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Southern California Fault Mechanics: Observations and Models

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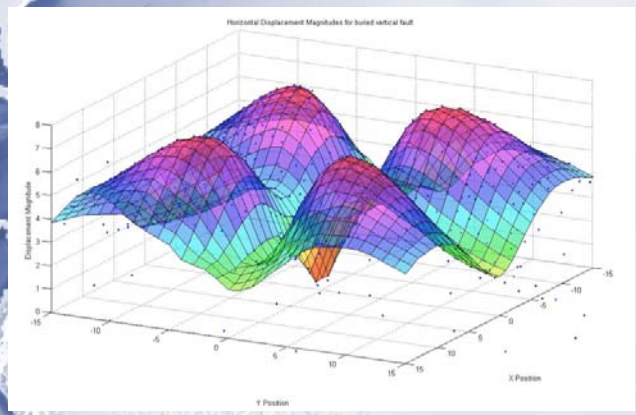
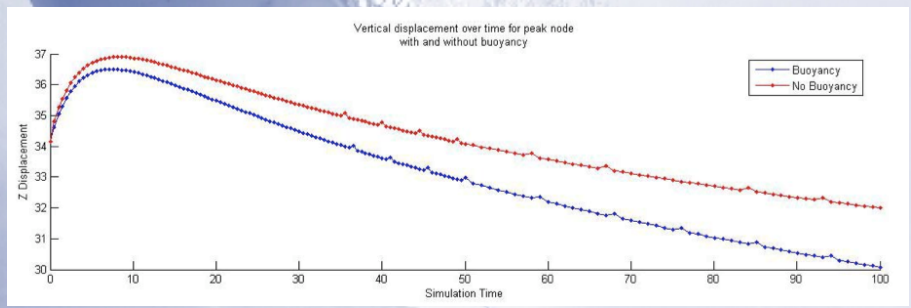
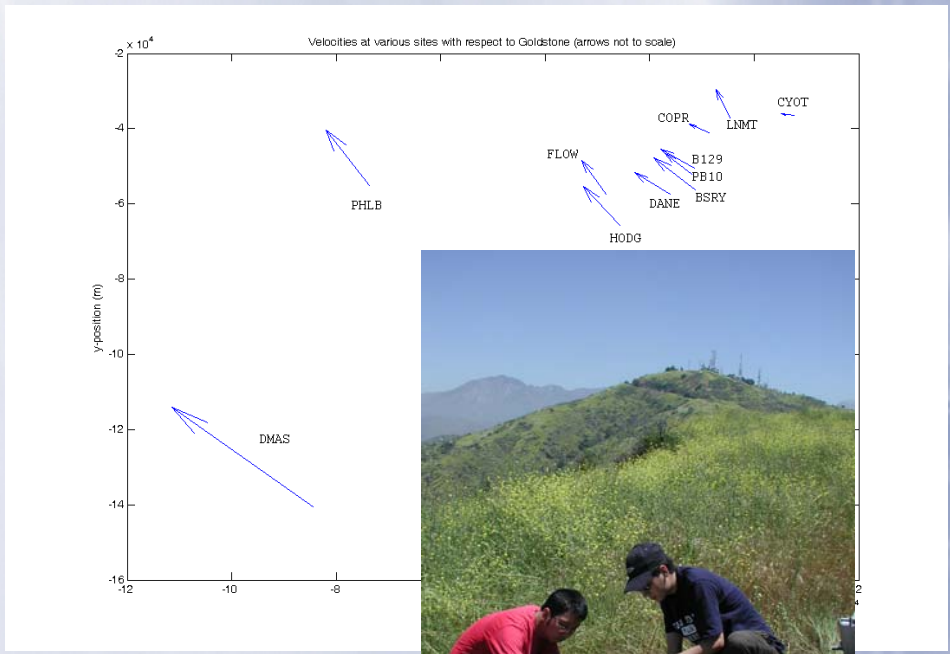
A dual research program involving both field geodetic observations and numerical modeling has been carried out to elucidate crustal deformation related to active faulting in Southern California. Repeated GPS observations provided estimates of tectonic velocities in the Mojave desert and San Gabriel blocks. 3-D finite element calculations have refined understanding of the roles of anelastic material layering, buoyancy and topography in the evolution of crustal motion.



Finite element modeling of vertical strike slip faults (shown above) and thrust faults revealed the effects of varying material properties



Finite element models investigate the effect of buoyancy stresses on post-seismic vertical movement following thrust events



Velocity vectors obtained for sites across Mojave desert showing strain associated with the East Mojave Shear Zone

Mar and Park carry out GPS geodetic data collection in San Gabriel Mountains