

Abstract Submitted  
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**Measurement of Surface Acoustic Wave Resonances in Ferroelectric Domains by Microwave Microscopy**<sup>1</sup> SCOTT JOHNSTON, YONGLIANG YANG, Stanford University, YONGTAO CUI, University of California Riverside, ERIC YUE MA, Stanford University, JIAN ZHOU, MINGHUI LU, YAN-FENG CHEN, Nanjing University, ZHI-XUN SHEN, Stanford University — Surface acoustic wave (SAW) devices made from ferroelectric materials are commonly used as radio frequency filters and delay lines in modern wireless devices. These devices can make use of the reflection of SAWs from ferroelectric domain walls. Here, we report on the measurement of SAW resonances within a closed domain in the ferroelectric LiTaO<sub>3</sub> via scanning Microwave Impedance Microscopy (sMIM). The sMIM probe is used for both SAW generation and measurement, allowing contact-less measurement within a mesoscopic structure. Measurements taken at different microwave frequencies demonstrate the expected wavelength dependence of the SAW patterns and agree with literature values for SAW velocity. This ability to map the surface acoustic wave patterns could be coupled with the well established ability to pattern ferroelectric domains via applied voltage on the same instrument to allow for rapid prototyping of novel SAW devices such as domain wall based wave-guides and couplers.

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