

# SOFTWARE DESIGN AND IMPLEMENTATION FOR HIERARCHICAL PARALLEL ARCHITECTURES TRACK NUMBER 1400

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## ABSTRACT

The emergence of computing platforms characterized by hierarchical parallelism is transforming computational simulation. To run effectively at scale in the presence of on-node accelerators, codes must negotiate massive parallelism, data locality, and hardware resilience, among other concerns. This minisymposium focuses on the design and implementation of engineering mechanics applications and related computational / communication kernels on next-generation supercomputing platforms, in particular approaches that replace or complement the traditional MPI programming model. Examples include strategies for performance portability across disparate hardware architectures, algorithmic advances for solvers, load balancing, and asynchronous tasking.