1109-35-262 **Pablo Seleson*** (selesonpd@ornl.gov), Oak Ridge National Laboratory, One Bethel Valley Road, P.O. Box 2008, MS 6164, Oak Ridge, TN 37831, and **Youn Doh Ha**, **Samir Beneddine** and **Serge Prudhomme**. *A Concurrent Multiscale Blending Scheme for Local/Nonlocal Coupling.*

Many complex systems, such as those involving material failure or anomalous transport, are not well described by classical local continuum models. To properly describe such systems, nonlocal models have been proposed. In solid mechanics, peridynamics (PD) has been proposed to model cracks and their evolution. As opposed to classical continuum mechanics (CCM) models, which depend on deformation gradients, PD models depend on finite deformation vectors and thus they remain valid along discontinuities. Cracks can then be naturally represented in PD. Models in PD are based on integro-differential equations, which make them computationally more expensive than CCM models. As a consequence, efficient and accurate simulations of PD problems involving cracks can be achieved by applying PD models only in critical regions, where cracks are present or may be generated, whereas employing CCM models elsewhere, where displacement fields are smooth. The challenge is to design proper algorithms to concurrently couple these local and nonlocal models. Using inherent connections between PD and CCM, we derive blending schemes for local/nonlocal coupling, which avoid common artifacts present in these types of methods. We demonstrate the performance of the coupling schemes analytically and numerically. (Received February 04, 2015)