

Exploration of Sonoluminescence

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Sonoluminescence(SL) is the emission of light from a bubble that is oscillating in a liquid medium due to acoustic vibrations. The process by which the light is produced is not well understood, but several methods exist to examine the characteristics of the bubble. Using an acrylic chamber¹, an air bubble in water will be driven in a way to induce sonoluminescence. While the bubble is emitting light, a study of its spectrum will be performed to confirm the distribution is consistent with previous experiments². Also, since the bubble scatters light effectively, a pulsed LED and video microscope will be employed to measure the maximum radius of the bubble. This value will be compared to predicted values³, as well as prior measurements⁴. Further work may include additional acoustic chambers with various geometries, as well as different gas/liquid combinations.

¹ F. B. Seeley and C. K. Joens, *Synchronous Sonoluminescence in Acrylic Resonant Chamber*, (American Journal of Physics, March 1998), 66 (3), pp. 259-260.

² W. C. Moss, D. B. Clarke and D. A. Young, *Sonochemistry and Sonoluminescence: Star in a Jar*, (Kluwer Academic Publishers, 1999) pp. 159-164.

³ Ronald A. Roy, *Sonochemistry and Sonoluminescence: Cavitation Sonophysics*, (Kluwer Academic Publishers, 1999) pp. 25-38.

⁴ Lawrence A. Crum, *Sonoluminescence*, (Physics Today, September 1994) pp. 22-29.