

GrainMapper3D™

Reconstruction Report

Summary

Report Creation Date	2021-03-08 23:59
GrainMapper3D Version	2.3.0.3184
Project File	E:\DCT\ET12-4_04.gm3d
Absorption File	ET12_4_ABS_110kV_le5_p525mu_recon.txm
DCT File	ET12_4_DCT_110kV_13mm_p525mu.txrm
Author	ZEISS

Data

Crystal Structure

Structure Name	Titanium
Crystal System	Hexagonal (6/mmm)
Cell Length	$a = b = 0.295 \text{ nm}, c = 0.4686 \text{ nm}$
Cell Angles	$\alpha = \beta = 90^\circ, \gamma = 120^\circ$
Symmetry	P 63/m m c
Spacegroup Number	194

Absorption Data

Absorption File Name	ET12_4_ABS_110kV_le5_p525mu_recon.txm
Extent	644.31 $\mu\text{m} \times 522.87 \mu\text{m} \times 408.18 \mu\text{m}$
Voxels	191 x 155 x 121
Voxel Size	3.3734 μm

DCT Data

DCT File Name	ET12_4_DCT_110kV_13mm_p525mu.txrm
Scan Start Date	2021-03-07 15:06
Scan Stop Date	2021-03-08 04:48
Scan Duration	05h 41m
Aperture	DCT aperture 250x750
Objective	DCT 4X
Beam Stop	Unknown
Number of Images	201
Image Size	1012 x 1012
Horizontal DCT Offset	-0.027364 pixels
Vertical DCT Offset	5.4556 pixels
Source-to-RA	13.024 mm
Detector-to-RA	13.001 mm

Grain Reconstruction Data

Extent	644 $\mu\text{m} \times 524 \mu\text{m} \times 408 \mu\text{m}$
Voxels	161 x 131 x 102
Voxel Size	4 μm
Number of Grains	2025 (+423 smaller than 10 Voxels)

Recipes

Recipes Summary

Data	ZEISS TXM/TXRM File Interface
Crystal Structure	Phase Definition
Absorption Crop	Absorption Crop
Absorption Segmentation	Automatic Threshold Segmentation
Detector Mask	Custom Beam Stop with Aperture
DCT Segmentation	DCT Laplacians of Gaussians
Calibration	Self Calibration
DCT Indexing	Fast Geometric Indexing (FGI)
Postprocessing	Define Grains

Recipe Parameters

ZEISS TXM/TXRM File Interface

Data Files

Absorption File (TXM)	Z:\STEVE\Proudhon\ET12_4\ET12_4_2021-03-05_175527\ABS_110kV_le5_p525mu\ET12_4_ABS_110kV_le5_p525mu_recon.txm
DCT File (TXRM)	Z:\STEVE\Proudhon\ET12_4\ET12_4_2021-03-05_175527\DCT_110kV_13mm_p525mu\ET12_4_DCT_110kV_13mm_p525mu.txrm

Advanced Absorption Data Import Options

Aperture Precrop Vertical	True
Sample Height	1600 µm
Aperture Precrop Horizontal	True
Sample Width	1600 µm
Sample Length	1600 µm

Advanced DCT Import Options

Apply Reference	True
Median Fluctuation Correction	True
Rolling Median Correction	11
Background Smoothening	11
Hotpixel Correction	60000

Phase Definition

Crystal Structure

Crystal Structure

HKL Families	{002}	Titanium
	{101}	Titanium
	{2-10}	Titanium
	{2-12}	Titanium

Absorption Crop

Crop Region

ROI Definition	XMin	-346.06 µm	XMax	296.81 µm
	YMin	-261.08 µm	YMax	261.63 µm
	ZMin	-202.4 µm	ZMax	205.78 µm

Automatic Threshold Segmentation

Custom Beam Stop with Aperture

Detector Crop Region

Beam Stop	XMin	-1577.8 µm	XMax	1639.4 µm
	YMin	-1555.4 µm	YMax	1689.8 µm
Aperture	XMin	-1042.8 µm	XMax	1093.2 µm
	YMin	-383.05 µm	YMax	338.26 µm

DCT Laplacians of Gaussians

Parameters

Background	1.5
Sigma	1.25
Percent	18 %

Spot Filter

Spot Size	>= 25 Pixels
-----------	--------------

Self Calibration

Calibration

Instrumental Parameters

Fast Geometric Indexing (FGI)

DCT Indexing Parameters

Maximum Level	0
---------------	---

Region of Interest

ROI Definition	XMin	-347.46 µm	XMax	296.86 µm
	YMin	-259.75 µm	YMax	263.12 µm
	ZMin	-202.4 µm	ZMax	205.78 µm
	Resolution		4 µm	

