

attoSNOM II: High Optical Resolution Imaging

Scanning near-field optical microscopes (SNOM) are designed to measure the optical contrast of a sample with sub-wavelength resolution. The attoSNOM II works by scanning a sharp probe in the near field of a sample surface. The probe consists of a glass tip that can be covered with an opaque metal layer, with a clear nanometric aperture dimension at the tip apex that records an optical signal.

The research and development of new probe concepts are gaining increasing interest in near-field optical microscopy. The aim is a better control of the light distribution at the probe aperture, a higher light transmission and an increase in the achievable resolution in the near-field. One possible solution is the use of a radiating gold nanostructure as a probe for near-field optical microscopy. The gold protruding nanostructure provides the facility to locally graft at the end of the tip a chemical linker to a specific molecule. The probe consequently consists of a topographical, optical and chemical sensor at the same time.

Related article:

O. Sqalli, M. Bernal, P. Hoffmann and F. Marquis-Weible, "Improved tip performance for Scanning Near-Field Optical Microscopy by the attachment of a single gold nano-particle", Appl. Phys. Lett. 76, 2134 (2000).

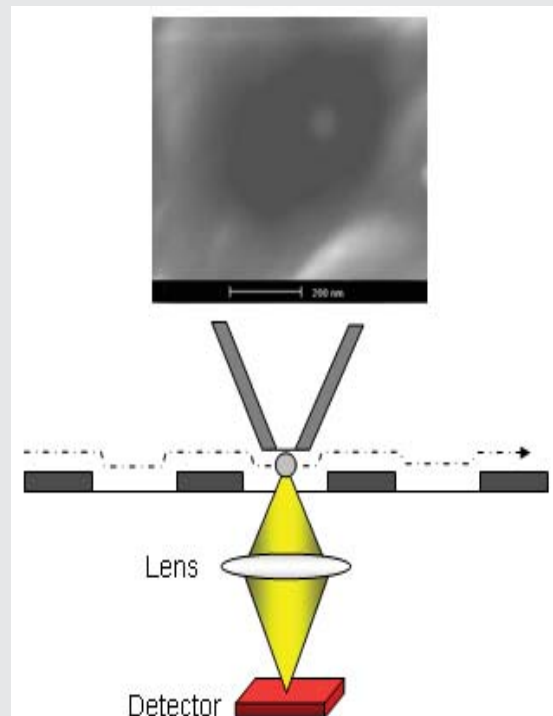


Fig. 1: SEM (Scanning Electron Microscopy) picture of a SNOM tip where a single gold particle is attached at the apex of the probe.



Fig. 3: The attoSNOM II microscope sensor head.

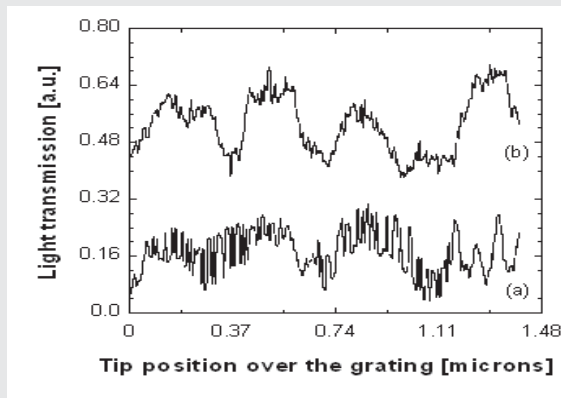


Fig. 2: Light transmission over a chromium on glass grating with a period of 372 nm before and after the attachment of a single gold nanoparticle at the tip apex: (a) no particle (b) with particle.

RELATED PRODUCTS

attoSNOM II	fiber based scanning near-field optical microscope
ANPxyz100/LT	high precision, piezo electric, inertial positioner for big loads
ANSxy100	high precision piezoelectric scanner
ANC150/3	electronic controller
ANC200	electronic scan controller
attoSCAN	data acquisition software
attoVIEW	data viewing software