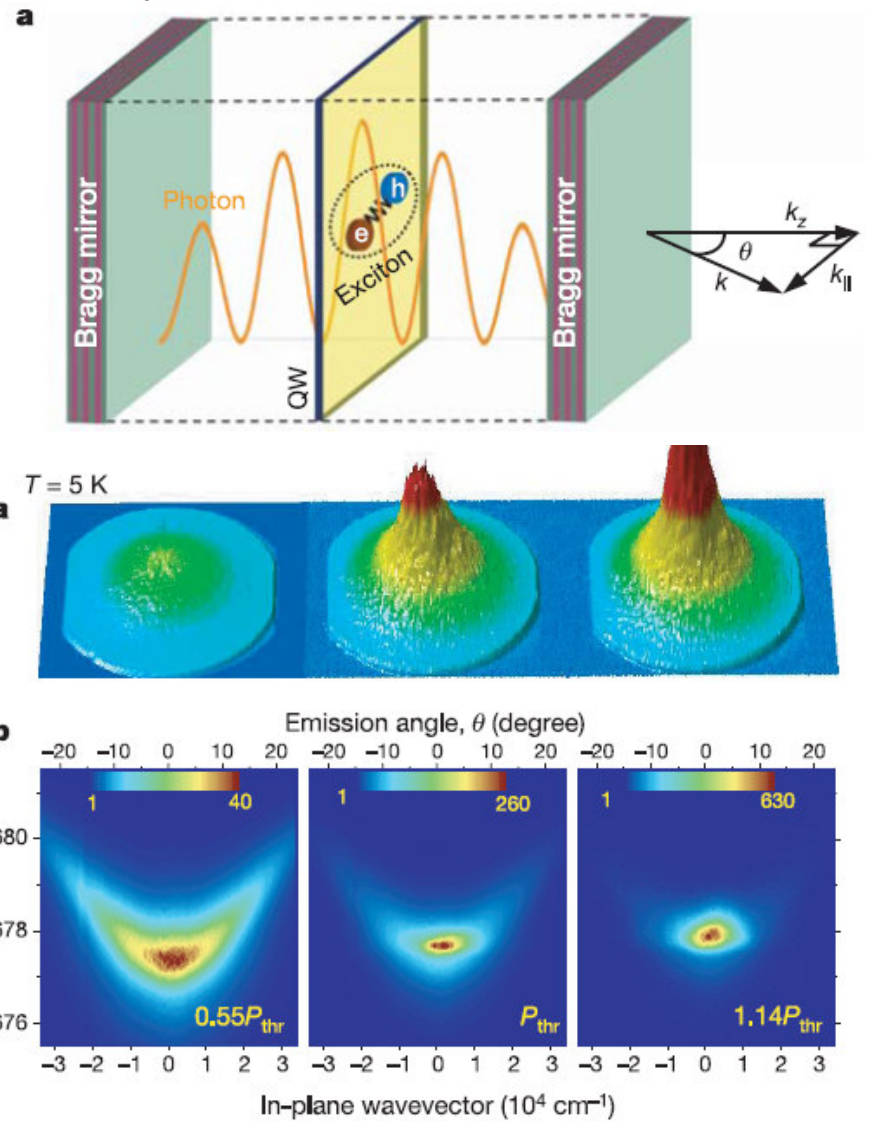
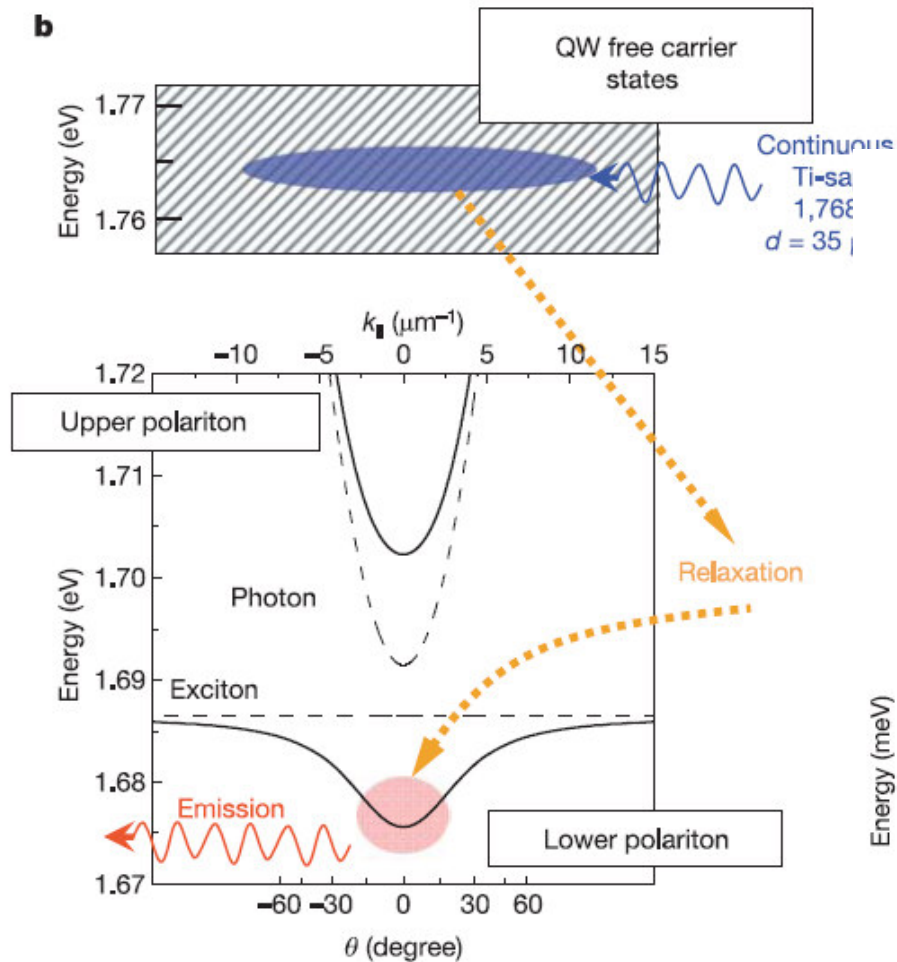


Kondensacja polaritonów

Mikrownęka – zwiększenie sprzężenia ekscyton-foton



J. Kasprzak et al. Nature **443**, 409 (2006)

Polaryzacja w stanie nieskondensowanym i skondensowanym

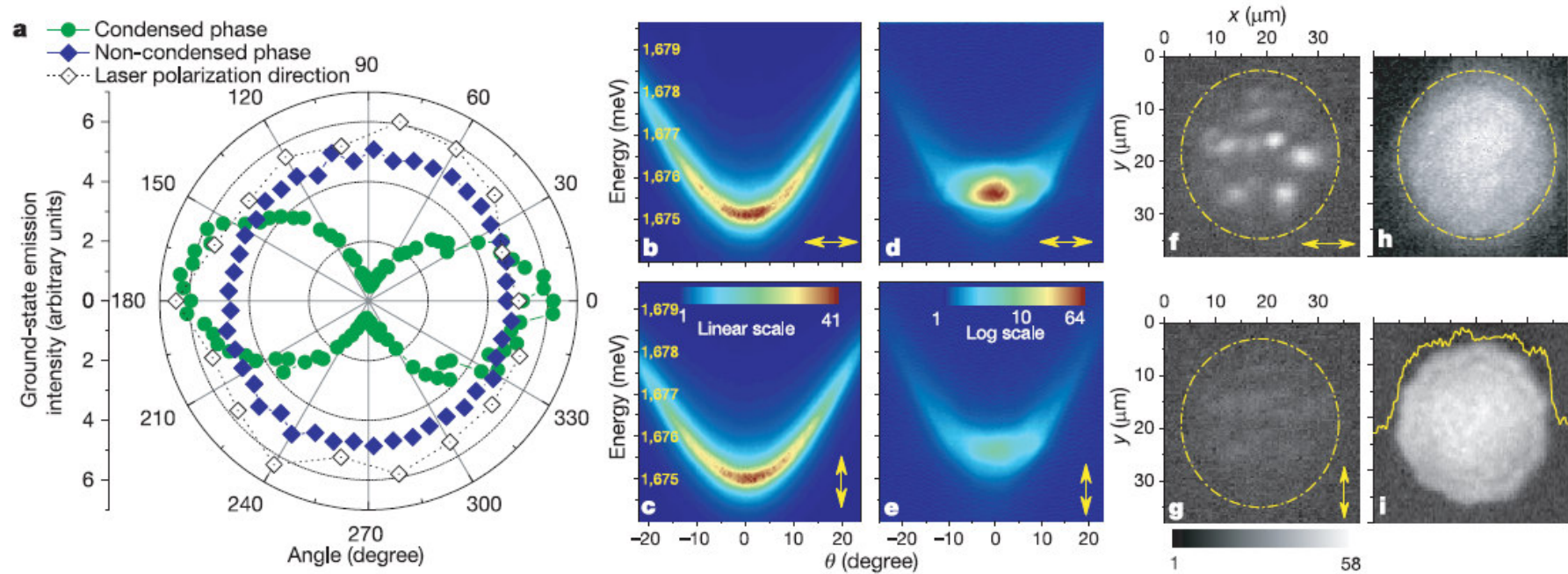


Figure 4 | Polarization properties of the polariton emission. a, The polar plot displays the intensity of the ground state emission at $k_{\parallel} = 0$ (within a 0.4° aperture) measured as a function of the angle of the linear analyser.

emission intensity is the same for horizontal and vertical polarizations. Above threshold, emission from the excited states remains depolarized, but emission from the ground state is strongly linearly polarized. Note the linear

