About cracks imaging in cementitious materials

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PESSAC, FRANCE

INTRODUCTION

OUTLINE

- Example 1
- Example 2
- Discussion
- Conclusion

EXAMPLE 1

About microcracking due to leaching in cementitious composites: X-ray microtomography description and numerical approach

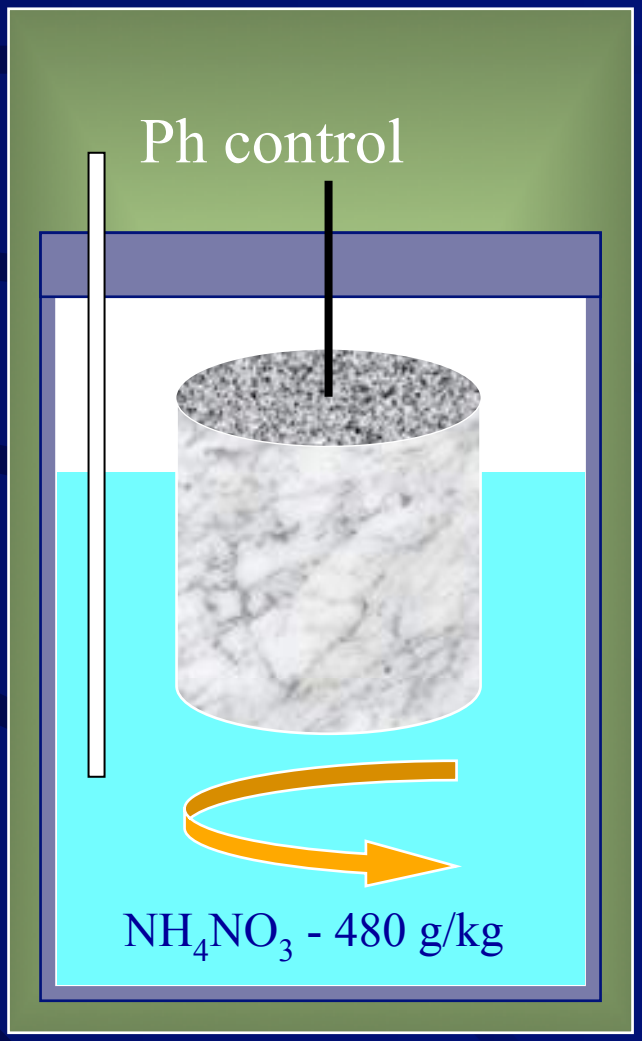
T. Rougelot, N. Burlion , D. Bernard, F. Skoczylas
Cement and Concrete Research 40 (2010) 271–283

Sample preparation and leaching process

Components	*Quantity*
Glass beads Different sizes	1350 kg/m^3
Cement CEM II/B 32,5 R*	450 kg/m^3
Water	225 kg/m^3
Water/Cement ratio	0.5

6 months in water at 20°C

Sample preparation and leaching process



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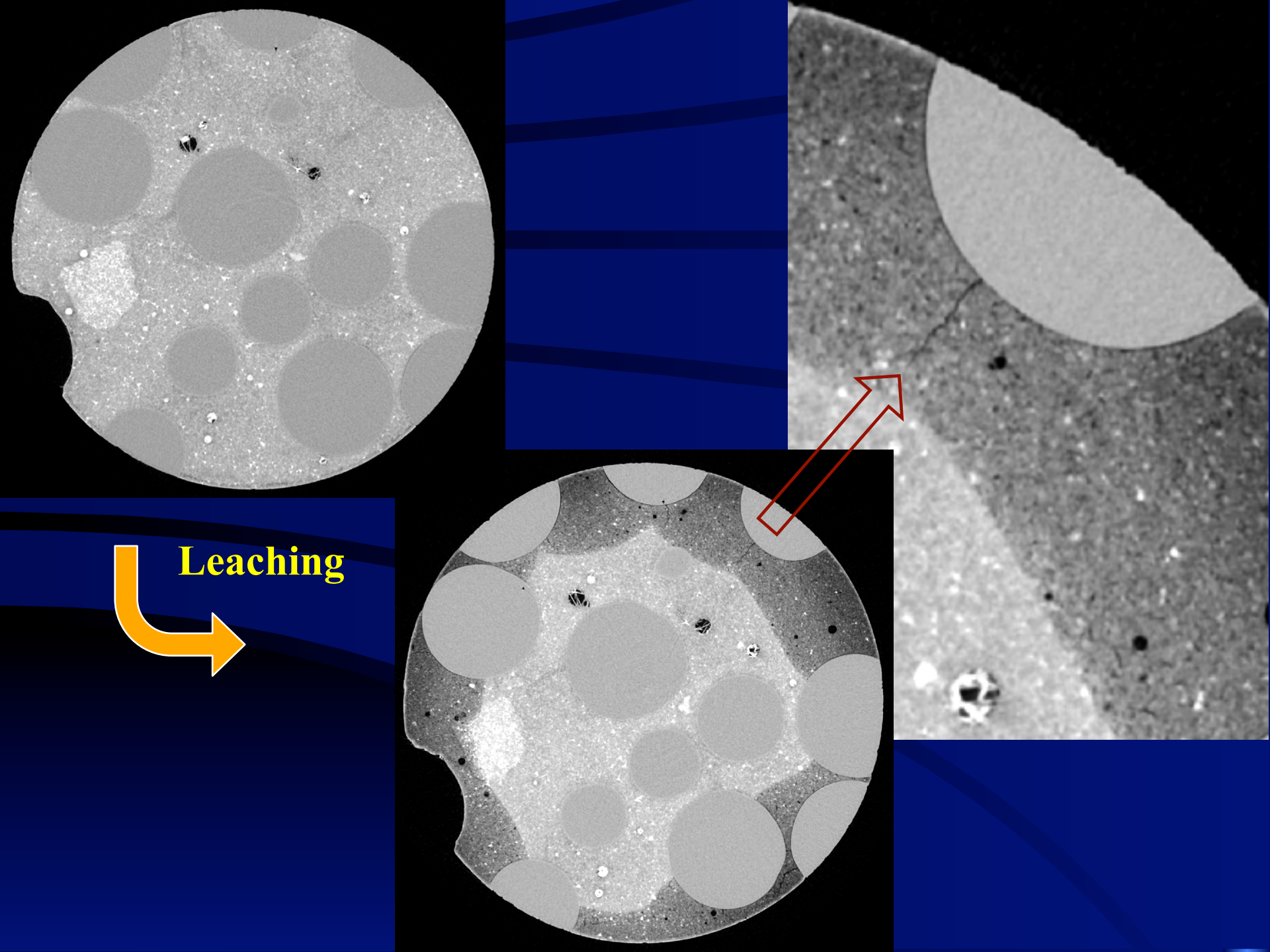
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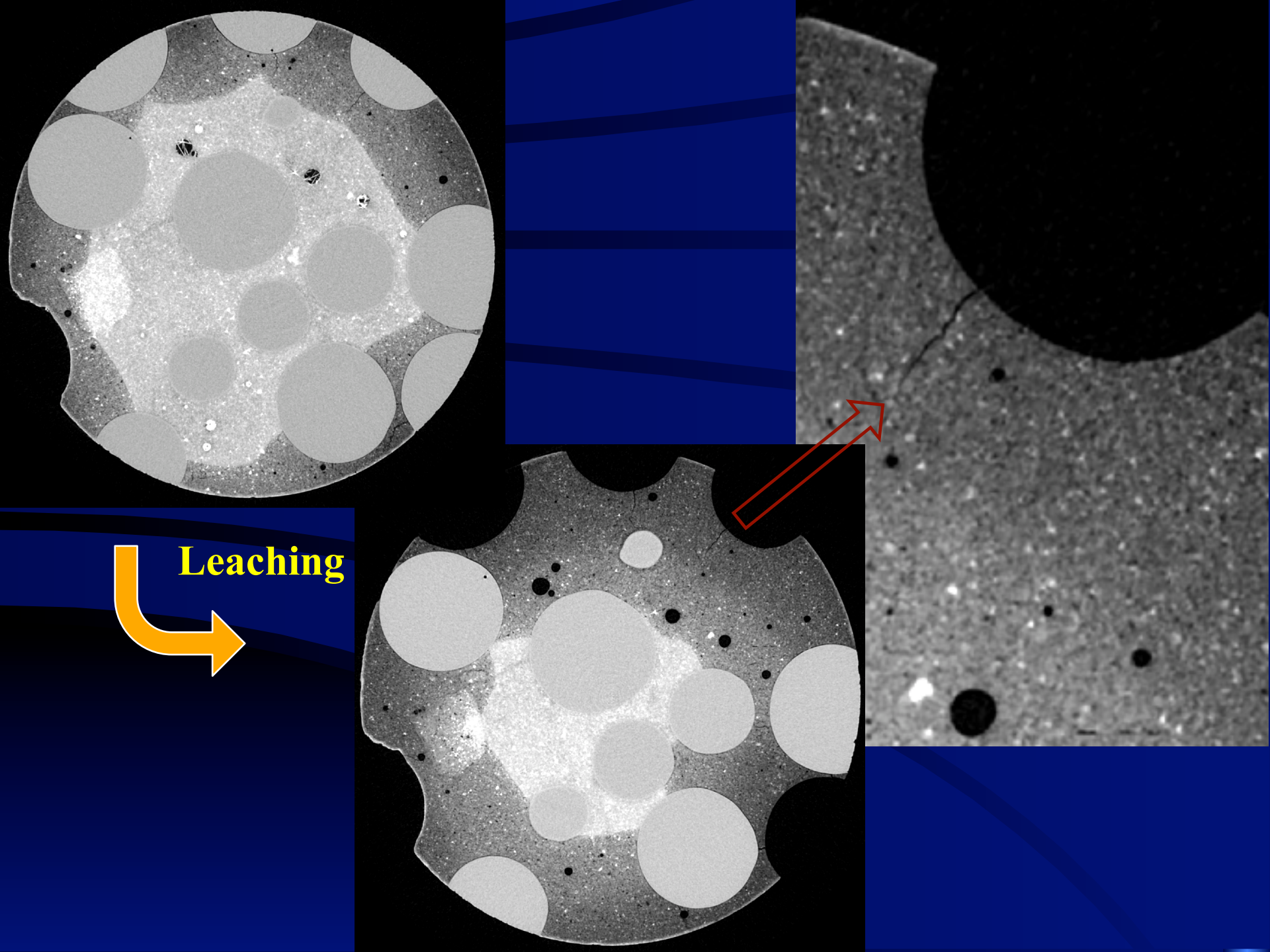
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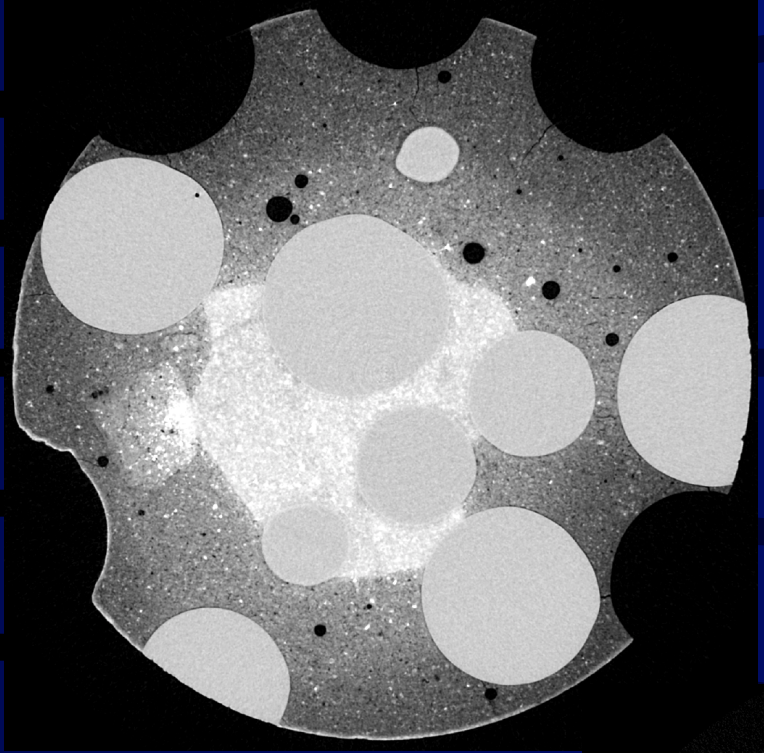

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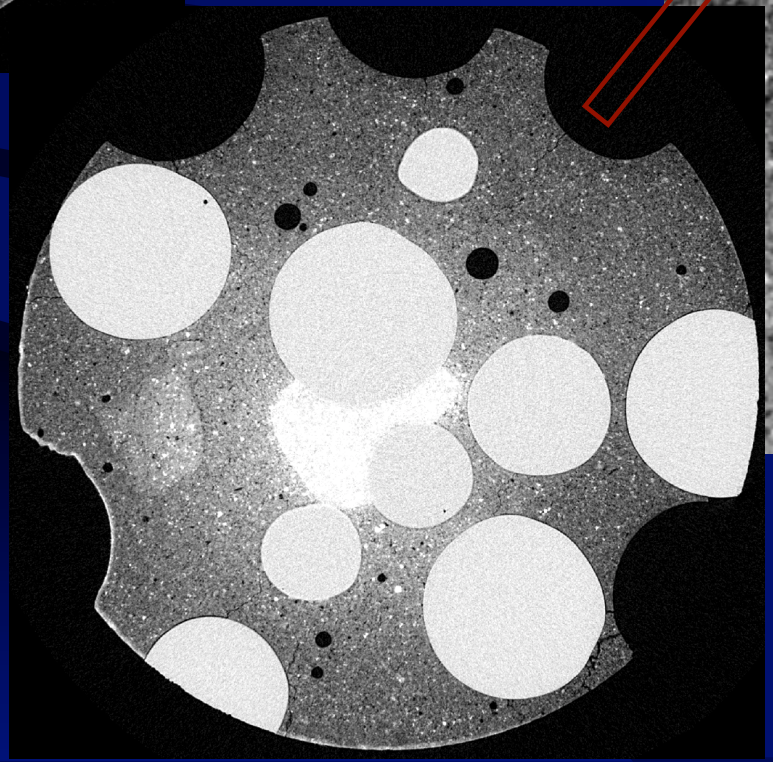

