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Altered vocal fold kinematics in synthetic self-oscillating models that employ adipose tissue as a lateral boundary condition. HIBA SAIDI, BYRON D. ERATH, Clarkson University — The vocal folds play a major role in human communication by initiating voiced sound production. During voiced speech, the vocal folds are set into sustained vibrations. Synthetic self-oscillating vocal fold models are regularly employed to gain insight into flow-structure interactions governing the phonation process. Commonly, a fixed boundary condition is applied to the lateral, anterior, and posterior sides of the synthetic vocal fold models. However, physiological observations reveal the presence of adipose tissue on the lateral surface between the thyroid cartilage and the vocal folds. The goal of this study is to investigate the influence of including this substrate layer of adipose tissue on the dynamics of phonation. For a more realistic representation of the human vocal folds, synthetic multi-layer vocal fold models have been fabricated and tested while including a soft lateral layer representative of adipose tissue. Phonation parameters have been collected and are compared to those of the standard vocal fold models. Results show that vocal fold kinematics are affected by adding the adipose tissue layer as a new boundary condition.

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