Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Alternative nanostructures for thermophones NATHANAEL MAYO, ALI ALIEV, RAY BAUGHMAN, A.G. MacDiarmid NanoTech Institute, University of Texas at Dallas, Richardson, TX, 75083, USA — There is a large promise for thermophones in high power sonar arrays, flexible loudspeakers, and noise cancellation devices. So far, freestanding aerogel-like carbon nanotube sheets demonstrate the best performance as a thermoacoustic heat source. However, the limited accessibility of large size freestanding carbon nanotube sheets and other even more exotic materials published recently, hampers the field. We present here new alternative materials for a thermoacoustic heat source with high energy conversion efficiency, additional functionalities, environmentally friendly and cost effective production technologies. We discuss the thermoacoustic performance of alternative nanoscale materials and compare their spectral and power dependencies of sound pressure in air. The study presented here focuses on engineering thermal gradients in the vicinity of nanostructures and subsequent heat dissipation processes from the interior of encapsulated thermoacoustic projectors. Applications of thermoacoustic projectors for high power SONAR arrays, sound cancellation, and optimal thermal design, regarding enhanced energy conversion efficiency, are discussed.

Nathanael Mayo
None

Date submitted: 14 Nov 2014 Electronic form version 1.4