Fraunhofer
EZRT

Development Center X-ray Technology
at Fraunhofer Institute for
Integrated Circuits IIS

Industrial Synchrotron Tomography by Fraunhofer

www.iis.fraunhofer.de/ezrt

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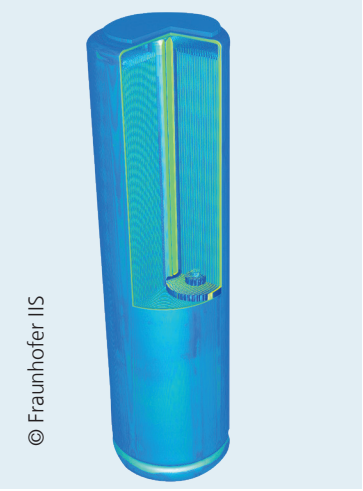
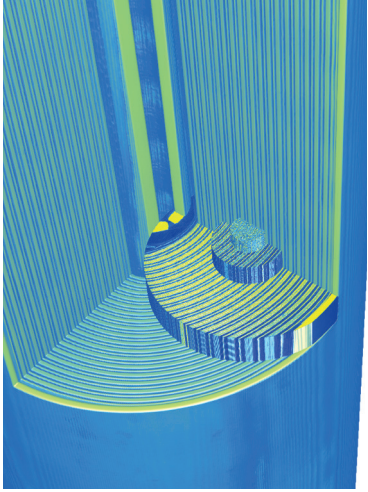
At the Fraunhofer Development Center X-ray Technology, researchers are developing modern cognitive sensor systems for X-ray imaging that generate an extensive amount of data.

From the obtained X-ray data, intelligent software-based methods are employed for a multitude of (industrial) image analysis applications, including materials characterization, dimensional metrology and many more. Additional metadata may be linked for any application-specific context. The generated knowledge enables a fast and data-centric decision process.

- >200 employees
- 4 locations
  (Fürth, Deggendorf, Passau, Würzburg)
- >15 Mio € turnover

© European Synchrotron Facility





In 2020, the ESRF – the European Synchrotron – in Grenoble, France, launched a brand-new, first-of-a-kind synchrotron, the Extremely Brilliant Source (EBS), providing the global scientific community with high-energy X-ray beams having unprecedented brightness and coherence in order to study the structure of matter in all its complexity down to the nanoscale.

X-radiation generated by synchrotrons is

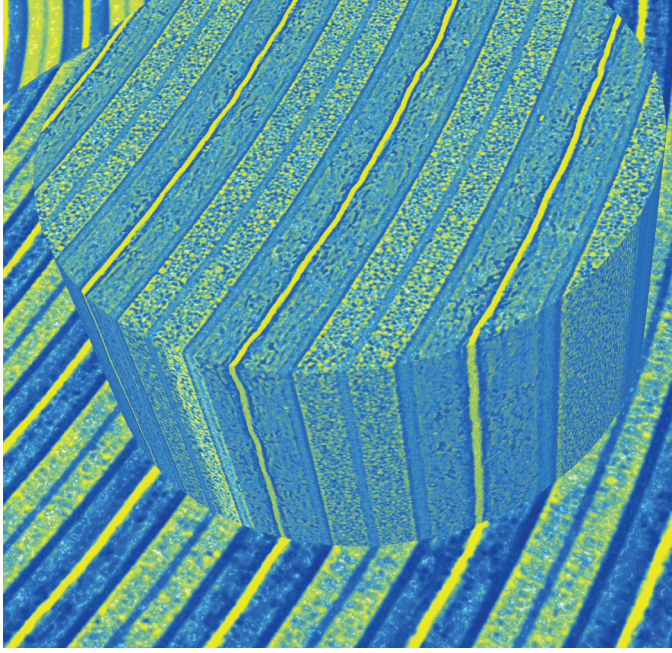
- Quasi parallel
- Highly coherent
- Very bright

The resulting CT scans are

- Very fast (<3min/scan)
- Phase contrasted
- Highly detailed (voxel sampling from 0.6µm to 42µm)

