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**Electrical breakdown of graphene and few-layer graphene structures** ABHISHEK SUNDARARAJAN, STEPHEN JOHNSON, D. PATRICK HUNLEY, ROEL FLORES, University of Kentucky, A.T CHARLIE JOHNSON, University of Pennsylvania, DOUGLAS STRACHAN, University of Kentucky — The electrical breakdown of graphene and few-layer graphene (FLG) structures are investigated. To better understand the dynamics of these nano-scale thermal effects, we investigate graphene and FLG nanowires of various dimensions and find that significant joule heating occurs inducing the structures to evolve. A distinct change in the behavior during electrical stressing indicates that different mechanisms occur at the various stages of evolution. The results are compared to detailed thermal modeling of our structures and could have implications on the development of high current carrying nanoscale graphene devices. Supported in part by NSF Award No. DMR-0805136, the Kentucky NSF EPSCoR program, the University of Kentucky Center for Advanced Materials, and the University of Kentucky Center for Nanoscale Science and Engineering.

Abhishek Sundararajan  
University of Kentucky

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