Electronic Supplementary Information for High resolution scanning near field mapping of enhancement on SERS substrates: comparison with photoemission electron microscopy

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In the figure S1, to the attention of the reviewer, we display here the polarization dependence of the electron yield of an Au sample. The latter dependence allows for a direct measurement of the nonlinearity order n of the electron emission process. For Au particles excited at 880 nm (1.41 eV), the data fitting with a \(\cos^2\theta\) function points to a \(n = 3\) apparent multiphoton process lower than the \(n = 4\) order expected from a work function of Au film either amorphous 4.7 eV (present case) or crystalline 5.3 eV. The latter non linearity keeps a \(n = 3\) value down to 542 nm, as shown the Figure S2, where photoemission data exhibit a Fermi step toward \(n = 2\).

Figure S1: Polarization dependence of the electron yield of an Au sample measured by photoemission.

Figure S2 shows the transition of the non-linearity order from \(n = 2\) to \(n = 3\) at wavelength of 542 nm (2.3 eV).
Figure S2: Wavelength dependence of the electron yield of an Au sample measured by photoemission.