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PUBLICATIONS AND SPEAKERSHIPS

Microprocessor Characterization

1. "Optical Probing of Flip-Chip-Packaged Microprocessors," T.M. Eiles, G.L. Woods, V.R. Rao, Proceedings of the IEEE Int. Solid State Circuits Conference (ISSCC), p. 220, 2000
2. "Application of advanced micromachining techniques for the characterization and debug of high performance microprocessors", Richard. H. Livengood, Paul Winer and Valluri Rao, 42nd International Conference on Electron, Ion and Photon beam technology and nanofabrication: Published in J.Vac. Sci. Technol. B 17(1), Jan/Feb 1999 pp 40 - 43
3. "Application of the Infrared Microscope (IREM1) for Flip-Chip C4 Failure Analysis", S. Seidel, V.R. Rao, T.H. Low, A.N. Zaplatin, F.J. Low., Proceedings of the 25th International Symposium for Testing and Failure Analysis (ISTFA), p.27, (1999).
4. "Optical Probing of VLSI IC's from the Silicon Backside", T. M. Eiles, G. L. Woods, and Valluri Rao, Proceedings of the International Symposium on Testing and Failure Analysis (ISTFA), 1999.
5. "Novel Optical Probing and Micromachining Techniques for Silicon Debug of Flip Chip Packaged Microprocessors", Mario Paniccia, T. Eiles, R. Livengood, V.R.M. Rao, P. Winer, and Wai Mun Yee, Micro and Nano Engineering conference MNE 1998, Leuven Belgium, September 1998.
6. "Optical Probing of flip chip microprocessors", M. Paniccia, V.R.M. Rao & Wai Mun Yee, 42nd International Conference on Electron, Ion and Photon beam technology and Nanofabrication: Published in J.Vac. Sci. Technol. B 16(6), Nov/Dec 1998 pp3525-3630 (awarded best paper of conference)
7. "Design for Diagnostics views and experiences", Valluri. R. Rao, ITC 1998 panel discussion, Diagnostic war stories, what saved the day? A technique debate, Proceedings of the International Test Conference, Washington DC 1998, pp 1135
8. IEEE design and Test Roundtable participant in ITC 1998
9. Class on "Internal Die Electrical Testing", Part of University of New Mexico lecture in IEEE sponsored course on VLSI Failure Analysis, Organizer Prof. Chuck Hawkins, June 1998
10. "Novel Optical Probing Technique for Flip Chip Packaged Microprocessors", M Paniccia, WM Yee, T. Eiles, V Rao, Proceedings of the International Test Conference, Washington DC 1998, pp 740 - 747
11. "FIB techniques to Debug Flip Chip Integrated Circuits", RH Livengood and Valluri Rao, Invited paper, Semiconductor International, March 1998, pp 111 - 116
12. "Electrical Fault Isolation Techniques for ULSI IC's", V.R.M. Rao, Invited Talk, MRS Spring meeting, San Francisco, 1997
13. "Fault Localization by Beam based Techniques" V.R.M. Rao, Chapter in Microelectronic Failure Analysis Desk Reference 1996 ASM International
14. International Society for testing and Failure Analysis (ASM International) workshop lecturer - 1992 through 1997

15. "Electron Beam Probing for Design Verification at Intel", Valluri Rao and Avtar Saini, Invited Talk, 5th European Conference on Electron and Optical beam testing of electron devices: Zurich: Published in *Microelectronic Engineering* 24 (1994) 25-34
16. "Electrical Fault Isolation in VLSI ICs" V.R.M. Rao, Invited lecture, 5th tropical college on applied physics, Universiti Sains Malaysia, 1993
17. "Selective Removal of dielectrics from Integrated Circuits for Electron Beam Probing", W. Baerg, V.R.M. Rao and R Livengood, Proceedings of the 30th IEEE International Reliability Physics Symposium, 1992, pp 320-326 (Best paper award for IRPS 1992)
18. "Primary beam movement effects in electron beam probing", V.R.M. Rao, 3rd European Conference on Electron and Optical beam testing of electron devices: Como Italy: Published in *Microelectronic Engineering* 16 (1992) 421 - 428
19. Validation and diagnosis panel discussion at VLSI symposium in Atlantic City 1991
20. "Electron beam Probing of VLSI Integrated Circuits - Techniques and Application", V.R.M. Rao, 111 page tutorial, IPFA conference, Singapore 1991
21. "Design and implementation of a high performance E-Beam tester", Valluri Rao and Paul Winer, *Microelectronic Engineering* 12 (1990) Elsevier Science Publishers BV pp 295-302
22. "Dynamic Fault Imaging of VLSI Random Logic Devices", TC May, GL Scott, ES Meieran, P Winer, V.R. Rao, Proceedings of the 1984 IEEE International Reliability Physics Symposium. (Best paper award for IRPS 1984)

