

Abstract Submitted  
for the DFD19 Meeting of  
The American Physical Society

**Phonation energy  
budget computed from high-fidelity aeroelastic-aeroacoustic simulation<sup>1</sup>**

LUCY ZHANG, FEIMI YU, Rensselaer Polytechnic Institute, MICHAEL KRANE, ARL, Pennsylvania State University — A rigorous accounting of phonation energy utilization is presented, using high-fidelity computer simulations. The simulation uses the modified immersed Finite Element (iFEM) formulation, supplemented by boundary condition control using Perfectly Matched Layers. Vocal folds mimic the swept-ellipse multilayer rubber model used in coordinated experiments. Simulations were run for a range of subglottal pressures. Simulation results are used to compute terms of the integral energy equation for the volume containing air in the larynx. Flow work terms in particular are decomposed to clarify power transfer mechanisms. The mechanism described by each energy equation term is then classified in terms of its role (input, output, loss). Laryngeal acoustic efficiency is also presented.

<sup>1</sup>NIH R01DC005642

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Date submitted: 31 Jul 2019

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