

Summary of Projects Developed During 2008

2.5D Simulations of Marine Controlled Source Electromagnetic (CSEM) Measurements .

D. Pardo, C. Torres-Verdin, M. J. Nam ,

Using a Fourier Finite-Element method equipped with a parallel iterative solver of linear equations, we will simulate marine CSEM problems in reservoirs.

2008. Status: 100% completed

Sponsors: Chevron.

Simulation of Triaxial Instruments in Deviated Wells with Arbitrary 3D Sources Using a 2D Self-Adaptive Goal-Oriented hp-Finite Element Method and a Fourier Series Expansion .

M. J. Nam, D. Pardo C. Torres-Verdin, V. Calo ,

To simulate a variety of resistivity logging instruments with arbitrary sources in deviated wells for the assessment and identification of electrical properties of the subsurface rock formation. Logging instruments include induction instruments with detailed geometrical reconstruction of the mandrel, and normal/laterolog instruments. The use of a 2D self-adaptive goal-oriented hp-FEM allows for high accuracy simulations of these logging instruments.

2008. Status: 100% completed

Sponsors: Joint Industry Consortium on Formation Evaluation (C. Torres-Verdin).

A 3D Parallel Iterative Solver for Simulation of Resistivity Geophysical Measurements based on 2D Block Jacobi Preconditioners .

M. J. Nam, D. Pardo, C. Torres-Verdin, M. Paszynski ,

The outcome of this research will be an efficient parallel iterative solver that enables accurate simulations of resistivity borehole measurements. The solver will be designed for use in combination with a Fourier series expansion in a non-orthogonal system of coordinates.

2008. Status: 100% completed

Sponsors: Joint Industry Consortium on Formation Evaluation (C. Torres-Verdin).

Simulation of 2D AC Dual Laterolog Measurements .

M. J. Nam, D. Pardo, C. Torres-Verdin, M. Paszynski ,

We employ a novel formulation using the scalar potential to study the Groningen effect in AC Dual Laterolog measurements. Numerical results indicate that the Groningen effect is strongly dependant of the distance between the logging instrument and the current return electrode.

2008. Status: 100% completed

Sponsors: Joint Industry Consortium on Formation Evaluation (C. Torres-Verdin).