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Development of a Backlighted Color-coded Micro-DDPIV System and its Application to a Backward Facing Step Micro-channel Flow[1] WEI-HSIN TIEN, DANA DABIRI, University of Washington, MORTEZA GHARIB, Caltech, JAY HOVE, University of Cincinnati — A backlighted micro color-coded Defocusing Digital Particle Image Velocimetry (Micro-DDPIV) is the latest implementation of the backlighted color-coded DDPIV system introduced by Tien et al. (2008). This micro-DDPIV system utilizes the DDPIV technique with an infinity-corrected microscope lens system. The multi-element system performance and the refraction effects are corrected by a careful calibration process, and the optical distortion of the system is calibrated by using an image dewarping scheme. The technique is successfully applied to imaging a backward facing step micro-channel flow, and a three-dimensional velocity field is extracted. The image volume is 0.58mm×0.58mm×0.6mm.

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