

# Modeling and inversion 3D electromagnetic datasets on HPC platforms

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## ABSTRACT

Modeling and inversion of 3D electromagnetic datasets on High-Performance Computing (HPC) have a fundamental role in solving the next generation of geoscience problems. These kind of problems are complex, multidisciplinary, and require collaboration to understand and solve the physical equations, pre-process and post-process the associated data with physical experiments, and build interpretations from the analysis of the numerical results.

In this talk, we present our advances in geophysical electromagnetic modelling and inversion using high-order vector finite elements (HEFEM), Markov chain Monte Carlo (MCMC), and HPC. The net result is an open-source parallel Python code, namely, PETGEM (Parallel Edge-based Tool for Geophysical Electromagnetic Modelling, <http://petgem.bsc.es>). As the main arguments of this talk, we present: 1) the mathematical bases of our electromagnetic modeling and inversion algorithms; 2) real cases of 3D electromagnetic modeling and inversion on HPC architectures; 3) a study of the code's performance and accuracy on different HPC architectures. Finally, we provide summary remarks and conclusions.

## REFERENCES

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