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Simulated electron holography of PSD particles

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Electron holography is an experimental technique that is capable of observing magnetic microstructures on the same scale as can be determined using numerical modeling and thus bridge the gap between experimental measurements and theory. I will present a technique for simulating holographic images from the results of micromagnetic models and demonstrate an easily used tool for generating holograms on the fly in an interactive environment (ie in ParaView). Since holography flattens 3D information onto a 2D image, some useful information can be lost. By looking at some examples of holograms of interesting 3D magnetizations (ie PSD structures), particularly how they change as they're rotated, along with comparisons of different structures, I will examine what information can be retrieved and what might be lost. The existance of an external dipole can be indicative of an in-plane component of a seemingly out-of-plane vortex core. It is also seen, however, that two quite different structures (in this case a [111] vortex core and a [111] uniform magnetization) can sometimes be quite indistinguishable.