Completeness Tolerances

Minimum Completeness	45 %
Trust Completeness	85 %
Completeness Drop-off	2 %

Define Grains

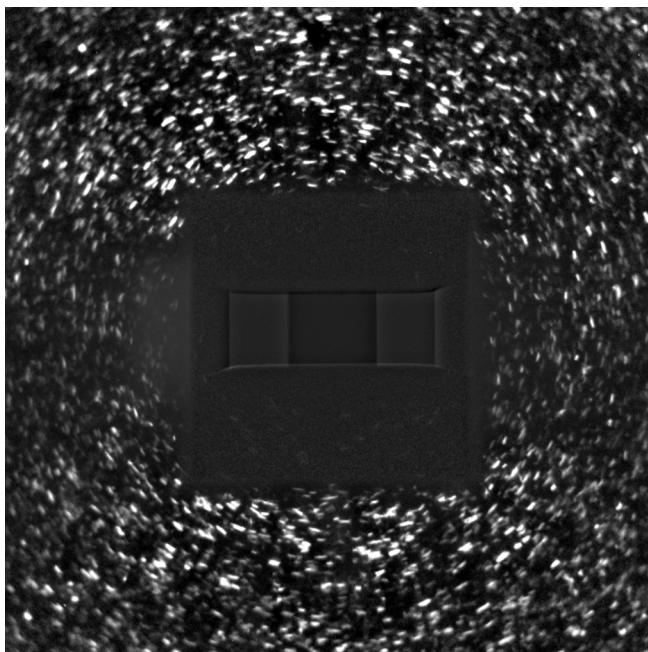
Cleanup Parameters

Misorientation threshold	0.5 °
Update Completeness	True

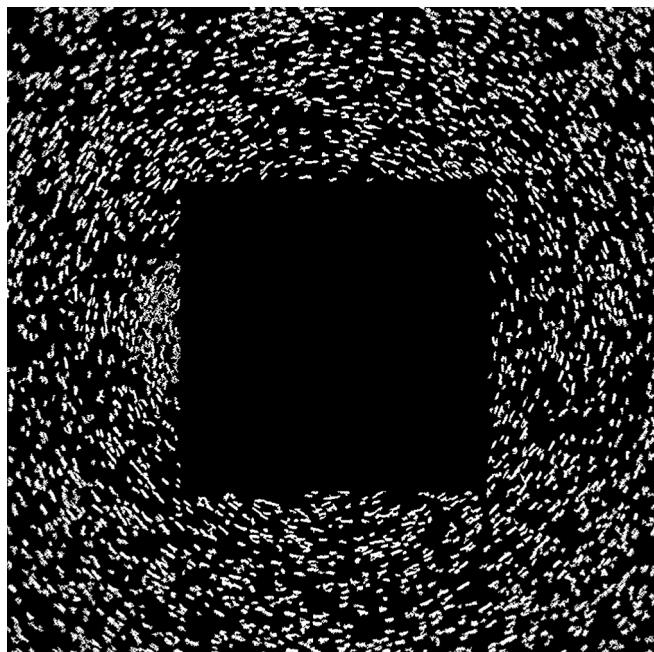
DCT Data

$\omega = -180^\circ$