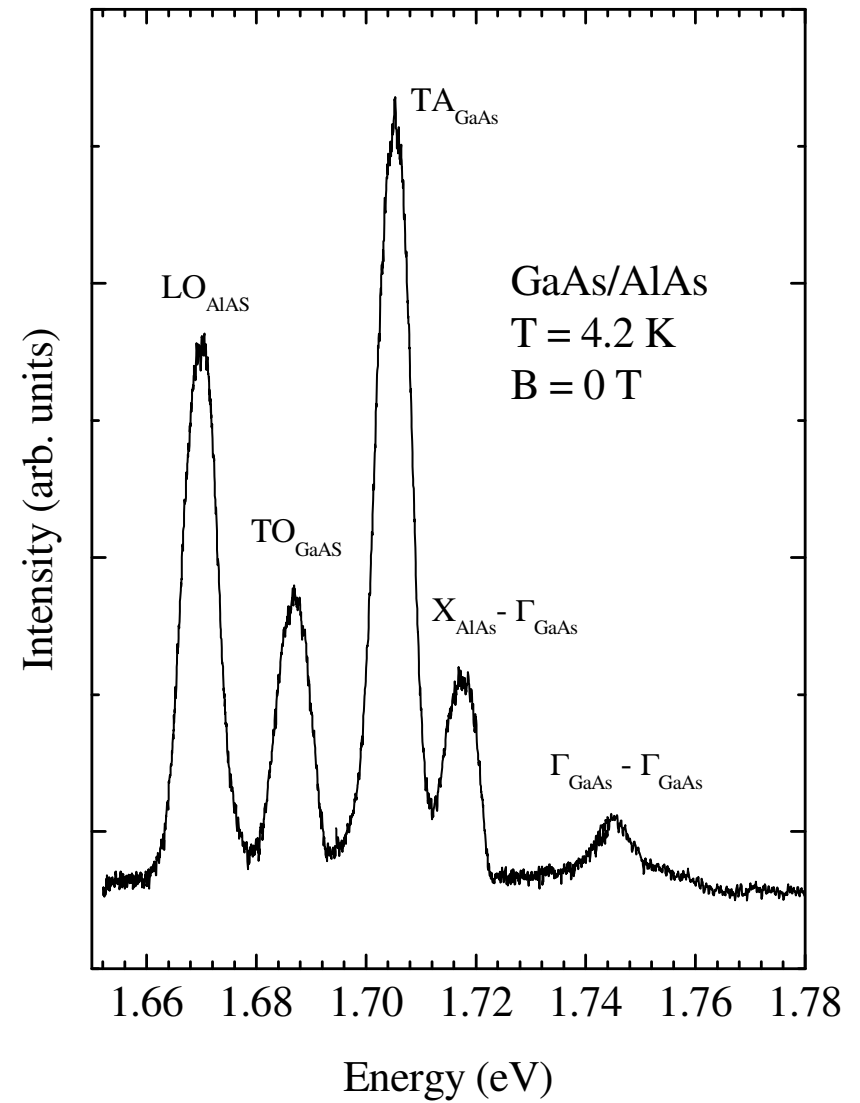
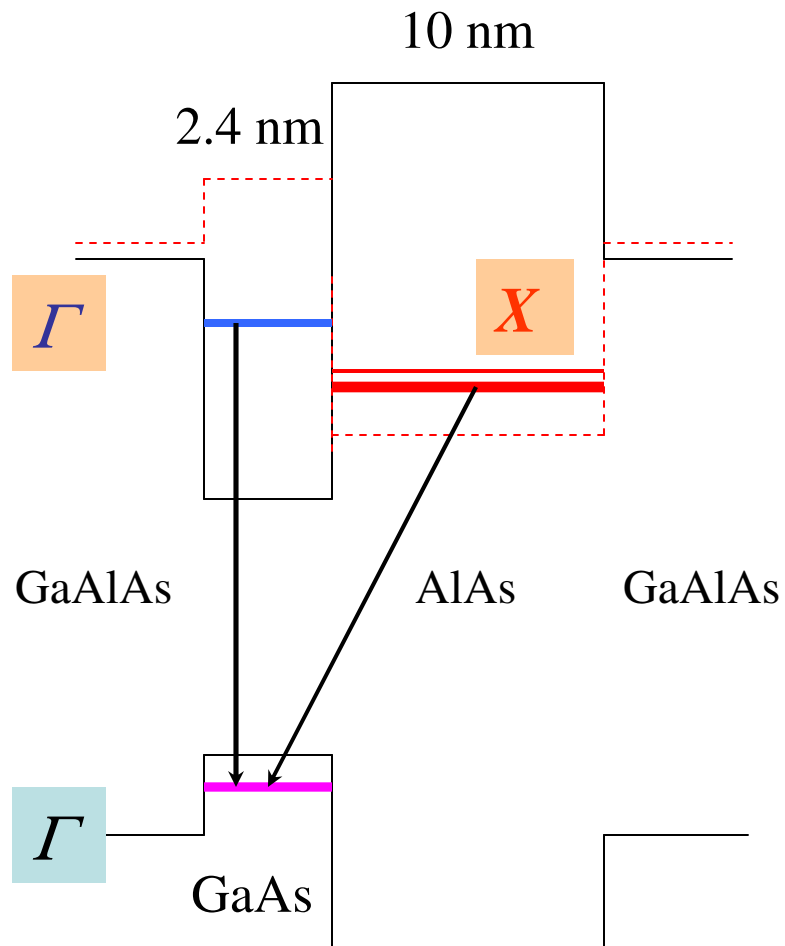
Współczesna fizyka ciała stałego

Struktury półprzewodnikowe o obniżonej wymiarowości

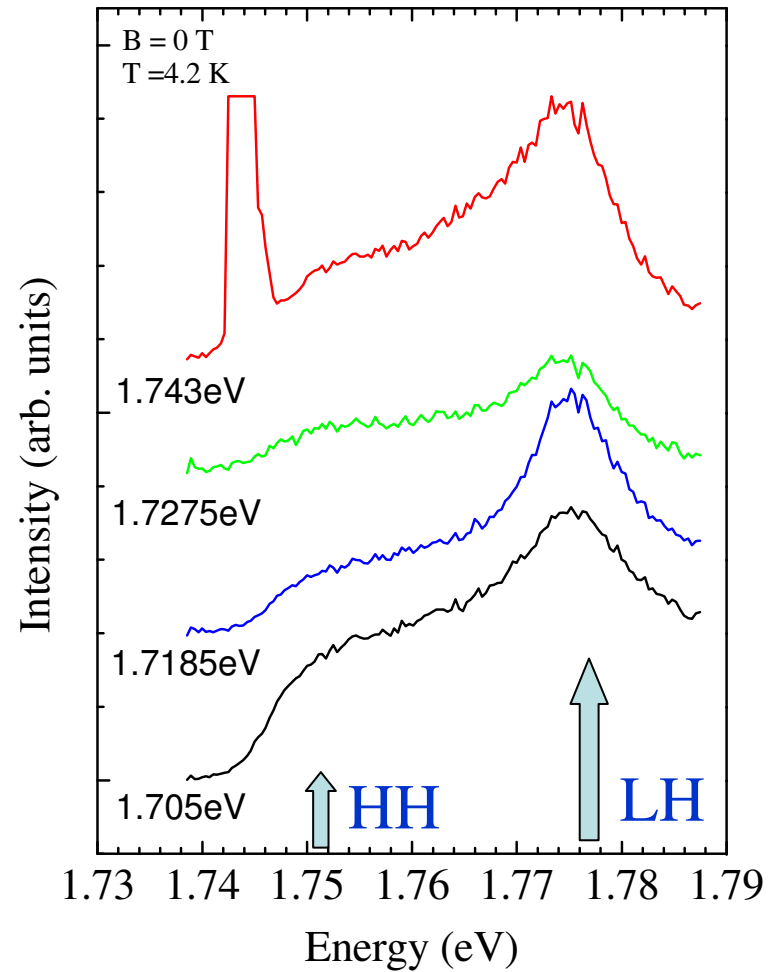
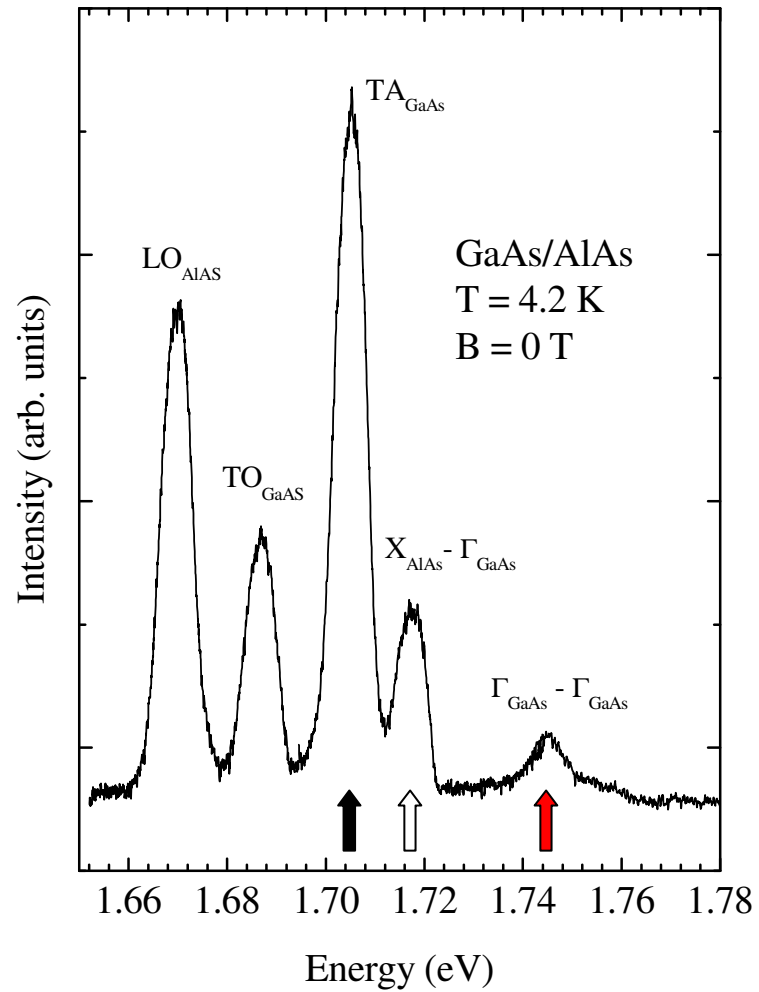
- studnie kwantowe,
- druty kwantowe,
- kropki kwantowe

- fulereny, nanorurki, grafen...

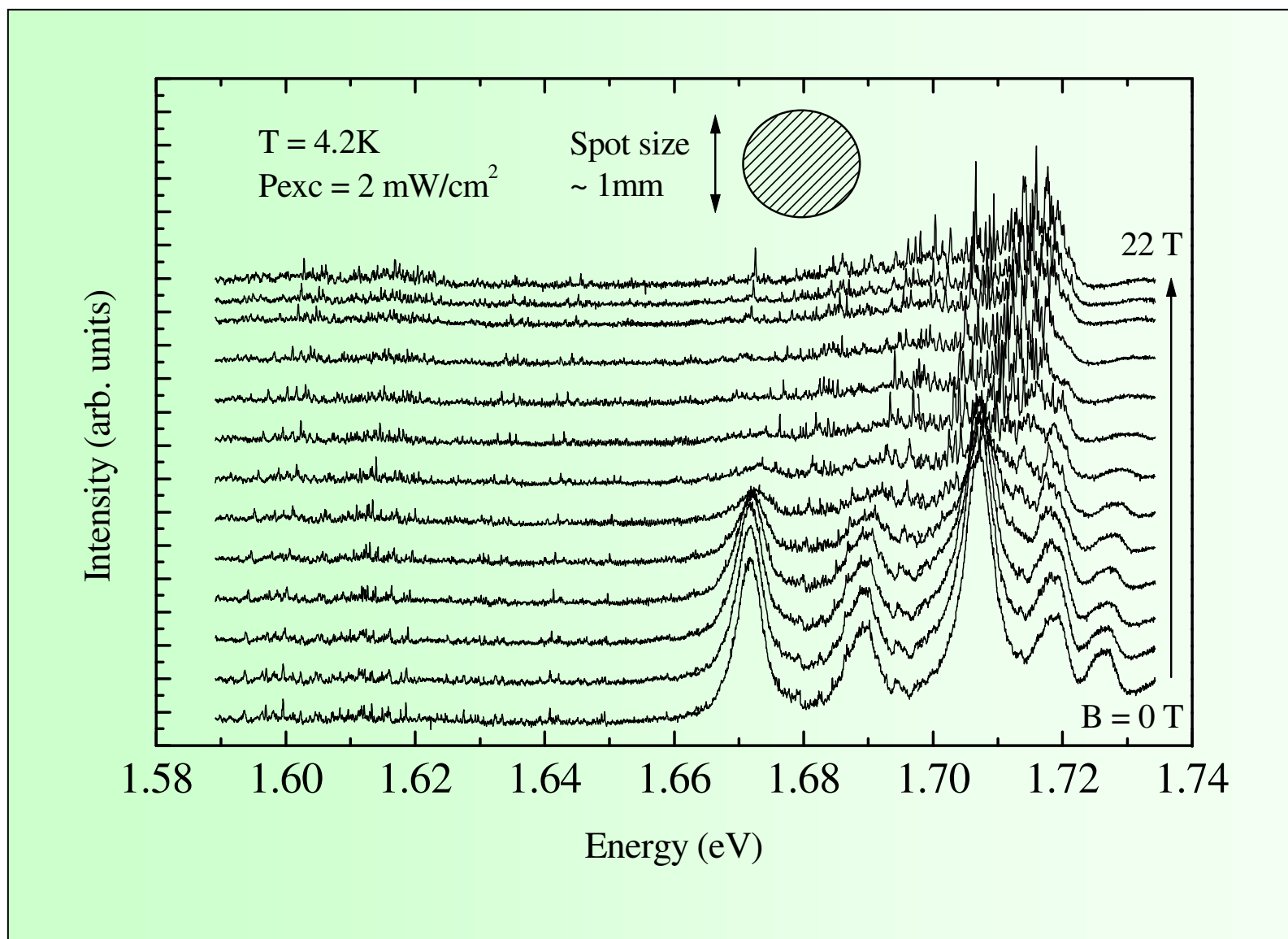
Podwójne studnie kwantowe GaAs/AlAs typu-II



