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## Detachment Size Measurement of Two Interacting Bubble Plumes Formed at Neighboring Needles Using an Acoustic Method

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**摘要** Detachment size determination with an acoustic method has been carried out for two interacting bubble plumes formed at neighboring needles in quiescent water. Two sets of needle pairs, one with 1.5mm and 0.8mm inner diameters and the other with the equal 1.5mm inner diameters, were separately used as the bubble pair injectors in the experiments. Consequently, four typical patterns of bubble plumes interaction could be observed in the two cases of needle pair matches. Through measuring the pressure pulses radiated by the bubble pairs immediately after their "pinching-off" and by making use of a sophisticated relation between oscillation frequency of volume mode and radius of gas bubble, the detachment size of the bubble plumes have been determined from the amplitude/frequency spectrum of the sound pressure pulses. The experimental results demonstrate that the acoustical method is valid in both of the interacting and non-interacting circumstances in bubble field and the bubble size measurements by this acoustical method agrees well with the measurements from photographic analysis. Finally, a comparison has been made on the strong and weak points of the acoustical method with the other size determination methods.

**关键词** [detachment size determination](#) [sound pressure pulses](#) [acoustical method](#), [bubble interaction](#) [bubble plumes](#)

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**Key words** [detachment size determination](#); [sound pressure pulses](#); [acoustical method](#) [bubble interaction](#); [bubble plumes](#)

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