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Characterizing the electronic properties of single Titania nanotube using e-beam lithography MOHAMED ABDELMOULA, LATIKA MENON, Northeastern University — Titania Nanotubes arrays fabricated by anodization became the main interest of many research groups mainly due to its promising applications. Solar energy harvesting is one of the most anticipated applications, in which the light conversion to electron-hole pairs can be carried out on the surface of these nanotubes. Extensive research work has been carried out to increase the aspect ratio of these tubes and up to our knowledge no previous work has been done to explore the transport properties of a single titania nanotube. In our work we are studying the electron transport properties of a single titania nanotube using e-beam lithography, first, for a amorphs titania nanotubes, where we will investigate the effect of wall thickness and tube length on the transport properties. Second, for annealed titania nanotubes, where we will investigate the effect of annealing conditions on the transport properties. Also we will investigate the response of these properties to different gases, in which we will learn more about the ability of single titania nanotubes to work as nanosensor and its selectivity to specific gases. As a result, we will get a more clear understanding of the charge transport properties, and explore new functions for these cheap and easily fabricated nanotubes.

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