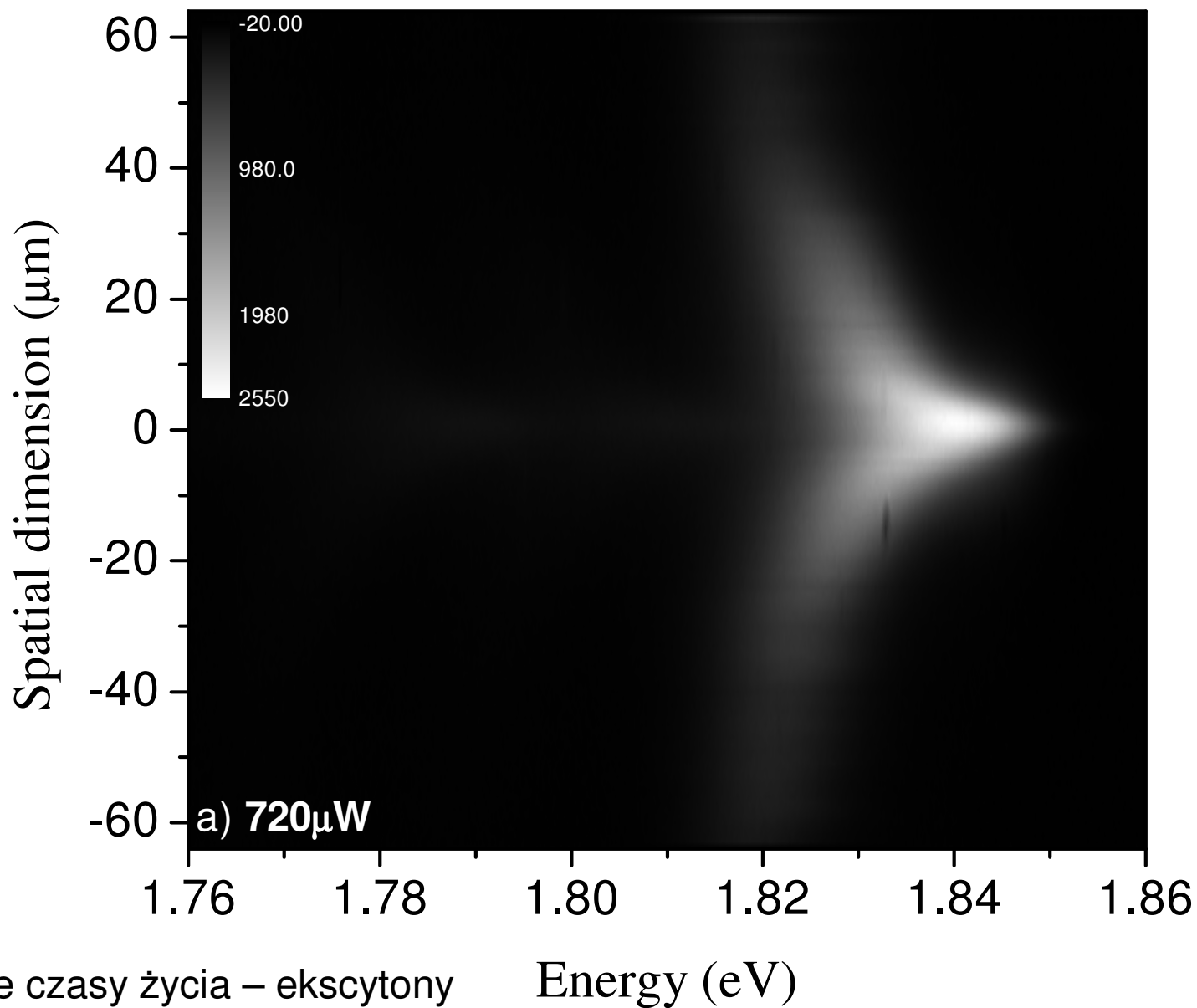
Widmo pobudzenia luminescencji



A w polu magnetycznym...



Dyfuzja nośników studniach typu II

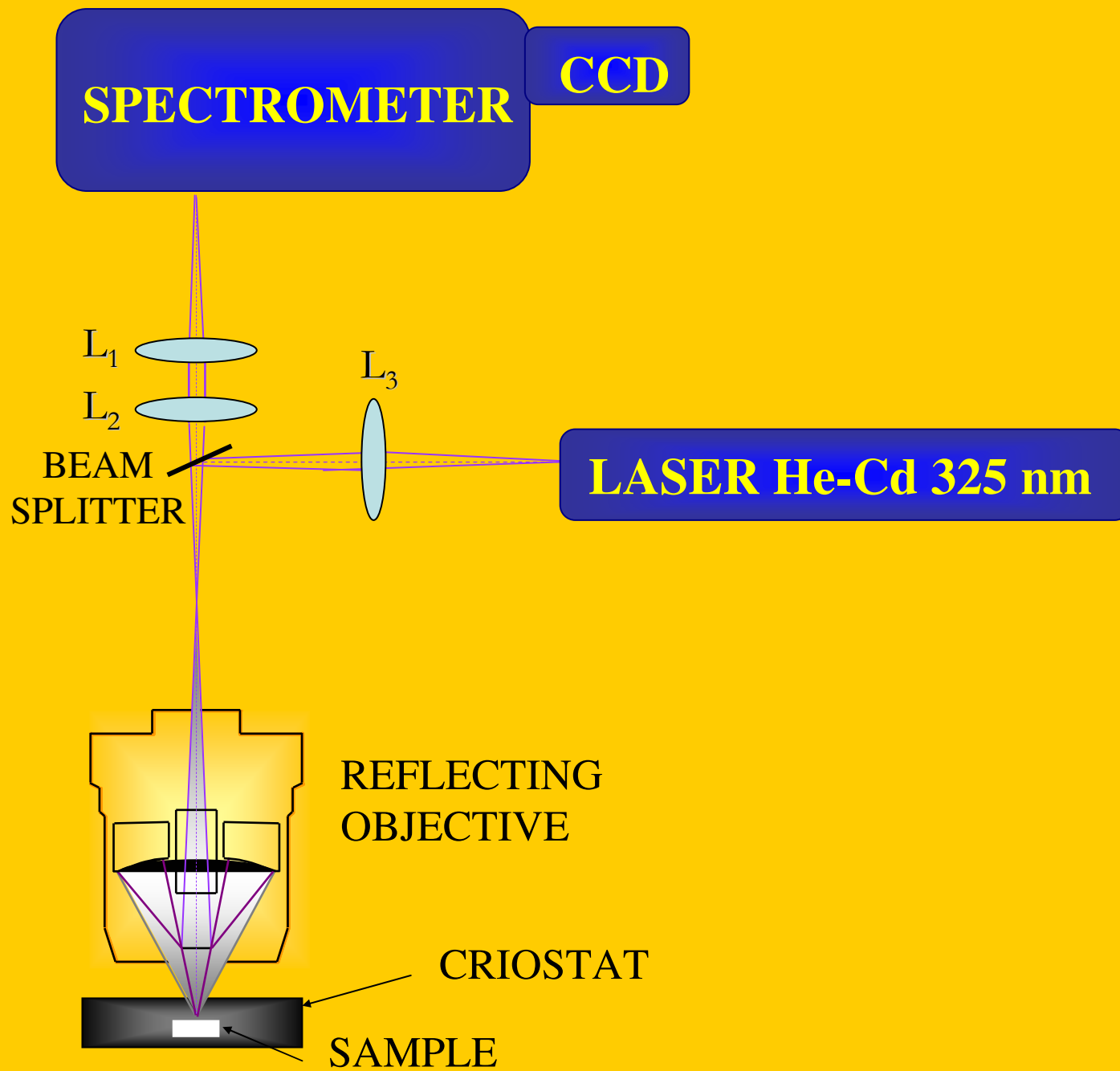


Długie czasy życia – ekscytony
mają czas na wędrówkę...

