Abstract Submitted
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Phonatory sound sources in terms of Lagrangian Coherent Structures[1] MICHAEL MCPHAIL, MICHAEL KRANE, ARL Penn State — Lagrangian Coherent Structures (LCS) are used to identify sound sources in phonation. Currently, it is difficult to causally relate changes in airflow topology from voice disorders to changes in voiced sound production. LCS reveals a flow's topology by decomposing the flow into regions of distinct dynamics. The aeroacoustic sources can be written in terms of the motion of these regions in terms of the motion of the boundaries of the distinct regions. Breaking down the flow into constituent parts shows how each distinct region contributes to sound production. This approach provides a framework to connect changes in anatomy from a voice disorder to measurable changes in the resulting sound. This approach is presented for simulations of some canonical cases of vortex sound generation, and a two-dimensional simulation of phonation.

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