Volume Segmentation and Ghost Particles[1] ISAAC ZISKIN, RONALD ADRIAN, Arizona State University — Volume Segmentation Tomographic PIV (VS-TPIV) is a type of tomographic PIV in which images of particles in a relatively thick volume are segmented into images on a set of much thinner volumes that may be approximated as planes, as in 2D planar PIV. The planes of images can be analysed by standard mono-PIV, and the volume of flow vectors can be recreated by assembling the planes of vectors. The interrogation process is similar to a Holographic PIV analysis, except that the planes of image data are extracted from two-dimensional camera images of the volume of particles instead of three-dimensional holographic images. Like the tomographic PIV method using the MART algorithm, Volume Segmentation requires at least two cameras and works best with three or four. Unlike the MART method, Volume Segmentation does not require reconstruction of individual particle images one pixel at a time and it does not require an iterative process, so it operates much faster. As in all tomographic reconstruction strategies, ambiguities known as ghost particles are produced in the segmentation process. The effect of these ghost particles on the PIV measurement is discussed.

Isaac Ziskin
Arizona State University

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