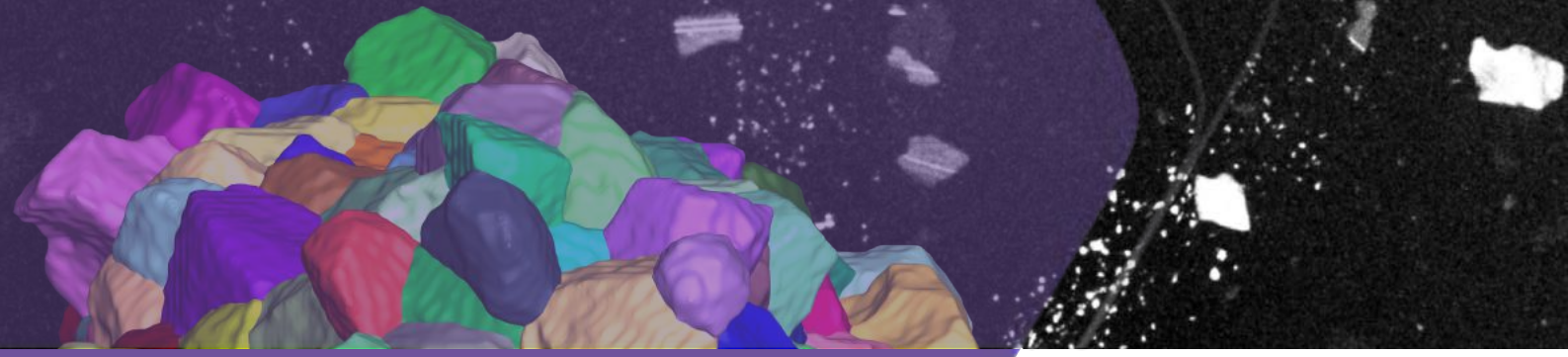

GrainMapper3D *Spotlight*

Peridotite Sample

Sample Description

- Peridotite Mineral
- Origin: Eifel Mountain, Germany
- Phases present: olivine and pyroxene
- Crystal system:
  - Olivine: orthorhombic (Pnma)
  - Pyroxene: orthorhombic (Pbca)
- Dimension: ~ 6 mm × ~4 mm × ~4 mm
- Sample possesses internal crackings

