

Abstract Submitted  
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**Heat Pulse Propagation in Carbon Nanotube Peapods** MOHAMED OSMAN, Washington State University - Tricities — Earlier studies of heat pulse propagation in single and double wall nanotubes at very low temperatures have shown that the heat pulse generated wave packets that moved at the speed of sound corresponding to LA and TW phonon modes, second sound waves and diffusive components [1,2]. The energy content of LA mode wave packets in SWNT was significantly smaller than the TW mode. The energy of the leading LA mode wavepacket in DWNT had a significant increase in the energy content compared to SWNT LA mode. Additionally, an increase simple strain within the LA mode was higher in DWNT compared to SWNT was also reported in [1]. This has motivated us to examine heat pulse propagation in carbon nanopeapods and the coupling between the (10,10) SWNT nanotube and the C60 fullerenes enclosed. The major coupling frequency between the C60 and the (10,10) occurs at 4.88 THz which correspond to the radial breathing mode frequency. We will discuss these results and report on the major phonon modes involved in heat pulse propagation in the (10,10) SWNT-C60 nanopeapod.

[1] T. Kim and M.A Osman, C. Richards, R. Richards, D. Bahr, Phys. Rev. B 76, 155424 (2007)

[2] M.A. Osman and D. Srivastava, Phys. Rev. B 72, 125413 (2005)

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