

Date: October 24th

Time: 11:00 AM

Location: Ames 234

Speaker: Dr. T. B. Gatski
NASA Langley Research Center

Title: "Analyzing Buoyant Turbulent Flows using
Representations Theory"

Abstract

A procedure is outlined for analyzing turbulence models for buoyant flows using equivalent scalar representations of the evolution equations for the Reynolds stress anisotropy tensor and the scaled turbulent heat flux vector. The effect on the functional form of closure models for the heat flux equation as well as on the calibration of the closure coefficients of these models is discussed. A methodology is then presented for the development of a composite explicit algebraic model for the Reynolds stress anisotropy and the scaled turbulence heat flux for buoyant flows. These explicit models are directly related to the corresponding differential forms under weak equilibrium conditions. Comparisons of model predictions with results from direct numerical simulations of homogeneous, buoyant turbulent flows are shown.