



Colloquium
Department of Engineering
and System Science,
Institute of Nuclear Engineering
and Science,
National Tsing Hua University

Development and application of
a large-volume, fully automated
3D electron backscatter diffraction
(EBSD) system

In this talk, I will present a recently-built, fully automatic large-volume 3D EBSD system (ELAVO 3D) system, which consists of a scanning electron microscope (ZEISS crossbeam XB 1540) with a dedicated sample holder, an adapted polishing automaton (Saphir X-change, QATM), a collaborative robotic arm (Universal Robots UR5), and several in-house built devices. The whole system is orchestrated by an in-house designed software, which is also able to track the process and report errors. The samples to be observed were featured with markers put on the perpendicular lateral surface, cut by plasma focused ion beam (PFIB) milling. The markers were used for removal rate measurements, which were in turn applied to investigate the individual effects of both 1 μm diamond and oxide polishing suspension (OPS) polishing. Internal coherent twin grain boundaries (CTGBs) in austenitic stainless steels were used to assess the stack spacing and the angular resolution of the 3D system, which was determined to be $\sim 2.5^\circ$. The applicability of the system to several different materials will be demonstrated and discussed.

Biography:



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