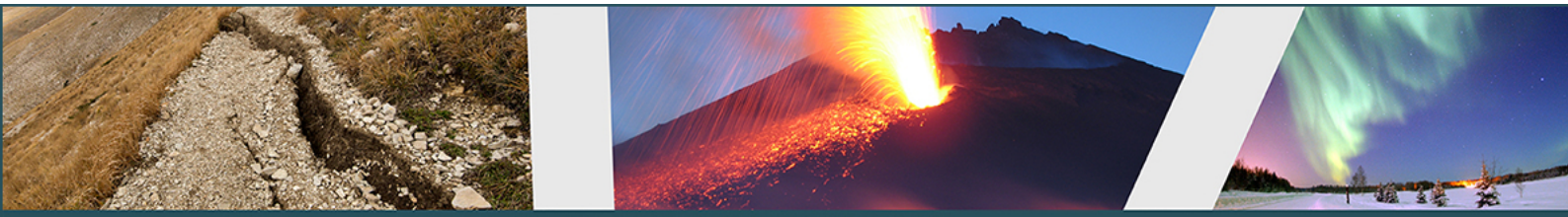

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Parallelisation technique for serial 3D seismic codes: SMS approach

Arrigo Caserta, Vittorio Ruggiero, Maria Pia Busico, Ivo Oprs˜al

Abstract

We investigate a fast and easy way to parallelise seismological serial codes mainly oriented for simulating the

seismic wave propagation through anelastic dissipative media. Having an efficient modelling tool is important

in both assessing strong ground motion and mitigation of seismic hazard when the site effects are considered,

and in crustal propagation when the crustal geological structures are of interest. Our chosen case study is representative of a set of such seismological 3D problems. The Scalable Modelling System (SMS) tool for parallelization is considered. The IBM SP5 native compiler has been used. Results such as Speed-Up and Efficiency are shown and discussed. SMS can run both in shared and distributed memory environments. The greater advantages of using SMS in such environments become apparent with the utilisation of a higher number of multiprocessor machines arranged in a cluster. We also demonstrate how successful porting from serial to parallel codes is realised by way of minimal instructions (6% of the serial original code only) provided that an ad hoc profiling analysis of the serial code is first performed.

Keywords

parallel computing – SMS – seismic wave propagation – numerical simulations – site effects

Full Text:

PDF

References

DOI: https://doi.org/10.4401/ag-4606

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

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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