

Abstract Submitted
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Estimates of glottal jet aerodynamics from vocal tract pressure measurements¹ MICHAEL KRANE, PAUL TRZCINSKI, ADAM NICKELS, ZACHARY YOAS, JEFF HARRIS, Penn State University — Pressure measurements in a model of the human upper airway were used to estimate the acoustic volume flow and pressure in the model vocal tract, as well as the glottal volume flow. The model was comprised of a 2.54cm square duct, with molded rubber vocal folds that divided the duct into trachea and vocal tract sections. Synchronous measurements of pressure using two kulite XCS-093 pressure transducers and 5 Larson-Davis ” microphones, distributed over the length of the duct, and high-frame rate imaging of the glottis were performed for a range of subglottal pressures. Cross-spectral analysis of pressure measurements were used to extrapolate acoustic pressure and volume flow throughout the duct. This information was then used to compute integral quantities such as the aeroacoustic source strength, and power flows between the laryngeal flow region and the trachea and vocal tract resonators. These estimates were used to construct an energy budget for phonation for an average vibration cycle.

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