

Abstract Submitted  
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**Neutron Dark-Field Imaging** DAVID MULLINS, Univ of Kentucky —  
Neutron imaging is typically used to image and reconstruct objects that are difficult to image using X-Ray imaging techniques. X-Ray absorption is primarily determined by the electron density of the material. This makes it difficult to image objects within materials that have high densities such as metal. However, the neutron scattering cross section primarily depends on the strong nuclear force, which varies somewhat randomly across the periodic table. In this project, an imaging technique known as dark field imaging using a far-field interferometer has been used to study a sample of granite. With this technique, interferometric phase images are generated. The dispersion of the microstructure of the sample dephases the beam, reducing the visibility. Collecting tomographic projections at different auto-correlation lengths (from 100 nanometers to 1.74 micrometers) essentially creates a 3D small angle scattering pattern, enabling mapping of how the microstructure is distributed throughout the sample.

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