

# Mapping nanoscale electric field hotspots of a plasmon-molecule system: a theoretical study

Junais Habeeb Mekkath<sup>1</sup>

<sup>1</sup>Kuwait College of Science and Technology

October 20, 2020

## Abstract

The coherent interaction between localized surface plasmon resonance modes and excitons of a single or a collection of quantum emitters have fueled the development of novel applications in quantum optics and material science. In this work, using first-principles simulations, we analyse the modifications in absorption spectra and electric near-field enhancements in a structure consisting of an aluminum nanotriangle interacting with a varying number of pyridine molecules (placed at the nanotriangle tips) in close proximity. What's more, we find very interesting spatial variation in induced electron density and electric near-field enhancements with a remarkable dependence on the number of interacting pyridine molecules and the direction of light illumination. Our results may help to improve our understanding of the light-matter interaction at the sub-nanometer scale.

## Hosted file

paper.pdf available at <https://authorea.com/users/368873/articles/487866-mapping-nanoscale-electric-field-hotspots-of-a-plasmon-molecule-system-a-theoretical-study>