



Real-Time Degassing of Rock during Deformation

SJ Bauer, ST Broome, P Gardner (UM), T Fischer (UNM)

Hypothesis:

- Noble gas release may be related to deformation state of rock
- Natural or doped gases may be used to signal deformation

Objectives:

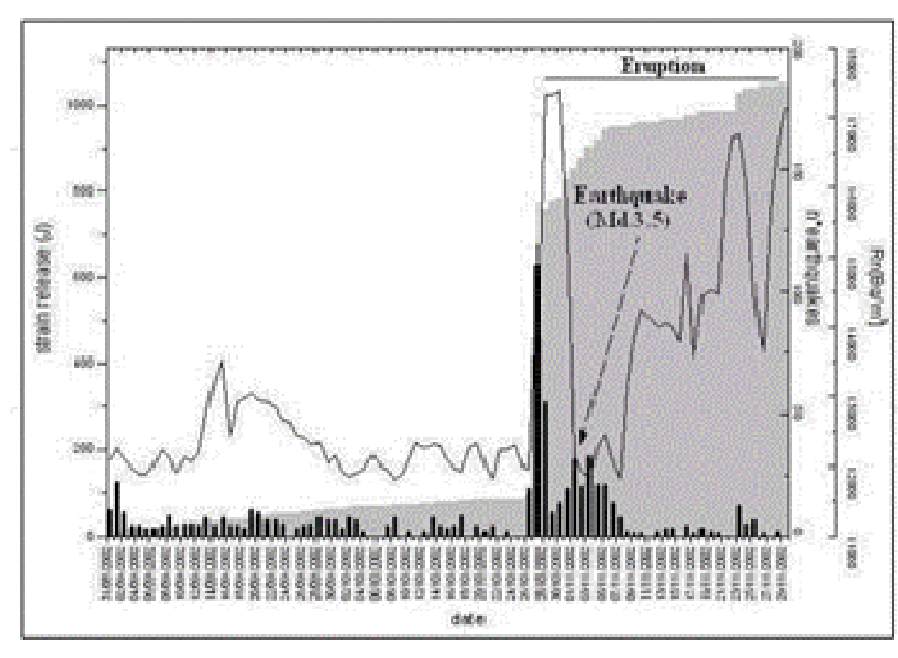
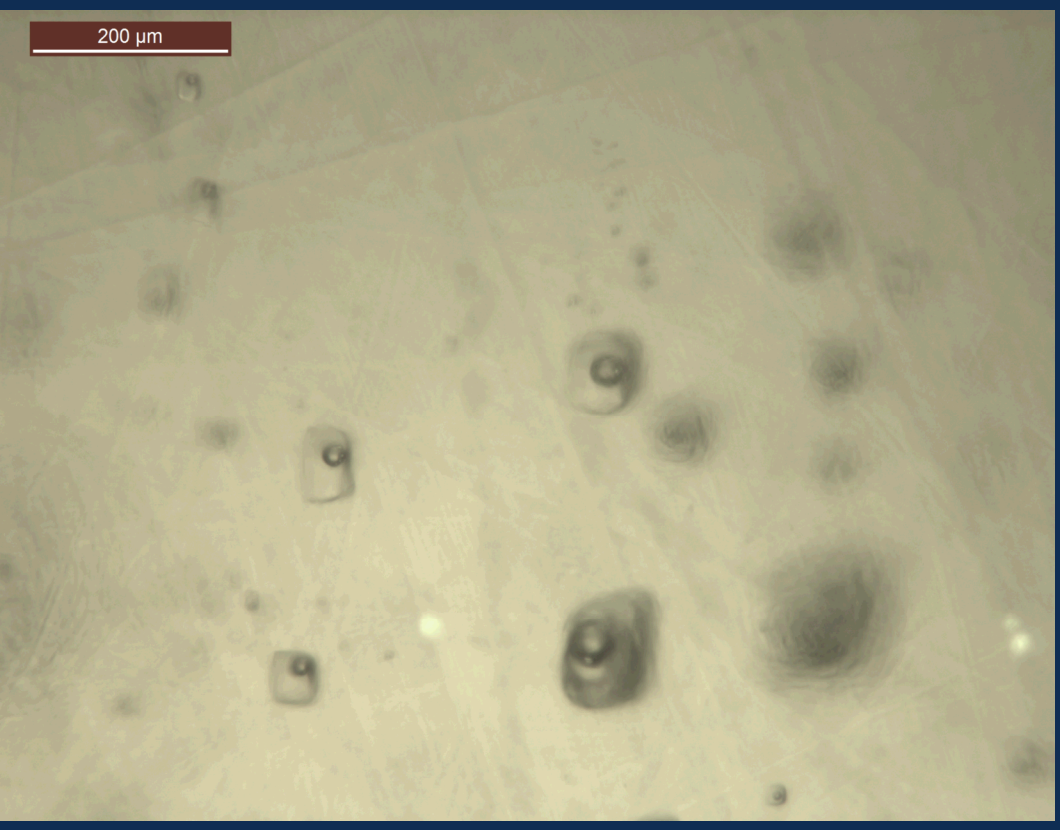
- Discovery of *real-time* gas emission during rock fracture and relate to deformation
- Demonstrate new tool in experimental rock deformation
- Inverse models used to infer fracture characteristics



