

Abstract Submitted
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Triple Pulse Particle Image Velocimeter/Accelerometer Measurements of Flow-Structure Interaction¹ SIVARAM GOGINENI, Spectral Energies, LLC, LIUYANG DING, RONALD ADRIAN, Arizona State University — A PIV-based instrument has been developed to measure position, velocity and acceleration of moving in fluids and the velocity and acceleration fields of the fluid motion simultaneously. The instrument extends conventional PIV by adding a third and sometimes fourth pulse, thereby increasing spatial resolution, velocity accuracy and enabling acceleration measurement. Images of the moving solid body are segmented from the fluid field and displacements are measured by cross-correlation, as in the fluid. To test the capabilities of this approach, a cylinder supported by elastic rods is oscillated sinusoidally in water to produce shed vortices that interact with the cylinder non-linearly. Phase averaged fields are obtained in the fluid, and accuracy of the measurements is assessed by comparing the measurements of fluid velocity and acceleration to solid their known counterparts at the solid-fluid interface,

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