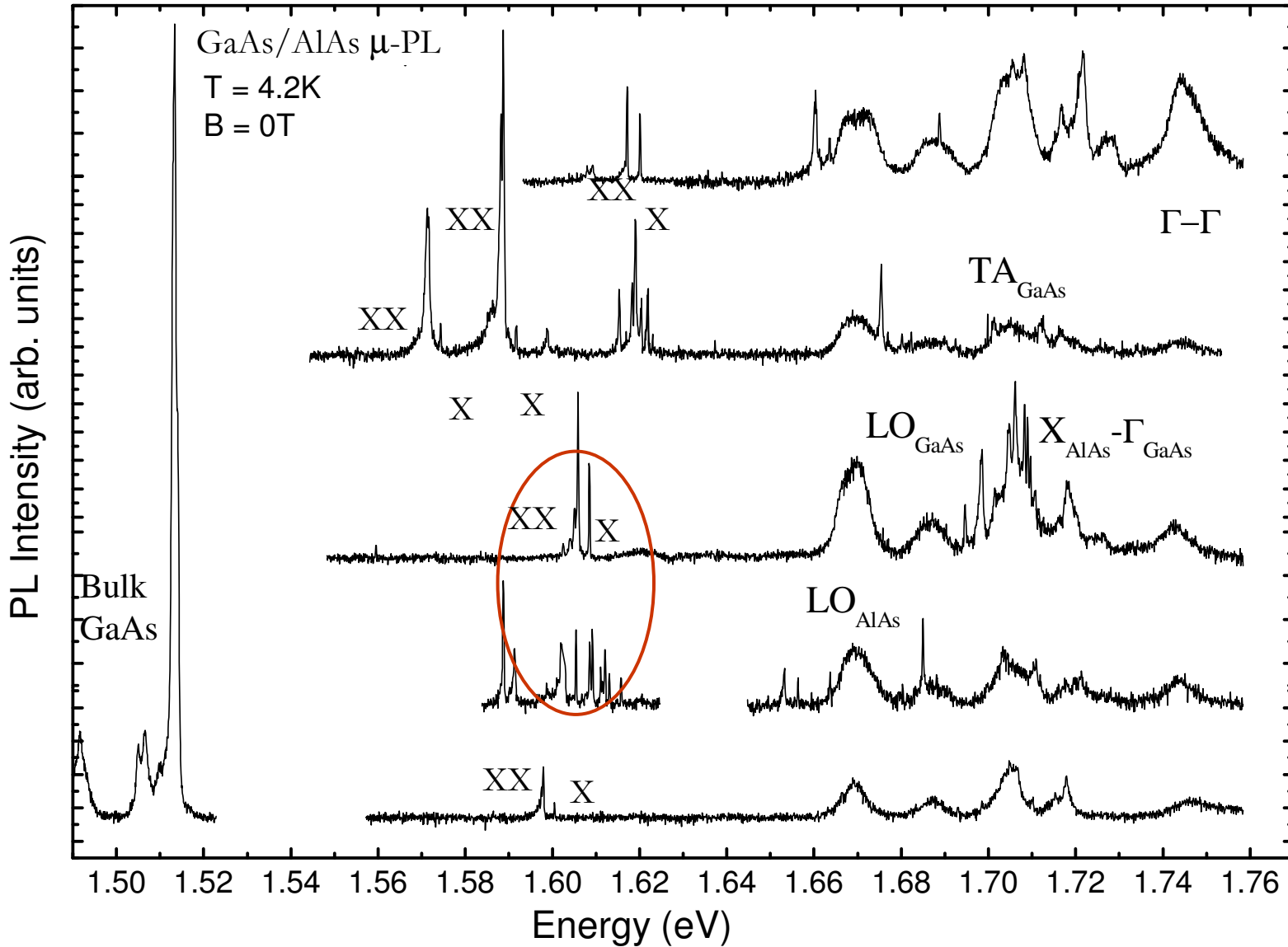
Energy (eV)

A. Lesiak, et al.

μ PL setup



Widma mikroluminescencji (μ - PL)

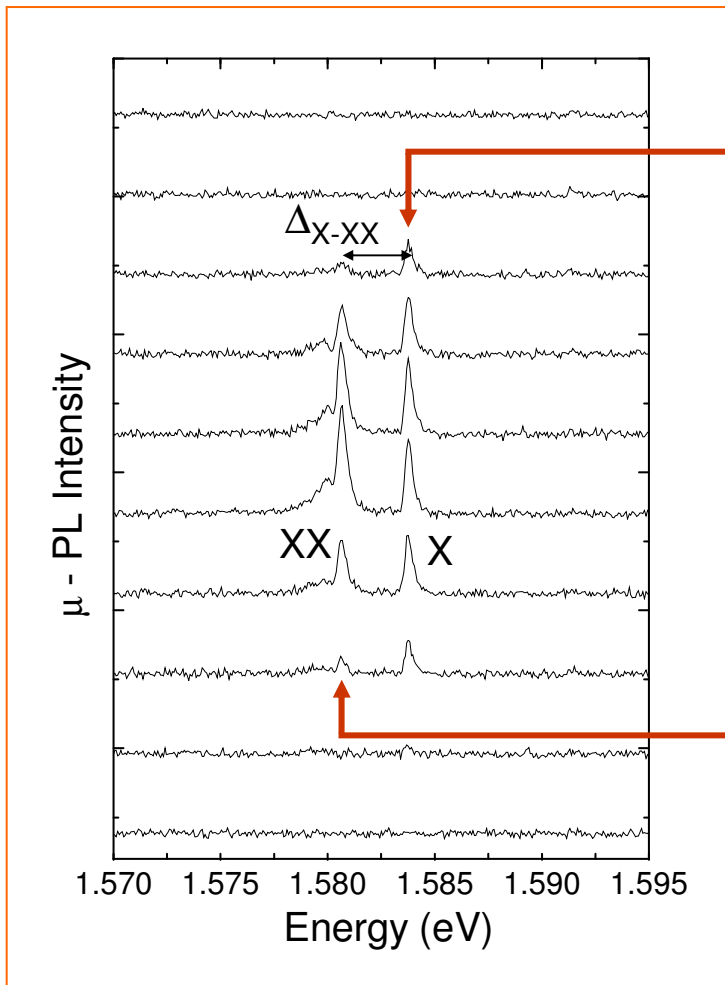


Kompleksy ekscytonowe...

B. Piętko, Praca Doktorska (2007)

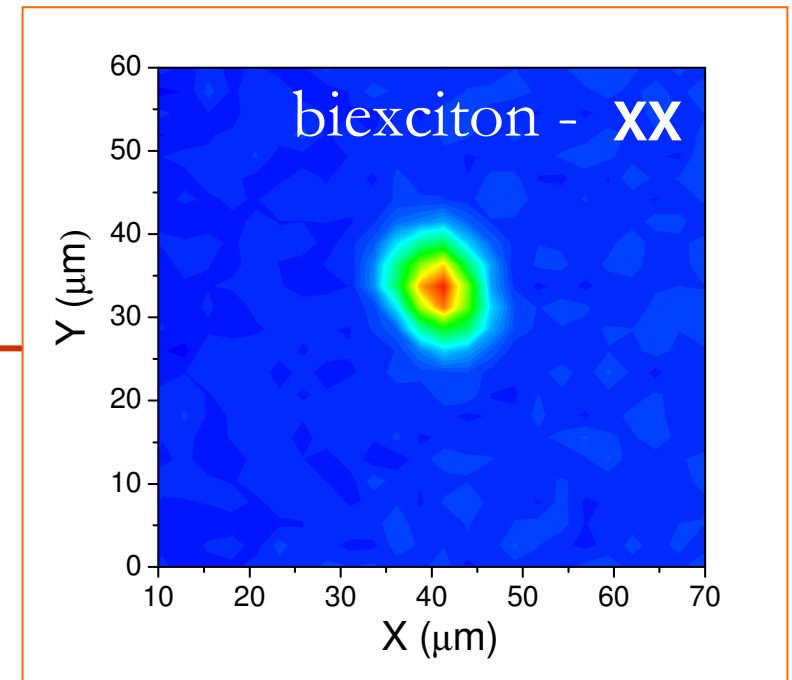
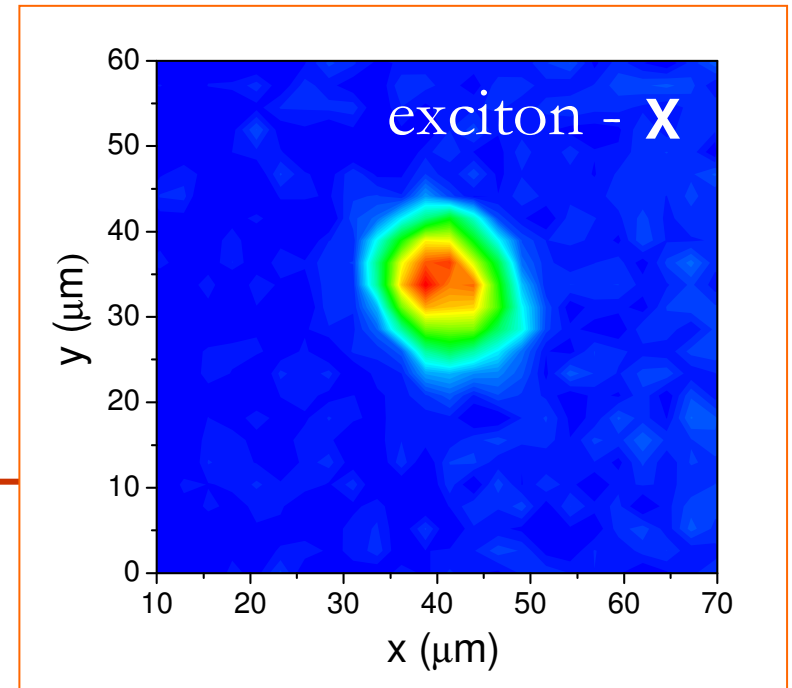
Mapowanie μ -PL