Raw DCT Data

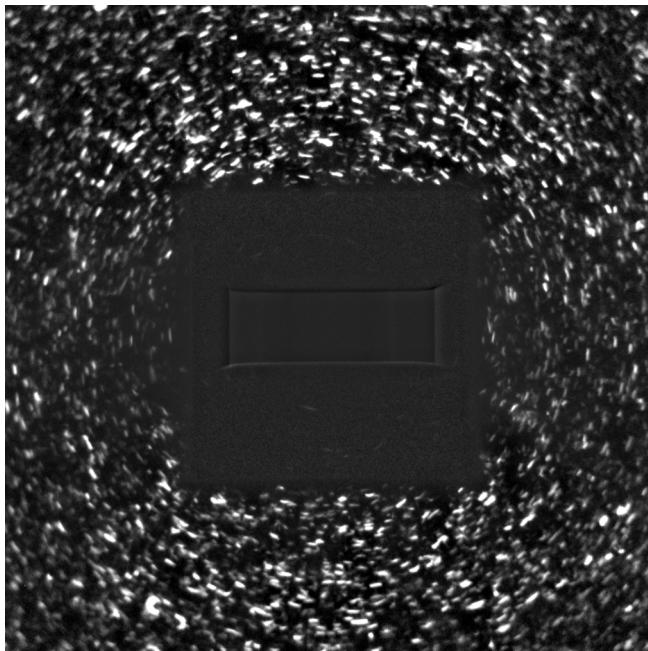


Segmented DCT Data

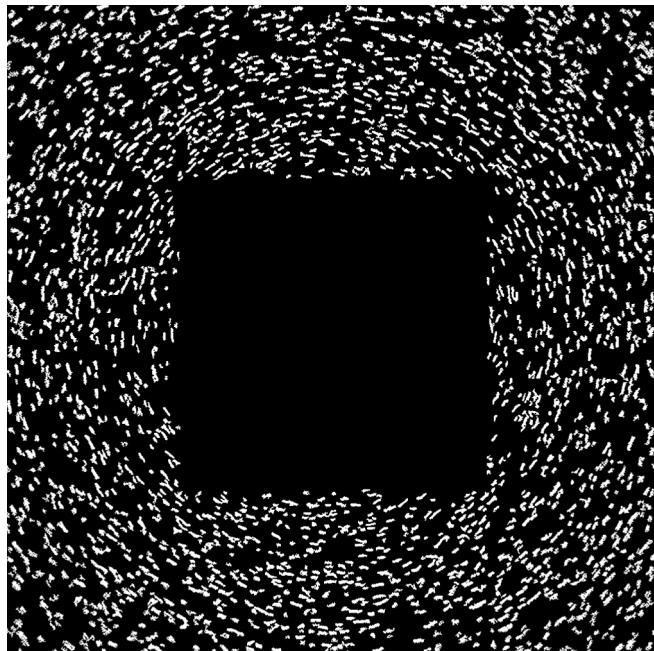


$\omega = -108^\circ$

Raw DCT Data

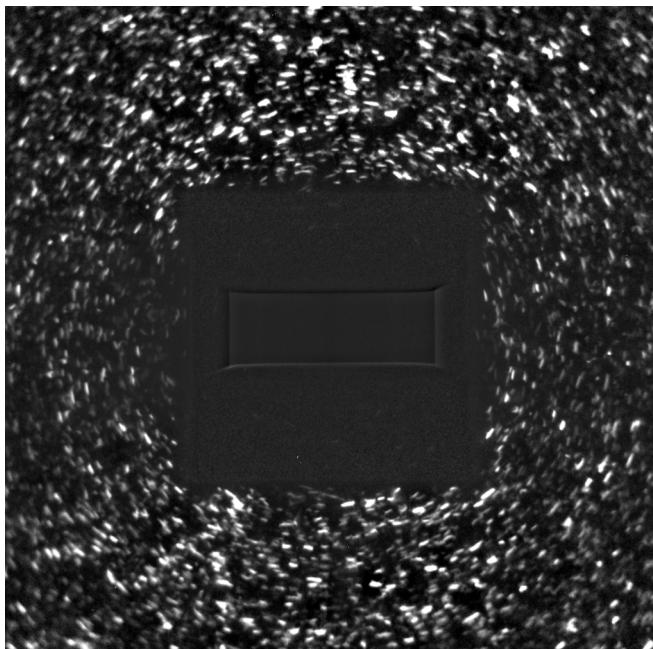


Segmented DCT Data

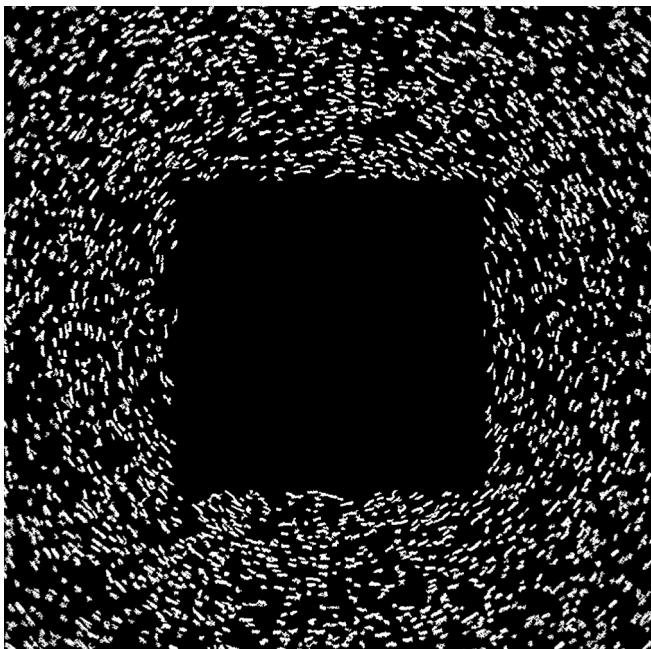


$\omega = -36.003^\circ$

