Abstract Submitted
for the DFD13 Meeting of
The American Physical Society

The lateral line system of fish as a "hydrodynamic antenna" JUN ZHANG, LEIF RISTROPH, Courant Institute, New York University, JAMES LIAO, University of Florida, Whitney Laboratory for Marine Bioscience — The lateral line of fish is a specialized flow detection system comprised of pressure- and shear-responsive sensors distributed over the body surface. Here, we explore how the arrangement of these sensors is related to the hydrodynamic information contained in flows. Using a cast model of a rainbow trout placed in a water tunnel, we devise ways to mimic the flows encountered by swimming fish while measuring the near-body flow field. Comparing our results to anatomical studies indicates that the lateral line sensors are well positioned to detect temporal and spatial changes in flow signals. These findings support a view of the lateral line as a "hydrodynamic antenna" that allows sophisticated behaviors such as rheotaxis and prey detection and tracking.

Leif Ristroph
Courant Institute, New York University

Date submitted: 02 Aug 2013 Electronic form version 1.4