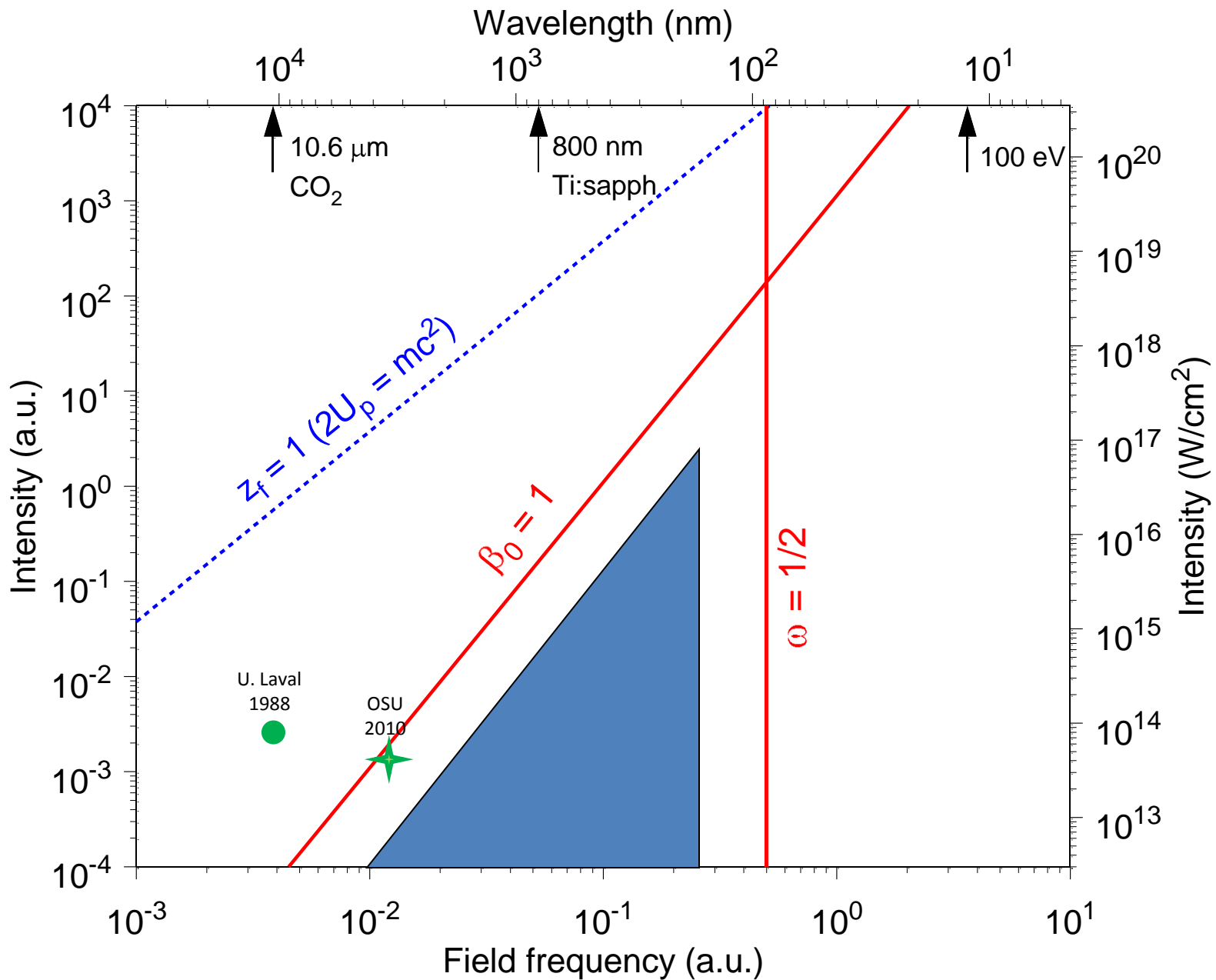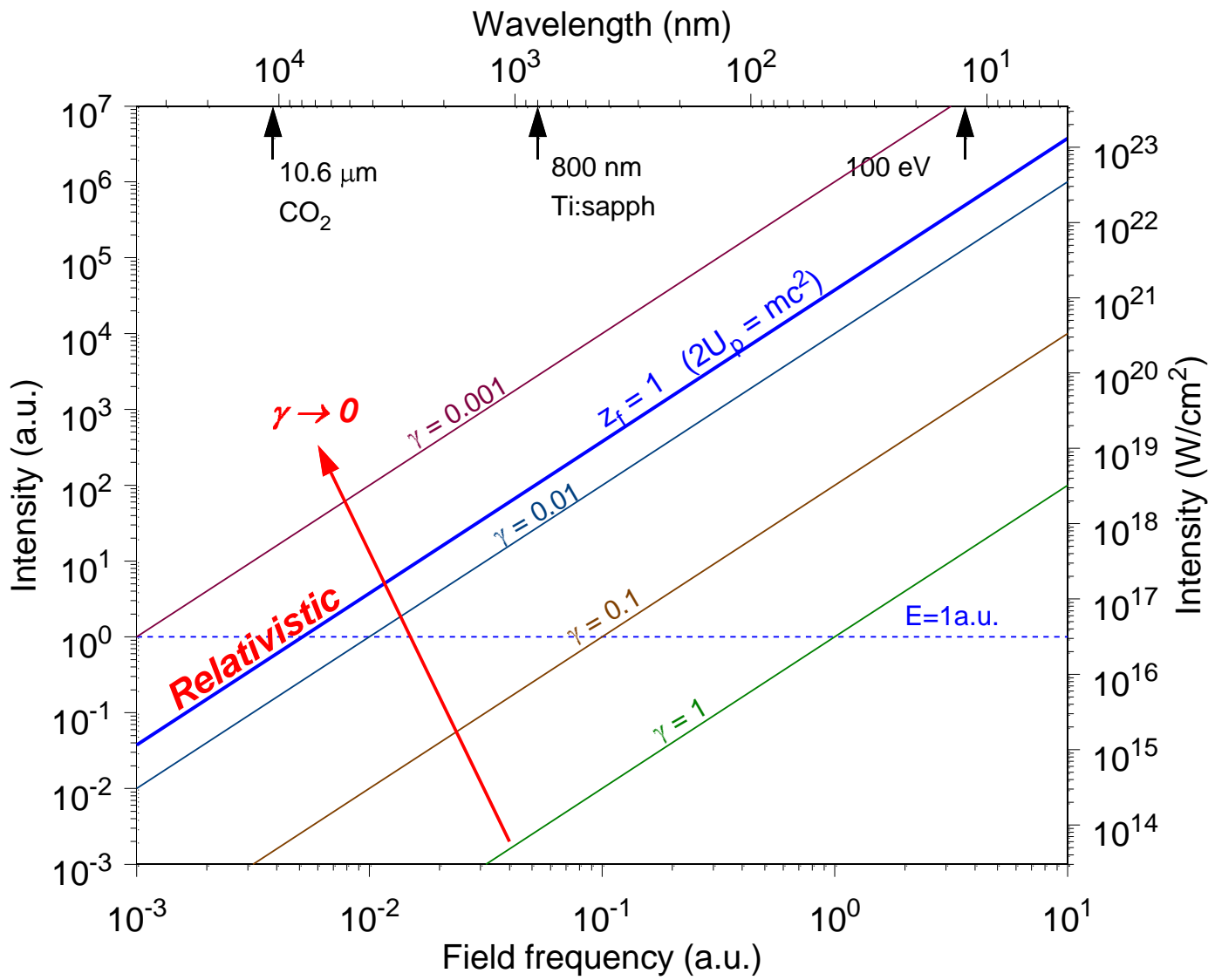TUNNELING THEORIES FOR LASER-INDUCED PROCESSES ARE LIMITED TO THE SHADED AREA

