

1096-VD-2425

Kristin McCullough* (kmccullough@grandview.edu), **Nader Ebrahimi** (nader@math.niu.edu) and **Zhili Xiao** (zxiao@niu.edu). *Modeling the Reliability of a Hydrogen Gas Nanosensor.*

Nanosystems have great potential in practical applications, such as significantly enhancing the performance of gas detecting sensors. Much research has been devoted to designing and fabricating these nanosystems, while the question of reliability has been overlooked. Here we focus on the reliability of one specific hydrogen gas nanosensor based on a network of ultra-small palladium nanowires. Unfortunately no data is available for reliability analysis, so we rely on a computer model to simulate the behavior of the nanosensor over repeated exposures to hydrogen gas. Using various lattices to represent the structure of the network, we evaluate the reliability, both analytically and through simulations, using site percolation. We attempt to resolve many of the unique difficulties that arise due to the small size and unique properties of the nanowires. (Received September 17, 2013)