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Acoustic chambers for sonofusion experiments - sensitivity on geometry and materials MARKUS J. STOKMAIER, Karlsruhe Institute of Technology, Germany, RICHARD T. LAHEY JR., Rensselaer Polytechnic Institute, NY, ANDREAS G. CLASS, Karlsruhe Institute of Technology, Germany, BERNARD A. MALOUIN, Rensselaer Polytechnic Institute, NY, THOMAS SCHULENBERG, Karlsruhe Institute of Technology, Germany — Sonofusion (SF) relies on the perfect realization of a symmetrically imploding vapor bubble in a compressing acoustic field, so that the center of the singularity yields extreme energy densities, potentially allowing for thermonuclear fusion to occur. An assembly of a cylindrical acoustic chamber with longitudinal wave reflectors allows excitation of the fundamental mode of the liquid body. Our finite-element simulations of such a vibrating glass chamber filled with liquid attempt to answer questions that have arisen since the claimed successful SF experiments of Taleyarkhan. In particular, we show that the sensitivity to geometry and materials of the acoustic chamber may be the reason why SF is apparently difficult to reproduce. This could be a reason why completely independent confirmation of SF is still lacking. A 2-D axisymmetric forced harmonic analysis in ANSYS, is presented and compared to own measurements of pressure amplitude and wall displacement.

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