NUMERICAL MODELS FOR EARTHQUAKE GROUND MOTION

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Physics-based numerical simulations provide a powerful tool to study the ground motion induced by earthquakes in regions threatened by seismic hazards. They can be used to better understand the physics of earthquakes, improve the design of site-specific structures, and enhance seismic risk maps. The distinguishing features of a numerical method designed for seismic wave propagation are: accuracy, geometric flexibility and parallel scalability. High-order methods ensure low dissipation and dispersion errors. Geometric flexibility allows complicated geometries and sharp discontinuities of the mechanical properties to be addressed. Finally, since earthquake models are typically posed on domains that are very large compared to the wavelengths of interest, scalability allows to efficiently solve the resulting algebraic systems featuring several millions of unknowns. In this talk we present a spectral element discontinuous Galerkin method on hybrid (non-conforming) grids for the numerical solution of three-dimensional wave propagation problems in heterogeneous media.