FACULTEIT WETENSCHAPPEN

CENTRE FOR X-RAY TOMOGRAPHY

THE UGCT CORE FACILITY: RECENT DEVELOPMENTS AND APPLICATIONS

Matthieu N. Boone

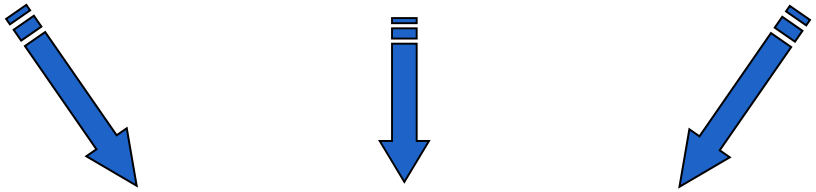
GHENT UNIVERSITY

WHO WE ARE

Radiation Physics
Prof. Dr. L. Van Hoorebeke
Prof. Dr. ir. M. Boone
Fundamental CT research
Scanner design & construction
Novel source & detector technology
CT software development
Application related research

Pore-scale Processes in Geomaterials
Prof. Dr. V. Cnudde
Geological applications of CT, mainly in-situ imaging

Laboratory for Wood Science
Prof. Dr. ir. J. Van Acker
Prof. Dr. ir. J. Van den Bulcke
Wood related applications of CT



UGCT : Centre for X-ray tomography

User facility and Centre of Expertise which makes UGCT expertise and hardware available to other researchers (for academic purposes)

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VALORIZATION

Centre for X-ray Tomography (UGCT)
Est. 2006

Ghent University
Center of Excellence

Inside Matters NV
Est. 2008

Services and software solutions for tomography communities.

X-ray Engineering bvba
Est. 2011

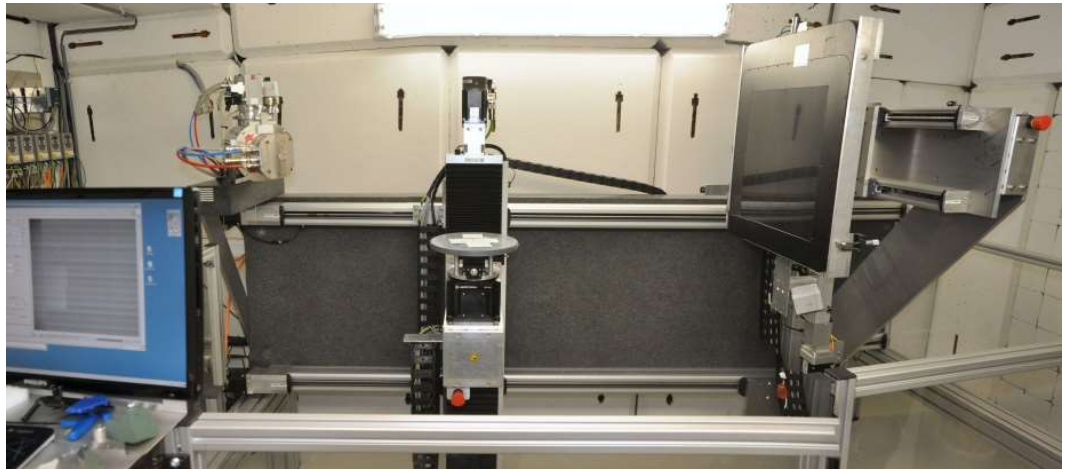
Developers of innovative micro-CT platforms

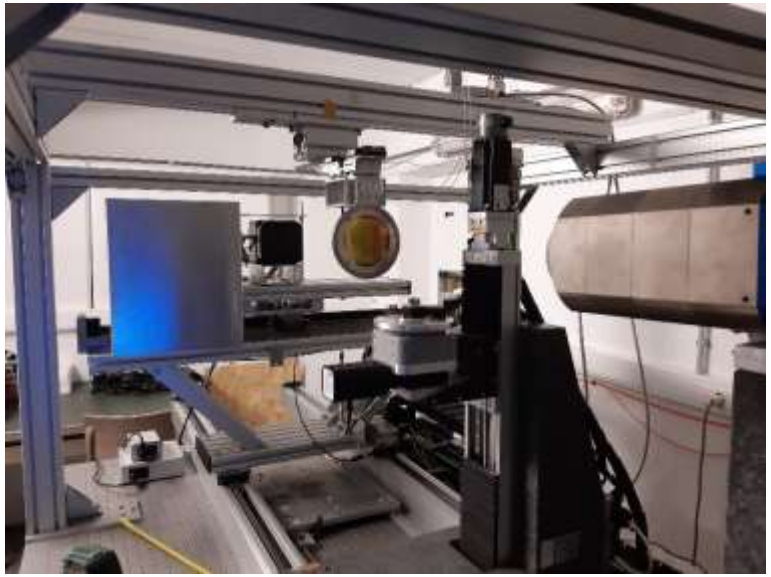
XRE NV
Est. 2017

A new alternative for 3D X-ray imaging
Dynamic solutions for your lab

- Design and manufacturers of high performance micro-CT platforms
- CT Scanning Services and Software

UGCT SETUPS





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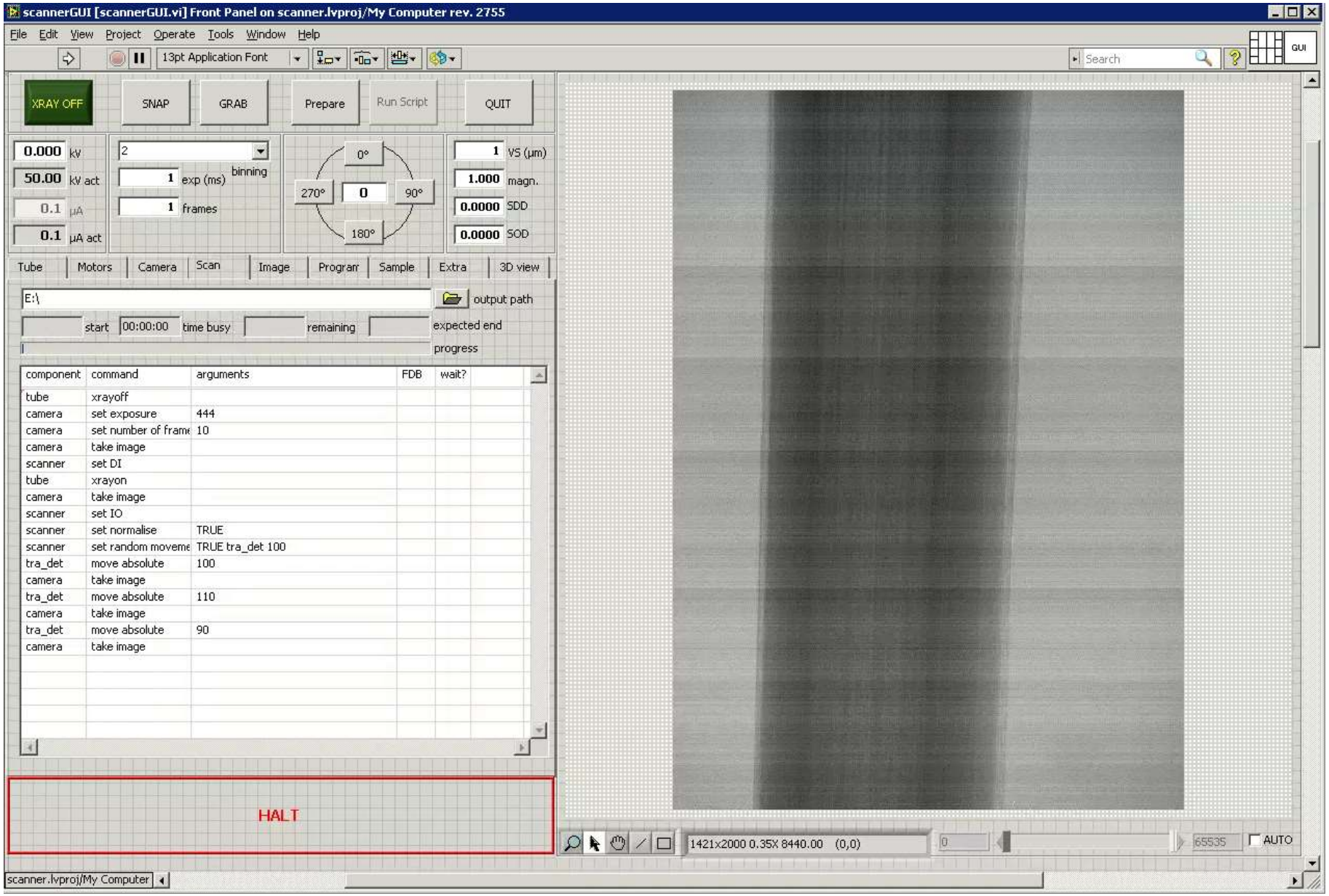
SCANNER CONTROL SOFTWARE



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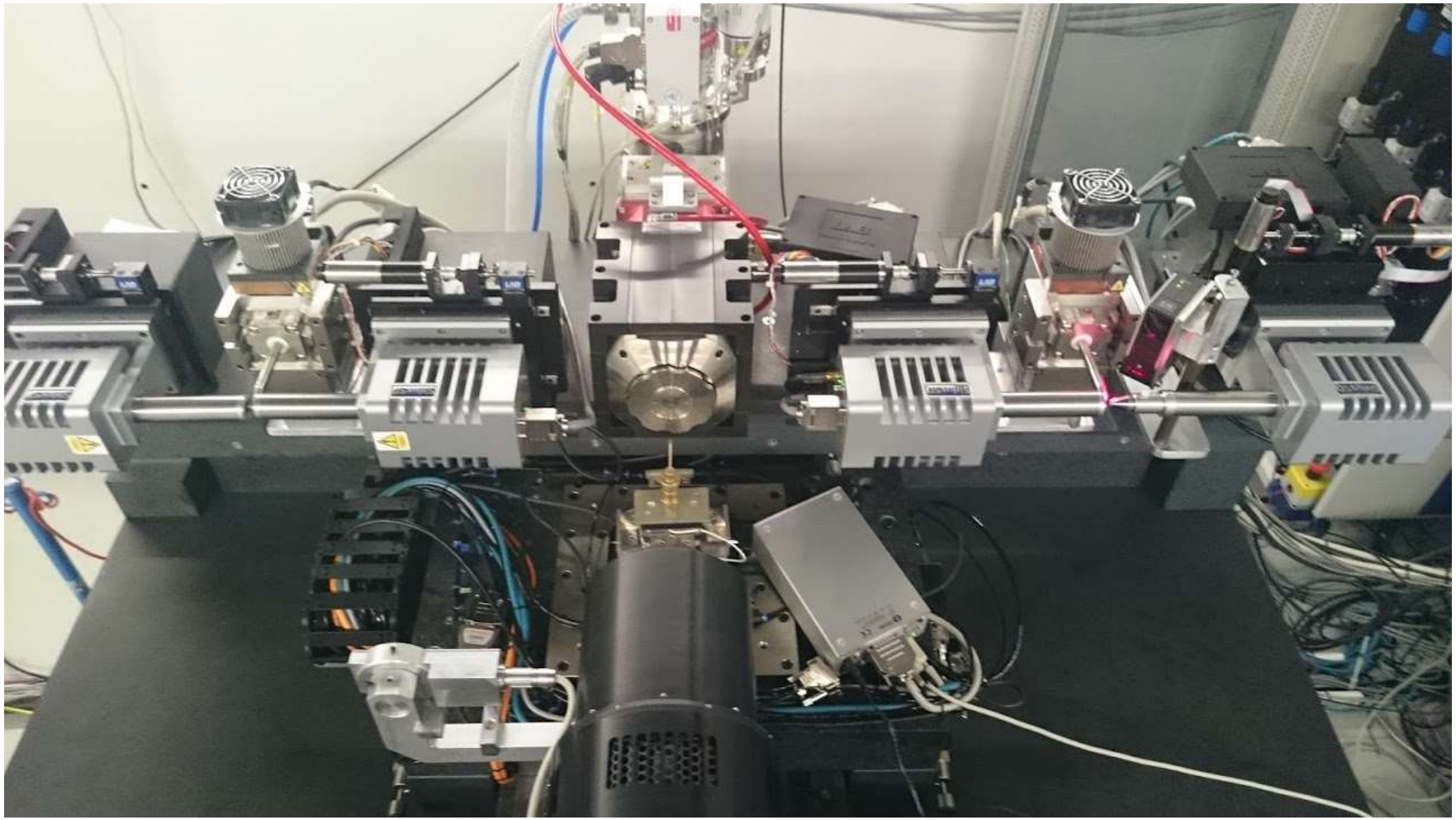
Dierick *et al.*, X-ray Sci Technol **18** (2010). DOI: 10.3233/XST-2010-0268