Widma mierzone w różnych miejscach na próbce



$$\Delta_{X-XX} : \\ 2.2 - 3.0 \text{ meV}$$

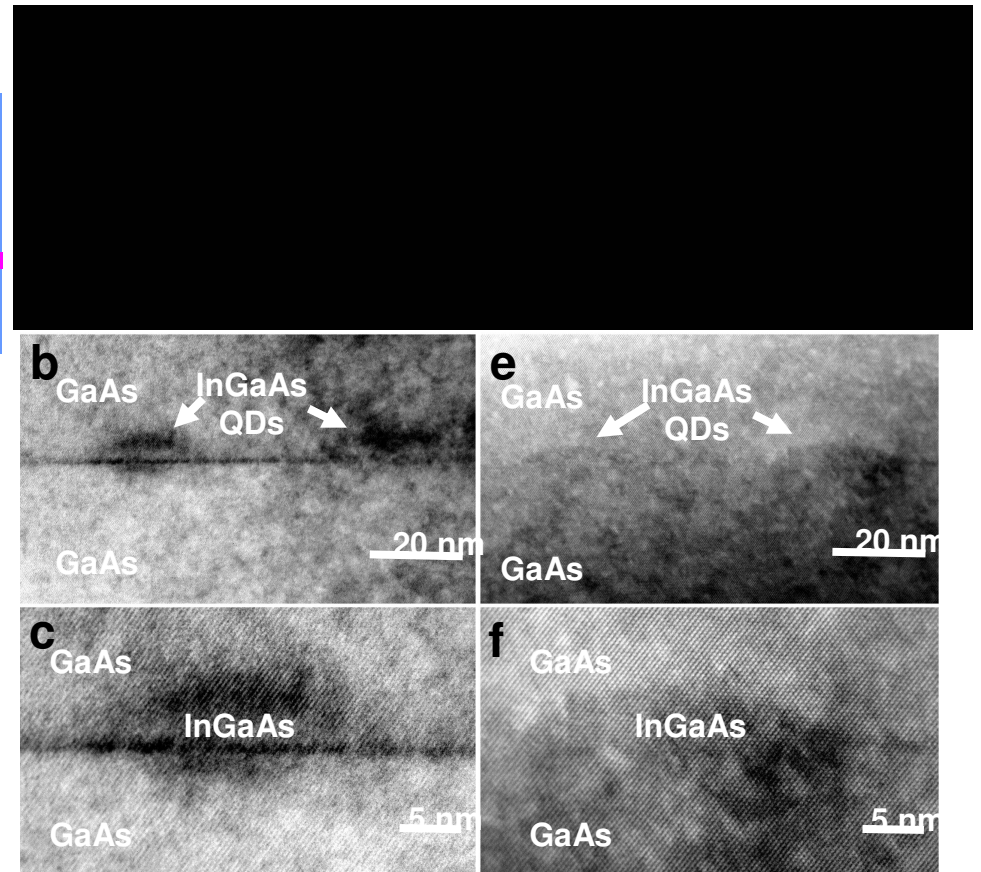
$$P_{exc} \sim 0.2 \mu W$$

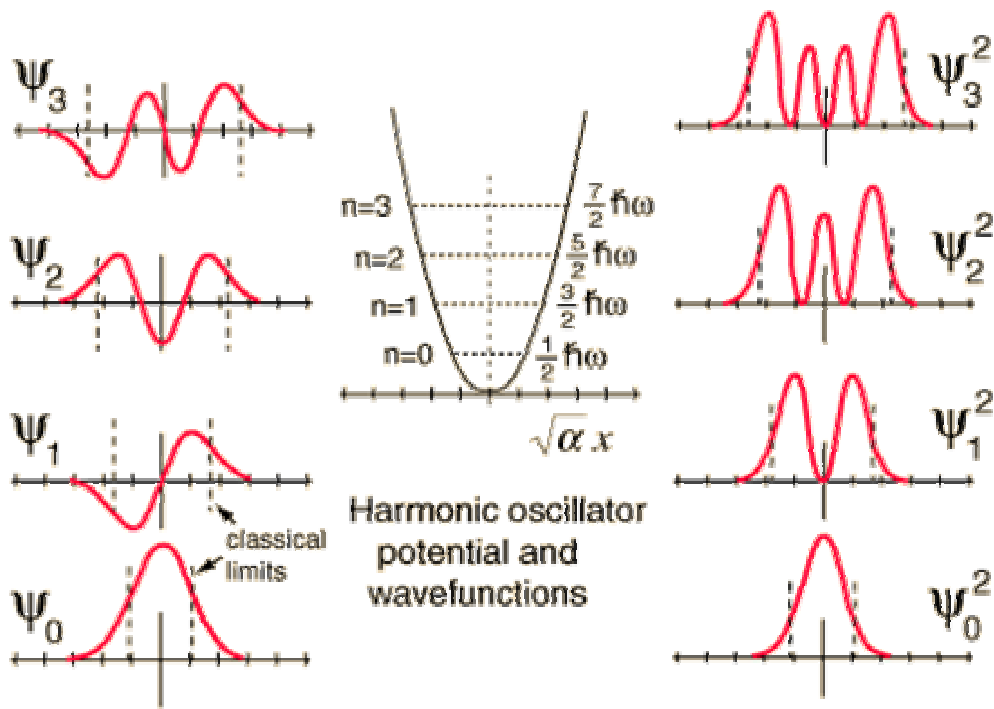


Samorganizujące się kropki kwantowe

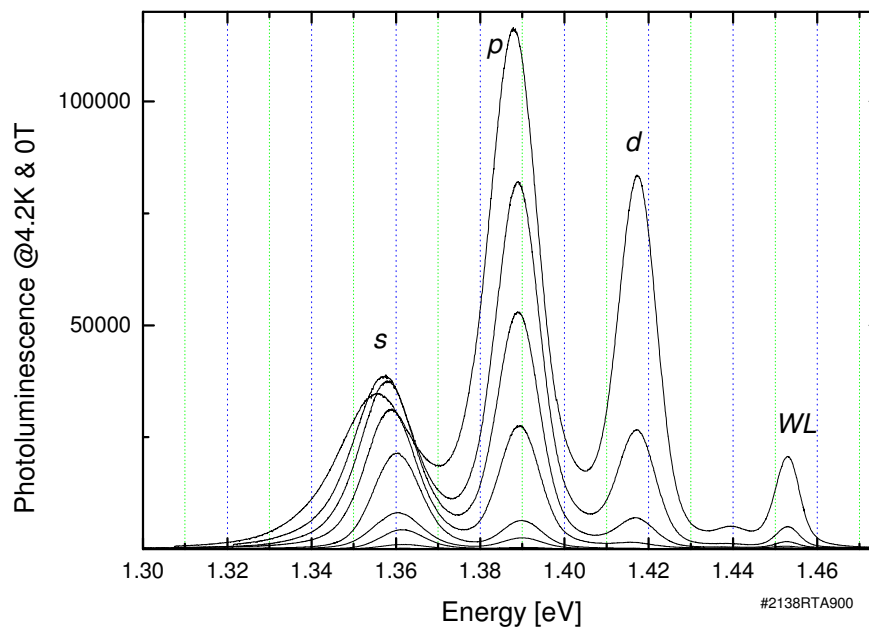
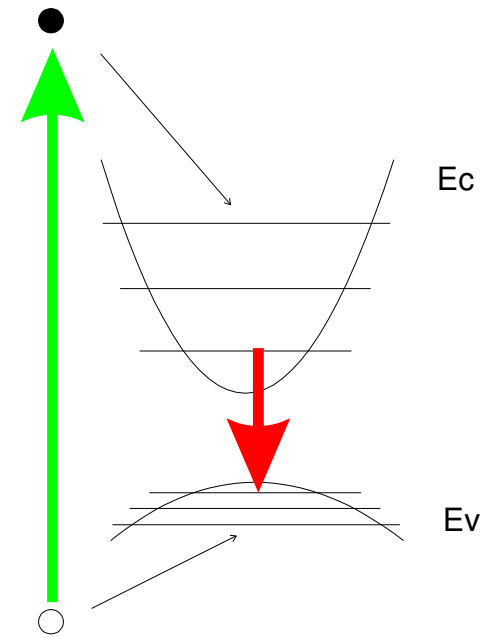


Kropki kwantowe powstają z materiału o stałej sieci różniącej się od stałej sieci matrycy

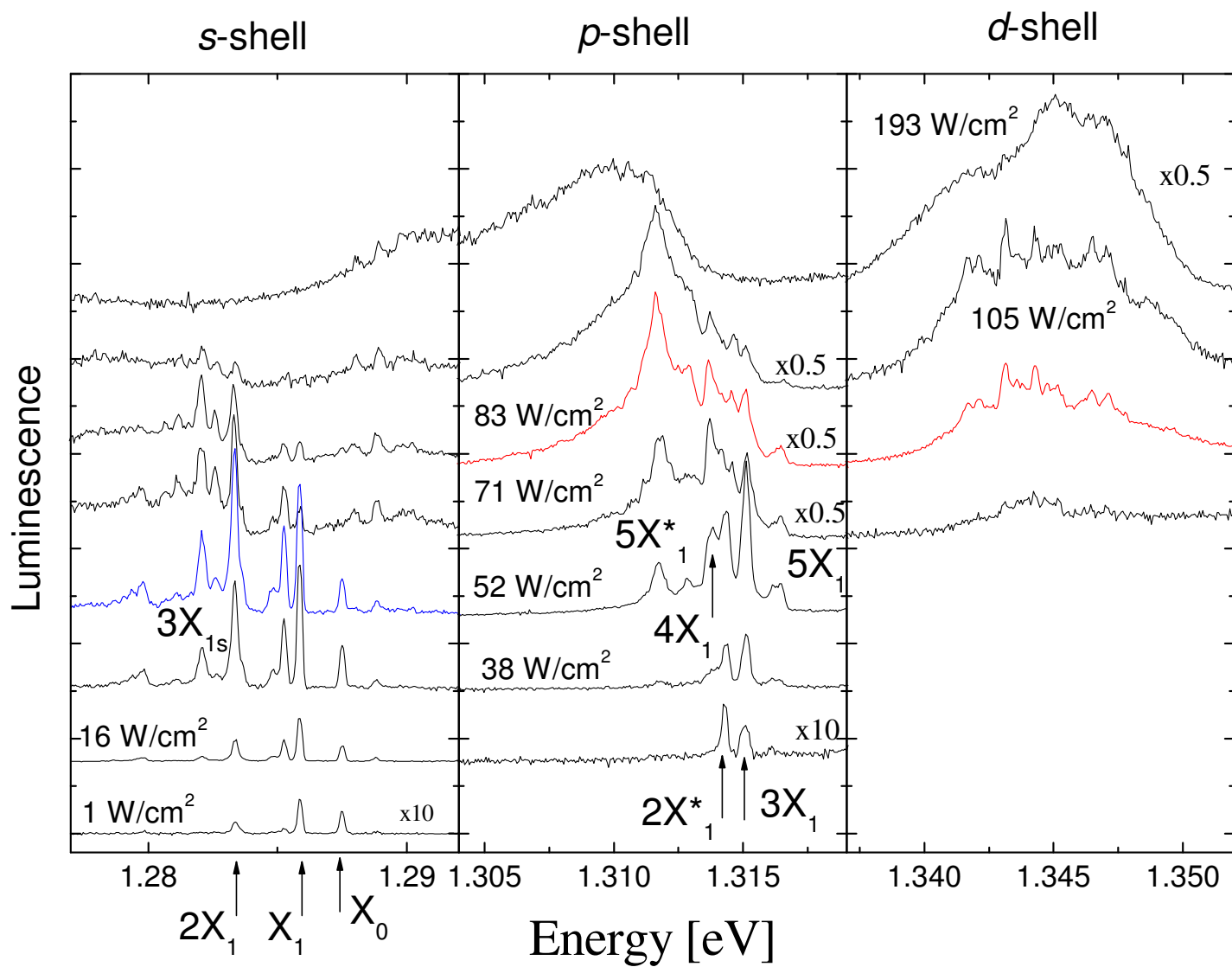




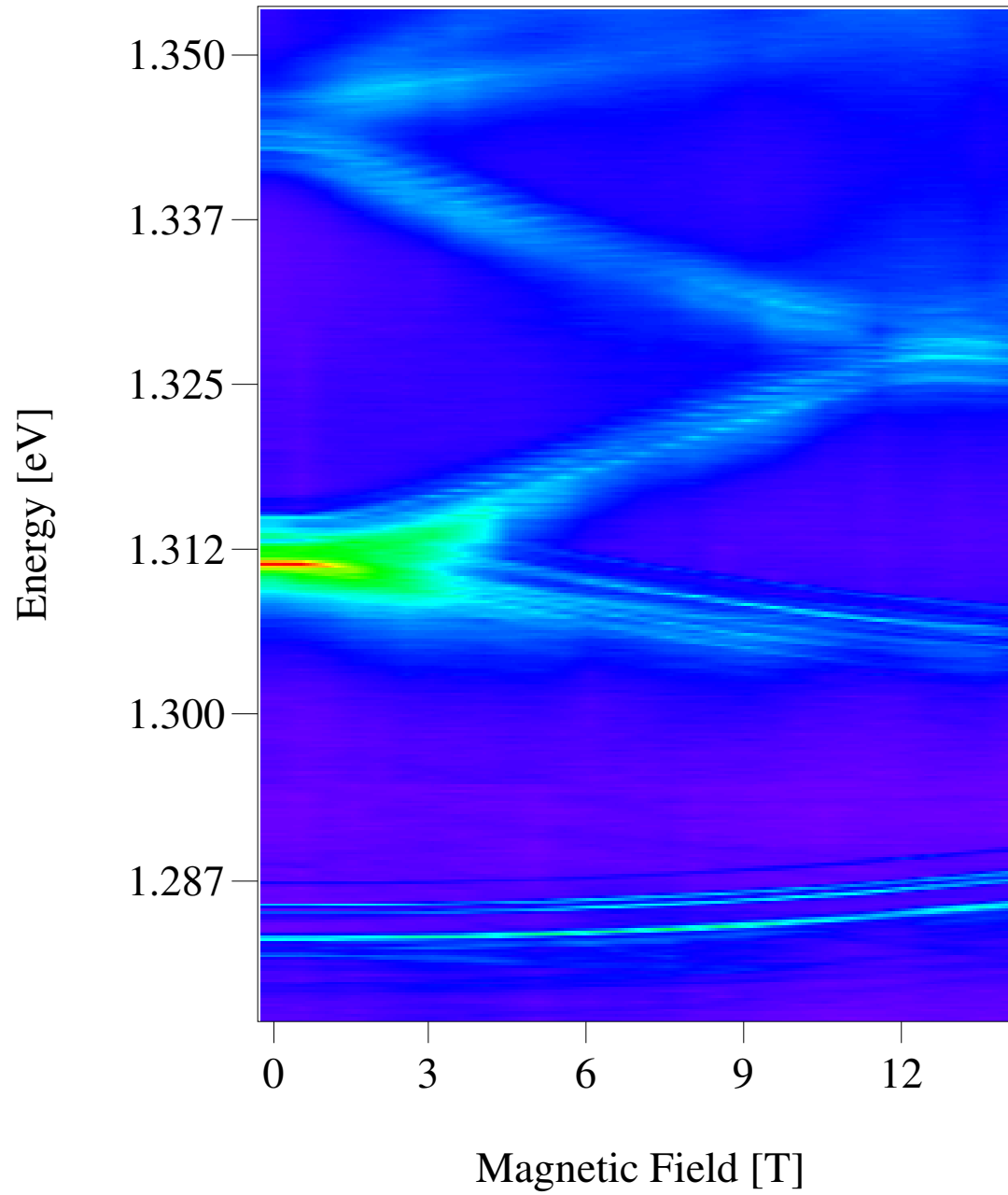
Fotoluminescencja



PL- Adam Babiński et al.



