Nuclear Explosion Monitoring Research and Engineering (NEMRE) Program
Quarterly Report DOE DE-FC52-06NA27319

Research Title: "ADVANCED WAVEFORM SIMULATION FOR SEISMIC MONITORING EVENTS"

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Reporting Period: <u>February 1, 2009-April 30, 2009</u>

Technical Progress:

A. <u>Description of Activities</u>

High-Resolution Source Parameters using Calibration from ASN
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Abstract
    Several new methods have been developed to retrieve local Green's functions based on the cross-correlation of ambient seismic noise (station-to-station) and conventional (source-to-station) inversions. The latter methods provide the most broadband results but require accurate source parameters for phase-delay recovery which depends on the starting model. Considerable progress is being made in providing such information from 3D modeling, *Tape et al*. (2008), using Adjoint Tomography. But to match waveforms for the recent Chino Hills event still requires shifting synthetics to align on data. This means that it is difficult to use 3D simulations to refine source locations in near-real time. We can avoid the 3D problems by applying the CAP method and storing shifts from past events, *Tan* (2006), and/or using ASN, *Shapiro et al.* (2005), to predict lags for surface waves. Here, we directly compare results from CAP predictions with ASN results using stations near the Chino Hills event. We use the same SC seismic model as used in the Library of Earthquakes to generate Green's functions for noise (single force) for comparison with ASN correlations and allow Cap delays. We apply these delays or corrections to determine precise Centroid locations.

B. <u>Progress</u> - on track.

C. <u>Progress is following the stated Work Statement.</u>