Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Enhanced Suppression of Superconductivity in Amorphous Films with Nanoscale Patterning[1] M.D. STEWART, JR., H.Q. NGUYEN, S.M. HOLLEN, AIJUN YIN, J.M. XU, J.M. VALLES, JR., Brown University — We have measured the thickness dependence of the superconducting critical temperature, $T_c(d_{\mathrm{Bi}})$, in amorphous Bi/Sb films patterned with a regular array of holes as well as nanoscale thickness variations. We find that the mean field T_c is suppressed relative to simultaneously produced unstructured films of the same thickness. Surprisingly, however, the functional form for $T_c(d_{\mathrm{Bi}})$, remains unaffected. The role of the thickness variations in suppressing T_c is compared to the role of the holes, through parameterization of the surface, as measured through AFM/SEM and a proximity effect calculation. These results suggest that these two nanoscale modifications suppress T_c about equally and are consistent with T_c being determined on a microscopic length scale.

[1]This work supported by the NSF through DMR-0203608 and No. DMR-0605797, by the AFRL, and by the ONR.

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Date submitted: 26 Nov 2008 Electronic form version 1.4