

The APS/ESRF/SPring-8 Metrology Round-Robin Campaign

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A first series of round-robin metrology measurements has been organized at the world's three largest hard x-ray synchrotron radiation facilities—the Advanced Photon Source (APS) in the USA, the European Synchrotron Radiation Facility (ESRF) in France, and the Super Photon Ring (SPring-8) in Japan—as part of their annual collaborative Three-Way Meeting. The purpose of these round-robin measurements is to compare instrumentation used by these facilities' respective optical metrology laboratories to evaluate beamline x-ray mirrors. In this initial step, the optics used in the measurements consist of two flats fabricated using two different non-conventional techniques, and one 800-mm-long cylinder with 3-cm sagittal radius. The three mirrors were successively measured at the three laboratories for both slope and roughness following a specific procedure. Both measured profiles and PSD profiles were compared. This paper reports on the lessons learned during this round-robin process; various aspects of the measurement process will be detailed, and results and future plans will be discussed.

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