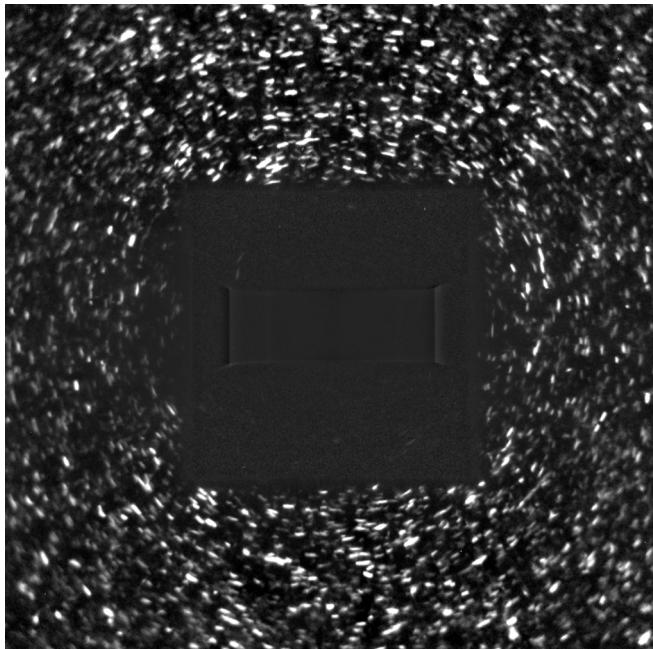
Raw DCT Data



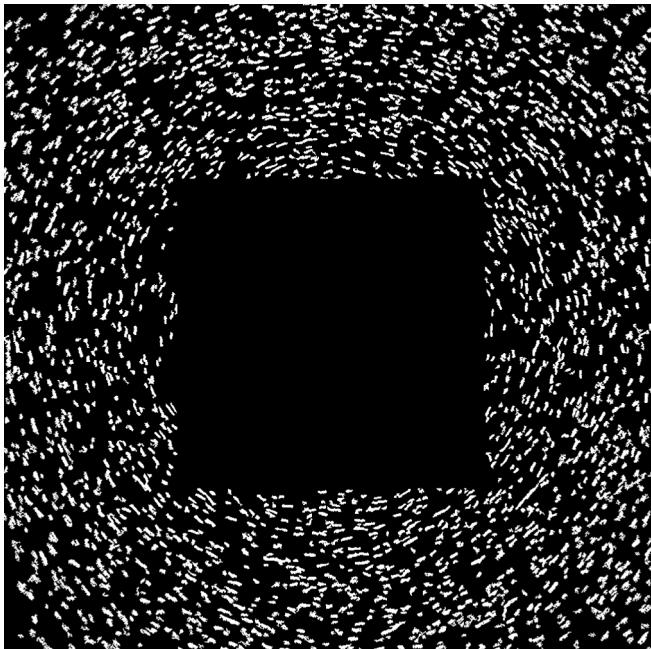
Segmented DCT Data

 $\omega = 35.997^\circ$

Raw DCT Data

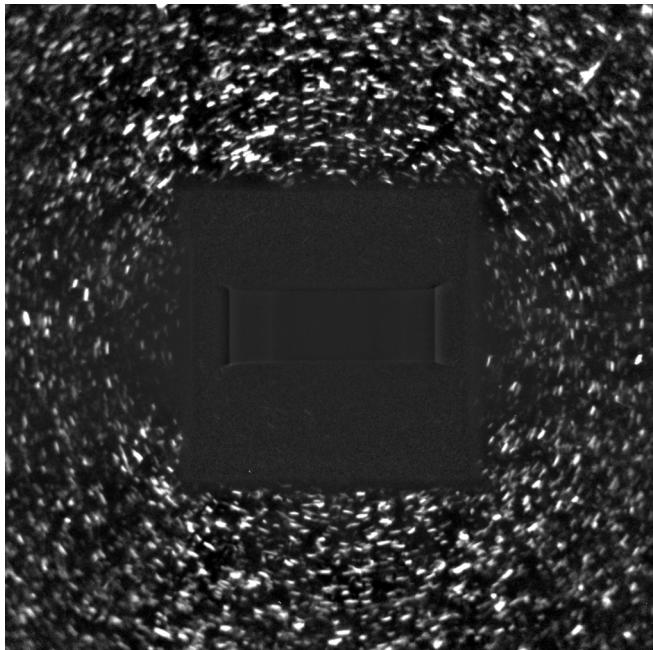


Segmented DCT Data

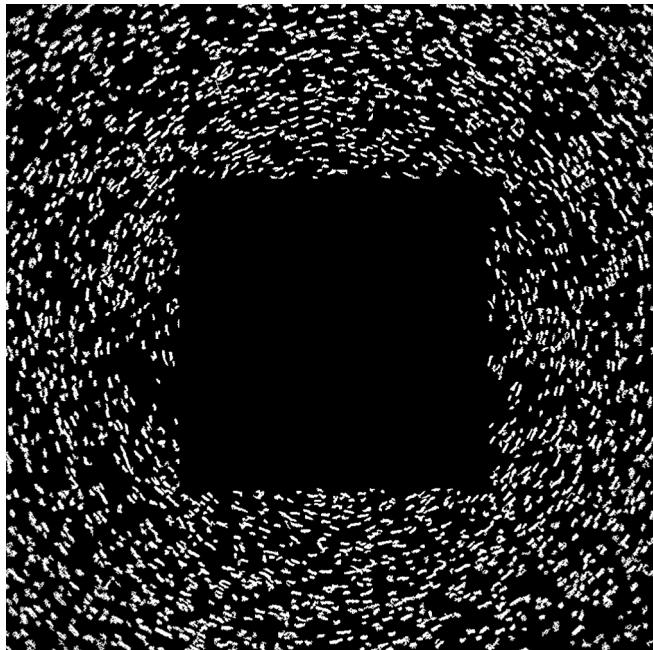


$\omega = 108^\circ$

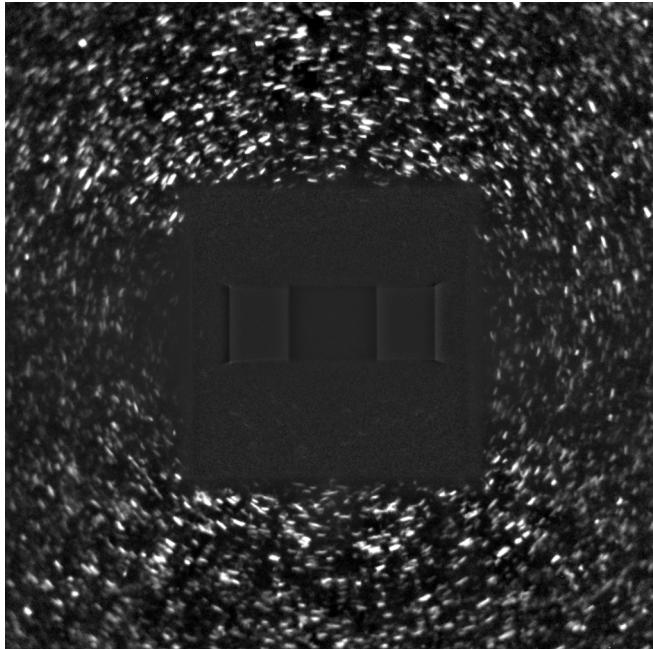
