Summary
X-ray Test Facility Cross-Calibration
→ Ground Calibration (Gcal) WG

Vadim Burwitz (MPE)
Yusa Wang (IHEP)
Takashi Okajima (GSFC)
Herman Marshall (MIT)

Heads of X-ray test Facilities present at IACHEC #17

15.05.2025

IACHEC #17, Osaka Japan

X-ray Test Facilities

- Japan
  - 30m (ISAS) Pencil beam
- China
  - XF100 (IHEP) Long beam
  - 12-m (NAOC) Long Beam
  - Shanghai (Tonji) Pencil beam
- USA
  - XRCF 518-m (MSFC) Long beam
  - 100-m (MSFC) Long beam
  - 100-m (GSFC) Long beam
  - 47-m (PSU) Long beam
  - 20-m Polarimetry (MIT) Long Beam

- Europe
  - PANTER (MPE,DE) 130-m Long beam
  - LLBTF (Leicester, UK) 27.5-m Long beam
  - XACT (Palermo, IT) 35-m Long beam
  - IKI60 (IKI, RU) 60-m Long beam

  - BESSY (cosine, DE) Pencil beam
  - ALBA (cosine, SP) Pencil beam

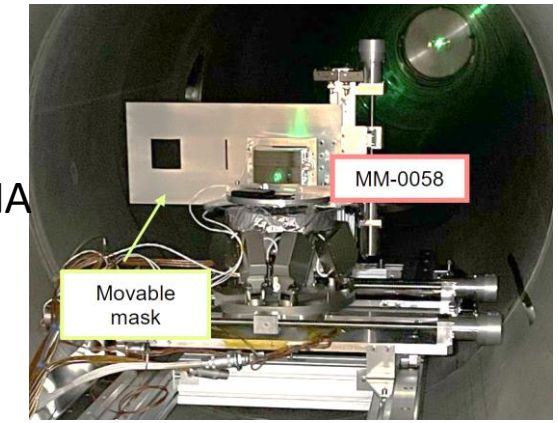
  - BEaTriX (Merate, IT) 12-m Parallel beam
  - Vert-X (MLT, IT, design) 12-m Parallel beam

X-ray Ground Calibration Facilities

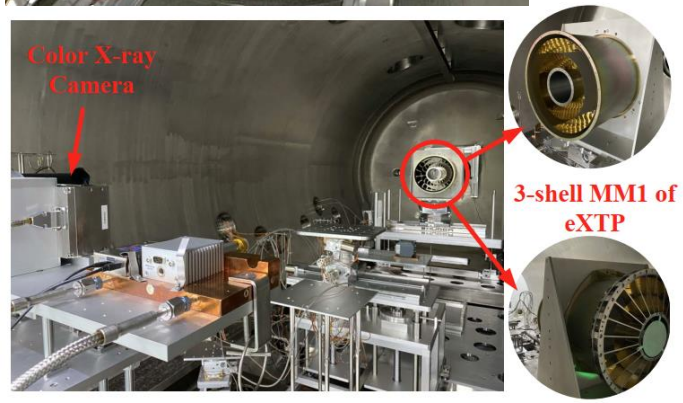
- Can support
  - Development
  - Testing (Environmental)
  - Calibration

- of X-ray
  - Optics
  - Detectors
  - Telescopes (optic + detector)

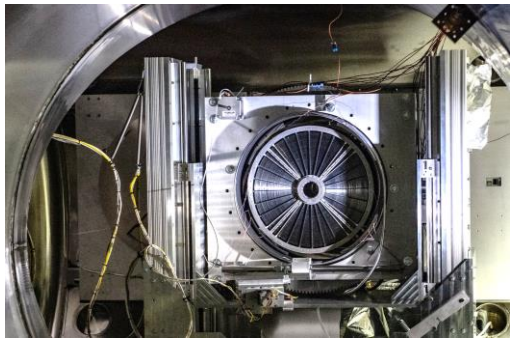
NewATHENA



eXTP



XRISM



X-ray Ground Calibration: Simulation / Data Analysis

- Raytracing simulations for
  - Mirrors
- Raytracing packages
  - comparison using a reference model
- Analysis Tools
  - Most critically PSF HEW determination for high spatial resolution PSFs

Ground Facility Cross-Calibration: what for?

- Measurement and understanding of on- and off-axis:
  - PSF
  - Effective Area / Vignetting
- Comparing measurements with simulations
  - Important to understand if optics perform as expected
- Making predictions for parallel illumination in orbit
  - Needed to have a solid starting point for in orbit calibration

Summary

The goals of the new "Ground Calibration Working Group"

- X-ray test facilities – cross-calibration using a reference optic
- Ray-Tracing packages – cross-check with a reference optic model
- Analysis methods – verify using master data set
- New Missions – guidance for ground calibration plans

Reasoning

- Get the calibration starting point right
  → accurate prediction of in-orbit performance
- Independent verification of the ground measurements
- If needed, spread the calibration load between facilities.

If you want to sign up to the working group send me an email : burwitz@mpe.mpg.de