1075-76-237 **H. Reed Ogrosky*** (ogrosky@email.unc.edu), **Roberto Camassa**, **M. Gregory Forest**, **Long Lee**, **John Mellnik** and **Jeffrey Olander**. *Ring-waves as a mass transport mechanism in air-driven core-annular flow.*

We design an experiment to emulate mucus movement by an air-driven vertical flow of high-viscosity silicone oil through a thin glass tube. When a constant flux of air is delivered through the bottom of the tube, instabilities arise, generating upward moving waves at the oil/air interface. These constitute a main mechanism of momentum transfer from air to oil, whereby oil is transported upward against gravity. We test this mechanism with several different flow rates of both air and oil. We also develop a long-wave model and numerically study solutions of the resulting evolution equation for the location of the air-oil interface. The numerical results are compared with the model in several ways; in particular we study under what conditions the waves are mass transport waves. A second experiment is designed to confirm this striking feature of the air-driven core-annular flow. (Received August 30, 2011)