



Contribution ID: 38

Type: Oral

Observations of dislocations in Soft Cu samples exposed to high fields

Monday, 19 September 2022 09:30 (30 minutes)

It was proposed that breakdown nucleation can be explained as emanating from surface plastic activity due to collective dislocation dynamics within the surface layer of samples exposed to high electric fields. In the past, we have demonstrated that extensive mobile dislocation structures are routinely observed in soft large-grained OFHC copper. However, as of this day we are missing a clear characteristic that is modified due to exposure to high fields. Specifically, there are no clear indications linking conditioning under high fields to variations in dislocation structure. In this talk, I describe the status of current efforts to identify such an effect and establish constraints on the effects of high fields. I demonstrate that although there are no clear signs of a simple change in dislocation density with field exposure, further study is required to address other features of the observed structures. Initial results and challenges for this are described.

Topic

Experiments and Diagnostics

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Session Classification: Experiments & Diagnostics

Track Classification: Experiments