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Recent advances in AFM based nanoscale infrared spectroscopy.
JAY ANDERSON, EOGHAN DILLON, KEVIN KJOLLER, ANIRBAN ROY, Anasys Instruments — This talk will focus on the recent advances in measuring the chemical and optical properties of materials with nanometer scale spatial resolution. Conventional infrared spectroscopy is one of the most widely used tools for chemical analysis, but optical diffraction limits its spatial resolution to the scale of many microns. Atomic force microscopy (AFM) enjoys excellent spatial resolution, but has historically lacked the ability to perform robust chemical analysis. This presentation will discuss the advances in two techniques (1) AFM-based infrared spectroscopy (AFM-IR) and (2) scattering scanning near field optical microscopy (s-SNOM). Both of these techniques overcome the diffraction limit, providing the ability to measure and map chemical and optical properties with 10 nanometer spatial resolution. Recent advances including Tapping AFM-IR and increases in laser sweep rates have significantly improved the resolution and sensitivity of AFM-IR, allowing for the capability to collect hyperspectral images. As complementary techniques, AFM-IR and s-SNOM together provide an unrivaled capability to perform nanoscale chemical analysis on a diverse range of organic, inorganic, photonic and electronic materials. This talk will focus on AFM and s-SNOM applications on samples from fields including polymers, life sciences, graphene and nanoantennas.

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