

# SOME EXAMPLES OF IMAGE BASED SIMULATIONS IN DIFFERENT APPLICATIONS

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Keynote

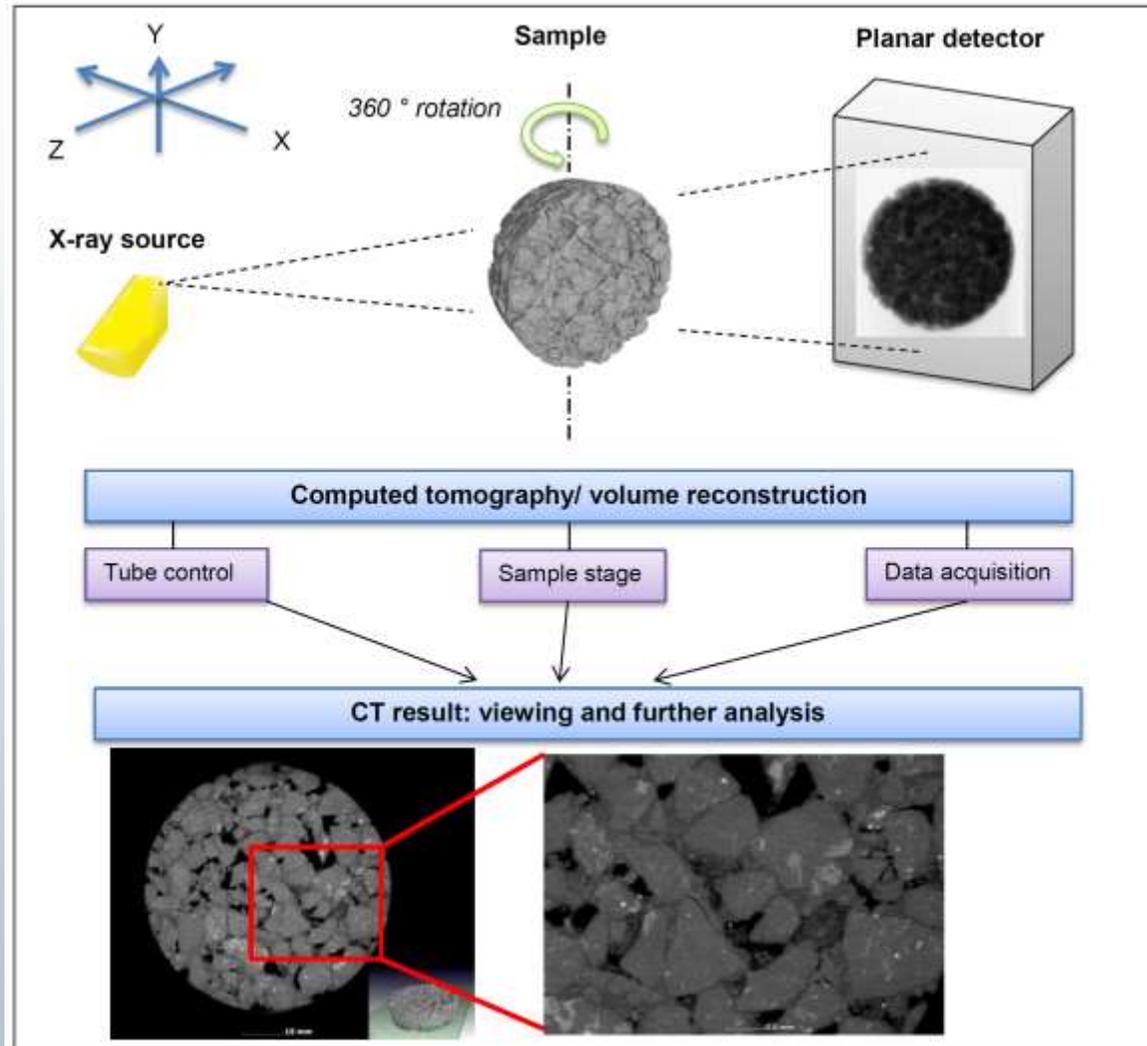


Research group  
3D INNOVATION



CT FACILITY  
STELLENBOSCH

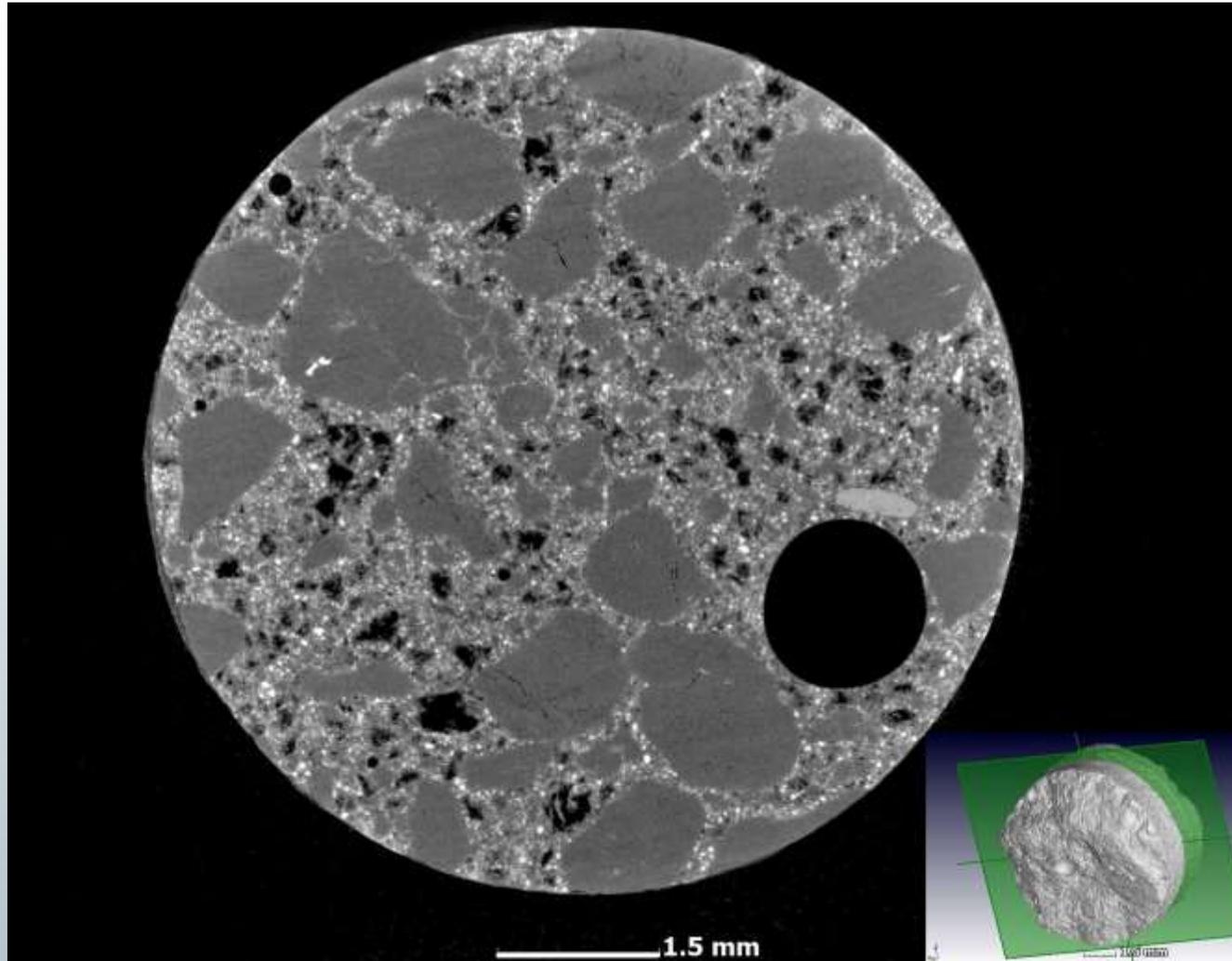
# CIVIL ENGINEERING – ASPHALT AND CONCRETE