Sample Courtesy: Dr. Lutz Kirste, Fraunhofer Institute IAF, Germany

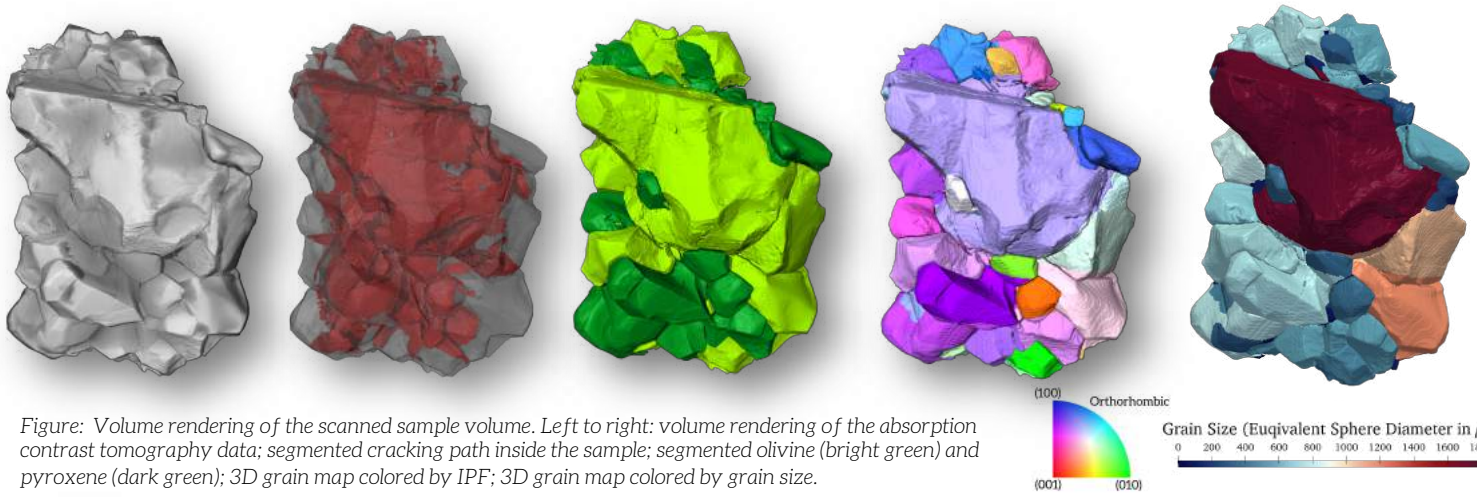

Figure: Volume rendering of the scanned sample volume. Left to right: volume rendering of the absorption contrast tomography data; segmented cracking path inside the sample; segmented olivine (bright green) and pyroxene (dark green); 3D grain map colored by IPF; 3D grain map colored by grain size.

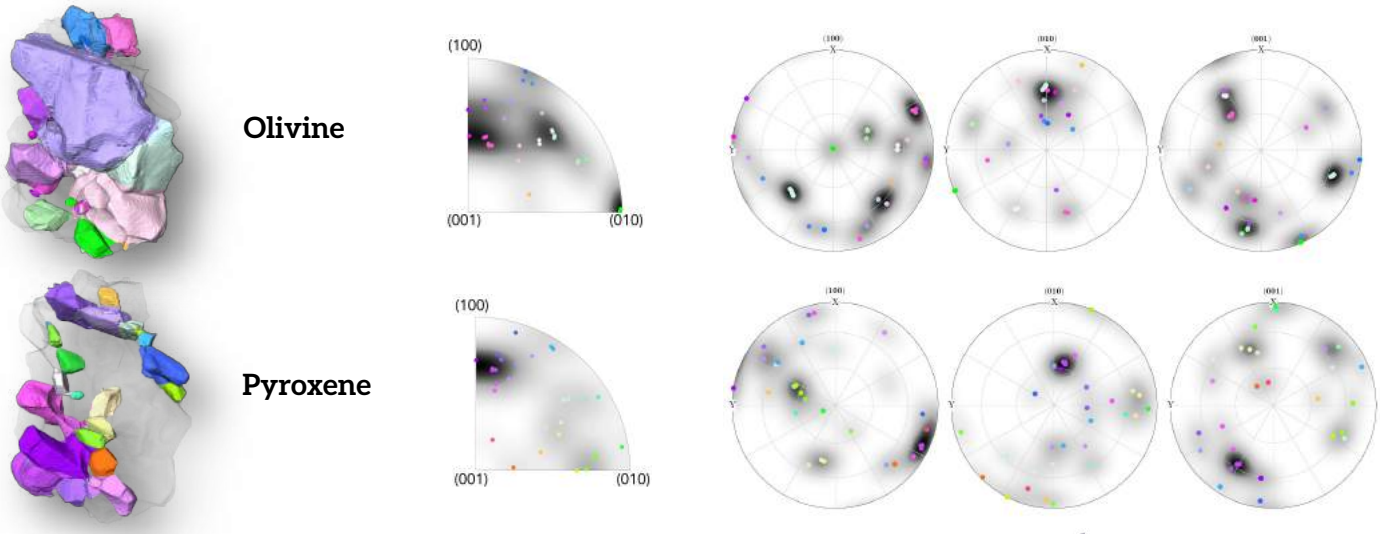

Figure: Orientation distribution function of the olivine and pyroxene grains, represented by inverse pole figure and pole figures.

