Sonoluminescence

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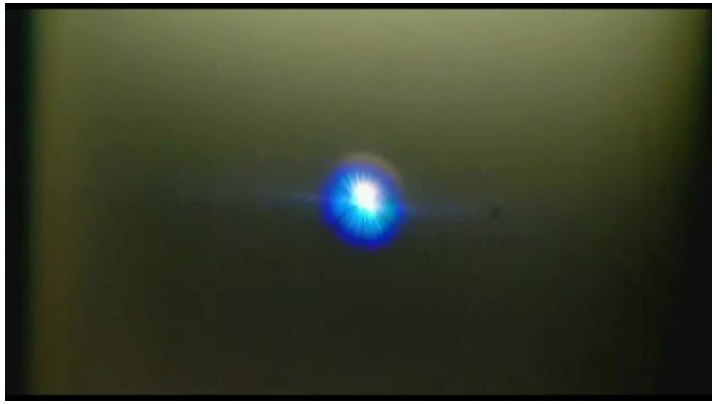
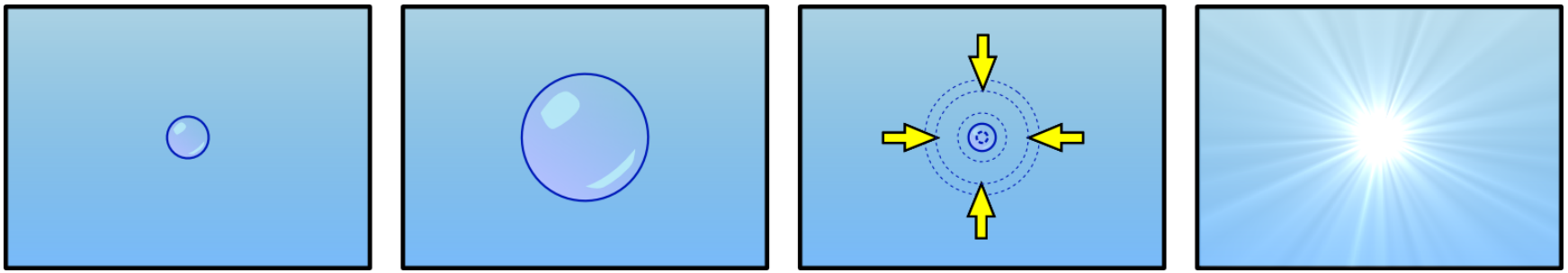
April 7th, 2014



SL Basics

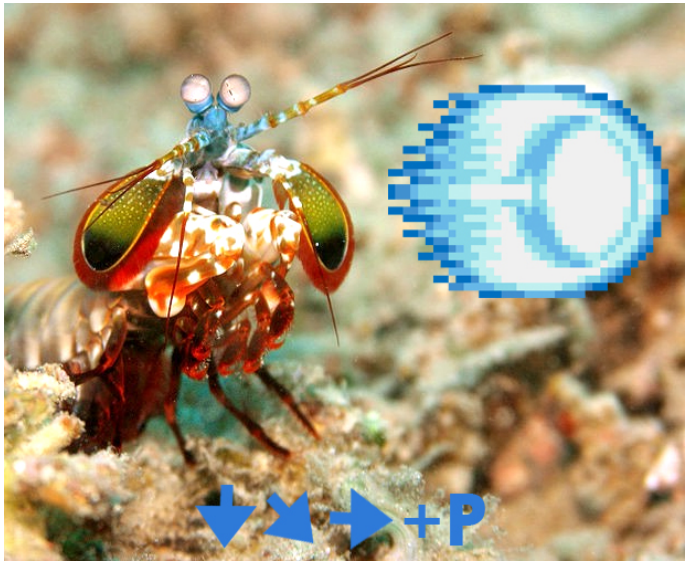


General Properties:

