

T07 Computed X-Ray Microtomography - CERTH

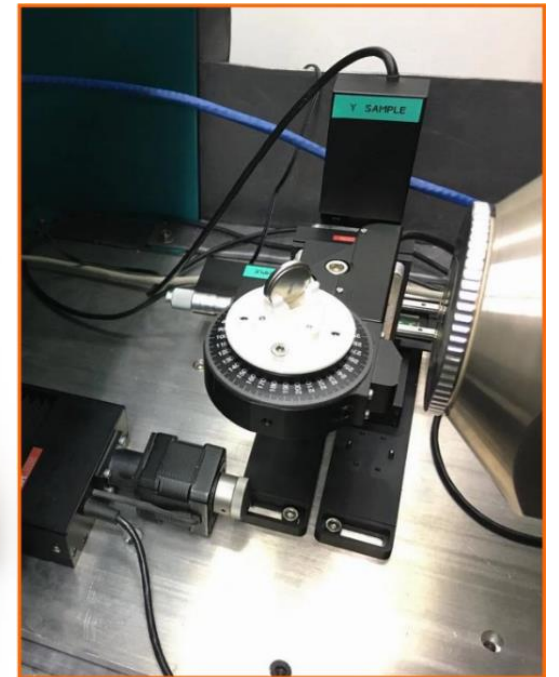
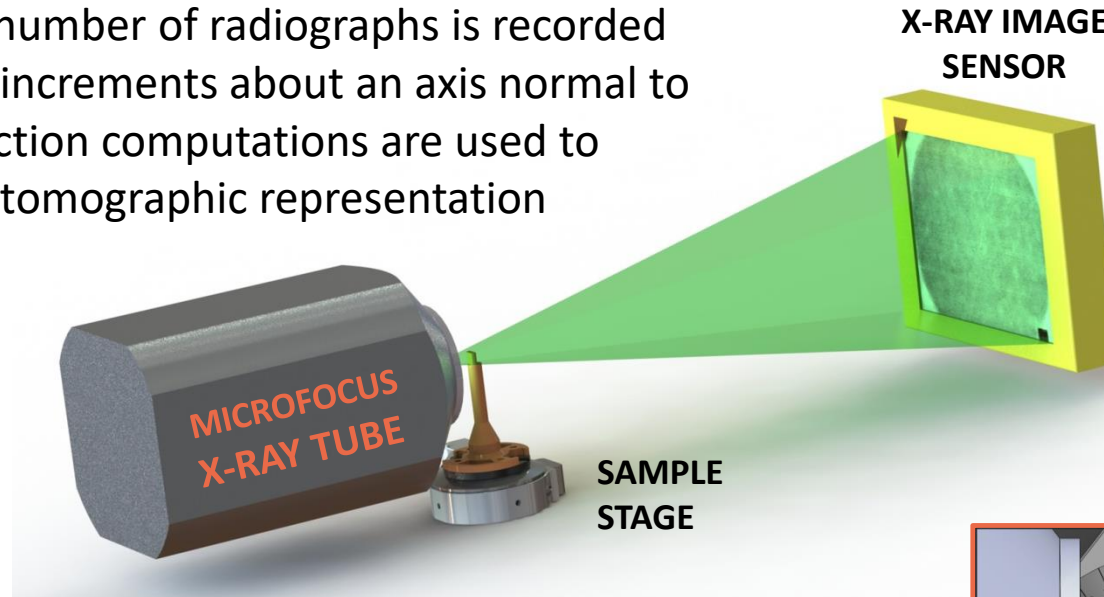


