Abstract Submitted for the DFD16 Meeting of The American Physical Society

Mass transfer effects on the transmission of bubble screens¹ DANIEL FUSTER, Institut d'Alembert UPMC-CNRS, LUCA BERGAMASCO, Institut d'Alembert UPMC — In this work we investigate, theoretically and numerically, the reflection and transmission properties of bubble screens excited by pressure wave pulses. We use modified expressions for the bubble resonance frequency and the damping factor in order to capture the influence of mass transfer on the reflection-transmission coefficients. In addition to the influence of variables such as the bubble radius and the averaged inter-bubble distance, the analysis reveals that in conditions close to the saturation line there exists a regime where the heat transport surrounding the bubble plays an important role on the bubble's response also influencing the reflection properties of the bubble screen. The linear analysis allows us to predict the critical vapor content beyond which liquid heat's transport controls the dynamic response of the bubbles. Numerical simulations show that these effects become especially relevant in the nonlinear regime.

¹ANR Cachmap

Daniel Fuster Institut d'Alembert UPMC-CNRS

Date submitted: 04 Aug 2016

Electronic form version 1.4