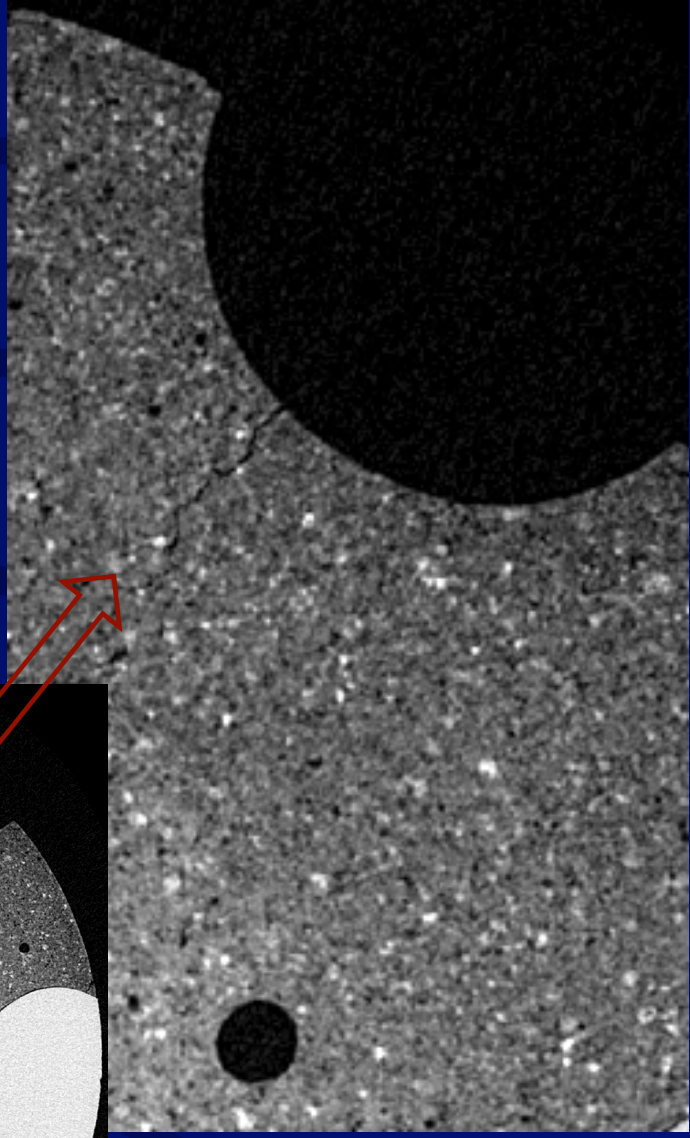

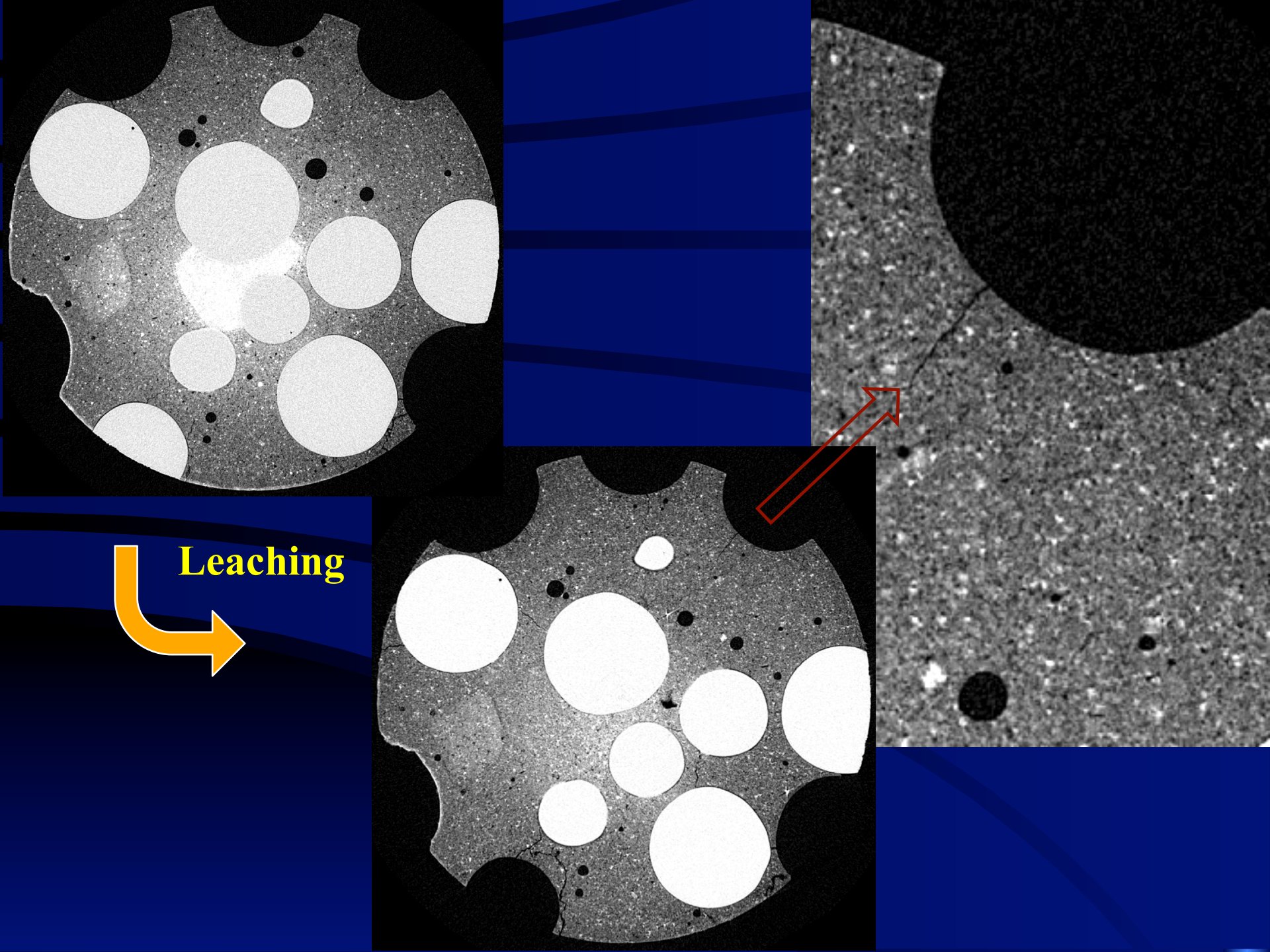
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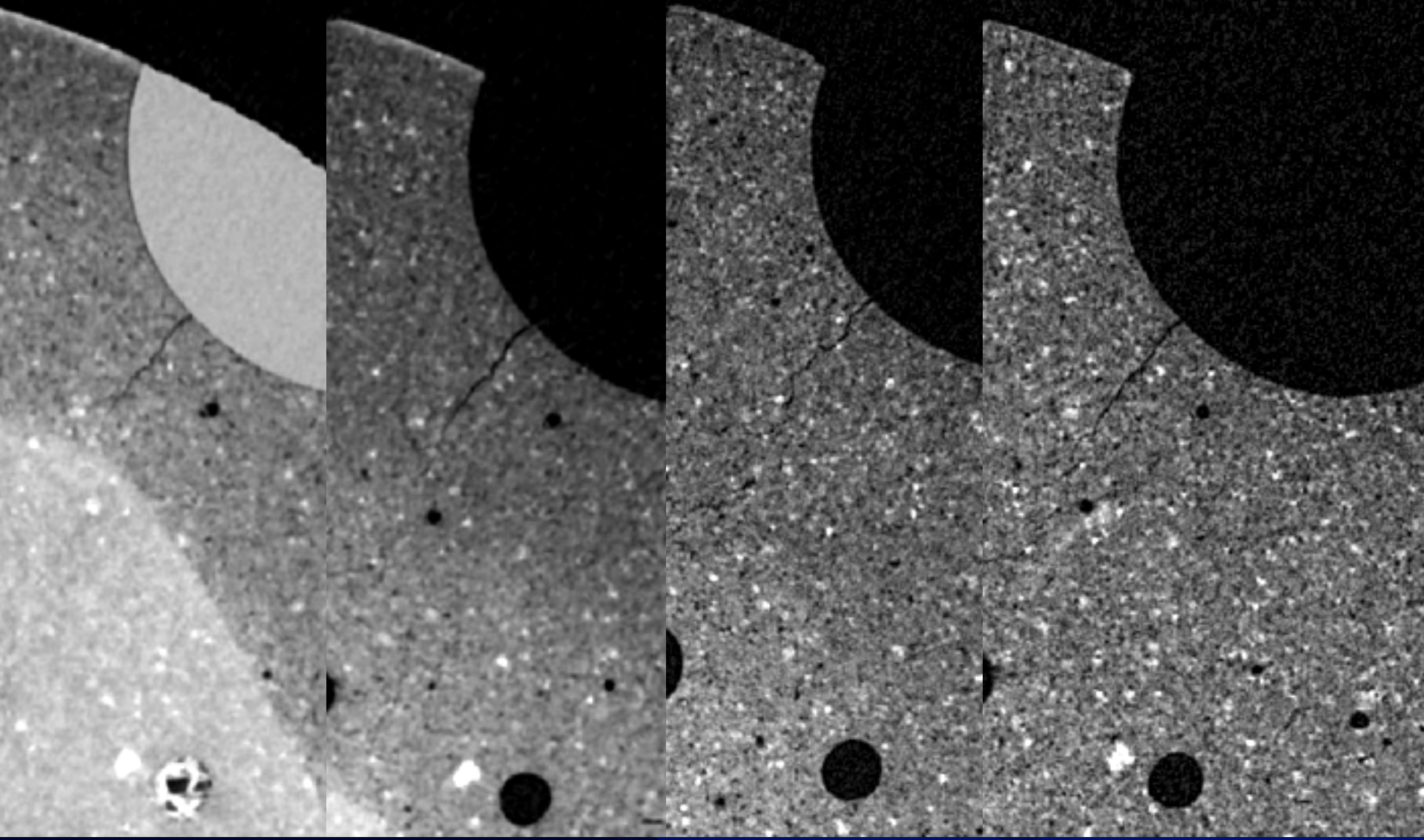

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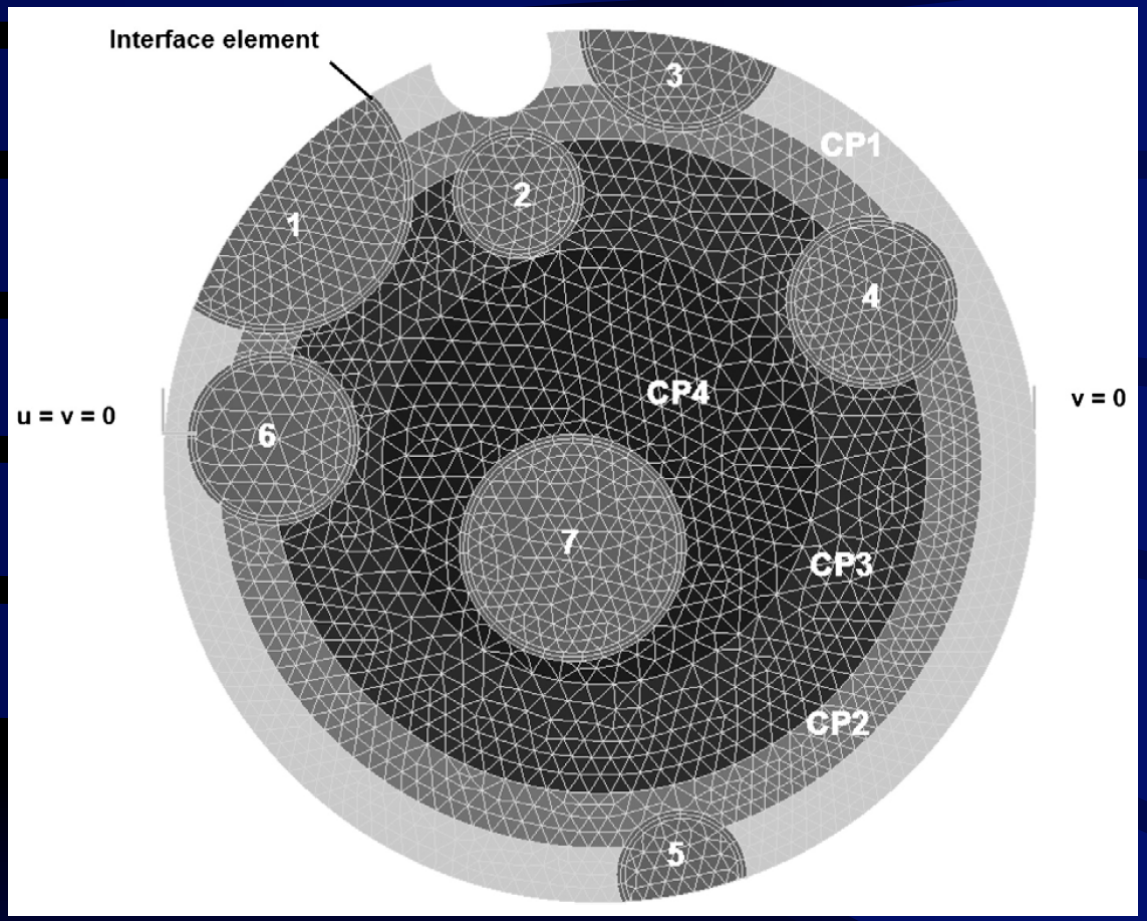
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4
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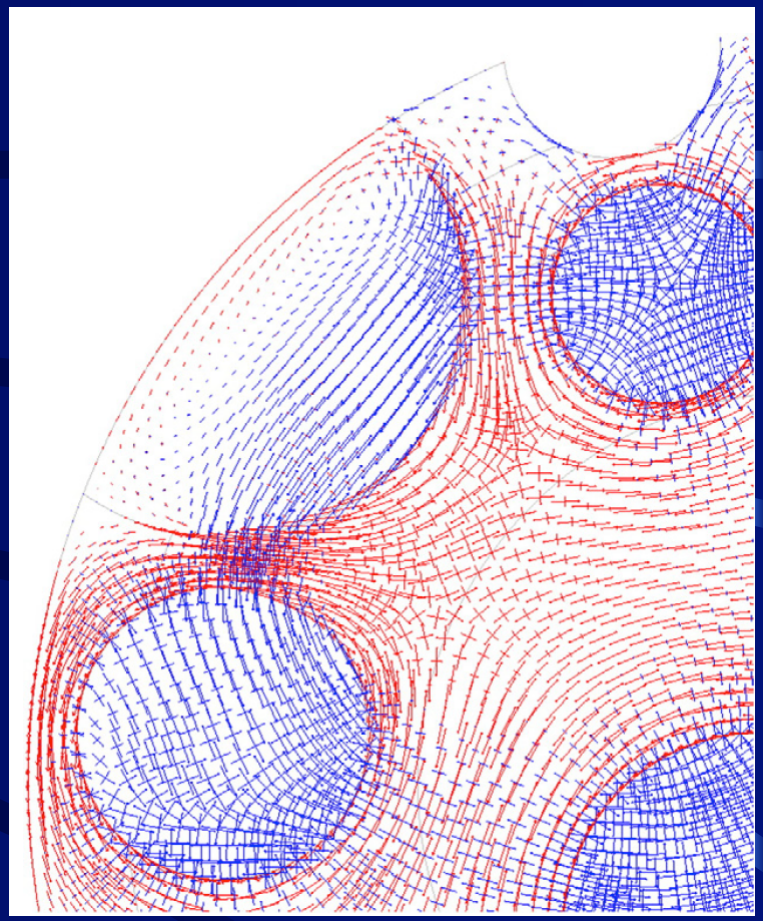
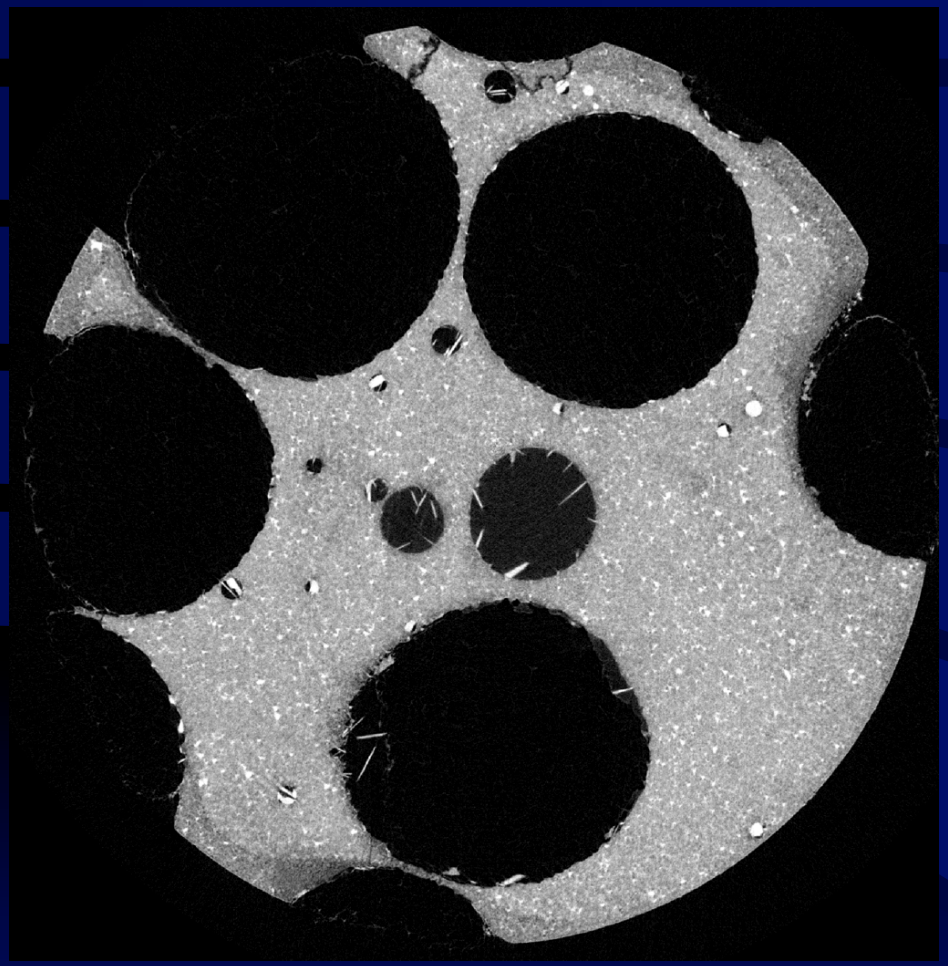
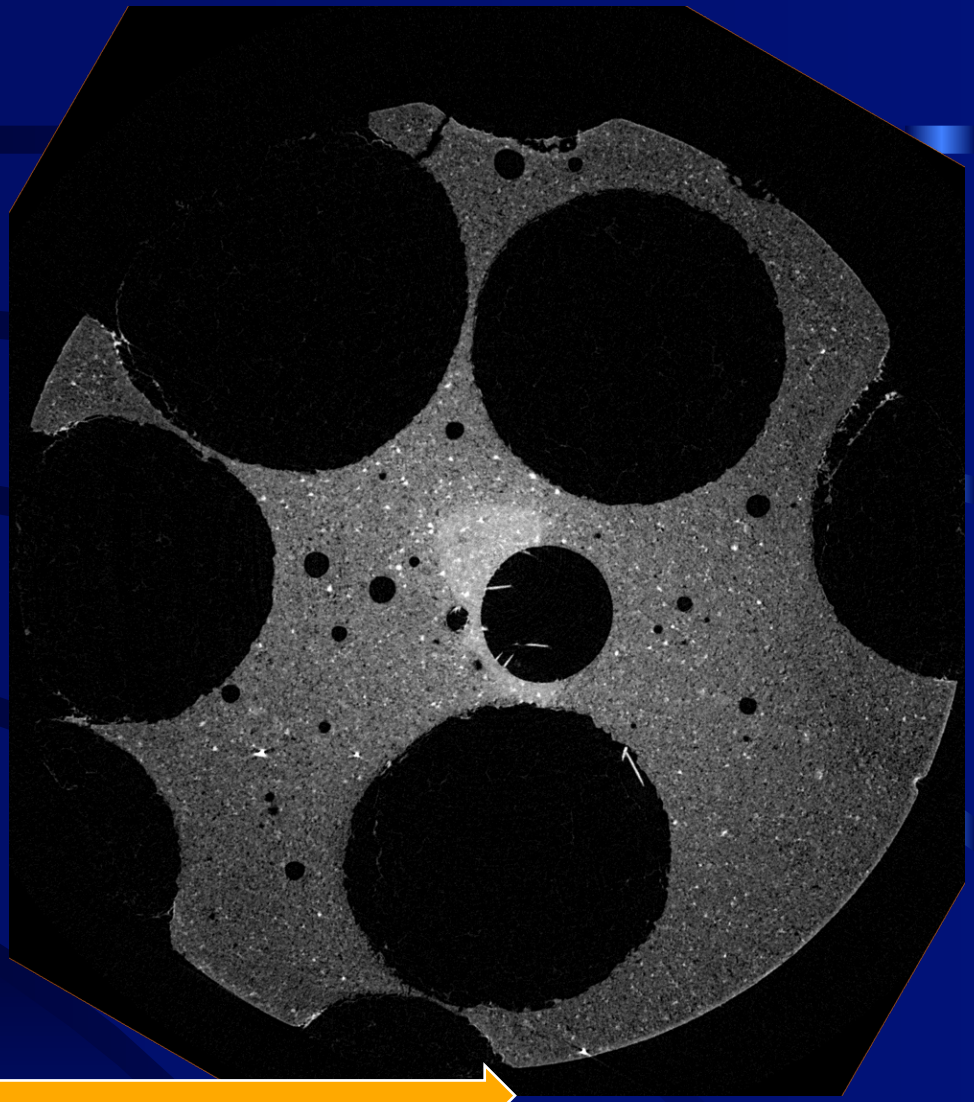
CP4
v = 0
6
7
CP3
CP2
5