Exceptional service in the national interest

Value Added:

New techniques for tracing stress, strain changes in earth materials



Dilatant behavior in advance of slip releases gases



Gas released during rock fracture inform of timing, depth, magnitude of events

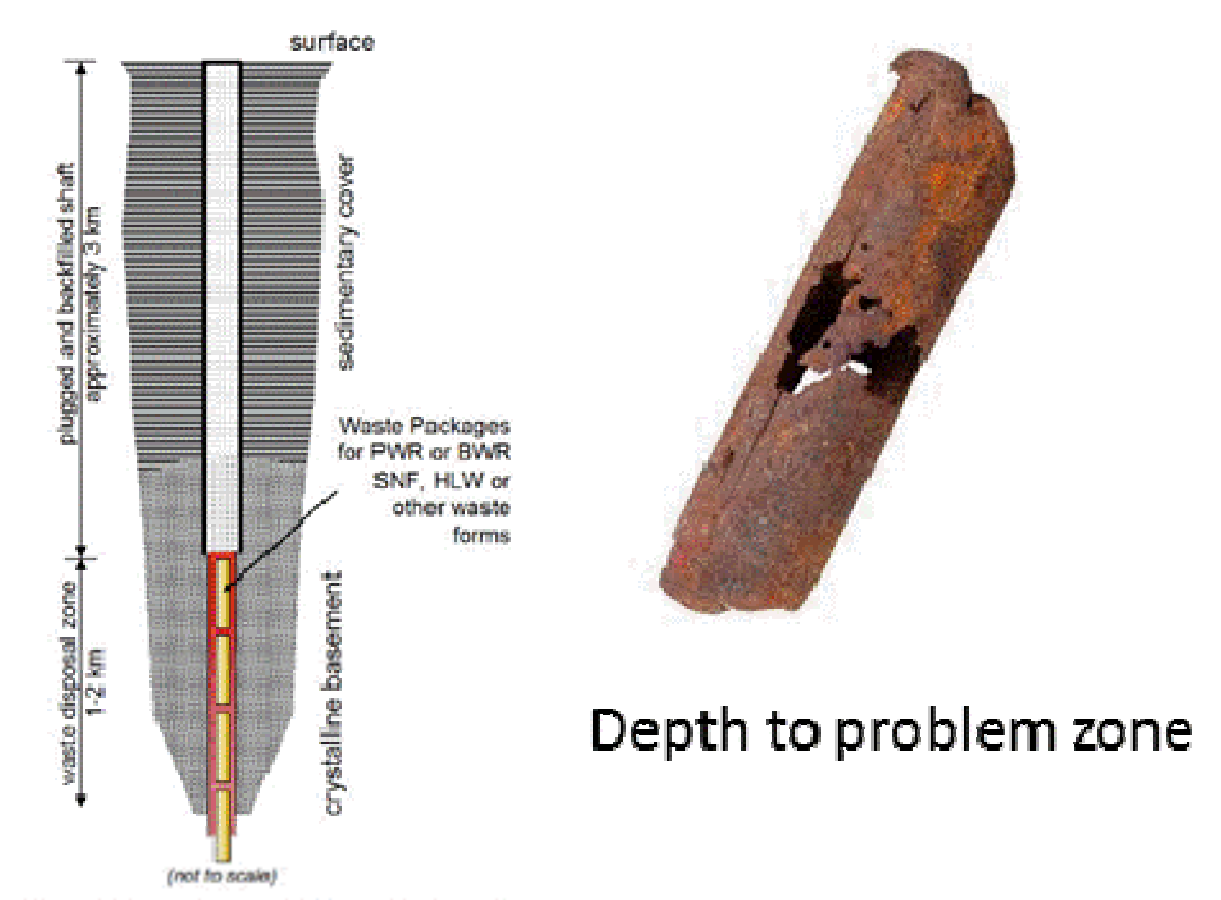
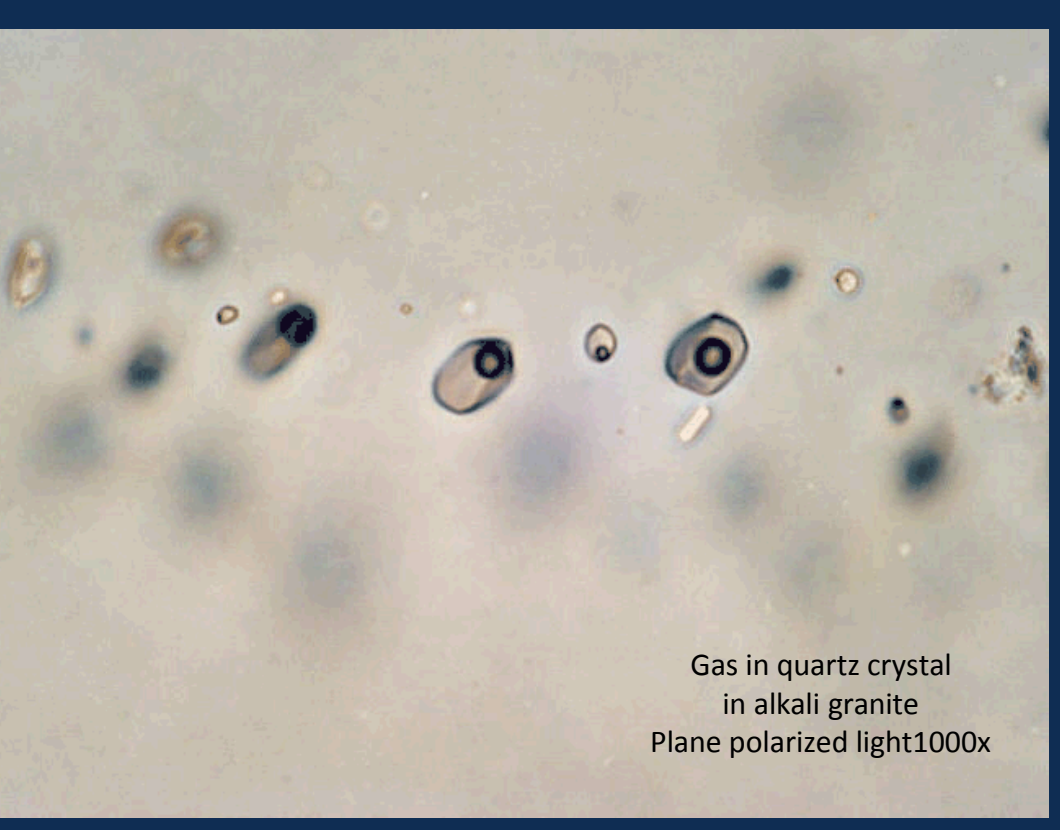
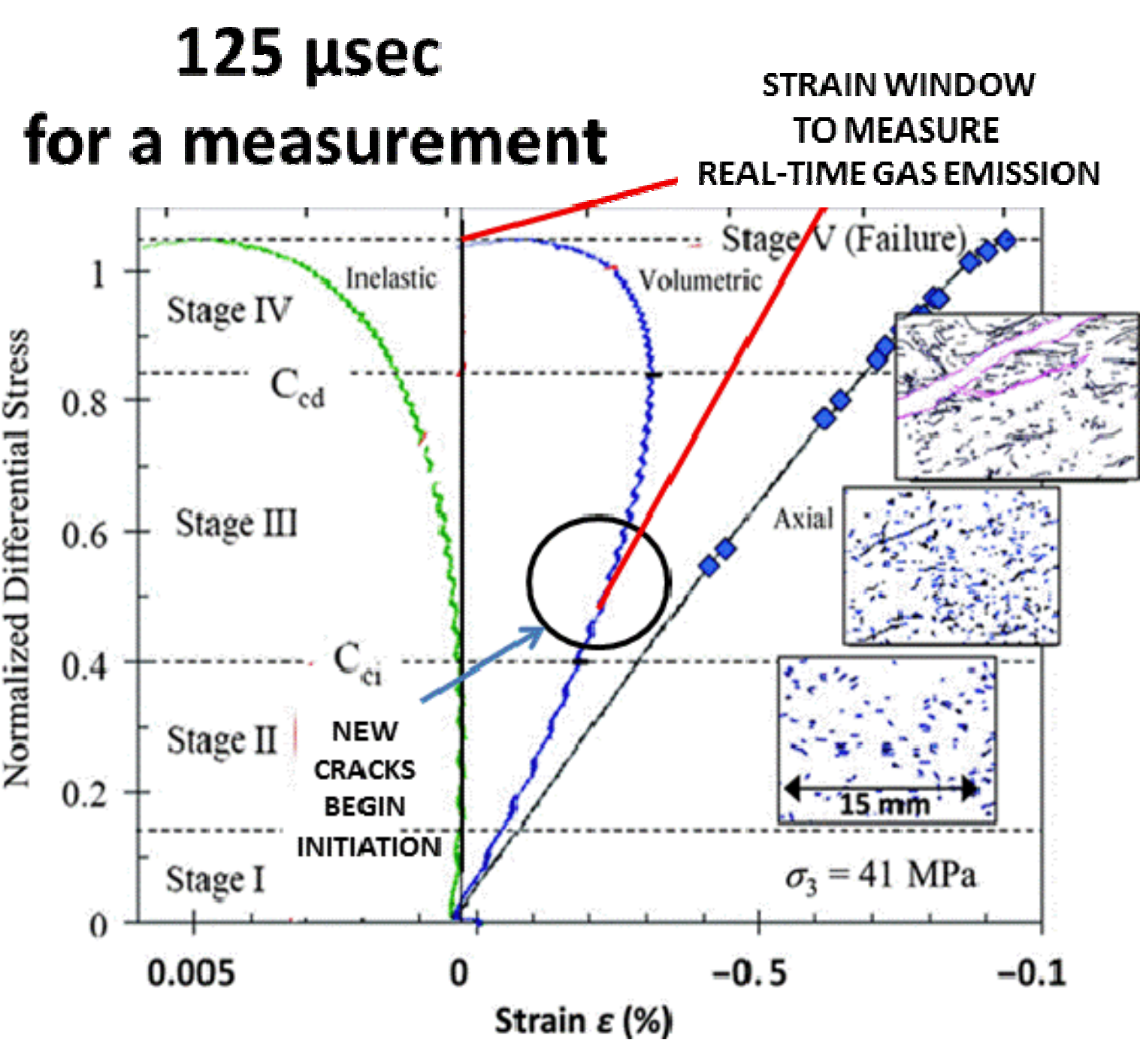


