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YEARLY REPORT FOR THE PERIOD Jan-Dec 2012

IC PROJECT W12c_earthuq " High-Performance Computing for Uncertainty Quantification of 3D Earth Models"

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Scientific and Programmatic Impact:

This proposal was written to be a new project leveraging on computational achievements of the two IC11 proposals "3D Geophysical Modeling Validation" and "Time-Reversal Imaging of tremor sources". W12c_earthuq involves additional codes/tools other than SPECFEM3D for data processing and planned a strong effort to move toward modeling at much larger scales than the aforementioned projects. W12c_earthuq goal was to use extensive HPC resources at LANL to assess the uncertainty of high-resolution 3D geophysical models. Validation of these models as planned in W11_geophys is the first step in a full assessment of uncertainty. So, the scientific and programmatic impacts of this project are the same as W11_geophys.

Summary of Computational Effort Accomplished:

The main effort related to w12c_earthuq is the preparation to transition to large runs with a resolution down to 2s. We already report the work done in the report for w11_geophys. Such resolution requires meshes with 10 billions elements with a size of about 5km and a few thousands of compute nodes. First tests on mustang have revealed that the I/O part of the code need to be reviewed because it opens too many files in its current version.

Publications/Presentations:

W12c_earthuq was a development project so we don't have specific publications to report for this IC project. Nevertheless, W11_geophys represents the first task to be done in the proposed work for w12c_earthuq. The publications and presentations for w11_geophys are thus relevant to this IC project.

Financial Impact:

W12c_earthuq has the same scientific and programmatic impacts so the final impacts are the same as the ones reported for w11_geophys.

Supporting Viewgraphs:
Viewgraphs submitted for w11_geophys are relevant for w12c_earthuq.