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# ABOUT THE AUTHORS

*G. Saccorotti*
Istituto Nazionale di Geofisica

e
Vulcanologia,
Sezione
OV,
Napoli,
Italia

*B. Di Lieto*
Dipartimento
di Fisica
«E.R.
Caianello»,
Università
degli Studi
di
Salerno,
Baronissi
(SA), Italy

*F. Tronca*
Istituto
Nazionale
di
Geofisica
e
Vulcanologia,
Sezione
OV,
Napoli,
Italia

*C.
Fischione*
Istituto
Nazionale
di
Geofisica

e
Vulcanologia,
Sezione
OV,
Napoli,
Italia

*R. Scarpa*
Dipartimento
di Fisica
«E.R.
Caianello»,
Università
degli Studi
di
Salerno,
Baronissi
(SA), Italy

*R.
Muscente*
Parco
Scientifico
e
Tecnologico
d'Abruzzo,
L'Aquila,
Italy

KEYWORDS

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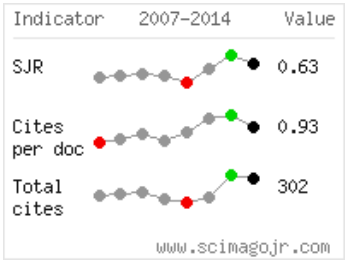


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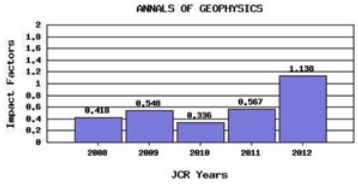

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# Performances of the UNDERground SEISmic array for the analysis of seismicity in Central Italy

*G. Saccorotti, B. Di Lieto, F. Tronca, C. Fischione, R. Scarpa, R. Muscente*

## Abstract

This paper presents the first results from the operation of a dense seismic array deployed in the underground
Physics Laboratories at Gran Sasso (Central Italy). The array consists of 13 short-period, three-component seismometers
with an aperture of about 550 m and average sensor spacing of 90 m. The reduced sensor spacing,
joined to the spatially-white character of the background noise allows for quick and reliable detection of coherent
wavefront arrivals even under very poor SNR conditions. We apply high-

resolution frequency-slowness and
polarization analyses to a set of 27 earthquakes recorded between November, 2002, and September, 2003, at epicentral
distances spanning the 20-140 km interval. We locate these events using inversion of P- and S-wave backazimuths
and S-P delay times, and compare the results with data from the Centralized National Seismic Network
catalog. For the case of S-wave, the discrepancies among the two set of locations never exceed 10 km; the largest
errors are instead observed for the case of P-waves. This observation may be due to the fact that the small array
aperture does not allow for robust assessment of waves propagating at high apparent velocities. This information
is discussed with special reference to the directions of future studies aimed at elucidating the location of
seismogenetic structures in Central Italy from extended analysis of the micro-seismicity.

# Keywords

seismic array;microearthquakes;Central Apennines

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