Geophysical Research Abstracts
Vol. 21, EGU2019-4364, 2019
EGU General Assembly 2019
© Author(s) 2019. CC Attribution 4.0 license.

The GPR ULTRADEEP “LOZA 2N”: study of the buried active system of faults in the plain "Il Lago" (Isernia, Southern Apennines).

Rosa Nappi (1), Valeria Paoletti (2), Germana Gaudiosi (1), Donato D’Antonio (3), Eleonora Di Marzo (2), Sabina Porfido (1,4)

(1) Istituto Nazionale di Geofisica e Vulcanologia, Osservatorio Vesuviano, Napoli, Italy (rosa.nappi@ingv.it), (2) Dipartimento di Scienze della Terra, dell’Ambiente e delle Risorse, Università degli Studi “Federico II”, Naples, Italy, (3) Geophysical Consultant, (4) Istituto di Scienze dell’Alimentazione, ISA - CNR, Avellino, Naples, Italy

Our paper shows the preliminary results of a geophysical survey by the Ground Penetrating Radar (GPR) ultradeep "Loza 2N", in the study of buried active faults. This particular and innovative Georadar technique offers several advantages over the classic GPR techniques. Through low frequency antennas (10 MHz), it is possible to carry out deep stratigraphic studies down to about 400 m, thanks to: i) skipping of the stroboscope and cable connections between transmitter and receiver, ii) a direct digitalization of the signal, iii) the use of capacitive coupling Wu-king antennas, iv) a 21 kV (20 Mwatt) transmitter. Furthermore, the latest development of the Loza receiver performed by RTG company allows using time windows up to 512000 nsec, scanning speed up to 1000/sec and stacking up to 100 tracks/sec. These characteristics make the GPR Loza different from most of the other GPR systems that can investigate, under optimal conditions, down to a maximum depth of about 30 m.
Through the GPR Loza it is possible to identify, deep stratigraphic contacts and groundwater surfaces, faults and large fracture systems at depth. The Loza interpretative sections of the underground are fully comparable with those deriving from reflection seismics, which on the other hand require costs and acquisition and processing times far larger. In this work, the performances of the instrument are illustrated for identifying the active buried fault system that borders the western edge of the plain "Il Lago" (IS) at the foot of Mount Patalecchia in the Molise Apennines (Southern Italy), an area of high seismotectonic interest. The "Il Lago" plain closes the structure of the Bojano basin towards NW and is bordered by a direct buried fault system. Historically, the area was hit by strong earthquakes: the earthquake of December 5, 1456 (I = XI MCS; Mw = 7.2) which affected central and southern Italy; the earthquake of June 5, 1688 (I = XI MCS, Mw = 7.1) with the epicentral area in the Sannio, and the earthquake of July 26, 1805 (I = X MCS, Mw = 6.7), known as the earthquake of S. Anna whose epicentral area was the Bojano plain.