

News from the EastGRIP ice core - on microstructure, impurities and the bridging of different scales

Nicolas Stoll, Maria Hörhold, Julien Westhoff, Tobias Erhardt, Pascal Bohleber, Jan Eichler, Anders Svensson, Ole Zeising, Tamara Gerber, Steven Franke, Nicholas Rathmann, Daniela Jansen, Daniel Richards, Kyra Streng, Johanna Kerch, Olaf Eisen, Dorthe Dahl-Jensen, Carlo Barbante, and Ilka Weikusat

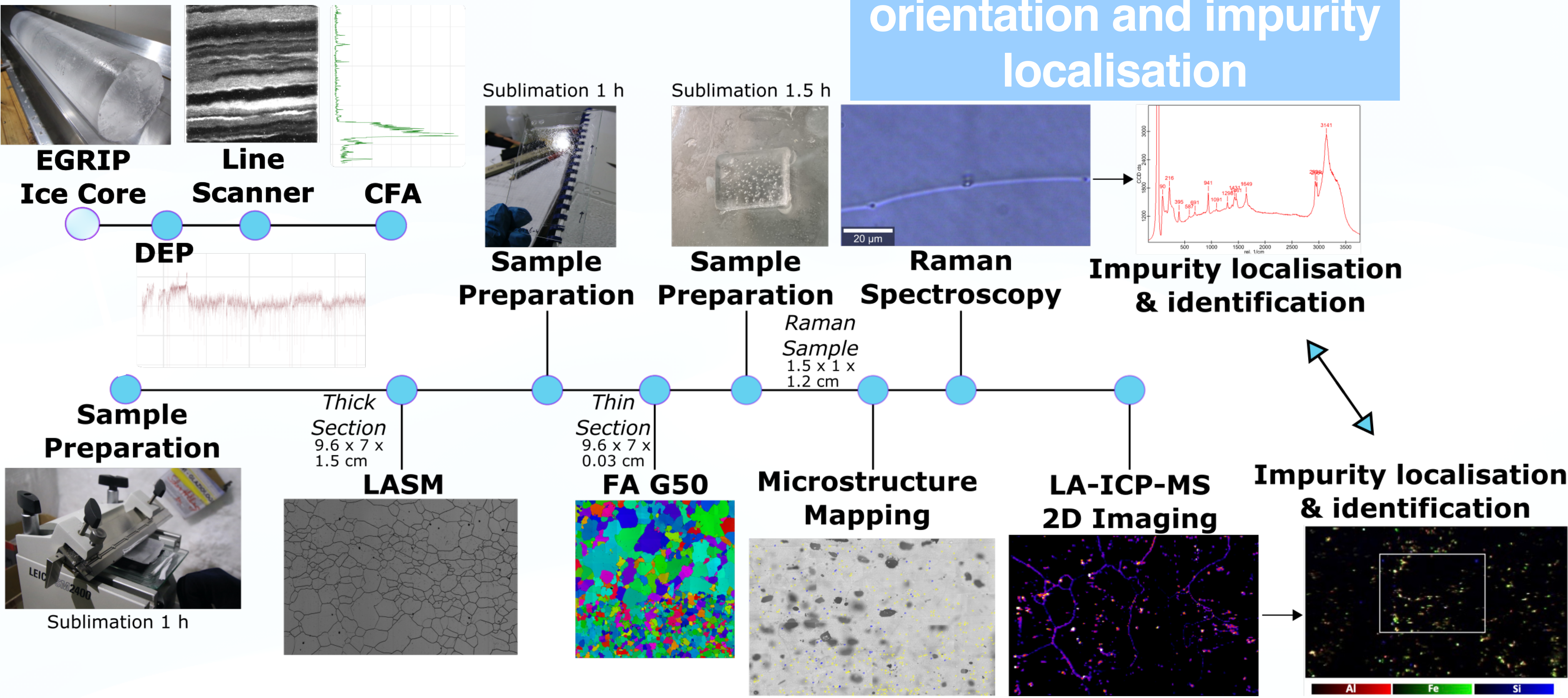


Northeast Greenland Ice Stream (NEGIS)



Impurities in EastGRIP

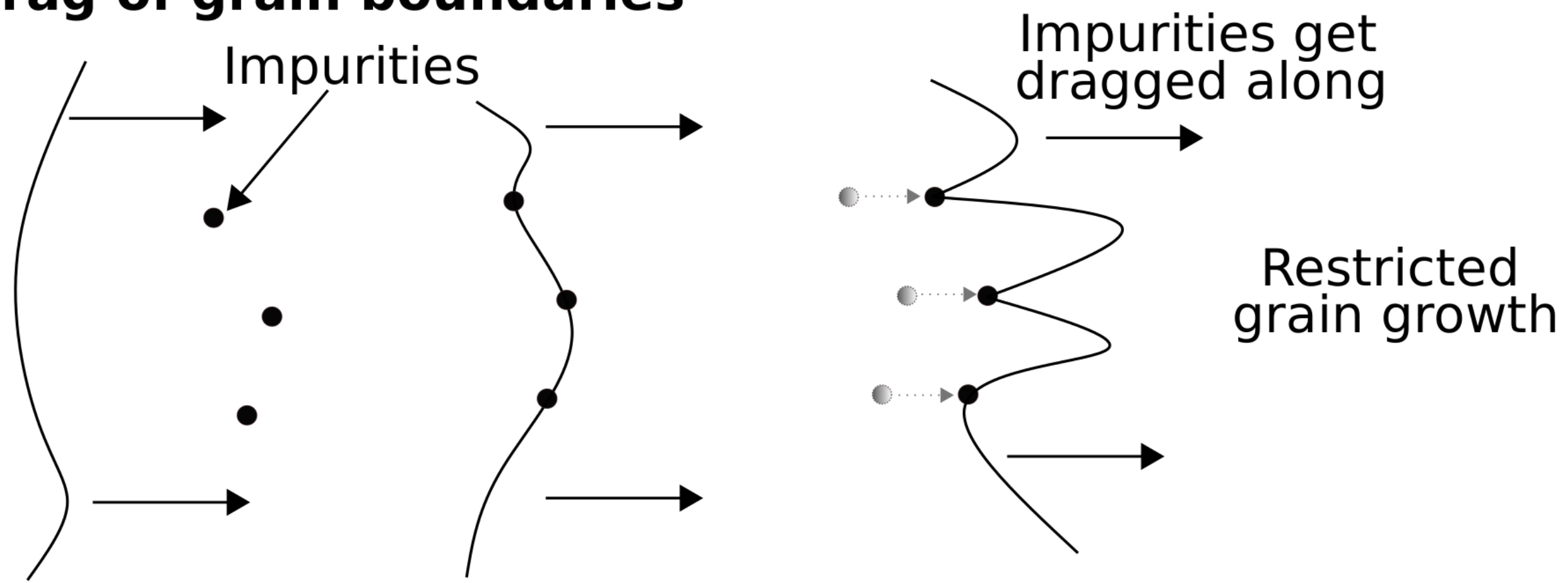
Microstructure, crystal orientation and impurity localisation