WITH POLYSTYRENE BEADS





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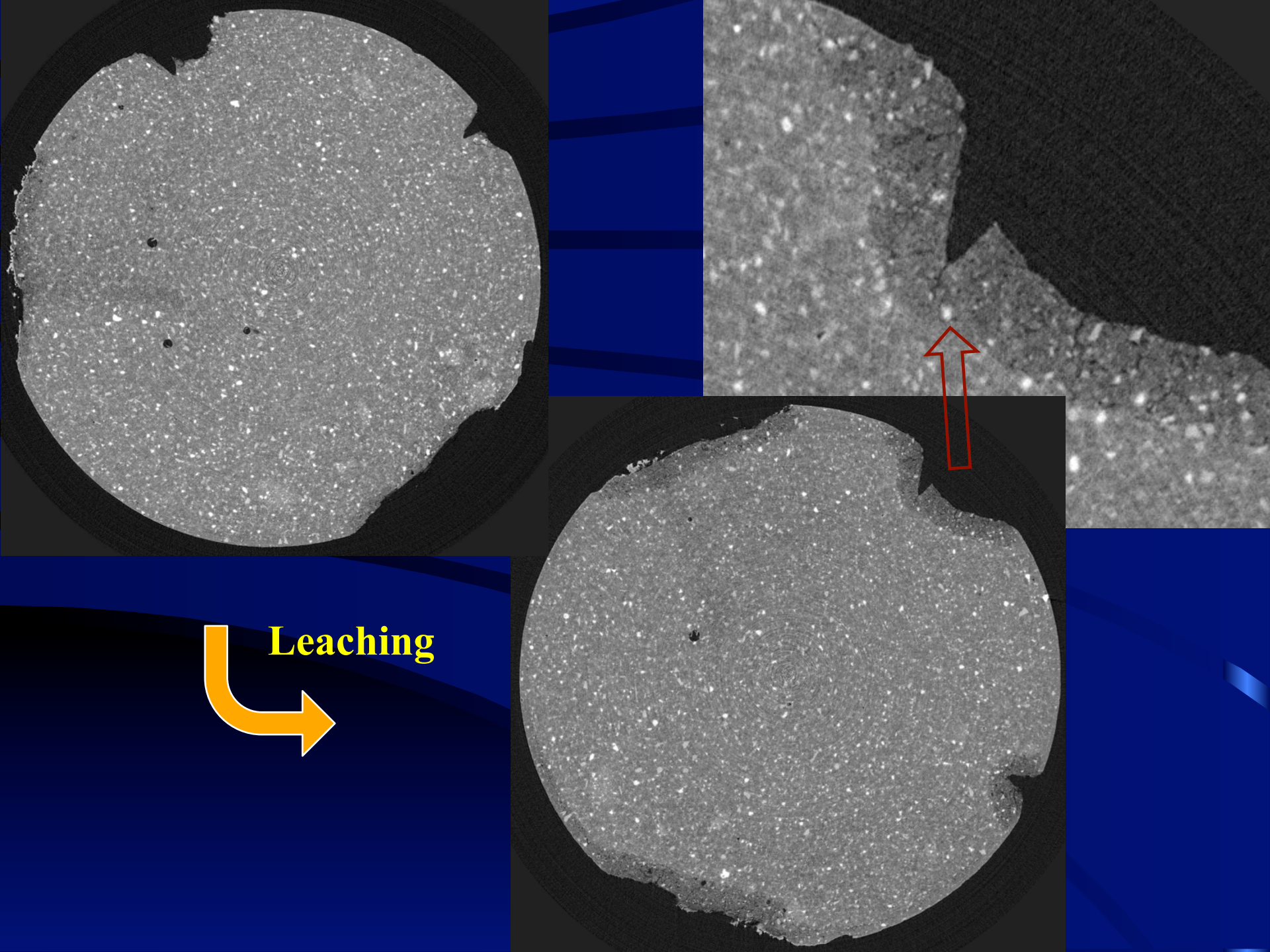
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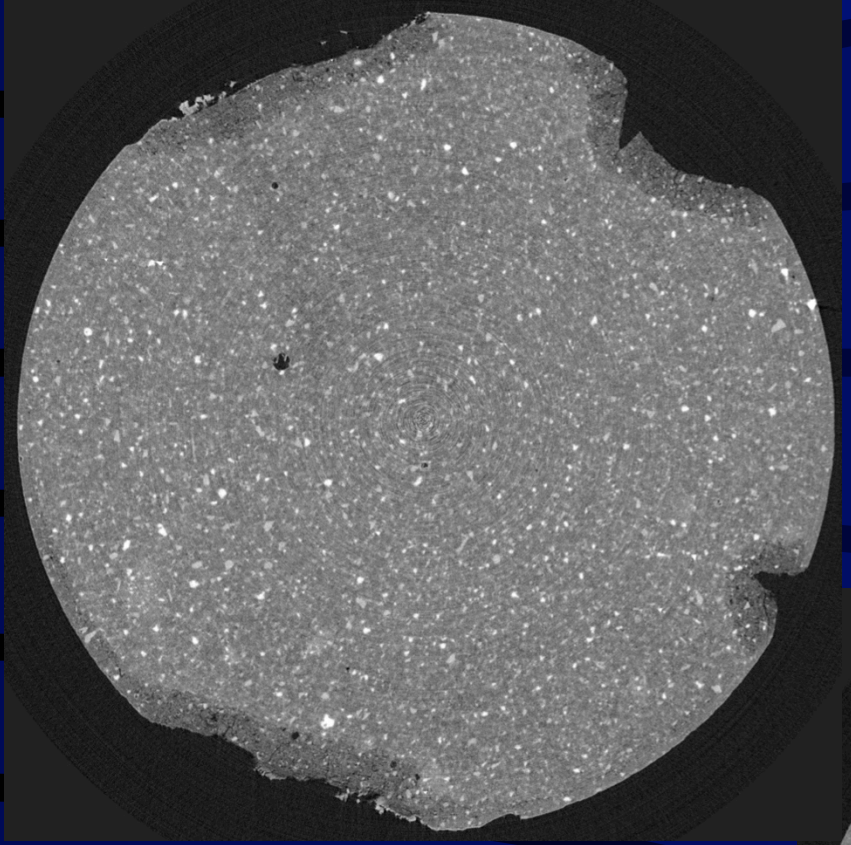

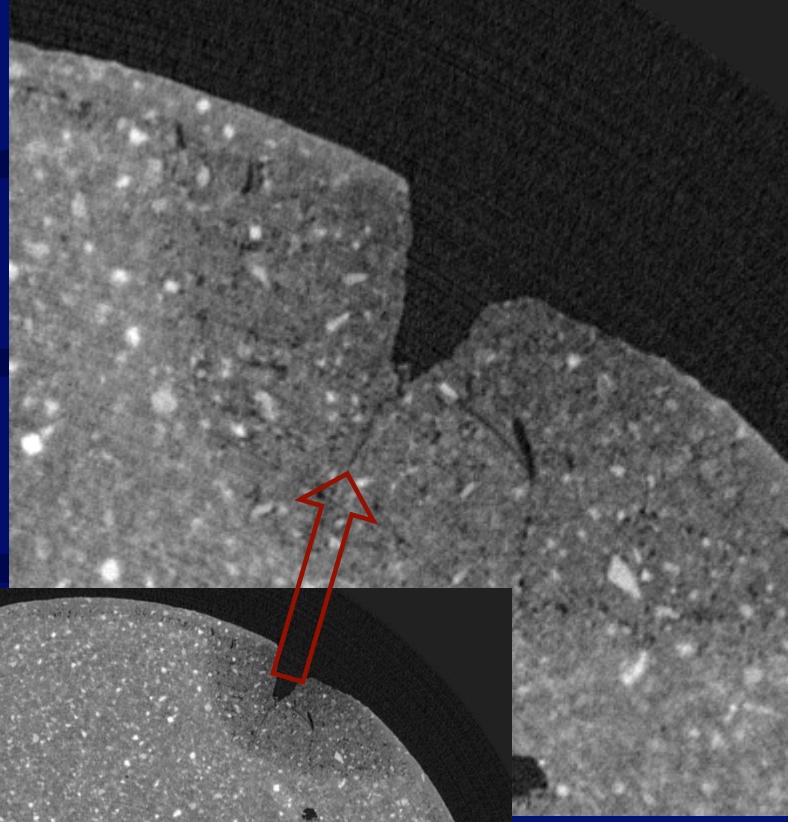

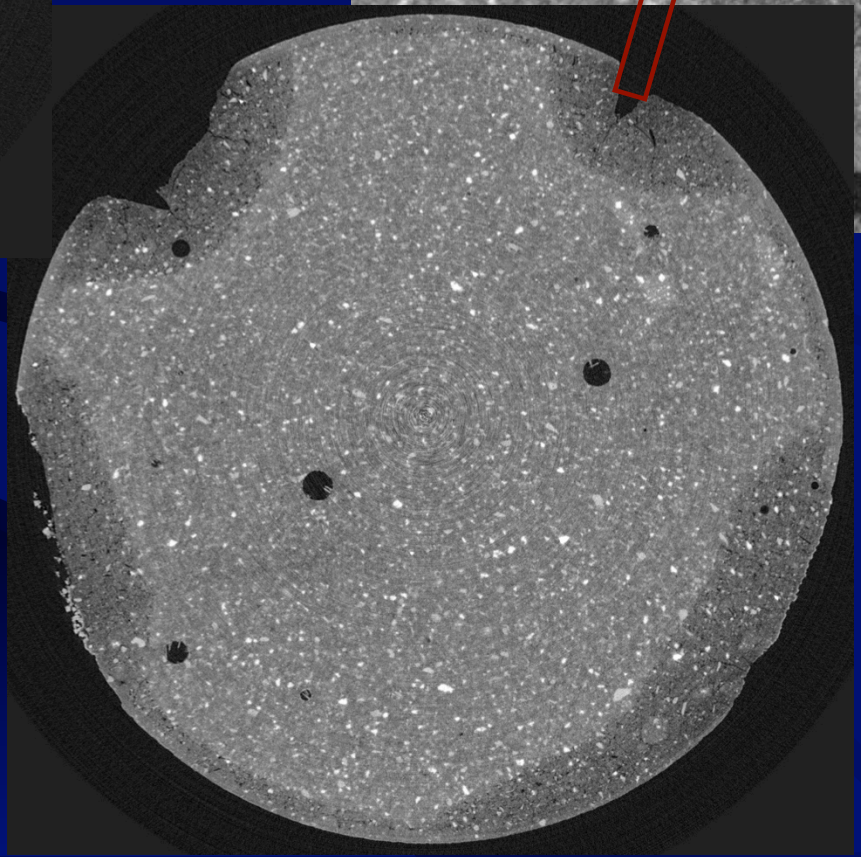

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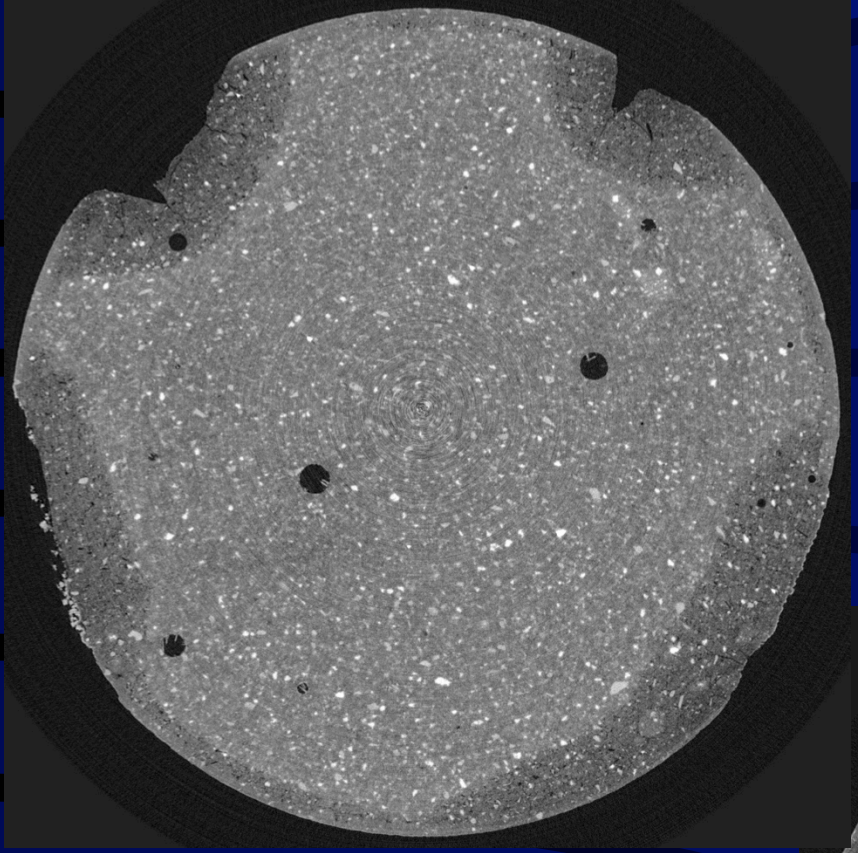

