Abstract Submitted
for the DFD12 Meeting of
The American Physical Society

Natural and forced asymmetries in flow through a vocal fold model[1] BETHANY DRAIN, LORI LAMBERT, University of Nebraska - Lincoln, MICHAEL KRANE, Penn State - Applied Research Lab, TIMOTHY WEI, University of Nebraska - Lincoln — Much of the complexity and richness of voice production stems from asymmetries in flow through the vocal folds. There are naturally occurring asymmetries, such as the Coanda effect (*i.e.* deviation of the glottal jet from the centerline as air passes through the nominally symmetric vocal folds). There are also asymmetries which arise from disease or dysfunction of the vocal folds. This study uses DPIV measurements in a dynamically scaled-up human vocal fold model to compare the flow characteristics between symmetric versus asymmetric oscillations. For this study, asymmetries were introduced by running one vocal fold out of phase with the other. Three phase lags, 0°, 18° and 36°, were examined over a range of frequencies corresponding to the physiological frequencies of 50-200 Hz. Control volume analysis was applied and time traces of terms from the conservation of linear momentum equation were generated. This allowed analysis of how differences in the glottal jet flow manifest themselves in the fluid pressure field. In addition, further examination of the Coanda effect in the context of fluid pressure will be discussed.

[1]Supported by NIH.

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Date submitted: 07 Aug 2012 Electronic form version 1.4