Figure 1. Deep Borehole Disposal Schematic.

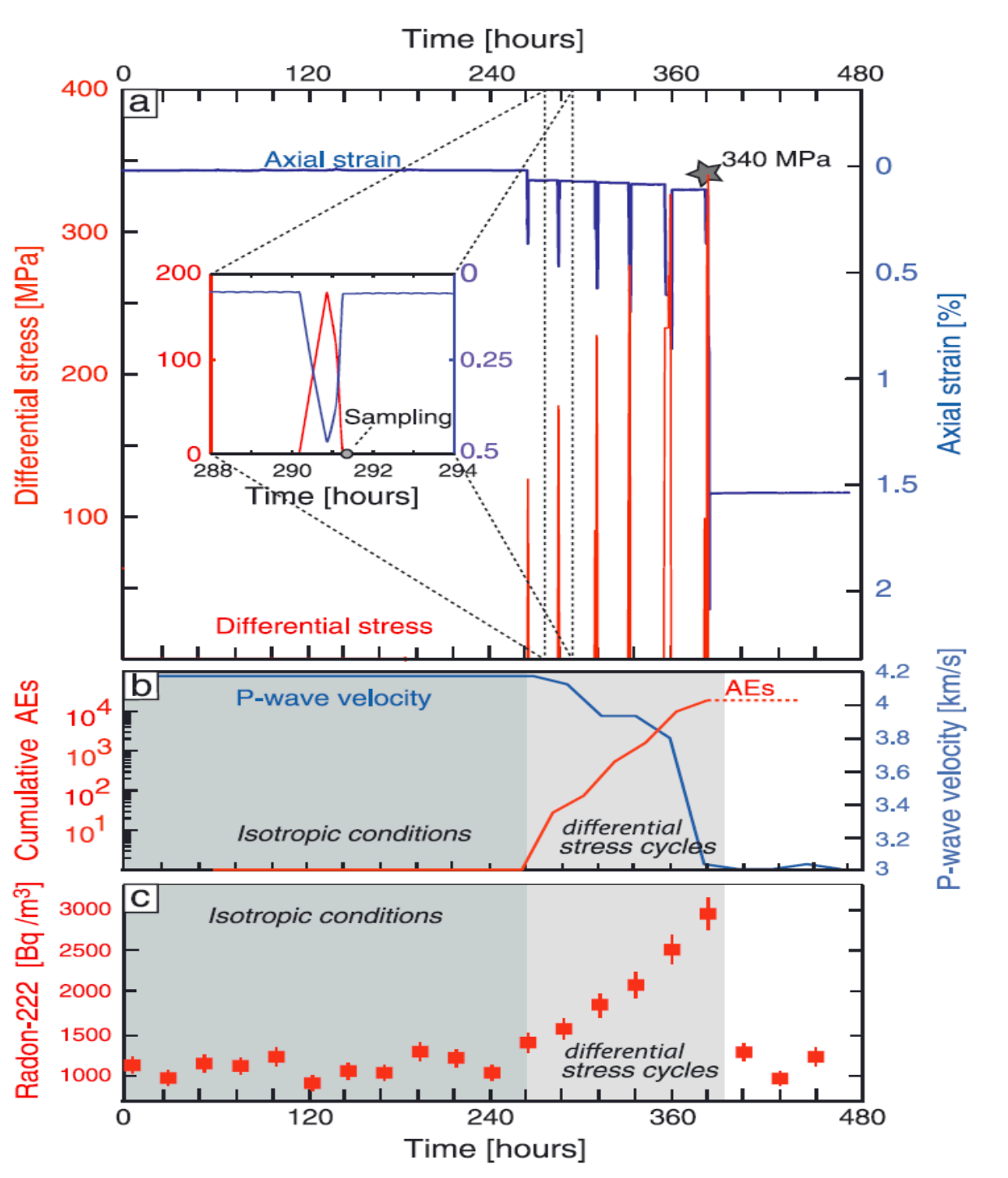


Gas in quartz crystal in alkali granite Plane polarized light 1000x

