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Evaluation of Synthetic Self-Oscillating Models of the Vocal Folds[1] ELIZABETH P. HUBLER, KELLEY S. WEILAND, ADRIENNE B. HANCOCK, MICHAEL W. PLESNIAK, The George Washington University — Approximately 30% of people will suffer from a voice disorder at some point in their lives. The probability doubles for those who rely heavily on their voice, such as teachers and singers. Synthetic vocal fold (VF) models are fabricated and evaluated experimentally in a vocal tract simulator to replicate physiological conditions. Pressure measurements are acquired along the vocal tract and high-speed images are captured at varying flow rates during VF oscillation to facilitate understanding of the characteristics of healthy and damaged VFs. The images are analyzed using a videokymography line-scan technique that has been used to examine VF motion and mucosal wave dynamics *in vivo*. Clinically relevant parameters calculated from the volume-velocity output of a circumferentially-vented mask (Rothenberg mask) are compared to patient data. This study integrates speech science with engineering and flow physics to overcome current limitations of synthetic VF models to properly replicate normal phonation in order to advance the understanding of resulting flow features, progression of pathological conditions, and medical techniques.

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Kelley Stewart
The George Washington University

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