

TECHNOLOGY OFFER

Structured Light Nanoparticle Enhanced Raman Spectroscopy

BACKGROUND

Raman spectroscopy is a powerful technique for material characterization, but its sensitivity is limited by the weak inelastic scattering signal. Traditional enhancement methods amplify the local electromagnetic field, but with limited control over polarization and spatial resolution at the nanoscale.

TECHNOLOGY OVERVIEW

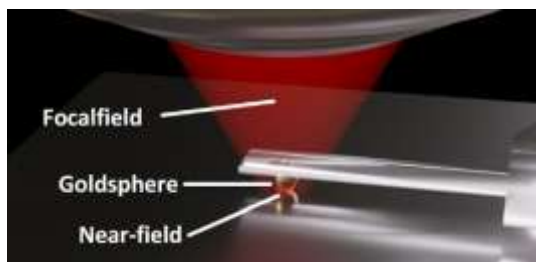
This technology solves the limitations of traditional Raman spectroscopy, which is lack of polarization contrast on the nanoscale, by combining spatially structured light with plasmonic nanoparticles to selectively enhance the Raman signals. This is done by tightly focusing laser beams with tailored polarization, controlling the excitation field precisely and placing a plasmonic nanoparticle in the focal field, so that it acts as a field enhancer.

ADVANTAGES

- ✓ Selective excitation of Raman modes in the subwavelength regime
- ✓ Polarization-resolved Raman spectra for advanced material analysis

APPLICATIONS

- ✓ All Raman-active materials, like e.g., semiconductors, dielectrics, biological samples, with nanoscale resolution.
- ✓ Measurements of: crystal structure, stress, and orientation, same as molecular fingerprints.



Principle of the technology
Illustration credit: J. Enenkel

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Research cooperation
Spin Off Investment

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