LIMIT $\gamma \to 0$ IS RELATIVISTIC, NOT CLASSICAL

Wavelength (nm)

Intensity (a.u.)

Intensity (W/cm²)

Field frequency (a.u.)

10.6 μm CO_2

800 nm Ti:sapph

100 eV

$\gamma = 0.001$

$z_f = 1$ $(2U_p = mc^2)$

$\gamma = 0.01$

$\gamma \to 0$

Relativistic

$\gamma = 0.1$

E=1a.u.

$\gamma = 1$

Xenon

10.6μm, 10^{14}W/cm², 1ns

Xiong, Yergeau, Chin, Lavigne
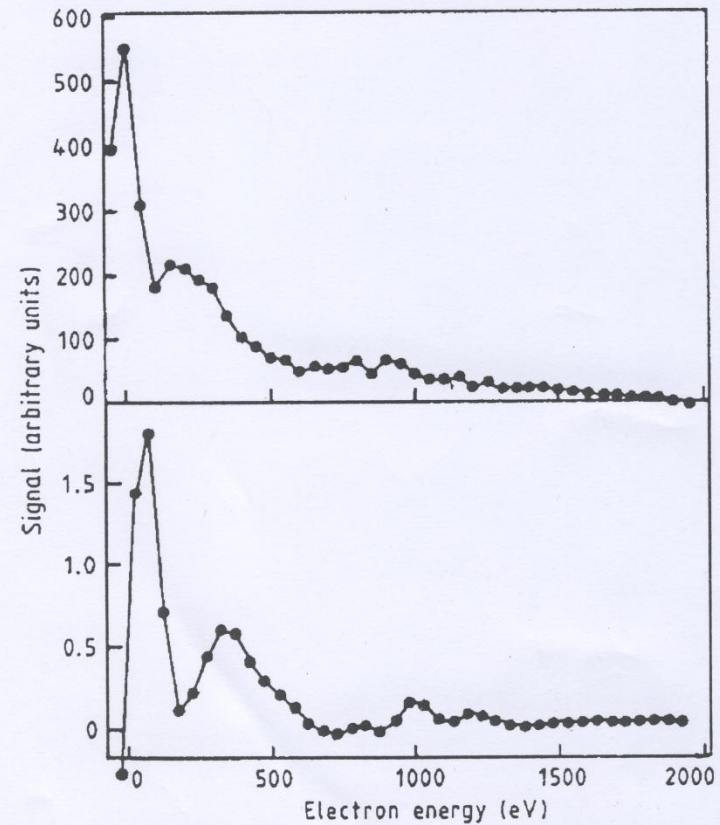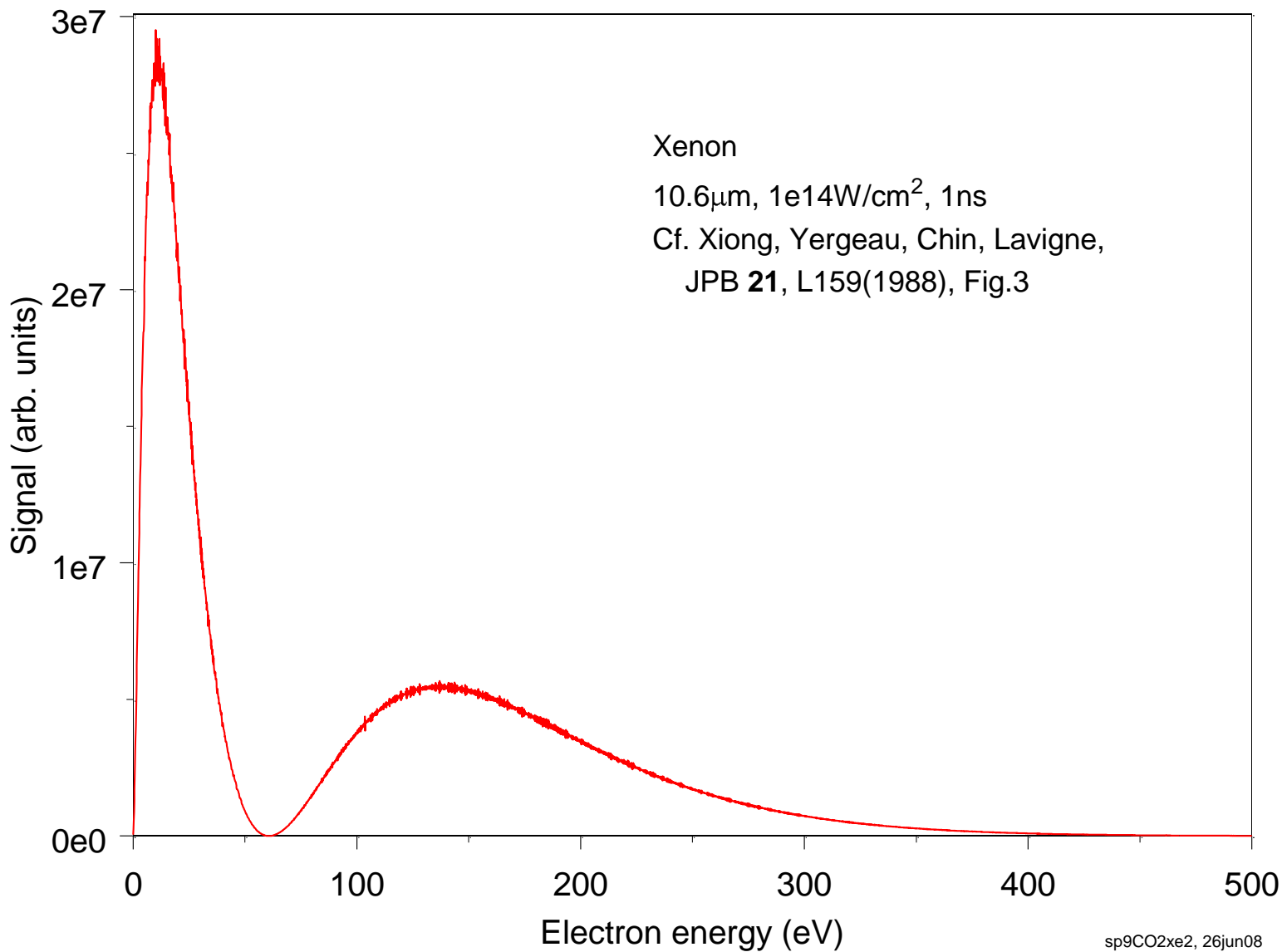J. Phys. B **21**, L159-L164 (1988)

Figure 3. Spectrum of Xe at a peak laser intensity of about 10^{14} W cm⁻². The top part shows the unsmoothed integrated spectrum, while the bottom part shows the derivative after two smoothing passes.

THE LONG-WAVELENGTH DOUBLE-PEAK SPECTRUM IS PREDICTED BY THE SFA

Xenon

10.6μm, 1e14W/cm^2, 1ns
Cf. Xiong, Yergeau, Chin, Lavigne,
JPB **21**, L159(1988), Fig.3

sp9CO2xe2, 26jun08

A SPLIT-PEAK CIRCULAR POLARIZATION SPECTRUM IS A NOVEL SFA PREDICTION

Xe, 3.6μm, 5e13W/cm^2
U_p=60.51eV, minimum at 60.7eV
Peak #1 at 47.2eV, Peak #2 at 70.3eV
circular polarization

U_p=60.5eV

spc8txe3, 16dec09