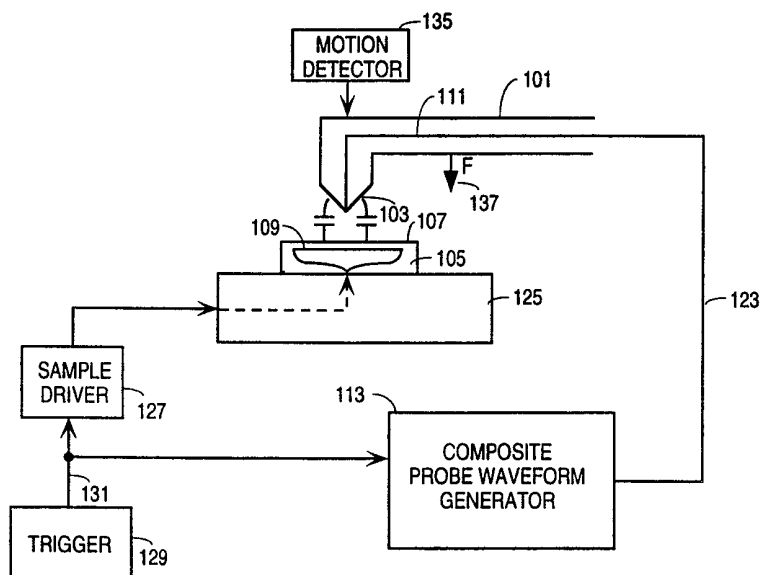




INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<p>(51) International Patent Classification ⁷ : G01B 5/28</p>	<p>A3</p>	<p>(11) International Publication Number: WO 00/17853 (43) International Publication Date: 30 March 2000 (30.03.00)</p>
<p>(21) International Application Number: PCT/US99/20077 (22) International Filing Date: 1 September 1999 (01.09.99) (30) Priority Data: 09/159,398 23 September 1998 (23.09.98) US (71) Applicant: MICRON FORCE INSTRUMENTS [/US]; 100 Century Center Court, San Jose, CA 95112 (US). (72) Inventors: BRIDGES, Greg, E.; 40 Goldenrod Cove, Winnipeg, Manitoba R2J 3Z8 (CA). THOMSON, Douglas, J.; 29 River Road, Winnipeg, Manitoba R2M 3Z1 (CA). (74) Agents: MILLIKEN, Darren, J. et al.; Blakely, Sokoloff, Taylor & Zafman LLP, 7th floor, 12400 Wilshire Boulevard, Los Angeles, CA 90025 (US).</p>		<p>(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).</p> <p>Published <i>With international search report.</i></p> <p>(88) Date of publication of the international search report: 27 July 2000 (27.07.00)</p>

(54) Title: MULTI-PULSE SAMPLING OF SIGNALS USING FORCE SAMPLING



(57) Abstract

A method and an apparatus for providing non-contact measurement of waveforms proximate to a surface (107) of a sample (105). In one embodiment, the described apparatus includes a composite probe waveform generator (113) configured to provide a composite probe waveform (123) having a plurality of overlapping component waveforms. Each of the overlapping component waveforms has a repetition rate substantially equal to the repetition rate of the sample waveform (201) to be measured from the sample. The apparatus includes a cantilever (101) with a signal path to carry the composite probe waveform to a position above the sample surface (107) where the sample waveform is to be measured. In one embodiment each of the component probe waveforms (203, 205, 207, 209, 211, 213, 215 and 217) of the composite probe waveform (123) is modulated at a frequency near the mechanical resonance frequency of the cantilever (101).

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US99/20077

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) :G01B 5/28
US CL :324/676, 72, 456,458; 73/105

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 324/676, 72, 73.1, 456,458, 537; 73/105

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4,992,728 A [MCCORD et al.] 12 FEBRUARY 1991 (12.02.91), entire document.	1-24
A	US 5,381,101 A [BLOOM et al.] 10 January 1995 (10.01.95), entire document	1-24
A	US 5,406,832 A [GAMBLE et al.] 18 April 1995 (18.04.95), entire document.	1-24
A,P	US 5,959,447 A [BRIDGES et al.] 28 September 1999 (28.09.99), entire document	1-24
A	WICKRAMASINGHE, H.K. Scanned-Probe Microscope, Scientific American, October 1989, pages 98-105.	1-24

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Date of the actual completion of the international search
04 APRIL 2000

Date of mailing of the international search report
13 APR 2000

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