Nozomu ISHII, Ph.D.

Associate Professor
Program: Electrical and Information Engineering
Area: Human Sciences and Assistive Technology
Undergraduate: Dept. of Engineering

Professional Expertise

His professional expertise encompasses antenna analysis, small antenna, planar antennas, antenna measurement, and electromagnetic compatibility. Especially, he and his group have studied Wheeler cap method and reflection method for measuring the radiation efficiency of small antenna and gain measurement method in the liquid in the microwave band. He also engaged in the development of millimeter antenna with quasi-optical mixers. Now, his interest is the measurement method of the total radiated power emitted by the radio equipment and the biomedical application of electromagnetic wave.

Research Fields of Interest

Simple and Accurate Radiation Efficiency Measurement

- Wheeler cap method and their numerical and uncertainty analysis
- Refection method and their numerical and uncertainty analysis
- Development of other measurement method of reflection coefficient using hybrid coupler or power divider for Wheeler cap method

Near-Field Gain Measurement in Lossy Homogeneous Medium

- Calibration of reference antenna operated in tissue equivalent liquid
- Development of waveguide aperture antenna and shielded loop antenna operated in the tissue-equivalent liquid as reference antenna for E-field probe calibration
- Calibration of E-field probe used in the standard SAR measurement of the mobile communication devises. (SAR: Specific Absorption Rate)

Total Radiated Power Measurement of Mobile Communication Devices

Education

1996: Doctoral Eng. degree in Electronic and Information Engineering, Hokkaido University, Japan
1991: Master Eng. degree in Electronic Engineering, Hokkaido University, Japan
1989: B.S. in Electronic Engineering, Hokkaido University, Japan

Professional Societies and Activities

1. Member, IEEE AP, EMC, IM MTT
2. Senior Member, IEICE, Japan
3. Secretary, Technical Committee on Antennas and Propagation of IEICE, 2011-2013
4. Vice-Chair, Technical Committee on Advanced Testing and Certification Technology for Radio Equipment of IEICE, 2010-2012
5. Associate Editor, IEICE Trans. Communications (Japanese Edition), 2007-2011

Awards

1. Outstanding Contributions Award of Communications Society, IEICE, Japan, 2011
2. Young Engineer Award of IEICE, Japan, 1996

Major Publications

Papers

[1]"Uncertainty evaluation for radiation efficiency measurement using Wheeler and reflection method," *IEICE Trans. Communications* (*Japanese Edition*), vol.J94-B, no.9, pp.1094-1103, 2011.

[2] "Comparison of sampling methods for total radiated power estimation from radio equipment integrated with antennas," *IEICE Trans. Communications*, vol.E94-B, no.5, pp.1174-1183, 2011.

[3] "Measurement of complex permittivity of construction material by the use of the model- based standing wave method," *IEICE Trans. Communications* (*Japanese Edition*), vol.J91-B, no.8, pp.852-860, 2008.

[4] "Simultaneous measurement of antenna gain and complex permittivity of liquid in Fresnel region using weighted regression," *IEICE Trans. Communications*, vol.E91-B, no.6, pp.1831-1837, 2008.

[5] "Analysis of the reflection method for measuring the radiation efficiency using the transmission line model," *IEICE Trans. Communications*, vol.E90-B, no.9, pp.2394-2400, 2007.

[6] "A method of measuring gain in liquids based on the Friis transmission formula in the near-field region", *IEICE Trans. Communications*, vol.E90-B, no.9, pp.2401- 2407, 2007.

[7] "Some techniques for avoiding dips of antenna radiation efficiency on improved Wheeler method", *IEICE Trans. Communications* (*Japanese Edition*), vol.J88-B, no.11, pp.2287- 2295, 2005.

[8] "A new estimation of Wheeler efficiency," *IEICE Trans. Communication* (*Japanese Edition*), vol.J88-B, no.7, pp.1370-1371, 2005.

[9] "Simultaneous measurement of antenna gain and solution dielectric properties," *IEICE Trans. Commu- nications*, vol.E88-B, no.6, pp.2268-2274, 2005.

[10] A method for achieving electromagnetic wave absorption by low-loss stratified construction materials," *IEEE Trans. Electromagnetic Compatibility*, vol.47, no.1, pp.105-111, 2005.

Books

[1] Ishii N. 2011, *Antenna Basic Metrology*, Corona Publishing, Co., Ltd. (written by Japanese)

[2] Ishii N. 2009, *Elementary Electromagnetism*, Corona Publishing, Co., Ltd. (written by Japanese)

[3] Maruyama T. and Ishii N. 2007 *Elementary Vector Analysis*, Corona Publishing, Co., Ltd. (written by Japanese)

Book Chapters

[1] Ishii N. 2008, sec.3.2, *Antenna Handbook 2nd edition*, edited by IEICE, Ohmsha, Ltd, pp.49-57. (written by Japanese)

[2] Ishii N. 2006, sec. III-1.2, III-1.5, III-3.2.4, *Antenna and Radio Handbook*, edited by Goto N., Nakagawa M., and Itoh K., Ohmsha, Ltd, pp.145-149, 162-164, 254-256. (written by Japanese)