Fri. Nov 2, 2018

Room1

Plenary Talk | Plenary Talk

[PL6] Plenary Talk 6
Chair: Karin Dahmen(University of Illinois at Urbana Champaign, USA)
8:30 AM - 9:20 AM Room1

[PL6] Plenary Talk 6
○Muneo Hori （Earthquake Research Institute, The University of Tokyo, Japan）

Plenary Talk | Plenary Talk

[PL6] Plenary Talk 6

Integrated earthquake simulation enhanced with high performance computing

Chair: Karin Dahmen(University of Illinois at Urbana Champaign, USA)

Fri. Nov 2, 2018 8:30 AM - 9:20 AM Room1

Muneo Hori

[PL6] Plenary Talk 6

○Muneo Hori （Earthquake Research Institute, The University of Tokyo, Japan）

(Fri. Nov 2, 2018 8:30 AM - 9:20 AM Room1)

[PL6] Plenary Talk 6

Integrated earthquake simulation enhanced with high performance computing

○Muneo Hori （Earthquake Research Institute, The University of Tokyo, Japan）

Integrated earthquake simulation (IES) is a seamless simulation of earthquake hazard, disaster and disaster response for an urban area. A set of numerical analysis of Earth Science, earthquake engineering and social sciences are used to carry out this simulation, together with analysis models of the target area that are automatically constructed by using available data of undergrounds, structures, and social activities. High performance computing is essential for the simulation with higher spatial and temporal resolution and for the evaluation of uncertainties related to a possible earthquake scenario, state of structures and social activities; capability computing is used to solve a large-scale model of an urban area, and capability computing is used to solve numerous cases and analysis models for the uncertainties. This lecture presents the current state of IES that uses K computer and other supercomputers. The following topics are focused: 1) key numerical techniques that are implemented into finite element method for scalable parallel computation; 2) particle simulation for fluid and human being; ad 3) the automated model construction that take advantage of various distinct data sources. Several examples of IES that are made for actual cities in Japan are presented. Discussions are made for the future use of higher fidelity models of structures in order to make more reliable seismic response analysis.