

Scientific Computing

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CBC Talk on Algorithms for Shock Wave Propagation in Tissue, Bones, and Kidney Stones - May 24, 2012



Professor Randall LeVeque from the University of Washington will hold a talk on algorithms for shock wave propagation in tissue, bones, and kidney stones; at 12:30 on Thursday the 24th of May in Bakrommet@Simula.

Total number of participants: 13
 Total number of guests outside of CBC: 2
 Number of different nationalities represented: 3
 Total number of speakers: 1
 Total number of talks: 1

Abstract

Lithotripsy is a medical procedure to break up kidney stones using focused shock waves. Extracorporeal shock wave therapy (ESWT) is a technique in which lower amplitude shock waves are found to be effective in stimulating bone growth or angiogenesis. Computational models can be used to better understand where shock waves focus in complex geometries, with reflections at interfaces between tissue and bone, for example.

Numerical algorithms for modeling nonlinear elastic wave propagation including shock waves are being developed in two and three space dimensions to aid in this study, using compressible fluid dynamics for tissue together with elasticity or poroelasticity to model bone. High resolution finite volume methods using Riemann solvers are employed along with adaptive mesh refinement. These methods work well for wave propagation problems in heterogeneous media and can accurately capture the transmission and reflection of waves at material interfaces.

What	
When	May 24, 2012 from 12:30 PM to 01:30 PM
Where	Bakrommet @ Simula
Contact Name	Hans Petter Langtangen
Attendees	Guests outside of CBC: Randy LeVeque Loyce Adams
Add event to calendar	 vCal  iCal