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Molecular vibrational resonance

Tech ID: 24730 / UC Case 2014-671-0

BRIEF DESCRIPTION

Modification of scanning probe microscope for direct measurement of both, amplitude and phase of vibration of a single molecule.

FULL DESCRIPTION

This invention describes a scanning probe microscopy method for the direct measurement of both the amplitude and phase of the vibrational motion of a single molecule (or a group of molecules). It is based on stimulating the molecular vibrational motion under a metal coated SPM probe tip using continuous wave pump and stimulating lasers that match the desired vibrational resonance. We use heterodyne detection with an independent frequency shifted reference optical beam to detect the stimulated Stokes beam from underneath the tip. By using an optically derived electrical reference from the scattered light from the tip end coupled with lock-in detection, both the amplitude and phase of the vibrating molecule under the probe tip can be directly measured immune to microphonics and other thermally induced noise sources.

SUGGESTED USES

*R&D

*Drug design

ADVANTAGES

The only available direct method to measure molecular vibration.

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	9,658,162	05/23/2017	2014-671

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OTHER INFORMATION

CATEGORIZED AS

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