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Characterization Of Side Branch Resonators Using Particle Image Velocimetry PETER OSHKAI, TING YAN, University of Victoria — Acoustically-coupled flow past a coaxial deep cavity (side branch) resonator mounted in a duct is investigated using digital particle image velocimetry. Various resonator geometries are characterized in terms of spatial structure and strength of the corresponding acoustic power source. Emphasis is on the effect of the separation between the coaxial side branches on the interaction between separated shear layers that form across the side branch openings. Phase-averaged images of the flow in conjunction with unsteady pressure measurements are evaluated in order to provide insight into the mechanisms of acoustic power generation. When the coaxial side branches are located relatively far away from each other, each of them forms an independent acoustic source. As the distance between the side branches decreases, interaction between the associated oscillating shear layers results in formation of a single acoustic source of complex spatial structure. In addition to the effects of the main duct width, the structure and strength of the acoustic source also depend on the stage of transverse oscillations of the separated shear layers.

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