Session: Computational seismology

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Ground Motion Analysis in the Valley of Mexico Using Large Scale Numerical Simulations

by

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This study presents an analysis of the ground motion in Central Mexico originating from interplate earthquakes located along the Pacific coast and intra-slab deep events via numerical simulations, with emphasis on the Valley of Mexico (VM). We explore the effects of the Trans-Mexican Volcanic Belt (TMVB) and the influence of the low velocity deposits on the amplitude and elongation of the duration observed in recorded motions in Mexico city. For this purpose, we developed a crustal model which includes a geotechnical structure of the VM. The model's subduction zone geometry and velocity distribution is consistent with the observed seismicity and recent tomography studies. Our 3D finite element wave propagation computations, valid up to 1 Hz, reveal that including a basin with a structure as complex as the VM dramatically enhances the regional effects induced by the TMVB. Moreover, the basin not only increases the ground motion amplitude and duration, it also favours the energy focusing into zones of the city, where buildings typically undergo high levels of damage.