

Abstract Submitted
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Aeroacoustic sources in phonation¹ MICHAEL KRANE, ARL Penn State — An analysis of the flow through a time-varying duct constriction is used to identify the primary aeroacoustic source mechanisms in human vocalization. The acoustic fields on either side of the constriction are matched using equations describing the flow through the constriction. The form of the resulting sound fields indicates that the primary source of sound is the unsteady aerodynamic drag due to separated flow, and that secondary sources arise from changes in glottis volume and the movement of the separation point. The source strengths are shown to depend on the incident sound field, calling into question the “source-filter” theory of voice production. A control volume analysis supports these results.

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