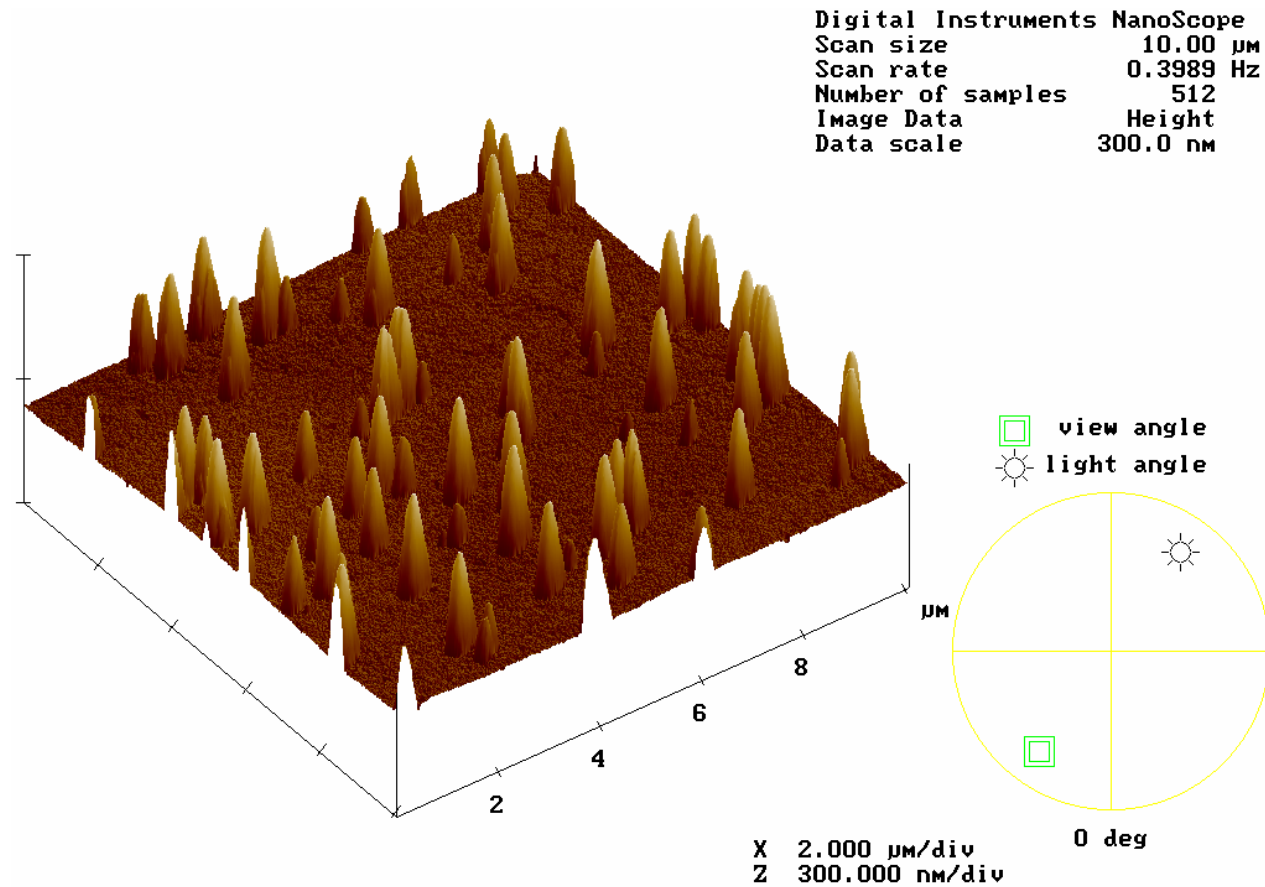
μ PL- Adam Babiński et al.



Pole magnetyczne
modyfikuje funkcje falowe

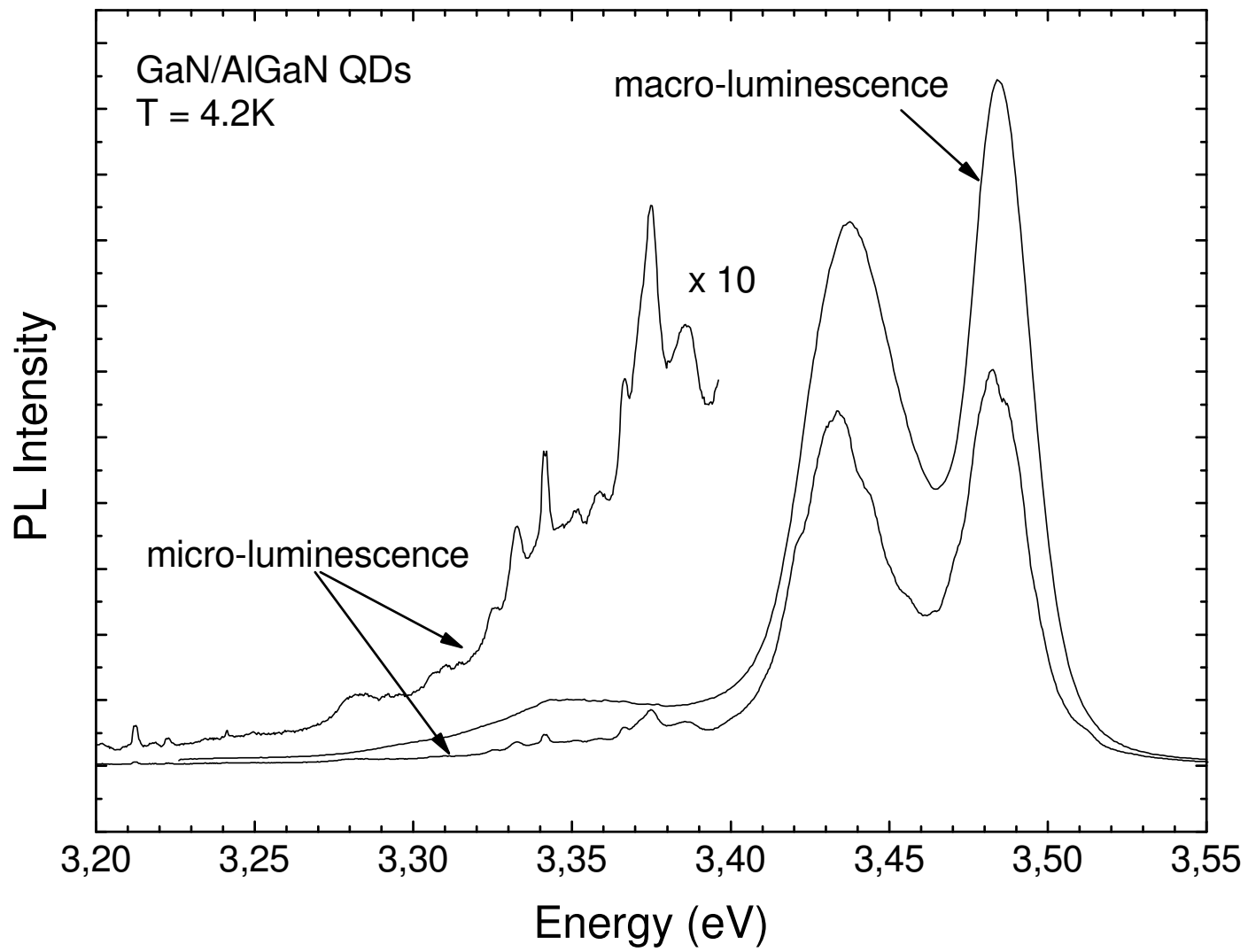
μ PL- Adam Babiński et al.