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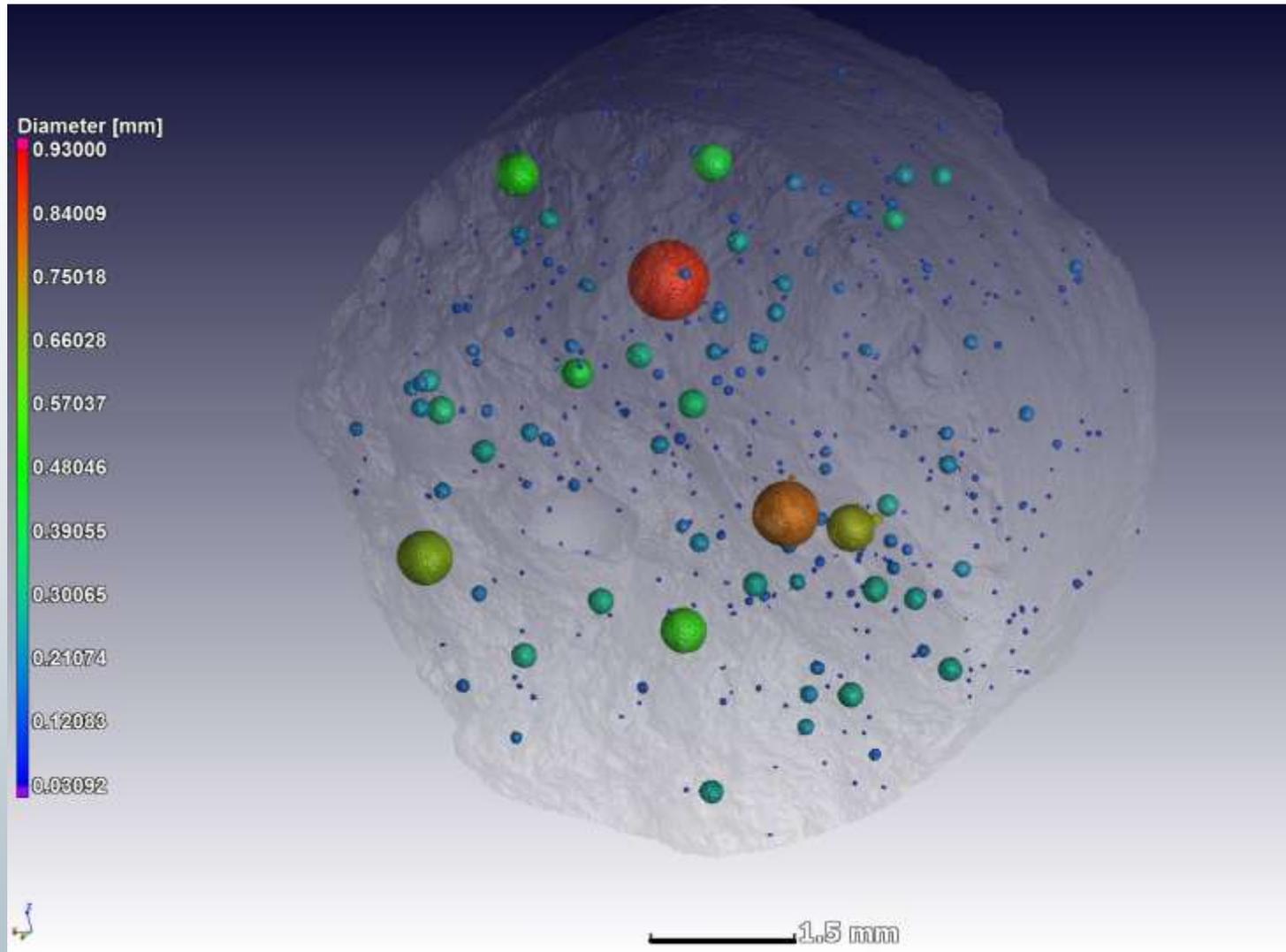
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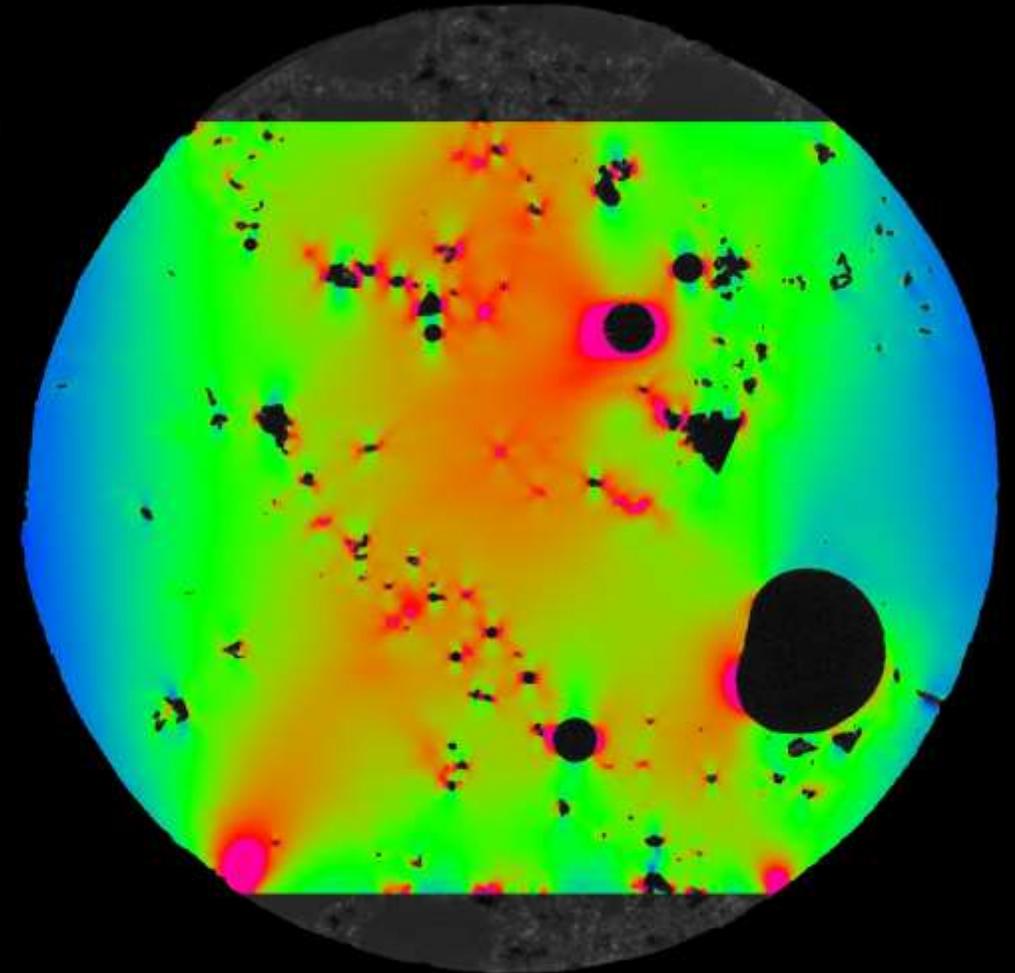
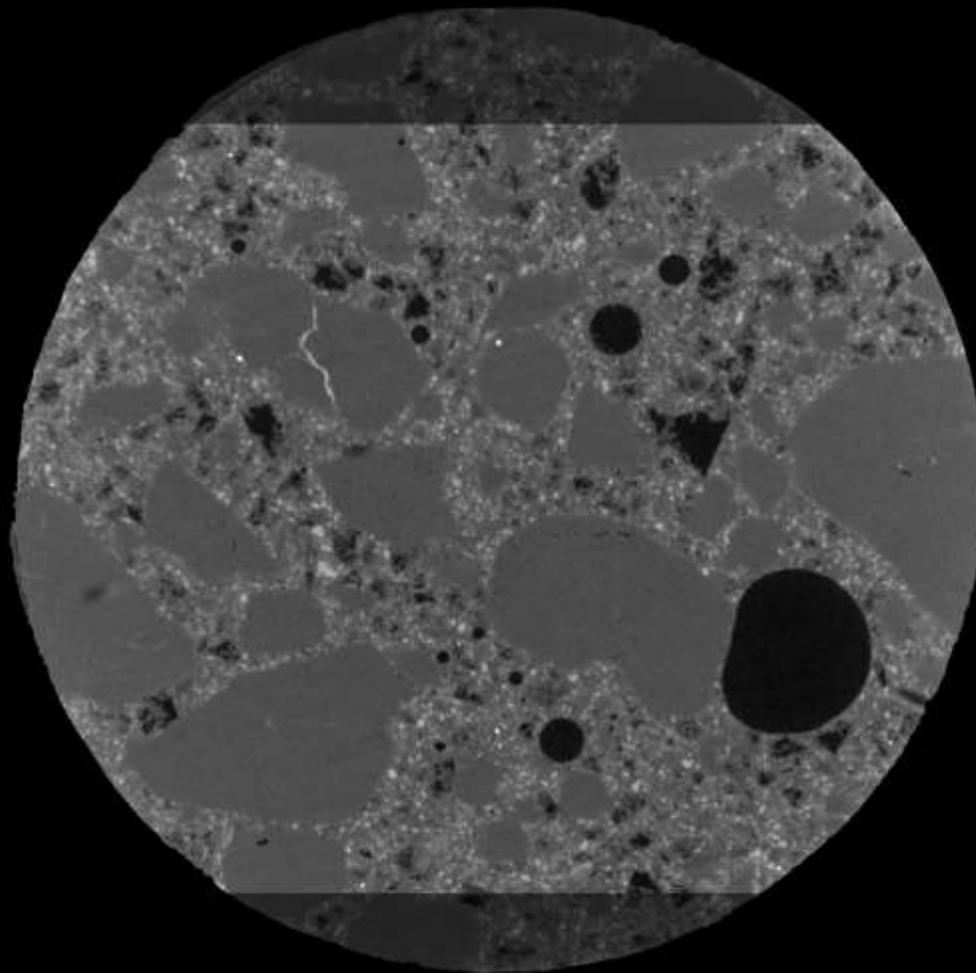
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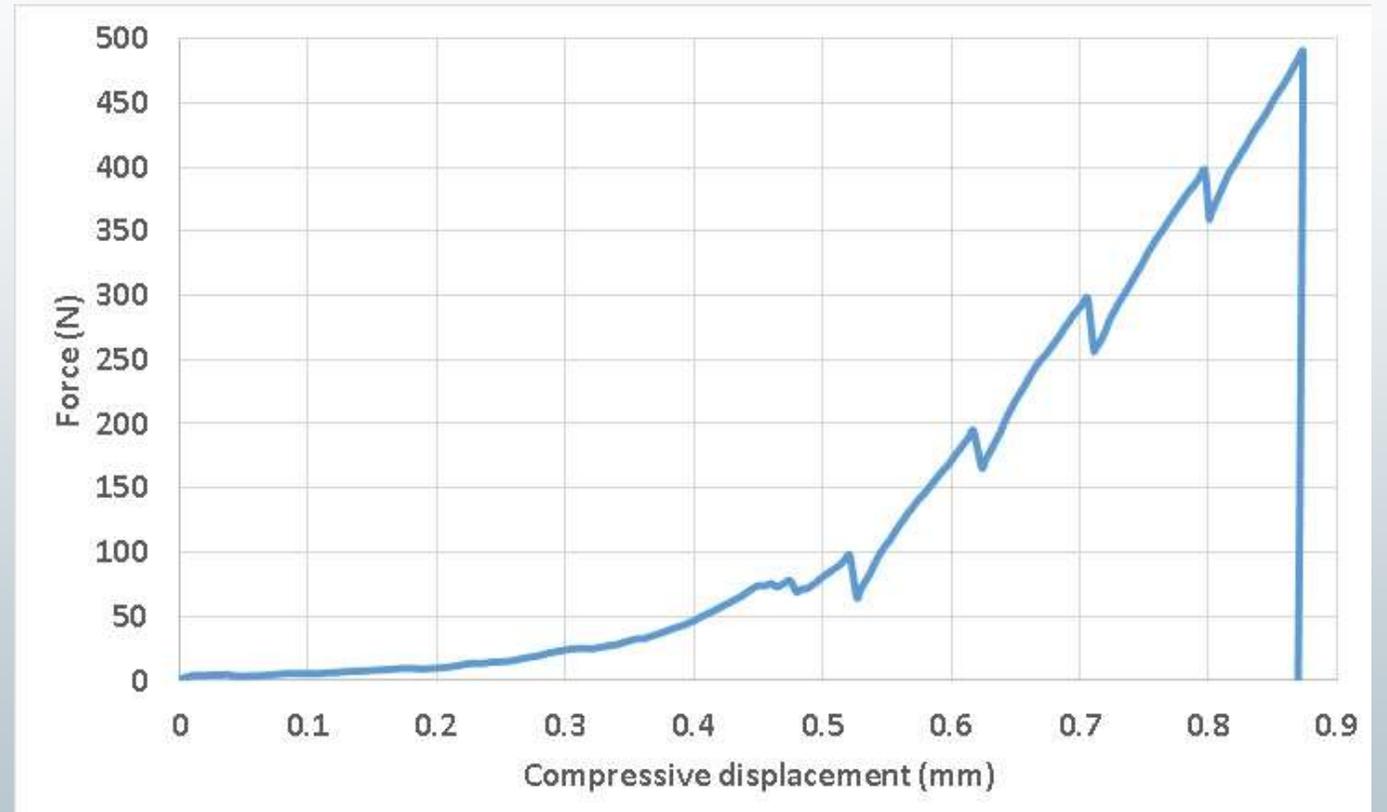
