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Enabling Comparability in Back-Scattered TERS instrumentation via Lithographic Test Structures ERIN WOOD, ANGELA HIGHTWALKER, National Institute of Standards and Technology — Tip-enhanced Raman spectroscopy promises unprecedented spatial resolution and selectivity; however this burgeoning technique is not yet truly robust. Tip size, shape and composition as well as variations in instrumental setup may cause deviation in the resultant spectra, even with the same sample. In order to account for these problems and enable comparability between different instruments, we propose to use a 3-D lithographically-printed, strained silicon standard which will act as both a calibration as well as a benchmark test for instrument robustness. This proposed test structure also will allow for further development and enhancement quantification of TERS instrumentation. Current progress on TERS mapping of the 3-D sample allows us to resolve individual SiGe@Si lines with widths of 32 nm. We also present methodology to allow for robust TERS-active probes using gold as the plasmonic enhancing materials.

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