Kropki kwantowe GaN/AlGaN

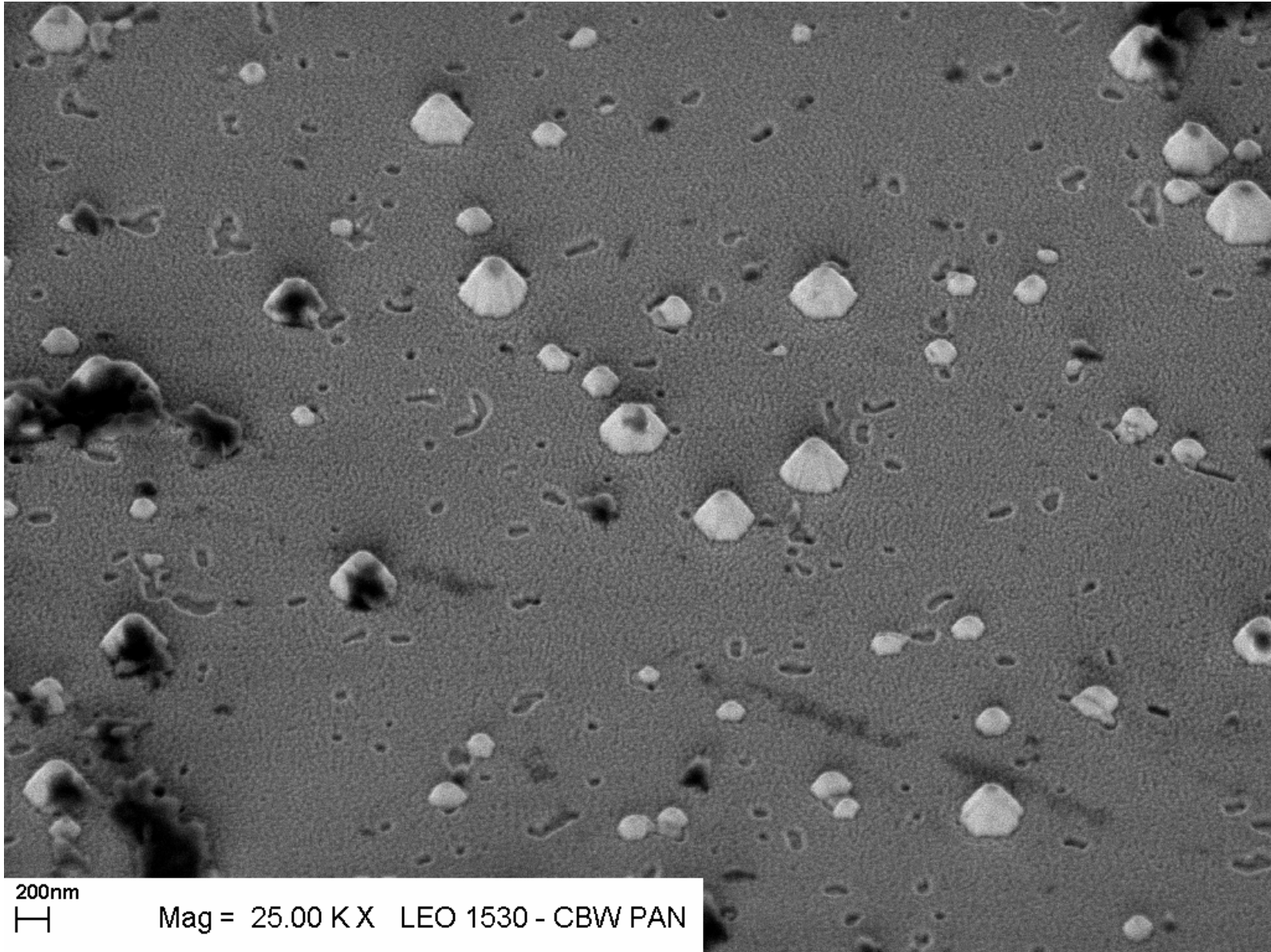


c585.000

Wzrost– K. Pakuła, AFM - Rafał Bożek, IFD UW

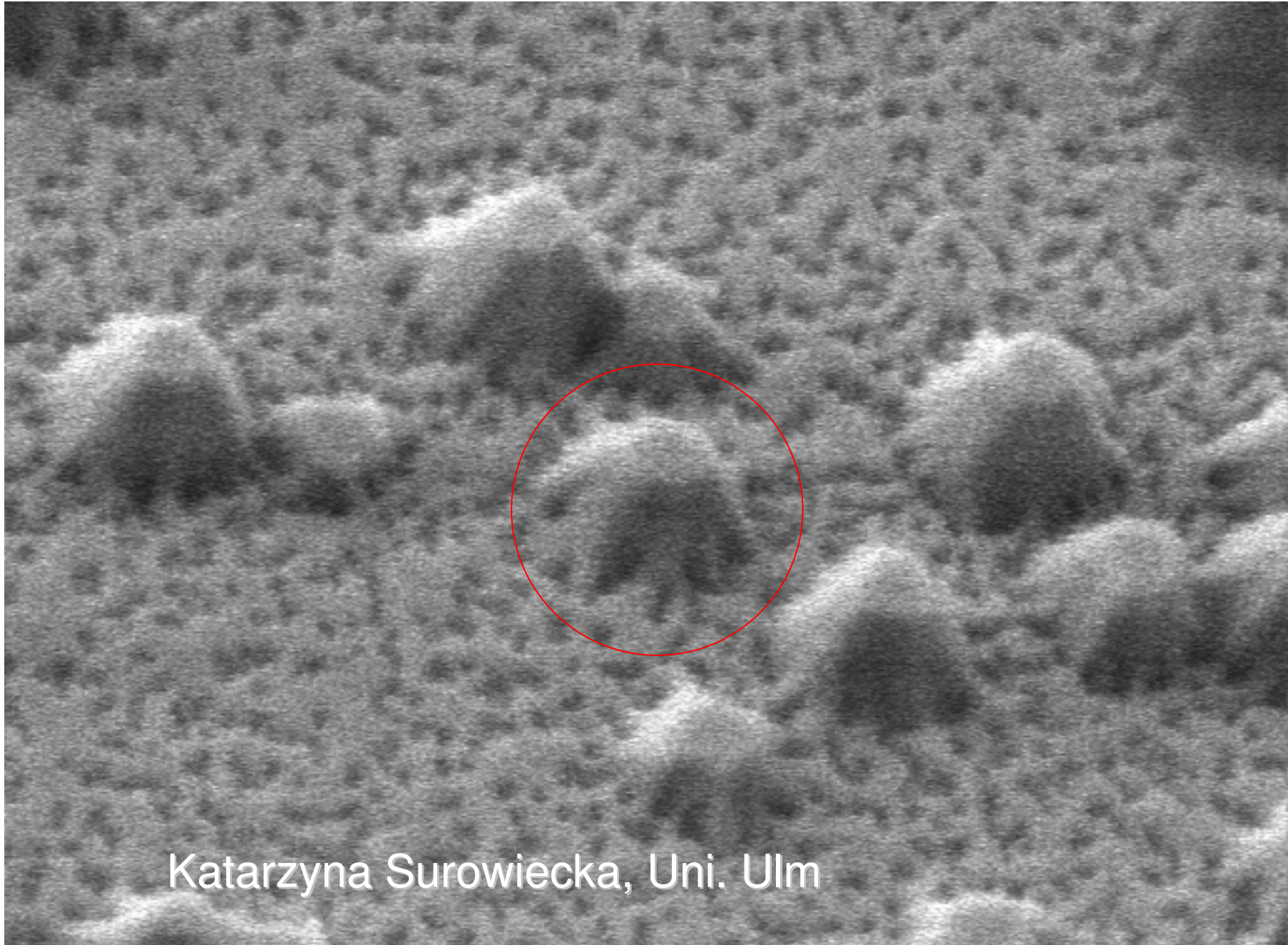


PL, μ PL- Barbara Chwalisz et al.



200nm
┆┆

Mag = 25.00 K X LEO 1530 - CBW PAN



Katarzyna Surowiecka, Uni. Ulm

x50000
512 x 512

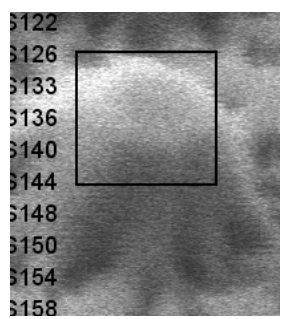
500nm

3.00kV
640P018.TIF

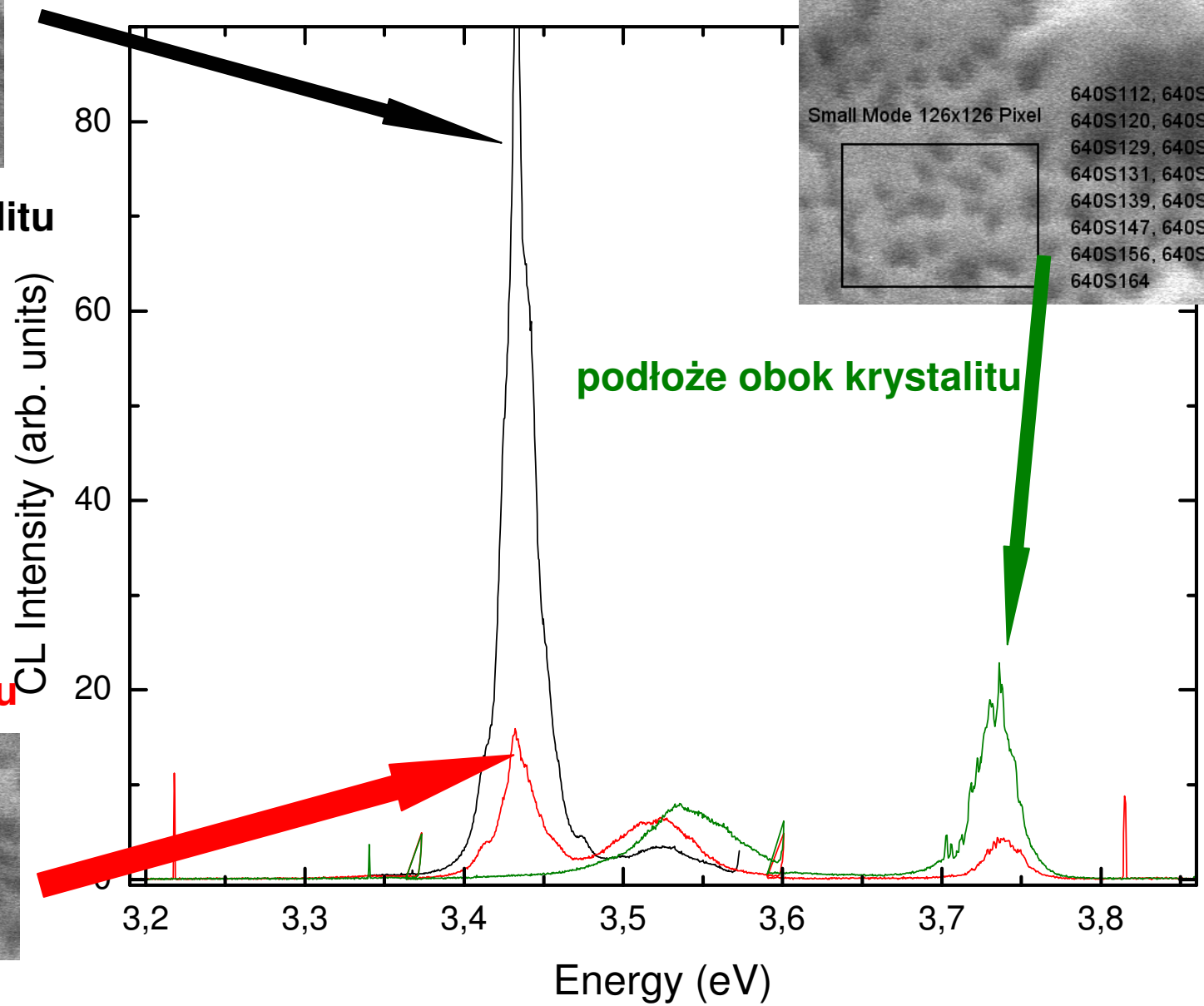
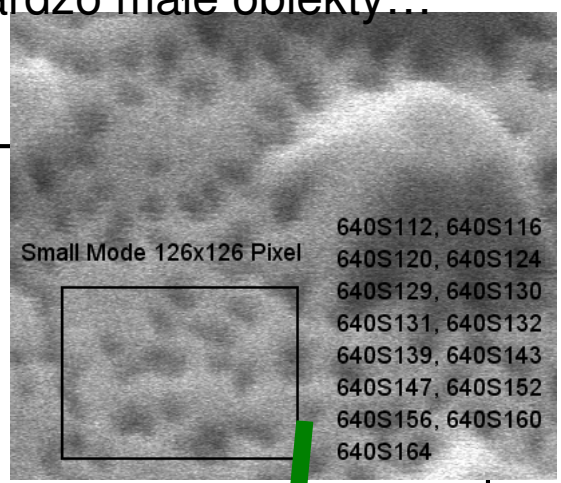
4mm

Katodoluminescencja – można wybrać bardzo małe obiekty...