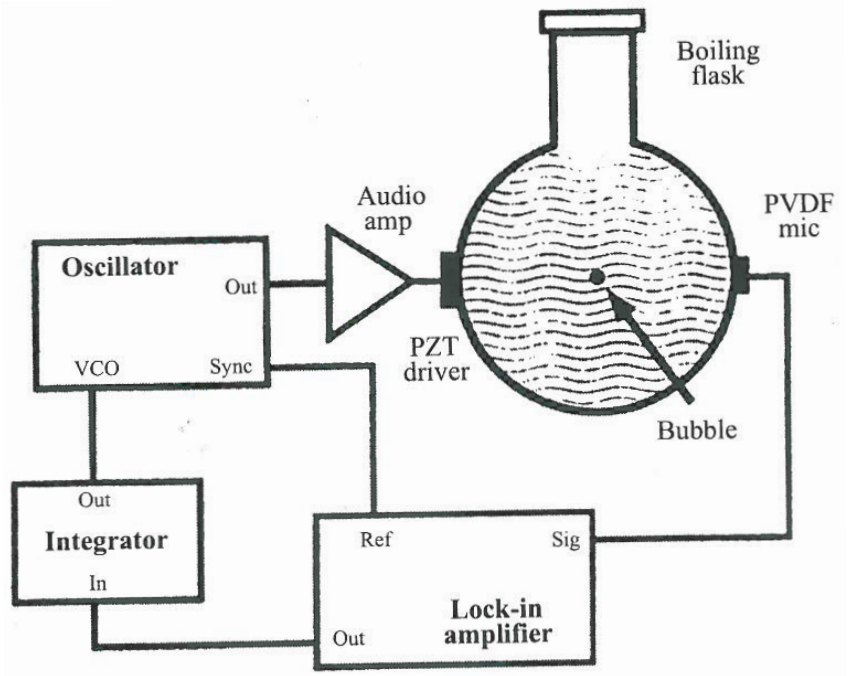
- Emission Time $\sim$ 35-200 ps.
- Bubble Radius at Emission $\sim$ 1 μm
- Temperature $\sim$ 10^3-10^4 K
- Power $\sim$ 1-10 mW

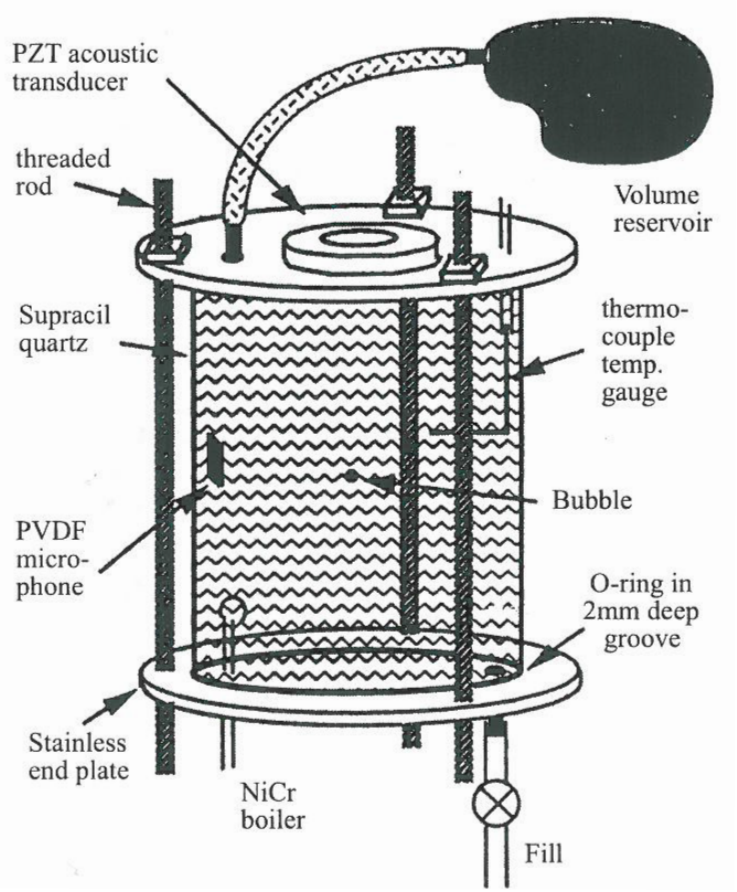
Examples of SL

- "Shrimpoluminescence"
- Waterfalls
- Gunshots Through Liquid
- Artificial Sources