Raw DCT Data



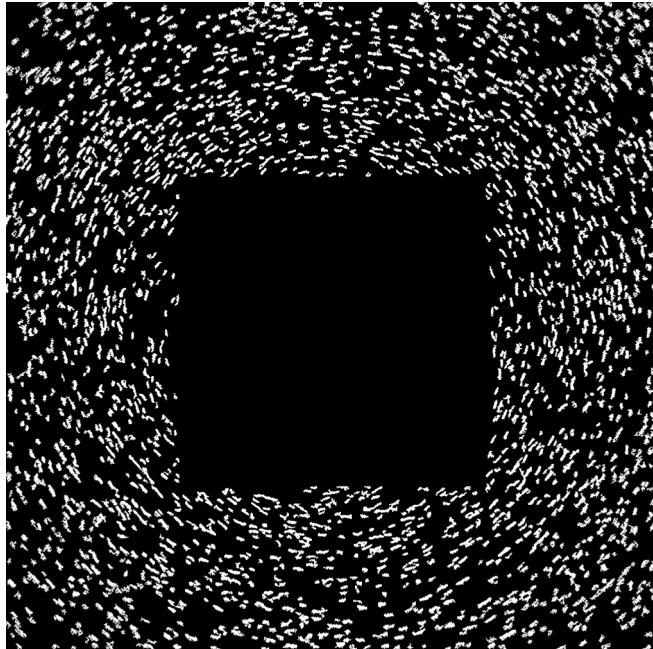
Segmented DCT Data

 $\omega = 180^\circ$

Raw DCT Data



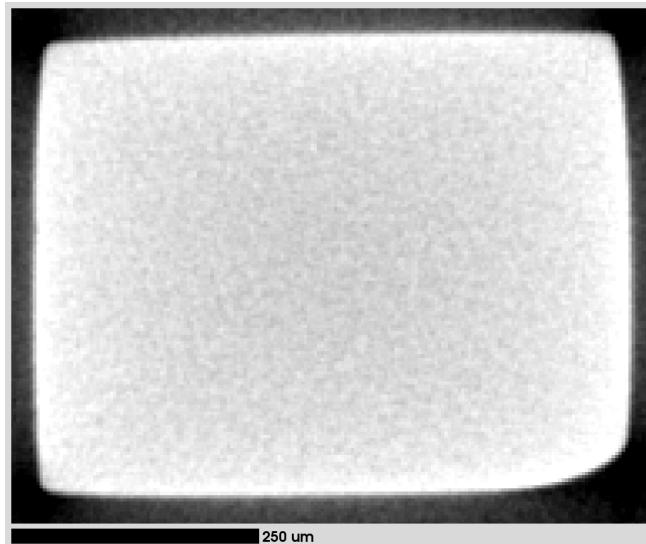
Segmented DCT Data



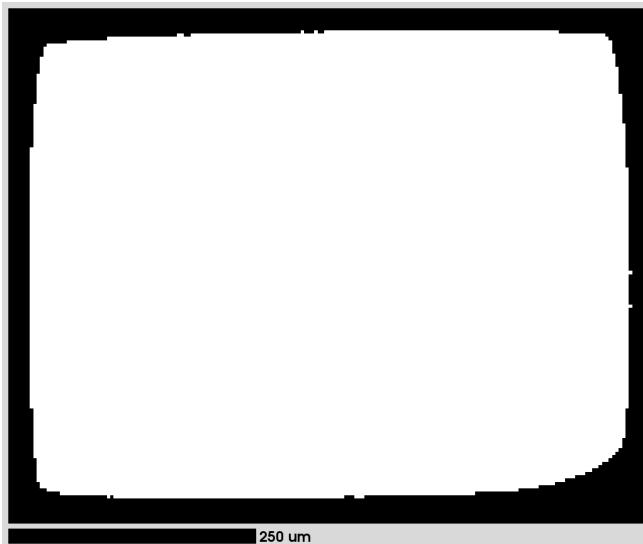
Absorption Data

Top View, Slice 59 of 120

Raw Absorption Data

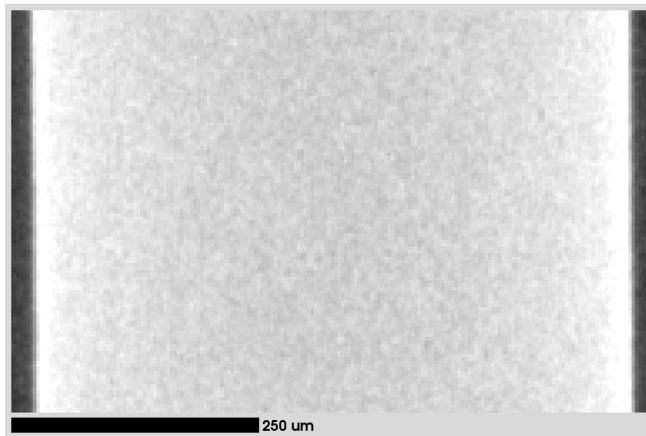