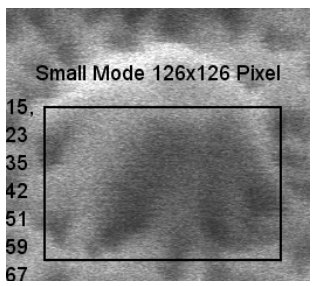
... i oglądać widma świecenia



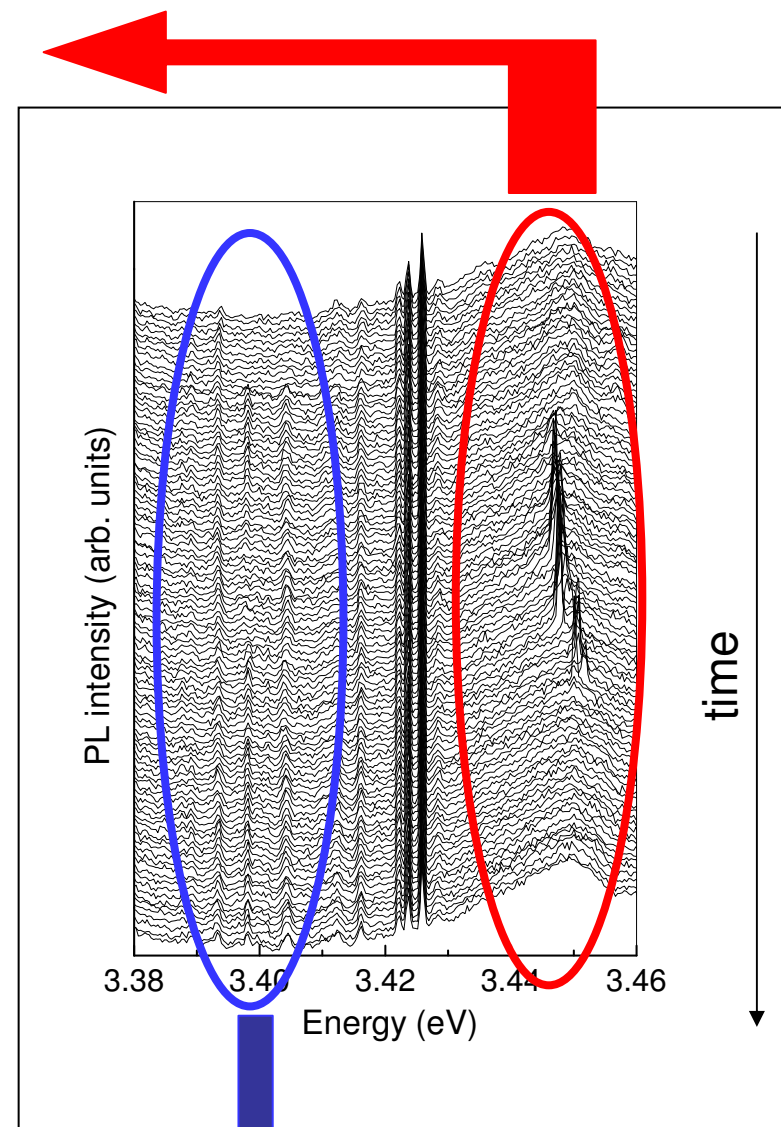
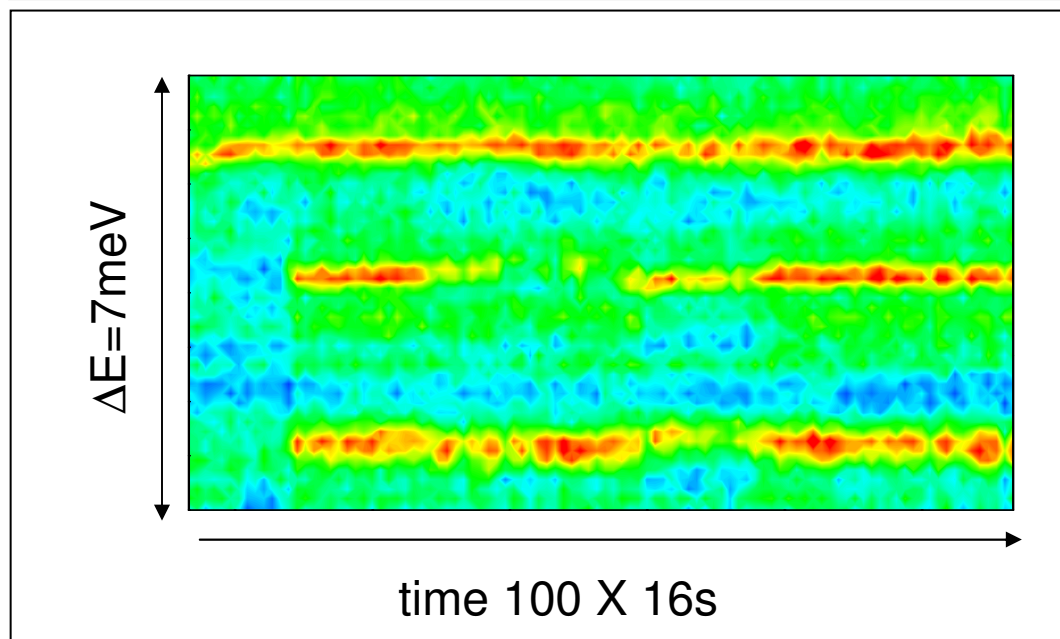
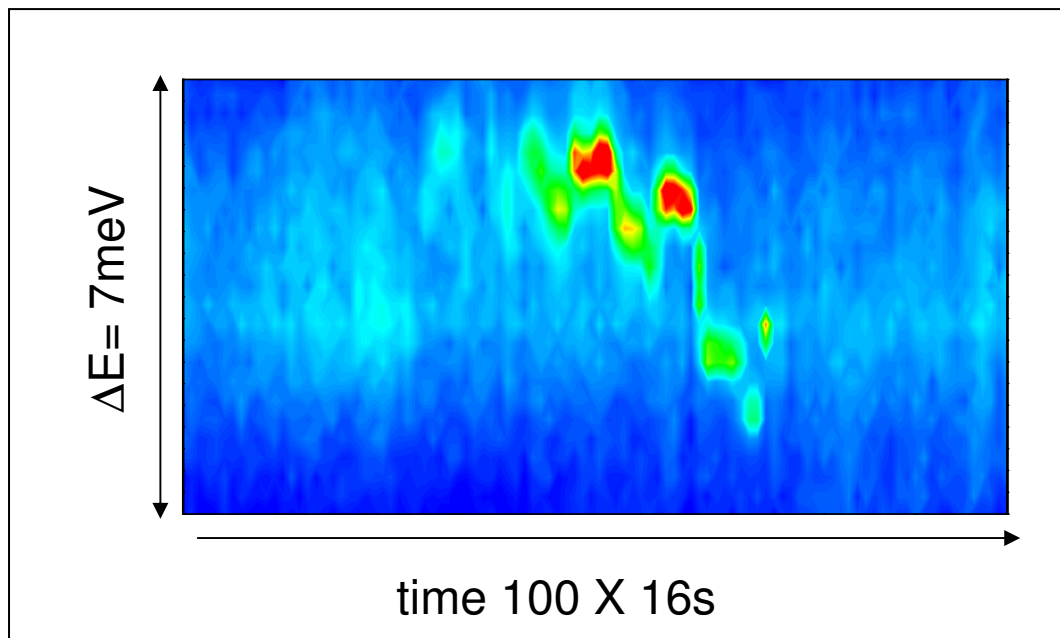
góra krystalitu



bok krystalitu

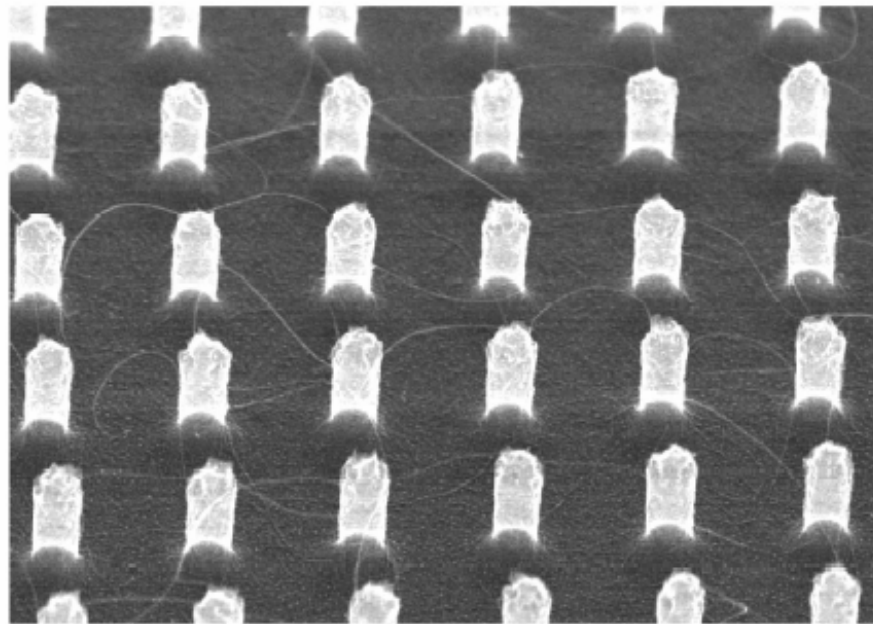


Zmiany intensywności i energii emisji...



K. Surowiecka (2005)

Węgiel świeci?



— 1 μm

FIG. 1. Scanning electron micrograph of nanotubes on pillars. An array of silicon pillars is shown from an angle ($\sim 30^\circ$). Single walled nanotubes are clearly seen bridging the pillars. On close inspection, some tubes lying on the surface below can also be seen.

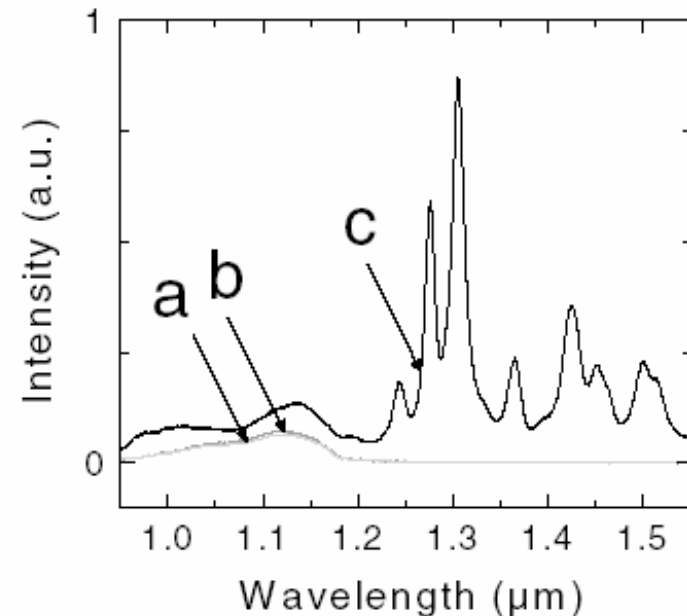


FIG. 2. Photoluminescence spectra: (a) from the pillar areas of an argon-only control sample; (b) on flat areas of a methane CVD sample with abundant nanotubes; (c) on pillar areas of methane CVD samples with bridging nanotubes. Spectra were taken at room temperature in air with the μPL configuration (see text), using a HeNe laser (633 nm) at 1.7 mW, with a 2 μm diameter spot.

J. Lefebvre et al. PRL, **90**, 217401-1 (2003)