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**Acoustic PIV: Measurement of the acoustic particle velocity using  
synchronized PIV-technique**

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This paper outlines a technique for measuring the acoustic particle velocity and the flow field simultaneously by applying synchronized particle image velocimetry (PIV). As test set-up a squared acrylic glass chamber was chosen. One side of the test section is connected to a loudspeaker, which allows a sinusoidal excitation of the chamber. To point out constraints of this method the investigation includes an analysis of excitation amplitude and frequency as well as the effect of the mean flow magnitude. Therefore a small PC fan can be mounted inside the test section to produce an adjustable mean flow. It can be shown that for a low number of averaged images (80) reasonable results can be achieved up to a certain level of fan rotation speed. Beyond this level the turbulence sensitivity increases and more images are necessary for the calculations. However, the acoustic particle velocity can be computed in the presence of turbulent flow. The presented method called acoustic PIV is a non intrusive technique, applied successfully in measuring acoustic particle velocity fields over a wide range of conditions.