UGCT – XMI SETUP



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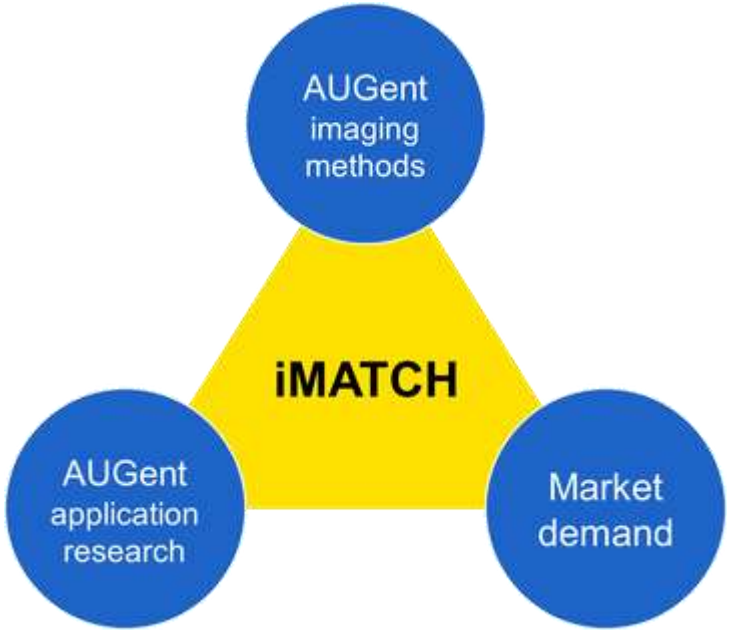
UGCT COMMERCIAL SCANNER



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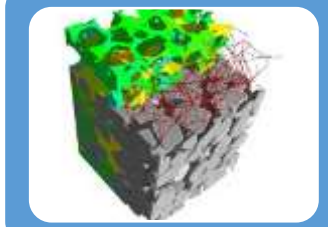
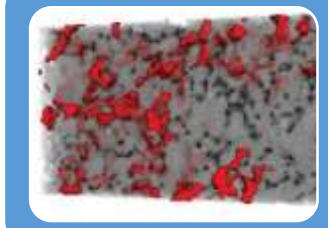
RESEARCH

3 pillars for research & industrial collaboration



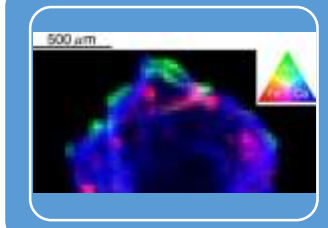
Structural imaging and analysis (SIA)

Research Focus: Multi-scale 3D imaging



Dynamic imaging, modelling and analysis (DIMA)

Research Focus: Fast 4D imaging



Multimodal imaging and analysis (MIA)

Research Focus: 3D Chemical characterization

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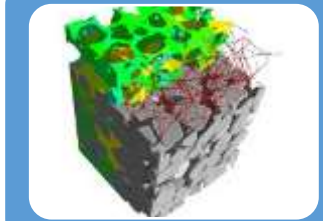
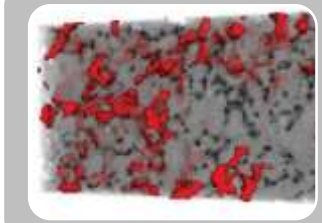
PILLAR 1



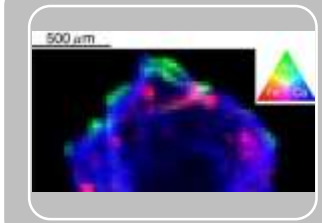
Structural imaging and analysis (SIA)

Research Focus: Multi-scale 3D imaging



Dynamic imaging, modelling and analysis (DIMA)

Research Focus: Fast 4D imaging



Multimodal imaging and analysis (MIA)

Research Focus: 3D Chemical characterization

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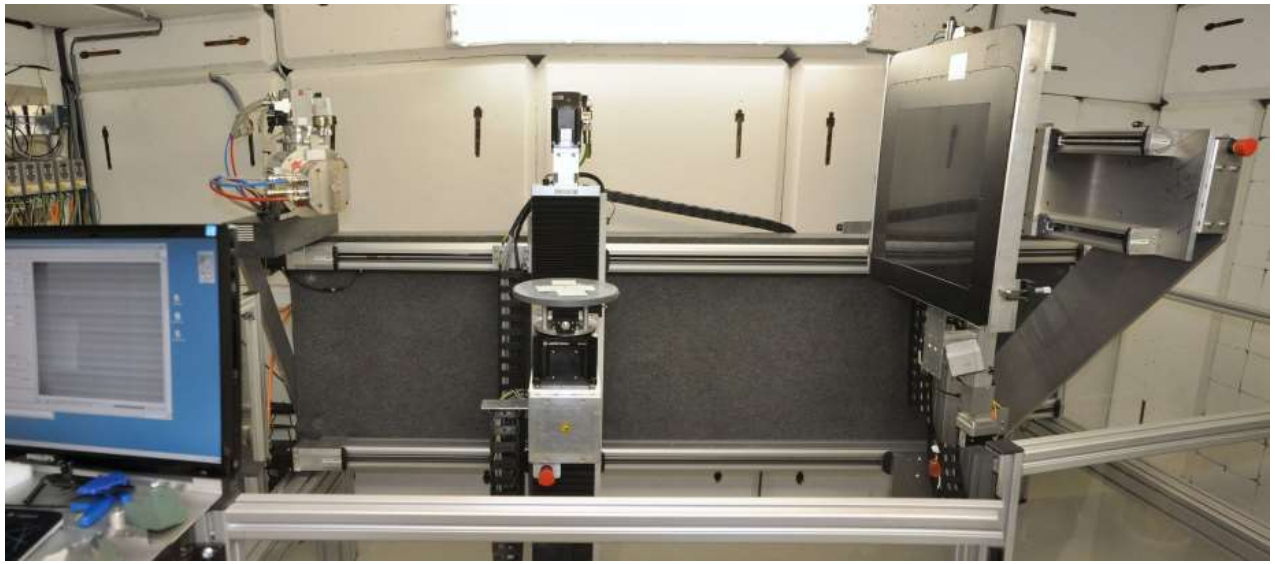
CONVENTIONAL SYSTEMS



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ETNOGRAPHICAL OBJECTS

UGent WOODLAB

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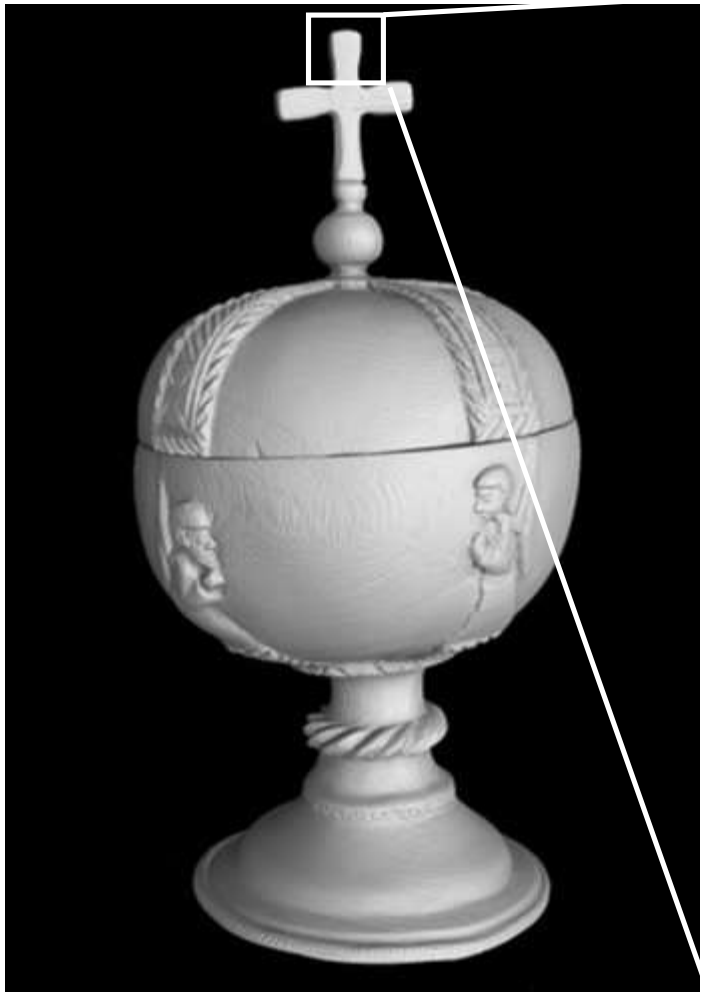
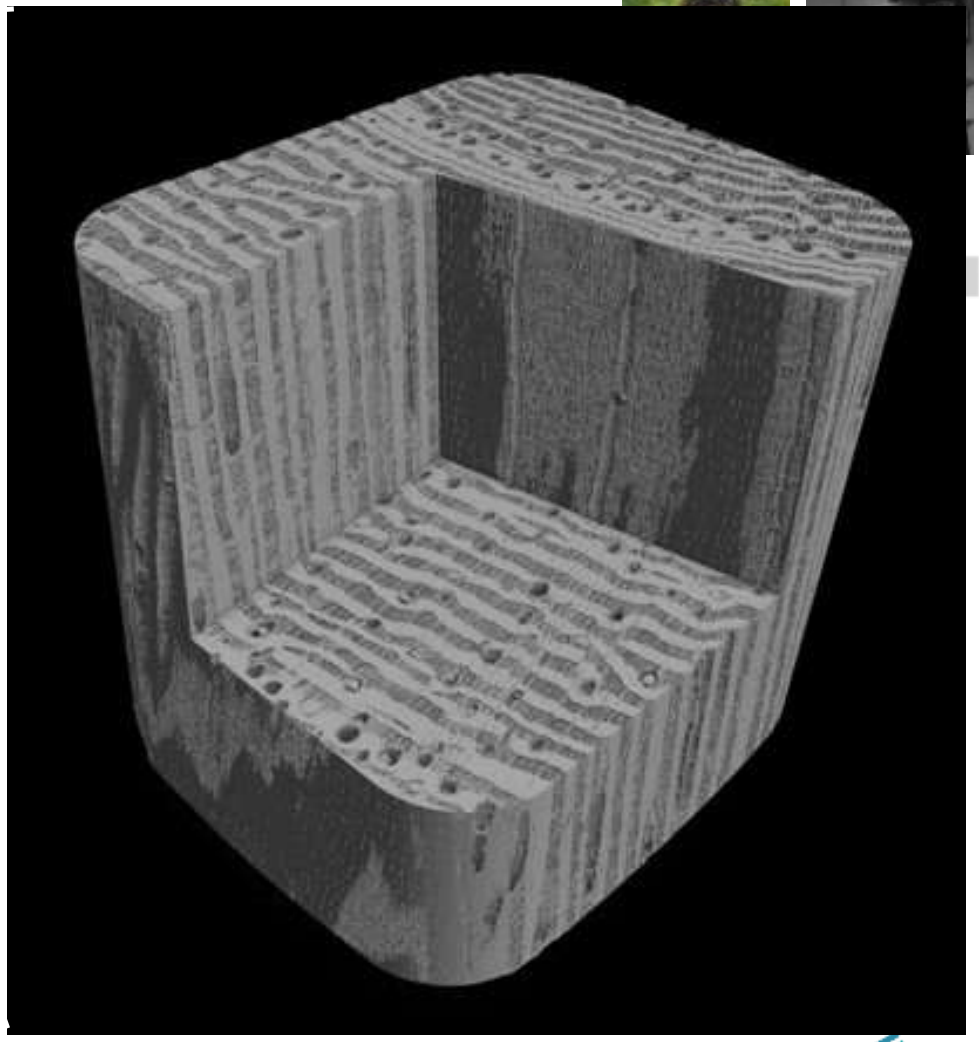
See also presentation at ‘From Forests to Heritage” (April 2022)

