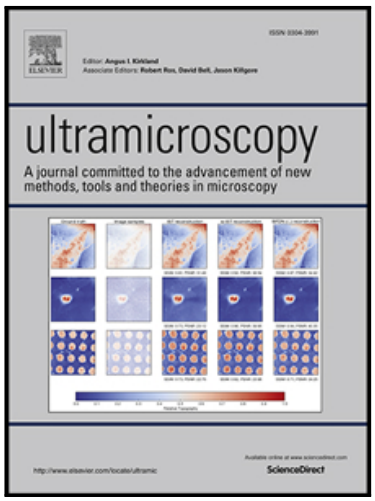

On the use of SEM correlative tools for in situ mechanical tests

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Highlights

- Special efforts are dedicated to reveal the uncertainties of various SEM measuring modalities: tilt correction error of SEM, slow scan error of SEM, coordinates error in EBSD images and orientation indexation error in EBSD. Several solutions are proposed to overcome these uncertainties.
- Properly sized platinum speckles are deposited onto the sample surface to facilitate the registration of EBSD and BSE/SE images. A specific speckle 'splitting' phenomenon in EBSD IQ images is observed and explained, and the average information depth of EBSD signal is quantified.
- A pixel-level precise overlap of EBSD and BSE images is trustfully obtained thanks to the speckles. Thus a very precise description of the polycrystalline microstructure and its changes along the tensile test, i.e. plastic strain and crystal rotation, are trustfully studied.