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Tip Enhanced Raman Scattering of Strained Silicon with Single and Multiple Probe Scanned Probe Microscopes. AARON LEWIS, Nanonics Imaging Ltd. — Raman spectroscopy is an effective tool for the identification and analysis of molecular components of complex materials. The spatial resolution of Raman spectroscopy is limited by the wavelength of the light. One approach to overcome this drawback is Surface Enhanced Raman Scattering (SERS). This technique uses nanometric interactions between metal structures and surfaces to effect enhancement of the Raman signals. An important mechanism for enhancement originates from an electrostatic lightning rod effect due to the excitation of localized surface plasmon resonances. This is accomplished in a scanned probe microscopy context by employing an ultra-sharp metalized tip that is brought into a focused laser spot on the sample surface thereby enhancing the Raman signal. In this technique also known as Tip Enhanced Raman Scattering (TERS) the electrical field is locally enhanced near the sharp metalized tip. Rastering the sample should then allow for Raman imaging with nanometric resolution. Within this context it will be shown that multiple probe scanned probe microscopes have considerable potential in such tip enhanced applications.

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