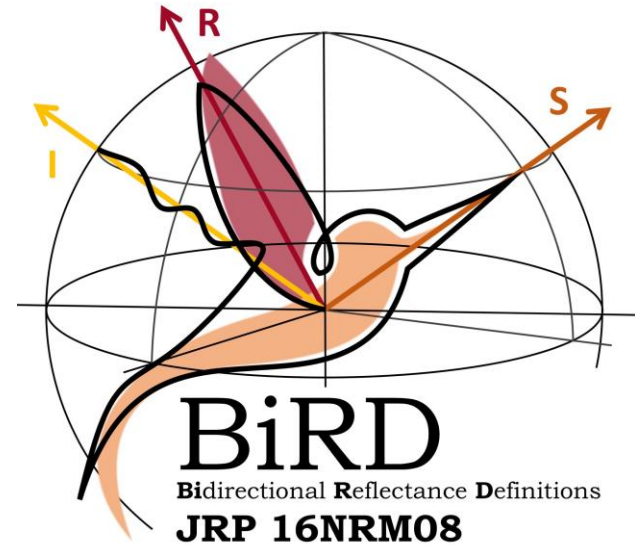


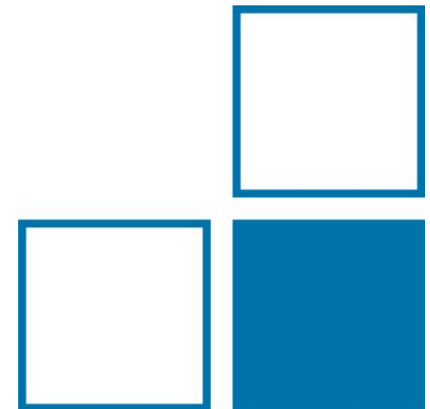
EURAMET EMPIR Project BiRD JRP 16NRM08



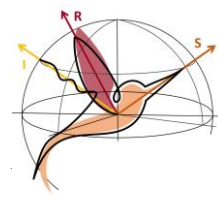
WP4:

Measurement of Sparkle and Graininess
at PTB Braunschweig

Alfred Schirmacher



Sparkle Measurements at PTB



ARGon^{3D} 3D Appearance robot-based gonioreflectometer

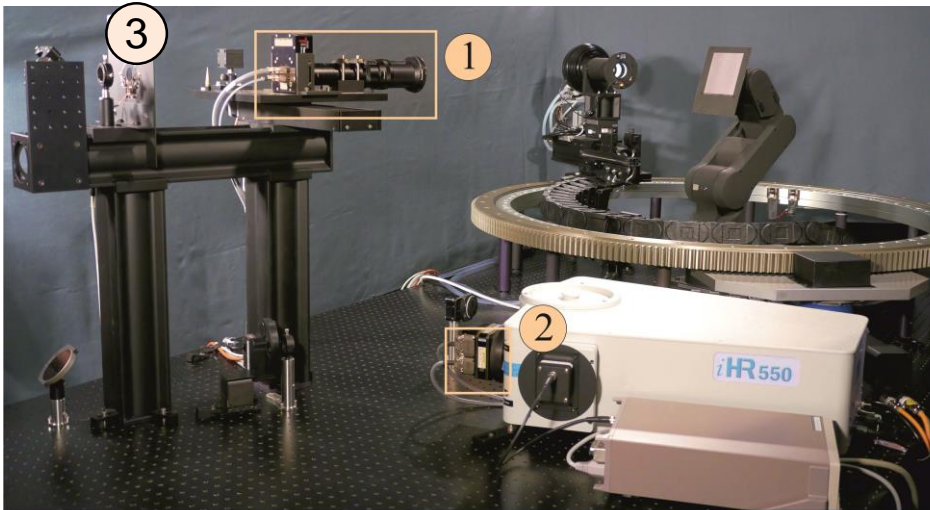
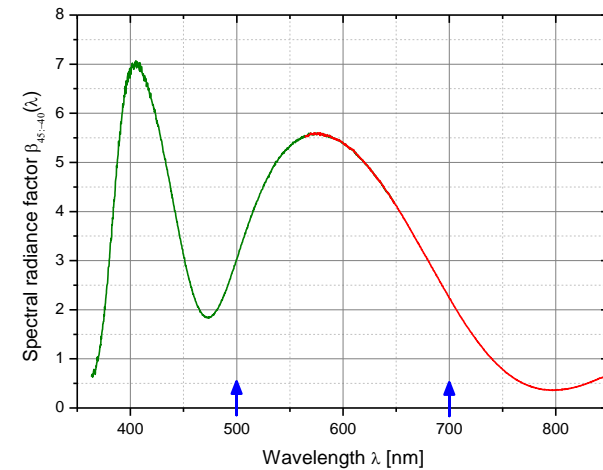


