

ACOUSTICS2008/2748
Bubble-bubble interaction in disperse bubble clouds

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Disperse bubble fields driven by pressure waves feature effects of time delays associated with the finite speed of travel of the driving acoustic wave, and the finite travel time of pressure waves between bubbles. The relative spatial arrangement of bubble nuclei in a disperse field, and the direction of the incoming pressure wave, both influence the cavitation behavior of a cloud of nuclei. In this paper, we consider the dynamics of a disperse field of bubble nuclei driven by a strong rarefaction, such as one sees in shock wave lithotripsy. We make comparisons to experimental work published in J. I. Iloreta, A. J. Szeri, Y. Zhou, G. Sankin and P. Zhong, Assessment of shock wave lithotripters via cavitation potential, *Physics of Fluids* 19, 086103 (2007). Bubble-bubble interactions are the key ingredient to resolving a mystery concerning the extent of cavitation bubble growth.