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ABSTRACT BOOK

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Building a comprehensive seismic catalog of the Montello-Collalto area (Eastern Southern Alps, Italy) for seismotectonic and induced seismicity purposes

Cipressi G.M.[1-2], Romano M.A.*[2], Bernardi P.[2], Diez E.[5], Franceschinel F.[2], Garbin M.[2], Guidarelli M.[2], Klin P.[2], Laurenzano G.[2], Moratto L.[2], Peruzza L.[2], Pettenati F.[2], Plasencia M.[2], Priolo E.[2], Rebez A.[2], Romanelli M.[2], Sandron D.[2], Santulin M.[2], Saraò A.[2], Tamaro A.[2], Lavecchia G.[3-4] & de Nardis R.[3-4]

[1] Dipartimento di Ingegneria e Geologia, Università "G. d'Annunzio" Chieti-Pescara. [2] Centro di Ricerche Sismologiche - OGS Trieste. [3] Dipartimento di Scienze Psicologiche, della Salute e del Territorio, Università "G. d'Annunzio", Chieti. [4] CRUST Centro InteRUniversitario per l'analisi Sismotettonica Tridimensionale con applicazioni territoriali, Università "G. D'Annunzio", Chieti. [5] CENAIS - Santiago de Cuba.

Corresponding author email: aromano@ogs.it

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The Montello-Collalto area is located on the outer front of the eastern Southern Alps (Italy), where a fold and thrust belt has formed since the middle Miocene and is still active (Picotti et al., 2022). A medium-high seismic hazard characterizes this area, as a strong earthquake has occurred in the past (the Asolo event of 1695, M6.5), but the causative fault has not yet been identified, even because most of the tectonic structures existing here are buried under recent sediments (e.g. the Montello thrust system). In the study area, seismicity has been monitored by the OGS since 1977 (Bragato et al., 2021) both at the regional scale, and at the local scale, with several temporary surveys carried out for various purposes. A breakthrough in the recording of earthquakes in the Montello-Collalto area is the Collalto seismic network – RSC (Priolo et al., 2015), a local network used to monitor underground gas storage (UGS) located here since 2012 by OGS on behalf of Edison Stoccaggio SpA. The RSC was developed to detect the potential microseismicity induced by the UGS, and after about 12 years, a seismic catalog of more than 3500 events with -0.9. So far, there is no evidence of anthropogenic phenomena, but discriminating between natural and induced earthquakes is still an open challenge, and further analysis needs to be carried out to establish that all the seismicity recorded by the RSC has a natural origin. On the other hand, the spatial pattern of this seismicity has provided insights into the depth geometry of the Montello thrust and its antithetic structure (Peruzza et al., 2022 and references therein), but its seismogenic behavior needs further investigation. These open questions require a multiscale analysis of the seismological data: the local scale for induced seismicity and the regional scale for seismotectonic studies. To this end, we first collected information on all seismic stations operating in the Montello-Collalto area and surroundings since 1977, i.e. location, start and end time, instrumental equipment, and availability of digital data. Then we collected, reviewed, and integrated all the seismic catalogs produced for the area in different periods by different monitoring infrastructures to obtain a unique and as long as possible list of earthquakes to which refer. The next step will be relocating seismicity homogeneously with local velocity models in order to obtain the best picture of seismicity for the study area, which will allow us to analyze its spatio-temporal evolution and understand the local seismogenetic processes.

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