FOREWORD

Special Section on SQUID & its Applications

Superconductivity was found 100 years ago, high Tc superconductor was found 18 years ago and SQUID (Superconducting Interference Device) was invented 47 years ago. This special session collected invited and regular papers on SQUID and its application.

There are two types of SQUIDs, a Low Tc SQUID working at liquid helium temperature and a High Tc SQUID working at liquid nitrogen temperature.

The low Tc SQUID was invented more than 40 years, and its application has been developed already. Dr. Hirota in Osaka University wrote a paper on clinical application of neuromagnetic recordings from functional imaging to neural recording. Dr. Adachi in Kanazawa Institute of Technology wrote on instruments and application to functional imaging of spinal cords. Dr. Yang-Hoo Lee wrote a paper on development and applications of SQUIDs in Korea, such as multichannel magnetocadiography system and Magnetoencepharography system. He also indicated a new application of SQUID, ultra-low field NMR, Micro-calorimeter for radiation detection, and measurement of ultra-small force using SQUIDs. Dr. Kong in State Key Laboratory of Functional materials for Informations, Shanghai Institute of Microsystem and Information Technology introduces a new SQUID driver; Bootstrap circuit and its application in magretocardiogram.

High Tc SQUID also has a lot of progress. Dr. Keenan in CSIRO in Australia reported a SQUID using step edge Josephson junction of MgO substrate. His group depeloped not only SQUID but also its various applications such as geomagnetic exploration, telecommunication and THz Imaging. Dr. Moriya in the University of Electro-Communication reports on balanced ternary quantum voltage generator based on zero crossing Shapiro steps in asymmetric two-junction SQUIDs.

This special session does cover a part of world activities on SQUID research, but we can feel that SQUID research is very active and are making a lot of successful results.

Hideo Itozaki, Guest Editor-in-Chief

Hideo Itozaki *(Member)* received B.E. and M.E. degree in engineering from Osaka University in 1974 and 1976, and obtained Ph.D. in materials science and engineering from Northwestern University, Illinois in the US in 1982. He joined Sumitomo Electric Industries in 1976 and researched on an optical fiver, an amorphous Si Solar cell, a high Tc superconducting thin film and a SQUID. He joined National Institute of Materials Science, Tsukuba as a director of superconducting research centre in 2001 and worked on a SQUID microscope. He became a professor at Graduate School of Engineering Science in Osaka University in 2004. He is researching on a STM-SQUID microscope and security sensing using nuclear quantum resonance and near infrared.