Microstructure and impurities

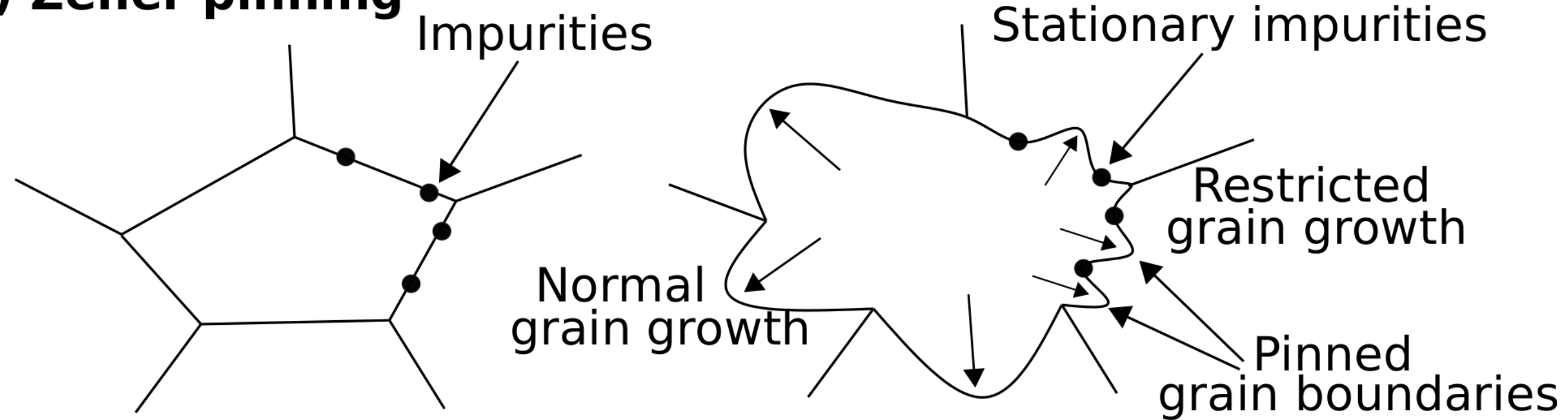
Microstructural processes/deformation

A) Drag of grain boundaries

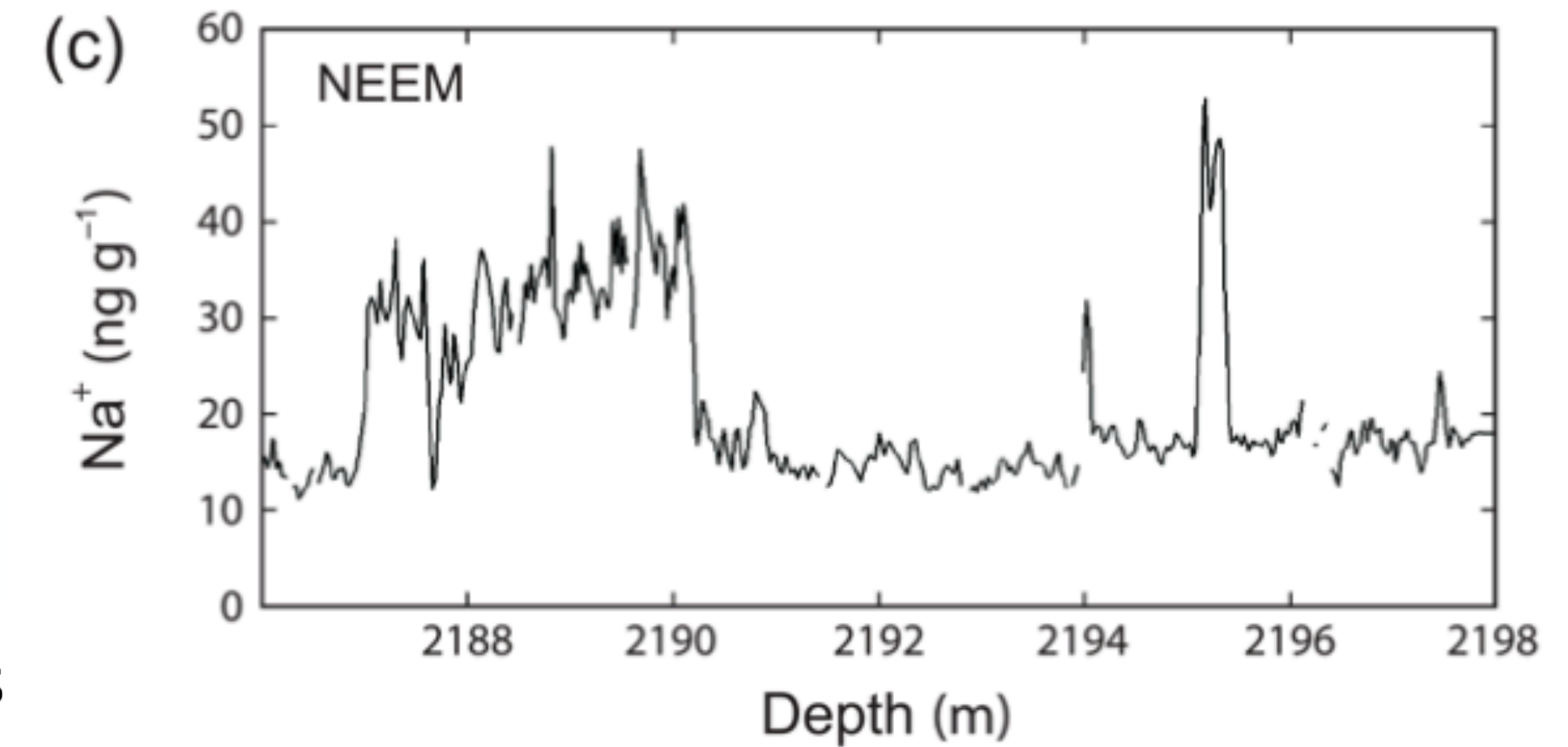
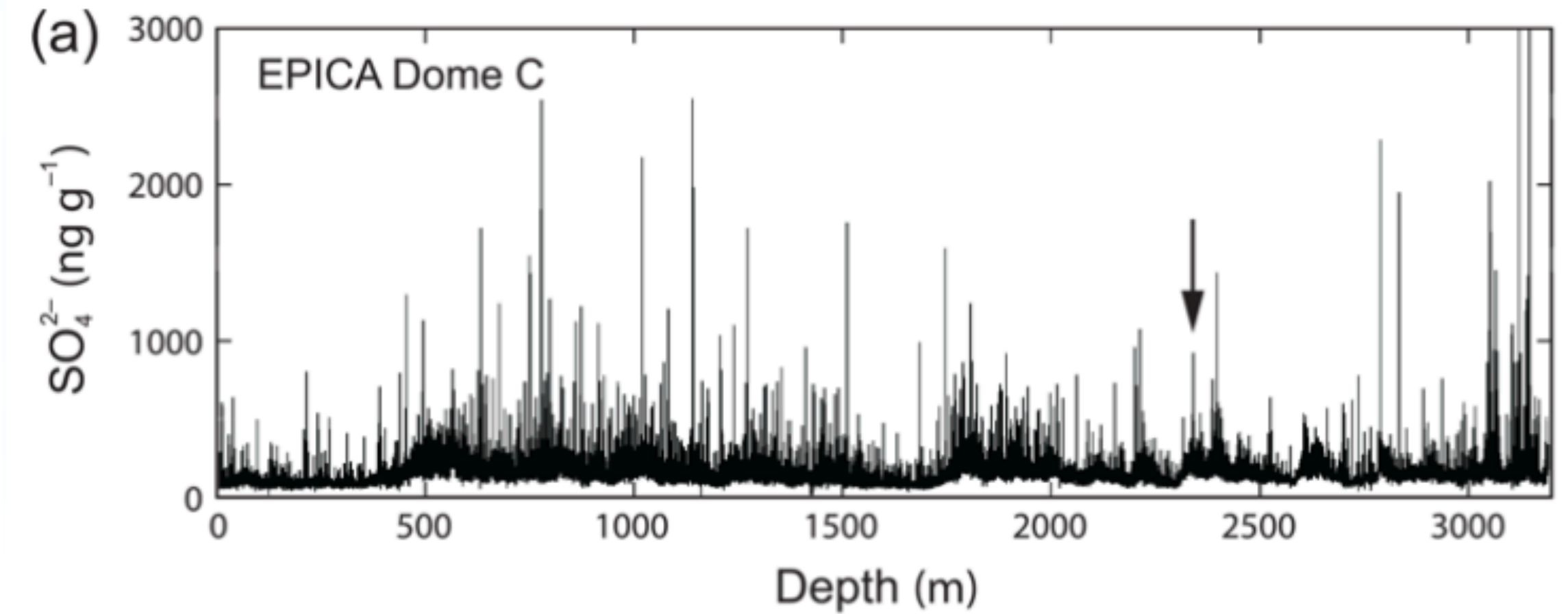


