Scilight

Photochemistry and Spectroscopy
https://www.sciltp.com/journals/ps

Supplementary Materials

Using Surface Phonons as a Guide for Optimizing SERS and Light-Driven Processes †

Ivano Alessandri [1,2,3,*]

[1] Information Engineering Department, University of Brescia, via Branze 38, 25123 Brescia, Italy; ivano.alessandri@unibs.it
[2] Research Unit of Brescia, Consorzio Interuniversitario per la Scienza e Tecnologia dei Materiali, INSTM, via Branze 38, 25123 Brescia, Italy
[3] Research Unit of Brescia, CNR-INO, via Branze 45, 25123 Brescia, Italy
† This article is dedicated to Prof. Giuseppe Zerbi in recognition of his outstanding scientific contributions to Spectroscopy.

Figure S1. Raman spectra of T-horex@Au acquired with a 0.5 N.A. objective as a function of the power attenuation.
Figure S2. Temporal stability of the 700 cm^{-1} mode.
Figure S3. Background-subtracted Raman spectra of Z-scan experiments and evolution of the 700 cm^{-1} mode.
Figure S4. Far-field Vis reflectance of T-horex and T-horex@Au.
Figure S5. Raman spectrum of Au (8 nm) on glass slide substrates.

Using surface phonons as a guide for optimizing SERS and light-driven processes

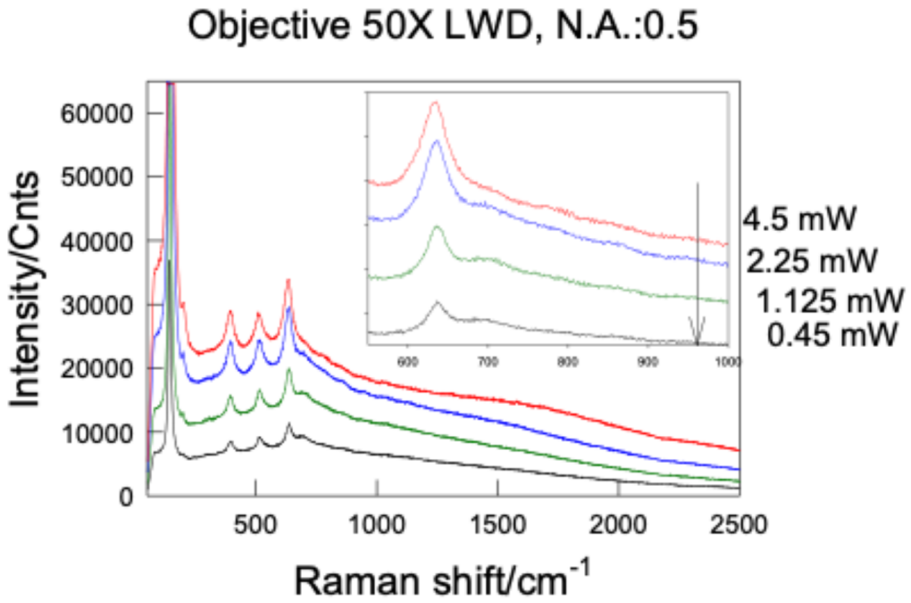

Figure S1. Raman spectra of T-horex@Au acquired with a 0.5 N.A. objective as a function of the power.

Copyright: © 2026 by the authors. This is an open access article under the terms and conditions of the Creative Commons Attribution (CC BY) license (https://creativecommons.org/licenses/by/4.0/).
Publisher's Note: Scilight stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Using surface phonons as a guide for optimizing SERS and light-driven processes

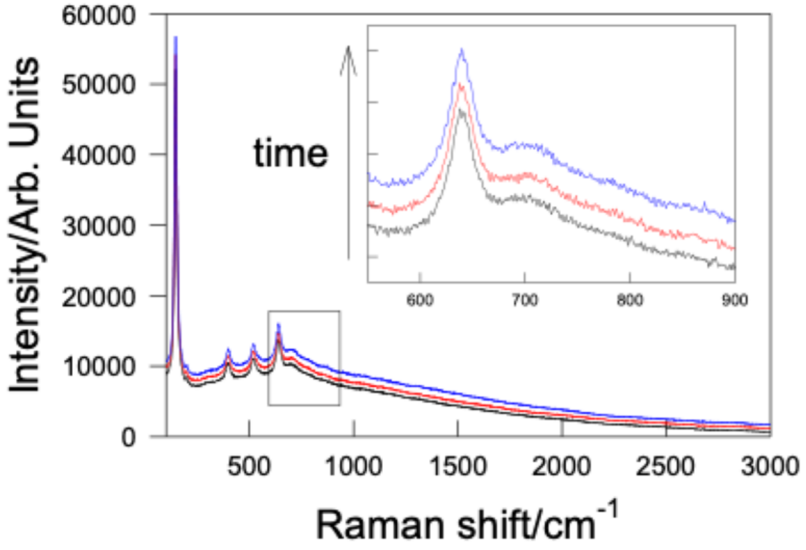

Figure S2. Temporal stability of the 700 cm^{-1} mode. The spectra have been stacked for clarity. The spectra were collected under the same conditions (power: 0.45 mW, acquisition time: 3 s) at $t = 0$ and after continuous irradiation for 5 and 10 min.