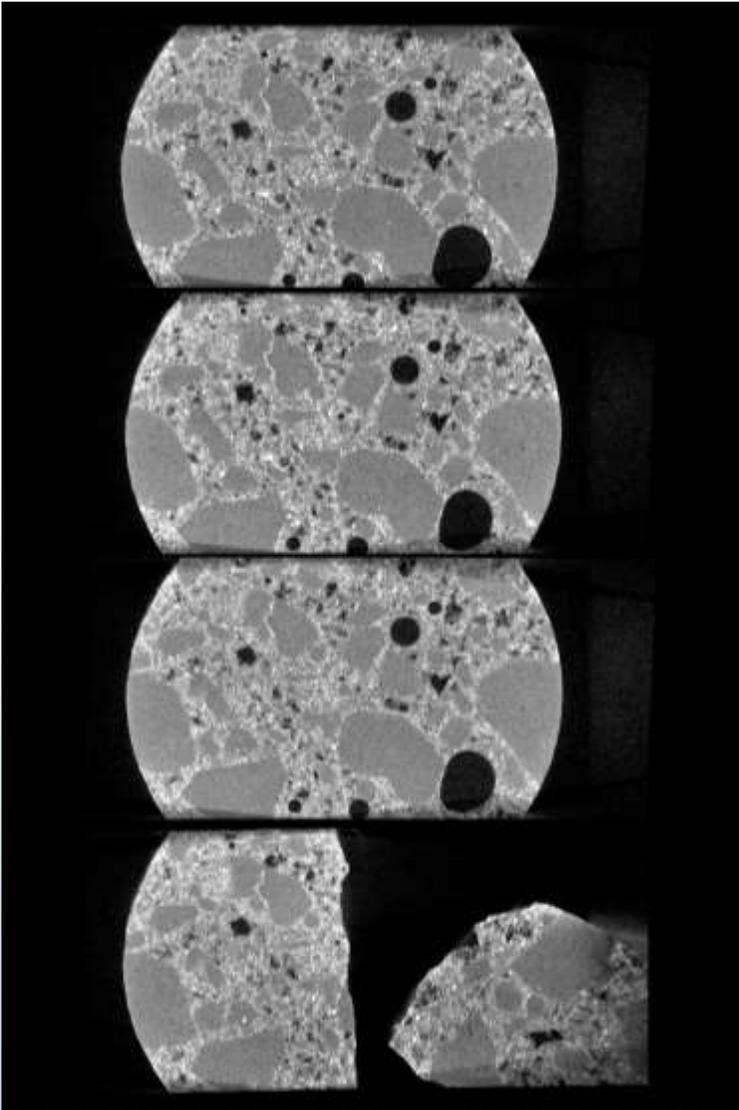
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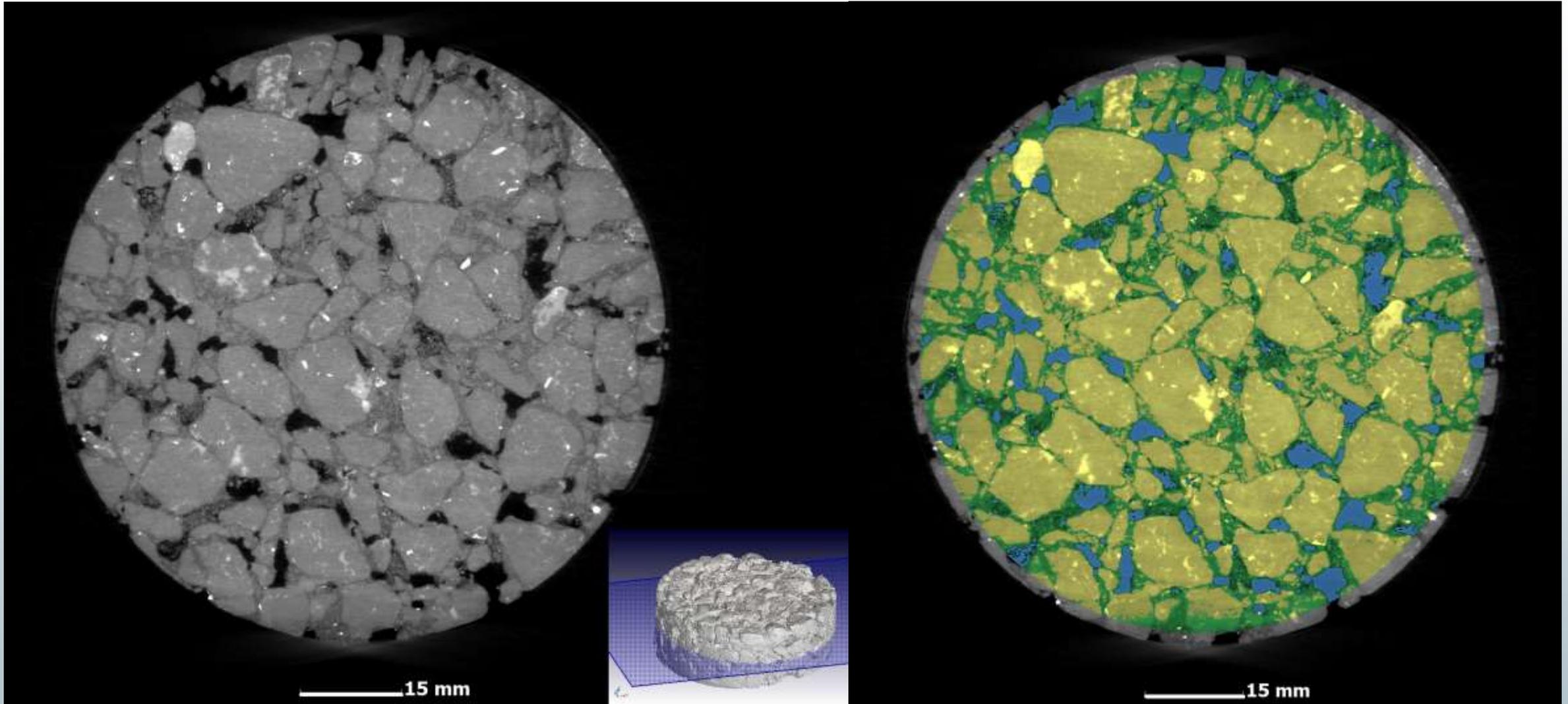
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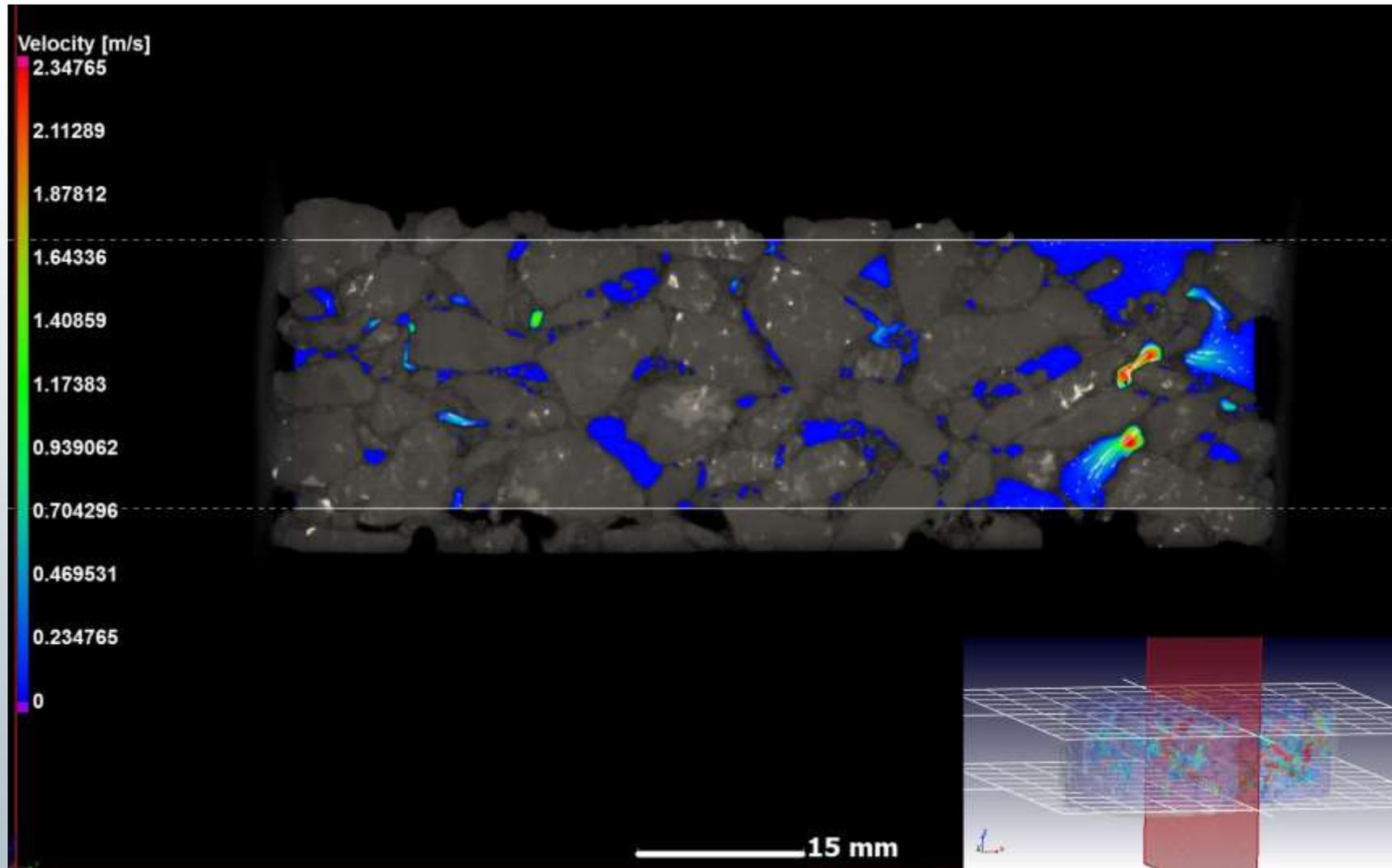
