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Electrical Noise in Individual Conducting Polymer Nanowires ALEXEY KOVALEV, YANYAN CAO, THERESA MAYER, THOMAS MALLOUK, Penn State University — Electrical property characterizations of conducting polymer nanostructures have been limited primarily to resistance measurements. Electrical noise is one aspect that is usually overlooked, yet critical to their device performance. Moreover, electrical noise is more sensitive to the polymer doping and microstructure than resistance, which makes it particularly interesting for sensor applications. In this talk, we will present the results on the electrical noise measurements of individual multisegmented electrodeposited nanowires based on Poly(3,4-ethylenedioxythiophene (PEDOT) [1]. The polymer was electrochemically doped with either poly(4-styrenesulfonic acid) (PSS) or perchlorate (ClO_4). The nanowires had gold contacts on both ends and were measured in four-point and two-point configurations. We found that the electrical noise behavior is typical of $1/f$ noise, with a spectral density that depends on the polymer structure and is affected by the ambient conditions. Our data show that the contact noise represents a significant contribution to the total noise level. We will discuss the interpretation of these results assuming that the polymer is a disordered conductor. [1] Cao *et al.*, *Nano Letters* **Article ASAP**

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