Performance and Portability of Seismic Imaging on Multicore and GPU Architectures

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***Abstract*—Reverse Time Migration (RTM) is a seismic imaging method used by the Oil & Gas industry. Petrobras, Shell and Total, companies that owned The Libra oil field, have ported their applications to High-Performance Computing architectures, providing more accurate results using less time. However, there are important decisions like choosing the architecture and the parallel programming API, which are strongly related to the programming effort, the performance and energy efficiency of the simulations. In this work, we investigate the impact of parallel programming APIs on the performance, portability and energy efficiency of seismic imaging simulations on multicore and GPU architectures. Our results show that, for seismic methods, the recommendation is programming using the OpenACC API for GPU architectures.**

***Index Terms*—Performance Optimization, Oil and Gas Simulation, Seismic Imaging, Reverse Time Migration, Code Portability.**

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DISCLAIMER

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