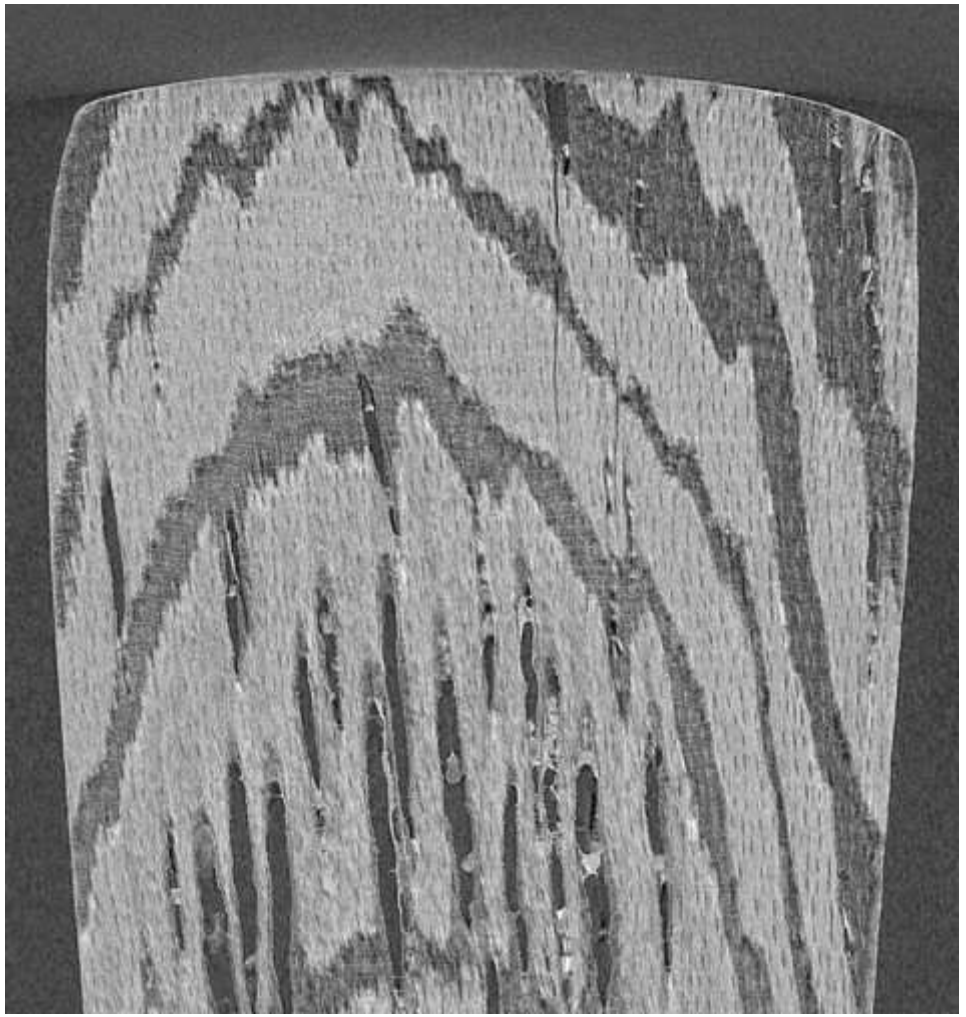
ETNOGRAPHICAL OBJECTS





INSIDEWOOD.LIB.NCSU.EDU

ETNOGRAPHICAL OBJECTS



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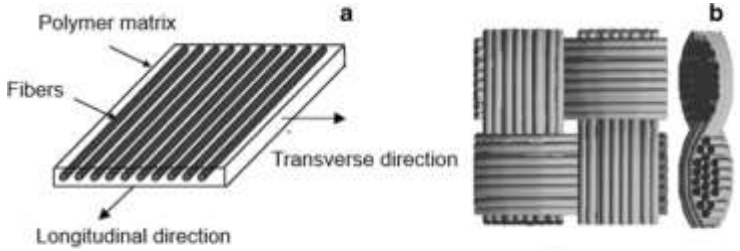
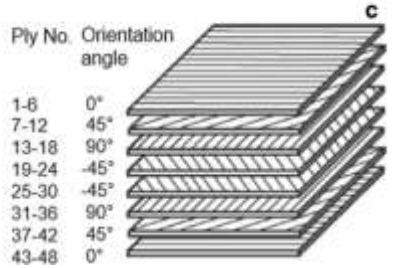
LEGUMINOSAE
PAPILIONOIDEAE
Millettia laurentii
D Wild.

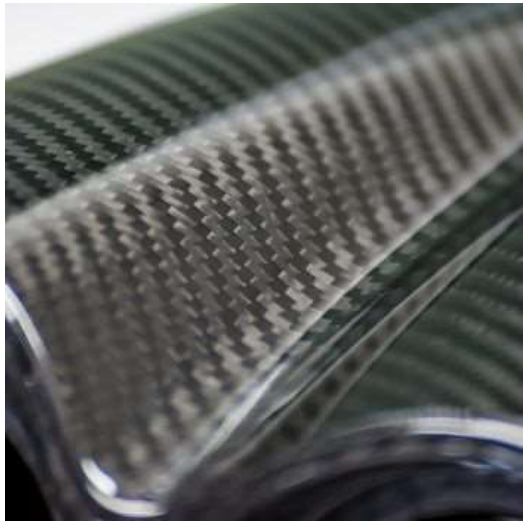
(Wenge)

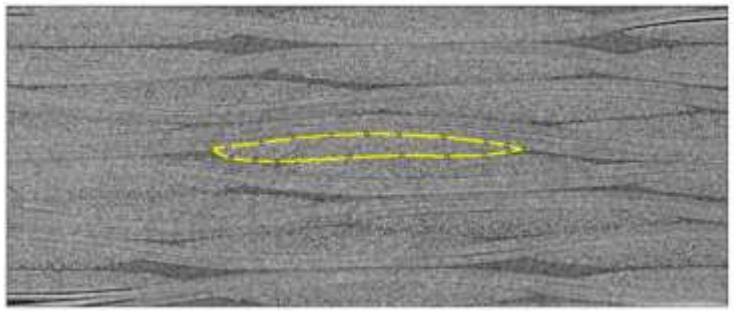
COMPOSITE MATERIALS

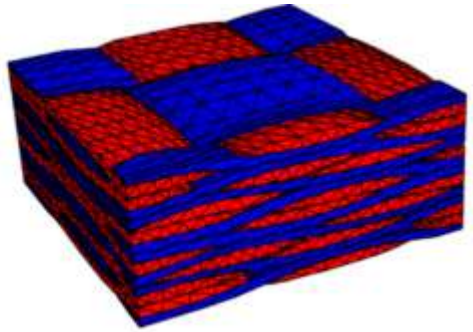


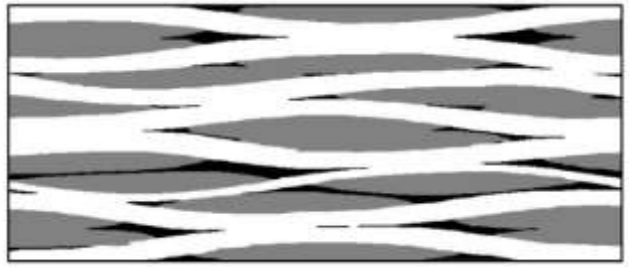


MoCCha-CT









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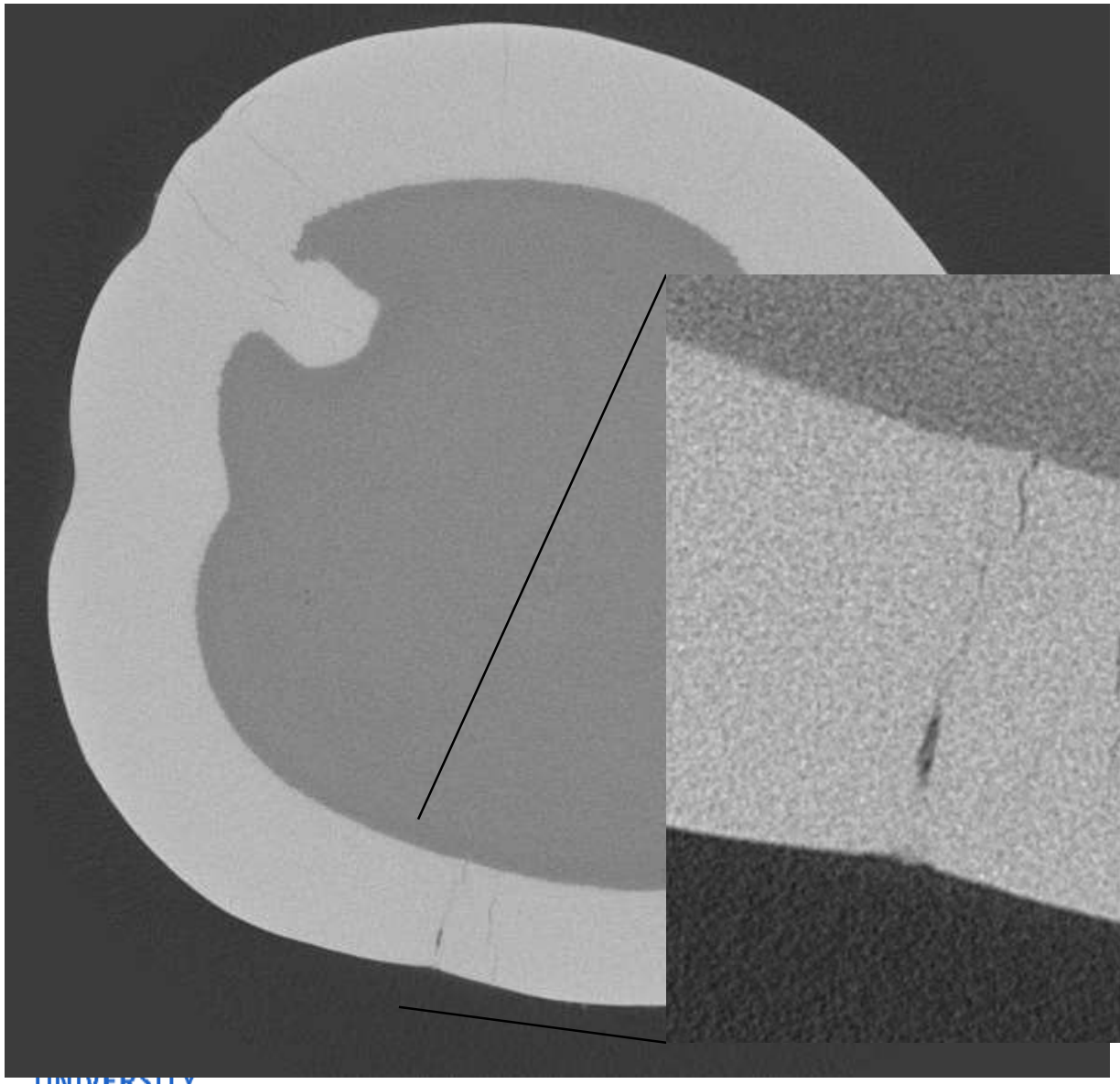
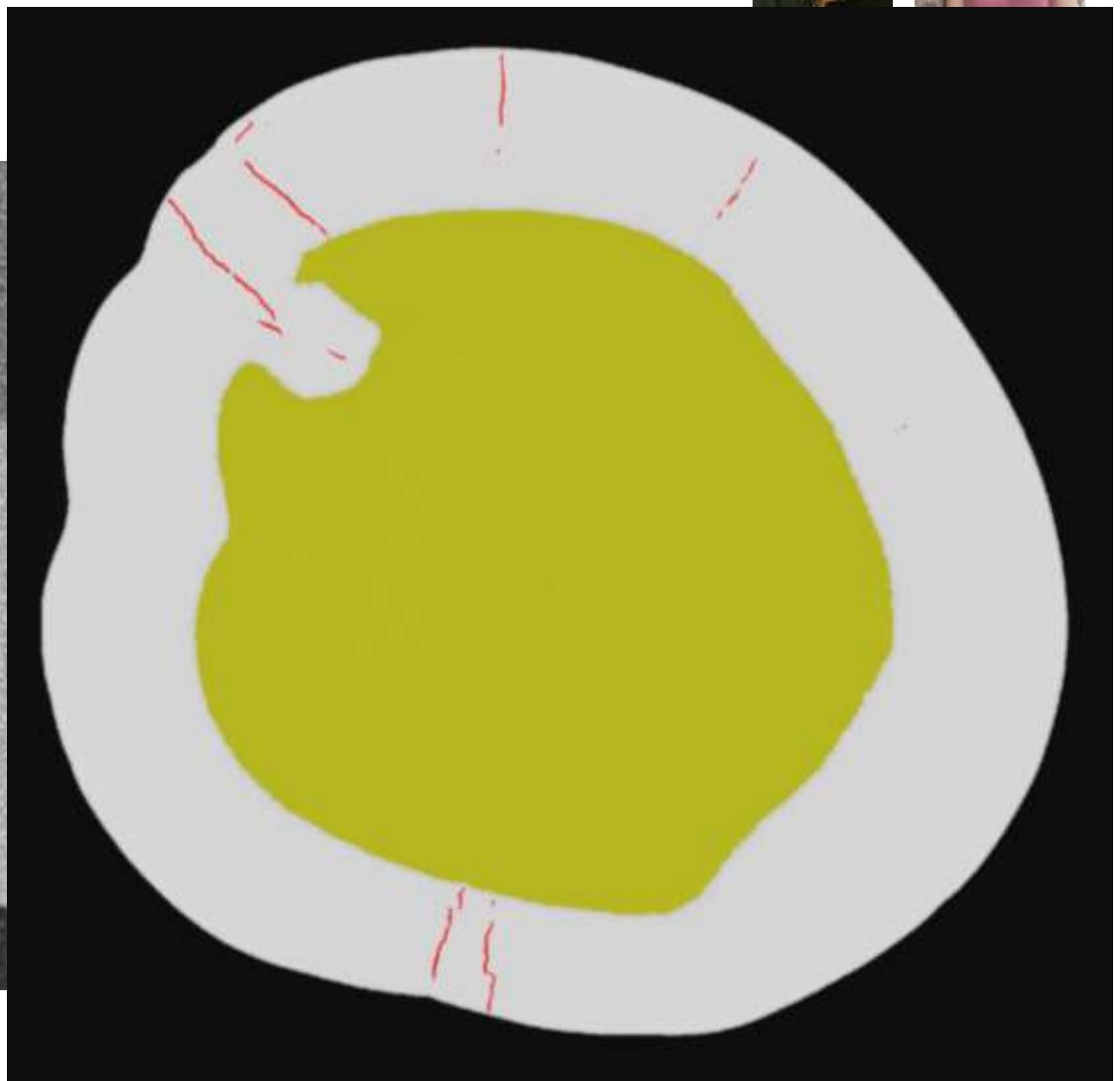
Sinchuk *et al.*, Materials **13** (2020). DOI: 10.3390/ma13040936

