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Scalable Tomographic PIV using a Reprojection Reconstruction Technique RODERICK LA FOY, SAMUEL RABEN, PAVLOS VLACHOS, Virginia Tech — Tomographic PIV is becoming a common experimental tool in fluid dynamics, but current algebraic reconstruction algorithms can be prohibitively computationally expensive. To this end, a tomographic reconstruction algorithm was developed that is simple to implement, computationally efficient, and scalable to an arbitrary number of cameras. This method reconstructs volumes from each camera independently by projecting the images back onto the volume using the camera calibration data. The projections from each camera are then combined to form a full three dimensional intensity field. The fluid's velocity field may then be calculated using standard three dimensional PIV or PTV techniques. This algorithm was used to reconstruct intensity fields from both simulated and experimental particle fields.

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