**Beam performance for microdiffraction**

- **Measurement:** Small areas, Mapping capability, High resolution, Short time
- **Beam distribution in:** Real space, Angular space, Wave-length or energy, Time
- **Beam generation:** Source brilliance, Optics efficiency, Beam path

**Brilliance:** Ph/mm²/mrad²/s in relevant part of spectrum
- Brilliance starts with the SOURCE.
- At best, optics beam path preserves brilliance while transforming beam to a useful (optimum) distribution in phase-space.

**Aspheric multilayer coated optics (FOX 3D)**

- X-ray multilayer coatings: high reflectivity, monochromatic beam
- Highly curved aspheric substrates: large collection angles, small spot size

**Advanced X-ray optics**

- FOX 3D preserves brilliance and focuses the X-ray beam on the sample
- Small spot configuration, High flux configuration

**Beam distribution in:** Real space, Angular space, Wave-length or energy, Time

**Brightness Indicator**

**Microfocus sources with aspheric multilayer optics for stress analysis on micro-area**

Sergio Rodrigues, Olivier Pacaud, Dan Cenda, Peter Høghøj*

* peter.hoeghoj@xenocs.com

**Source-optic coupling for microdiffraction**

- Microfocus sources provide very high brilliance at low power (better heat dissipation)

**Features**

- Low Power Source (30 or 50W)
- Compact system
- Control & Command unit
- Safety & Fast Shutters
- Remote Operation (Ethernet)

**Benefits**

- Low power consumption
- High brilliance
- Easy to integrate
- Ease of use
- Space clearance from sample
- Low maintenance
- Extreme beam stability

**Test on a Fe 211 sample**

**GeniX: The x-ray beam delivery concept**

- Integrated system for optimized source optic coupling

**Features**

- High X-ray beam stability

**Benefits**

- Measurement time: 18 Hours
- Flux Variation: < +/- 0.2%

**Application test with ultra-fast detector Meteor1D**

In collaboration with GE Sensing & Inspection Technologies

**Test on a Fe 211 sample**

**The complete solution for microdiffractometer**

- A new GeniX platform optimized for integration

**Monochromatic Beam**

**Integrated system for optimized source optic coupling**

- Microfocus sealed tube (14W;36kV/0.4mA)
- Single reflection multilayer optic
- Evacuated beampath
- Flux (Cr-Kα) > 10 Mph/s under vacuum
- Processing gain is ~4000 (compared to a pinhole placed at 38 cm from source)

**Divergence < 1°**

- Beam size at focus of 25 x 19 µm FWHM

**Longer Stand-Off**

- 20 up to 170°

**Flux Variation (%) - Time (hours)**

**Results:**

- Flux Variation: < +/- 0.2%
- Measurement time: 18 Hours

**With Meteor1D detector**

**Data Courtesy of Rainer Stabenow, GE Sensing & Inspection Technologies**

**Evacuated beampath**

**High Intensity**

**Small Spot**

- Beam size at focus of 25 x 19 µm FWHM

**Divergence < 1°**

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