Geophysical Research Abstracts
Vol. 12, EGU2010-6048, 2010
EGU General Assembly 2010

2D and 3D Electrical Resistivity Tomography imaging of earthquake related ground deformations at the Ancient Roman Forum and Isis Temple of Baelo Claudia (Cádiz, South Spain).

Pablo G. Silva (1) and the P. Carrasco (2), P. Huerta (1), R. Pérez López (3), A. Cabero (4), A. Ribó (5), M.A. Rodríguez Pascua (3), J.L. Giner Robles (6), J. Lario (4), K. Reicherter (7), C. Grüztner (7), J.L. Goy (1), C. Zazo (5) Team

(1) Universidad de Salamanca, Geología, Escuela Politécnica Superior Ávila, Spain (pgsilva@usal.es), (2) Universidad de Salamanca, Cartografía e Ing. Terreno, Escuela Politécnica Superior de Ávila, Spain. (pcarrasco@usal.es), (3) IGME- Instituto Geológico y Minero de España, Area de Peligrosidad y Riesgos Geológicos, Madrid, Spain (rperez@igme.es), (4) Universidad Nacional de Educación a Distancia (UNED), Ciencias Analíticas, Madrid. Spain, (5) Museo Nacional de Ciencias Naturales (CSIC), Geología, Madrid. Spain, (6) Universidad Autonoma de Madrid, Geología, Madrid, Spain, (7) RWTH Aachen. Neotectonics and Natural Hazards. Aachen, Germany. (k.reicherter@nug.rwth-aachen.de)

The ancient roman city of Baelo Claudia has been subject of several papers on earthquake environmental effects (EEE) and well as earthquake archaeological effects (EAE). During the field training course on archaeoseismology and palaeoseismology conducted in September 2009 (INQUA-IGCP567 Workshop) held at Baelo Claudia, four Electric Resistivity Tomography (ERT) profiles were carried out, by the teams of the Salamanca University (Spain), RWTH Aachen University (Germany) and the Geological Survey of Spain (IGME). ERT surveys were developed in the eastern side of the ancient roman Forum across the unexcavated sector of the archaeological site heading on the 1st Century AD Isis Temple. Each ERT profile was constituted by a 48 multielectrode array with spacing of 2 m resulting in a total length of investigation of around 384 m. ERT lines were separated 10 m each other resulting in a total research area of 3840 m2 to a mean investigation depth of 16 m. The selected survey configurations were Pole-Dipole and Wenner in order to get detailed information about lateral resistivity contrasts, but with a reasonable depth of investigation. The resulting 2D resistivity pseudosections clearly display deformations of the buried roman pavements which propagated in depth within the pre-roman clayey substratum of the Bolonia Bay area.. 3D modelling of the 2D pseudosections indicates that the observed deformations are related to near-surface landsliding, being possible to calculate the minimum volume of mobilized material. ERT 3D imaging allow to refine previous GPR surveys conducted at this same area and to get a subsurface picture of ground deformations caused by repeated earthquakes during the 1st and 3rd Centuries AD. Preliminary calculated volume for the mobilized materials affecting the foundations of the Isis Temple and Forum clearly points to a minimum ESI-07 VIII Intensity validating previous research in the zone.

This study has been supported by the Spanish Research Projects ACI2008-0276 (USAL), CGL08-03998BTE (USAL), CGL08-04000BTE (MNCN, CSIC)