Abstract Submitted
for the MAS20 Meeting of
The American Physical Society

Backfolded acoustic phonons as ultrasonic probes in metal-oxide superlattices[1] FRYDERYK LYZWA, Department of Physics and Fribourg Center for Nanomaterials, University of Fribourg, Chemin du Muse 3, CH-1700 Fribourg, Switzerland, ANDREW CHAN, The MacDiarmid Institute for Advanced Materials and Nanotechnology, 1010 Auckland, New Zealand, JARJI KHMALADZE, Department of Physics and Fribourg Center for Nanomaterials, University of Fribourg, Chemin du Muse 3, CH-1700 Fribourg, Switzerland, KATRIN FRSICH, BERNHARD KEIMER, Max-Planck-Institut fr Festkrperforschung, Heisenbergstrasse 1, 70569 Stuttgart, Germany, CHRISTIAN BERNHARD, Department of Physics and Fribourg Center for Nanomaterials, University of Fribourg, Chemin du Muse 3, CH-1700 Fribourg, Switzerland, MATTEO MINOLA, Max-Planck-Institut fr Festkrperforschung, Heisenbergstrasse 1, 70569 Stuttgart, Germany, BENJAMIN P. P. MALLETT, The MacDiarmid Institute for Advanced Materials and Nanotechnology, 1010 Auckland, New Zealand — Ultrasound has been widely used as an incisive probe of internal interfaces. For thin-film structures however, it is largely ineffective because the signal is dominated by the substrate. Using confocal Raman spectromicroscopy, we show that multiple reflection of sound waves at internal interfaces of a metal-oxide superlattice generates standing waves that are insensitive to the substrate. These backfolded acoustic phonon modes are sensitive to atomic-scale thickness variations of the sublayers and thus serve as a powerful characterization tool for metal-oxide superlattices.

[1]Supported by the SNF through Grant No.200020-172611, the Rutherford Foundation and the MacDiarmid Institute.

Fryderyk Lyzwa
University of Fribourg, Switzerland

Date submitted: 02 Nov 2020 Electronic form version 1.4