Non-local piezoresponse in 3 u.c. LaAlO$_3$/SrTiO$_3$ MENGCHEN HUANG, FENG BI, University of Pittsburgh, CHUNGWUNG BARK, SANGWOO RYU, CHANGBEOM EOM, University of Wisconsin, JEREMY LEVY, University of Pittsburgh — Nanoscale control of the metal-insulator transition in 3 unit cell (u.c.) LaAlO$_3$/SrTiO$_3$ heterostructures can be achieved by the conducting AFM lithography,$^1$ however the mechanism behind this transition is still not well understood. One proposed mechanism invokes ionic transport through the LaAlO$_3$ layer.$^2$ We have performed a variety of local and non-local piezoforce measurements on 3 u.c. LaAlO$_3$/SrTiO$_3$ heterostructures. The existence and nature of the non-local piezoelectric effect places strong constraints on the origin of the piezoelectric response. This work is supported by NSF DMR-1104191.


$^2$A. Kumar, S. Jesse, A. Gruverman, C. B. Eom, S.V. Kalinin, unpublished

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