Real-time characterization of nanostructures written at the LaAlO$_3$/SrTiO$_3$ interface$^1$ ALEXANDRE GAUTHIER, PATRICK IRVIN, JEREMY LEVY, University of Pittsburgh — Nanostructures can be written on the LaAlO$_3$/SrTiO$_3$ interface using conductive AFM lithography$^2$. These structures can be configured into devices including photodetectors$^3$ and transistors$^4$. Characterization of complex devices requires simultaneous measurements between several pairs of electrodes. We have developed a method to take measurements between all electrodes simultaneously by both measuring and applying a bias at a unique frequency to each electrode. Fourier analysis is then used to separate measured signals by source terminal. This allows us to efficiently characterize multi-terminal devices in real-time, as they are being created. This method will allow for the use of new experimental techniques.

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