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**Flow in a Geometrically-Realistic, Vibrating Model of the Human Vocal Tract**[1] SCOTT THOMSON, JAYRIN SEEGMILLER, Brigham Young University — Airflow within the human vocal tract is an important component of voice quality. Understanding the nature of the airflow will help better understand voice production, potentially leading towards improved clinical diagnostics and treatments. An up-scaled experimental setup was developed to study three-dimensional flow features in a realistic model of the human larynx. The subglottal and supraglottal sections were made of clear silicone, with geometry derived from CT scan data. A cylindrically-shaped supraglottal section was also fabricated to compare flows with and without anatomically-accurate supraglottal sections. The glottal section consisted of two counter-rotating, mechanically-driven cams, covered by a silicone membrane, to approximate the alternating convergent-divergent profile of vibrating vocal folds. A mixture of water and glycerol was pumped through the system, the index of refraction matching that of the silicone for optical access into the sub- and supraglottal sections. Velocity fields throughout the glottal cycle were acquired using particle image velocimetry (PIV), giving particular attention to differences in flow features (e.g., jet skewing and axis switching) between models with CT-derived and cylindrically-shaped supraglottal geometry. In this presentation, the model design and characteristics will be given, and PIV flow results will be presented and discussed.

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Scott Thomson
Brigham Young University

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