

## ACOUSTICS2008/2006 Doppler ultrasonography using wave phase conjugation

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Ultrasound wave phase conjugation (WPC) is an efficient tool for velocimetry of flows due to its sensibility to the break of time reversal invariance of acoustic fields in moving media. The presence of flow leads to the non compensated Doppler phase shift of the backward phase conjugate wave relatively to the primary probing wave. This phase shift provides detection, diagnostics and velocimetry of flows and does not require the presence of any scatterers in a flow. Furthermore the phase shift of phase conjugate wave can be used in liquid flowmeters. As it was shown in previous works the sensitivity of liquid flowmeters using phase conjugate ultrasonic waves essentially increases by using nonlinear effects appearing during propagation of phase conjugate waves in a moving liquid. In the present paper we report the theoretical and experimental results on imaging of flow velocity distributions in tubes and phantoms of blood vessel. The scanning auto-confocal system based on parametric ultrasonic wave phase conjugator at 10MHz operation frequency is used in the experiments. The preliminary results of experimental measurements of velocity of vascular blood flow in soft tissues in vitro are discussed.