

Abstract Submitted
for the DFD09 Meeting of
The American Physical Society

Flow Induced Vibration and Glottal Aerodynamics in a Three-Dimensional Laryngeal Model¹ XUDONG ZHENG, QIAN XUE, RAJAT MITTAL, Johns Hopkins University, STEVEN BIELAMOWICZ, George Washington University — Three-dimensional effects associated with phonation remain unclear due to the lack of capability of simulating 3D fluid-tissue interaction in the past. To advance the state-of-the-art in this arena, an immersed-boundary method based flow solver coupled with a finite-element solid dynamics solver is employed to conduct high-fidelity direct-numerical simulations of phonation in a 3D model of the human larynx. Three-dimensional vibration patterns are captured along with turbulence effects and three-dimensional vortex structures in the glottal jet. Results from these simulations are presented.

¹Supported by NIDCD Grant R01 DC007125-01A1

Xudong Zheng
Postdoc. at Johns Hopkins University

Date submitted: 06 Aug 2009

Electronic form version 1.4