

Abstract Submitted
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Force due to vortex ring impact¹ DANIEL ANDRUS, RHETT JEFFERIES, MICHAEL KRANE, ARL Penn State — The impact force of a vortex ring collision on a solid surface is presented. The focus of this study is to estimate the unsteady wall pressure distribution from time-varying velocity fields. The velocity fields are produced analytically after a Lagrangian computation of the vorticity in the vortex ring is performed. Two pressure estimations are used in this study. The first is a discretized green's function solution of Poisson's equation for total pressure (Hofmans, 1998). The second (Dabiri, et al., 2014) integrates the acceleration, estimated from the material derivative of the discrete velocity field. These analytical estimations are compared with one another and to experimental data (McErlean, 2011).

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