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Maria Emelianenko* (memelian@gmu.edu), Department of Mathematical Sciences, MS 3F2, George Mason University, 4400 University Dr, Fairfax, VA 22030. *Advances in Multiscale Modeling of Grain Growth in Polycrystals*.

This talk will focus on the simulation and analysis of the effects grain growth has on the properties of polycrystalline materials. Several kinetic models have been developed in recent years that can predict coarsening rates and accurately describe evolution of important grain boundary distributions. Here we will focus on the progress made in combining these novel mesoscopic level descriptions with macroscopic microstructure analysis tools such as OOF2. In particular, we will discuss the strategy for quantifying the rates of degradation experienced by the microstructure during coarsening and assess the impact texture and other initial grain boundary distributions have on the local stress/strain development and other materials properties. Some discussion of the novel simulation and numerical modeling techniques used in this analysis will also be provided. (Received August 22, 2011)