

Manipulating particles and enhancing spectroscopy with plasmonics and photonics

Abstract:

Kenneth CROZIER
Harvard University
School of Engineering and Applied Sciences
Mazwell Dworkin
33 Oxford St.
Cambridge, MA 02138
U.S.A.

Field enhancement from plasmonic and photonics structures presents new opportunities for optical manipulation and surface enhanced Raman spectroscopy (SERS). We begin with a discussion of the underlying concepts in optical manipulation and in SERS (especially electromagnetic enhancement). We follow this with a review of the developments over the last few years, including work from Professor Crozier's group. For the latter, experimental results on the trapping of micro- and nanoparticles using localized and propagating surface plasmons, and using silicon photonics, will be presented. The development of plasmonic nanostructures for SERS, including those with single molecule sensitivity, will be described.