

Dear Colleagues,

Concurrent multi-length scale modeling is critical for modeling systems with strong couplings between different length scales, and paves the way for the future research in large-scale materials that are of both scientific and industrial importance. We cordially invite you to participate in the 12th U.S. National Congress on Computational Mechanics (US-NCCM12) and give a talk in our minisymposium **Multiscale Concurrent Multi-Length Scale Modeling: from Finite Element to Atoms and Electrons**. The Congress will be held in Raleigh, NC, USA, from July 22 to July 25, 2013.

Abstract

Nowadays, state-of-art supercomputers can perform atomic simulations with billions of atoms and reach the length scale of micrometers. However, it is very unlikely in near future that such brutal force atomistic modeling can solve those scientific and engineering problems in which physical phenomena happen at the length-scale of hundreds of micrometers or even larger, such as fracture. Finite element modelings are lack of atomistic resolution. Atomistic simulations are too computational expensive to treat such large length scale. Multiple length scale modeling is then required to couple finite element modelings and atomistic simulations. This minisymposium (number: MS4_9) is dedicated to concurrent multi-length scale modeling, and focuses on the applications of concurrent multi-length scale modeling in computational mechanics and the development of theories and algorithms, such as quasi-continuum method, coupled atomistic and discrete dislocation method, concurrent atomistic-continuum method, multiscale coarse-graining method, super-atom method, dissipative particle dynamics, coarse-grained molecular dynamics, micromorphic theory, and atomistic field theory.

Topics of interest include but not limited to:

1. Multiscale modeling from finite element methods (meshed or meshless, including XFEM, SPH, EFG, etc) to atomistic simulations.
2. Quantum mechanics/molecular mechanics methods.
3. Full spectrum multiscale couplings (FEM/MM/QM and more).
4. Phase field models.

All methodologies and applications related to multi-length scale modeling are welcome. Contributions that integrate both experimental and computational approaches in mechanics and materials are particularly encouraged.

Important dates:

Abstracts due: February 15, 2013. Please submit via <http://12.usnccm.org/abstract-submission>

Acceptance notification: March 15, 2013

Travel Award Applications: March 1 - 31, 2013

Early registration: March 15 - May 15, 2013

We look forward to your participation at USNCCM 2013.

Best Regards,

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