

A method and a device for position and mass measurements



INVENTORS: Beltram Fabio
Biasiol Giorgio
Piazza Vincenzo
Pingue Pasqualantonio
Sorba Lucia
Strambini Elia

PATENT STATUS: Granted

PRIORITY NUMBER: ITPI20080103A·2008-09-30

PUBLICATION: 2011-11-18

PUBLISHED AS: IT

Invention

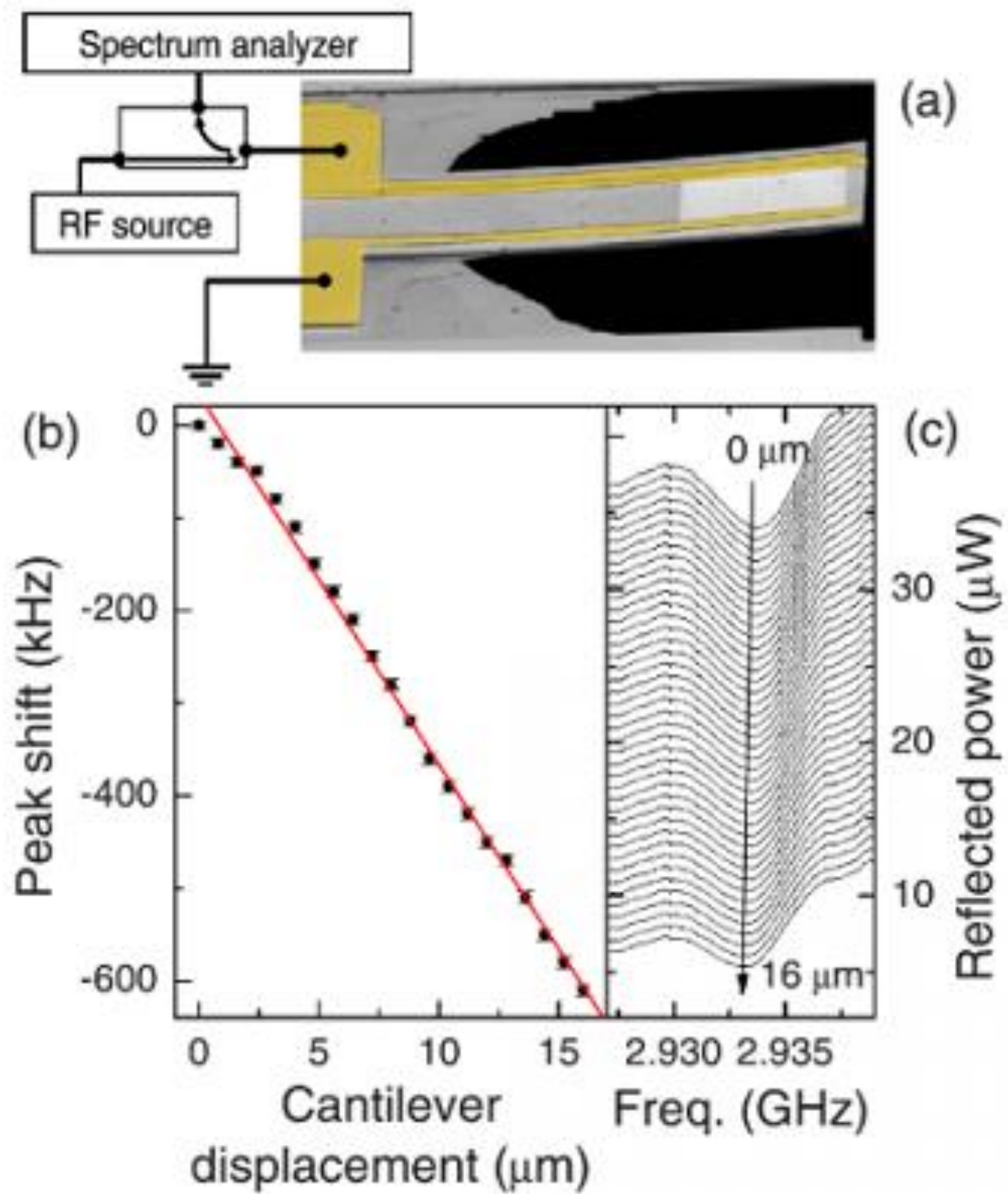


The present invention relates to a method and a device for carrying out position measurements such as scans of surfaces for the study of their topography and physical properties with microscopic resolution, and mass measurements (microscopic masses) by means of probes in dynamic mode, oscillating at a given frequency.

The invention provides a method and a device that uses a cantilever to guide a probe in order interacting with the sample to be measured. This interaction can be used in scanning probe microscopy systems, microbalances, detectors of environmental characteristics such as concentration of chemicals and local pressure. This device also allows scanning surfaces in dynamic mode. This detection system can be also used both in a wireless mode and in liquid or in cryogenic environment. It is based on the generation and contextual detection of surface acoustic waves (SAW) generated and detected by one or more interdigitated transducers (IDT) present on the surface of the foil having a piezoelectric active layer.

Compared to other existing devices, it exploits a robust technology having not moving parts that is based on the variation of the speed of sound in the material caused by a deformation, a technology that allows its use in different working conditions and highly reliable.

Drawings
& pictures



Industrial applications



It can be used in the Sensors field and for development of advanced diagnostic methods:

- Scanning probe microscopy;
- Microbalance (mass sensor);
- Environmental characteristics detectors;
- Wireless position and mass sensor;
- Position and mass sensor in liquid environment;
- Position and mass sensor in cryogenic conditions.

Possible developments



The patent is available for licensing.

The device can be employed in various technological fields, from wireless sensors, to the NEMS sector, for applications in the microelectronics, biomedical, aerospace, I4.0, scanning probe microscopy.

A technological collaboration is required to increase the TRL of the device and to use it in an area where its peculiar characteristics can find a specific market.

TRL: 4

For more information:



Research and Technology Transfer Office of Scuola Normale Superiore

Headquarters: Piazza dei Cavalieri, 7 - 56126 Pisa, Italy

Web site: sns.it

E-mail: kto@sns.it

For more information:



Ufficio Regionale di Trasferimento Tecnologico

Headquarters: Via Luigi Carlo Farini, 8 50121 Firenze, Italy

E-mail: urtt@regione.toscana.it

