



The European Synchrotron

Recent news and R&D activities at the ESRF

T. MARTIN on behalf of the Detector Unit

High-resolution Scintillator R&D and Production

- ❑ LPE: 200 SCF scintillators sold
- ❑ Development of LYSO:Ce SCF on YbSO: fast decay time (SR and XFEL)
- ❑ Scintillator polishing: 60µm thick LYSO:Ce freestanding
- ❑ Heat-resistant detectors: high heat load on scintillators which causes huge local stress

KNOWLEDGE AND TECHNOLOGY TRANSFER

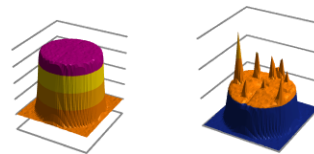
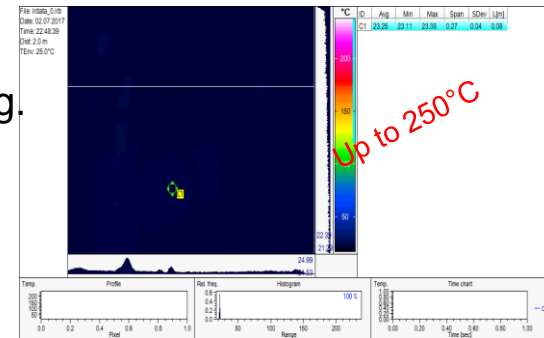
SCINTILLATORS: THE KEY TO A SUCCESSFUL ENDEAVOUR

ESRF HIGHLIGHTS 2017

Scintillators are a major component of the ESRF FELs and are essential for the production of high-resolution diffraction patterns. The scintillators are produced by liquid phase epitaxy (LPE) and are then polished to a high degree of surface quality. The scintillators are then mounted in a detector assembly and are used to detect the diffraction patterns. The scintillators are a key component of the ESRF FELs and are essential for the production of high-resolution diffraction patterns.

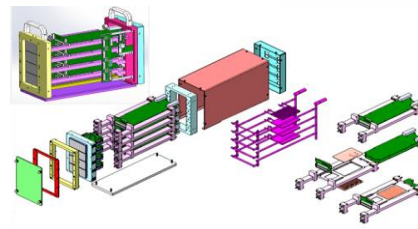
R&D and Production: Beam viewers and Diamond XBPMs

- ❑ White BV deployment on BLs and development of compact 4x mag.
- ❑ Commercial route for Diamond XBPMs: Micron semiconductor
- ❑ Validation of scCVD diamond quality



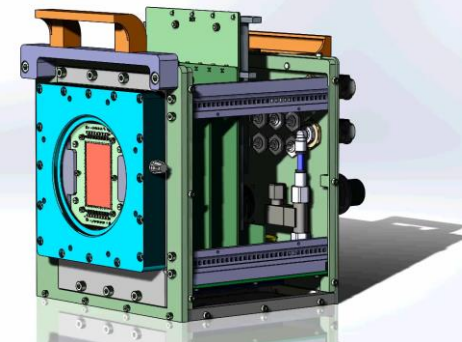
EIGER/PSI: Exploitation of full performances

- ❑ 500k (ID02&ID10) and 2M (ID01): 22kHz with 500k module @ 4-bit



New 16-channel FRELON Camera

- ❑ 16µm² pixel size, 1920 x 1920 pixels, 40fps

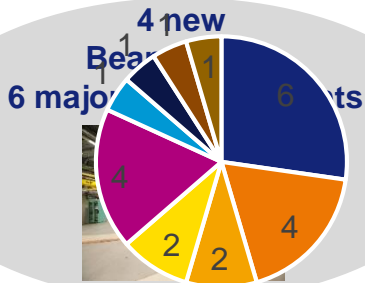


EBS 2015 - 2022

Ultra low Emittance Storage Ring



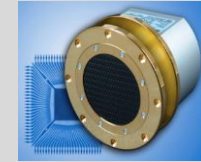
Procurement and integration for EBSL
~22 detectors



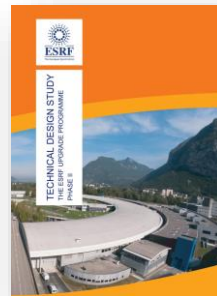
- Hybrid pixel (Si)
- CCD systems
- Energy dispersive detector (Si)
- Optics
- Diodes
- Hybrid pixel (High-Z)
- Fast cameras
- Energy dispersive detector (Ge)
- APD system



New instrumentation



Data Analysis and IT



Study of new 2D detectors optimized for:

- High-Z sensors
- High DR (EBS)

T1 – Improved X-ray sensors

T2 – Advanced control and data acquisition

T3 – Energy dispersive detection technology

Detectors

- ❑ SMARTPIX: Medipix3 collaboration, TSV
- ❑ JUNGFRAU: collaboration with PSI
- ❑ iLGAD: collaboration with CNM
- ❑ Large format CMOS sensors: commercial devices
- ❑ More to come...

Technologies

- ❑ High-Z semiconductor: GaAs, CZT
- ❑ High-Z structured scintillators: co-doped CsI
- ❑ More to come....

Thank you for your attention
Available for questions during coffee breaks ,...

Acknowledgements: ISSD and Beamline staff