Materials Issues for Tunable RF and Microwave Devices

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Materials Issues for Tunable RF and Microwave Devices

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CONTENTS

*Invited Paper

*Invited Paper

HIGH-FREQUENCY APPLICATIONS OF FERROELECTRICS

FERROELECTRICS

*Invited Paper

MATERIALS CHARACTERIZATION

*Invited Paper

PREFACE

This proceedings contains papers presented at Symposium KK, "Materials Issues for Tunable RF and Microwave Devices," held November 30–December 2 at the 1999 MRS Fall Meeting in Boston, Massachusetts. Electric or magnetic tunability of RF and microwave devices is desirable for a variety of civilian and military applications. In recent years, there have been tremendous advances in thin-film processing, in particular the metal-oxide thin films. Consequently, it has been recognized that the integration of nonlinear-dielectric, ferrite, colossal magnetoresistive (CMR), and superconductor materials could revolutionize tunable devices by providing new capabilities while significantly reducing size and cost.

Some of the crucial issues facing the tunable RF and microwave device technology concern the material properties, in particular the loss in thin films of the tunable materials. Extensive efforts are being devoted to understand the tuning and loss mechanisms, improve thin-film processing and characterization, develop new materials, and design novel device concepts. The papers contained in this volume are a reflection of the work currently in progress in this exciting area. They range from electric-field to magnetic-field tuning, from devices to materials, and from fundamental understanding to materials characterization. The authors come from different materials communities: nonlinear dielectric, ferrite, colossal magnetoresistive (CMR), semiconductors, superconductivity, and device engineering, etc. We hope that this volume will serve as an up-to-date reference for the researchers inside and outside the field of tunable RF and microwave devices, and thus contribute to new breakthroughs in the basic and applied research in this rapidly expanding field.

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