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Pressure drag evolution of a pair of interacting vortex rings ANGELIKI LASKARI, RAMMAH SHAMI, ROELAND DE KAT, BHARATHRAM GANAPATHISUBRAMANI, University of Southampton — To determine whether there is a drag benefit for interacting vortex rings compared with a single one, we obtain time evolution of pressure drag coefficients of a pair of interacting vortex rings using 2D Particle Image Velocimetry data. Finite-Time Lyapunov Exponent fields are used to identify vortex boundaries. Streamwise pressure gradients are computed using the incompressible Navier Stokes equations and subsequently integrated across the boundary of the rings. The acceleration term is estimated by either an Eulerian, Lagrangian or Taylor's Hypothesis approach. Preliminary results show that the latter appears to be the least sensitive to noise, resulting in smoother acceleration fields and fewer oscillations in the evolution of the pressure drag coefficient. Effects of different separation lengths are assessed for the interacting pair and results are compared with those for a single ring.

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