

Abstract Submitted  
for the DFD14 Meeting of  
The American Physical Society

**Hydrodynamic Stability Analysis on Sheared Stratified Flow in a Convective Flow Environment** YUAN XIAO, WENXIAN LIN, College of Science, Technology & Engineering, James Cook University, STEVEN ARMFIELD, MICHAEL KIRKPATRICK, School of Aerospace, Mechanical and Mechatronic Engineering, The University of Sydney, YINGHE HE, College of Science, Technology & Engineering, James Cook University, FLUID DYNAMICS RESEARCH GROUP, JAMES COOK UNIVERSITY TEAM, FLUID DYNAMICS RESEARCH GROUP, UNIVERSITY OF SYDNEY TEAM — A hydrodynamic stability analysis on the convective sheared boundary layer (SCBL) flow, where a sheared stratified flow and a thermally convective flow coexist, is carried out in this study. The linear unstable stratifications representing the convective flow are included in the TaylorGoldstein equations as an unstable factor  $J_b$ . A new unstable region corresponding to the convective instability, which is not present in pure sheared stratified flows, is found with the analysis. It is also found that the boundaries of the convective instability regions expand with increasing  $J_b$  and interact with the sheared stratified instability region. More results will be presented at the conference

Yuan Xiao  
College of Science, Technology & Engineering, James Cook University

Date submitted: 31 Jul 2014

Electronic form version 1.4