Abstract Submitted
for the DFD10 Meeting of
The American Physical Society

Examination of Flow in a Scaled-Up Vocal Fold Model for Diseased Conditions ERICA SHERMAN, LUCY ZHANG, WANG XINSHI, WEI TIMOTHY, RPI, MICHAEL KRANE, Penn State ARL — An experiment to provide DPIV measurements in a scaled up dynamic human vocal fold model is presented. The 10x scale vocal fold model is a new design that incorporates both the rocking as well as the oscillatory open/close motions characteristic of vocal fold motions. The experiment is run in a free-stream water tunnel where the oscillation frequencies and flow speeds are dynamically matched to physiologic conditions for both male and female phonation. The effects associated with vocal fold paralysis will be discussed. Flow measurements showing fluid kinematics including jet velocity and orientation, and vortex shedding as a function of time through an oscillation cycle will be presented. In addition, key data relevant to phonation, such as volumetric flow rate and glottal behavior will be presented.

Timothy Wei
RPI

Date submitted: 06 Aug 2010 Electronic form version 1.4