Abstract Submitted
for the DFD05 Meeting of
The American Physical Society

Velocity field measurements in oblique static divergent vocal fold models[1] BYRON ERATH, MICHAEL PLESNIAK, Purdue University — During normal phonation, the vocal fold cycle is characterized by the glottal opening transitioning from a convergent to a divergent passage and then closing before the cycle is repeated. Under ordinary phonatory conditions, both vocal folds, which form the glottal passage, move in phase with each other, creating a time-varying symmetric opening. However, abnormal pathological conditions, such as unilateral paralysis, and polyps, can result in geometrical asymmetries between the vocal folds throughout the phonatory cycle. This study investigates pulsatile flow fields through 7.5 times life-size vocal fold models with included divergence angles of 5 to 30 degrees, and obliquities between the vocal folds of up to 15 degrees. Flow conditions were scaled to match physiological parameters. Data were taken at the anterior posterior mid-plane using phase-averaged Particle Image Velocimetry (PIV). Viscous flow phenomena including the Coanda effect, flow separation points, and jet flapping were investigated. The results are compared to previously reported work of flow through symmetric divergent vocal fold models.

[1]supported by NIH Grant R01-DC03577

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Date submitted: 11 Aug 2005 Electronic form version 1.4