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Effect of a ground plane on a turbulent vortex ring trajectory MARIA-LAURA BENINATI, Bucknell University, MICHAEL MCERLEAN, MICHAEL KRANE, ARNOLD FONTAINE, Pennsylvania State University — Experiments were conducted to assess how a turbulent ($Re=20000$) vortex ring's trajectory is affected by a ground plane parallel to its initial trajectory. This study, part of a larger effort in vortex-particle interaction, aims to characterize the vortex ring flow disturbance that interacts with a particle. Vortex ring motion was characterized for four distances between the initial vortex ring axis and the ground plane. Characterization included vortex centroid motion and diameter from high-speed video, vortex ring circulation from DPIV, and the wall pressure disturbance time traces. It was observed that in all cases the vortex ring trajectory is deflected toward the plane, ending in a collision. As plate height is decreased, the collision occurs closer to the ring generator, the wall pressure signature is also more intense, and the symmetry of the ring is affected more strongly.

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