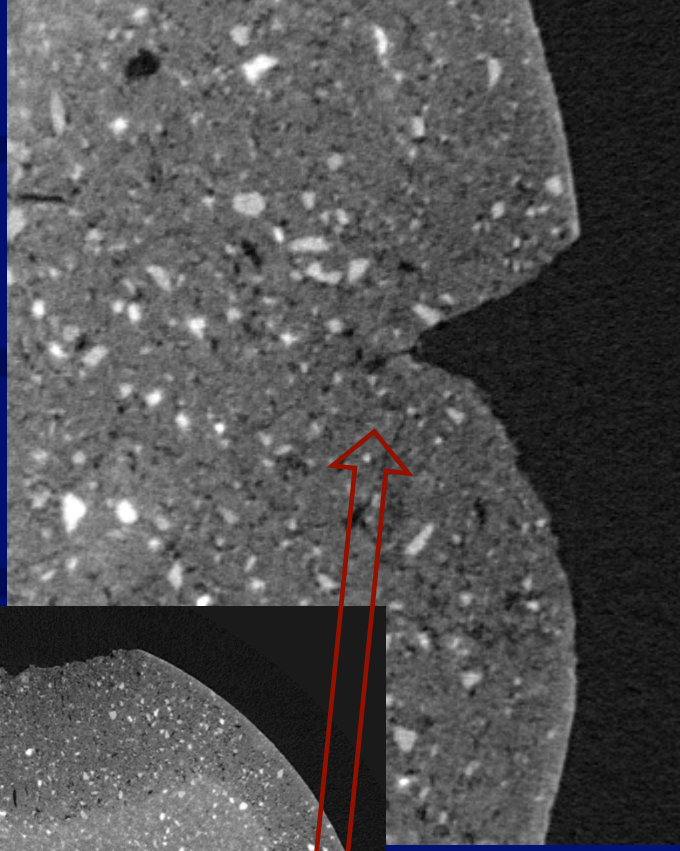

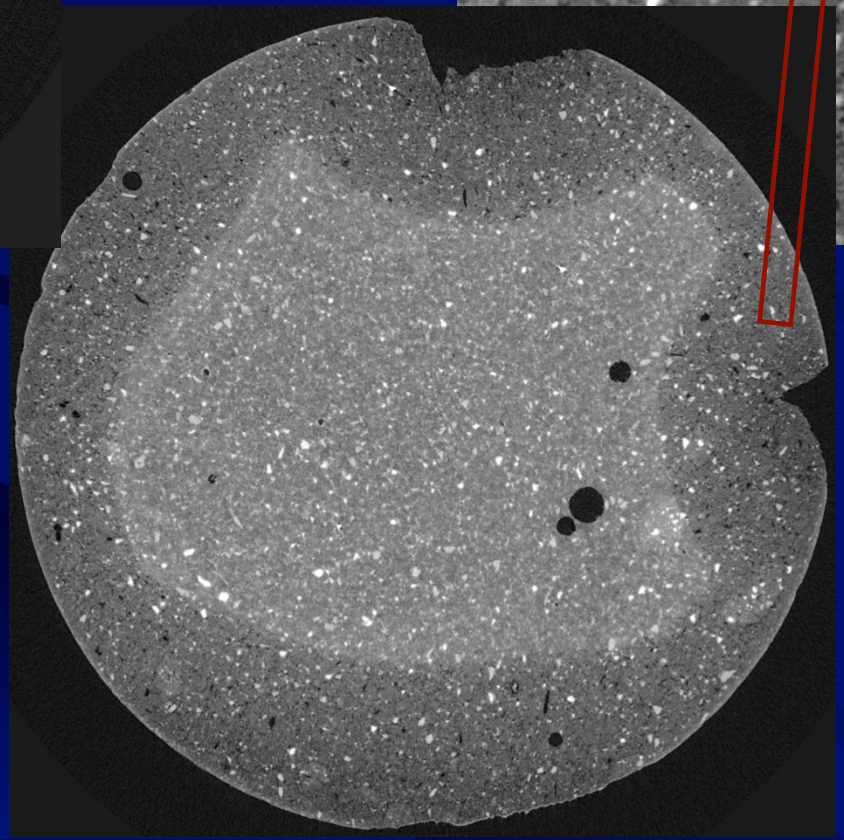

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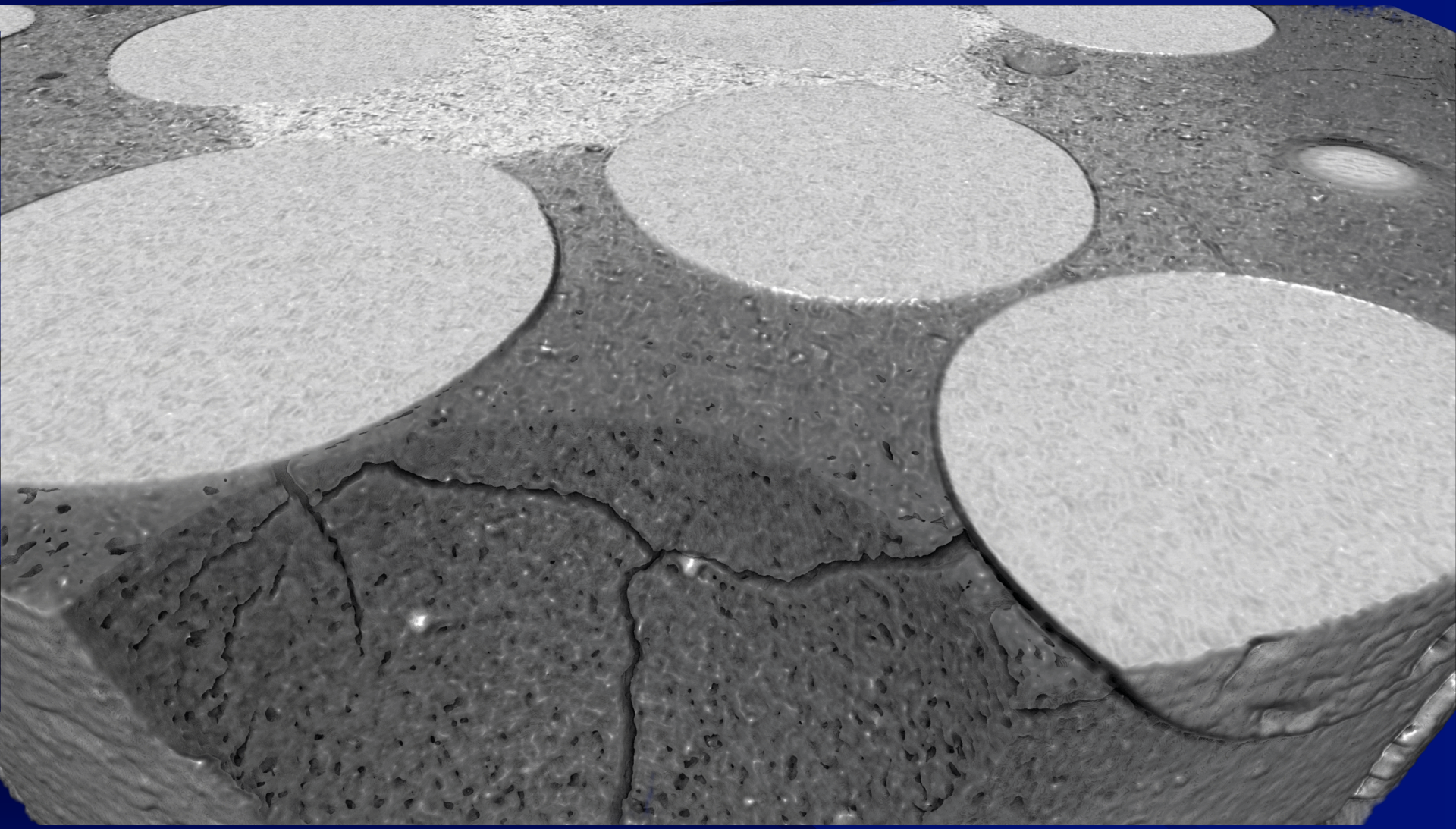


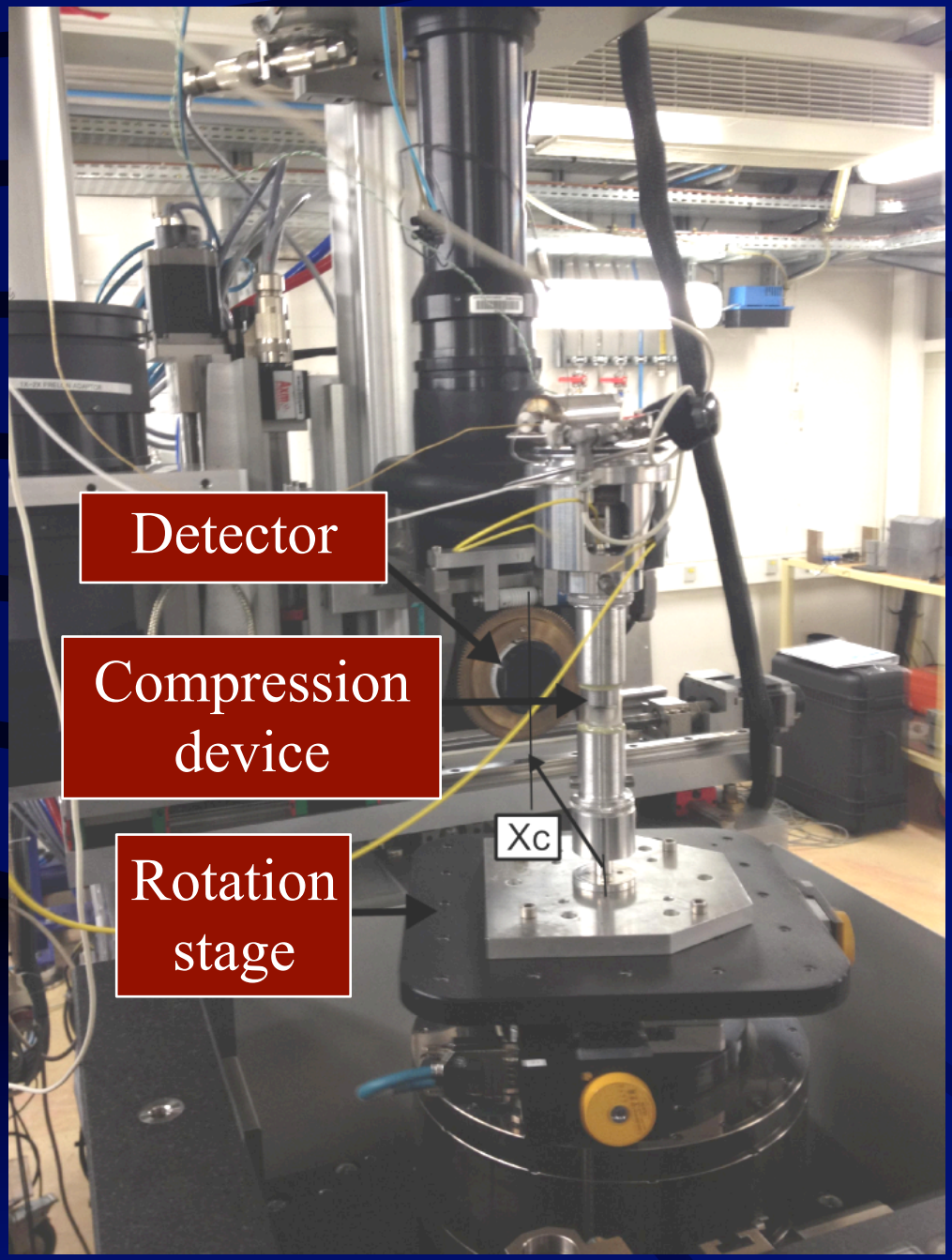
SUMMARY EXAMPLE 1

- Local phenomena
- Local characterisation
- Local interpretation
- Common in porous media physics

EXAMPLE 2

Microtomographie X de matériaux à comportement pseudo-fragile : identifation du réseau de fissures

G. Hauss
PhD thesis, Univ. Bordeaux, 2012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Rotation stage
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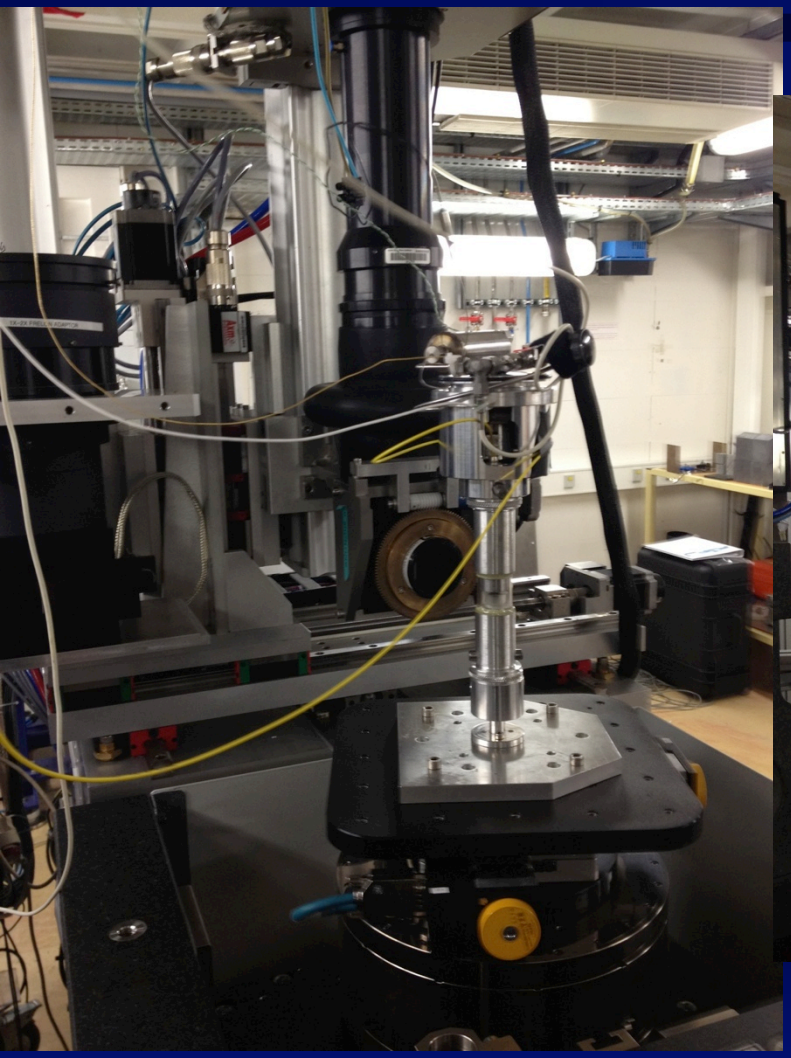
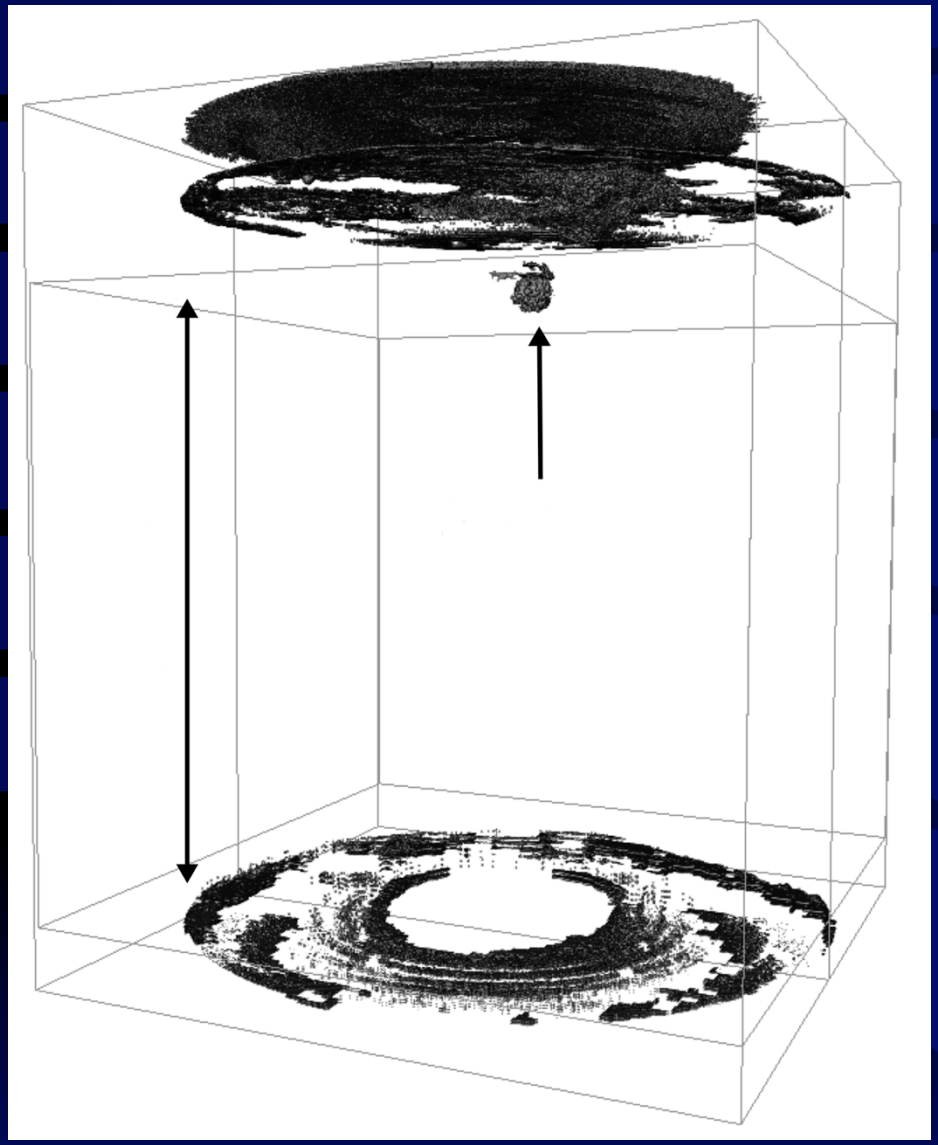