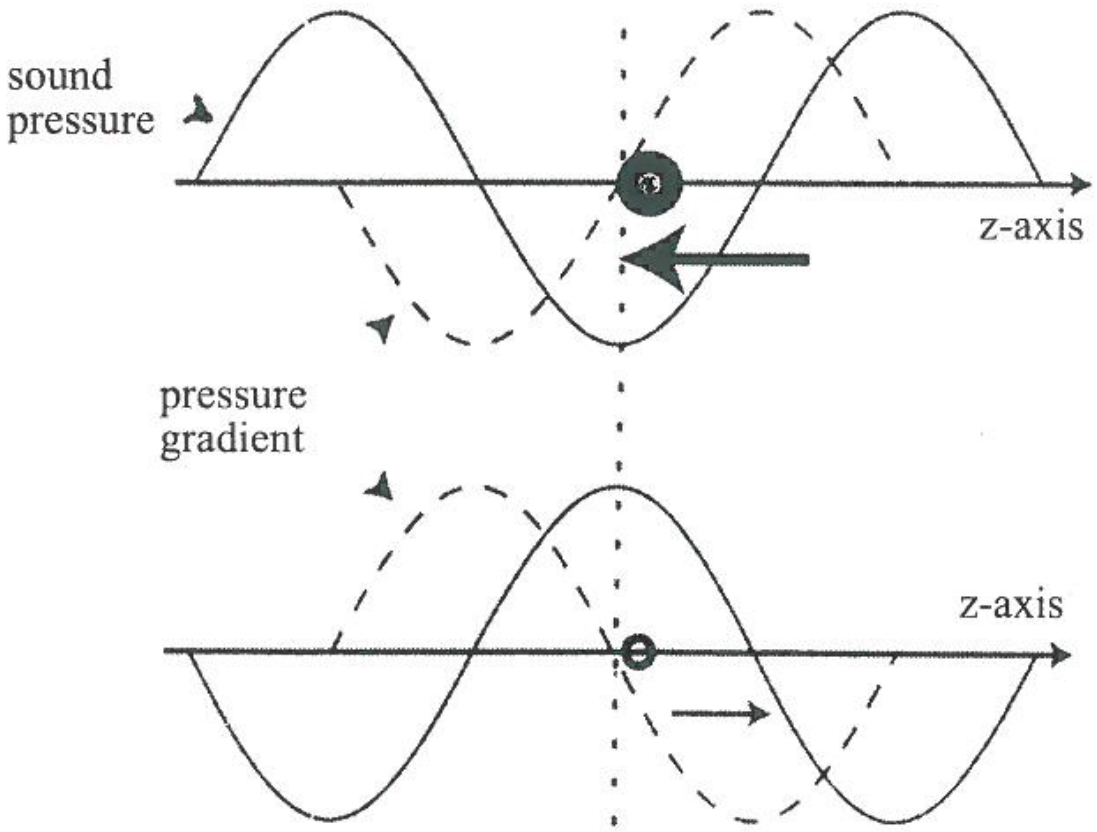


Production of Single Bubble SL

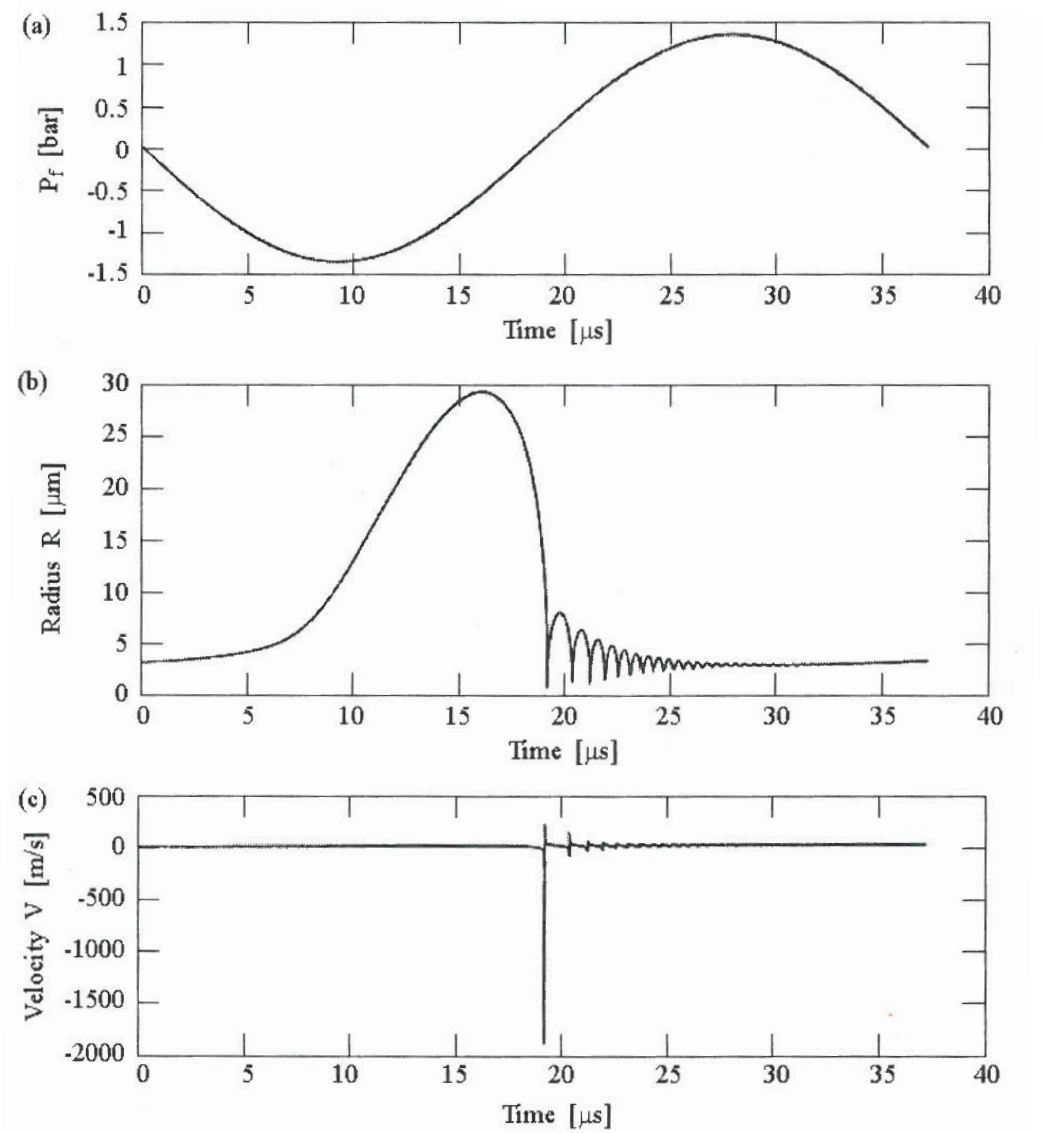