Restricted grain growth

B) Zener pinning



Integrity of ice core record

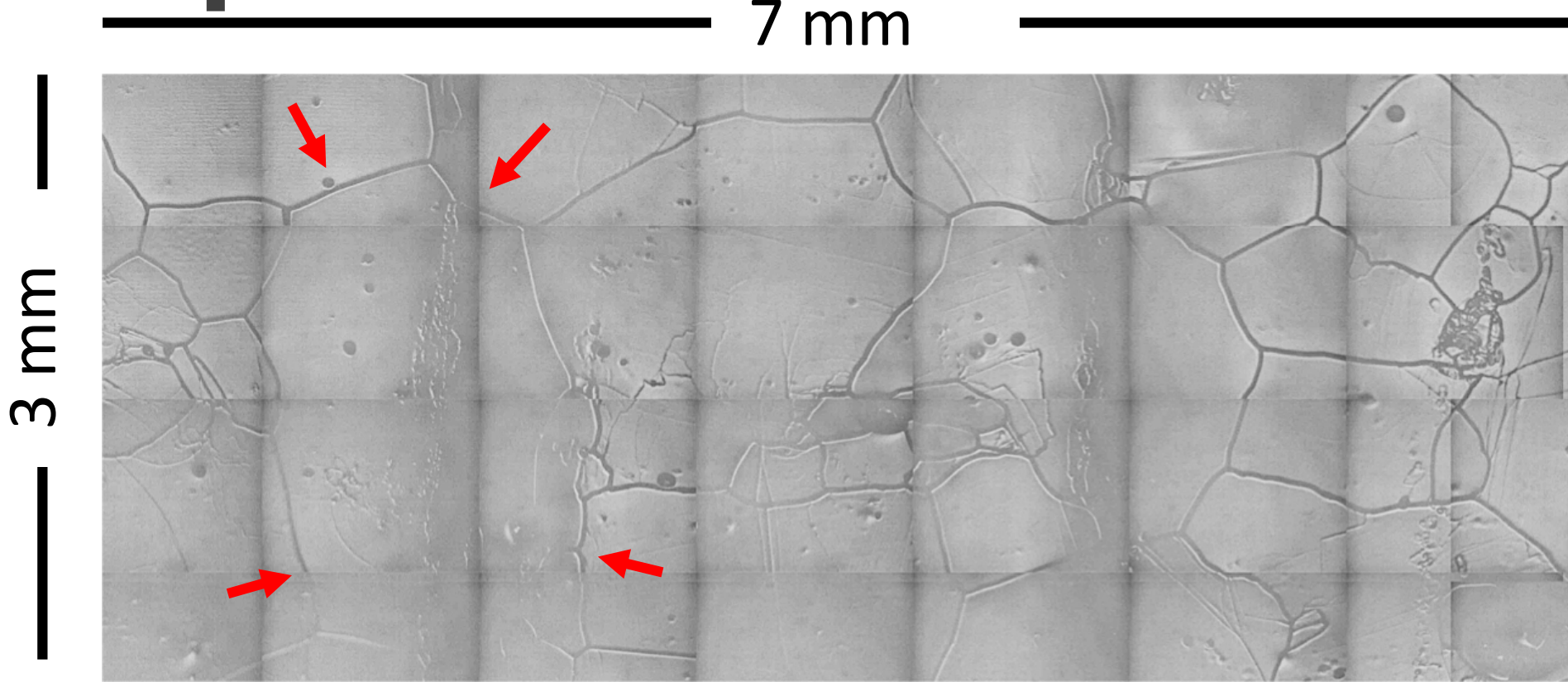


Stoll et al. (2021), *Frontiers in Earth Science*

Ng (2021), *The Cryosphere*

Microstructure and impurities

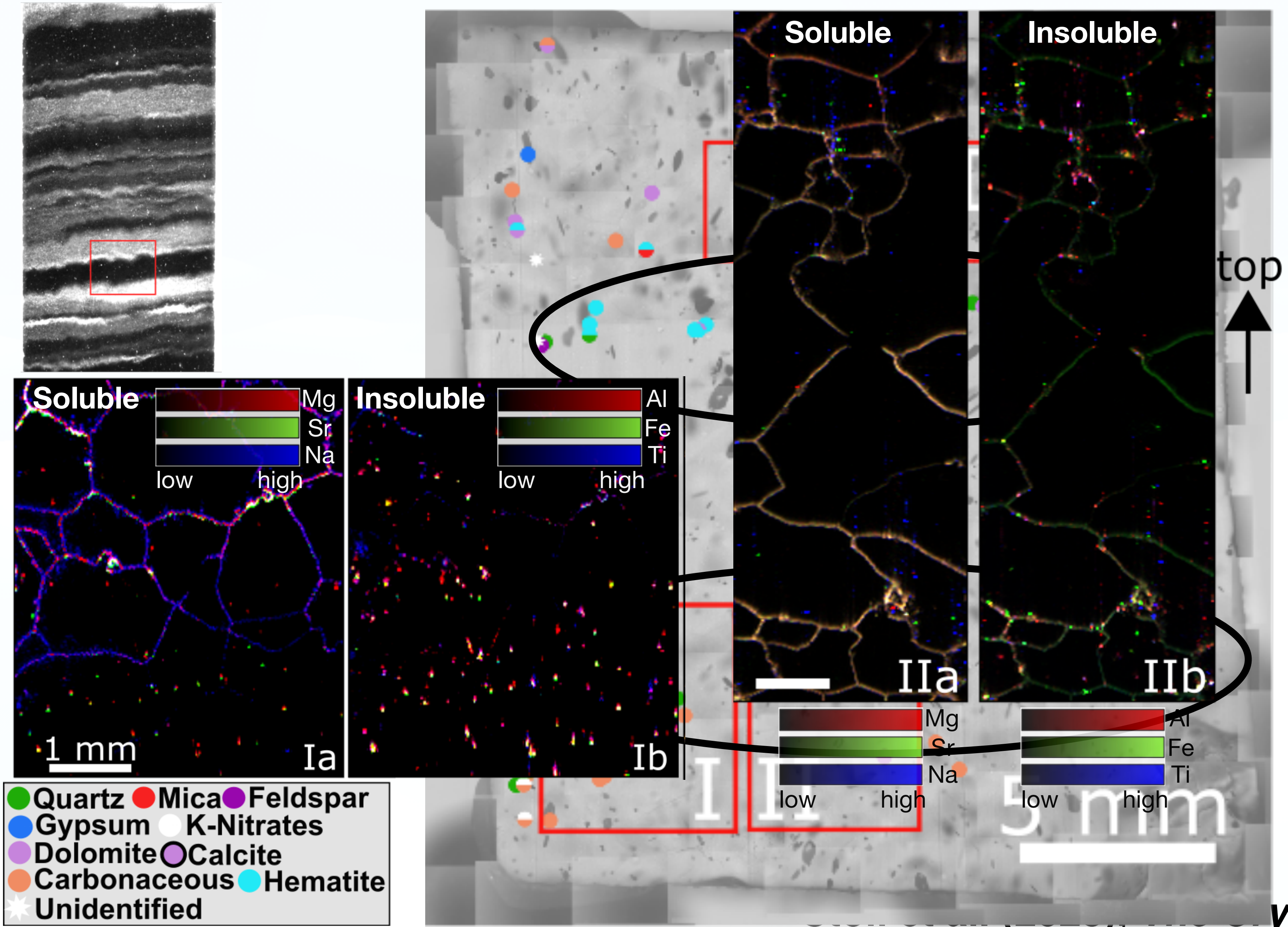
optical
image



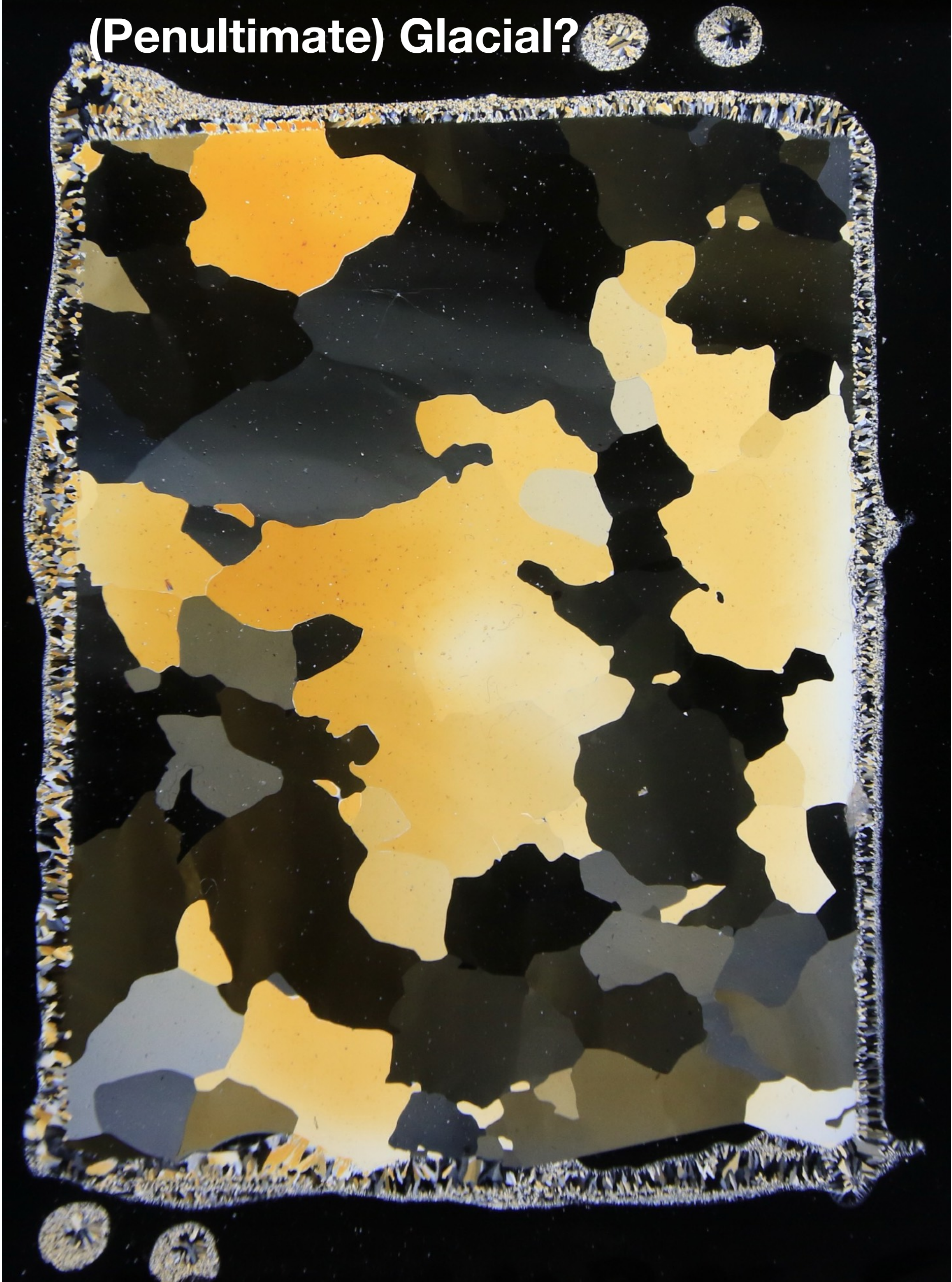