Fig. 1: Photo showing the setup of the ARGon³ facility. ① is a high-resolution video photometer system. ② is a line-scan camera module attached to an imaging spectrograph. ③ detection aperture w shutter



modified for Sparkle studies

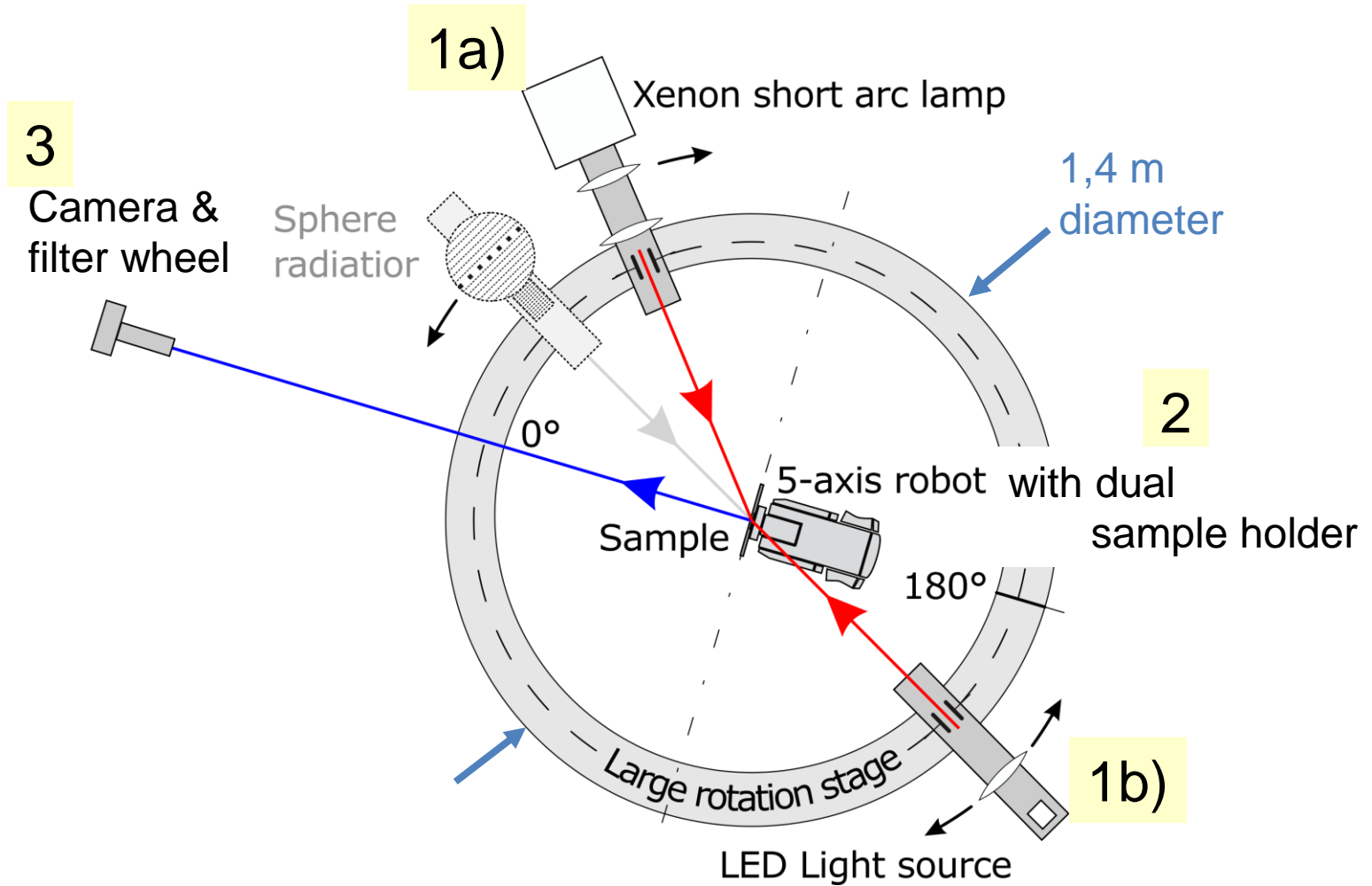
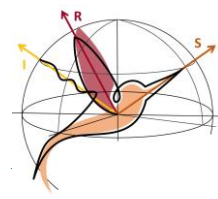
Newrad 2011 &

