



Contribution ID: 137

Type: **Poster**

Magnetotelluric phase tensor analysis and its significance for tectonic interpretation: Case studies of the Los Humeros and Acoculco geothermal resources, Mexico

Wednesday, October 9, 2019 2:30 PM (20 minutes)

A joint geothermal project of a European and Mexican consortium began in late 2016 with the purpose to develop geothermal energy in the easternmost region of the Trans-Mexican Volcanic Belt. Two sites that belong to the Comisión Federal de Electricidad (CFE) have been investigated. For both systems the phase tensor analysis from magnetotelluric data and its outcome for structural interpretation have been investigated.

The Los Humeros geothermal reservoir is a superhot geothermal resource that is exploited with a high number of wells. On the other hand, an enhanced geothermal system (EGS) is proposed to be developed in the Acoculco geothermal prospect. In order to explore the geothermal resource and guarantee a future sustainable exploitation, an extensive international research program was initiated, aimed at investigating the characteristics of both areas, superhot conditions for Los Humeros and the potential of EGS development for Acoculco. Besides seismological and gravimetric techniques, the magnetotelluric method displays the subsurface resistivity structure allowing a hint about the reservoir architecture.

While data acquisition and processing as well as the inversion and interpretation are provided by other studies, here we evaluate the phase tensor of the 122 MT measurements in and around the Los Humeros caldera and the 68 MT recordings in the vicinity of the two Acoculco wells. In combination with geoelectric strike direction and induction arrows, preferential orientations and structures of the subsurface conductivity distribution will become visible.

After analysis and interpretation of the phase tensor, a correlation with structural geological data is conducted to investigate the characteristics of the detected tectonic features.

This abstract presents results of the GEMex Project, funded by the European Union's Horizon 2020 research and innovation program under grant agreement No. 727550, and by the Mexican Energy Sustainability Fund CONACYT-SENER, Project 2015-04-268074. More information can be found on the GEMex Website: <http://www.gemex-h2020.eu>.

Author: Dr HELD, Sebastian

Co-authors: BENEDIKTSDÓTTIR, Ásdís; ARANGO GALVAN, Claudia; Dr LIOTTA, Domenico; PÁLL HERSIR, Gylfi; CORNEJO, Natalia; SALAS, Jose Luis; SCHILL, Eva

Presenter: Dr HELD, Sebastian

Session Classification: Poster Session