DENTAL





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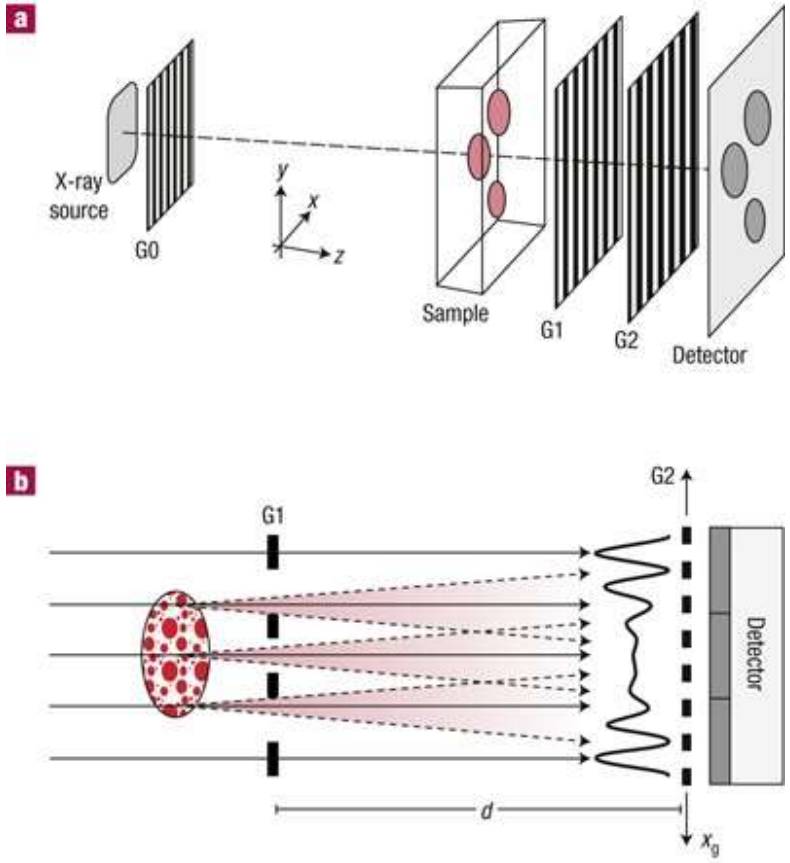
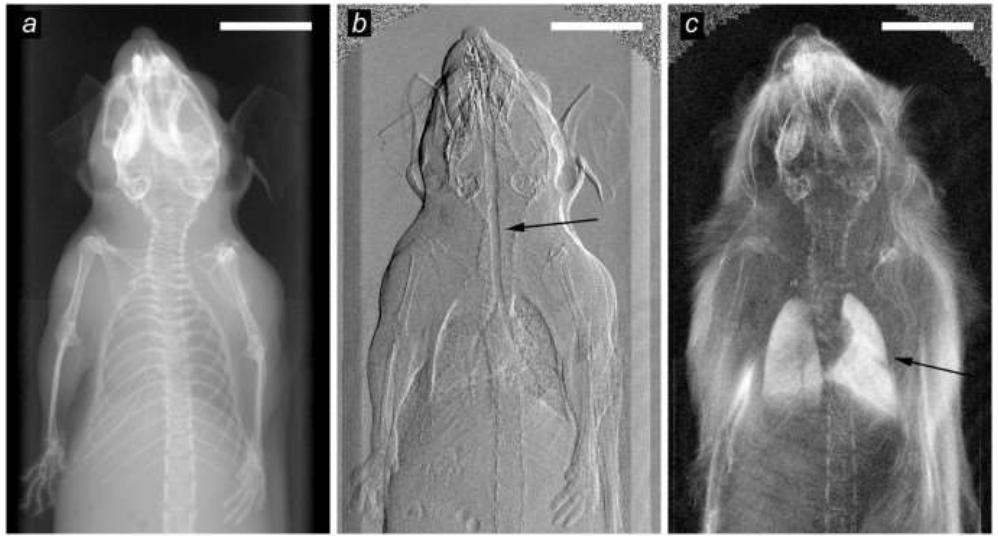
DARK-FIELD CONTRAST



Pfeiffer *et al.*, Nature Mat. **7** (2008)



Bech *et al.*, Sci Rep **3** (2013)

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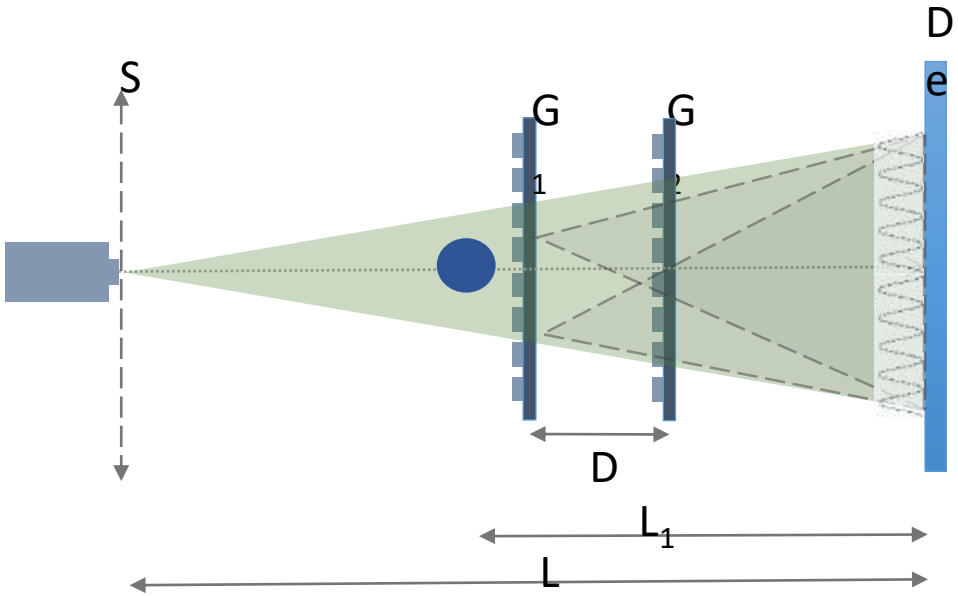
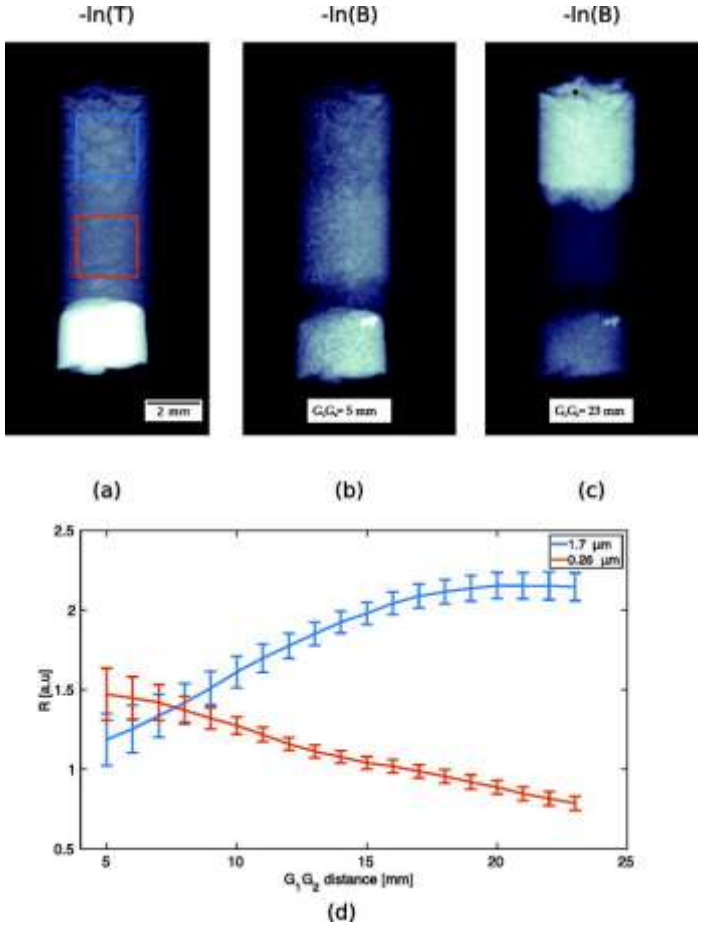
TUNABLE DARK-FIELD CONTRAST





Kagias *et al.*, Appl Phys Lett. **110** (2017)

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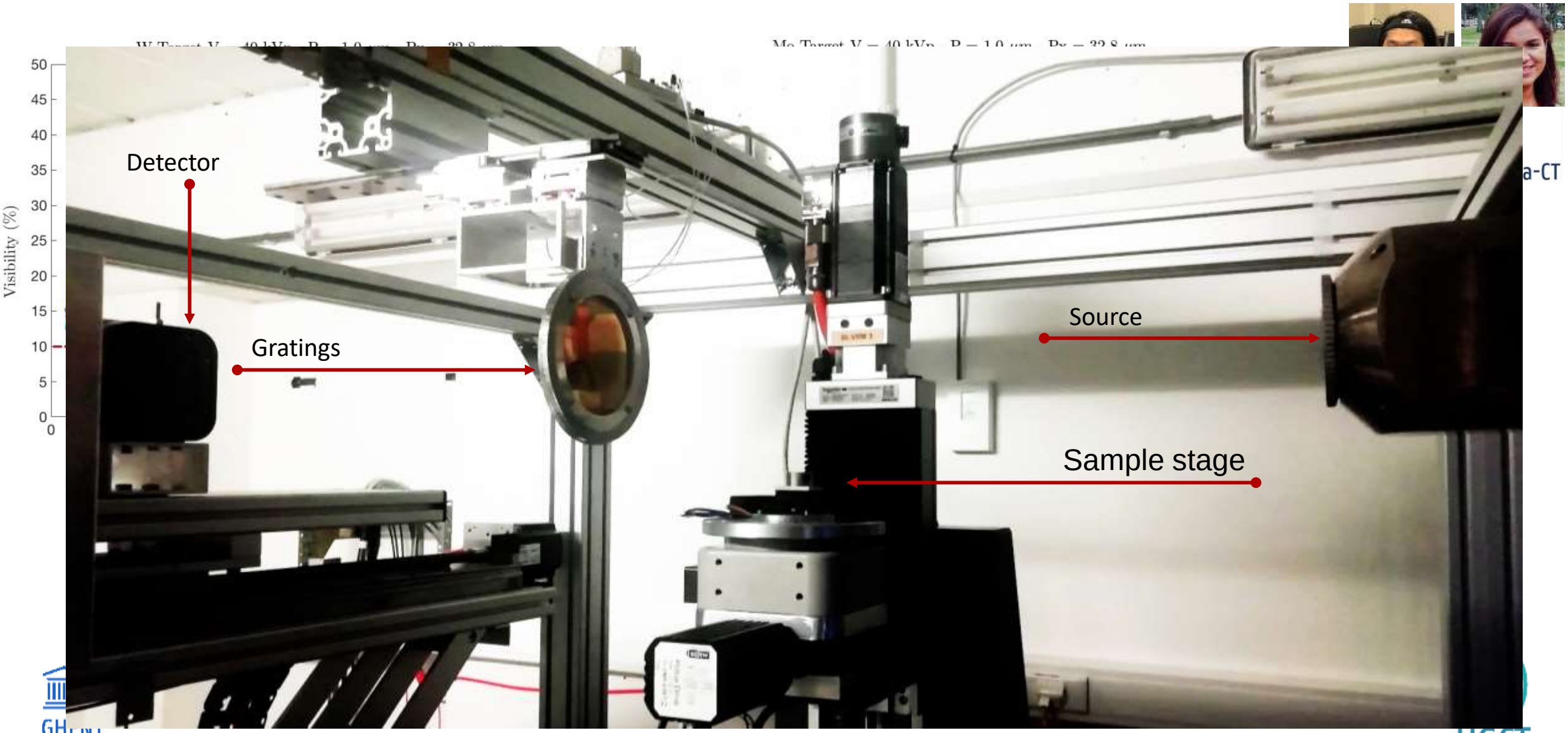
TUNABLE DARK-FIELD CONTRAST