Xc = 900 mm

Xc = 100 mm



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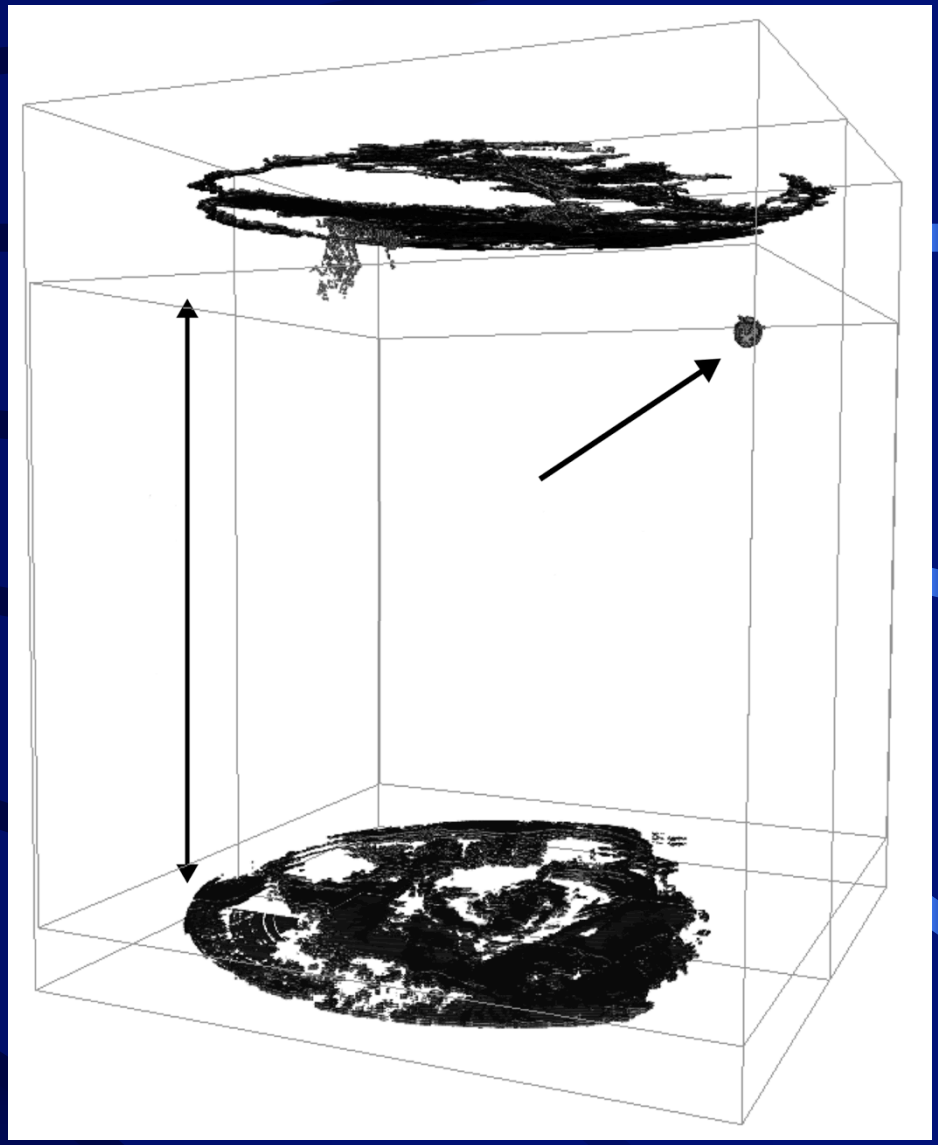

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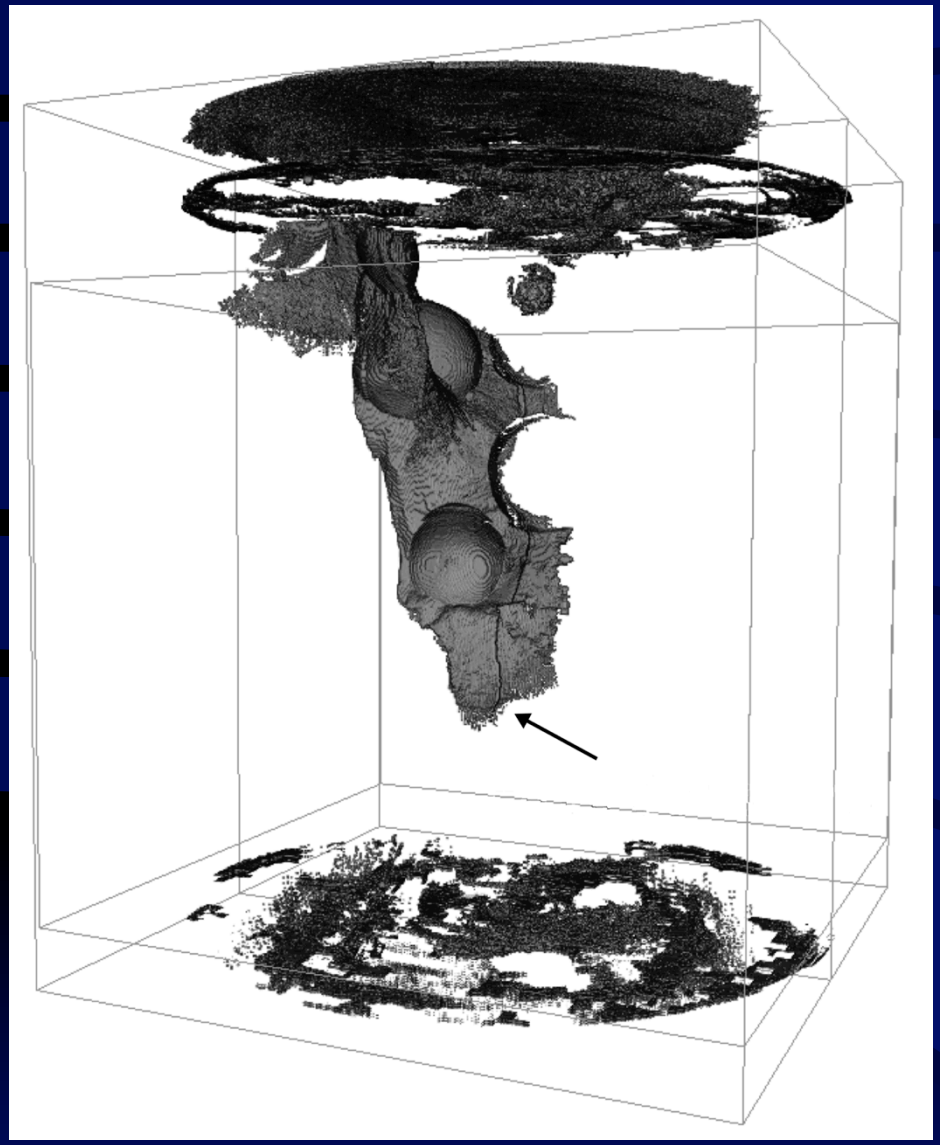

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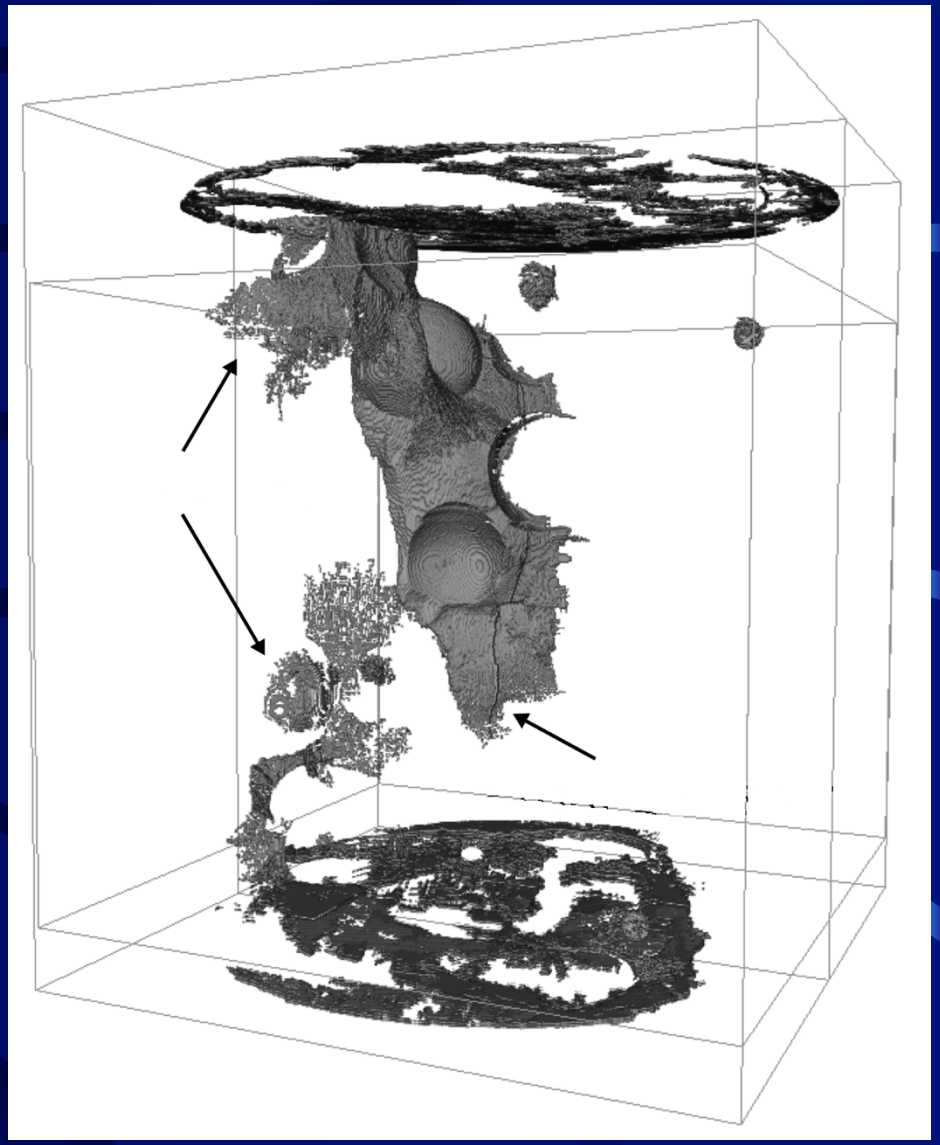

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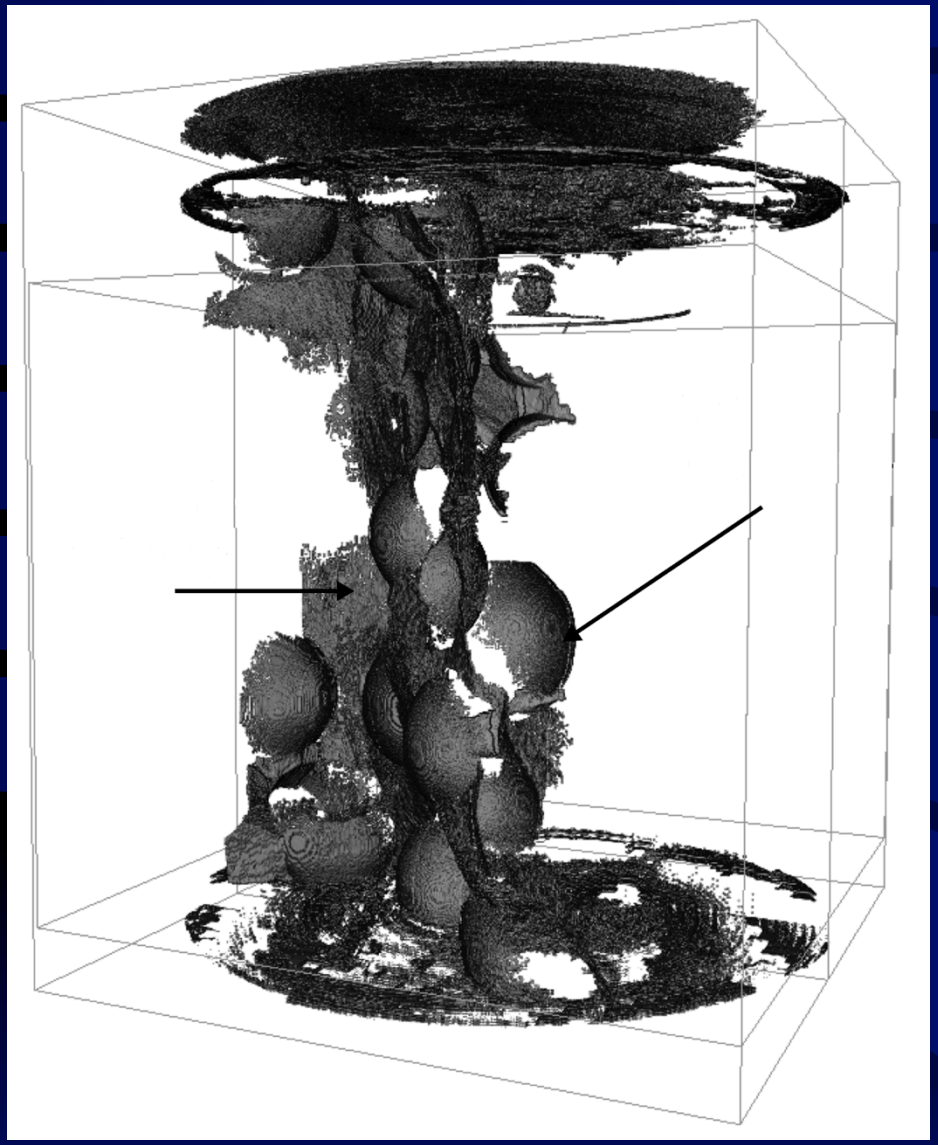

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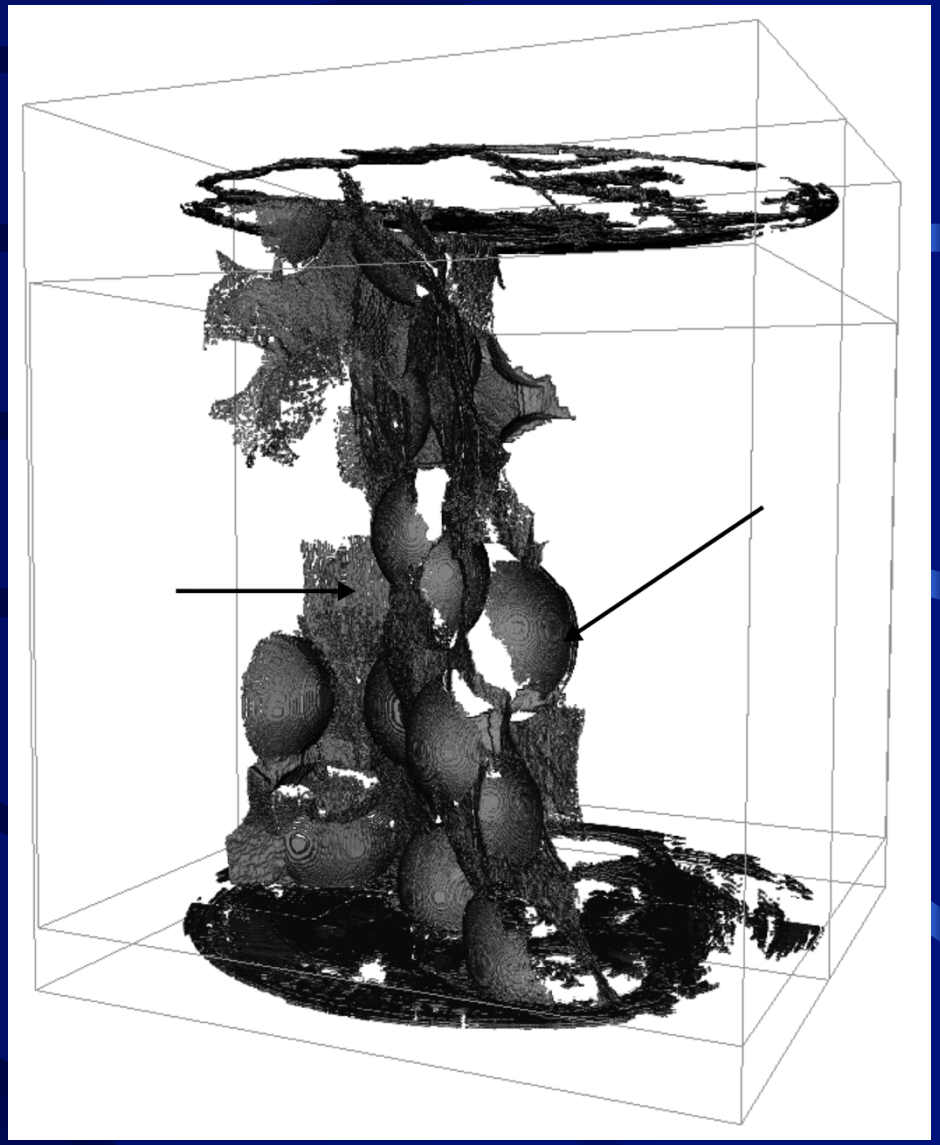

