# 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 $(\cos\theta)^{2n}$ 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.

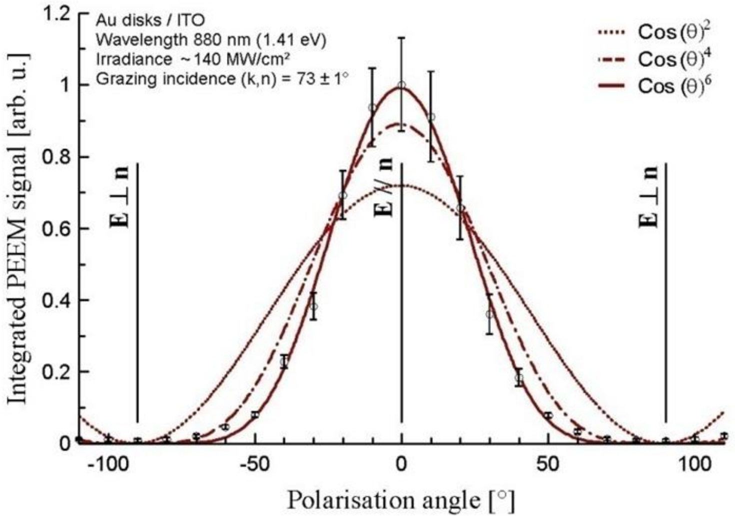

*Figure S1: Polarization dependence of the electron yield of an Au sample measured by photoemission.*

Figure S2 shows the transition of the non-linearity order from n=2 to n=3 at wavelength of 542 nm (2.3 eV).

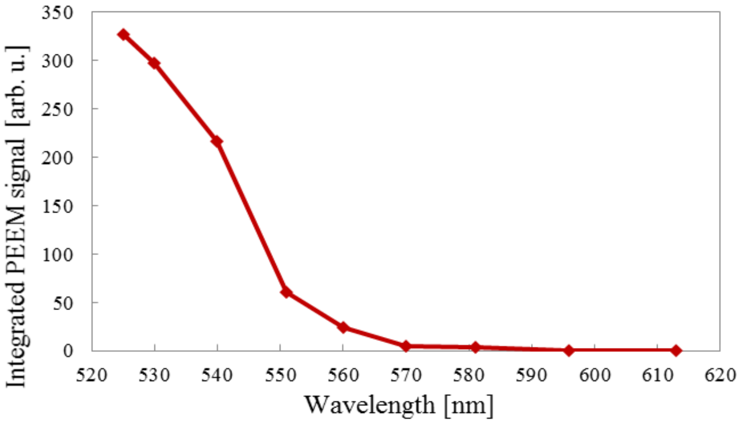

*Figure S2: Wavelength dependence of the electron yield of an Au sample measured by photoemission.*