

Abstract Submitted  
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**Development and Application of a Modified Single-Camera 3DDPIV System** WEI-HSIN TIEN, DANA DABIRI, University of Washington — Three Dimensional Defocusing Particle Image Velocimetry (3DDPIV), as a true three-dimensional measurement system, allows for the measurement of three-dimensional velocities within a volume. Initially designed using a single CCD and 3-pinhole mask (Willert & Gharib; 1993), it has evolved into a multi-CCD camera system in order to overcome the limitations of image saturation due to multiple exposures of each particle and as well as being able to properly image large areas (Pereira F, Gharib M, Dabiri D, et al.; 2000). We have modified the original single CCD implementation in order to allow for imaging of small areas without the above-mentioned limitation of multiple exposures of each particle. How these limitations are overcome towards achieving this modified single camera 3DDPIV system are presented and discussed. We apply this towards quantitatively visualizing the three-dimensional flow within a Rayleigh-Bernard convection cell (chamber height is 7 mm).

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