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Near-Field Enhanced UV Resonance Raman Spectroscopy Using an Aluminum Bow-tie Nano-antenna LING LI, SHUANG FANG LIM, ROBERT RIEHN, HANS HALLEN, North Carolina State University — An aluminum bow-tie nano-antenna is combined with the resonance Raman effect in the deep UV to dramatically increase the sensitivity of Raman spectra to a small volume of material, such as benzene used here. By carefully choosing the right geometric parameters for the nano-antenna, we achieved a gain of a half million in signal intensity from the near field enhancement due to the surface plasmon resonance in the aluminum nanostructure. The on-line resonance enhancement contributes another factor of several thousands, limited by the laser line width. Thus, an overall gain of billions is achieved. We also demonstrated that the strong electric field gradients inside the bow-tie gap induce gradient-field Raman peaks for several strong IR modes.

Prefer Oral Session
 Prefer Poster Session

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