Using surface phonons as a guide for optimizing SERS and light-driven processes

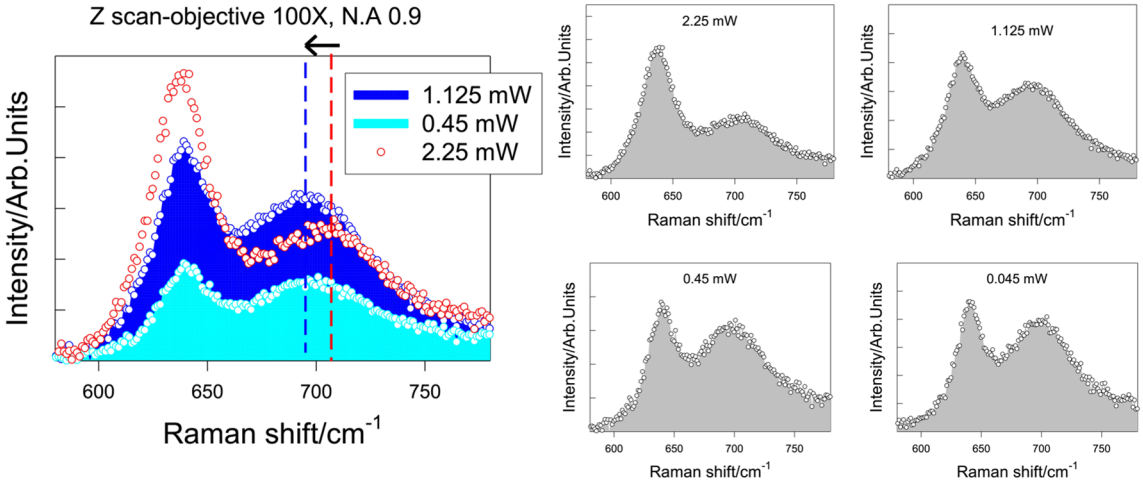

Figure S3. Background-subtracted Raman spectra of T-horex@Au acquired with a 0.9 N.A. objective as a function of the power (see Figure 3 in the main text). The phononic mode has been fitted with Pseudo-Voigt curves, the g-factor for 2.25 and 1.125 mW is 0.425 and 0.572, respectively, whereas it is 0 in the other cases, which indicates a progressive increase of the band symmetry. The maximum of the center of the mode is also shifted by −5 cm^{-1} on passing from 2.25 to 1.125 mW.

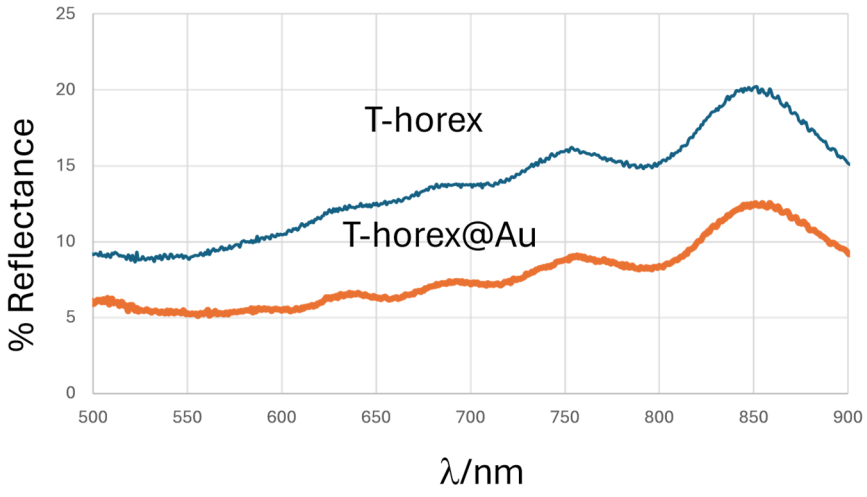

Figure S4. Far-field Vis reflectance of T-horex and T-horex@Au.

Using surface phonons as a guide for optimizing SERS and light-driven processes

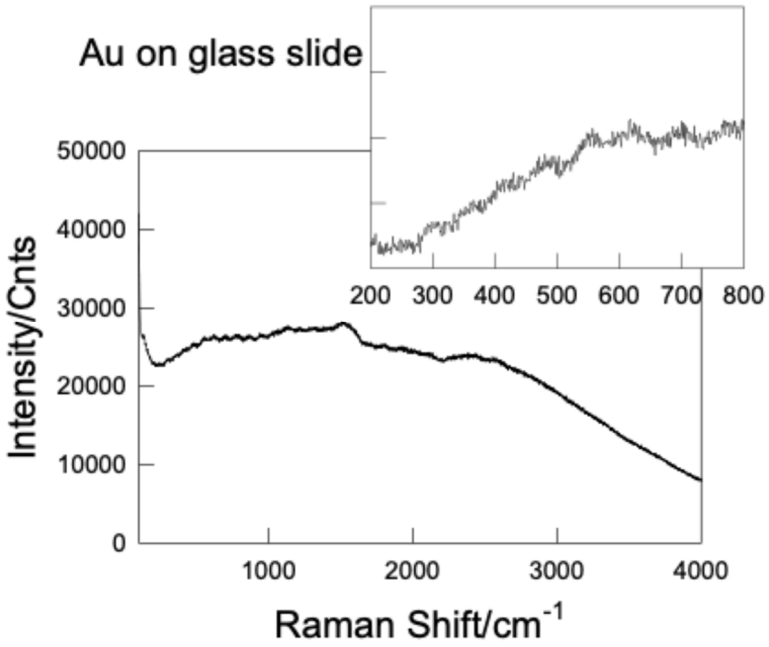

Figure S5. Raman spectrum of Au (8 nm) on glass slide substrates, acquired under the same conditions of Raman experiments show in Figure 5 of main text.