

Preliminary results from the Magnetotelluric Experiment in Zapotecan and Chiapas Ancient Lands (MEZCAL): combining seismology, tectonics, and electrical techniques.

The September 8, 2017 Mw 8.2 Tehuantepec, Mexico earthquake (located offshore) was one of a small number of Mw 8.0+ intraplate normal fault earthquakes to have ever been recorded. Its hypocentral depth of 45 km puts it at the edge of what are considered shallow and intermediate depth intraplate earthquakes. It is the only Mw 8.0+ normal faulting earthquake to sit in this intermediate depth range. The Tehuantepec ridge subducts directly into that region and appears to deflect the coast suggesting very strong coupling. Strong coupling suggests that there should be many large earthquakes occurring there, however it is in the middle of a seismic gap with no large earthquake ever recorded there. A basic question is why did the Mw 8.2 earthquake occur within the slab and not at the interface of the seismogenic zone? The area is also interesting because it sits at the edge of the Trans Mexican Volcanic Belt and the Chiapas Arc, two distinct subduction regions that shift from flat slab to steep subduction. The earthquake itself and previously recorded earthquakes appear to stop at the limit of the two arcs. It is a limit that earthquakes cannot cross? We present preliminary results from an amphibious magnetotelluric (MT) experiment and seismic analysis of this region. The first portion of the onshore portion of the MT soundings have been recorded. The second are ongoing and the offshore portion will occur in April – May, 2023. A temporary aftershock seismic network was installed from October 2017 - February 2018. We present the preliminary analysis of those data within the context of the tectonic setting.