Segmented Absorption Data

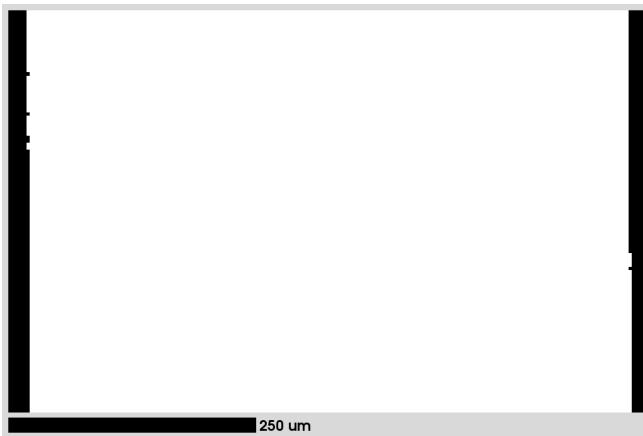


Front View, Slice 76 of 154

Raw Absorption Data

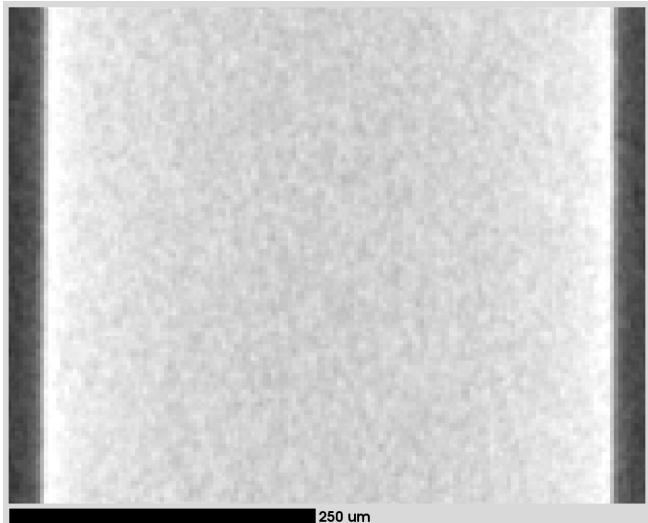


Segmented Absorption Data



Side View, Slice 94 of 190

Raw Absorption Data



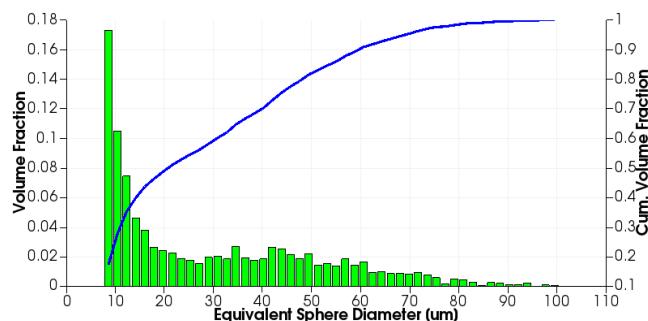
