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High-speed flow visualization with a new digital video camera
JASON VOLPE, GARY SETTLES, Penn State University — Scientific photography opened new vistas upon high-speed physics in the previous century. Now, high-speed digital cameras are becoming available to replace the older photographic technology with similar speed, resolution, and light sensitivity but vastly better utility and user-friendliness. Here we apply a Photron Fastcam APX-RS digital camera that is capable of megapixel image resolution at 3000 frames/sec up to 250,000 frames/sec at lower resolution. Frame exposure is separately adjustable down to 1 microsecond. Several of the "icons" of high-speed flow visualization are repeated here, including firecracker and gram-range explosions, popping a champagne cork, vortex rings, shock emergence from a shock tube, the splash of a milk drop, and the burst of a toy balloon. Many of these visualizations utilize traditional schlieren or shadowgraph optics to show shock wave propagation. Still frames and brief movies will be shown.

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