Höpe, A & Atamas, T & Hünerhoff, D & Teichert, S & Hauer, K-O. (2012)

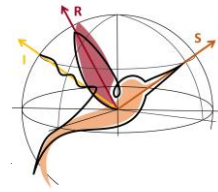
ARGon(3): "3D appearance robot-based gonioreflectometer" at PTB.

The Review of scientific instruments. 83. 045102. 10.1063/1.3692755.

Sparkle Measurements at PTB



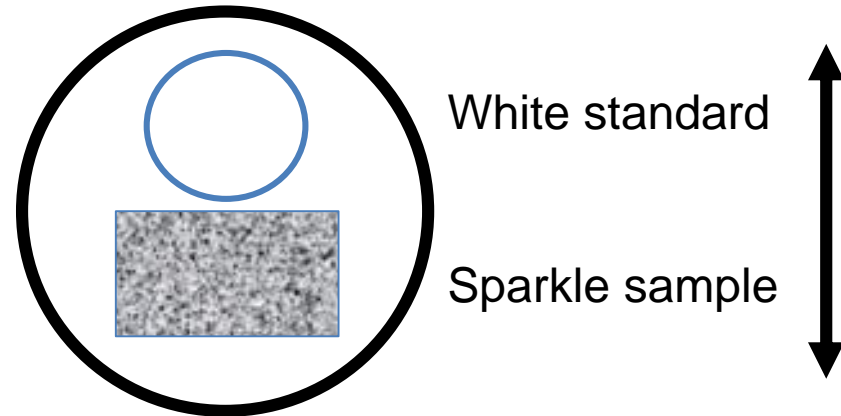
Sparkle Measurements at PTB



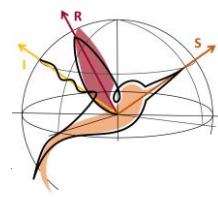
Parameters & modifications

- 1a) Xenon short arc lamp (full divergence approx. = 1.8° / 0.775 msr)
- 1b) LED light source (full divergence = 2.6° / 1,617 msr)

- 2) Dual sample holder with fast exchange



Sparkle Measurements at PTB



Parameters & modifications

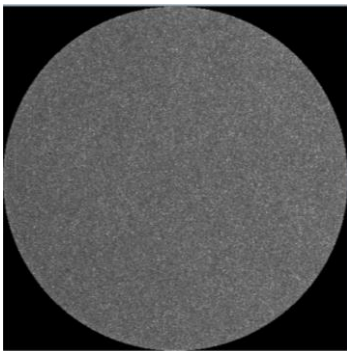
3) CDD Camera for spatially resolved data acquisition

SBIG STF-8300

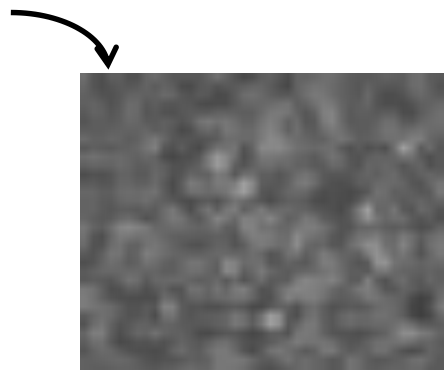
Kodak KAF-8300, 3326 (H) x 2504 (V) , BW, Full Frame CCD Image Sensor,
pixel size = 5,4 μm

+ 5 position filter wheel

& $f = 210$ mm Schneider-Kreuznach Componon-S objective
(collection solid angle 1,27 msr)



