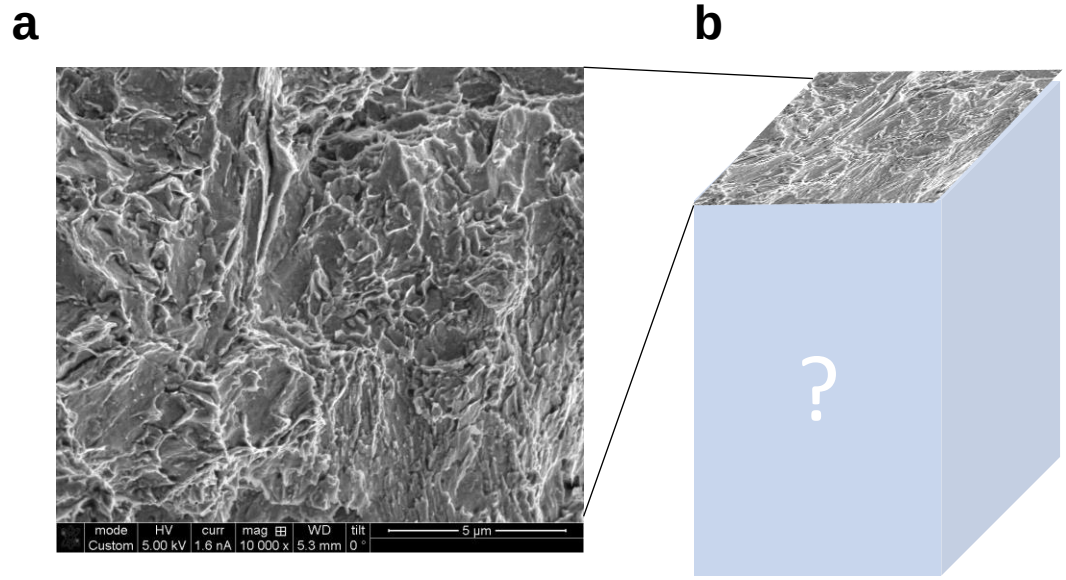
“Quasi-cleavage” features in a hydrogen-embrittled steel

In this project, you will apply the slice and view method in focused ion beam (FIB) to reconstruct the 3D structure underneath the fracture surface of a steel sample which suffers from hydrogen embrittlement.



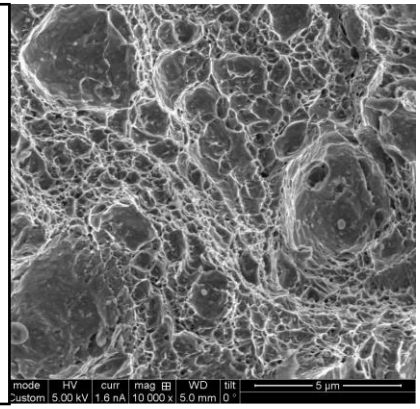
(a) An SEM image of the fracture surface of a hydrogen embrittled steel showing typical “Quasi-cleavage” features . (b) The volume to be reconstructed.

Supervisor: Lin Tian *ltian@phys.uni-goettingen.de*

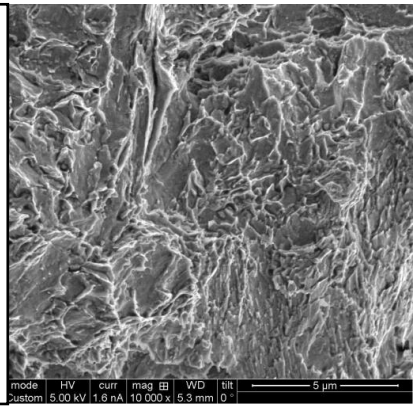
The fracture surface of hydrogen embrittled steel features quasi-cleavage morphology. Investigation of the surface landscape and volume underneath it the will help with the understanding of fracture mechanism of steel in hydrogen embrittlement. The result will be compared to those acquired from sample tested without hydrogen charging.

1. Observation of fracture surface using scanning electron microsopy (SEM).
2. 3D reconstruction of the fracture surface and the distribution of voids underneath it using slice and view function of focused ion beam (FIB).

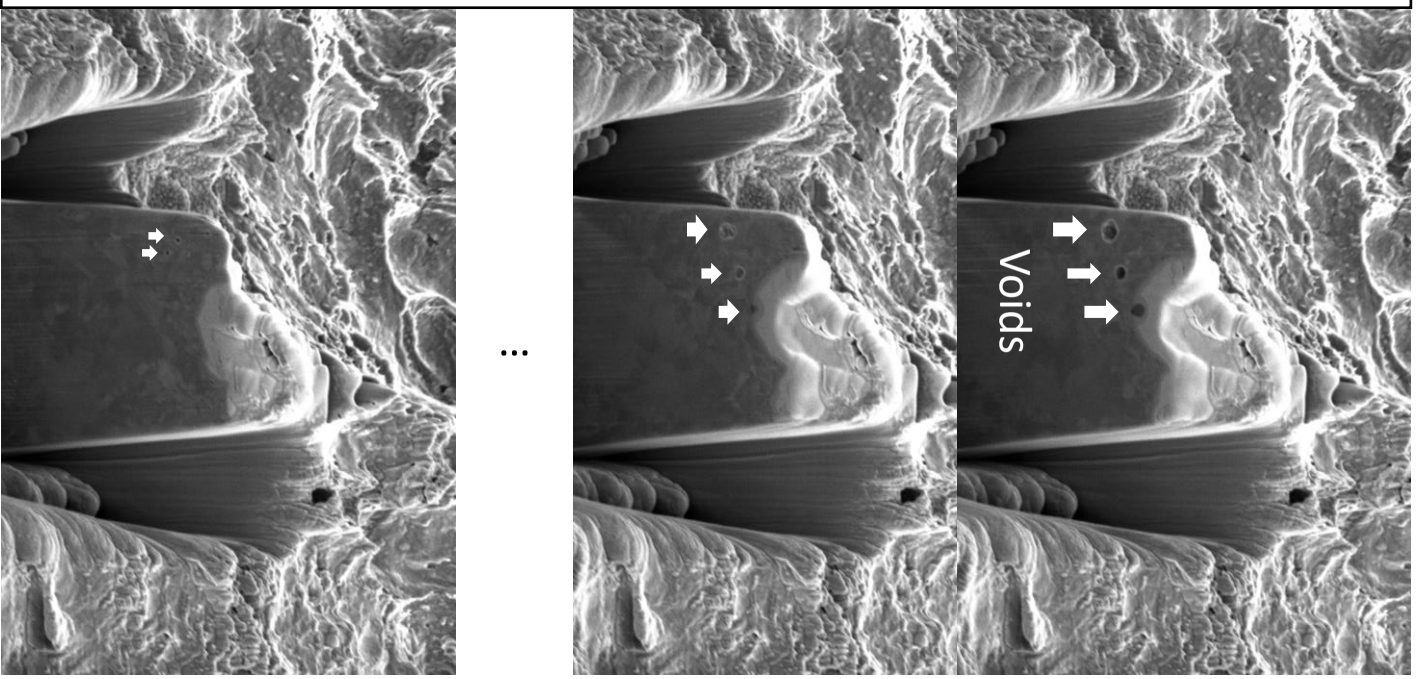
Without Hydrogen
Dimples



With Hydrogen
Quasi-cleavage



Without Hydrogen



With Hydrogen