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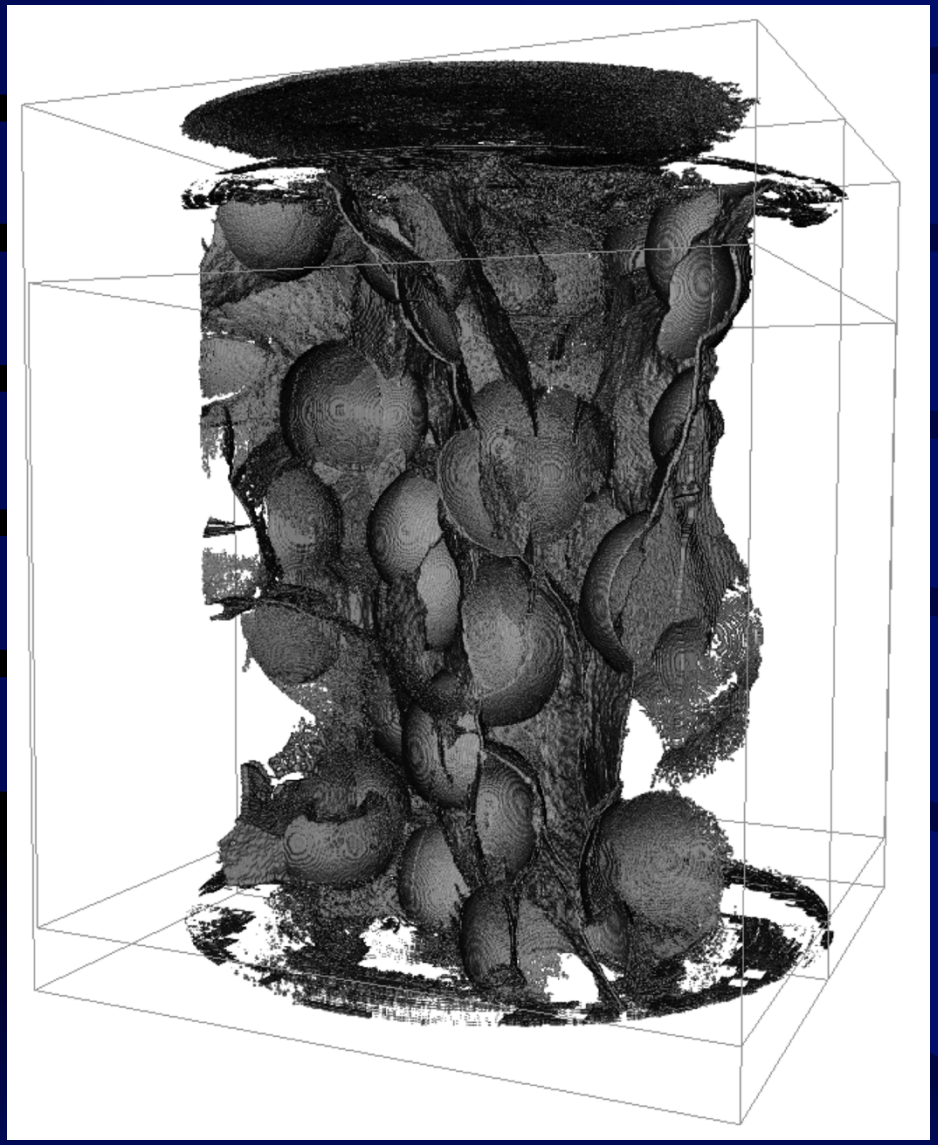

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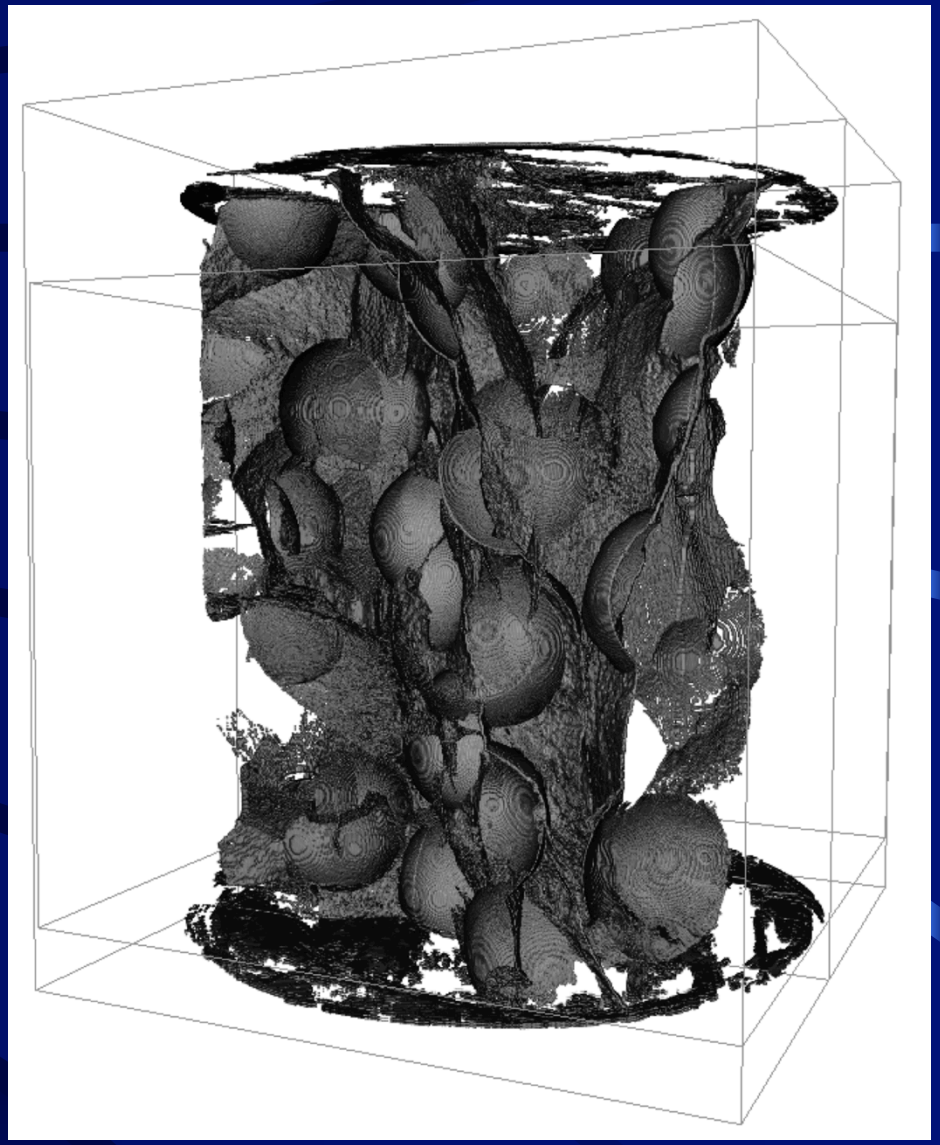
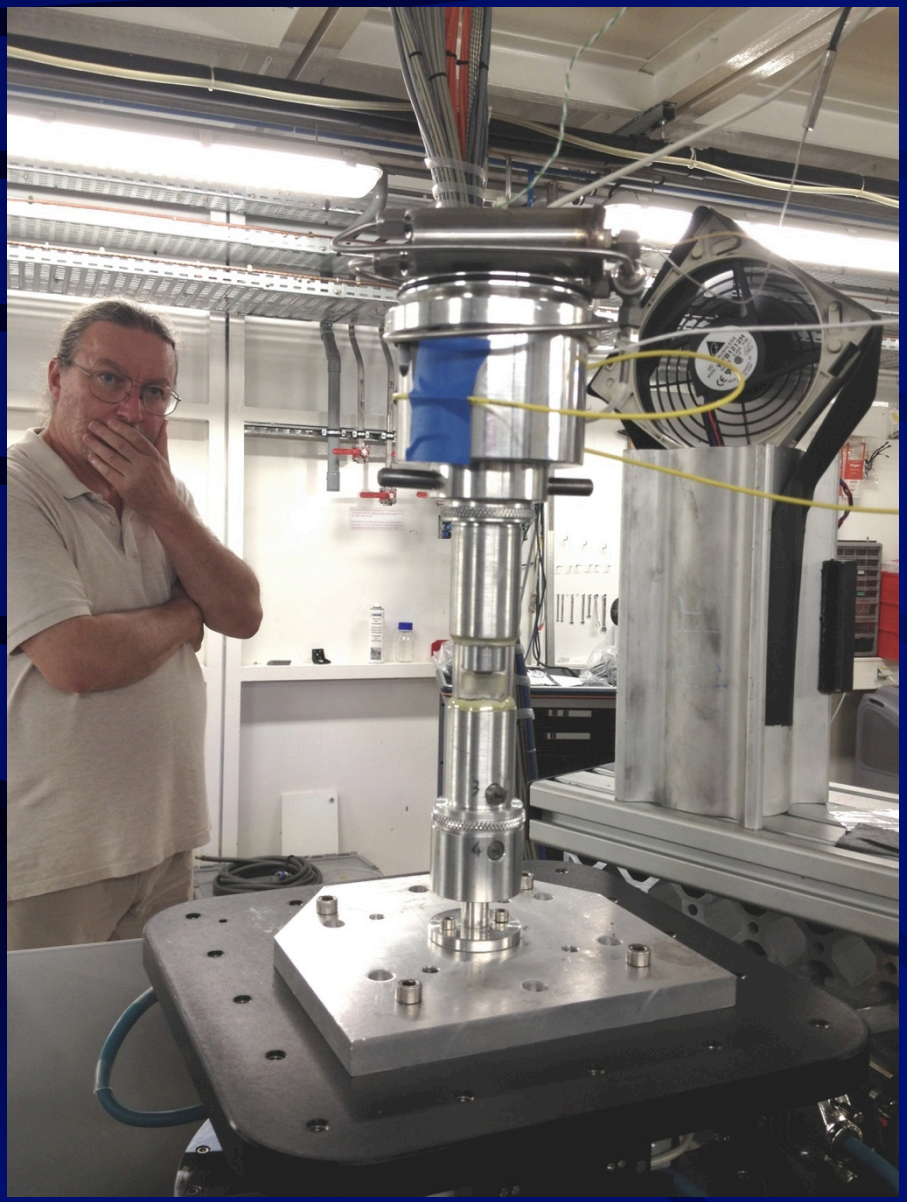


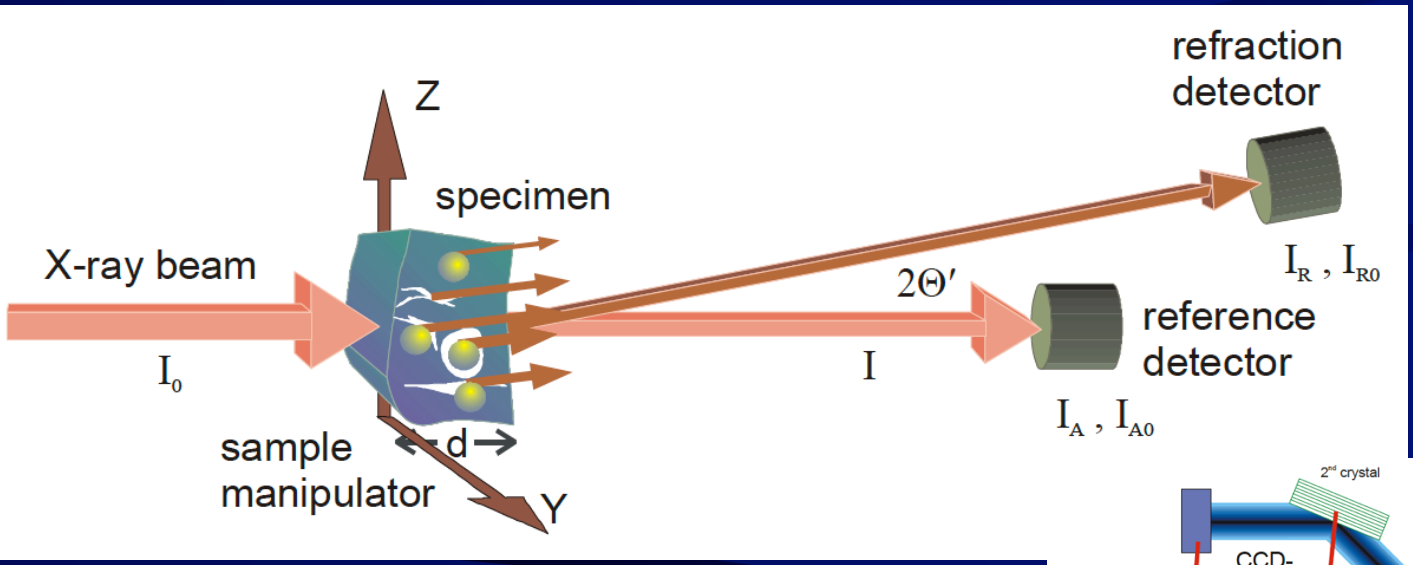
SUMMARY EXAMPLE 2

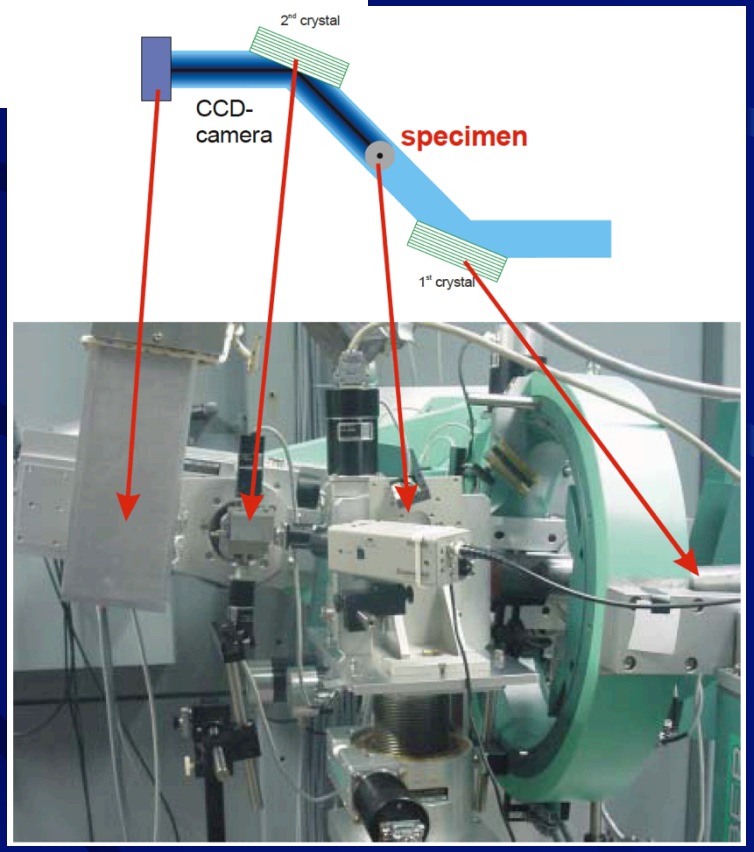
- Local phenomena
- Local characterisations
- Global interpretation