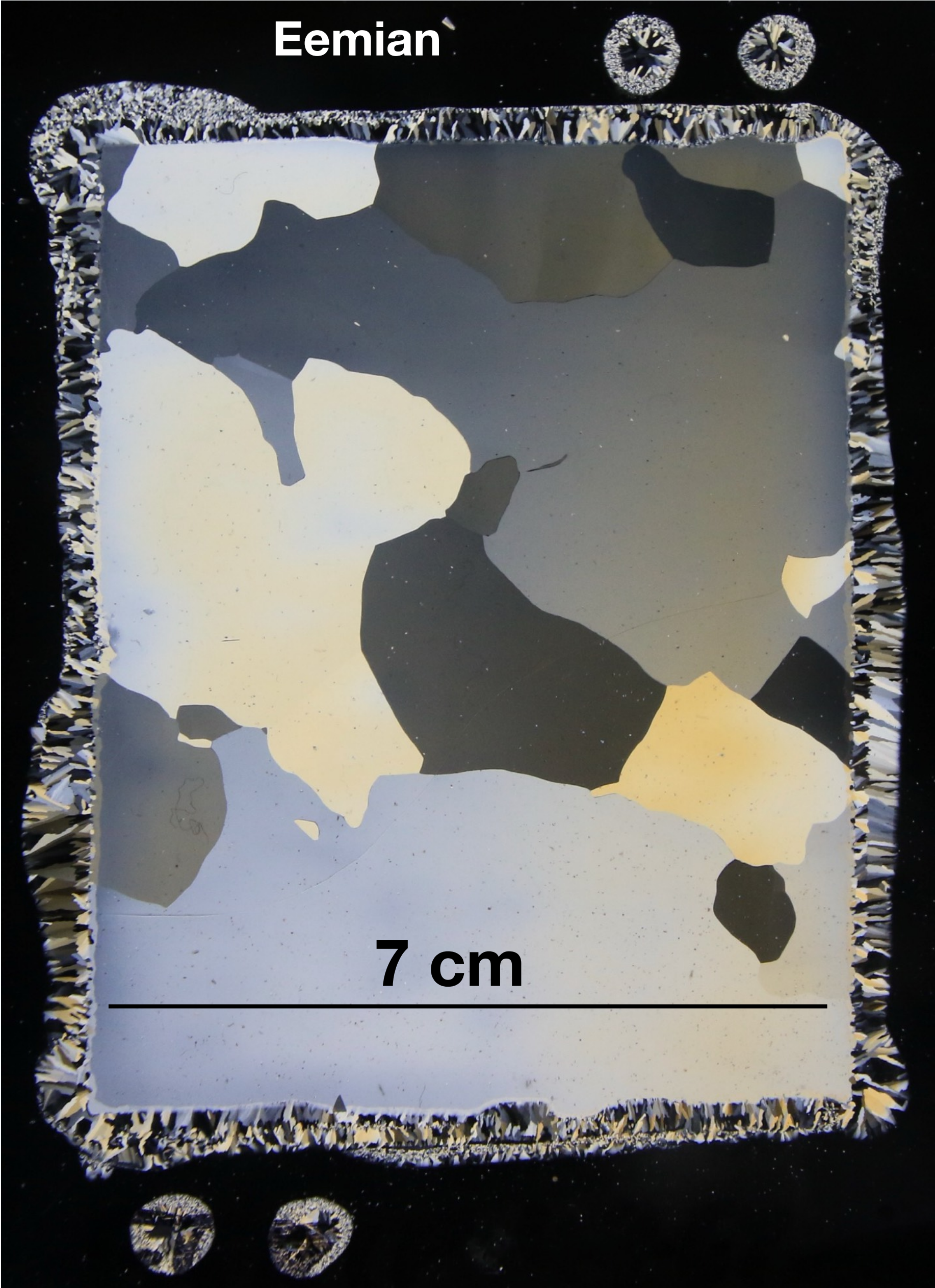
Tomorrow 08:51: Ice Core III
eLightning session

C51H-08: Laser Ablation
impurity images and profiles
in Holocene and Glacial ice
of the Renland ice cap

Microstructure and impurities



EastGRIP 2023

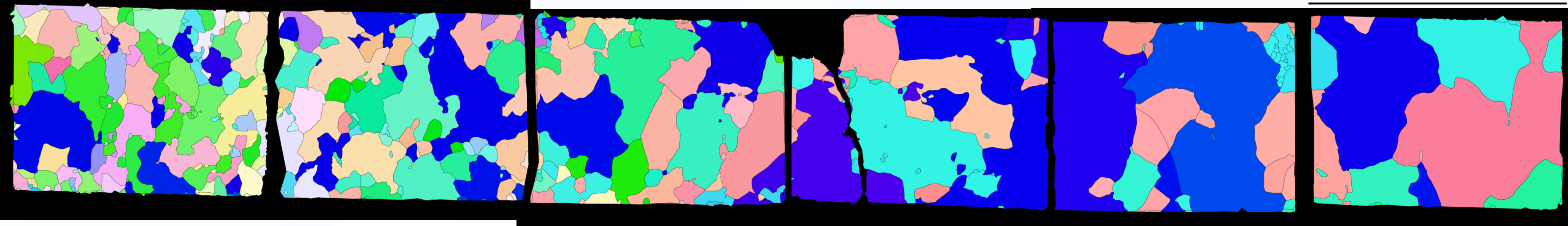


Penultimate Glacial?