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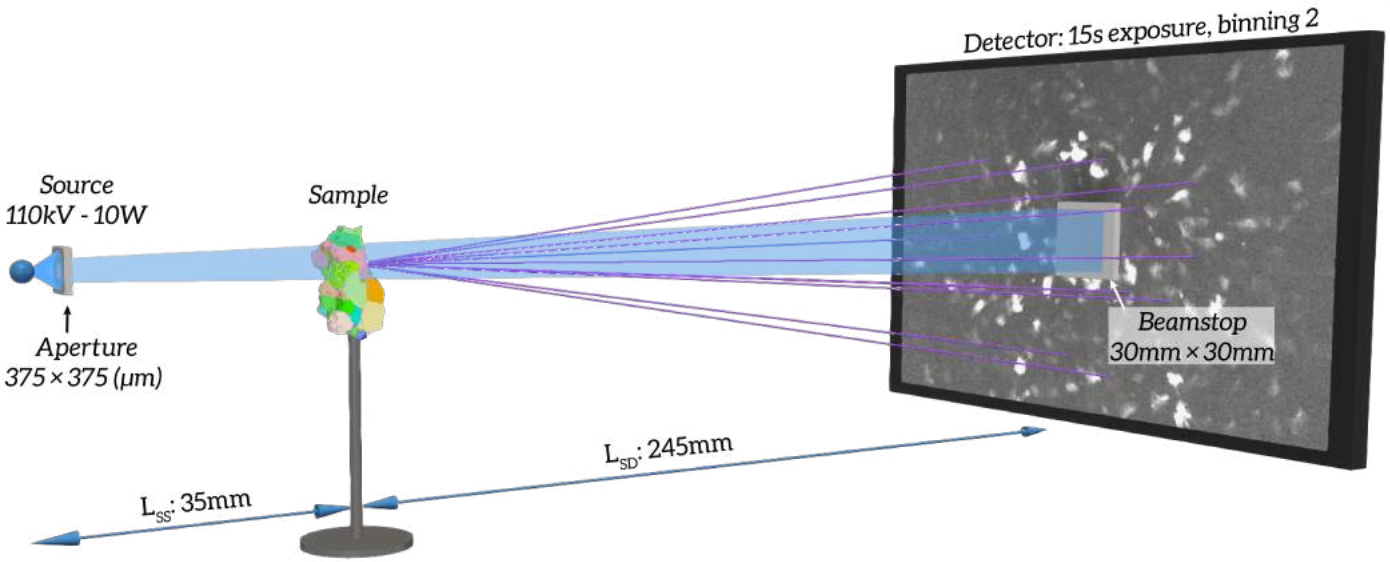

Figure: Schematic illustration of the setup for diffraction contrast tomography data acquisition of the peridotite sample. Key acquisition parameters are marked. In this case, projection geometry is used with geometrical magnification factor of 8.

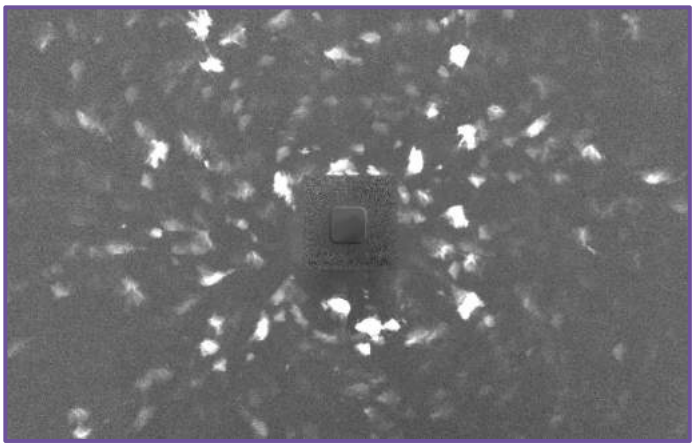

Figure (left): Example diffraction contrast projection at a certain rotation angle. The sample was scanned with projection geometry, with the shape of the diffraction spots representing the shape of the grains. The olivine and pyroxene grains are relatively large so even with a geometrical magnification factor of 8, the diffraction spots still appear relatively large.

Data Acquisition Parameters

System: ZEISS Xradia 520 Versa with LabDCT Pro

Absorption Contrast Tomography

- *Voltage*: 50 kV
- *Power*: 4 W
- *Objective*: 4× Detector
- *Source – Sample distance*: 25mm
- *Sample – Detector distance*: 14 mm
- *Exposure*: 2s / binning 2
- *Number of projections*: 2400
- *Voxel size*: 4.32 μm

Diffraction Contrast Tomography

- *Data acquisition mode:* Helical Phyllotaxis Raster
- *Aperture*: DCT 375 × 375 (μm × μm)
- *Voltage*: 110 kV
- *Power*: 10 W
- *Objective*: Flat Panel Detector
- *Source – Sample distance*: 35 mm
- *Sample – Detector distance*: 245 mm
- *Exposure*: 15s / binning 2
- *Number of projections*: 2664
- *3D Grain Map voxel size*: 20 μm

Xnovo Technology ApS
Galoche Allé 15, 1.
4600 Køge, Denmark
info@xnovotech.com
www.xnovotech.com

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