

# Substructuring, Dimension Reduction and Applications: An Introduction

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There are a variety of reasons to go for substructuring and dimension reduction in scientific computations and applications. Substructuring makes it possible to solve large and seemingly intractable computational problems solvable in today technology by some kind of Divide-and-Conquer technique; Substructuring offers a general methodology to do parallelization; And substructuring allows one to design algorithms to preserve substructures at a very fine level of underlying problems of interest, which usually go unnoticed by more general purposed methods. Often if done right, payoff will be significant. Dimension reduction is a rather broader concept referring to techniques that achieve significant reductions of problem sizes so as to make intractable numerical simulations tractable. Successful examples are abundant, including reduced order modelling from dynamical systems and circuit design, cluster text data analysis, and data mining. This minisymposium presents currently active researches in substructuring strategies, model reduction and applications, and domain decompositions, among others.