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# Negative differential resistance and switching behavior in single wall bamboo-shape carbon nanotubes based molecular device: A first-principles study nanoscale device design

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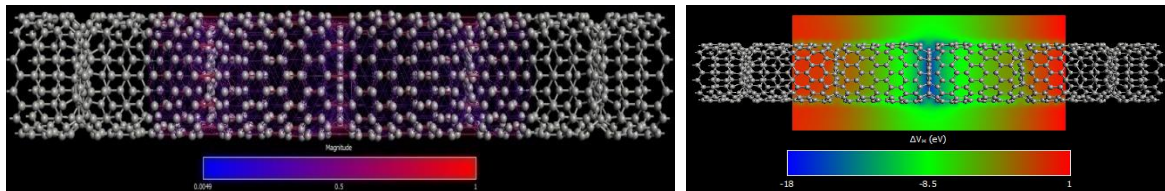
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## GRAPHICAL ABSTRACT

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Utilizing first principles density functional theory coupled with nonequilibrium Green's function, the transport properties of molecular device based on single wall bamboo-shape carbon nanotubes were explored theoretically.



Transmission pathways and electrostatic potential plots for the device

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## HIGHLIGHTS

- Transport properties of single wall bamboo-shape carbon nanotubes are examined for the first time in a theoretical manner.
- Excellent negative differential resistance (NDR) behaviour observed in case of single wall bamboo-shape carbon nanotubes.
- Very High peak to valley ratio are observed.
- Unique properties of single wall bamboo-shape carbon nanotubes are attractive to potential application for future nano-circuit design.

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