TEESMAT

Open Innovation Test Bed for Electrochemical Energy Storage Materials

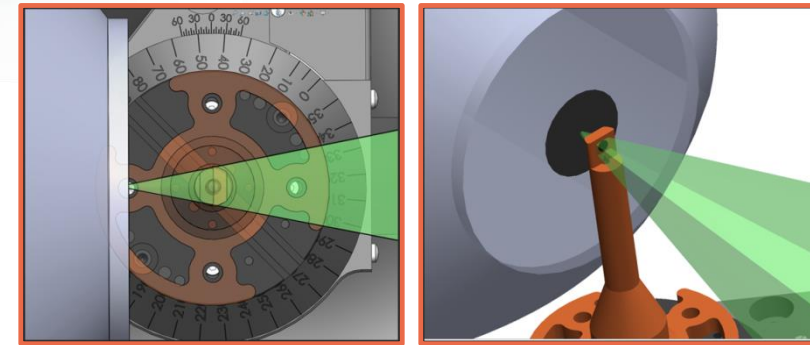
How it works

A very small x-ray source (diameter $\approx 1 \mu\text{m}$) projects a beam through the sample onto a high resolution image sensor which records digital radiographs on a computer. A large number of radiographs is recorded while the sample is rotated in small increments about an axis normal to the projection direction. Back-projection computations are used to combine the radiographs into a 3-D tomographic representation of the sample.



What kind of sample ?

- **Coin cells** (max. $\varnothing 25\text{mm}$, approx. 80% sample imaged)
- **Electrode material** (circular coupons $\approx \varnothing 2.5\text{mm}$, $3 \mu\text{m}$ resolution possible)
- **Cylindrical cells** (up to $\approx \varnothing 18 \text{ mm}$, $\approx 10 \mu\text{m}$ resolution attainable)



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What can be seen ?

- Sections (tomographs) through the sample.
- Internal geometric features / alignment
- Voids, delamination, homogeneity of coatings.

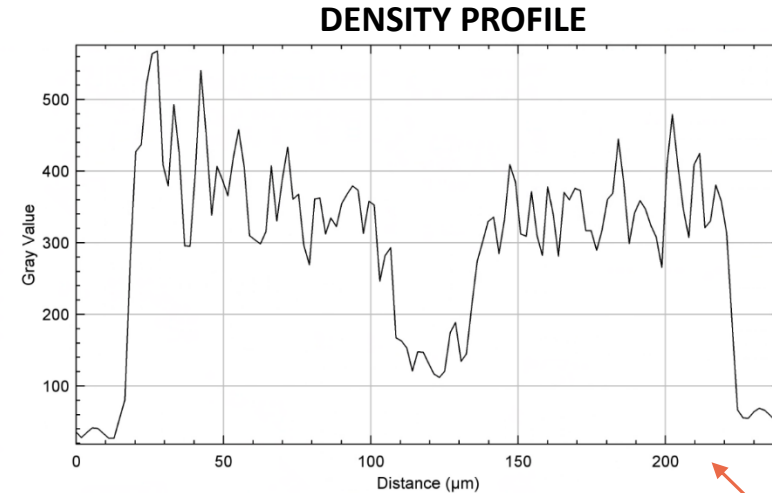
Why is it useful ?

- Production control (verify internal geometric features, characterise electrode homogeneity)
- Non-destructive volumetric inspection
- Understanding failure mechanisms (delamination, swelling)
- Complementary to nano-tomography and SEM (larger volumes accessible)

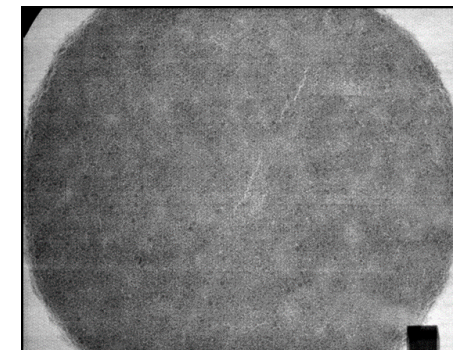
Maturity level

- Workflow fully developed for electrode samples and coin cells.
- Methodology for in situ study requires development.

Investigation time : days / 1 week



RADIOGRAPH
(electrode sample)



SECTION

