

Abstract Submitted
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The effects of geometry on flow in a venturi formed by fast-closing jaws JOSE VALDES HERRERA, DANIEL AGUIRRE, FRANCISCO GODINEZ, Univ Nacl Autonoma de Mexico — We designed a mechanical apparatus inspired by the snapping-claw of pistol shrimps. The device consists of a pair of jaws, each with an inner contour that conforms to a half-venturi geometry. One of the jaws is fixed and the other rotates around a pivot. When the jaws suddenly close a venturi tube-like is formed with the subsequent generation of a high speed cavitation flow. Geometrical parameters as the ratio of the throat section length to diameter, the ratio of the diameters of the throat section to the contraction section and the diffusion angle were varied to experimentally evaluate their influence on the flow dynamics. Conventional 2-D PIV was used to visualize the flow structure features and high-speed imaging was performed to study the dynamics of bubble clouds induced by pressure drop at the end of the closing process. The experiments were conducted with tap water under laboratory conditions using ten different geometries. We were able to determine which geometry induces more bubbles; as well as their location and the intensity with which they collapse inside the tube. These aspects are key to developing venturi reactors.

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