

Preface

This is the nineteenth volume collecting a group of selected papers presented during the annual national conference of the “Gruppo Nazionale di Geofisica della Terra Solida” (GNGTS). It may be considered a sort of summary of the novelties arising during the congress.

GNGTS was established in 1978 as an offshoot of the Italian “Consiglio Nazionale delle Ricerche” to promote, develop, and coordinate research in the field of solid Earth geophysics. GNGTS comprises various sections: seismology, geodesy and gravimetry, geothermal research, crustal geophysics, mining and environmental geophysics, near-surface applications, as well as seismic exploration. In the past years, in spite of its limited budget, GNGTS has funded several research activities and has sponsored multi-disciplinary projects, mainly devoted to the study of the Earth’s crust. About 500 researchers refer to the GNGTS and meet every autumn for a national assembly: a point of reference in the life of the Italian geophysics. Although the institution GNGTS was closed in December 2000, the annual conference GNGTS continued to be held and reached its silver anniversary in 2006.

Peer-reviewed proceedings of the national conferences have been published since 1997 in special volumes and on CD-Roms, mainly in Italian. These documents are also available at the GNGTS website gnfts.inogs.it. Since the year 2000, with the exceptions of 2012 to 2015, when the volumes of the proceedings of the conference were printed, it was decided to publish selected papers from the GNGTS conferences in an international geophysical journal, also in order to achieve a better dissemination of the GNGTS activities for an international audience.

Over the years, multidisciplinary and single-theme volumes have been issued. The multidisciplinary volumes, which make up the vast majority of the published volumes, generally presented one paper from each of the sessions of the GNGTS conference. In this case, all three broad themes, i.e. geodynamics, seismic characterisation of the territory, and applied geophysics, have been documented by a suite of papers. Conversely, the three thematic issues published up to now, have presented papers from a single GNGTS session that was of particular interest in the year of presentation. In this way, one BGTA volume was devoted to the 2009 L’Aquila earthquake (Amato *et al.*, 2011), another to the GNGTS session concerning earthquake forecasting and hazard assessment (Albarello and Meletti, 2012), a third to the international session on the seismic hazard of the critical facilities (Grimaz and Slejko, 2014), and a fourth referred to the session about science, technology, and communication to support seismic prevention (Dolce and Martelli, 2019).

The present volume consists of 6 out of the 222 papers presented orally or as posters during the 36th GNGTS national conference, held in Trieste in November 2017, plus a paper (Slejko, 2020) describing the structure of the GNGTS together with the main activities that the Group developed over the years. The topics treated in this volume cover several themes of solid Earth geophysics, such as volcanology, geodynamics, seismic hazard, and applied geophysics.

The paper by Godio (2020) was presented as a key lecture at the conference. It discusses the basic theoretical background of the relationships between some geophysical investigated parameters and the ice/snow properties; moreover, some examples illustrate the application of the seismic and electromagnetic methods to detect the snow and ice properties in high-altitude Alpine regions.

Buono *et al.* (2020) present the preliminary results of a geochemical, isotopic, two-dimensional, and three-dimensional textural study performed on the volcanic products emitted during the Plinian

phase of the Pomici di Base eruption of the Somma-Vesuvius volcanic complex, and aimed to reconstruct in more details the magmatic evolution of this large caldera-forming eruption.

Nardò *et al.* (2020) applied the multitemporal PS-InSAR technique to the detection of pre- to post-seismic ground displacements in the region struck by the normal faulting 2009 L'Aquila earthquake. They have used ERS, and ENVISAT PS data sets from both ascending and descending orbits, covering a 20-year long period.

Peresan and Gentili (2020) carried out a formal selection and comparative analysis of earthquake clusters for selected earthquakes which occurred in north-eastern Italy and adjacent regions since 1977. The comparison is, then, extended to the earthquake sequences associated with some strong earthquakes in central Italy over the period 1981-2017, occurring in different seismotectonic settings.

To verify the feasibility and potentiality of mapping the local seismic hazard through the HMS parameter, Martelli and Ercolessi (2020) carried out a test in four municipalities of the Emilia-Romagna region in central Italy. The test demonstrates the simplicity and the highly important advantages of seismic microzonation through the HMS parameter.

Schettino and Ghezzi (2020) present a new software tool for the analysis and interpretation of archaeological magnetic anomalies, based on classical algorithms of the forward modelling and a technique of error assessment. The proposed methodology allows the users to determine the geometry, physical properties, and location of buried archaeological features, as well as the occurrence of fires or other historical events that may have affected the observed magnetic signal.

We wish to thank N. Abu-Zeid, D. Albarello, D. Di Bucci, E. Eva, P. Galli, K.L. Kvamme, G. Lanzafame, P. Marianelli, G. Naso, F. Pacor, G. Papadopoulos, L. Peruzza, S. Picotti, A. Vuan, and I. Zaliapin, who participated in the selection and reviewing process of the papers.

REFERENCES

- Albarello D. and Meletti C. (eds); 2012: *Earthquake forecasting and hazard assessment*. Boll. Geof. Teor. Appl., vol. 53, No. 1, 190 pp.
- Amato A., Galli P. and Mucciarelli M. (eds); 2011: *The 2009 L'Aquila earthquake: geophysical insights from the 28th GNGTS congress*. Boll. Geof. Teor. Appl., vol. 52, No. 3, 225 pp.
- Buono G., Pappalardo L. and P. Petrosino P.; 2020: *Magma storage and ascent during the largest eruption of Somma-Vesuvius volcano: Pomici di Base (22 ka) Plinian event*. Boll. Geof. Teor. Appl., **61**, 23-40, doi: 10.4430/bgta0294.
- Dolce M. and Martelli L. (eds); 2019: *Science, technology and communication to support seismic prevention*. Boll. Geof. Teor. Appl., vol. 60, No. 2, 238 pp.
- Godio A.; 2020: *An overview on cryogeophysics in the Alpine environment*. Boll. Geof. Teor. Appl., **61**, 3-22, doi: 10.4430/bgta0304.
- Grimaz S. and Slejko D. (eds); 2014: *Geophysics and critical facilities*. Boll. Geof. Teor. Appl., vol. 55, No. 1, 237 pp.
- Martelli L. and Ercolessi G.; 2020: *Evaluation and representation of the local seismic hazard through the H_{MS} parameter: example in Emilia-Romagna*. Boll. Geof. Teor. Appl., **61**, 81-88, doi: 10.4430/bgta0243.
- Nardò S., Ascione A., Mazzoli S., Terranova C. and Vilardo G.; 2020: *PS-InSAR Data analysis: pre-seismic ground deformation in the 2009 L'Aquila earthquake region*. Boll. Geof. Teor. Appl., **61**, 41-56, doi: 10.4430/bgta0251.
- Peresan A. and Gentili S.; 2020: *Identification and characterisation of earthquake clusters: a comparative analysis for selected sequences in Italy and adjacent regions*. Boll. Geof. Teor. Appl., **61**, 57-80, doi: 10.4430/bgta0249.
- Schettino A. and Ghezzi A.; 2020: *Forward modelling of magnetic anomalies in archaeological geophysics: a new software tool*. Boll. Geof. Teor. Appl., **61**, 89-102, doi: 10.4430/bgta0296.
- Slejko D.; 2020: *The Italian Group for Solid Earth Geophysics*. Boll. Geof. Teor. Appl., **61**, 103-118, doi: 10.4430/bgta0295.

Giuliana Rossi and Dario Slejko

Istituto Nazionale di Oceanografia e di Geofisica Sperimentale, Trieste, Italy