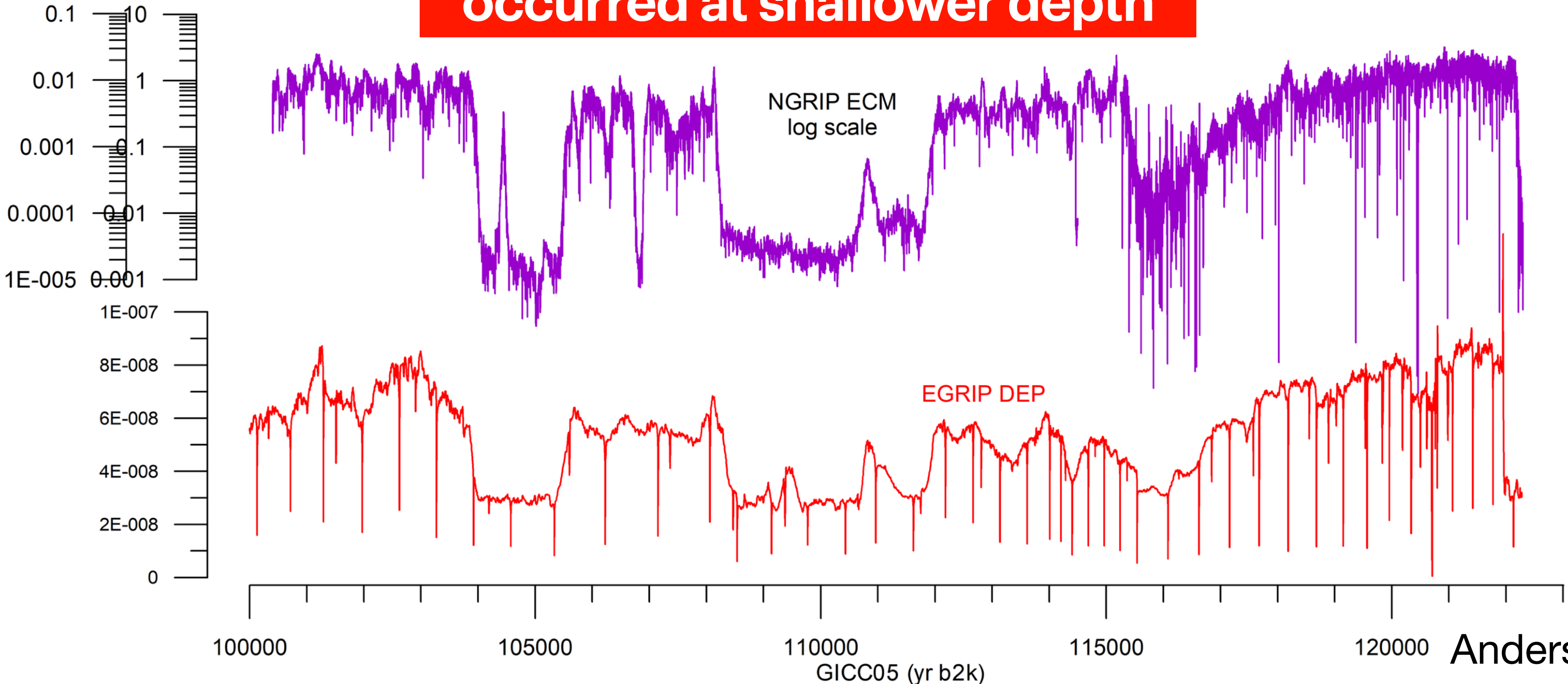
Eemian



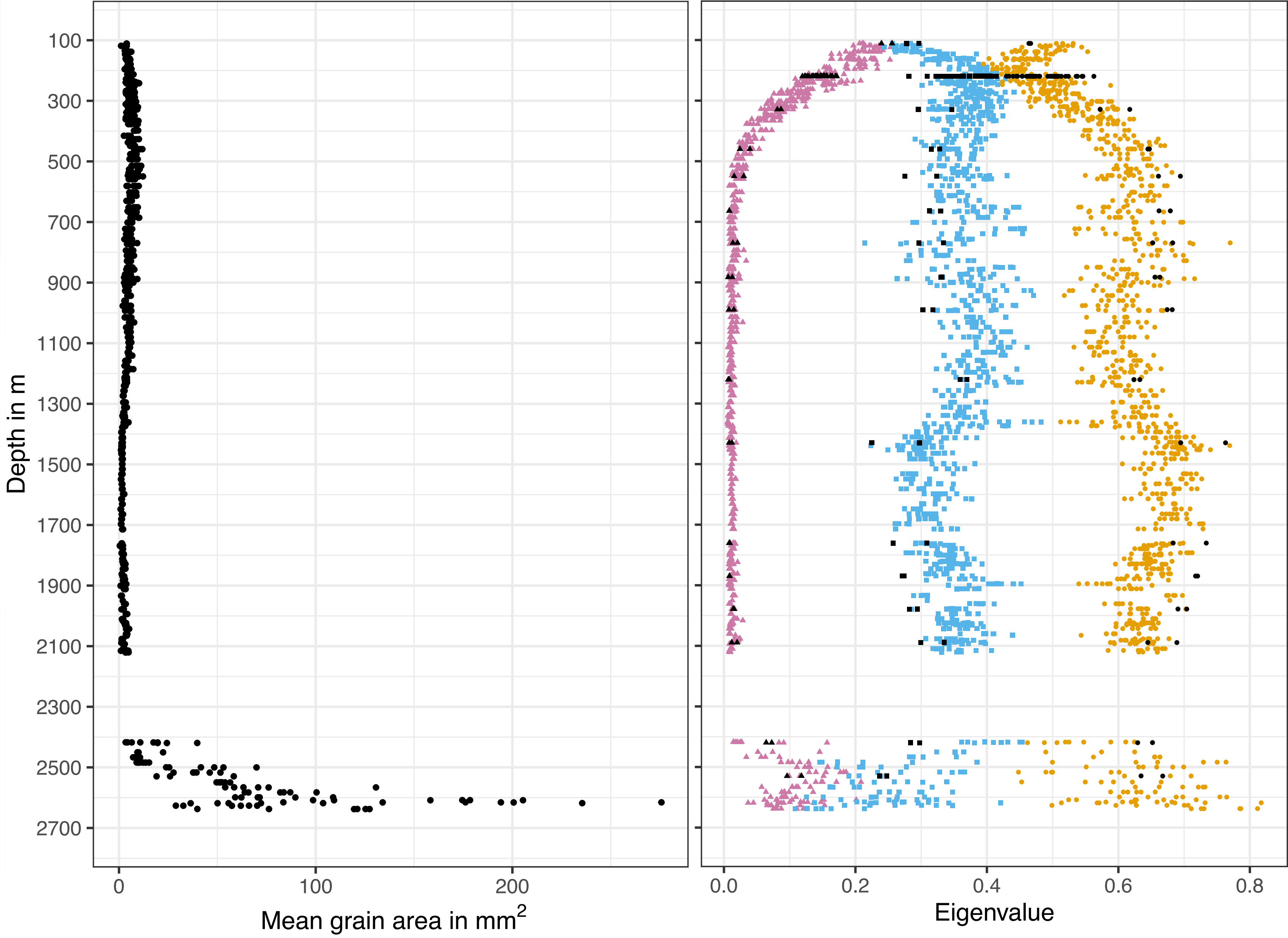
9.2 cm



Preliminary, folding might have occurred at shallower depth



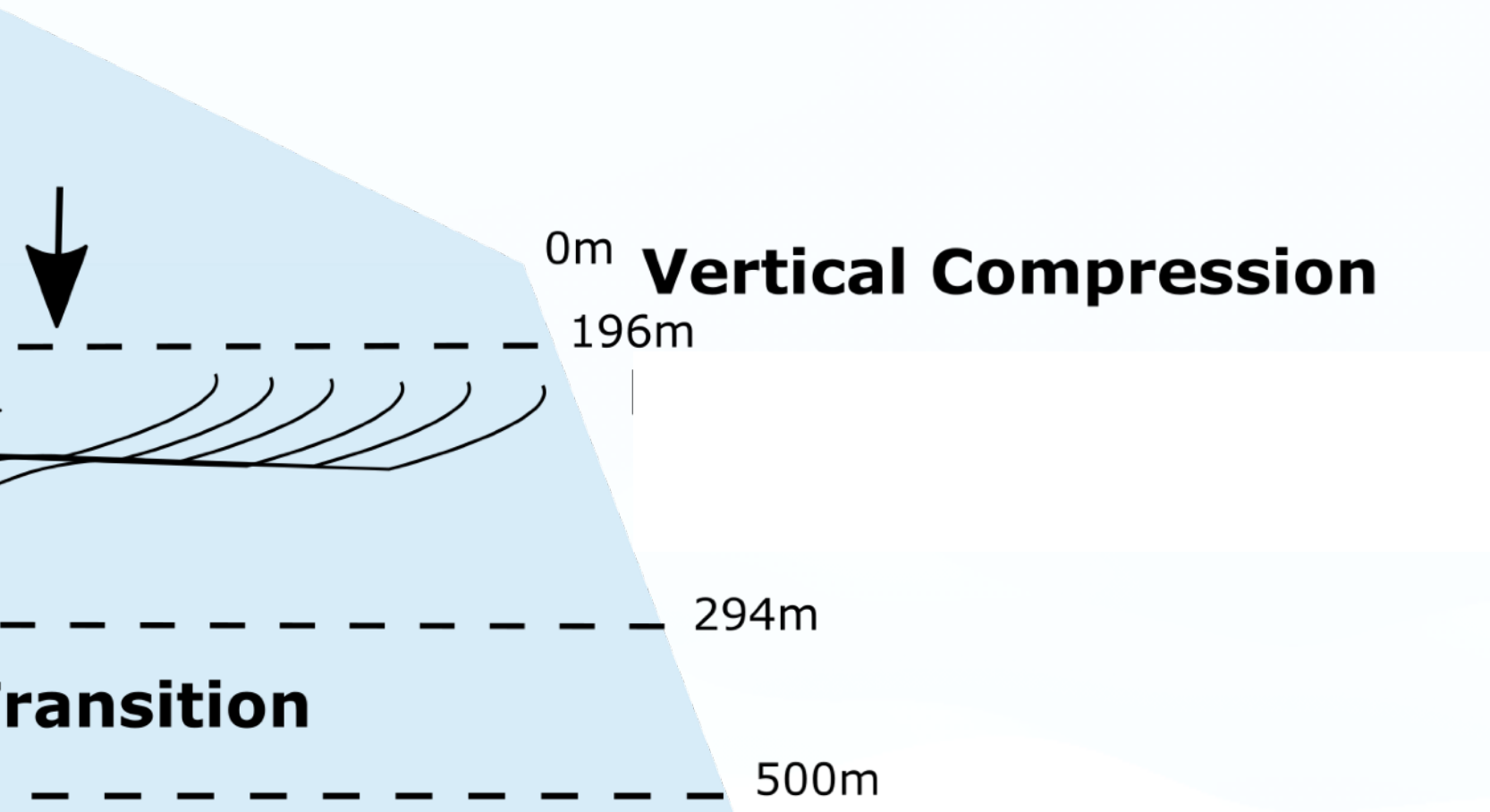
Ice crystals and the flow of NEGIS