MEMS and Photonics

1. Ultra High Density MEMS probe memory device, *Microelectronic Engineering* (Elsevier), 87 (2010) 1198-1203
2. An ultraclean tip-wear reduction scheme for ultrahigh density scanning probe-based data storage, *ACS Nano*, 2010, 4(10), pp5713-5720
3. CMOS compatible Poly-SiGe Cantilevers with Read/Write system for probe storage device: *IEEE transducers* 2009
4. Scanning Probe Charge reading of Ferro-Electric Domains, *Applied Physics Letters*, Feb 2009, Vol 94, Issue 6, pp 063105 - 063105-3
5. Nanochip: a MEMS-Based Ultra-High Data Density Memory Device: *Sensors and Transducers Journal*, Volume 7, October 2009, pp. 34-46
6. New Paradigms of scaling for MEMS applications; invited talk at INC4, 4th international nanotechnology Conference, Tokyo, Japan April 2008
7. Emerging Nanotechnology for Nano-Electronics applications - MEMS, International Electron Devices Meeting 2007, short course tutorial
8. "MEMS and Microsystems opportunities through scaling", V.R.M. Rao, Invited Keynote, MEMS industry Group, Executive Congress, Pittsburgh PA 9/20/2005
9. "Characterization of polycrystalline AlN films using variable-angle spectroscopic ellipsometry", Li-Peng Wang, Dong Shim, Qing Ma & Valluri Rao, *Journal of Vacuum Science and Technology*. A 23(24), July/August 2005
10. "Applications of Microsystems in Wireless Communications", V.R.M. Rao, Invited Keynote, Proceedings of MEMSWAVE 2004. 5th workshop on MEMS for millimeter wave communications: Uppsala Sweden 6/30/2004 to 7/2/2004
11. "MEMS technology challenges for volume manufacturing", V.R.M. Rao, Invited Talk, Proceedings of the American Vacuum Society: 49th international symposium November 2003
12. MEMS research at Intel, invited talk to MIT VLSI seminar series, March 18 2003
13. "Heterogeneous Integration of III-V and Silicon Devices for Digital VLSI", V.R.M. Rao, Invited Talk, U.C. Santa Barbara, *Solid State Technology Review*, Nov 2002

Graduate Work

1. "Optimization of the optical parameters in variable shape electron beam lithography", GAC Jones, V.R.M. Rao, HT Sun and H Ahmed, International Conference on Electron, Ion and Photon Beam Technology (1983): Published in J.Vac. Sci. Technol. B 1(4), Oct-Dec 1983
2. "Modeling of electron beam columns for lithography", GAC Jones, V.R.M. Rao and H Ahmed, Proceedings of the Micro Circuit Engineering Conference 1982, Grenoble, France pp 328-333
3. "Current Distribution in shaped E-Beams", V.R.M Rao, GAC Jones and H Ahmed, International Conference on Electron, Ion and Photon Beam Technology (1981): Published in J.Vac. Sci. Technol. B 19(4), Nov/Dec 1981 pp 1098-1102
4. "A Computational and experimental analysis of fifth order deflection aberrations", V.R.M. Rao and WC Nixon, International Conference on Electron, Ion and Photon Beam Technology (1981): Published in J.Vac. Sci. Technol. B 19(4), Nov/Dec 1981 pp 1037-1041
5. "An experimental technique for the assessment of electron beam deflection errors", V.R.M Rao and WC Nixon, OPTIK 56, No.1 (1980) 113-122
6. "Large Area Scanning Electron Beam Exposure System", V.R.M Rao and W.C. Nixon, Microcircuit Engineering, Editors H. Ahmed and W.C. Nixon, Cambridge University Press, 1980, ISBN 0 521 23118 3, pp 395-407
7. "Direct recording with electron scanning" V.R.M. Rao, PhD Dissertation, Engineering Department & Jesus College, Cambridge University U.K., March 1979.
8. "A direct electron beam photographic recording system for large area scanning electron microscopy readout", V.R.M. Rao and W.C. Nixon, Proceedings of the 9th International Congress on Electron Microscopy, Toronto, Canada, 1978, Vol. 1 pp 96-97