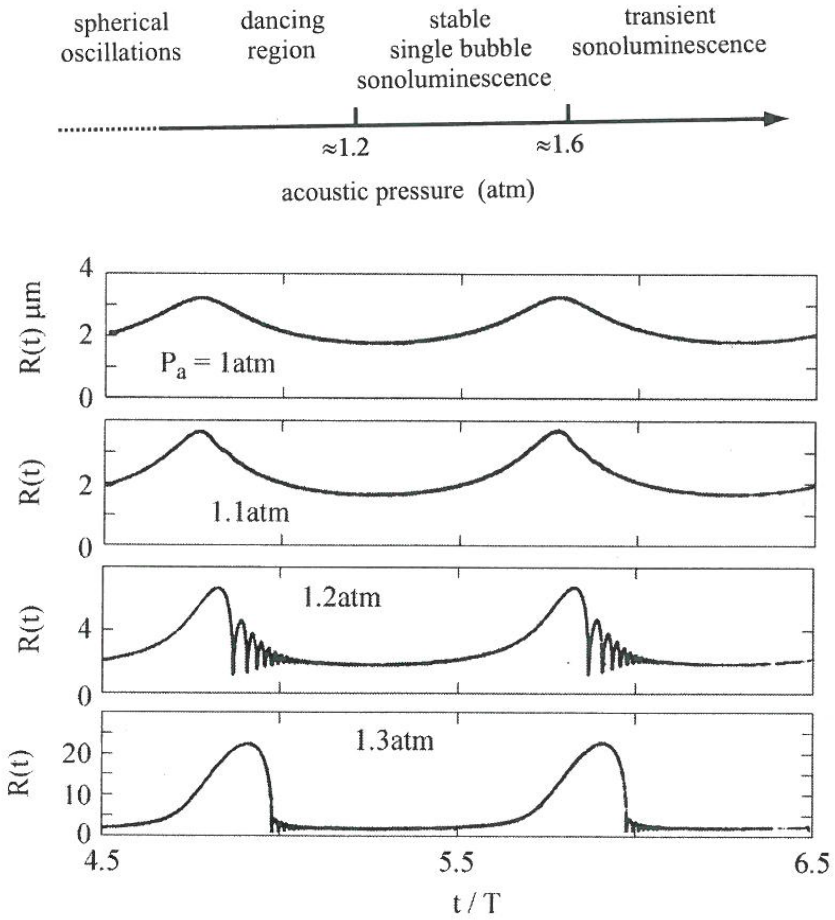
Manipulation of Single Bubble



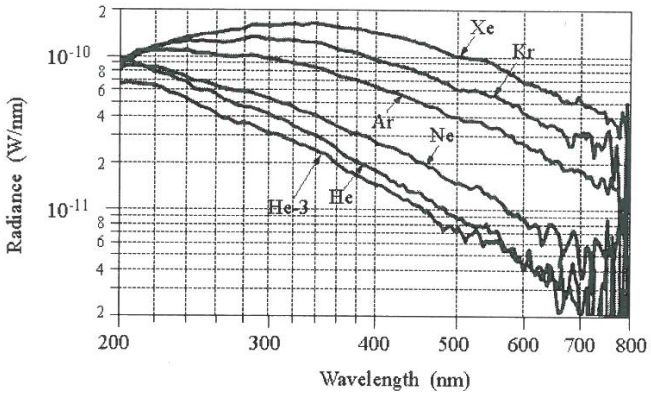
SL Acoustic Field & Response