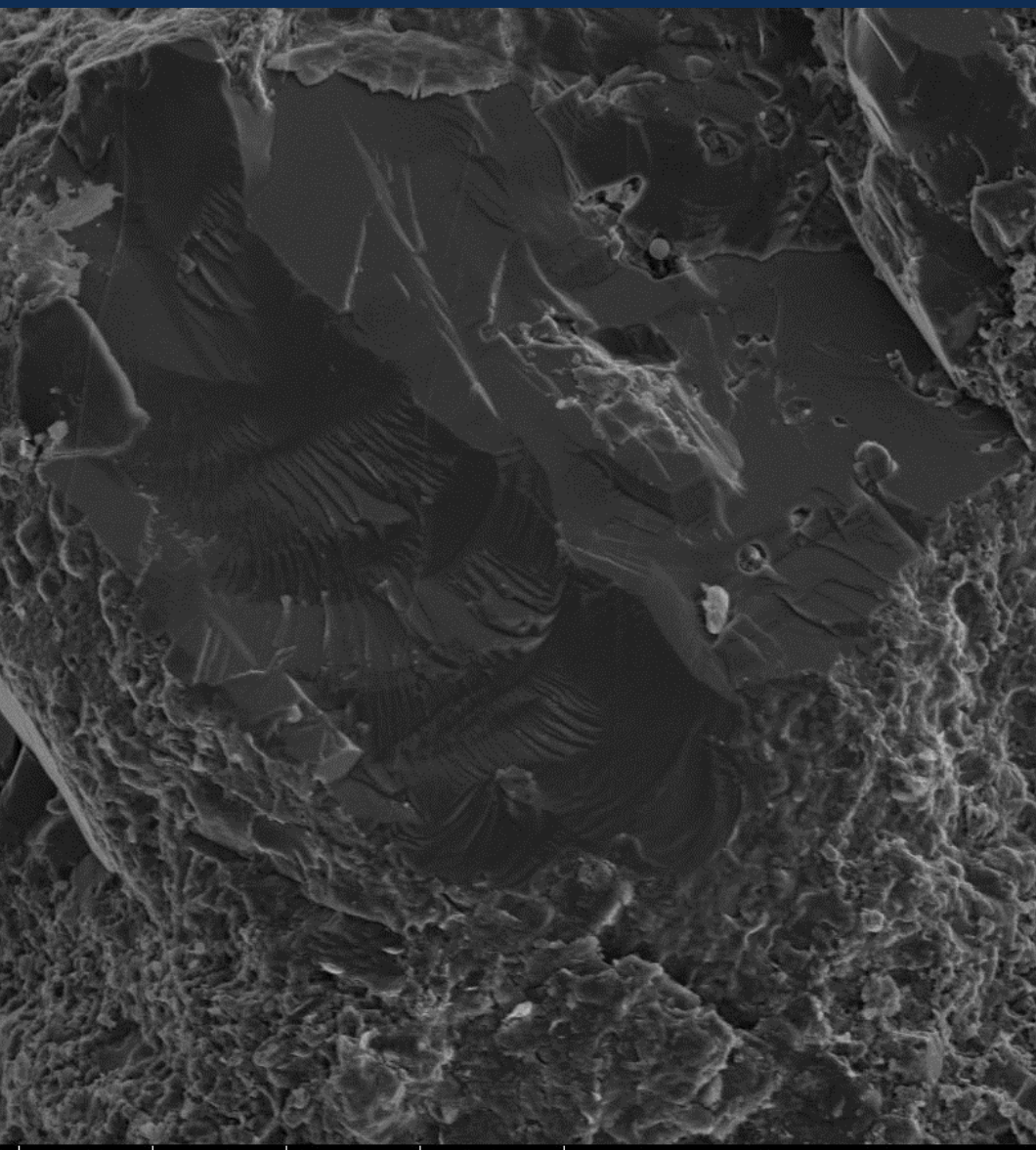


High Pressure Geomechanics Systems

Extent of fracturing/ fractured lithology



HiQuad System



HV 7.50 kV, curr 50.9 pA, mag 1500 x, WD 18.8 mm

