“An extension of continuum mechanics to non-local problems”

Dr. Siv. Sivaloganathan
Department of Applied Mathematics
University of Waterloo
&
Centre for Mathematical Medicine
Fields Institute

Abstract

It is well-known that the classical equations of continuum mechanics are not well-suited to the modelling of many problems of fundamental importance in solid mechanics (e.g., crack formation, phase transitions etc). Non-local methods have been proposed in recent years to address the limitations of classical continuum mechanics. We shall briefly review one such approach - the peridynamic theory of Silling and co-workers, and briefly indicate how fractional derivatives can be used to extend the classical continuum mechanics formalism to encompass this non-local theory.