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Phonatory experiments and computational analysis of rabbit larynges using *in vivo* models[1] ZHIPENG LOU, JUNSHI WANG, HAIBO DONG, University of virginia, JAMES DANIERO, University of virginia Health System, JINXIANG XI, University of Massachusetts Lowell — In this work, a numerical approach driven by experiments is employed to characterize the airflow through the vocal cord. The study is based on invivo MRI images for rabbits' vocal folds geometry and performed through direct numerical simulation (DNS) with immerse boundary method for fluid-structure interaction. The MRI scan data and in vivo high-speed video microscopy (HSVM) data are processed for the reconstruction of a 3D high-fidelity model. The time-dependent glottal height is evaluated A sharp-interface immersed-boundary-methodbased compressible flow solver is employed to generate CFD solutions. The main purpose of the computational effort is to evaluate the possible effects of the vocal folds that applied to the airflow during phonation. The vocal fold kinematics and the vibration modes are quantified, pressure performance and the vortex structures are analyzed. The results have shown significant effects of the phonation on the vortex formation, pressure oscillation and velocity. The reconstructed 3D model from this work helps develop potential improvement for diagnosis of phonation disorder.

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