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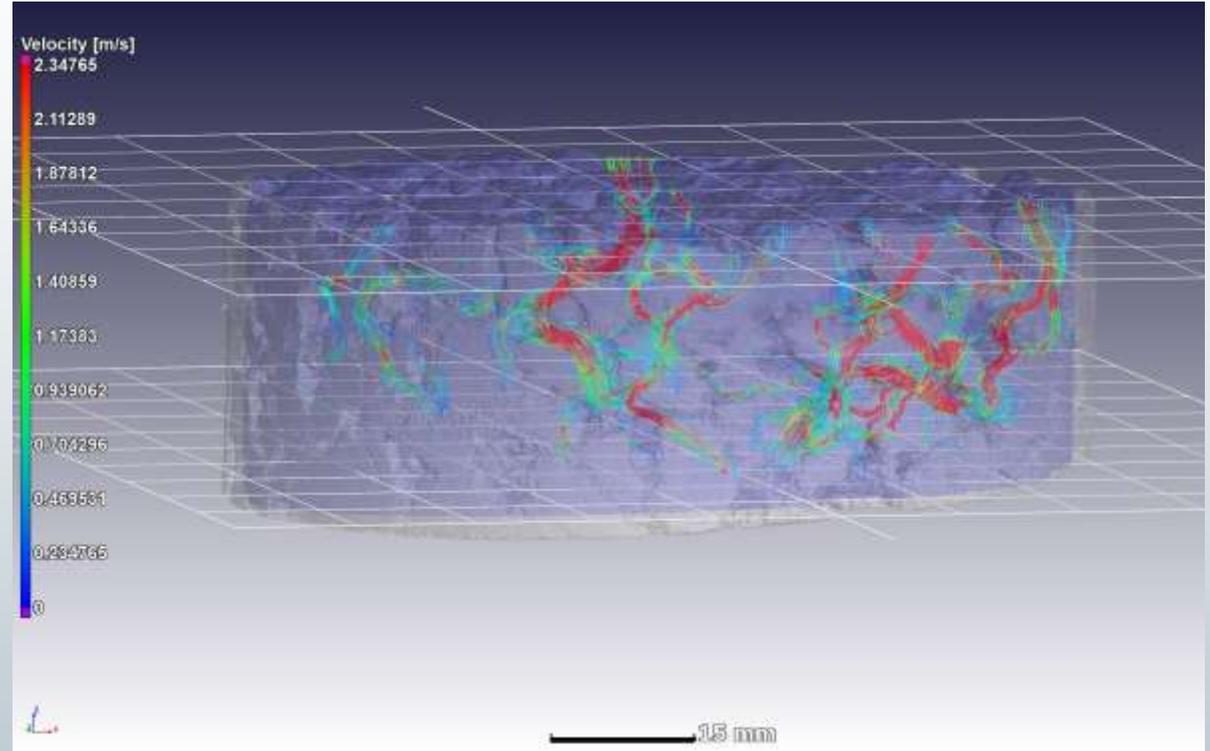
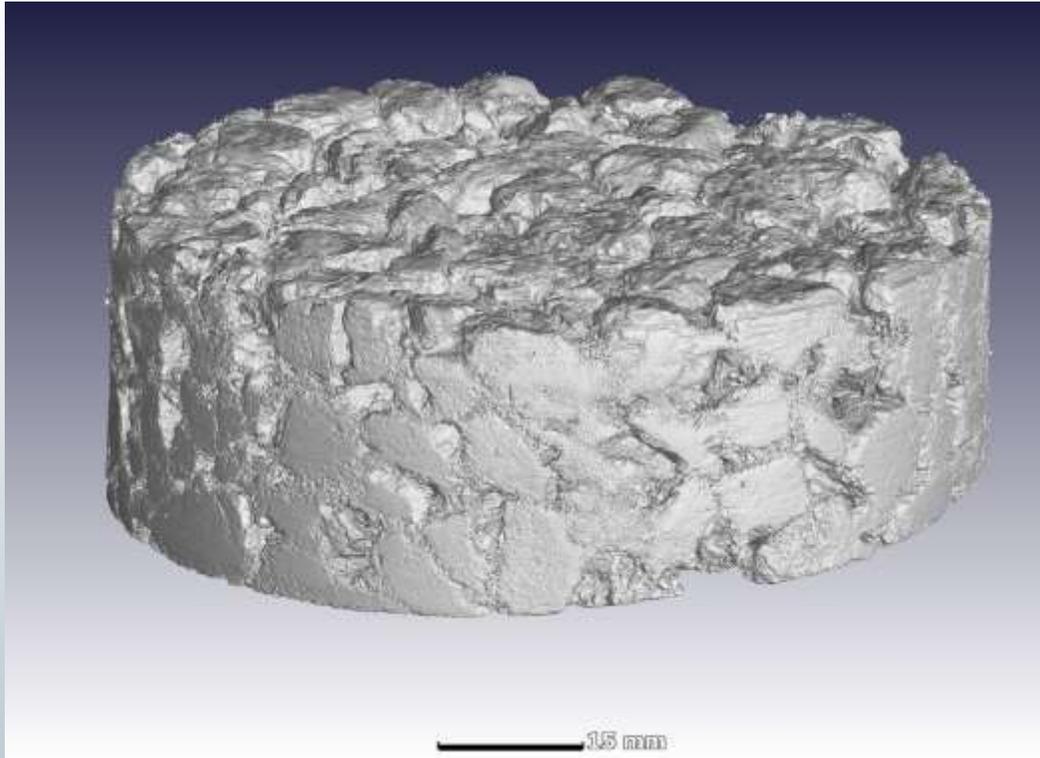
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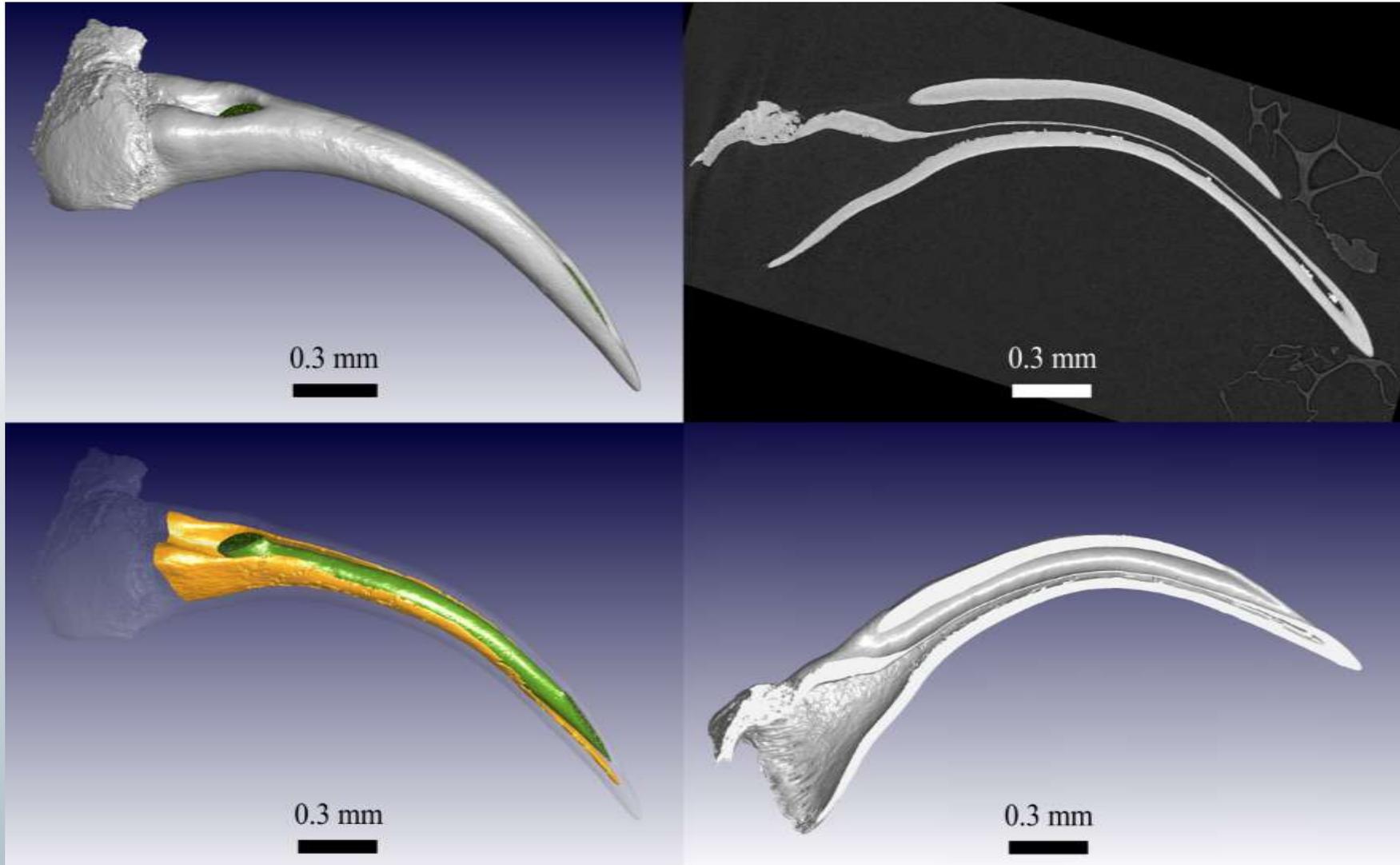
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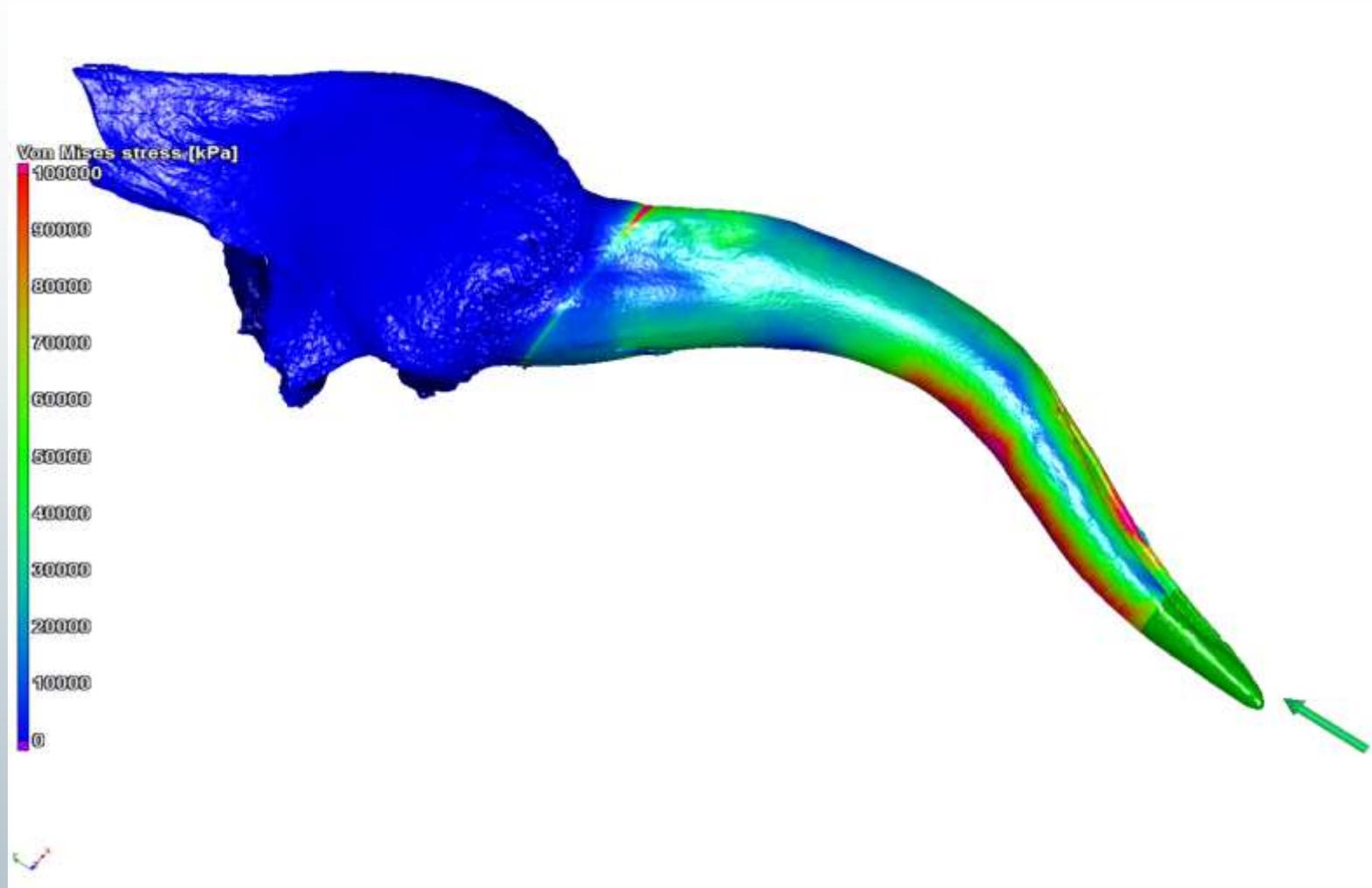
# SNAKE FANGS



