基于超高速摄影显微成像和超声散射的纳米包膜造影微泡包膜厚度估计

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　　纳米包膜微泡和携带药物的生物微系统在超声成像和药物传递与释放等方面具有重要的应用价值。本文使用时间分辨率最小可达10纳秒的新型超高速显微成像装置，得到微泡在超声场中的振动曲线，经过与理论预测结果做最小均方误差对比，获得包膜厚度估计值，对微泡的结构分析与力学参数估计有重要作用。

Evaluation of the Thickness of the Nanometer-sized Ultrasound Contrast Agents Microbubble Shell Using a Novel Ultra High Speed Camera Combined with Ultrasound Backscatter

　　This work is motivated by the need to measure the thickness of ultrasound contrast agent microbubble shell generally of nanometer scale, which is of great value in the structure analysis and mechanics parameters evaluation on microbubble. A novel ultra high speed digital camera capable of 100 million frames/s was used to capture the radial fluctuations of a bubble during insonation. By comparison of the predicted radial oscillations with those measured optically, the thickness of the shell can be evaluated in Root-Mean-Square sense. It is envisioned that the use of the new technique will expand to find its way in the target drug encapsulation and delivery as well as ultrasound contrast imaging methods.

关键词