Sandia LabNews

Labs Accomplishments 2012

1. Please check the ONE most-appropriate category:

☐ Nuclear weapons engineering (incl. surety, survivability, etc.)	☐ Weapons security (safeguards, transport, incident response, etc.)	☐ Product realization (incl. NW design, manufacture, etc.)
☐ Remote sensing (electronics for global awareness, verification, surveillance, reconnaissance, etc.)	☐ Military programs (incl. military systems, missile defense, defense technology products & support, etc.)	☐ Energy (nuclear energy, alternative energy, fossil fuels, water, energy security, etc.)
☐ Global security (nonproliferation, global threat reduction, international maritime security, etc.)	☐ Homeland security (incl. materials detection, event mitigation, force protection, border security, etc.)	☐ Infrastructure protection
☐ Bioscience	☐ Computer & information sciences (incl. modeling & simulation, visualization, etc.)	☒ Engineering sciences (incl. experimentation, validation, predictive simulation, etc.)
☐ Materials (nano, materials processing, reliability, etc.)	☐ Microelectronics & Microsystems	☐ Pulsed Power
☐ Partnerships & alliances	☐ HR, Finance, & Legal	☐ ES&H & Security
☐ IT, networks, & facilities	☐ Supply chain	☐ Other (specify): Click here to enter text. (ex.: Management)

2. SMU: Indicate which SMU(s) this project supports (required)? Energy, Climate and Infrastructure Security (ECIS)

3. Description of accomplishment: Be brief (**85 words**) and lively. Remember that this is for a general audience. Emphasize significance and/or potential application, interest to customers, etc. Avoid acronyms. Include center numbers at end of item for all centers that made significant contributions. Accomplishment should have occurred largely during FY11.
[Write here: 85 words or less]

Accurate prediction of fuel injection processes is recognized as a critical need for the development of advanced internal combustion engines. Researchers at the Combustion Research Facility have performed joint computational and experimental studies to account for real-fluid nonideal behavior that exists when conditions are supercritical, a situation applicable to modern engines. A series of high-fidelity large-eddy simulations were performed, considering engine sprays at supercritical conditions for the first time. The simulations are able to reproduce key experimental features of flow structure and mixing.

4. Illustrations: IMPORTANT: If you have a photo, drawing, or chart, please provide it, along with a brief caption. Submit electronically via e-mail in jpg, tif, PhotoShop, or other common format. (PowerPoint images or images embedded in Word files don't work well.) Please be sure to label any separate graphics file in such a way that it can be readily associated with the written submission.
[Caption here: Please note filename for graphic]

Comparison of the fuel distribution from a Large Eddy Simulation with measured Rayleigh-scatter images (see the baseline n-heptane experiment at www.sandia.gov/ECN). (Graphic: LES_Exp_n-heptane.jpg).

Questions: Call Darrick Hurst (3601) at 505-844-8009	MS 0165; drhurst@sandia.gov

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