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Simultaneous Surface-Enhanced Raman Scattering Imaging and Spectroscopy in Confocal Mode. DENIS PRISTINSKI[1], MELEK EROL[2], HENRY DU[1], SVETLANA SUKHISHVILI[2], Stevens Institute of Technology — Noble colloidal metal nanoparticles deposited on a planar substrate facilitate ultrasensitive measurements via surface-enhanced Raman scattering (SERS) spectroscopy. Due to the random nature of nanoparticle immobilization, the variation of interparticle distance and possible aggregate formation cause significant fluctuation in SERS signal intensity across the substrate. To study the nature of these intensity fluctuations we have built a microscope capable of simultaneous imaging in epi-fluorescent mode and spectroscopy of a point of interest in confocal mode. Two excitation beams from the same laser (DPSS 532 nm) are mixed to expose the imaged area and to focus on the point of interest through high N.A. objective. The scattered light collected by the same objective is filtered and split between a cooled CCD camera for imaging and a fiber-connected spectrometer for confocal mode spectroscopy. Positively charged Ag nanoparticles prepared by polyethyleneimine-assisted reduction were deposited on glass substrate and used for the assessment of uniformity of SERS signal from subsequently adsorbed anionic molecules and for the identification of proteins.

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