

Presentation information

Poster

Joint Symposia » J08. Imaging and interpreting lithospheric structures using seismic and geodetic approaches

[J08-P] Poster

Fri. Aug 4, 2017 3:00 PM - 4:00 PM

Shinsho Hall (The KOBE Chamber of Commerce and Industry, 3F)

3:00 PM - 4:00 PM

[J08-P-01] Multicore parallelization of 3D ray tracing algorithm using OpenMP

Madineh Banihashem Kalibar¹, Hossein Sadeghi^{1, 2}, Sayyed Keivan Hosseini¹

(1.Earthquake Research Center, Ferdowsi University of Mashhad, Mashhad, Iran, 2.Department of Geology, Faculty of Sciences, Ferdowsi University of Mashhad, Mashhad, Iran)

Parallel computing is now being used to solve problems much faster than the traditional serial computations in a wide variety of scientific computing applications. Parallel programming allows us to break a problem into a discrete series and execute by different processing units simultaneously. Multi-core processors which support parallel computing are quite common now, however writing a parallel code is more difficult than a sequential code. OpenMP is a standard programming interface for shared memory parallel computing which helps to create more easily multithreaded codes of existing serial programs. In this work, we present the use of OpenMP to parallelize the Lotos bending algorithm (Koulakov, 2009) for ray tracing in a 3D velocity model. In order to take the advantage of multicore capabilities, the parallelization of the bending ray tracing was carried out for both data-parallel and task-parallel. We successfully achieved performance of the parallelized algorithm on two multicore laptops; intel i7 and intel i5.