Segmented Absorption Data



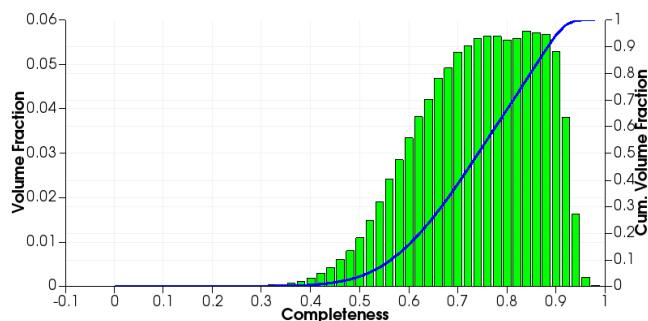
Grain Reconstruction

Grain Statistics

Grain Size Distribution

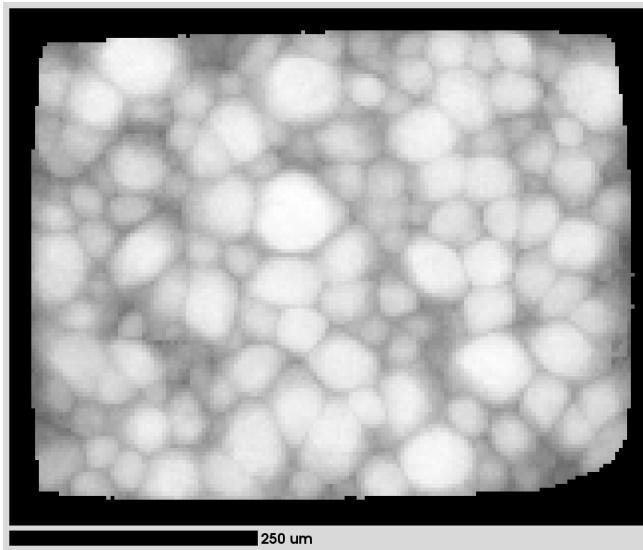


Completeness Distribution

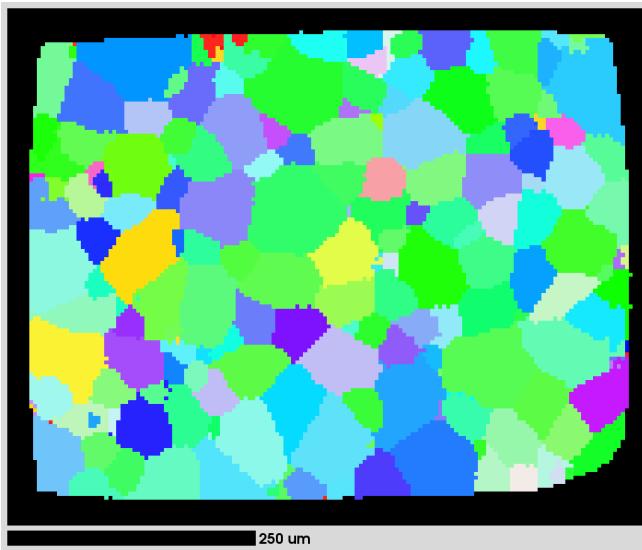


Top View, Slice 50 of 101

Completeness Map

