
XIAOCHUAN TIAN, The University of Texas at Austin

Nonlocal models with heterogeneous localization and their application to seamless local-nonlocal coupling

Motivated by recent development on nonlocal mechanical models like peridynamics, we consider nonlocal integral models with a spatially varying horizon that allows the finite range of nonlocal interactions to be position-dependent. In particular, we focus on linear variational problems of such nonlocal models with heterogeneous localization on co-dimension one interfaces. The well-posedness is established for variational problems. We also study their seamless coupling with local models. In addition, we present numerical studies of the nonlocal models and local-nonlocal coupled models based on the asymptotically compatible Galerkin finite element discretizations.