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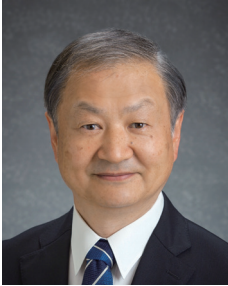
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## SPECIAL ISSUE ON GRAPHENE-BASED SENSORS

### PREFACE



Since the renewed attention from Novoselov and Geim in 2004, graphene has attracted researchers in various fields all over the world owing to its extraordinary physical properties. Sensor application is no exception. With its ideal surface-to-volume ratio, extremely high electron and hole mobilities as well as its unique Dirac Fermion energy spectrum, graphene provides an ideal material in this direction. The purpose of this special issue is to illustrate the state-of-the-art status of graphene in its sensor applications.

This special issue contains four papers. The first one discusses the application of graphene-based THz detectors. By using the bolometric modulation of carriers caused by THz irradiation, the proposed device, consisting of a graphene layer sandwiched by black-arsenic-phosphorus layers, is shown to provide a high responsivity. The second paper discusses an even wider range of possible applications of graphene, including bolometric, photovoltaic, and photo-thermoelectric sensors. The points associated with graphene are unique Landau levels as well as a small heat capacity, low density of states, and weak electron-phonon coupling. The third paper is concerned with the fabrication process of graphene-based sensor devices. The proposed solution-based formation of Al-oxide followed by microwave annealing is shown to be a reliable method of forming a dielectric layer for graphene-based FETs. The final paper describes operando photoelectron nanospectroscopy as a new analytical tool for investigating the charge transfer at graphene-related interfaces with a spatial resolution of 70 nm.

I hope this special issue inspires further research in sensor applications. I would like to express my gratitude to all the authors who contributed to this special issue. I would also like to thank the reviewers and Ms. T. Tanabe at MY K.K. for their kind support in the publication of this issue.

Maki Suemitsu  
Professor Emeritus  
Research Institute of Electrical Communication  
Tohoku University  
Japan