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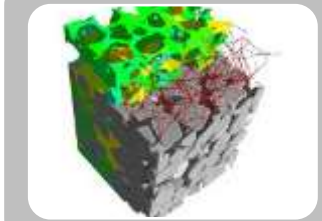
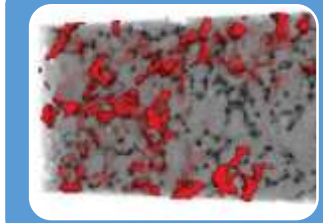
PILLAR 2



Structural imaging and analysis (SIA)

Research Focus: Multi-scale 3D imaging



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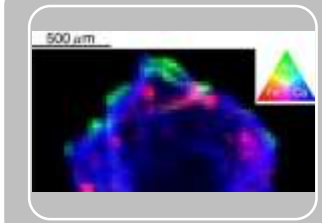

Multimodal imaging and analysis (MIA)

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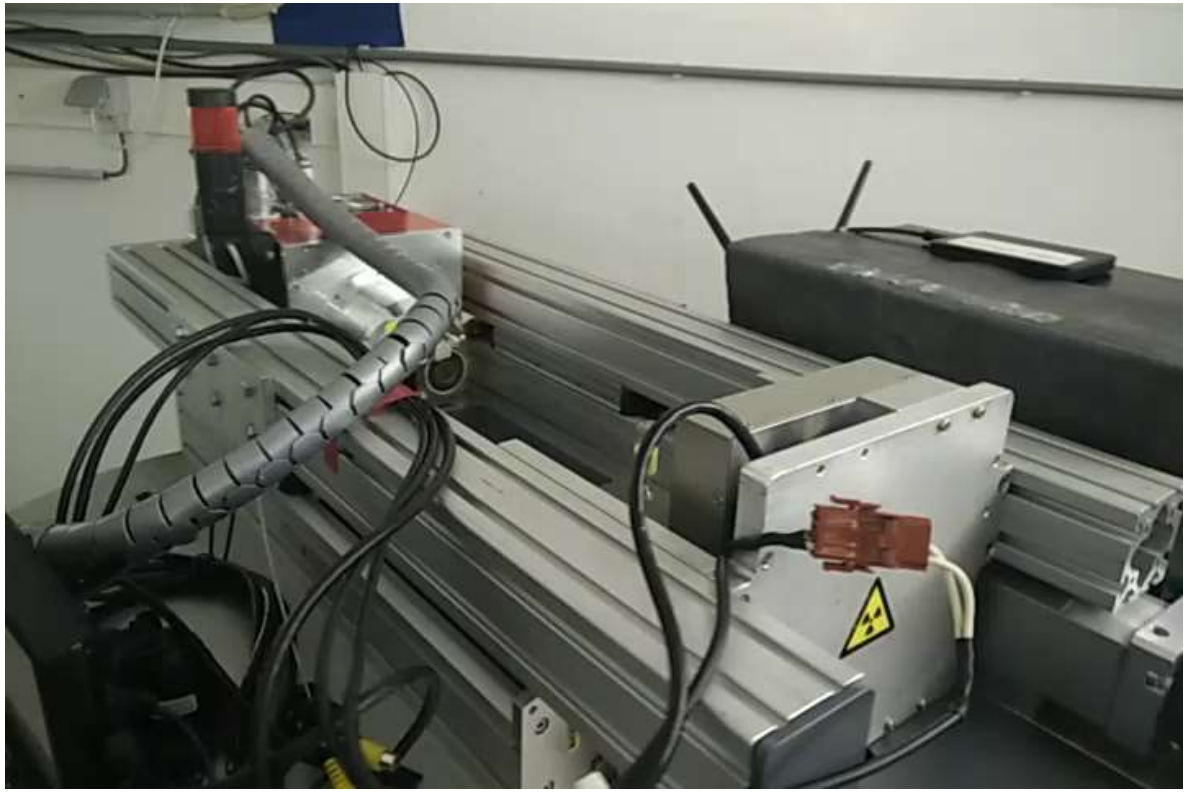
DYNAMIC IMAGING: 4D-µCT



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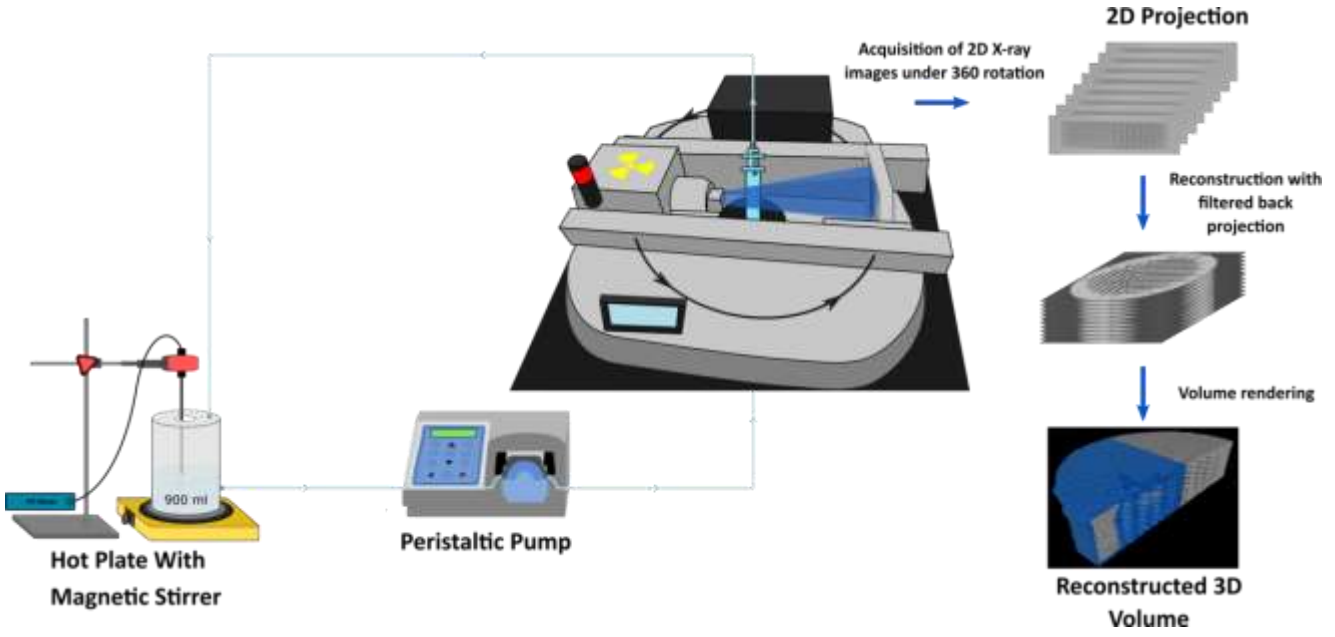
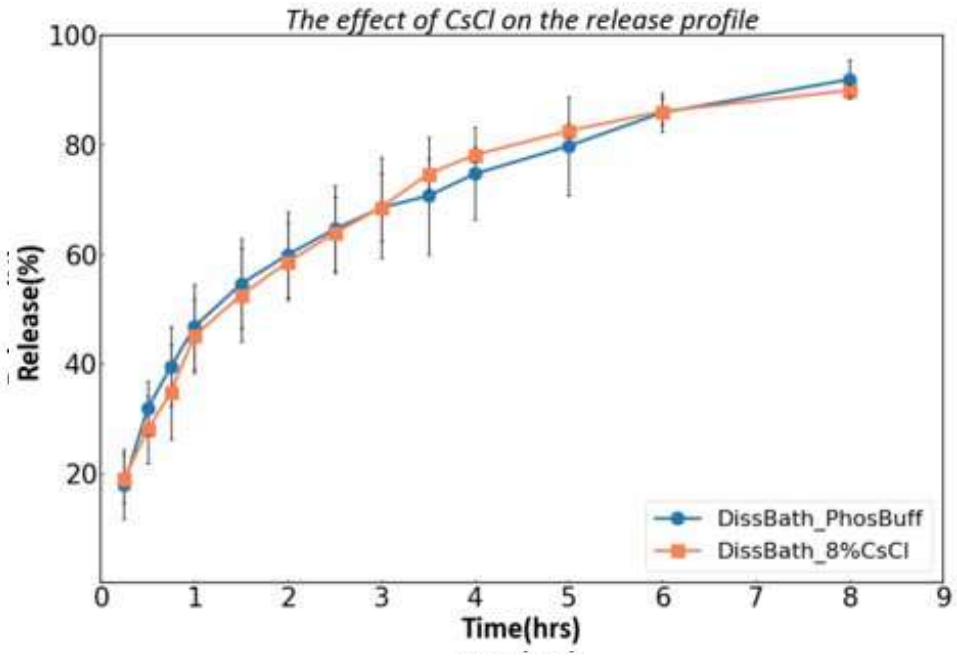
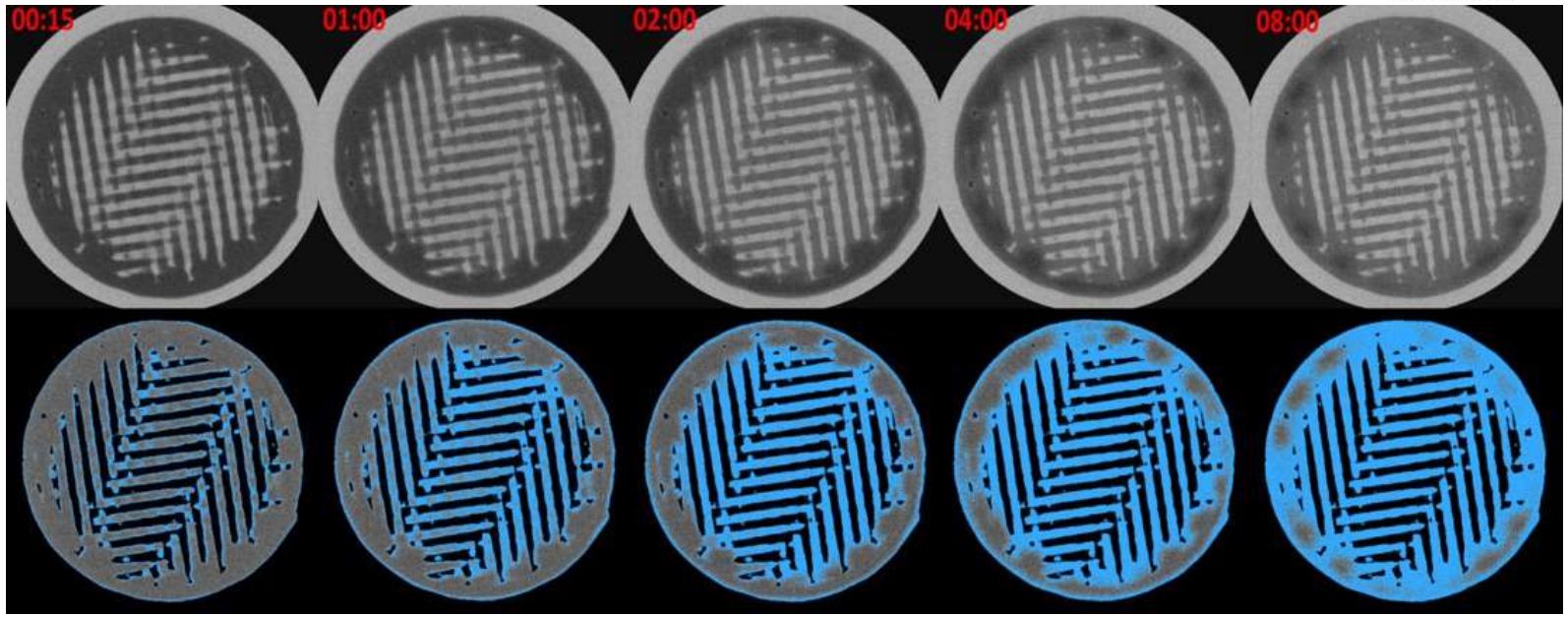
Dierick et al. (2014). Nucl. Inst. & Meth. 324 (0).

