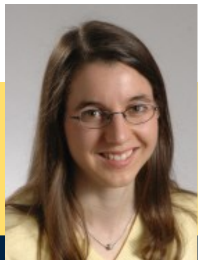
SAMUELI SCHOOL OF ENGINEERING
UNIVERSITY of CALIFORNIA · IRVINE | Department of Civil and Environmental Engineering

Environmental Engineering Seminar Series

Friday, January 17th from 1:30PM-2:20PM

McDonnell Douglas Auditorium (MDEA)

From the Great Plains to the Sierras: Stable Boundary Layer Flow Over Complex Terrain



Tina completed her undergraduate studies at Harvard University, where she received a B.S. in Engineering Sciences in 1998. She then received M.S. (1999) and Ph.D. (2004) degrees in Environmental Fluid Mechanics and Hydrology from the department of Civil and Environmental Engineering at Stanford University. She spent one year in the Atmospheric Sciences Division at Lawrence Livermore National Laboratory as a post-doctoral researcher. Tina joined the UC Berkeley Department of Civil and Environmental Engineering in July 2005 and is now an Associate Professor. She received an NSF CAREER award in 2007 and the Presidential Early Career Award for Scientists and Engineers (PECASE) in 2011. Tina's current research interests are in performing large-eddy simulations of atmospheric boundary layer flows, with a focus on the development and testing of new turbulence models and improved boundary conditions. She and her students have worked on applications to mountain meteorology, urban dispersion, wind energy, and land-atmosphere coupling, among others.

Presented By: Fotini (Tina) Katopodes Chow, Ph.D.

Associate Professor, University of California, Berkeley

<u>Abstract:</u>

Predictions of the stable boundary layer (SBL) are challenging for air quality modeling, weather forecasting, and wind energy resource assessment purposes, because the length scale of turbulent eddies is much smaller than under convective or neutral conditions, thus making it difficult to resolve and characterize the turbulence. The SBL is further complicated by low-level jets, inertial oscillations, and gravity waves. Variations in surface topography, from shallow depressions to steep mountains, also greatly affect flow development. In this work, we perform large-eddy simulations (LES) of the SBL using a nested mesoscale atmospheric model to resolve flow features at very fine resolution. Simulations over the Great Plains and over the Sierras identify new intermittency mechanisms which lead to turbulent bursting events under stably stratified conditions. The role of turbulence closure models is also discussed.

<u>Next Week's Seminar (Friday, January 24th)</u>

Mike Hoffmann

California Institute of Technology

Questions? Email: CEE@UCI.EDU Phone: (949) 824-5333