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New Strategies for the Processing of Images and Co-location of Samples in a LVEM5 Instrument

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Electron microscopy has offered valuable insights into the shape distribution, interactions and other properties of engineered nanomaterials. Yet, polydisperse materials properties have been extremely difficult to quantify. This is a particularly difficult problem for soft (polymers) and hybrid materials, as recently reviewed [1]. Low voltage instruments offer several advantages over traditional ones for the characterization of soft engineered nanomaterials, including their ability to image the materials without using staining agents due to their inherently higher contrast. Some of the advantages are, however, less evident and are the consequence of the peculiar design of the instrument, like the possibility of retracing the location of a region of interest using combined modes of observation of the sample; an otherwise inherently difficult task. On the other hand, the optical path in LVEM5 instruments [2] offer opportunities as well as challenges for the proper processing of the images obtained with them. In this presentation, we will discuss new strategies for the rapid processing of large datasets obtained using LVEM5 instruments and their implementation in GPGPU clusters for the rapid characterization of engineered nanomaterials. This project has been funded in part with federal funds from the National Cancer Institute, National Institutes of Health, under contract HHSN261200800001E. The content of this publication does not necessarily reflect the views or policies of the Department of Health and Human Services, nor does mention of trade names, commercial products, or organizations imply endorsement by the U.S. Government. References 1. Sweeting the small stuff. Lauren K Wolf, Chemical and Engineering News, pages 48-50, May 28, 2012 2. http://en.wikipedia.org/wiki/Low-voltage_electron_microscope