

# The hidden becomes apparent: Measurements of Carbon Layer Thickness in Air

*Monday, 16 June 2025 17:00 (20 minutes)*

Homogeneity and thickness of a graphite film affect the performance of dispersive optical elements made by depositing of thin HOPG and HAPG crystals on a substrate of custom shape (Graphite Optics produced by Optigraph GmbH, Germany).

Standard techniques for analysis of carbon layers and compounds require expensive measuring equipment with a vacuum chamber. A new method for fast and accurate controlling of the carbon coating thickness, based on the X-ray measurements in air and normal pressure was developed for M1 MISTRAL (Bruker Nano GmbH, Germany).

Simple raster measurements in air provide the accurate and reliable information about thickness and homogeneity of carbon films on different substrates in the thickness range from 0.5  $\mu\text{m}$  up to 100  $\mu\text{m}$ . The method was validated with reference samples measured in M4 TORNADO plus (Bruker Nano GmbH, Germany) and in a synchrotron X-Ray source (BESSY II, Germany).

The newly developed method has been implemented at Optigraph GmbH for quality control of Graphite Optics, as well as freestanding films for novel applications, such as special X-ray windows and electrons stripping films.

**Primary authors:** Dr BLOKHINA, Elena (Bruker Nano GmbH); Dr GUDI, Gennadi (Optigraph GmbH)

**Co-authors:** Mr REINHARDT, Falk (Bruker Nano GmbH); Dr GRIGOREVA, Inna (Optigraph GmbH)

**Presenters:** Dr BLOKHINA, Elena (Bruker Nano GmbH); Dr GUDI, Gennadi (Optigraph GmbH); Dr GRIGOREVA, Inna (Optigraph GmbH)

**Session Classification:** Instrumentation