

# Department of Ocean and Resources Engineering

*Seminar*

## **A Predictive Model of Droplet Number Spectra for the Injection of an Inviscid Fluid into another Inviscid Fluid**

by

Dr. Gérard C. Nihous  
Hawaii Natural Energy Institute

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### **Abstract**

A basic model to predict droplet number spectra resulting from the injection of a fluid into another fluid is proposed. A stochastic approach is followed since injection times are long compared to jet breakup times. The source of jet-surface disturbances is represented as broadband white noise. Unstable symmetric and antisymmetric wave pairs are assigned random phases. The ability of unstable waves to form droplets is assumed to be inversely proportional to a fundamental breakup time. The theory predicts a shift toward smaller droplets with increasing Weber numbers. When symmetric and antisymmetric wave regimes compete, the possibility of multiple spectral peaks is shown. A quantitative matching of theoretical results with recent experimental data is attempted.