PHARMACEUTICAL DOSAGE FORMS







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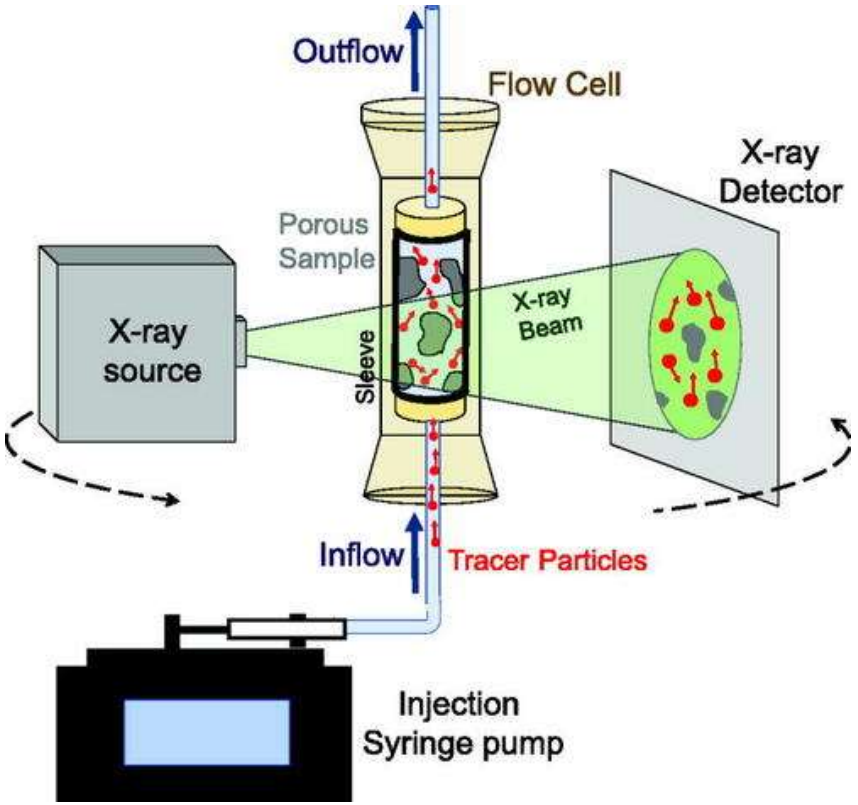
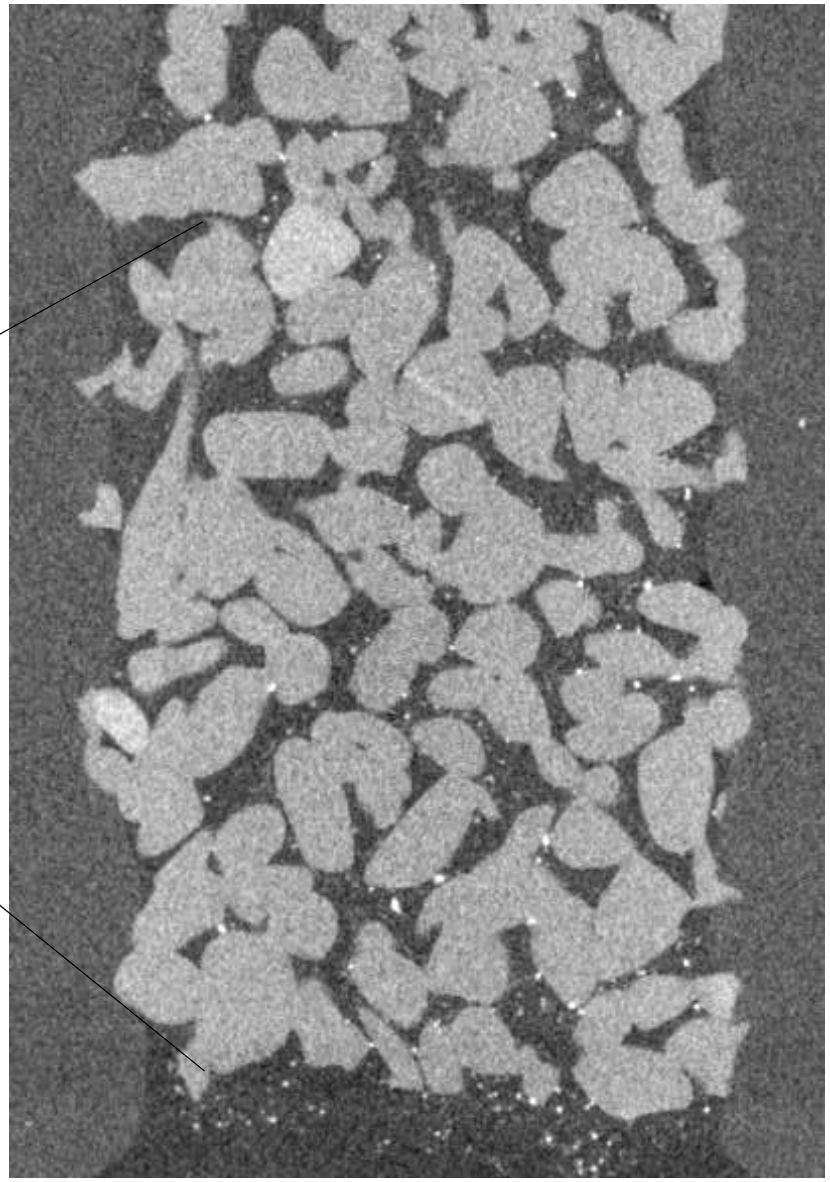
MICRO-PARTICLE VELOCIMETRY



4x8 mm



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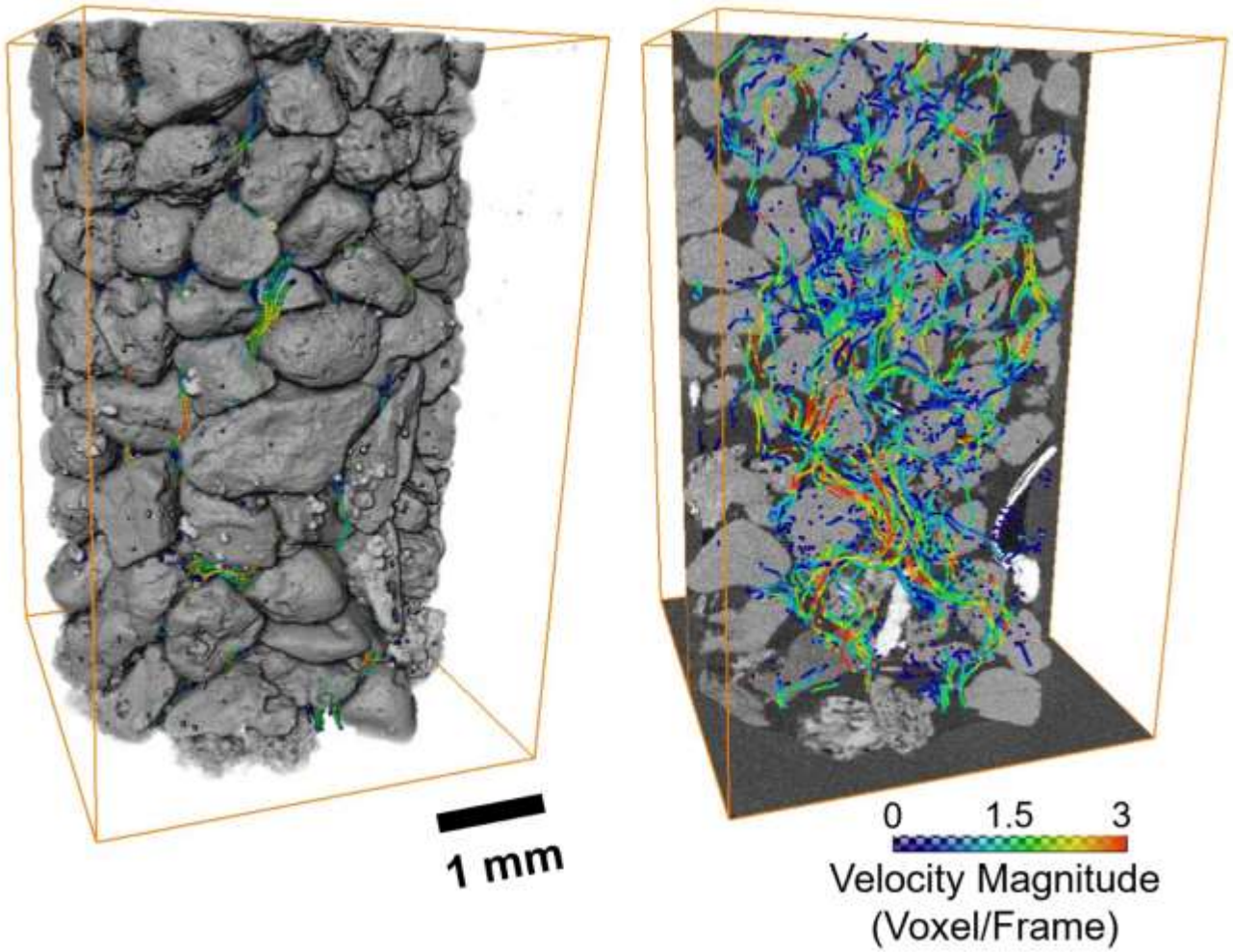
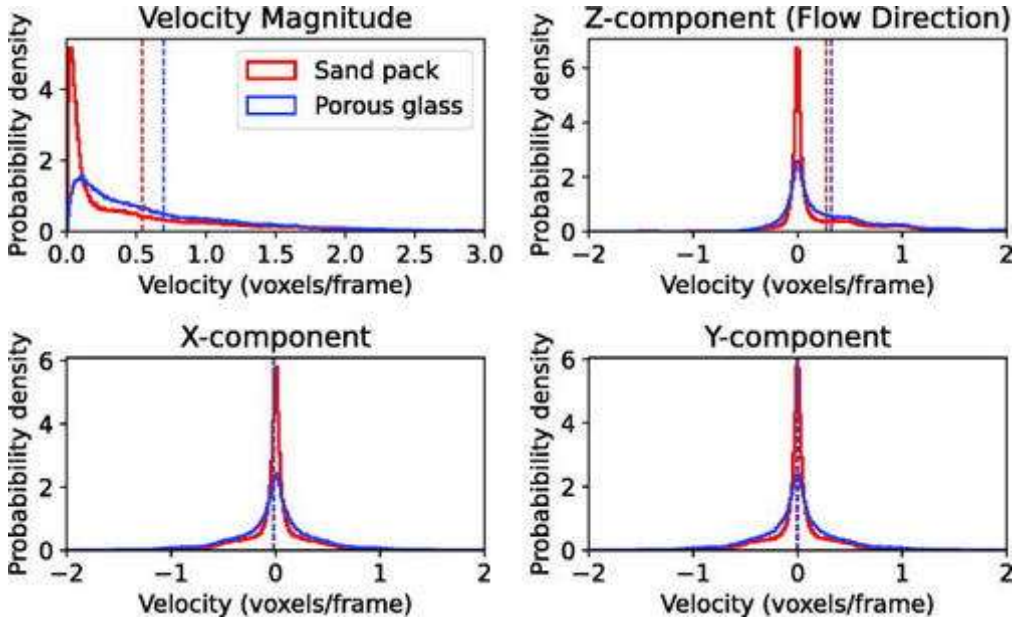
MICRO-PARTICLE VELOCIMETRY





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Bultreys *et al.*, Phys. Fluids **34** (2022). DOI: 10.1063/5.0088000

