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How to Save Billions of Gallons of Gasoline

Scientists at Lawrence Livermore National Laboratory study potential of drag-reducing devices on semi-trucks to conserve billions of gallons, save tens of billions of dollars and spare tens of millions of tons of CO2

EMBARGOED until 5:00 p.m. PT on Monday, November 24, 2014

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WASHINGTON, D.C., November 25, 2014 -- Each year, the more than 2 million tractor-trailer trucks that cruise America's highways consume about 36 billion gallons of diesel fuel, representing more than 10 percent of the nation's entire petroleum use. That fuel consumption could be reduced by billions of gallons a year through the use of drag-reducing devices on trucks, according to studies by researchers at Lawrence Livermore National Laboratory.

The findings will be described today in a talk at the American Physical Society's Division of Fluid Dynamics (DFD) meeting in San Francisco, Calif. A press briefing featuring this and several other talks will be streamed live over the Web from the conference at 1:00pm PST on Monday, November 24 in room Foothill F of the San Francisco Marriott Marquis. For more information, email jbardi@aip.org

Fluid dynamicists Kambiz Salari and Jason Ortega ran aerodynamic tests on a detailed 1/8 scale model of a semi-truck in the wind tunnel facilities at NASA's Ames Research Center at Moffett Federal Airfield in California. The truck was tested in various configurations. In some, it was outfitted with trailer skirts, which are panels affixed along the lower side edges of a trailer that reduce drag resulting from airflow interacting with wheels and other structures under the body of the trailer; in others, a boat tail fairing, a device affixed to the back of the trailer that decreases drag by reducing the trailer wake size, was added. In still other tests, the truck was rigged with both of the drag-reducing devices (or with neither one).

Salari and Ortega found that adding both of the devices -- which are currently used in combination on about three to four percent of the nation's semi-trucks -- reduced the aerodynamic drag by as much as 25 percent, which represents about a 13 percent decrease in fuel consumption. "Even a minor improvement in a truck's fuel economy has a significant impact on its yearly fuel consumption," Salari said. "For example, 19 percent improvement in fuel economy, which we can achieve, translates to 6.5 billion gallons of diesel fuel saved per year and 66 million fewer tons of carbon dioxide emission into the atmosphere. For diesel fuel costing $3.96 per gallon, the savings is about $26 billion."

"We are in the process of designing from the ground-up the shape of the next-generation of highly aerodynamic and integrated heavy vehicles to radically decrease aerodynamic drag and improve the fuel efficiency," Salari said.

The presentation, "Aerodynamics of Drag Reduction Devices for Semi-Trucks," is at 3:15 pm on Tuesday, Nov. 25, 2014 in the Moscone (West) Convention Center, Room 2016.
ABSTRACT: http://absimage.aps.org/image/DFD14/MWS_DFD14-2014-001049.pdf

Session info: http://meetings.aps.org/Meeting/DFD14/Session/R30.11

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MEETING INFORMATION
The 67th Annual Division of Fluid Dynamics Meeting will be held at Moscone West Convention Center in San Francisco, Calif. from Nov. 23-25, 2014. More meeting information: http://apsdfd2014.stanford.edu/

REGISTERING AS PRESS
Any journalist, full-time or freelance, may attend the conference free of charge. Please email: jbardi@aip.org and dfdmedia@aps.org and include "DFD Press Registration" in the subject line.

ONSIGHT AND ONLINE PRESS ROOMS
Workspace will be provided on-site during the meeting. The week before the meeting, news, videos and graphics will be made available on the Virtual Press Room: http://www.aps.org/units/dfd/pressroom

LIVE MEDIA EVENT
A press briefing featuring a selection of newsworthy research talks will be webcast live from the conference at 1:00pm PST on Monday, November 24 in room Foothill F of the San Francisco Marriott Marquis. For more information, email jbardi@aip.org

ABOUT THE APS DIVISION OF FLUID DYNAMICS
The Division of Fluid Dynamics (DFD) of the American Physical Society (APS) exists for the advancement and diffusion of knowledge of the physics of fluids with special emphasis on the dynamical theories of the liquid, plastic and gaseous states of matter under all conditions of temperature and pressure. DFD Website: http://www.aps.org/units/dfd/index.cfm