**A. Du Plessis, C. Broeckhoven, and S. G. Le Roux, "Snake fangs: 3D morphological and mechanical analysis by microCT, simulation, and physical compression testing," *Gigascience*, vol. 7, pp. 1–8, 2018.**

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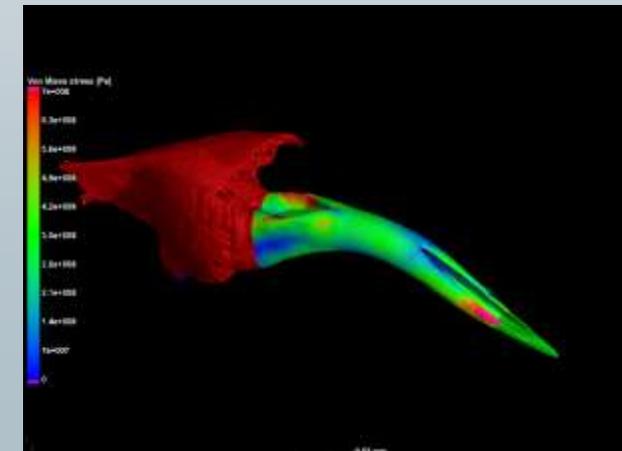
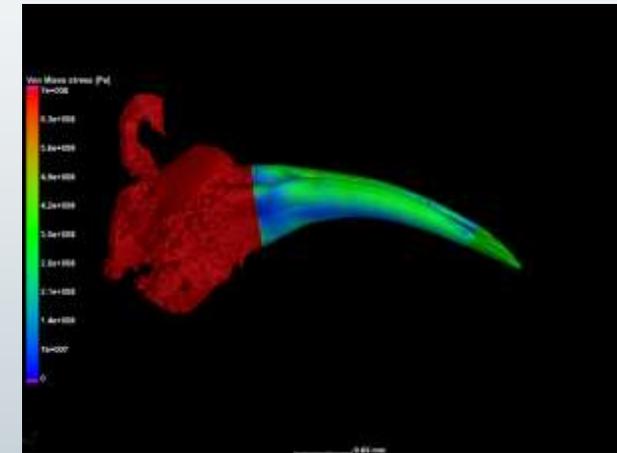
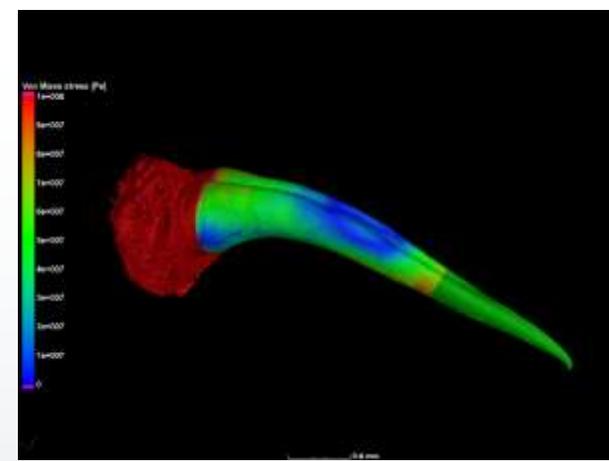
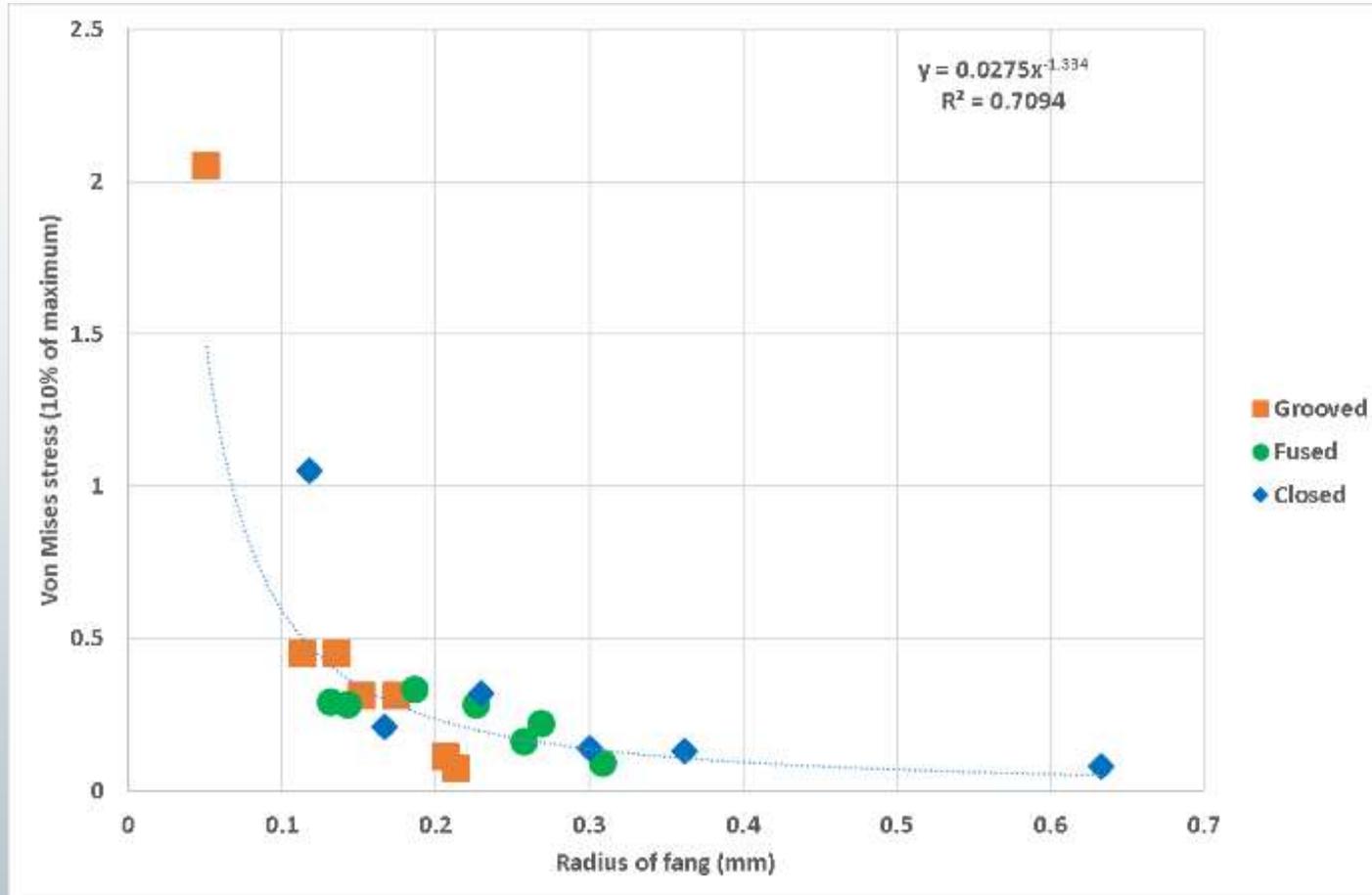
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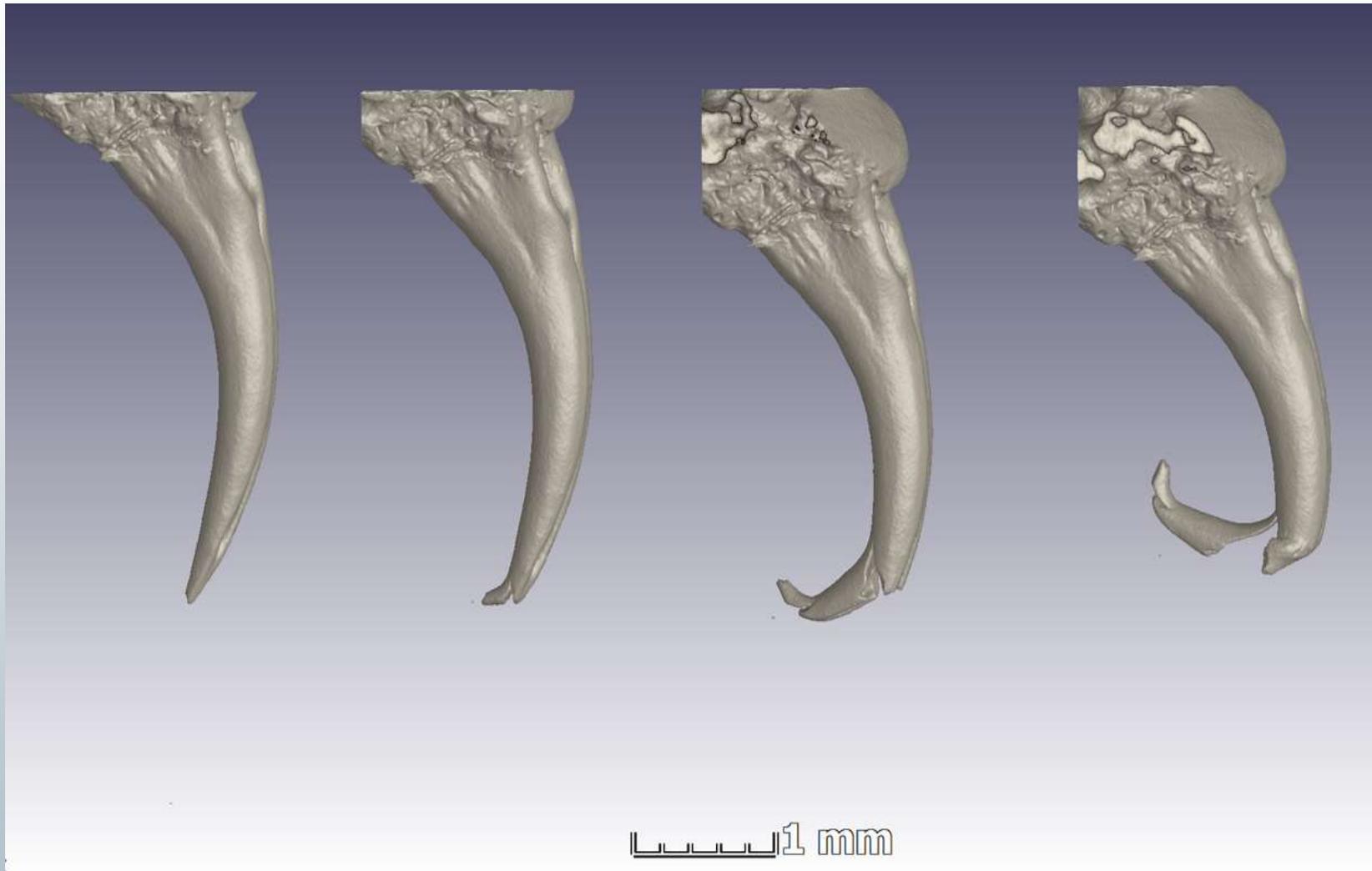
