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On the behavior of a bubble cloud under an ultrasound field[1] ANA MEDINA-PALOMO, ELENA IGUALADA-VILLODRE, JAVIER RODRIGUEZ-RODRIGUEZ, Universidad Carlos III de Madrid — We present our latest numerical results on the determination of the resonance frequency of a bubble cloud excited by an acoustic wave. Thermal effects are incorporated to the Keller-Miksis equation by integration of an ode which models the heat transfer between the bubble and the liquid. It is found that thermal effects make the bubble oscillations damp out faster, which difficultates the resonance detection. We study how the parameters of the population, i.e. the mean and variance of the size distribution, affect the spectra, and thus, the detection of the resonance frequency. Spectra of monodisperse populations exhibit a peak at the resonance frequency that is easier distinguished compared to the case of polydisperse populations. To overcome the issue that the resonance peak is usually smaller than the central peak corresponding to the insonating wave, we focus on two strategies. Firstly, the use of a chirp, i.e. an acoustic pulse variable in frequency. This signal has a flat spectrum in a wide frequency band and is therefore more appropiate to excitate a population with different sizes. A second strategy consists in insonating the bubbles with a shock pressure wave. In the laboratory this is achieved by placing them in an open bottle that is suddenly hit at its mouth.

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