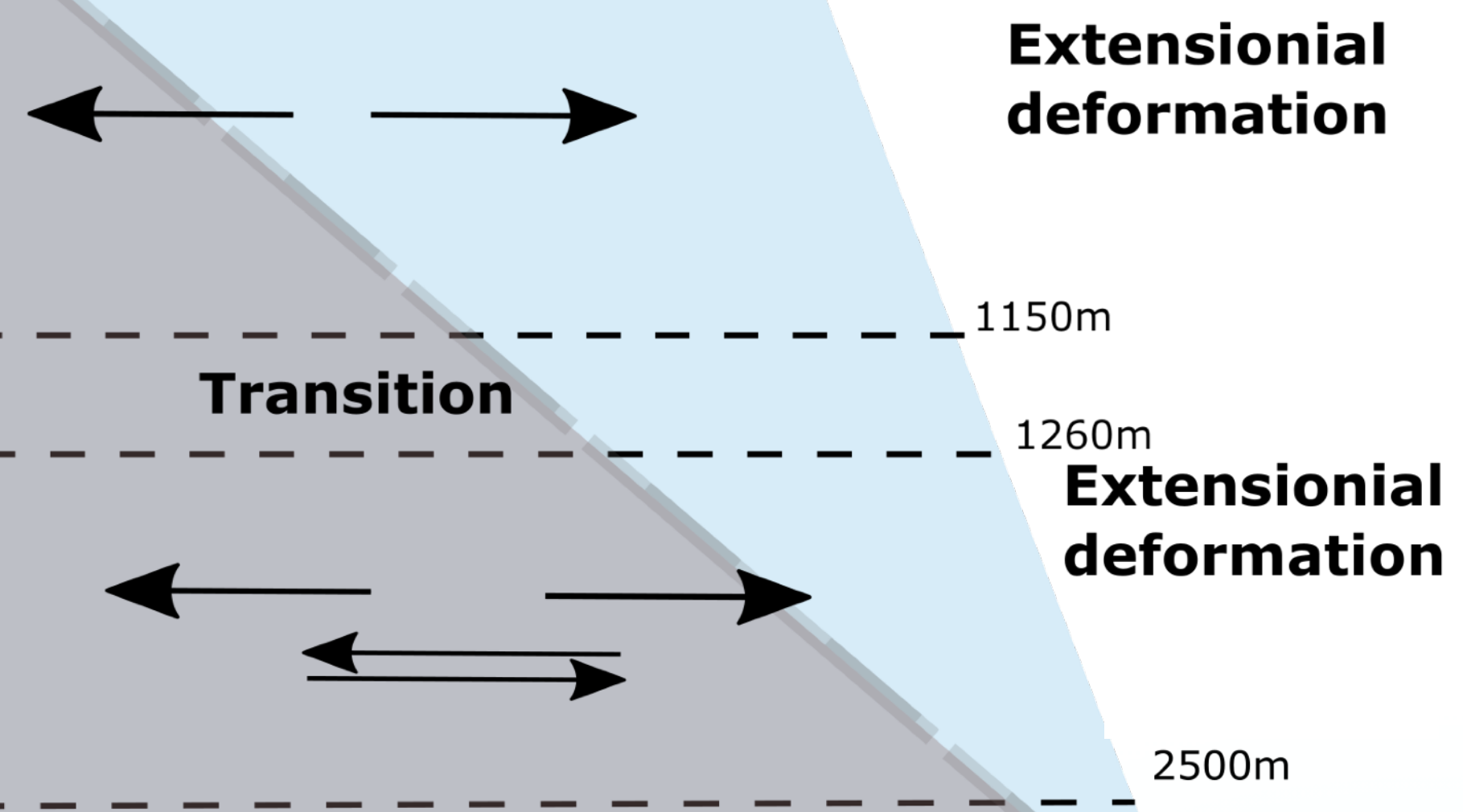
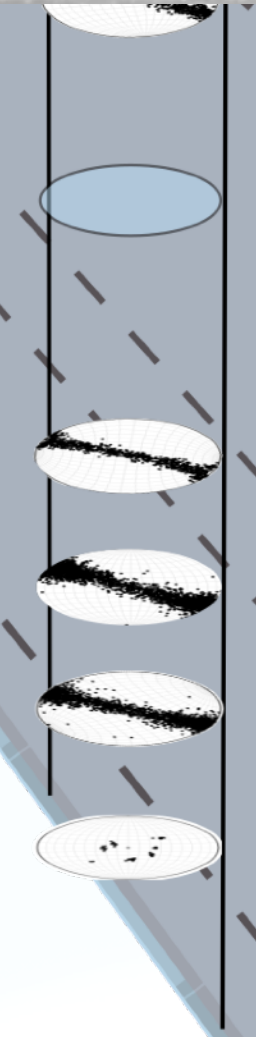
2nd order
orientation tensor
≈ crystal
orientation

Ice crystals and the flow of NEGIS

Field diary 21.07.23



NEGIS slides
water-saturated m...