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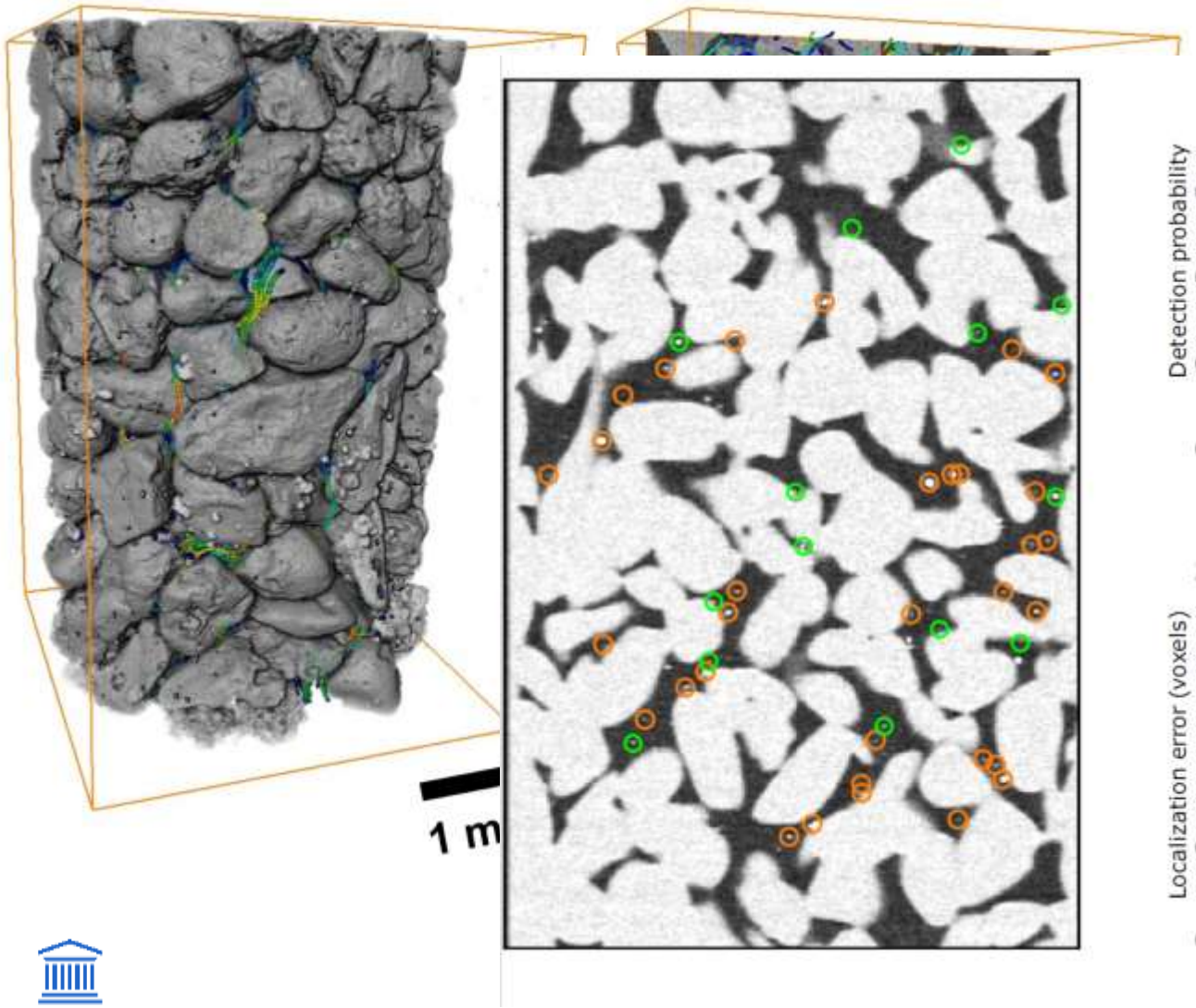
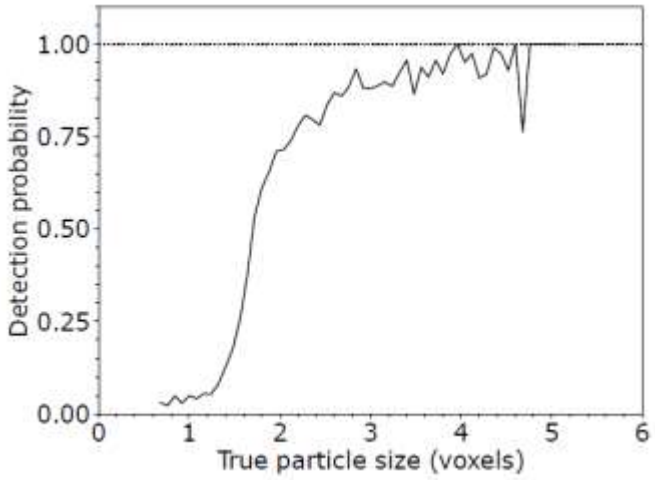
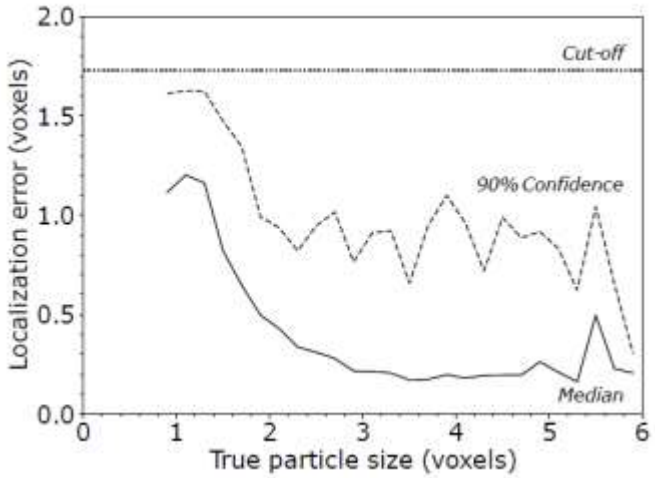
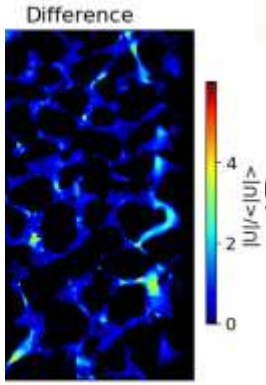
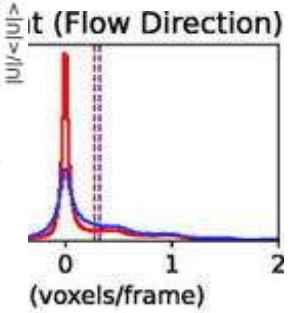
MICRO-PARTICLE VELOCIMETRY

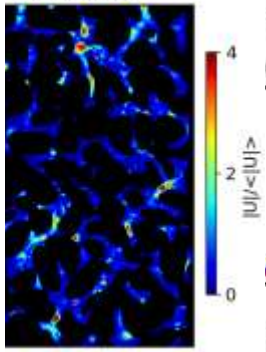


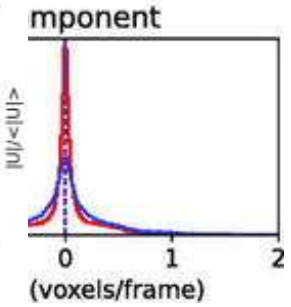












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Bultreys *et al.*, Phys. Fluids **34** (2022). DOI: 10.1063/5.0088000

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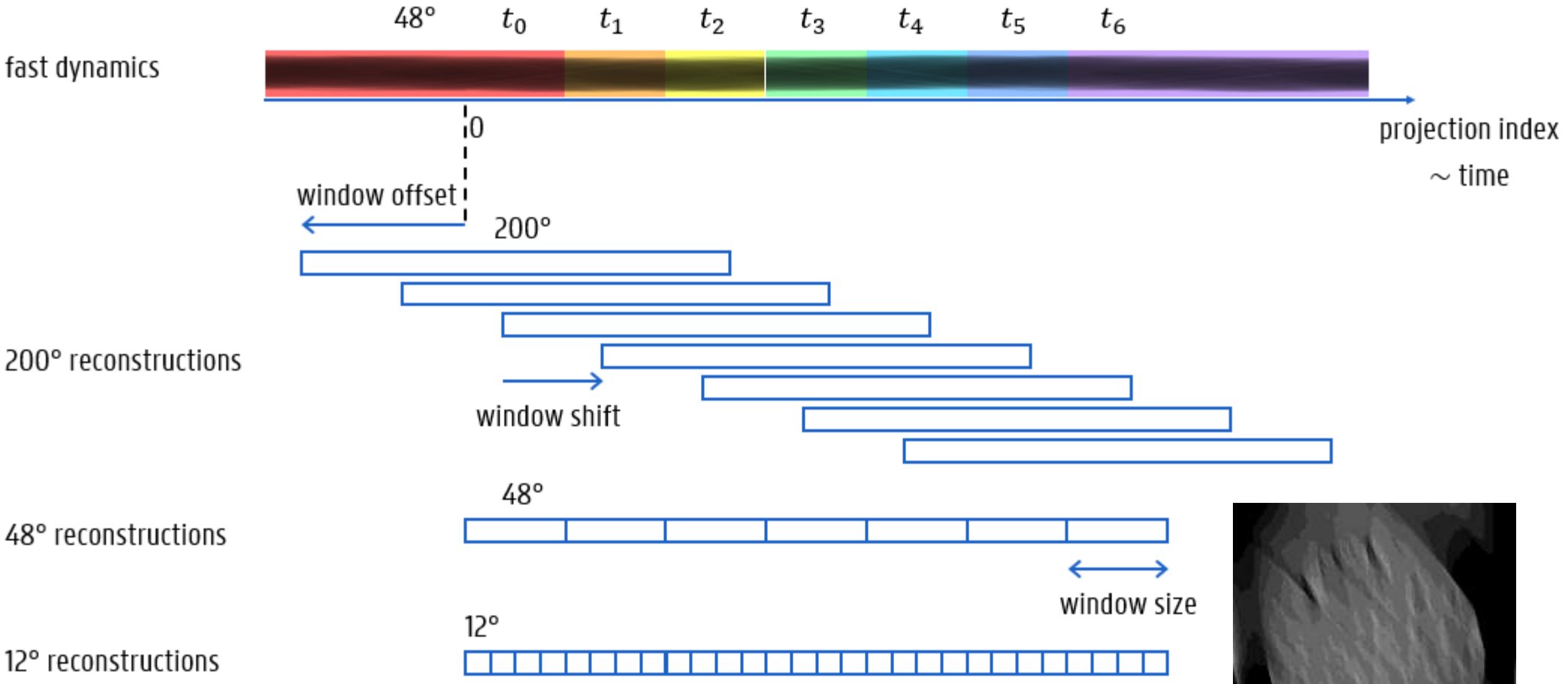
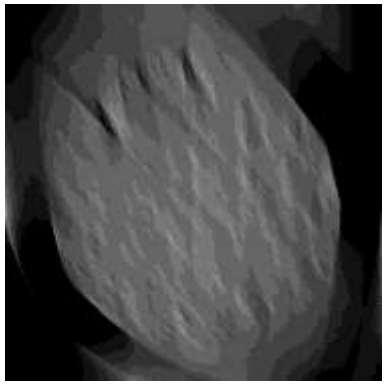
INCREASING TEMPORAL RESOLUTION





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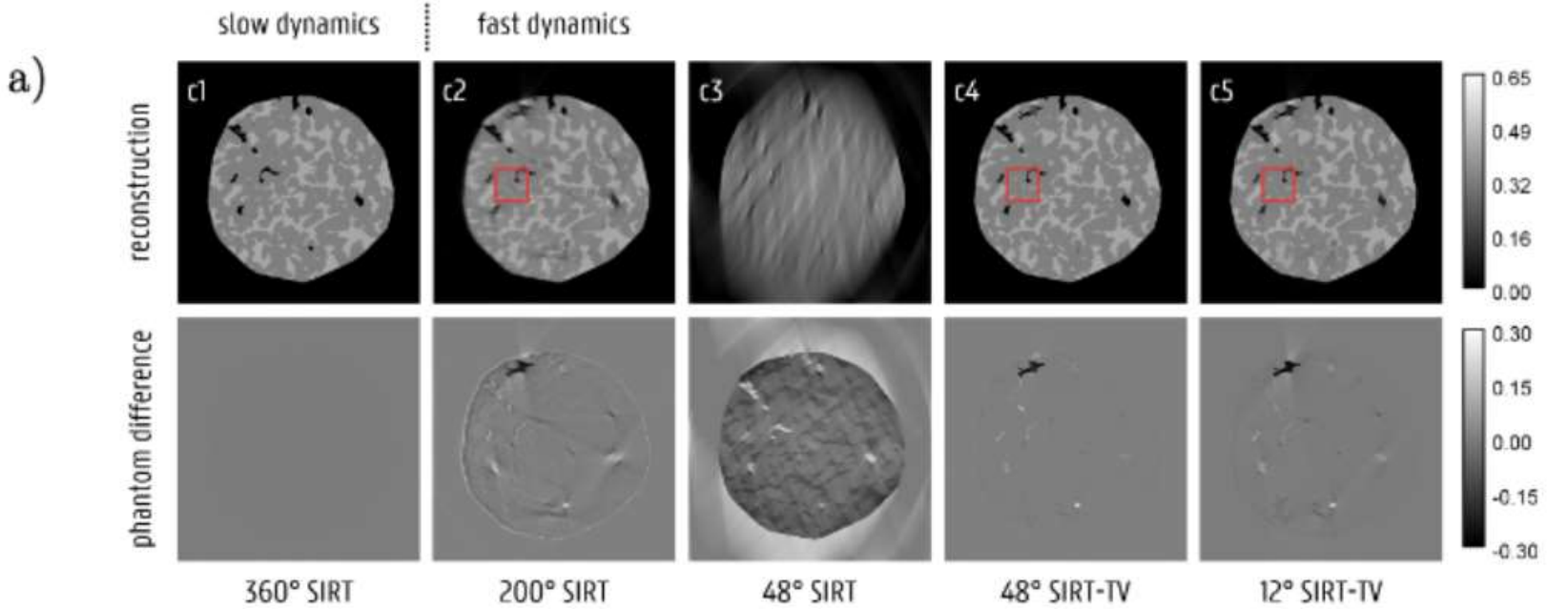
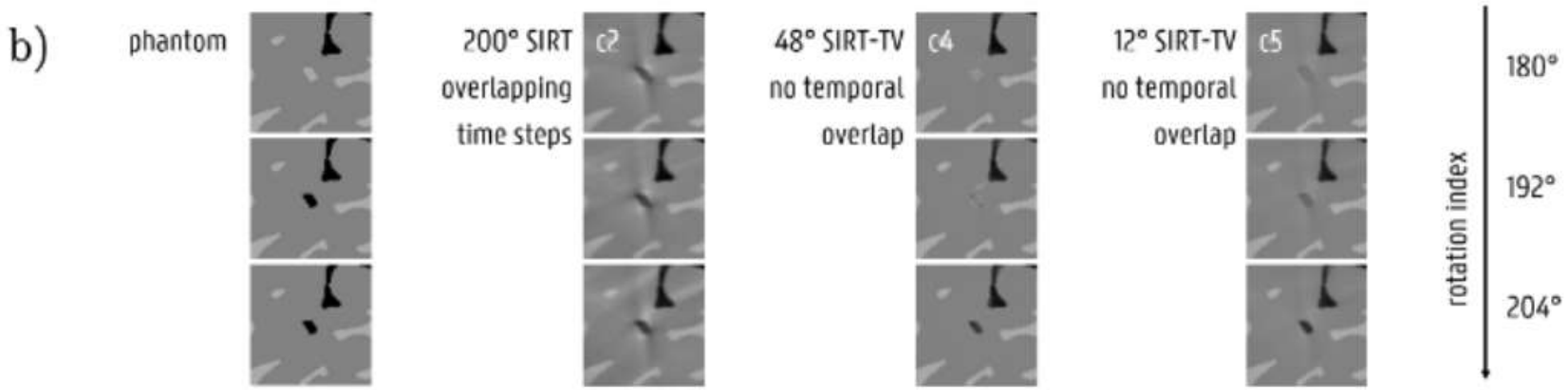
INCREASING TEMPORAL RESOLUTION





