UTSA The University of Texas at San Antonio™

DATE:
Friday,
May 7, 2021

TIME:
12:00-1:00pm CDT

LOCATION:
via Zoom (Click HERE to Join)

CAMEE

NASA MIRO CAMEE

CENTER FOR ADVANCED MEASUREMENTS IN EXTREME ENVIRONMENTS

PRESENTS:

Dr. Chang Hsin Chen is a CAMEE Postdoctoral Fellow and recent graduate of Texas A&M University. He also co-leads our CAMEE Student Research Journal Club and CAMEE student-centered activities.

Title: ***Turbulent budgets in natural thermal plumes***

Abstract:
Turbulent plumes exist in many different natural systems, such as wildfires and volcanic eruptions. Those phenomena are critical to environment protection and aviation safety, and therefore, it is important to understand these plume structures. This presentation focuses on the budget analyses in natural thermal plumes using Weather Research and Forecasting-Large eddy simulation (WRF-LES) model. Due to high turbulent intensities and plume structures over large spatial extent, densities change drastically resulting in non-negligible compressibility effects. As a result, the turbulent transport equations are presented based on density-weighted decomposition. The results show that buoyant productions are found dominating the transport of Reynolds stresses and turbulent heat fluxes at initial developing stage. As plume structures continue evolving, pressure contributions become dominant. For thermodynamic fluctuations, the productions are due to the mean thermodynamic gradient. Finally, viscous dissipations are found negligible.

More details of Dr. Chen's Research: https://www.utsa.edu/NASA-CAMEE/students.html

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