

Abstract Submitted  
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**Study of the Isotropic-Nematic and the Nematic-Smectic-A  
Phase Transitions in Carbon Nanotubes and Liquid Crystal Composites**

KRISHNA SIGDEL, GERMANO IANNACCHIONE, Worcester Polytechnic Institute — A high-resolution ac-calorimetric study of the isotropic to nematic (*I-N*) and the nematic to smectic-A (*N-SmA*) phase transitions of carbon nanotubes (CNTs) and liquid crystal octyl-cyanobiphenyl (8CB) composites (8CB+CNTs) as a function of CNTs concentration is reported. Scans were performed on heating and cooling for all samples (0.5-6 wt% of CNTs) over a wide temperature range well above and below the two transitions in pure 8CB. Both the *I-N* and the *N-SmA* transitions evolve in character and have their transition temperatures shift lower as the wt% of CNTs increases. For intermediate wt% values, new transitions features are observed, which suggest new phase ordering of the CNTs within the liquid crystal host.

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