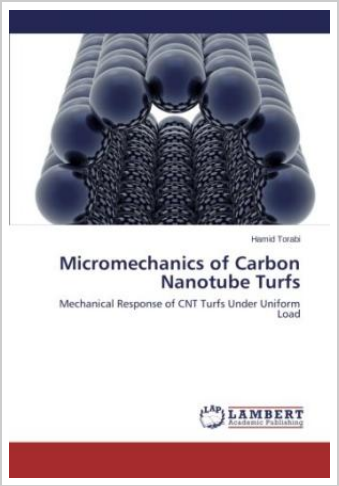

Micromechanics of Carbon Nanotube Turfs

By Torabi, Hamid

Condition: New. Publisher/Verlag: LAP Lambert Academic Publishing | Mechanical Response of CNT Turfs Under Uniform Load | Complex structures consisting of intertwined, nominally vertical carbon nanotubes (CNTs), grown from a substrate, are called turfs. These turfs have promising electrical, thermal and mechanical properties for use in applications such as contact thermal switches. These properties are controlled by the details of the turf microstructures. Under uniform compression experiments CNT turfs exhibit permanent collective buckling of a layer preceded by reorientation of CNT segments. The buckling length is controlled by the nanostructural parameters of the turf which are the turf density, connectivity, and tortuosity (average curvature). In this study, we develop a discrete computational model to simulate the collective buckling of CNT turfs and investigate the relationship between the macroscopic material properties, including the buckling length and nanostructural parameters under uniform loads. The model is based on the representation of CNT segments as elastica finite element. The initial turf configuration is generated by means of the restricted random walk algorithm and subsequent relaxation. The van der Waals forces between adjacent tubes are modeled as distributed loads. | Format: Paperback | Language/Sprache: english | 88 pp.

Reviews

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