DISCUSSION



OTHER METHODS

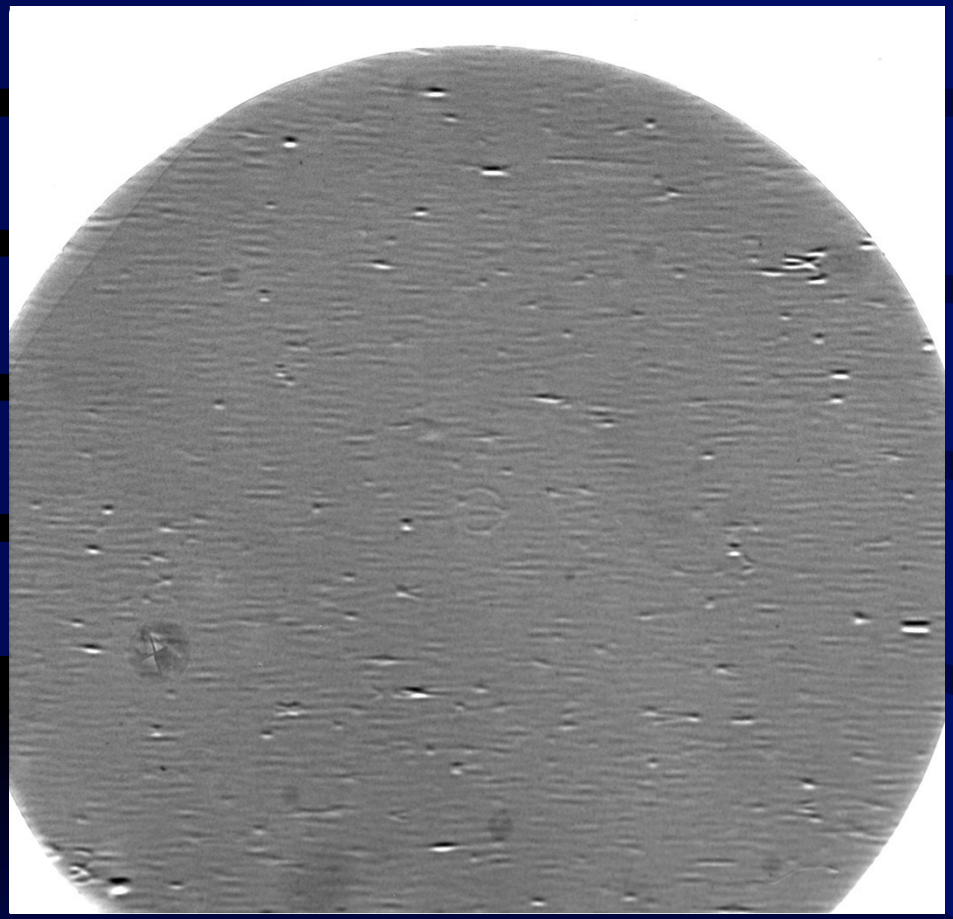


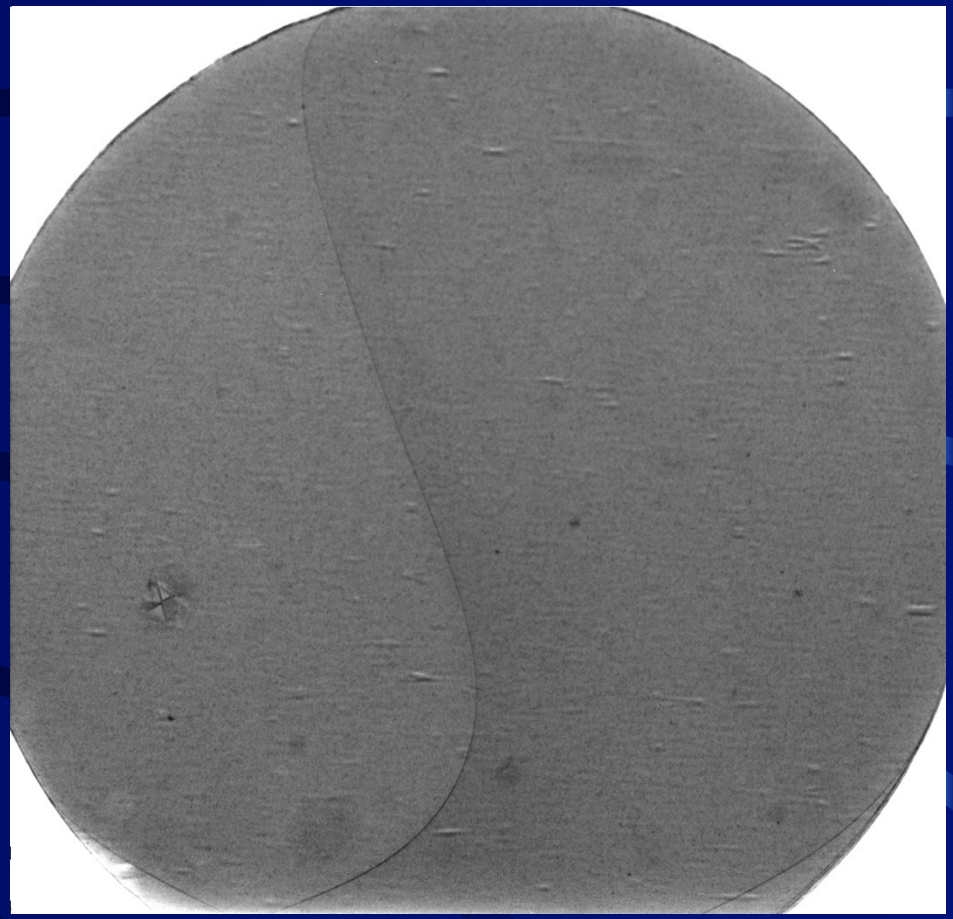


BAM line at BESSY II
(Berlin)

B. R. MÜLLER
A. KUPSCH
R. LAQUAI
G. BRUNO

REFRACTION





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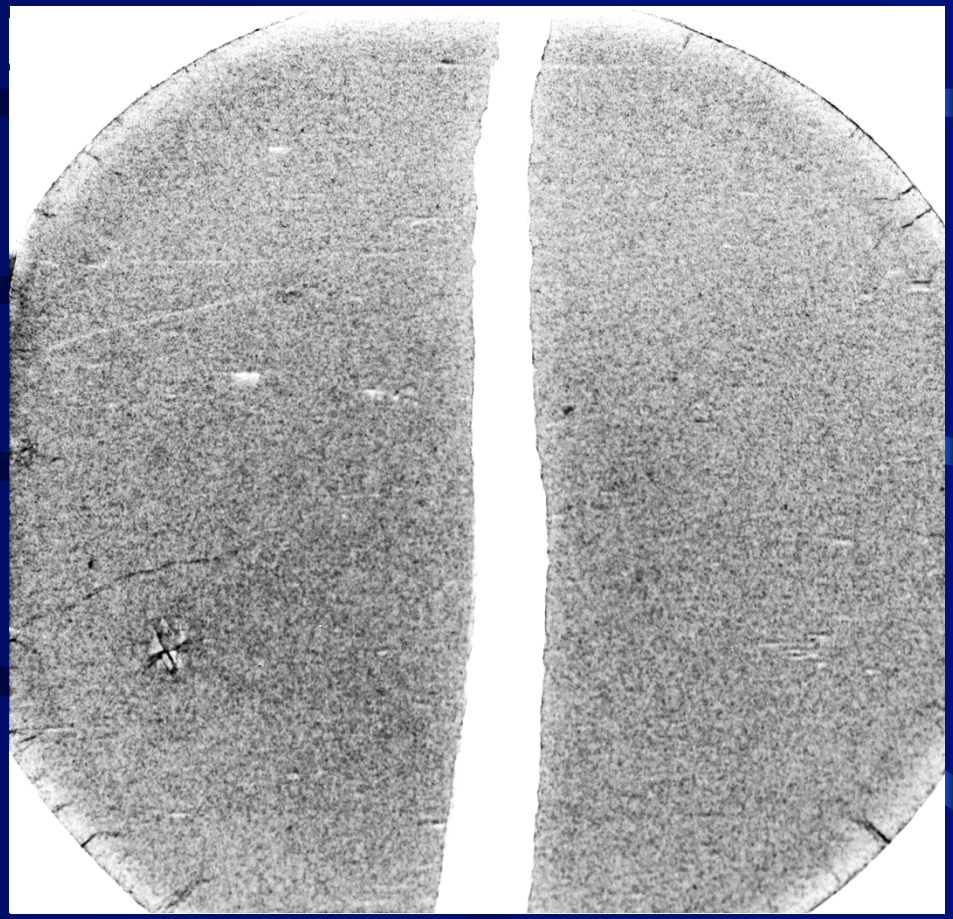

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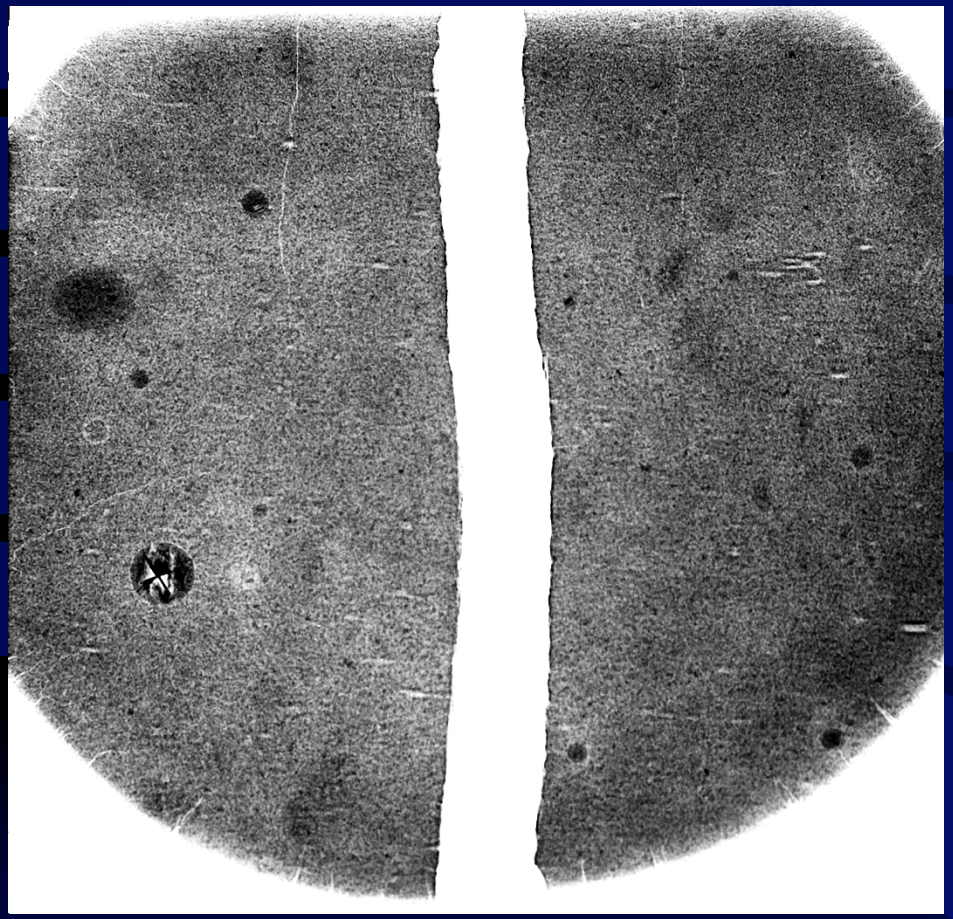
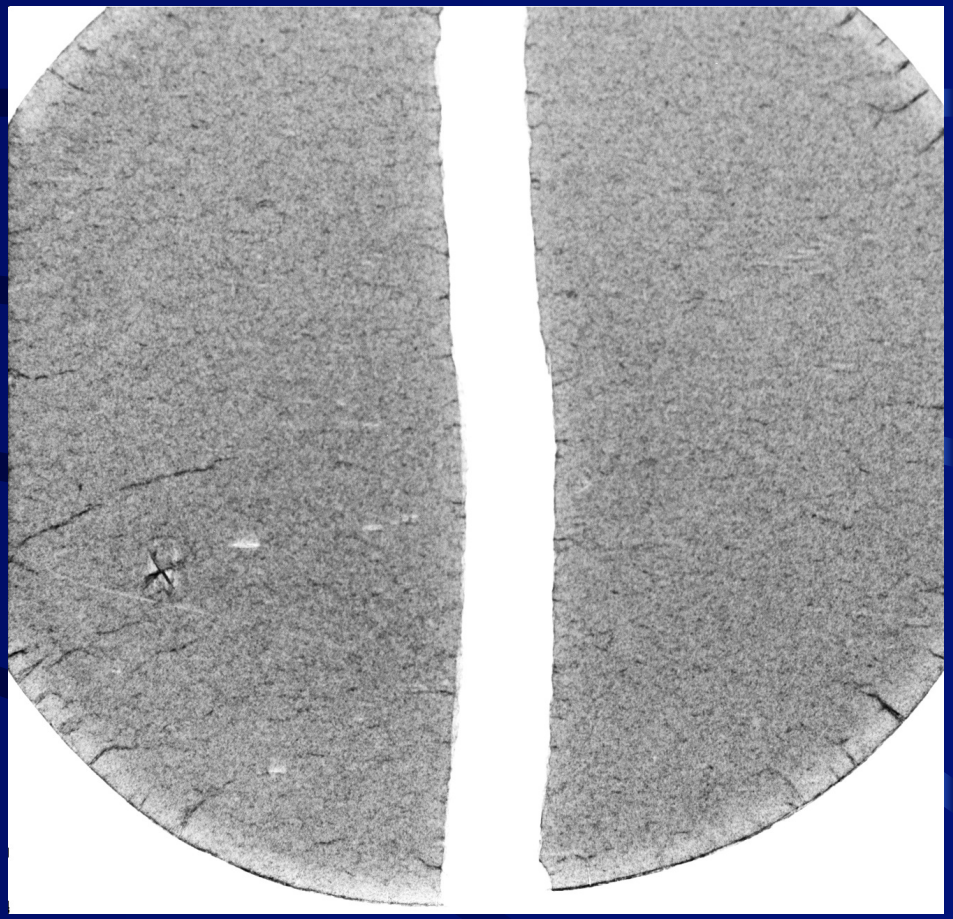
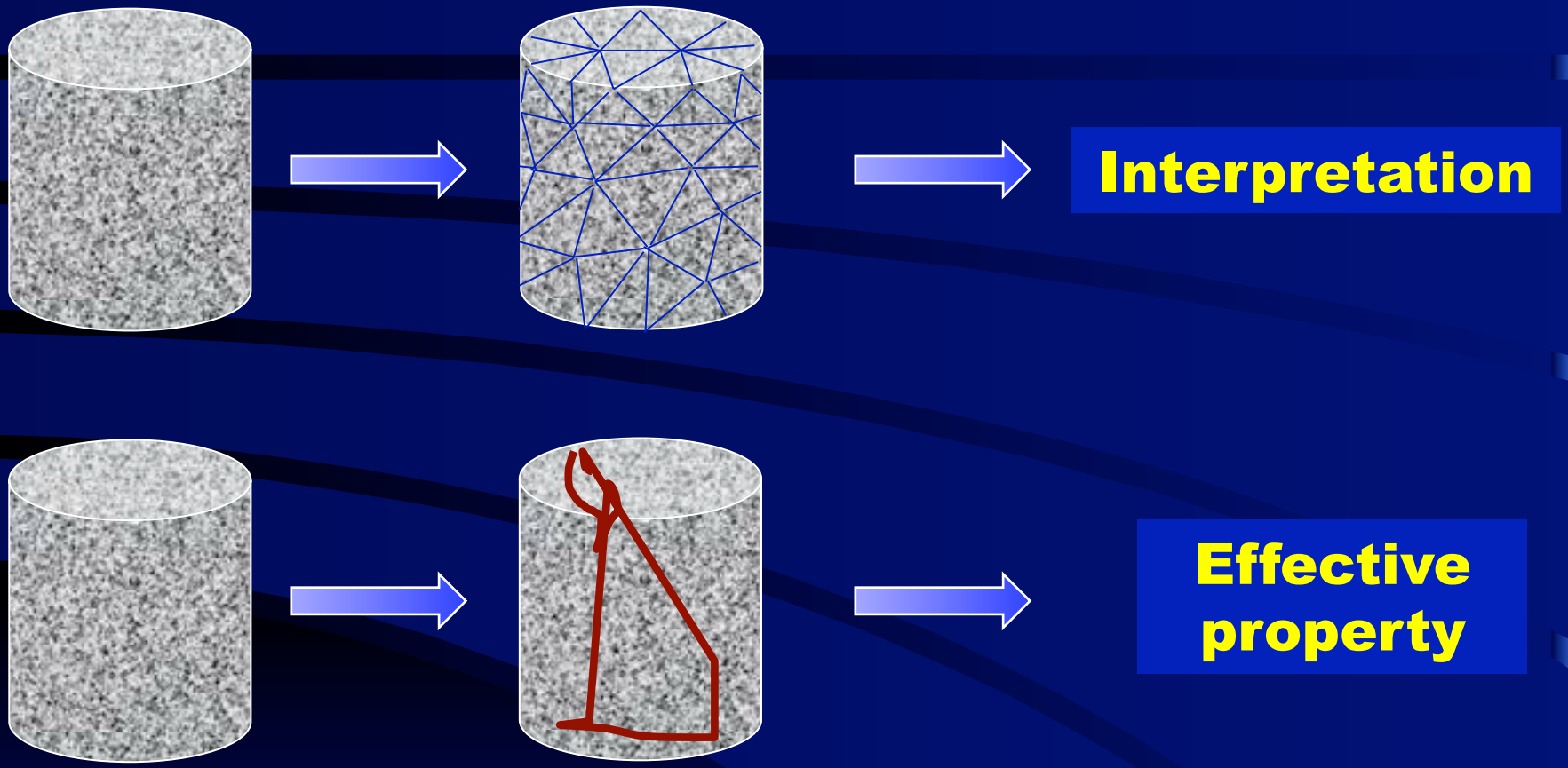