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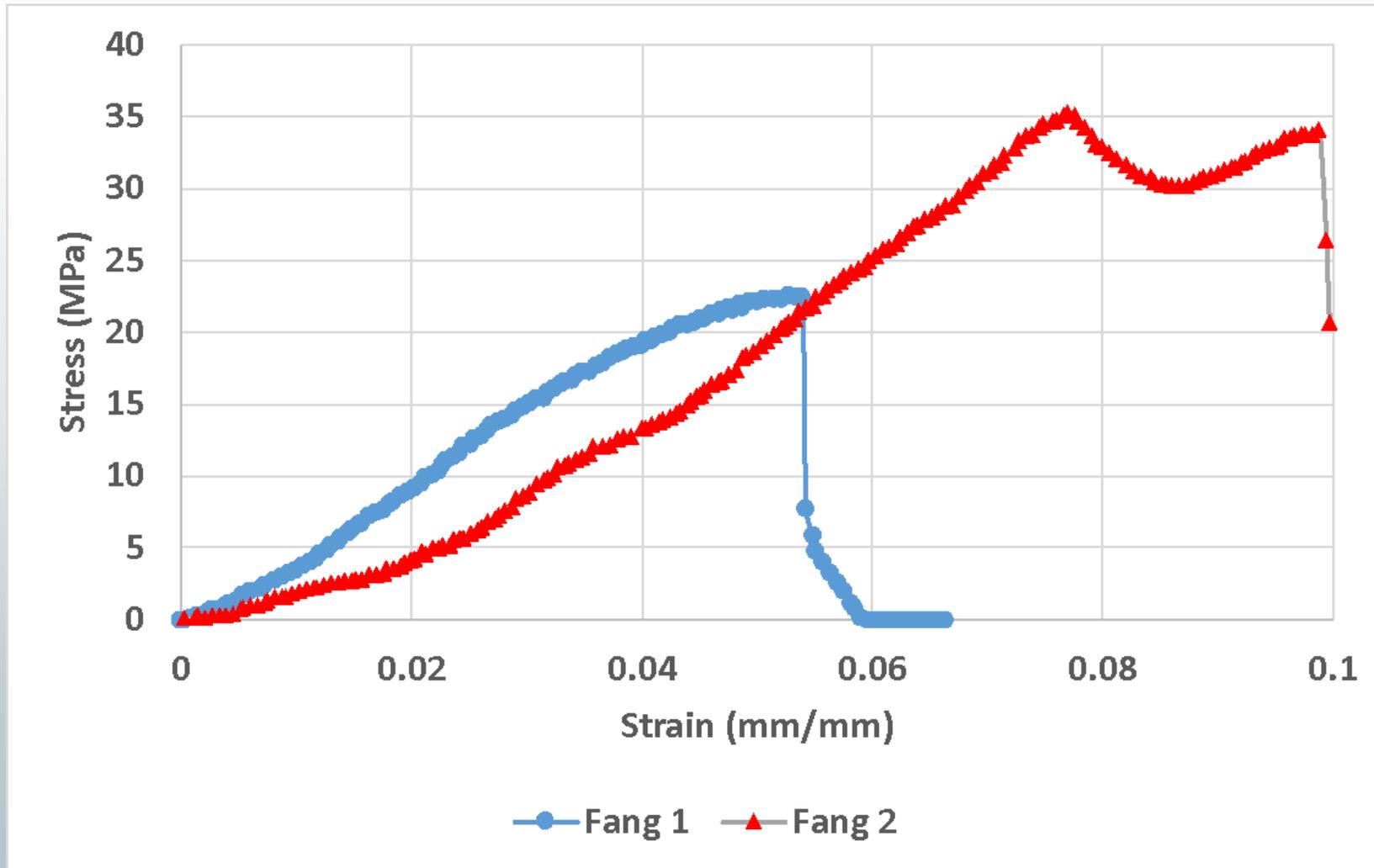
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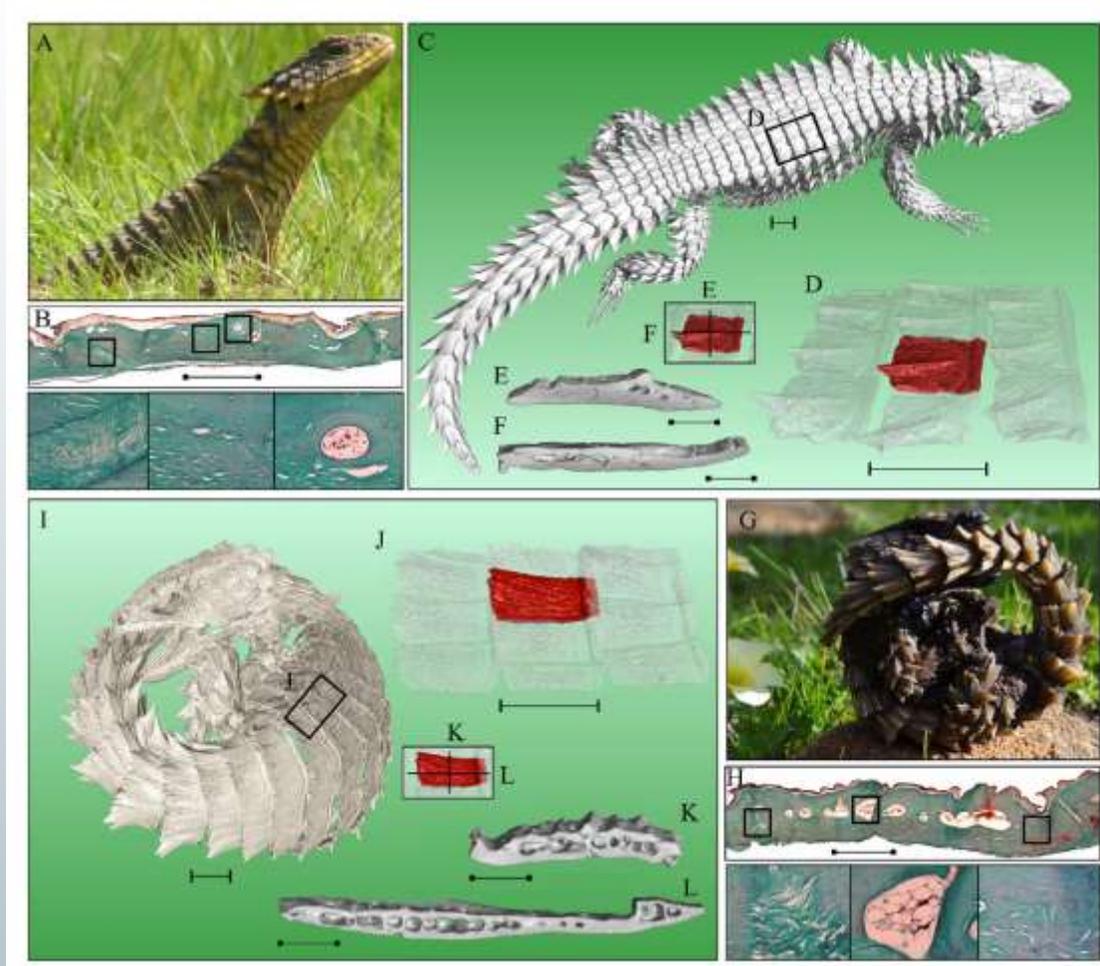
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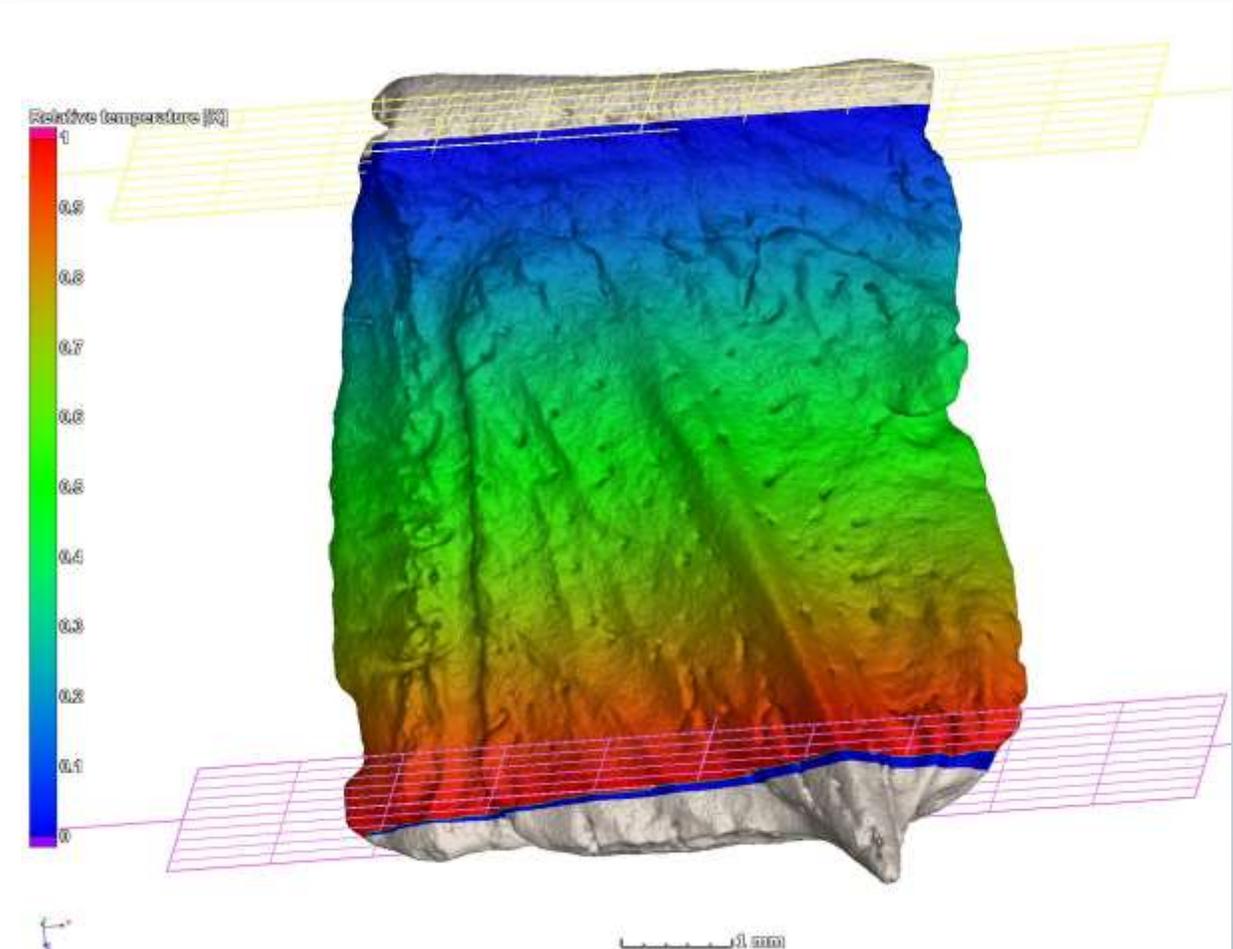
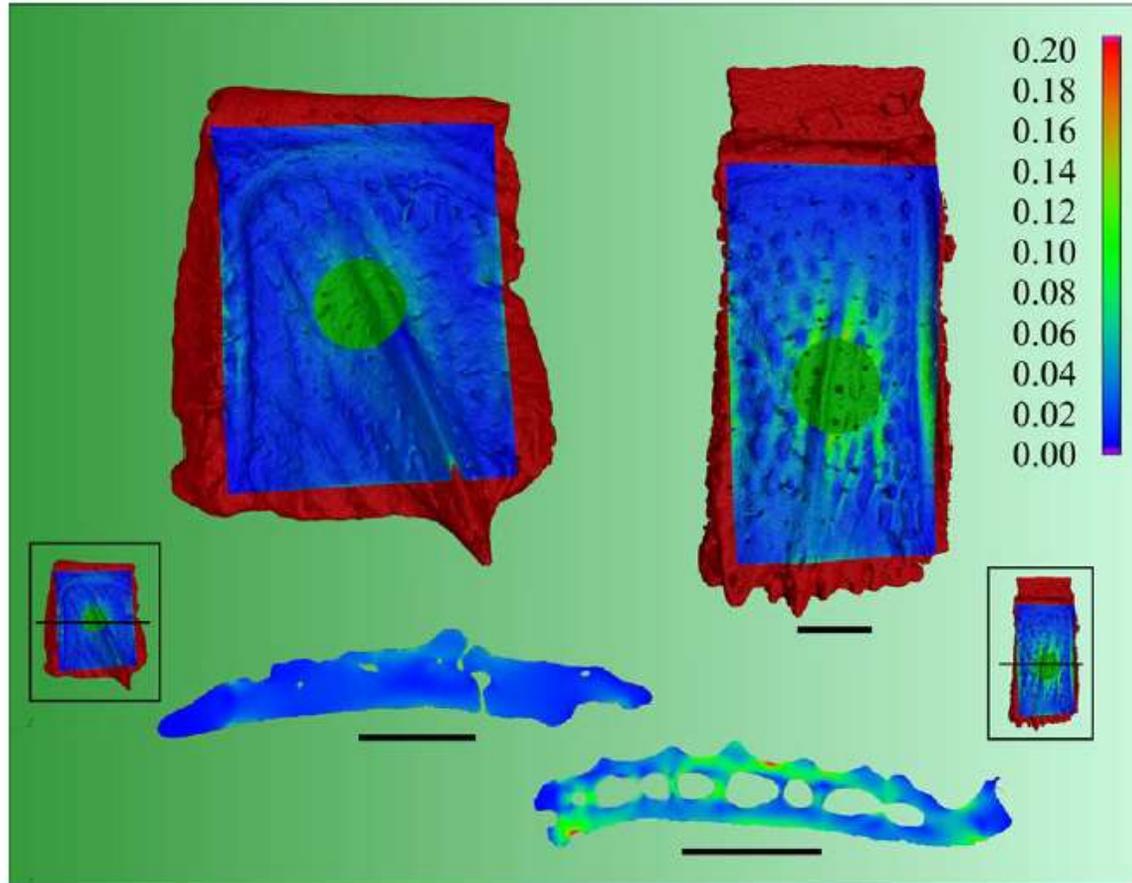
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# BODY ARMOUR OF LIZARDS – STRENGTH VS THERMAL CAPACITY