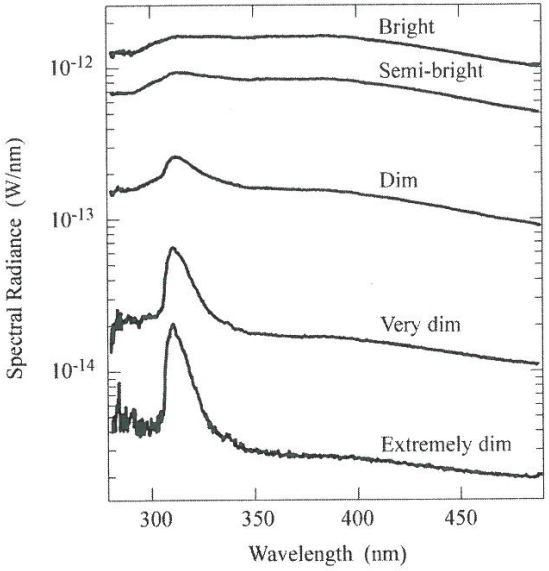


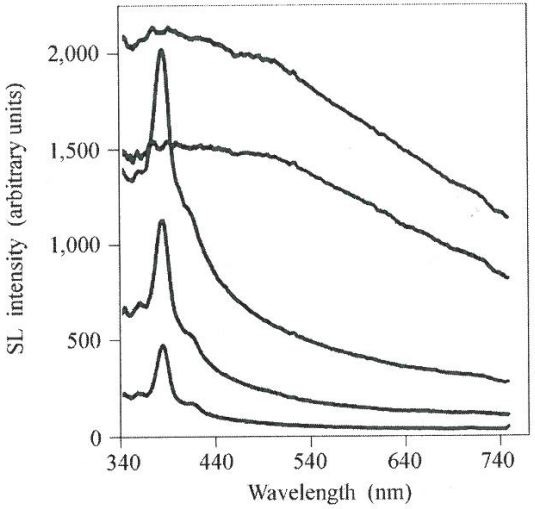
SL Driving Level



SL Spectra (Single Bubble)



