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Maximum Size of an Explosively Growing Bubble YUENONG LING, MINKI KIM, ERIC JOHNSEN, University of Michigan — Tissue damage produced by cavitation bubbles is an inherent part of a variety of therapeutic ultrasound procedures, including lithotripsy and histotripsy. Past studies suggest that the size of the damaged region scales with the maximum bubble radius achieved during the process. In this work, we investigate the dependence between the maximum radius of a spherical gas bubble driven by an incident pressure pulse and the parameters entering the problem, including the waveform properties and the material properties. Theoretical scaling for the bubble size and velocity is developed and verified with numerical solutions to Rayleigh-Plesset-based equations for spherical bubble dynamics. The implications of the results to therapeutic ultrasound will be discussed at the meeting.

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