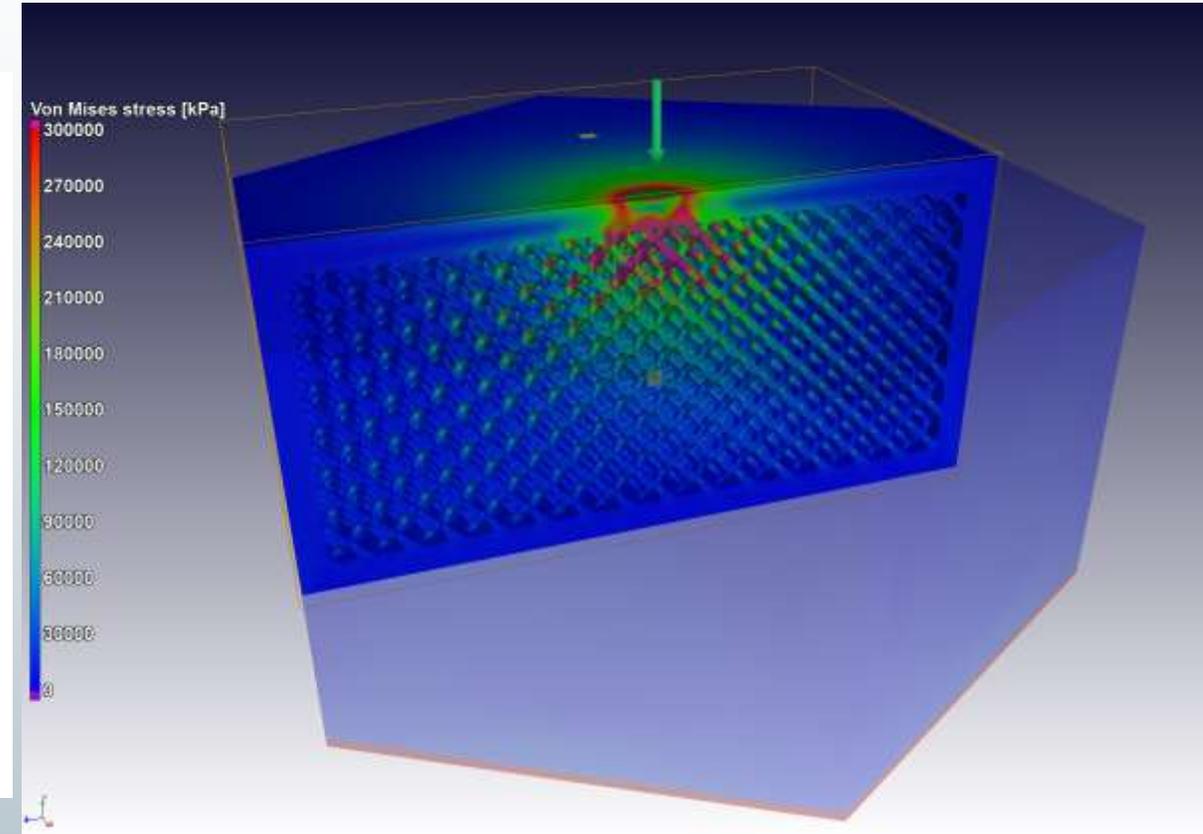
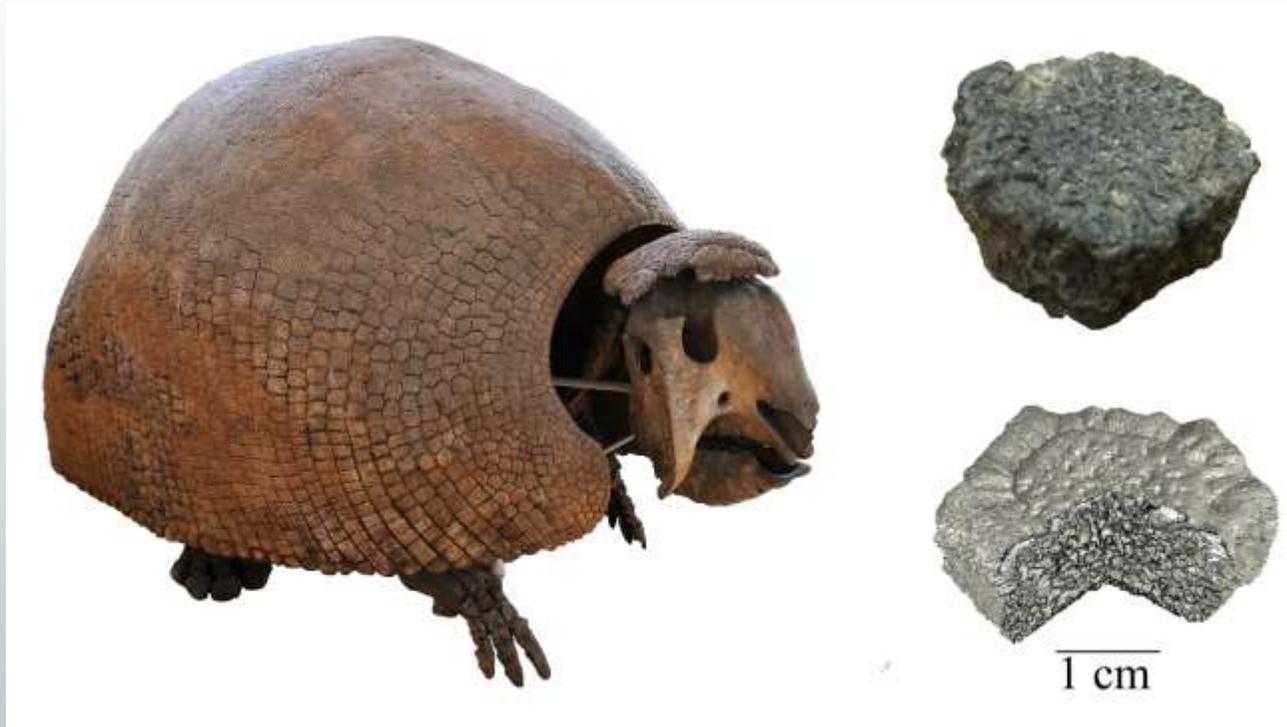
Broeckhoven, C., du Plessis, A. and Hui, C., 2017. Functional trade-off between strength and thermal capacity of dermal armor: insights from girdled lizards. *Journal of the mechanical behavior of biomedical materials*, 74, pp.189-194. <https://doi.org/10.1016/j.jmbbm.2017.06.007>