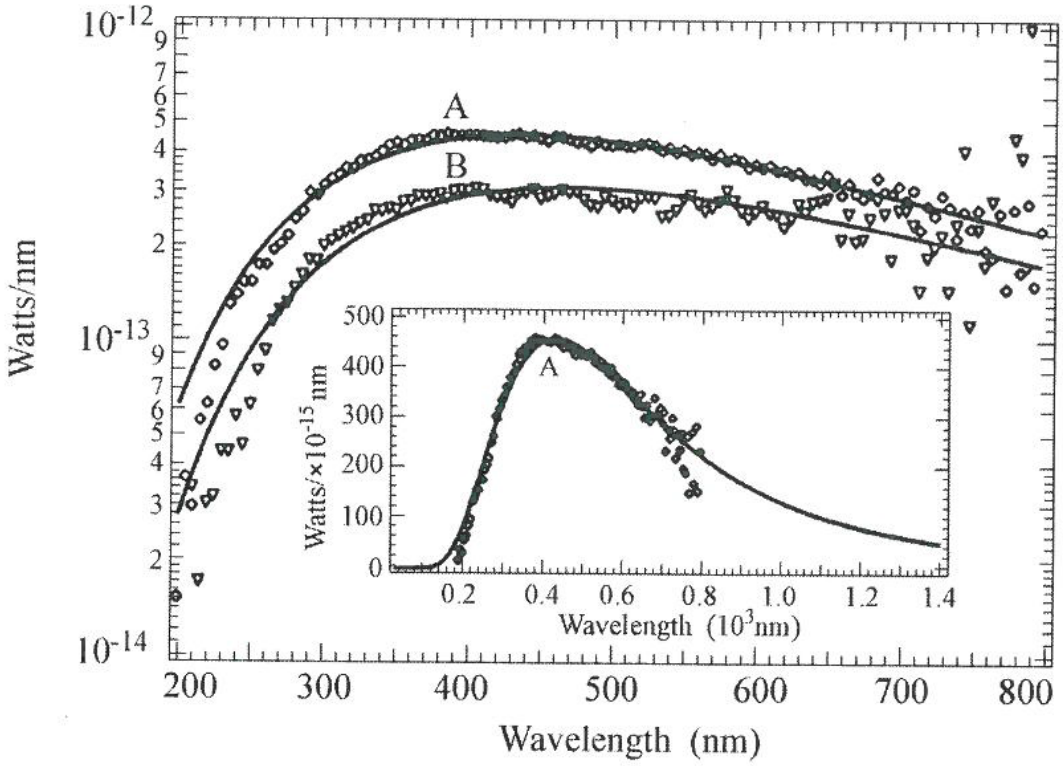




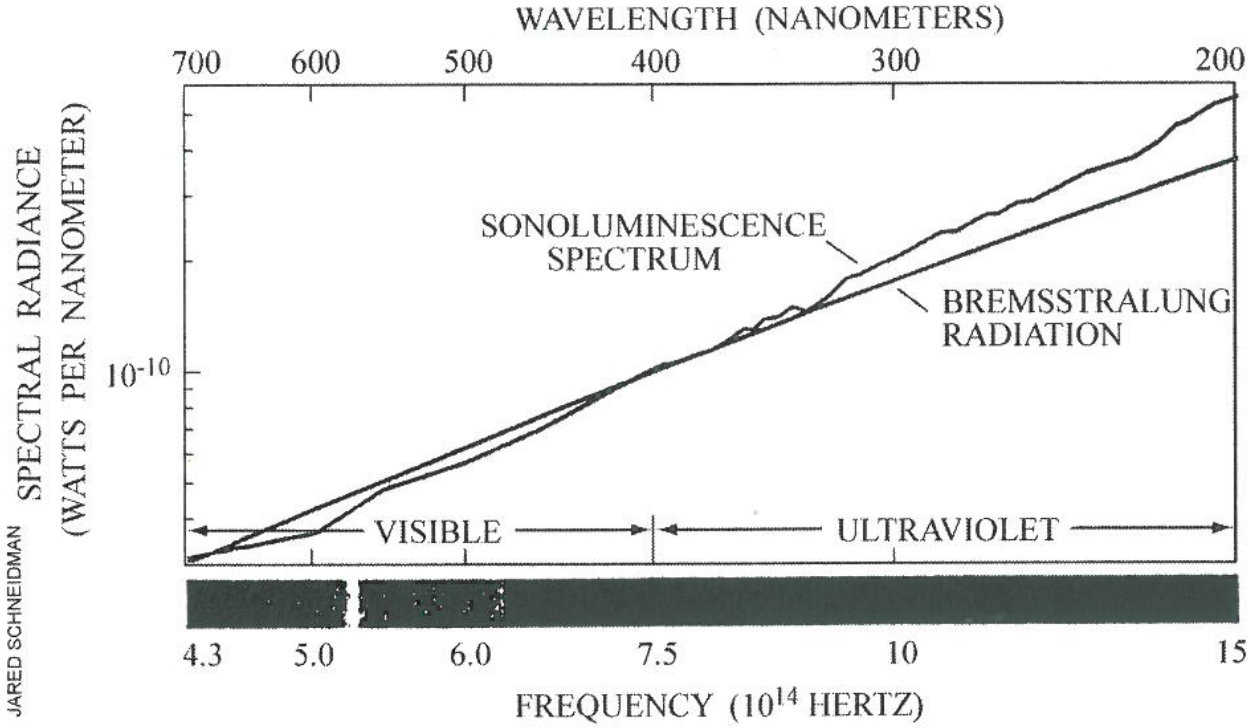
Theories

- Hotspot Theory
  - Black Body Radiation
  - Bremsstrahlung Radiation
- Hydrodynamic Theory
  - Weak Bubble Photon Absorbtion

