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Rapid generation of reports on post-seismic events with gmProcess: A case study for a dense accelerometric network in Veneto (NE Italy)

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In 2022, the National Institute of Oceanography and Experimental Geophysics - OGS established a dense accelerometric network to monitor strong ground shaking occurrences in the Veneto region (Northeastern Italy) resulting from earthquakes. The network currently encompasses over 50% of the region's municipalities, comprising 312 installation sites. Its primary focus lies in collecting data for rapid damage assessment and facilitating the swift organization of rescue operations following seismic events. The infrastructure comprises state-of-the-art accelerometers utilizing the latest generation of cost-effective MEMS technology, characterized by high signal-to-noise ratio and sensitivity adequate for capturing recordings useful for earthquakes with a magnitude exceeding 2.5. This dense accelerometric network employs the open-source software tool "gmProcess," developed by the United States Geological Survey (USGS), to process ground motion. This software promptly generates a report for each station following a seismic event, determining parameters such as PGA (Peak Ground Acceleration) and other engineering metrics. Given the extensive volume of waveforms and the necessity for near real-time processing, we leverage the High Performance Computing (HPC) infrastructure provided by the Italian Institute of Computing “Cineca”, as part of the TeRABIT project. The advantages of integrating HPC infrastructure within a seismic monitoring network will be discussed in the context of this case study in Northeastern Italy.