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Vocal Fold Pathologies and Three-Dimensional Flow Separation Phenomena[1] ADAM G. APOSTOLI, KELLEY S. WEILAND, MICHAEL W. PLESNIAK, The George Washington University — Polyps and nodules are two different pathologies, which are geometric abnormalities that form on the medial surface of the vocal folds, and have been shown to significantly disrupt a person's ability to communicate. Although the mechanism by which the vocal folds self-oscillate and the three-dimensional nature of the glottal jet has been studied, the effect of irregularities caused by pathologies is not fully understood. Examining the formation and evolution of vortical structures created by a geometric protuberance is important, not only for understanding the aerodynamic forces exerted by these structures on the vocal folds, but also in the treatment of the above-mentioned pathological conditions. Using a wall-mounted prolate hemispheroid with a 2:1 aspect ratio in cross flow, the present investigation considers three-dimensional flow separation induced by a model vocal fold polyp. Building on previous work using skin friction line visualization, both the velocity flow field and wall pressure measurements around the model polyp are presented and compared.

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Kelley Stewart
The George Washington University

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