CONTENTS

PREFACE iii

PART I - ION IMPLANTATION AND DAMAGE ANNEALING

* PREDICTING LOW ENERGY DOPANT IMPLANT PROFILES IN SEMICONDUCTORS USING MOLECULAR DYNAMICS 3
K. M. Beardmore and N. Gronbech-Jensen

THREE-DIMENSIONAL MONTE-CARLO ION IMPLANTATION SIMULATION FOR MOLECULAR IONS 18
A. Hoessinger, S. Selberherr, and M. Kimura

COMPUTATIONALLY EFFICIENT ANALYTICAL MODEL FOR 2-D ION IMPLANTATION 26
D. Li, G. Balamurugan, B. J. Obradovic, G. Wang, Y. Chen, and A. F. Tasch

PHYSICALLY BASED MODELS FOR INDIUM AND GERMANIUM ION IMPLANTS INTO SILICON 33
Y. Chen, B. Obradovic, M. Morris, G. Wang, G. Balamurugan, A. F. Tasch, D. Kamenitsa, W. McCoy, S. Baumann, R. Bleier, D. Sieloff, D. Dyer, and P. Zeitzoff

* MONTE CARLO SIMULATIONS OF DEFECTS EVOLUTION AND CLUSTERING IN ION-IMPLANTED SI 46
A. La Magna, S. Coffa, S. Libertino, L. Colombo

* A NOVEL METHOD TO INVESTIGATE ION-BEAM-INDUCED DEFECT EVOLUTION IN SI 58
M. Posselt

DOSE, ENERGY, AND ION SPECIES DEPENDENCE OF THE EFFECTIVE PLUSFACTOR FOR TRANSIENT ENHANCED DIFFUSION 75
G. Hobler, L. Pelaz, and C. S. Rafferty

LOCAL DAMAGE ACCUMULATION MODEL FOR ULTRA-LOW ENERGY ION IMPLANTATION 87
J.-W. Kang, K. W. Lee, and H. J. Hwang

DIRECT SIMULATION OF ION BEAM INDUCED STRESSING AND AMORPHIZATION OF SILICON 96
K. M. Beardmore and N. Groenbeck-Jensen

* Invited Paper

CONTENTS

PART II - DIFFUSION, SEGREGATION AND AGGREGATION

THE DOPANT TRAPPING AND DE-TRAPPING AT THE SIO_2/SI INTERFACE — 108
S. Zhao, C.F. Machala, and M.-C. Chang

PHOSPHORUS DIFFUSION FROM DOPED POLYSILICON THROUGH ULTRATHIN SIO_2 FILMS INTO SI SUBSTRATES — 116
Y. Tsubo, Y. Komatsu, K. Saito, S. Matsumoto, Y. Sato, Y. Yamashita, and I. Yamamoto

* THE PIECES OF THE PUZZLE: CHALLENGES IN MODELING OF TRANSIENT ENHANCED DIFFUSION — 123
A. H. Gencer and S. T. Dunham

A PROCESS SIMULATION MODEL FOR TRANSIENT AND EQUILIBRIUM ARSENIC/PHOSPHORUS CODIFFUSION IN SILICON WITH ZERO COMPUTATIONAL OVERHEAD — 136
A. Hoefler

ENERGETICS AND KINETICS OF EXTENDED {311} DEFECTS IN Si — 143
P. Fastenko and S. T. Dunham

MODELING OF VACANCY CLUSTER FORMATION IN ION IMPLANTED Si — 153
S. Chakravarthi and S. T. Dunham

AB INITIO CALCULATIONS OF As-VACANCY INTERACTIONS IN SILICON — 165
J. Xie, M. Jones, and S. P. Chen

* Invited Paper

CONTENTS

PART III - BACK END PROCESSING

* DISLOCATION DYNAMICS IN SILICON NEAR PATTERNED PADS CORNERS — 177
K. Schwarz and D. Chidambarrao

ATOMISTIC MODELLING OF CU FILM GROWTH — 198
Z. Wang, Y. Li, and J. Adams

LAYOUT-RELATED FAILURES OF DEFECT-FREE ISOLATION SCHEMES FOR ADVANCED CMOS DEVICES — 203
I. Peidous, T. Schuelke, R. Sundaresan, and S. Lahiri

STUDY OF CHEMICAL MECHANICAL POLISHING ON STI (SHALLOW TRENCH ISOLATION) TO OBTAIN LOW DEFECT — 215
M. K. Baek, E. G. Chang, C. I. Kim, and S. Y. Kim

NUMERICAL SIMULATIONS OF SPUTTER DEPOSITION AND ETCHING IN TRENCHES USING THE LEVEL SET TECHNIQUE — 220
P. O'Sullivan, F. H. Baumann, and G. H. Gilmer

AUTHOR INDEX — 224

SUBJECT INDEX — 226

* Invited Paper