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**Au Bowtie Nanostructures for Surface-enhanced Raman Spectroscopy** DANIEL WARD, Department of Physics and Astronomy, Rice University, NATHANIEL GRADY, Department of Electrical and Computer Engineering, Rice University, CARLY LEVIN, Department of Chemistry, Rice University, NAOMI HALAS, Department of Electrical and Computer Engineering, Rice University, DOUGLAS NATELSON, Department of Physics and Astronomy, Rice University — Designing nanostructures for surface-enhanced Raman spectroscopy (SERS) is an active area of research because of the potential for chemical sensing with single-molecule sensitivity. We report preliminary SERS measurements on Au bowtie structures with nanometer size interelectrode gaps fabricated by electromigration. Initial data suggest that the bowtie structure provides a large electromagnetic enhancement for SERS over a small volume, enabling few or single molecule spectroscopy. The local plasmon resonance of the bowtie structure is tunable by varying the width of the gap between the two halves using electromigration. Additionally we report on a multiple bowtie structure that combines several bowtie devices in parallel allowing for the simultaneous electromigration of several devices at once to similar gap sizes.

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