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Prediction of sound from human vocal folds DANIEL BODONY, University of Illinois at Urbana-Champaign, HAOXIANG LUO, Vanderbilt University, RAJAT MITTAL, George Washington University — The creation of voiced sounds in humans depends on the flow-induced vibration of the vocal folds within the larynx. The vocal folds, which are a complex structural system of cartilage and tissue, create an oscillatory “glottal jet” whose harmonic content partially determines the tone of the speech. In this work we will discuss the process of sound generation in the larynx by combining a fully coupled two-dimensional fluid-structure simulation of the incompressible flow field in the vicinity of the vocal folds to an acoustic analogy description of the sound field. The structural dynamics of the vocal folds are based on physically realistic properties and are coupled to the motion of the fluid via an immersed boundary method. Relationships between the sound produced and the vocal fold dynamics will be discussed.

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