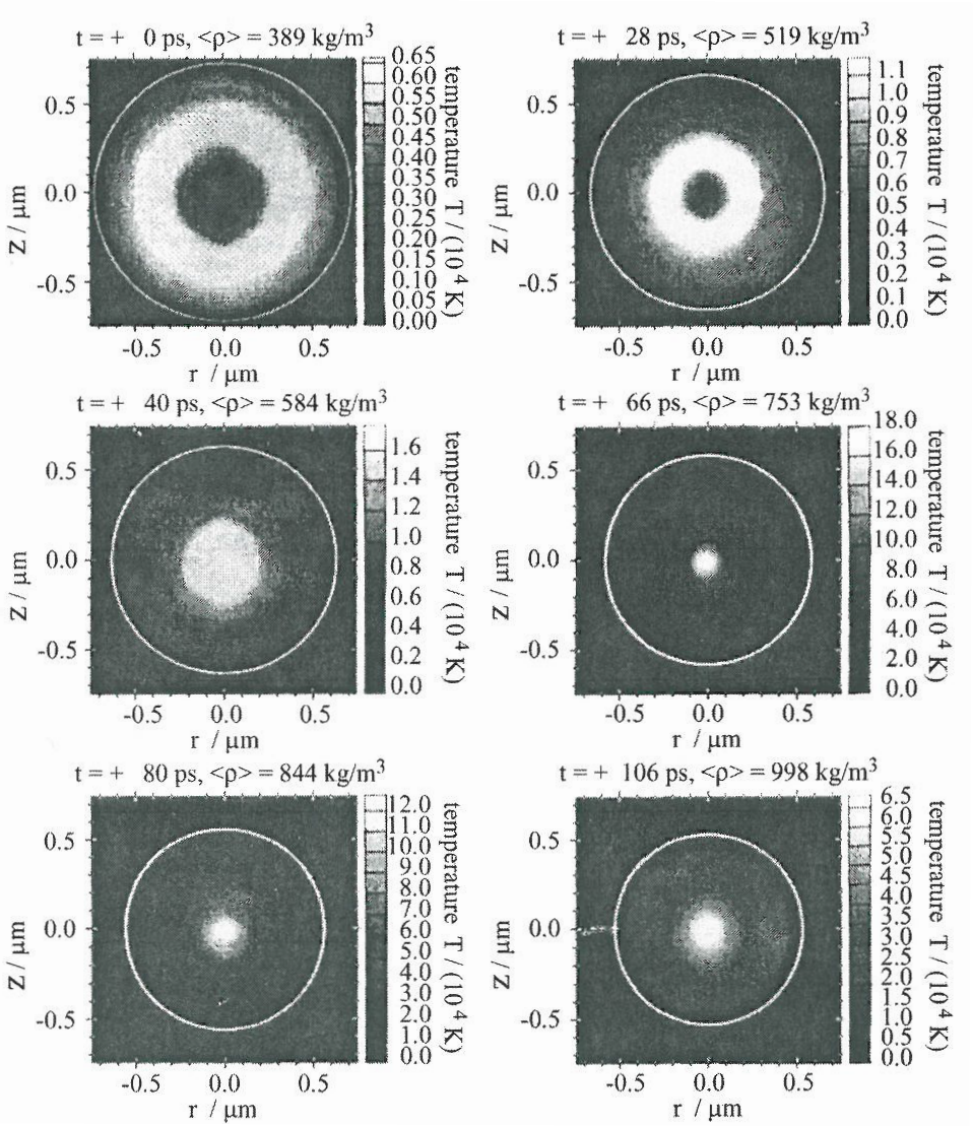
Black Body Radiation



Bremsstrahlung Radiation



Hydrodynamic Theory



References

1. Young, F. Ronald. *Sonoluminescence*. Boca Raton: CRC, 2005. Print.
2. "Mechanism of Sonoluminescence." *Wikipedia*. Wikimedia Foundation, n.d. Web. 06 Apr. 2014.

Questions?