FOREWORD

Special Section on Optical Access Technologies

Optical access, which economically provides much higher speed communications compared to metallic access, has become a key technology to realize broadband services. Recently, PON (Passive Optical Network) technology has been established, and commercialized systems have been deployed world-wide. Further evolution of optical access technologies is still expected and much technical researches are needed to improve bandwidth and performance of optical access systems. For instance, international standardization activities, researches, and development on 10GE-PON, which is aiming for achieving higher bit-rates than GE-PON and G-PON, are in progress, and are expected to be commercialized within few years. 10GE-PON is based on the current technologies, such as TDM-based PON. On the other hand, in order to overcome the limitation of the current TDM-based PON, researches on WDM-PON using wavelength division multiplexing technology and optical CDMA using code division multiplexing technology are also being carried out extensively. These technologies are expected to make a significant advance in optical access systems. Furthermore, reach extension of PON, traffic control on access systems, and migration technologies are quite important issues. This special section aims to gather advanced research results and promote research activities in this field. This special section will be published in February, 2010.

This special section is intended to discuss recent advances in optical access technologies and includes the following topics of interest.

- Time-slot-multiplexing-based optical access (e.g., GE-PON, G-PON and 10GE-PON)
- Wavelength-multiplexing-based optical access (e.g., WDM-PON)
- Code-multiplexing-based optical access (e.g., Optical CDMA)
- Technologies for capability improvement (e.g., long-reach PON, branch count increase of PON and protection switching for higher reliability)
- Video distribution technologies over optical access (e.g. optical modulation for TV signal transmission, multicast method for packetized video)
- Migration from the current system to a new system

This section consists of three invited papers, two letters and three papers that were selected from 14 submissions. The invited papers provide excellent discussion on new optical access architecture, standardization trends, and new concept of optical access.

Here, I would like to express my sincere thanks all authors for their excellent papers, and the reviewers and editorial committee members for their great efforts that significantly contributed to the outstanding quality of this special section.

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Tomohiro Ishihara *(Member)* received B.E. and M.E. degrees from Waseda University, Japan in 1983 and 1985 respectively. He joined Fujitsu Laboratories Ltd. in 1985 and worked for R&D of optical communication systems, SDH (Synchronous Digital Hierarchy) transmission systems, and ATM-based transmission systems. He was a visiting researcher in University of California, Berkeley from 1991 to 1992. He also led R&D of broadband access system and home network system. He is currently the director of Server Networking Laboratory in Fujitsu Laboratories, and leading R&D on network technologies for cloud computing systems. He has been the chair of Technical Committee on Communication Systems in IEICE Communications Society since 2008. He is a member of IEEE.

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