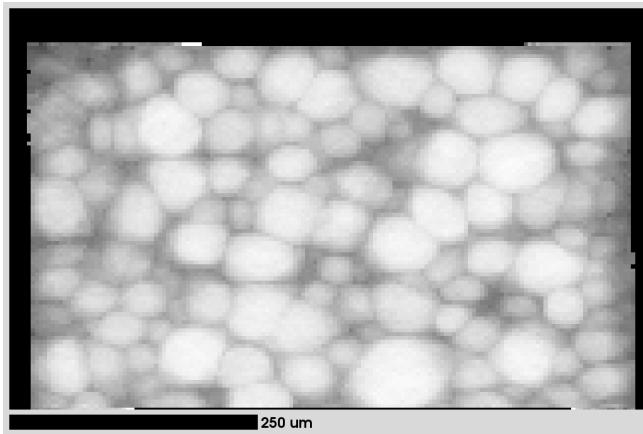


IPF (+Z) Map

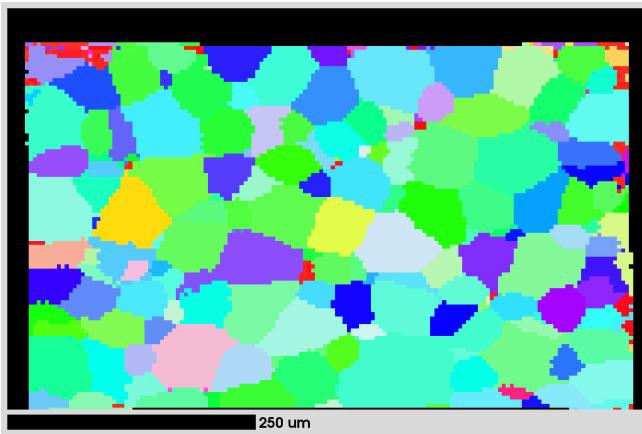


Front View, Slice 64 of 130

Completeness Map

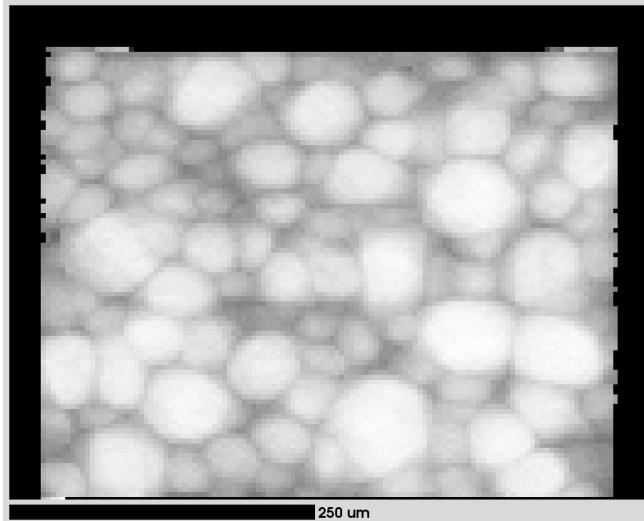


IPF (+Z) Map

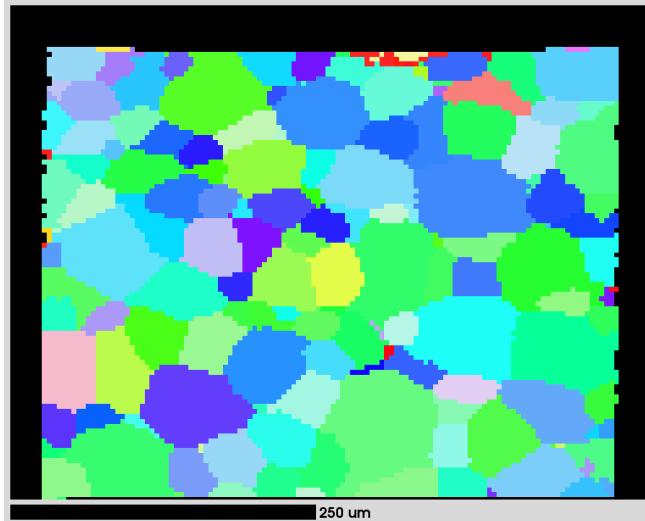


Side View, Slice 79 of 160

Completeness Map



IPF (+Z) Map



Titanium IPF (+Z)