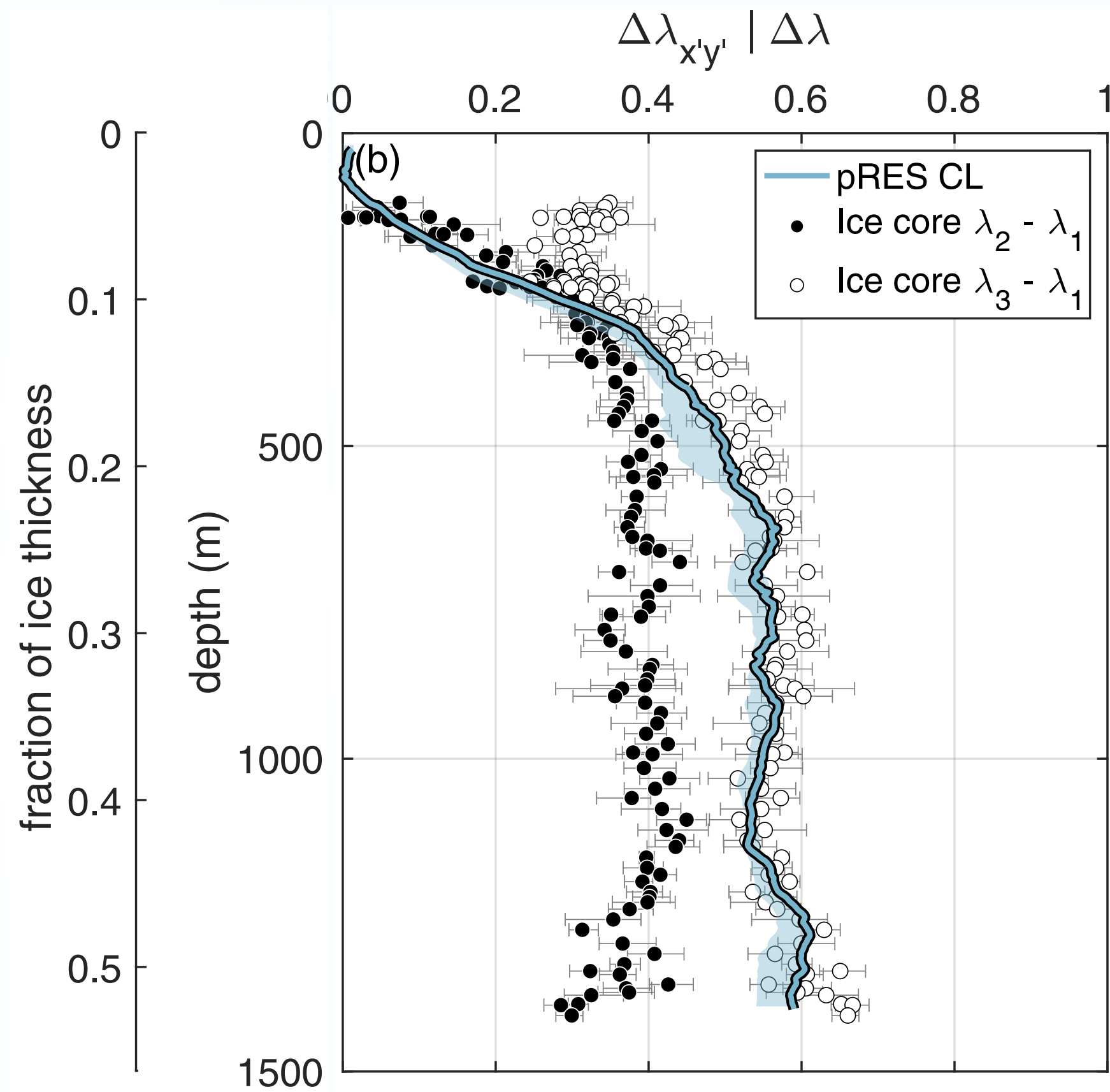


Dynamic recrystallisation

2660m

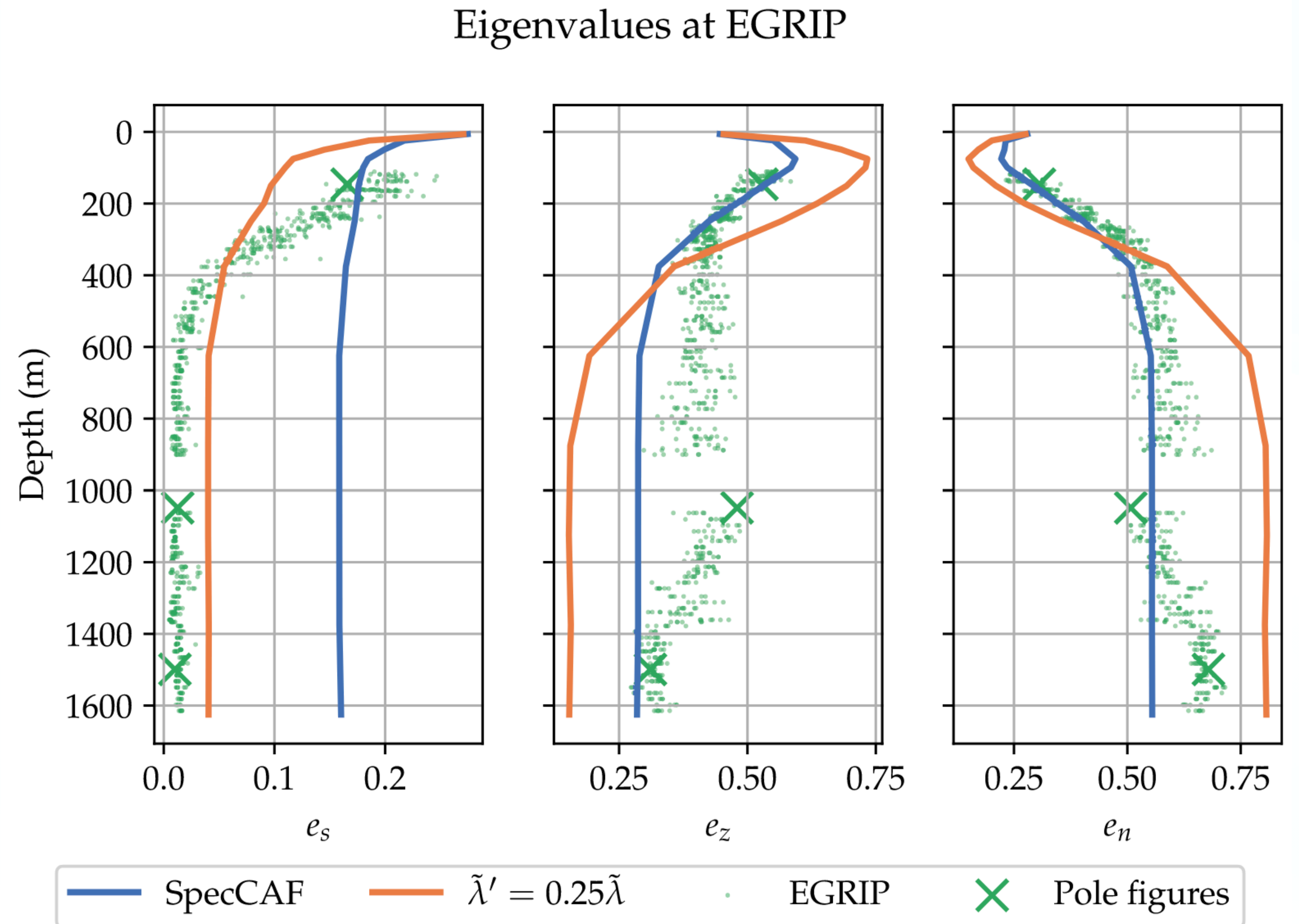
Combining approaches and bridging scales

