Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Infrared Near-field Microscopy of Semiconductor Devices FRITZ KEILMANN, ANDY J. HUBER, RAINER HILLENBRAND, Max-Planck-Institut für Biochemie — We report optical imaging at ultrahigh resolution < 30 nm of cross-sectional preparations of state-of-the-art transistors. Our technique employs a scanning optical near-field microscope of scattering type (s-SNOM). It is based on a tapping-mode AFM with a standard, metallized tip, and an interferometric receiver. This detects a pseudo-heterodyne signal detection that is filtered at a low harmonic of the tapping frequency. The illumination wavelength of 10.7 μm allows to record specific contrasts—which are obtained in amplitude as well as in phase—distinguishing not only all material components in the transistors, but furthermore highlighting the charge carriers. Prospects of quantitative carrier density mapping will be discussed. A.J. Huber et al., Adv. Mat. 19, 2209 (2007)

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Date submitted: 13 Dec 2007 Electronic form version 1.4