

Abstract Submitted  
for the DFD09 Meeting of  
The American Physical Society

**Cilia-induced fluid mixing in mucociliary clearance** SARAH LUKENS, Tulane University, XINGZHOU YANG, Mississippi State University, LISA FAUCI, Tulane University — The surfaces of the upper airways to the lung are coated with a surface liquid (ASL), which prevents inhaled pathogens from accumulating in the lungs. The ASL contains a watery periciliary layer (PCL), where a dense mat of cilia beat, propelling the viscous mucus layer above toward the trachea and mouth. We investigate fluid transport and mixing in the PCL based upon a computational model that couples the internal force generating mechanisms of cilia with external fluid dynamics, including an elastic mucus layer. We use Lagrangian Coherent Structure (LCS) methods to identify different spatial mixing regions, and study qualitative behavior of cilia with and without the mucus layer.

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Date submitted: 22 Jul 2009

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