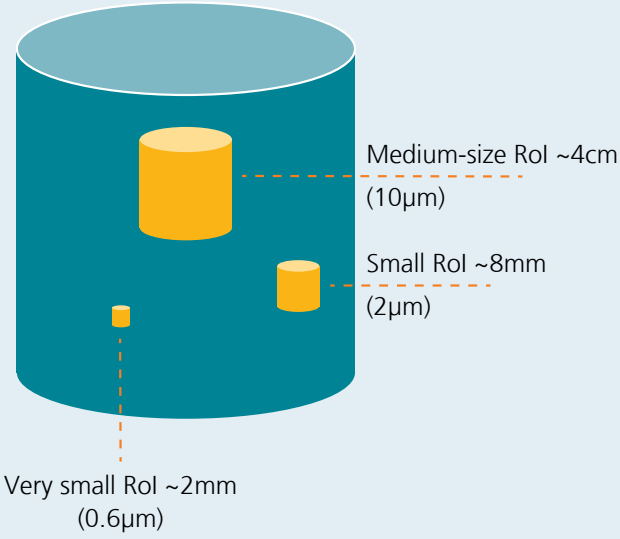
Hierarchical Zoom Tomography

- No more cutting the object for smaller field-of-views
- Freehand selection of detailed 3D regions of interest of medium (cm) or small (mm) size in overview scan of the whole object.



Battery Scan with Hierarchical Zoom Tomography

Object size up to ~50cm (with stitching) (42µm)



Key applications include the highly detailed analysis of

- Additively manufactured parts (Aluminum, Titanium, Steel)
- Batteries
- Cultural heritage

Objects under test can have dimensions of up 50x150 cm. The hard X-radiation can penetrate 15 cm bulk aluminium or 3 cm steel easily.

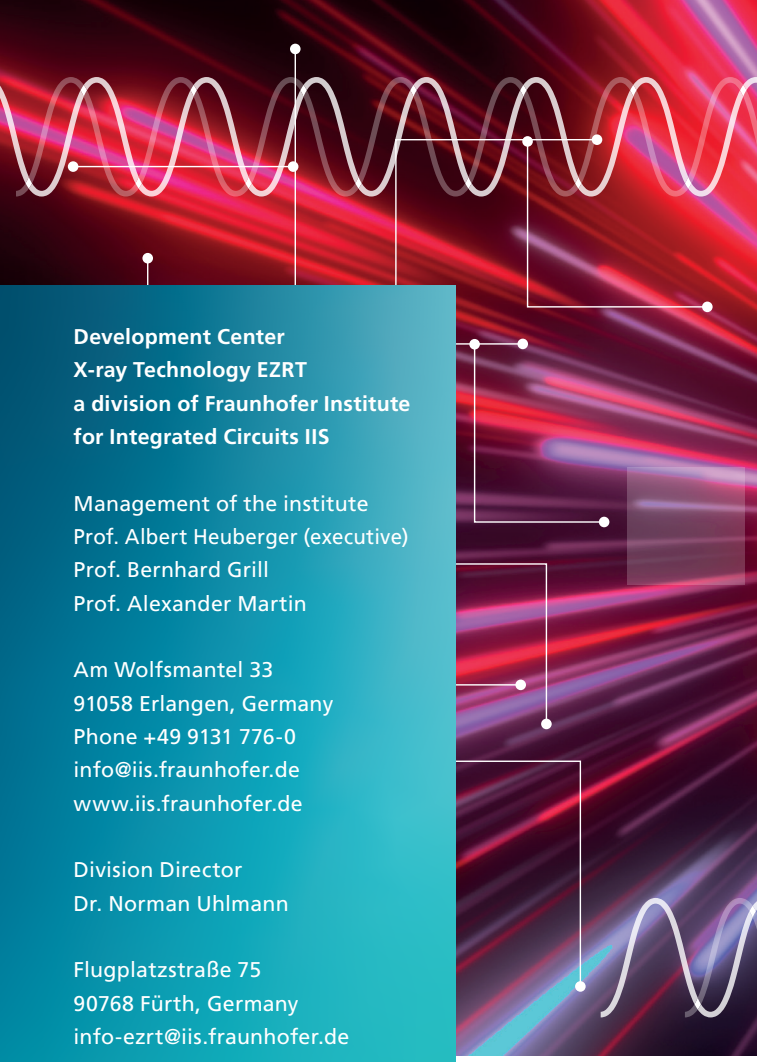
Fraunhofer evaluates the data for

- Porosity / defect detection
- Granulometry characterization
- Reverse engineering
- Big data processing (compression, segmentation, data analysis)
- Big data visualization (rendering, quantification)

In cooperation with:

ESRF
The European Synchrotron

Visit for further information:
iis.fraunhofer.de/bm18



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