Abstract Submitted for the DFD07 Meeting of The American Physical Society

Combined optical and acoustical characterization of coated microbubbles MICHEL VERSLUIS, JEROEN SIJL, DETLEF LOHSE, Physics of Fluids Group, University of Twente, RIK VOS, NICO DE JONG, Biomedical Engineering Group, Erasmus MC Rotterdam — Optical ultra high-speed imaging of ultrasound contrast agents has revealed new detailed information on the dynamics of coated microbubbles, e.g. surface modes and "compression-only" behavior. How these non-spherical and non-symmetrical bubble oscillations translate into an acoustic response is unknown. Acoustic studies of individual microbubbles have been hindered by the ability to isolate a single contrast bubble and by the transducer calibration and its corresponding sensitivity. Here we present a combined optical and acoustical setup to characterize individual ultrasound contrast agents. Bubbles were isolated in a capillary fibre by an active flow control. The receiving transducer was accurately calibrated, therefore both the optical and acoustical recordings provide quantitative information on the microbubble response, allowing for a direct comparison between the two methods. For larger bubbles oscillating in the linear regime, the measured acoustic bubble response was in good agreement with the response predicted from the optically recorded radial bubble dynamics.

> Michel Versluis University of Twente

Date submitted: 19 Jul 2007

Electronic form version 1.4