

Abstract Submitted
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Interaction of a Vortex Ring Parallel to a Plane Wall¹ MITCHELL ALBRECHT, DOUGLAS BOHL, Clarkson University — In this work, Laser Induced Fluorescence (LIF) is used to investigate the motion of a vortex ring parallel to a plane wall. When the wall is more than 1.75 generator diameters (D_{gen}) away from the center of the generator, there is no observed effect on the path of the vortex ring. When the wall is closer, the vortex ring initially convects parallel to the wall and then turns towards the wall. The location at which the ring begins to turn towards the wall is a function of the wall location. This motion is consistent with inviscid theory. For moderate distance ($1.75 D_{\text{gen}}$ to $0.75 D_{\text{gen}}$) both legs of the vortex ring break up before interacting with the wall. When the wall is very close to the vortex ring ($<0.75 D_{\text{gen}}$), the leg of the vortex ring closest to the wall first moves towards, then bounces and moves away from the wall. Meanwhile, the leg farthest from the wall continues towards the wall and interacts, forming boundary layer and new shed structures. This process is qualitatively similar to the interaction of a vortex ring normal to a plane wall.

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