ApRES - small scale radar



**Zeising et al. (2023),
*The Cryosphere***

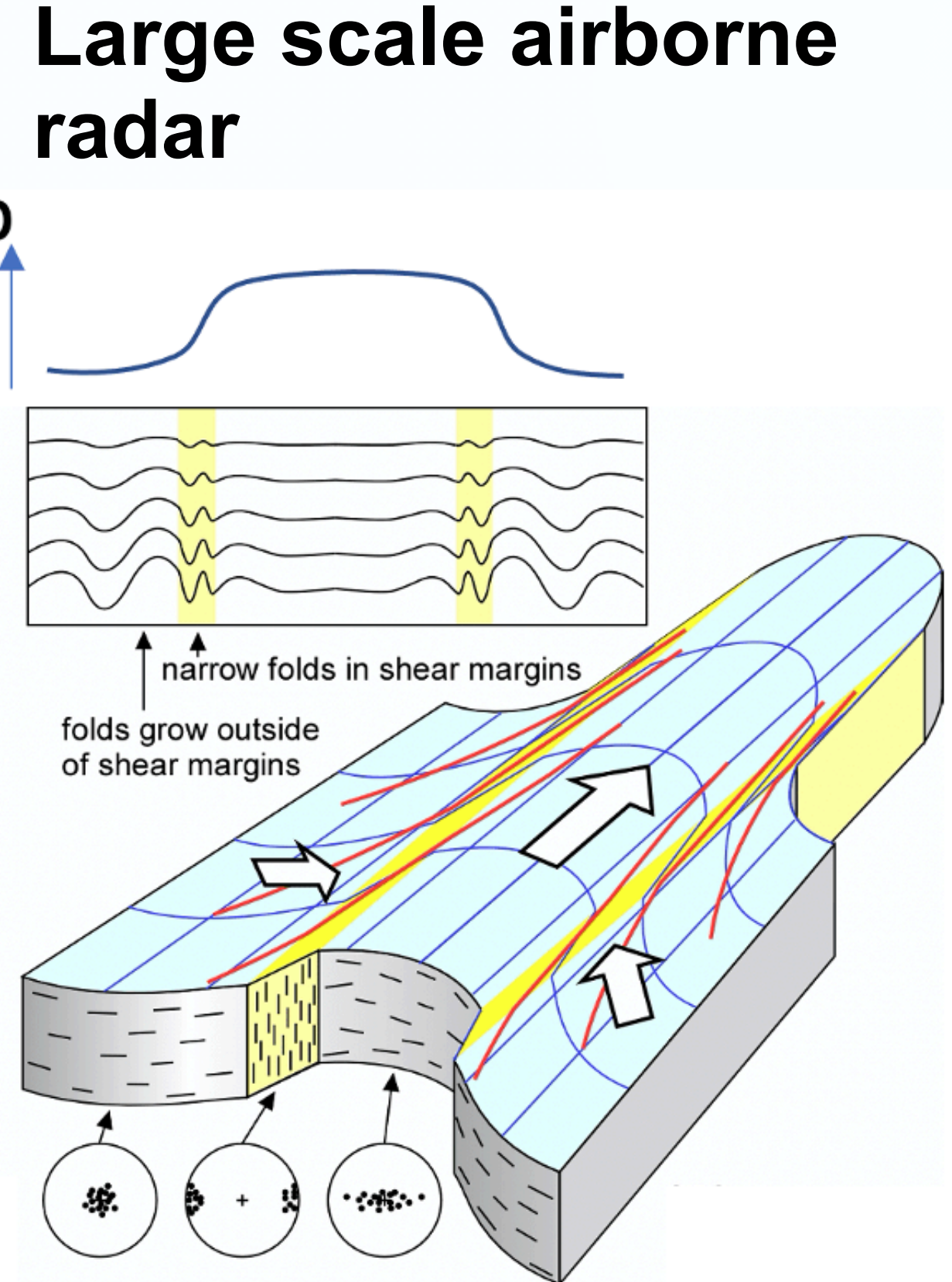
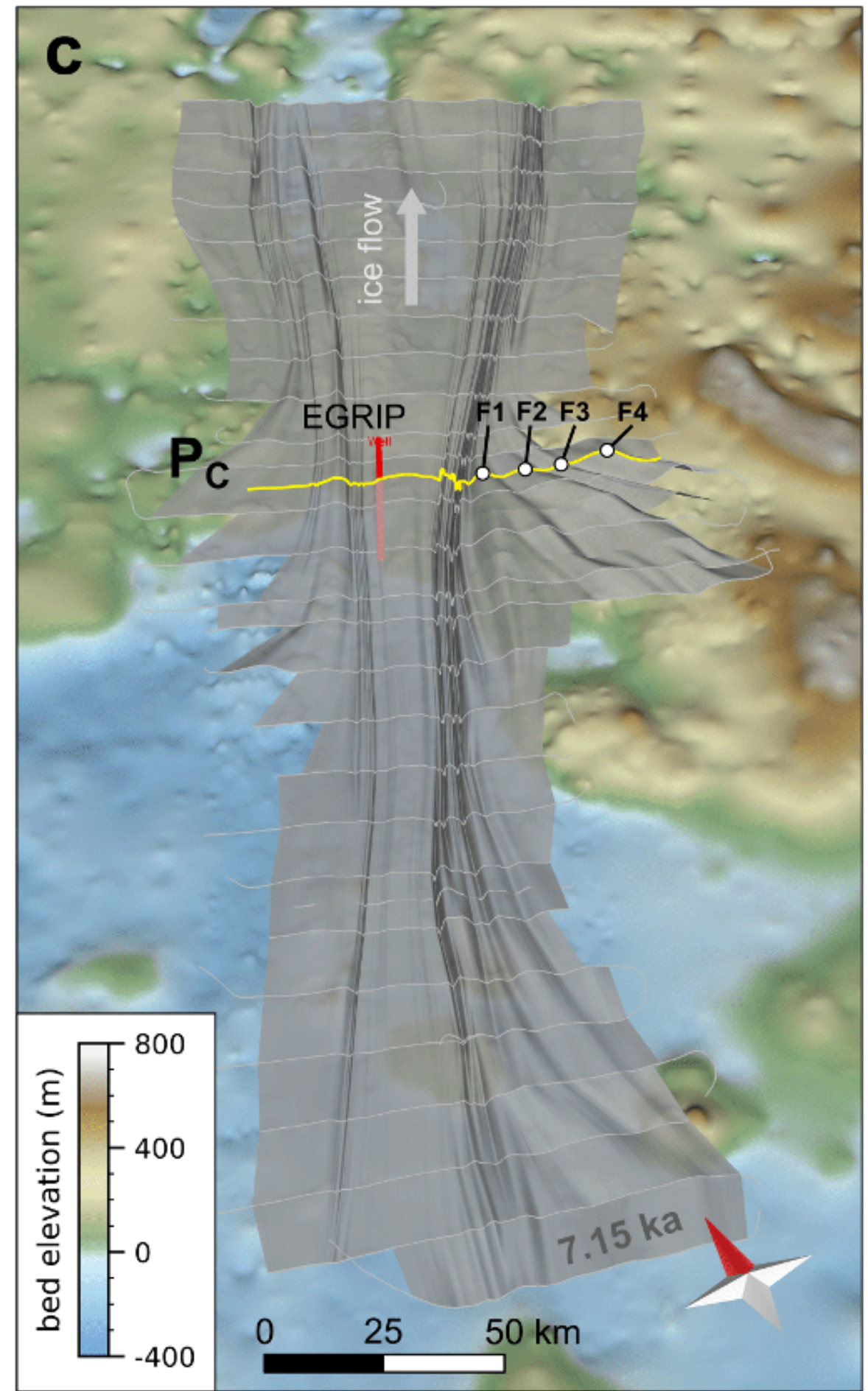
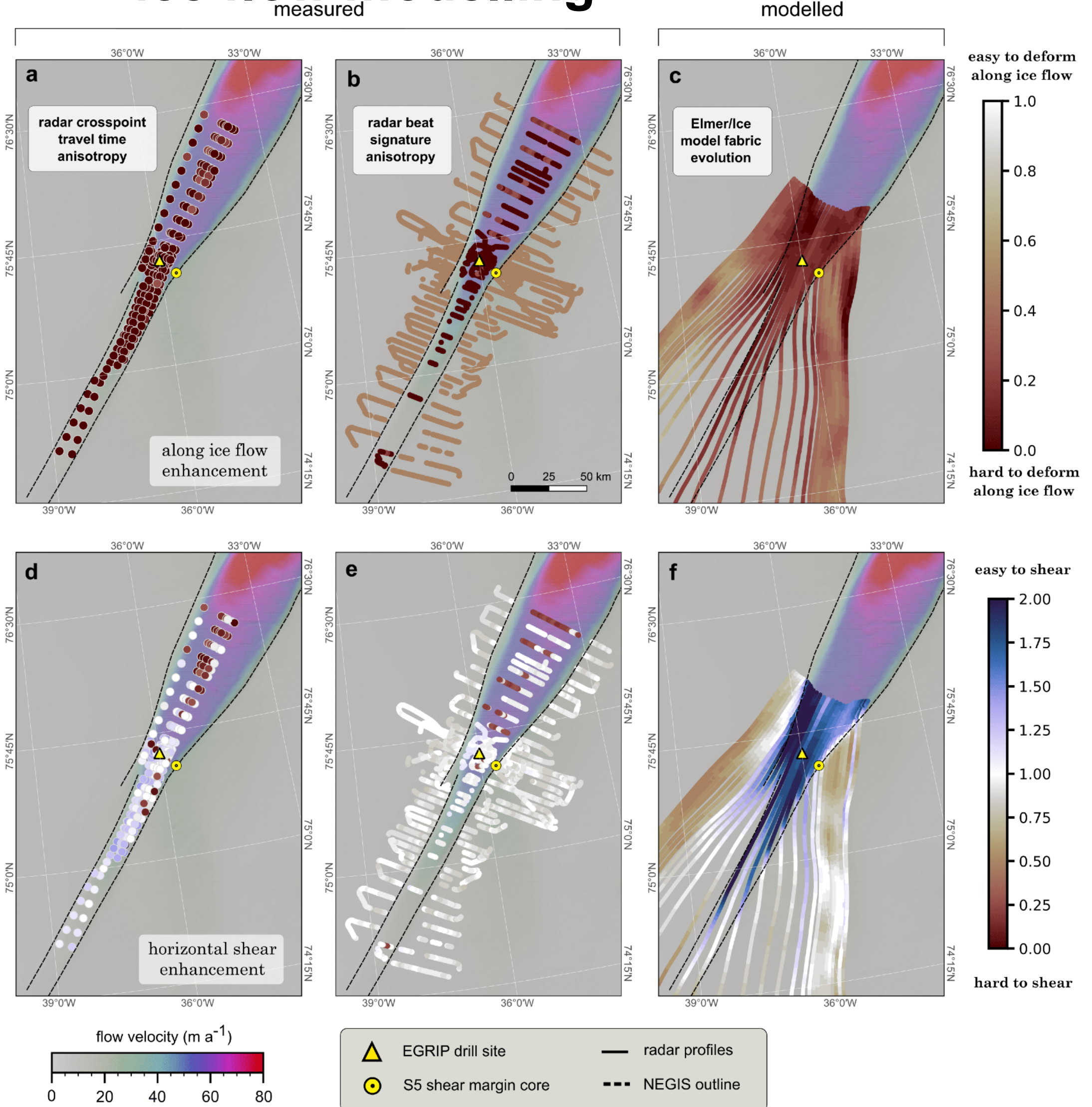
SpecCAF fabric evolution modelling



**Richards et al. (2023),
*JGR: Solid Earth***

Combining approaches and bridging scales

Airborne radar + pRES + ice flow modelling



Jansen et al. (In Revision at *Nature Communications*)

Thanks to

Ilka Weikusat, Pascal Bohleber, Julien Westhoff, Steven Franke, Maria Hörhold, Jan Eichler, Daniela Jansen, Tobias Erhardt, Tamara Gerber, Anders Svensson, Ole Zeising, Wataru Shigeyama, Daniel Richards, Carlo Barbante, Kumiko Azuma, Dorthe Dahl-Jensen and everybody involved in EastGRIP



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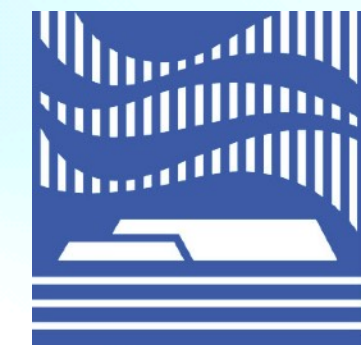
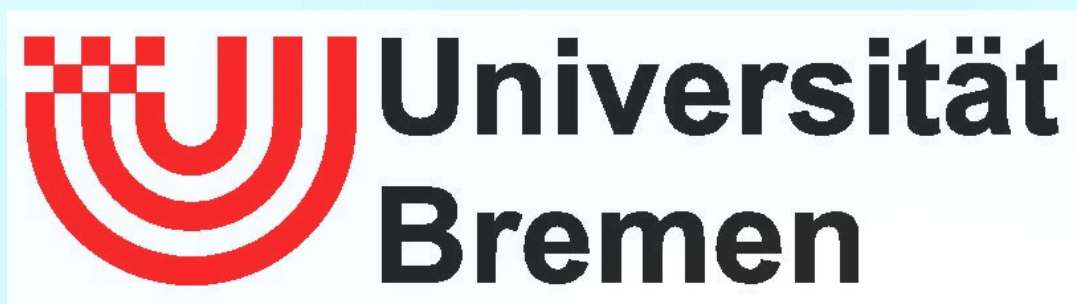
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