

Multidimensional nanoscale mechanical and electrical analysis at every pixel

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In this 30 mins workshop, Bruker application scientists will perform live demonstration of the new NanoElectrical Lab™ on the Dimension Icon XR scanning probe microscope. The DataCube modes of operation are elegant big-data approach for simultaneous multidimensional nanoscale analysis of mechanics and electrical, at every pixel [1]. This approach avoids contact mode imaging, thus extending electrical measurements to soft and fragile samples and improving measurement consistency. Moreover, this is a general approach that is applicable to most nanoelectrical modes and applications, while simultaneously providing nanomechanical properties of your sample. Extracting image slices, spatio-spectral slices, or spectra at every pixel opens the door to new data reduction methods and analyses.

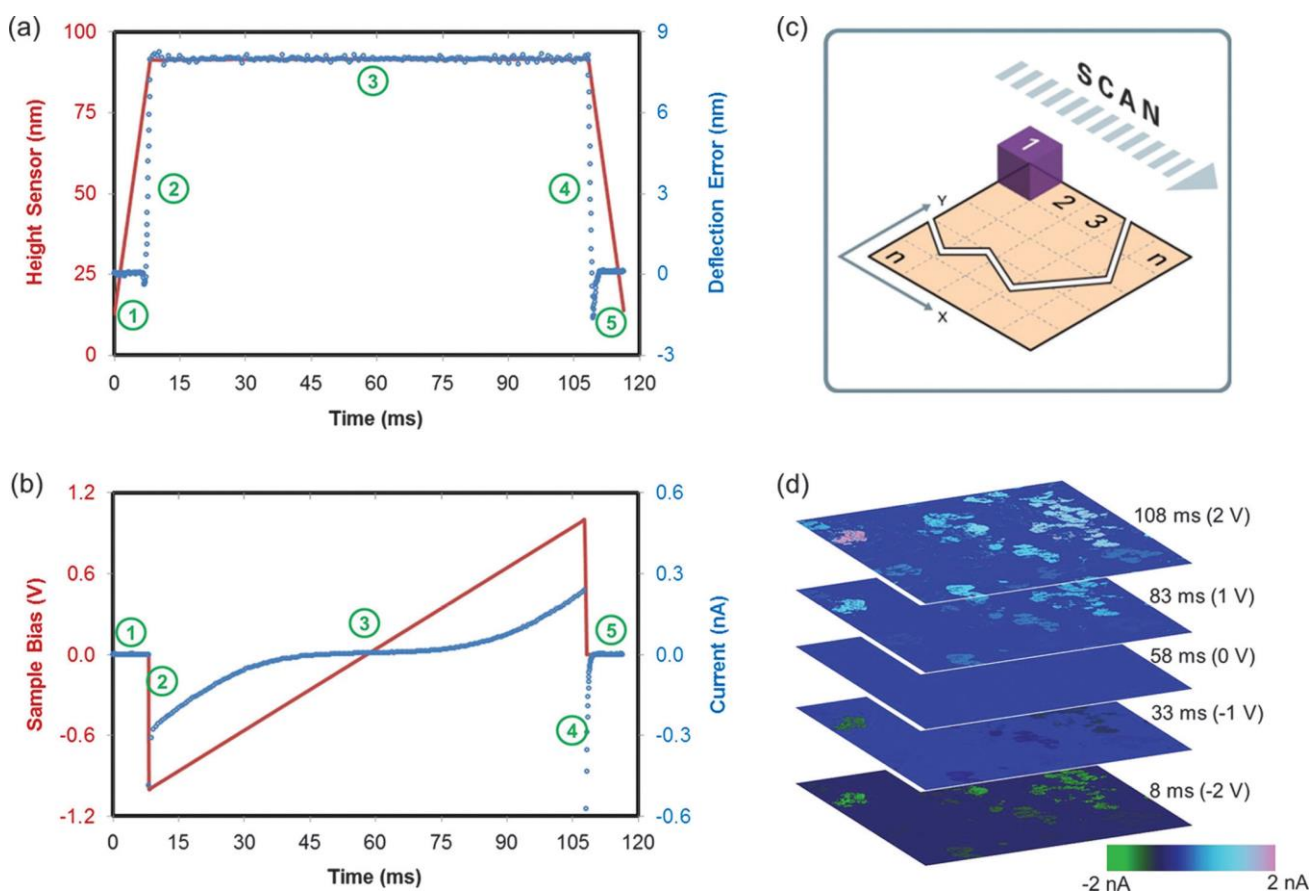


Fig. 1. Data cube (DCUBE) modes operating on fast force volume (FFV) approach: (a) height sensor (red) and deflection error (blue open circle) plots with segments showing extend (1–2), dwell (3), and retract (4–5) cycles; (b) pattern of sample bias (red) and corresponding tunnelling AFM (TUNA) current (blue); (c) illustration of scan pattern during acquisition of DCUBE-mode data; and (d) showing five out of hundreds of TUNA current slices from the DCUBE-TUNA results.

[1] De Wolf, P., Huang, Z., Pittenger, B., Dujardin, A., Febvre, M., Mariolle, D., ... Mueller, T. (2018). Functional Imaging with Higher-Dimensional Electrical Data Sets. *Microscopy Today*, 26(6), 18–27. <https://doi.org/10.1017/S1551929518001025>