

Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Fluctuation electron microscopy studies of complex structured materials GONGPU ZHAO, School of Earth and Space Exploration and Department of Chemistry/Biochemistry, Arizona State University, Tempe, AZ, 85287, ANNICK ROUGÉE, Department of Physics, Arizona State University, Tempe, AZ, 85287, PETER BUSECK, School of Earth and Space Exploration and Department of Chemistry/Biochemistry, Arizona State University, Tempe, AZ, 85287, MICHAEL TREACY, Department of Physics, Arizona State University, Tempe, AZ, 85287 — Fluctuation electron microscopy (FEM) is a hybrid imaging-diffraction technique. This technique is particularly sensitive to paracrystalline structures of dimension 0.5-2 nm, which are difficult to detect by either imaging or diffraction techniques alone. It has been successfully deployed to study paracrystalline structures in amorphous silicon, germanium thin film. This technique has also been used to study metallic glasses and oxide glasses. Until now, FEM has not been used to study disordered geological materials. In this talk we present our FEM studies of shungite, a naturally occurring disordered carbonaceous material, reveal that trace quantities of tightly curved graphene structures such as C60, or fragments of C60, is present in shungite. We also present results from our study of metamict zircon, whose crystal structure is destroyed by self-radiation during naturally occurring α decay events. Work is in progress to study the structural evolution during the metamictization process.

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Date submitted: 12 Dec 2007

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