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Goethals *et al.*, WRR **58** (2022). DOI: 10.1029/2021WR031365

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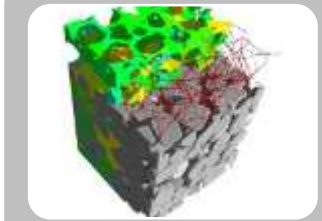
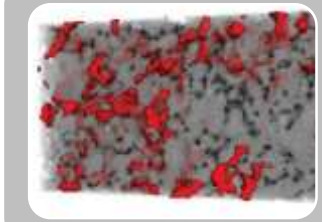
PILLAR 3



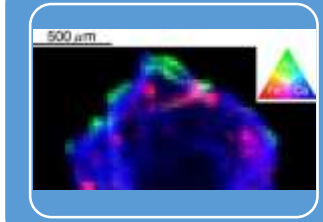
Structural imaging and analysis (SIA)

Research Focus: Multi-scale 3D imaging



Dynamic imaging, modelling and analysis (DIMA)

Research Focus: Fast 4D imaging



Multimodal imaging and analysis (MIA)

Research Focus: 3D Chemical characterization

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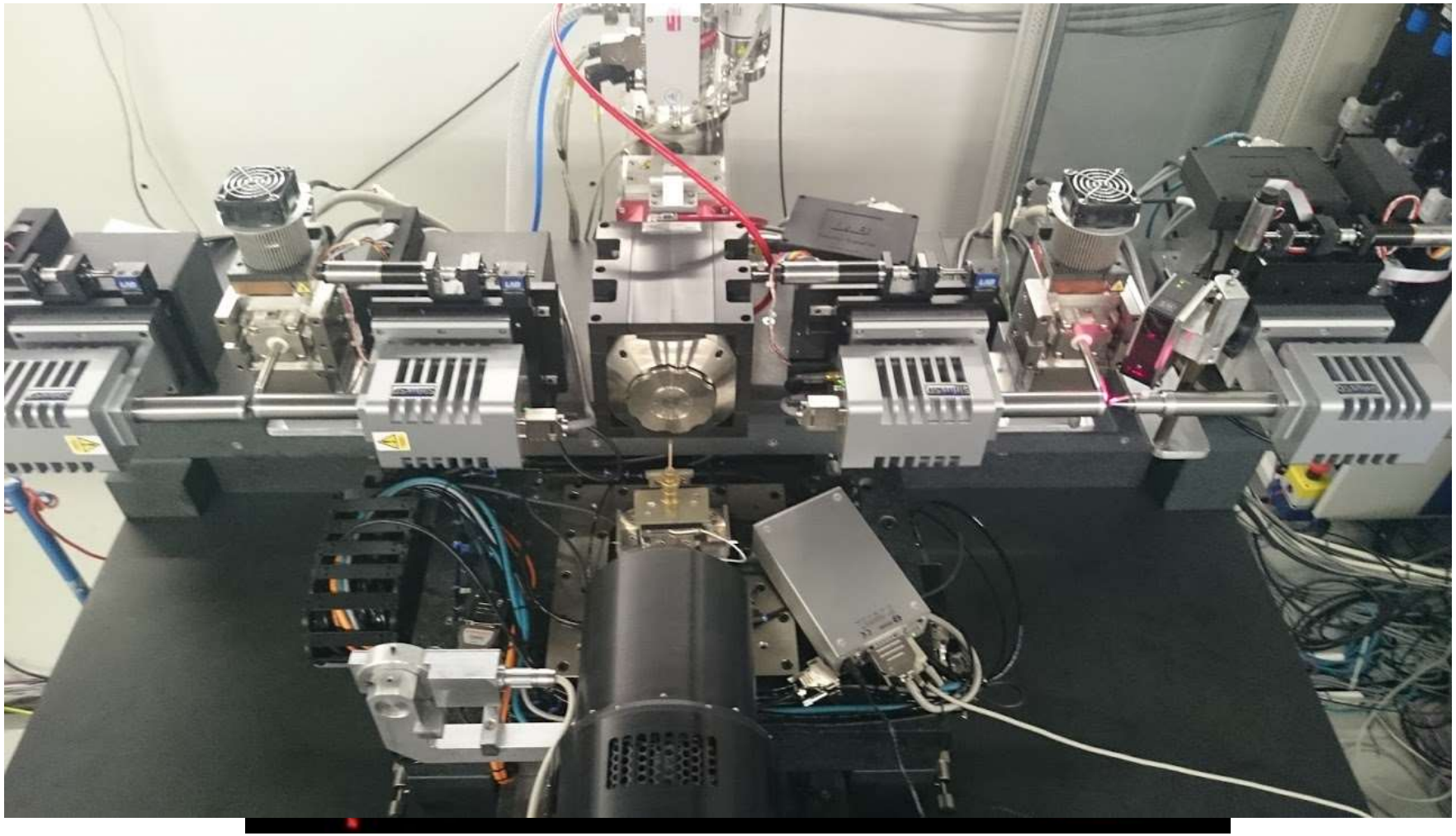
COMBINED XRF AND CT



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XMI

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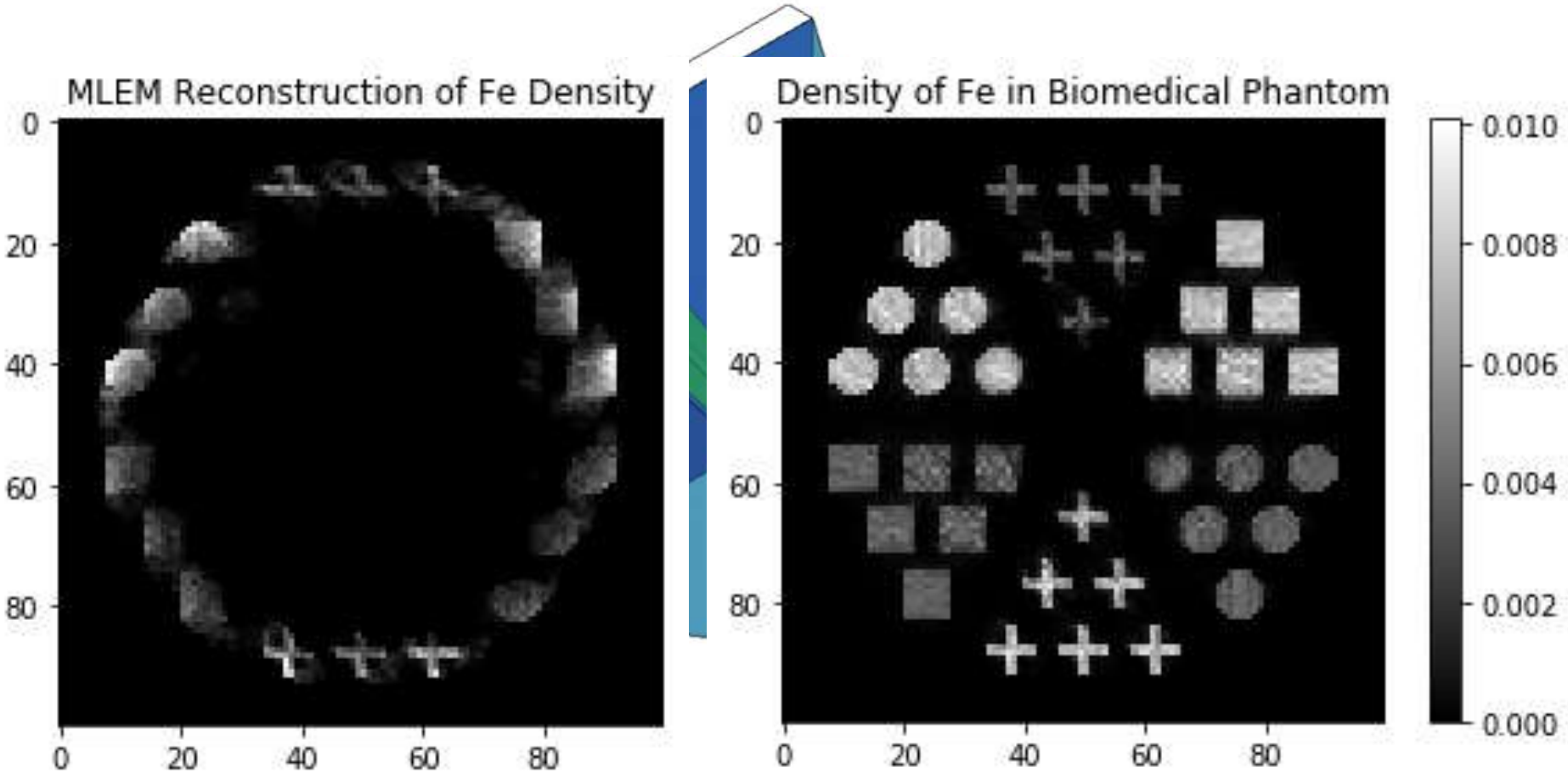
SELF-ATTENUATION



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Gao *et al.*, Anal Chem **170** (2021). DOI: 10.1021/acs.analchem.0c03828

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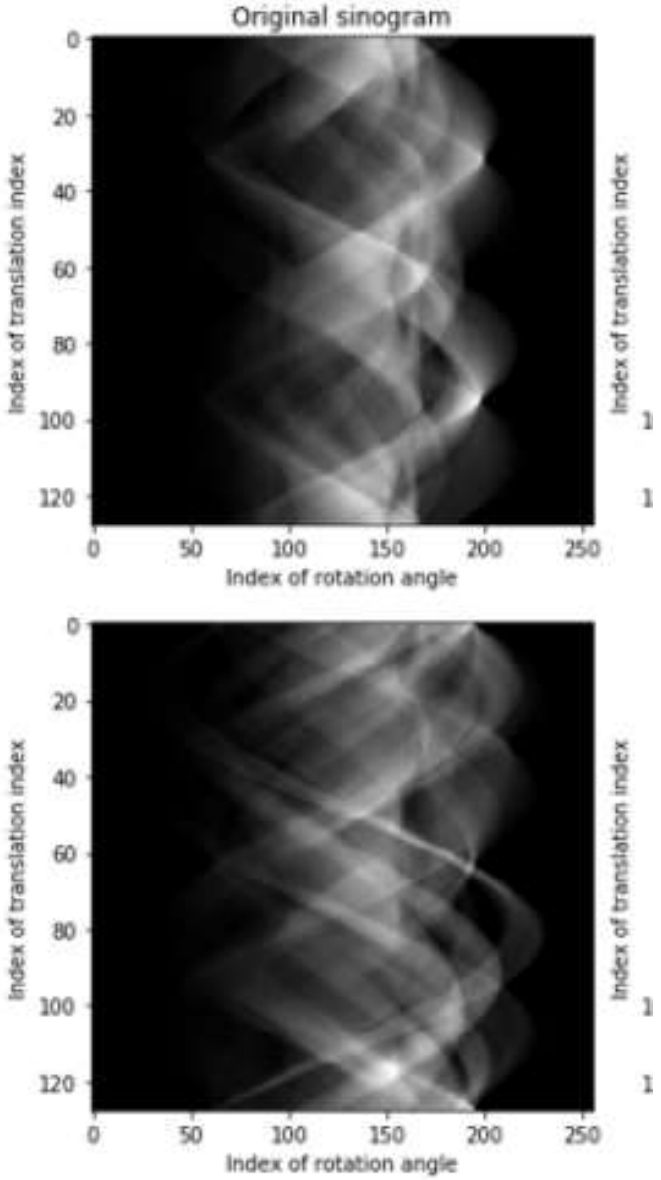
SELF-ATTENUATION CORRECTION



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Gao *et al.*, IEEE TNS **68** (2021). DOI: 10.1109/tns.2021.3079629

THANK YOU!

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