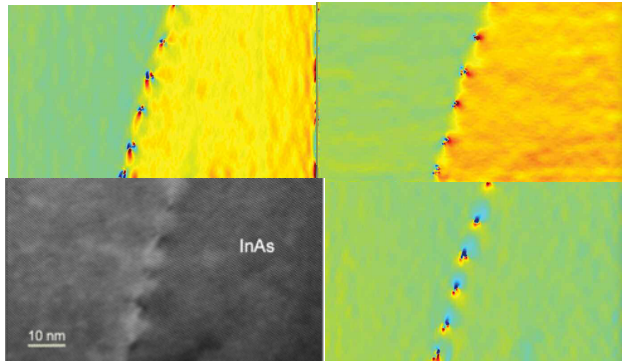
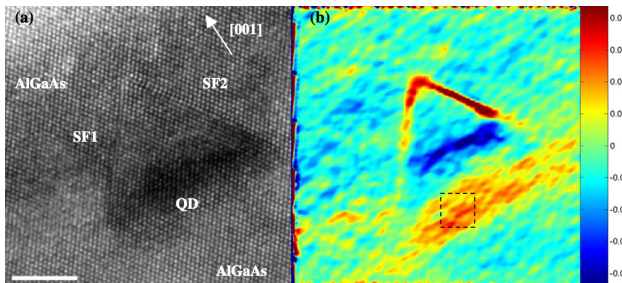


Peak-Pairs Analysis

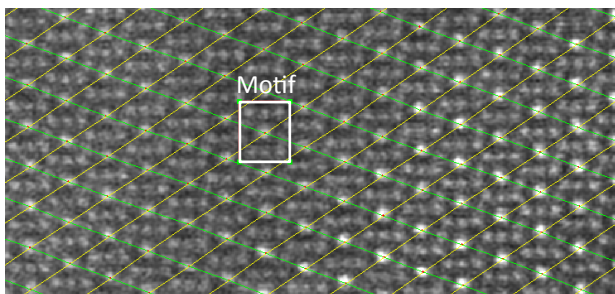
High-Resolution Peak Measurement and Strain Mapping Analysis



Strain tensors ϵ_{xx} , ϵ_{yy} and ϵ_{xy} showing a misfit dislocation network just at the InAs/GaAs interface [2].



Strain along [001] at a quantum dot (QD) and two stacking faults (SF1 & SF2) in AlGaAs [3].



Lattice and peak-pairs determination of a complex structure using a small reference region (Motif).

PPA offers peak intensity analysis and local strain map calculation from high-resolution images.

PPA is based on *Peak-Pairs* algorithm originally developed by Pedro L. Galindo [1].

Key Features

- ◆ Peak location at sub-pixel resolution using 2D filtering (Bragg, Wiener, ...) and cubic interpolation techniques
- ◆ Robust *Peak detection* in noisy images using a small reference region (*Motif*) (see the bottom figure)
- ◆ Local strain tensor determination using *Peak-Pairs* Analysis [1] at atomic-column level.
- ◆ Local representation of strain at the atomic-column level using color scales superimposed on HREM image
- ◆ Automatic peak intensity measurement.
- ◆ Image distortion correction due to a projector lens system (CTEM) or a scanning system (STEM).

References:

- [1] P L Galindo, S Kret, AM Sánchez, J-Y Laval, A Yáñez, J Pizarro, E Guerrero, T Ben and S I Molina, *Ultramicroscopy* 107 (2007) 1186-1193: The Peak Pairs algorithm for strain mapping from HRTEM images.
- [2] P L Galindo, J Pizarro, S I Molina and K Ishizuka, *Microscopy and Analysis*, March (2009) 23-25: High Resolution Peak Measurement and Strain Mapping using Peak Pairs Analysis.
- [3] D L Sales, J Pizarro, P L Galindo, R García, G Trevisi, P Frigeri, L Nasi, S Franchi and S I Molina, *Nanotechnology* 18 (2007) 475503 (6pp): Critical strain region evaluation of self-assembled semiconductor quantum dots