The fault within the faults? A team of French geologists and seismotectonicists are investigating in the Southwest of the United States

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Current earthquake models provide an incomplete picture of seismic behavior. The hypothesis underlying the project led by Isabelle Manighetti (Université Côte d’Azur) is that these models do not take into account the actual 3D geometry and mechanical properties of the faults that produce the earthquakes.

Several researchers and doctoral students involved in the FAULTS_R_GEMS (properties of FAULTS, a key to Realistic Generic Earthquake Modeling and hazard Simulation) project, funded by the French National Research Agency, have come to the USA to acquire field data documenting the 3D fault geometries and mechanical properties. These researchers, from CNRS laboratories at the Universities of Côte d’Azur and Montpellier, collaborate with teams from Arizona State University, UNAVCO and CalTech. They have acquired at three fault sites in Western USA (Capitol Reef, Utah; Granite Dells, Arizona; Valley of Fire, Nevada) high-resolution fault images using different techniques (LIDAR, photogrammetry from drone, helium balloon, and hand held camera). These high-resolution images will be combined with larger-scale images from the French Pleiades satellite so as to produce 3D fault models and derive their mechanical properties. The ultimate goal is to input these 3D fault geometries and mechanical properties into theoretical earthquake models, to better simulate the earthquake behavior and improve the Earthquake Early Warning systems.