1075-76-236 **Roberto Camassa**, **Claudia Falcon**, **Zhi Lin**, **Richard McLaughlin** and **Keith Mertens*** (mertens@email.unc.edu), University of North Carolina, Department of Mathematics, Phillips Hall CB 3250, Chapel Hill, NC 27599, and **David Nenon**, **Casey Smith**, **Bailey Watson** and **Brian White**. *Entrapment phenomena of buoyant fluids passing through sharply stratified density transitions.*

With motivation coming from the recent Gulf Oil spill, questions arose concerning when/if trapping of buoyant fluids can occur due to underlying sharp stratification. In this talk, experimental results will be presented concerning when emulsified oil plumes, micro-particle jets, and dense vortex rings can be trapped when passing through sharply stratified density transitions. Connections will be drawn between these continuous sourcing jets and the initial release of a finite volume fluid droplet. A critical length scale is shown to exist for which complete entrapment can occur in these settings. Scaling arguments will be given to understand this critical length scale for each case. In the case of plumes and jets, an exact solution will also be shown, and compared to experiments, which predicts this critical length scale coming from classical Morton Turner Taylor theory. (Received August 30, 2011)