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Manipulation of avalanche characteristics in nanoscaled VO_2 devices[1] SIMING WANG, KEVIN G. WEST, IVAN K. SCHULLER, Department of Physics and Center for Advanced Nanoscience, University of California San Diego, La Jolla CA 92093 — The temperature driven metal insulator transition (MIT) in nanoscaled VO_2 devices occurs through a series of resistance jumps ranging over two decades in magnitude. A power law distribution of the jump sizes, demonstrates that the transition is caused by avalanches across the percolation transition. We investigate the effect of a DC write current on the intrinsic behavior of the MIT transition in nanoscaled VO_2 devices. We find an increase in the maximum resistance jump size by as much as a factor of 10x after application of a DC write current at room temperature. Interestingly, we find no significant changes in the exponent of the power law distribution as a function of an applied DC write current. The observations suggest that the DC current changes the intrinsic properties of the VO_2 thin film and may be related to spatial confinement which leads to an increase in the maximum resistance jump size.[2]

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[2]Hong-Ying Zhai, J.X. Ma, D.T. Gillaspie, X.G. Zhang, T.Z. Ward, E.W. Plummer, and J. Shen, Phys. Rev. Lett. **97** 167201 (2006).

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