 108091U (2018)