DISCUSSION



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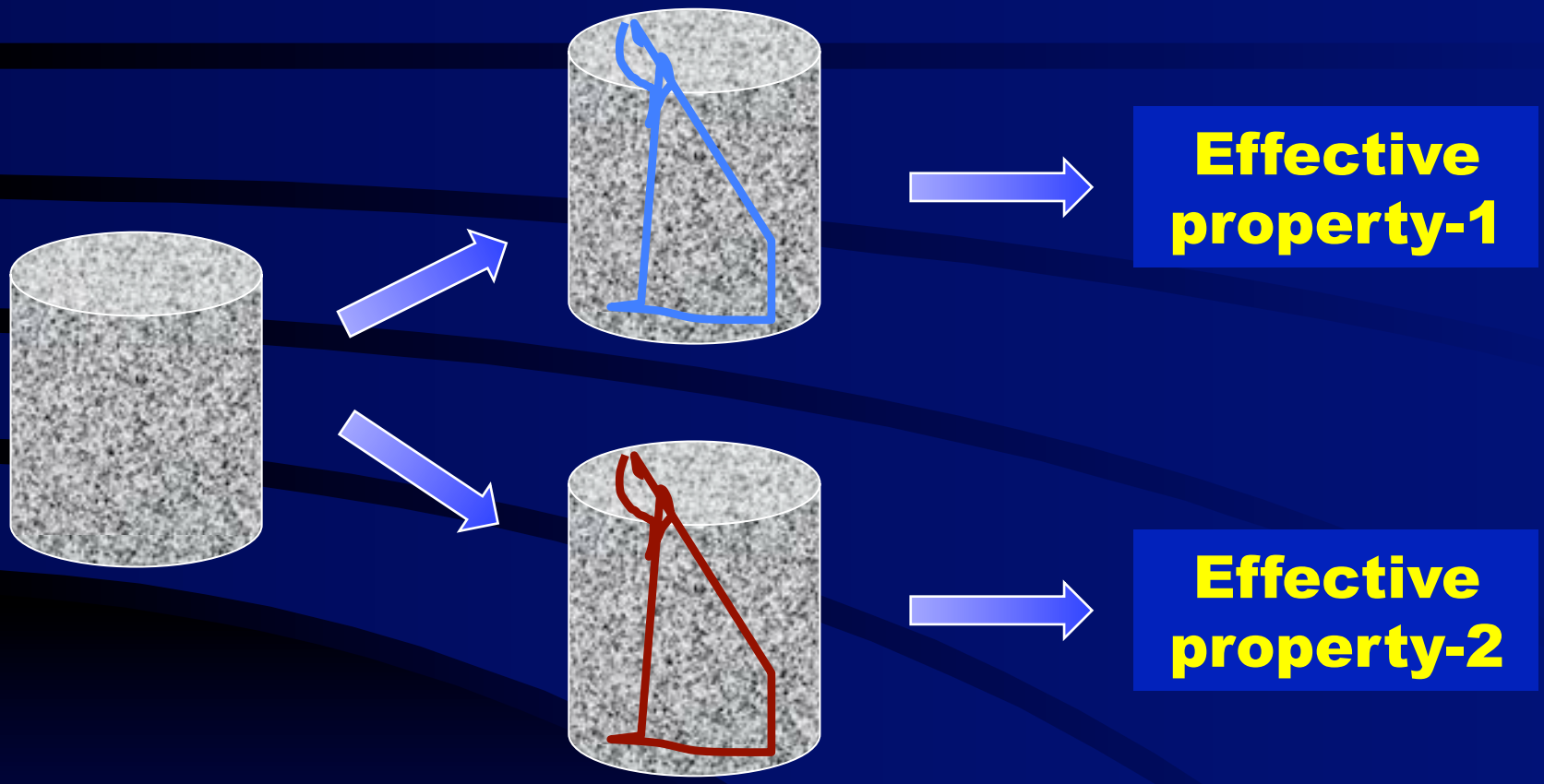
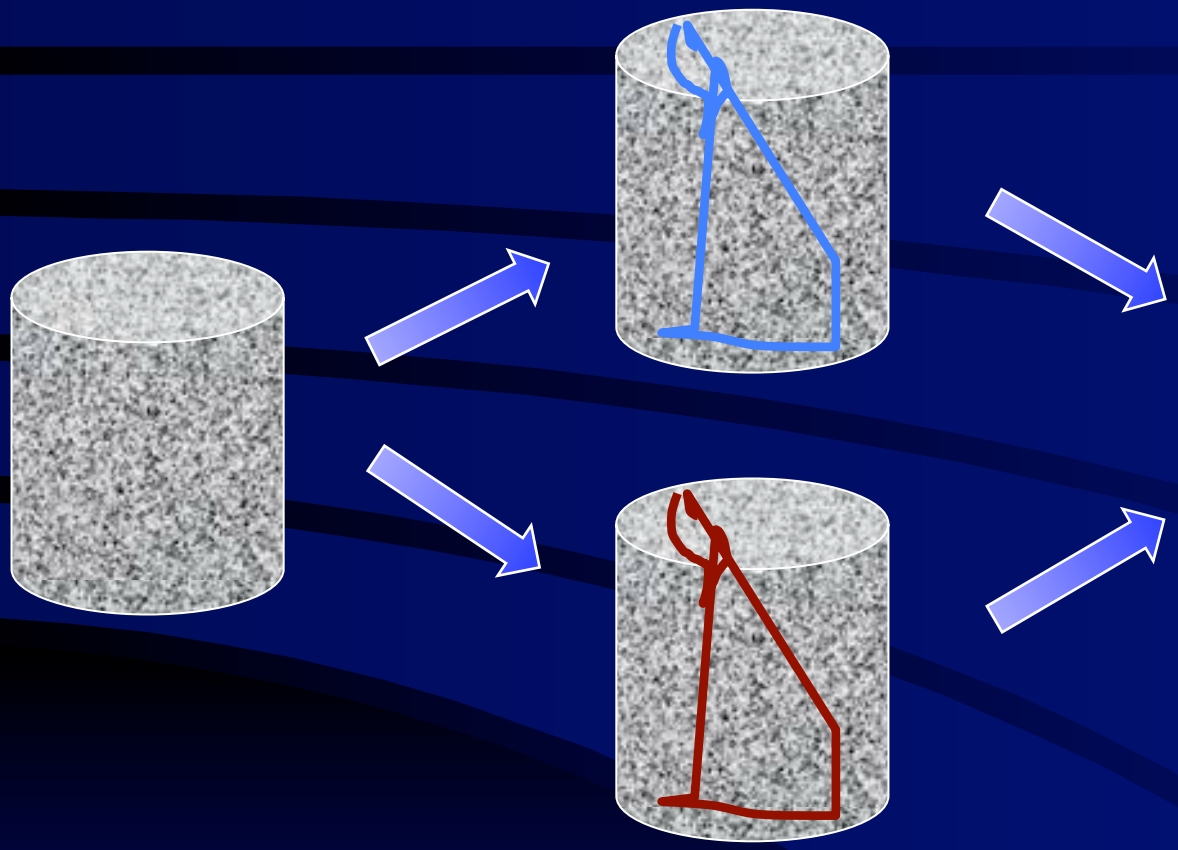
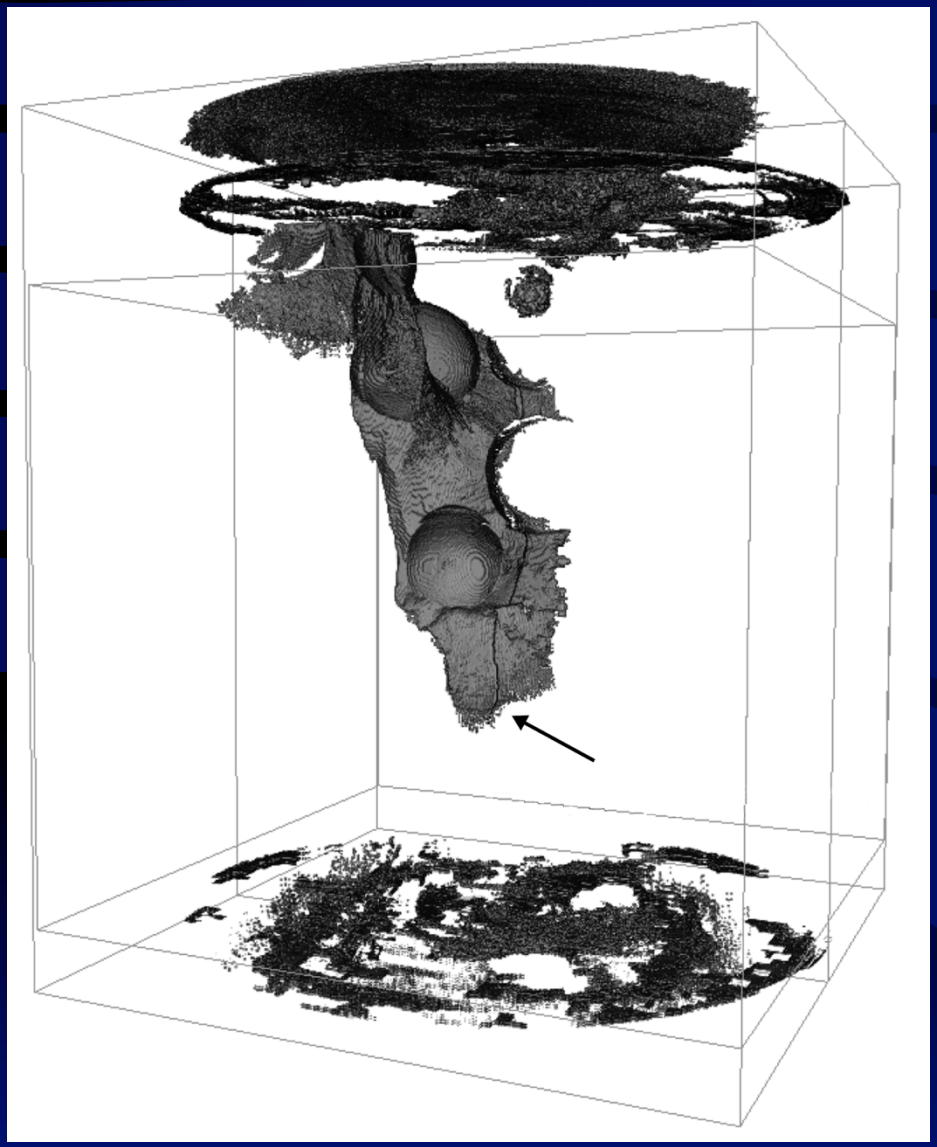


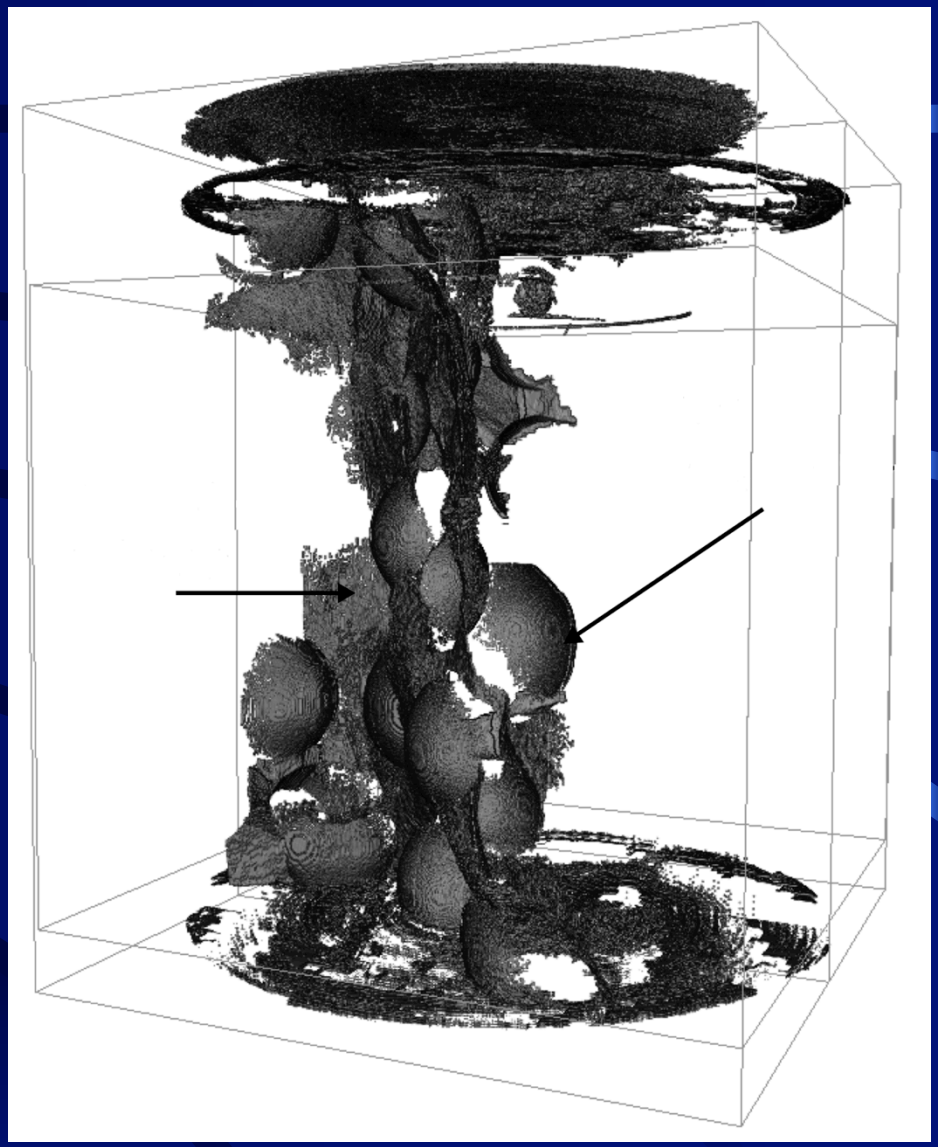
DISCUSSION



Effective property (resolution)

DISCUSSION



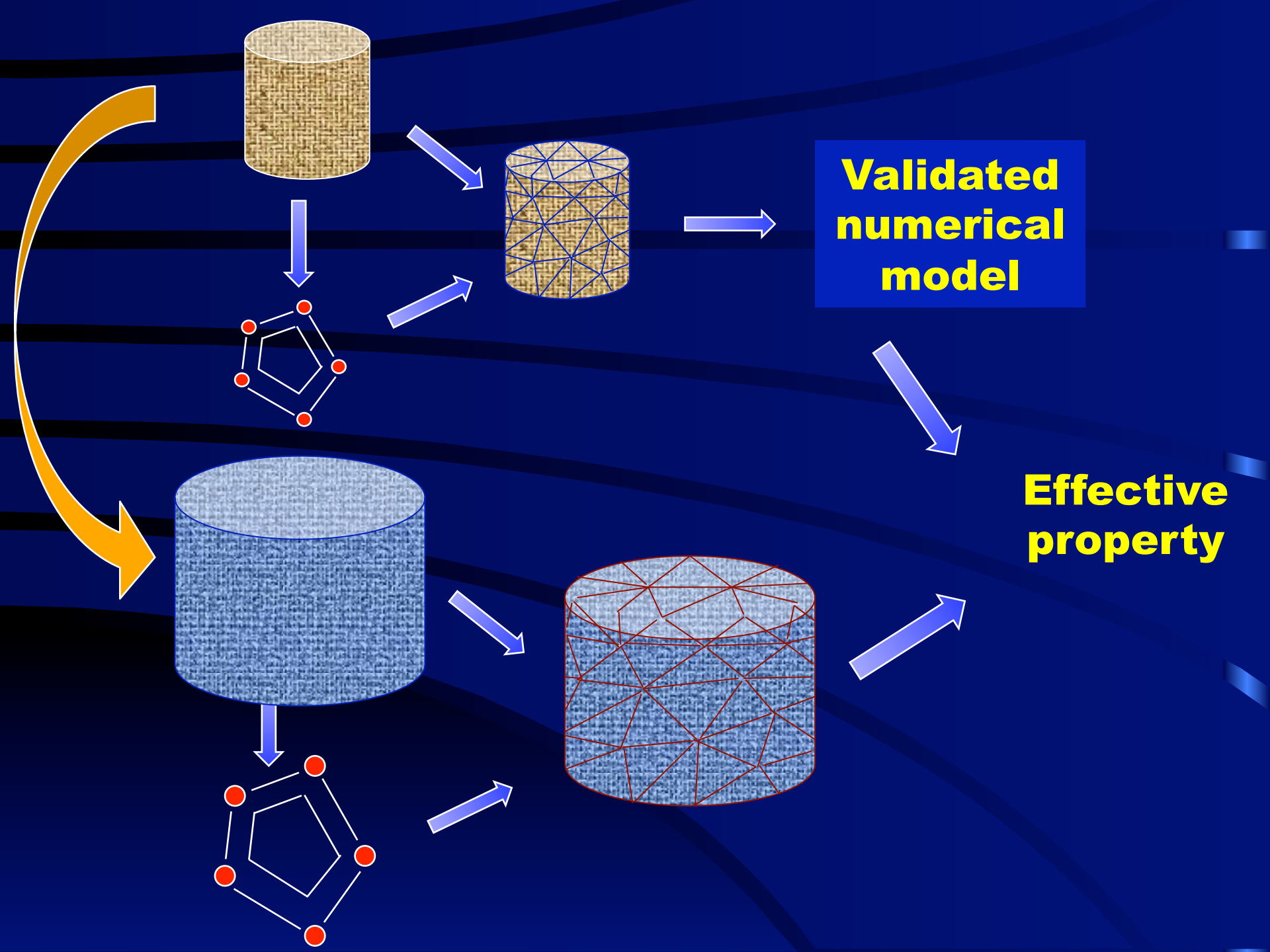


CONCLUSIONS

Image size

Resolution

Representativeness


Validated numerical model
Effective property