Flow in patients with left ventricular thrombus using optimized echo PIV-PTV KAUSHIK SAMPATH, THURA T HARFI, RICHARD T GEORGE, JOSEPH KATZ, Johns Hopkins Univ — Applications of echocardiographic particle image velocimetry and particle tracking velocimetry (echo PIV-PTV) for characterizing cardiovascular flows have been expanding. It involves acquisition and processing of time-resolved contrast echocardiograms of in vivo flows seeded with micro bubbles. Here, a set of image enhancement and particle tracking methods are implemented on in-vivo data from five patients with history of past or current confirmed left ventricular thrombus (LVT). Our aim is to correlate the LV mixing with thrombogenicity. For cases with persistent LVT and low cardiac efficiency, results show low velocities around the clot as well as low penetration depth of the jet at the exit from the mitral valve and strength of the associated LV vortex. The speeds increase with increasing kinesis (wall motion) and distance from the clot. Patients with recovering cardiac function and diminishing clot size exhibit improved flow, LV vortex strength and penetration even when their efficiency is lower than normal. Trends of the apical washing are consistent with those predicted by the E-wave propagation index.

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Date submitted: 30 Jul 2016
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