

## **Multi-pace Heat Conduction in Carbon Nanotube Bundles Induced by Structure Separation**

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Vertically aligned arrays of carbon nanotubes (CNTs) are attractive for a wide range of macroscopic applications which can exploit the remarkable properties of individual nanotubes. Knowledge of thermal transport in these micro/nanoscale structures has become indispensable considering the temperature and thermal response of materials strongly affect their mechanical, optical, and electrical properties. In this work, an abnormal thermal behavior of CNT bundles in heat conduction is revealed by the transient electro-thermal (TET) technique. This is not possible to discover in other heat conduction studies, especially studies using the steady state method. A polarized Raman experiment is performed to characterize the orientation of CNTs inside the bundle, The unique structure of CNT bundles constitutes the parallel thermal transfer paths which results in multi-pace heat conduction in carbon nanotube bundles induced by structure separation.