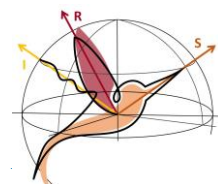
L1-EN1 15°



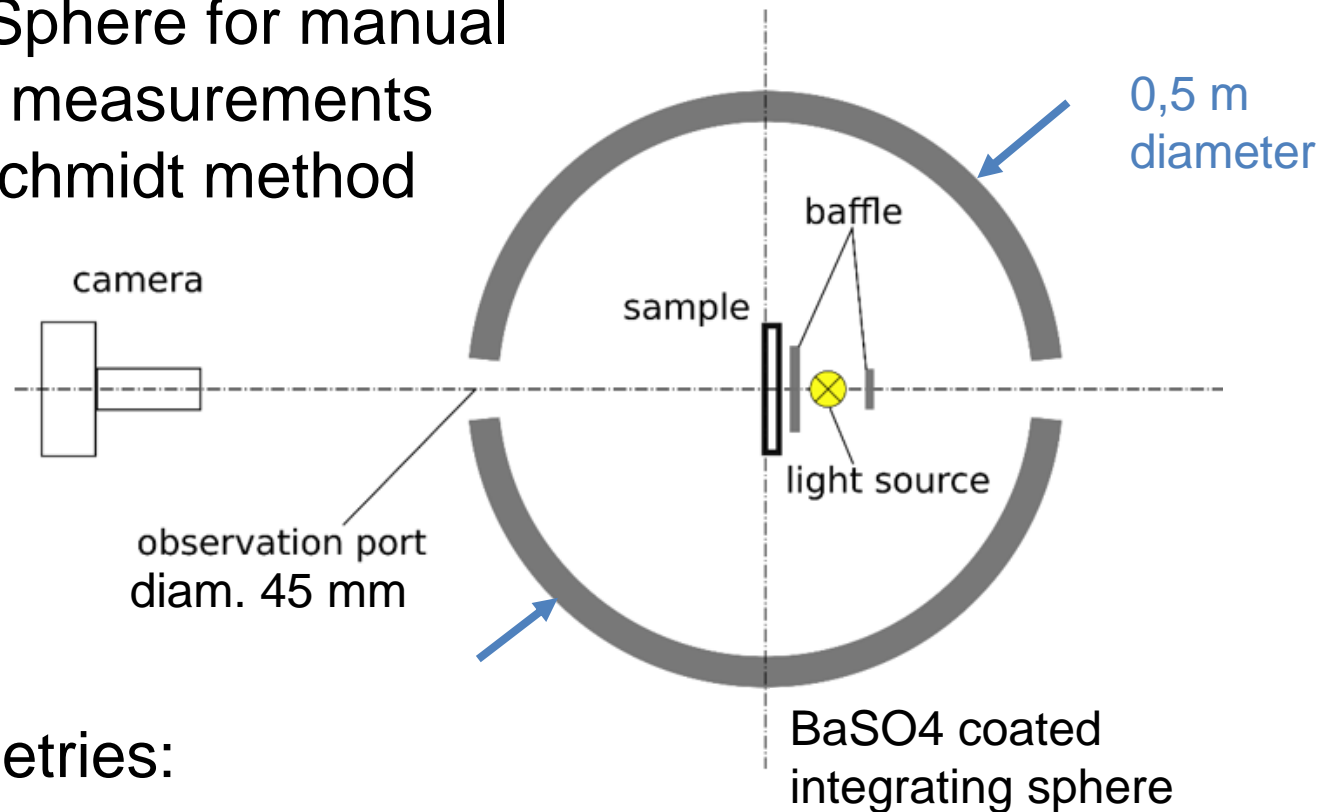
24 μm Spatial resolution
on sample

binned x5 in evaluation

Graininess Measurements at PTB



50 cm diameter Sphere for manual
luminance factor measurements
applying Korte-Schmidt method



Possible Geometries:

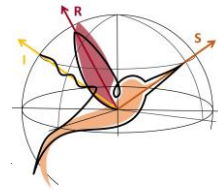
$d / 0^\circ$ (gloss excludes by default)

$d_i / 8^\circ - 10^\circ$

2 rotation points:

- centre of sample surface
- centre of obs. port

Graininess Measurements at PTB



CDD Camera for spatially resolved data acquisition

QSI 520i CCD

Kodak KAI-2020M, 1600 (H) x 1200 (V) , BW, Interline CCD Image Sensor,
pixel size = 7,4 μm

& $f = 28$ mm Sigma Mini-Wide II fixed focal length

Distance Camera – observ. Port / mm 664 / 784 / 902 / 1023
for black spot evaluation

Thank you



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