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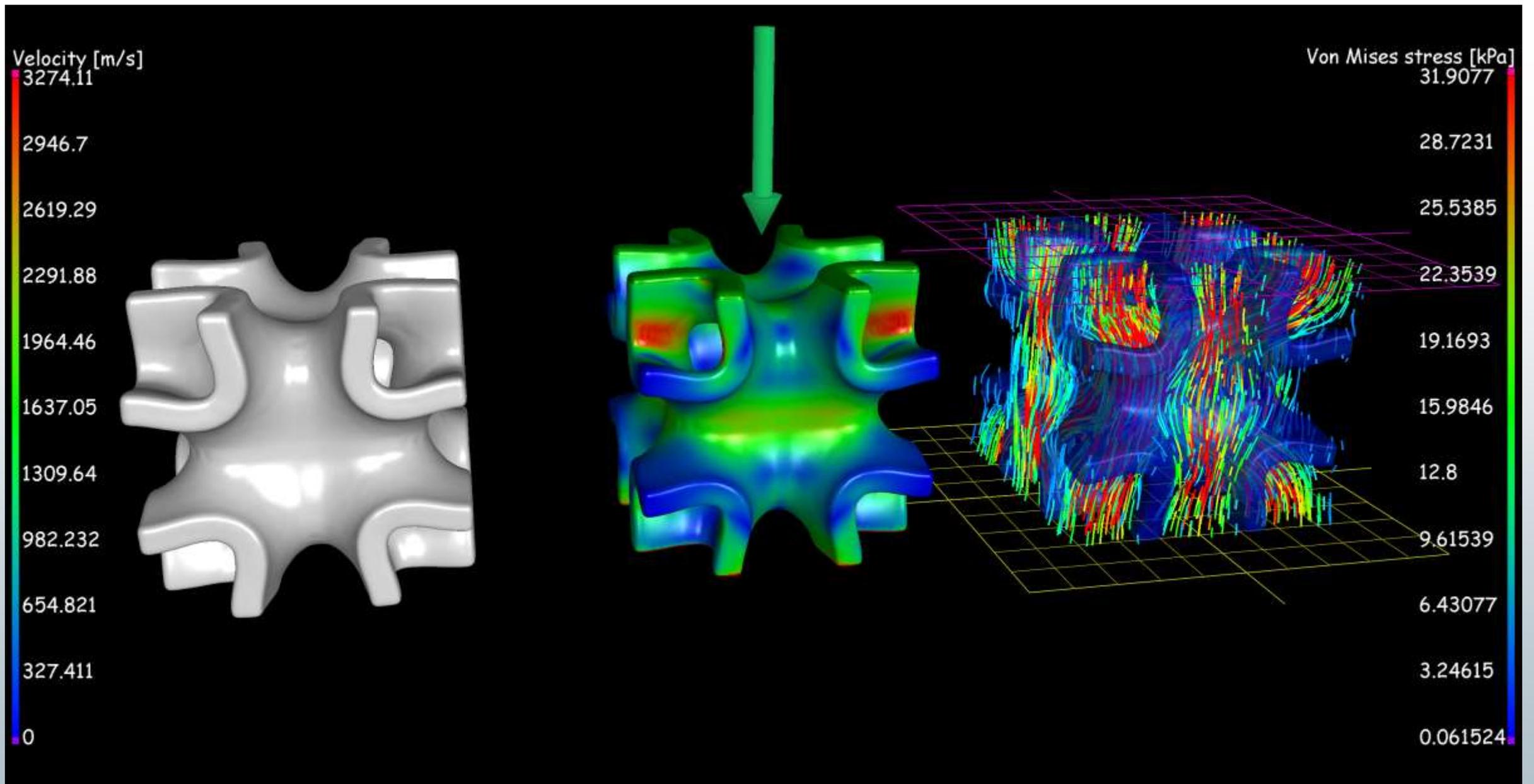


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# NATURAL PROTECTIVE MATERIALS - BIOMIMICRY



du Plessis, Anton, Chris Broeckhoven, Igor Yadroitsev, Ina Yadroisava, and Stephan Gerhard le Roux. "Analyzing nature's protective design: the glyptodont body armor." *Journal of the Mechanical Behavior of Biomedical Materials*(2018). <https://doi.org/10.1016/j.jmbbm.2018.03.037>



\* More of this in my keynote talk tomorrow

# CONCLUSIONS

- **IMAGE BASED SIMULATIONS ARE USEFUL FOR A VARIETY OF RESEARCH TOPICS**
- **ALSO FOR INDUSTRY APPLICATIONS – WE NEED TO FIND THESE APPLICATIONS**
- **IT IS ESPECIALLY USEFUL FOR COMPARISON BETWEEN SAMPLES – RELATING PROBLEMS IN MATERIALS TO PHYSICAL STRUCTURES BY SIMULATION**