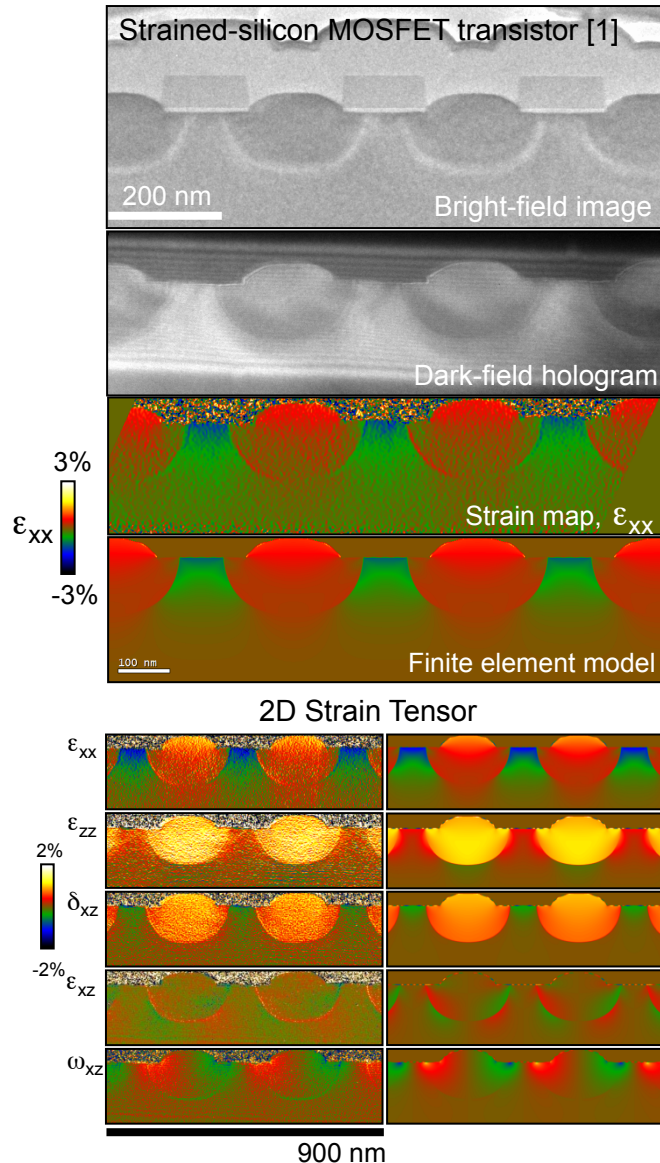


HoloDark – holography for strain

Lattice Deformation and Strain Analysis using Dark-Field Holography



HoloDark generates quantitative deformation and strain maps over wide fields of view from a pair of dark-field electron holograms [1,2].

HoloDark is based on the patented technique and routines developed by Martin Hýtch et al [3].

Key Features

- ◆ Determines geometric phases from dark-field electron holograms, and corresponding deformation maps
- ◆ Generates full 2D deformation tensor from pairs of dark-field holograms of differing diffraction vectors
- ◆ Displays color maps and contours of strains
- ◆ Aligns multiple holograms by correcting drift, rotation and magnification changes
- ◆ Corrects for Fresnel fringes and optical distortions due to the projector lens system and CCD camera [4]

References:

- [1] M.J. Hýtch, F. Houdellier, F. Hüe, and E. Snoeck, *Nature* 453 (2008) 1086-1089. Nanoscale holographic interferometry for strain measurements in electronic devices
- [2] F. Hüe, M.J. Hýtch, F. Houdellier, H. Bender, and A. Claverie, *Appl. Phys. Lett.* 95, 073103 (2009). Strain mapping of tensile strained silicon transistors with embedded Si_{1-y}C_y source and drain by dark-field holography.
- [3] M.J. Hýtch, F. Houdellier, F. Hüe, and E. Snoeck, *International Patent Application* N° PCT/FR2008/001302
- [4] F. Hüe et al. *J. Electron Microscopy* 54 (2005) 181-190. Calibration of projector lens distortions