Multidimensional in-situ S/TEM imaging and analysis - Challenges and Solutions

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The Electron Microscopy of tomorrow appears more and more to be highly dynamic, with the growing development of many different ways to look at real-time in-situ experiments. Being one of the world leading suppliers of scientific instruments in the field of Transmission Electron Microscopy, FEI pursues its efforts in developing in-situ microscopy at ultra-high resolution by not only better integrating existing third party portable in-situ solutions and sample holders, but also keeping its leadership on the very demanding market of Environmental Transmission Electron Microscopes (ETEM). This presentation will highlight the latest FEI developments in both directions, showing how much improvement has been made in ETEM through presentation of several unrivaled results, as well as how much the versatility of the most recent FEI TEMs family, including Talos and Themis, can accommodate the use of various in-situ sample holders, either from FEI or from other suppliers, with the fruitful help of the new FEI CMOS Ceta 16M camera. Here as well, some very realistic examples will show how much a 'standard' TEM, Cs corrected or not, can associate with the most advanced in-situ solutions to become a surprising laboratory at the sub-nanometer scale…

Key words: TEM, STEM, ETEM, in-situ, 3D EDS Tomography, CMOS camera.