Abstract Submitted
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Cylindrical Organic Solar Cells with Carbon Nanotube Charge Collectors[1] DANTE ZAKHIDOV, NAVANEETH RAVI, RAYMOND LOU, TAMS, ALEX COOK, KAMIL MIELCZAREK, UTD, NANOEXPLORERS TEAM — Traditional organic photovoltaic (OPV) solar cells are produced on flat substrates. When applied on a large scale the maximum area covered by such flat OPV is limited to a two dimensional plane, moreover the light absorption is never strong enough due to very small OPV thickness (∼200 nm). Organic cylindrical solar cell devices, suggested in this talk, have a vertical structure that allows more sunlight to be absorbed in a smaller area due to photons being trapped and reflected multiple times from the cylindrical walls. The schematics of the organic cylindrical solar cell device is similar to that of a traditional organic cell but instead of using ITO as the p-type or hole collecting layer, transparent multi-walled carbon nanotubes (MWCNT) are applied. The highly conductive nature of MWCNTs and 3-dimensional charge collection allows for increased efficiency over flat ITO while the device still remains transparent. A PEDOT: Methanol mixture is used on top of the MWCNTs as a buffer layer that helps in the transport of holes while blocking electrons. The photoactive layer consists of P3HT/PCBM and aluminum is deposited onto the device as a cathode or as an electron collecting layer.

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