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Resolving pressure from DPIV measurements in a dynamically scaled-up vocal fold model[1] LORI LAMBERT, University of Nebraska - Lincoln, MICHAEL KRANE, Penn State - Applied Research Lab, ERICA SHERMAN, TIMOTHY WEI, University of Nebraska - Lincoln — This presentation highlights application of control volume analysis to DPIV measurements in a dynamically scaled human vocal fold model. For the first time spatially and temporally resolved pressure field information can be extracted from voice experiments. The vocal fold model was built around a computer driven mechanism that replicates both the transverse vibrations as well as the streamwise rocking of human vocal folds. A range of experiments were conducted corresponding to 50 – 200 Hz life frequencies. Volumetric flow rate and maximum velocity measurements will be presented for several control surfaces in the glottal flow. The direction of the glottal jet (coandă) was noted for each instantaneous oscillation cycle. The pressure forces acting in the glottis were calculated using the streamwise and transverse linear momentum equations and control volume analysis. In addition to serving as a baseline study, data from these experiments provide the comparison for follow on studies of diseased and abnormal vocal fold vibrations.

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