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Title: Method for measuring interaction e.g. infrared radiation, with sub-micron region sample on substrate with probe atomic force microscope, involves measuring probe response due to interaction enhanced electric field with sample

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Abstract: NOVELTY - The method involves interacting an electric field enhancing tip (2) a probe microscope with a region a sample (4). The tip and the region the sample are illuminated with a source modulated infrared radiation. An electric field induced by the infrared radiation is enhanced in a region surrounding an apex the tip. A probe response due to the interaction the enhanced electric field with the sample is measured. A metallic coating is provided on the tip, where the metallic coating comprises a metal chosen from a list gold, silver, copper, platinum and palladium.

USE - Method for measuring interaction radiation e.g. infrared, UV, visible, and terahertz (all claimed), with a sub-micron region a sample on a sample substrate with a cantilever probe a probe microscope i.e. atomic force microscope (AFM).

ADVANTAGE - The method enables providing enhancement to significantly reduce illumination power levels, thus improving spatial resolution by confining a sample-radiation interaction to the region field enhancement. The method enables obtaining spectral information about the sample surface and the sample tip, thus creating high resolution spectral maps sample composition. The method enables enhancing detection in a small area near the tip-sample contact, thus paving the way for the use much broader array samples and sample substrate.

DETAILED DESCRIPTION - The source infrared radiation is selected from quantum cascade laser, optical parametric oscillator, globar and Fourier Transform Infrared Spectrometer and pulsed source. The radiation is selected from UV, visible, and terahertz.

DESCRIPTION DRAWING(S) - The drawing shows a schematic view an atomic force microscope.

Electric field enhancing tip (2)

Sample (4)

Drawing:

Derwent Class Code(s): S02 (Engineering Instrumentation, ing equipment, general testing methods); S03 (Scientific Instrumentation, photometry, calorimetry)

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