An algorithm for doble difference joint hypocenter determination: application to the 2002 Molise (Central Italy) earthquake sequence

R. Console, A. Giuntini

Abstract

We have developed an original computer code for double difference hypocenter determination including an independent routine for the cross-correlation estimate of the time difference between two waveform segments, relative to different events recorded by the same stations. This computer code has been tested relocating a set of 26 events recorded by the seismic stations of the telemetered Italian national network operated by the INGV. The hypocentral solutions so obtained are characterized by standard deviations typically of the order of magnitude of 50 m, in comparison with the errors of a few kilometers characterizing the performance of the INGV bulletins. The proximity of hypocenters in several groups of events closely separated in time shows that our relocations are the result of an accurate analysis, rather than that of random errors. The method developed in this study is suitable for rapid and accurate hypocentral determination carried out by a permanent sparsely distributed network of stations, even before that mobile equipment installed in the area affected by new seismic activity allows higher resolution locations.

Keywords

Aftershocks;Foreshocks;Joint Hypocenter Determination;Double Difference

Full Text:

PDF

References

DOI: https://doi.org/10.4401/ag-3134

Published by INGV, Istituto Nazionale di Geofisica e Vulcanologia - **ISSN:** 2037-416X

ABOUT THE AUTHORS

R. Console
Istituto Nazionale di Geofisica, Via di Vigna Murata 605, 00143 Roma, Italy

Geofisica, Via di Vigna Murata 605, 00143 Roma, Italy

KEYWORDS

Central Italy Earthquake GPS Historical seismology Ionosphere Irpinia earthquake Italy Mt. Etna Seismic hazard Seismic hazard assessment Seismology UN/IDNDR earthquake earthquakes historical earthquakes ionosphere magnetic anomalies paleoseismology seismic hazard seismicity seismology