Introduction to the Issue on Fiber-Optic Passive Components

THIS ISSUE of the IEEE JOURNAL OF SELECTED TOPICS IN QUANTUM ELECTRONICS (JSTQE) is devoted to providing an overview of recent progress in the field of fiber-optic passive components and to highlight new developments and current trends. Contrary to its name, fiber-optic passive components is a very active field of research and development. Looking at today's photonics communications, we find many passive components being used in systems and deployed in the field. As in the past, we can expect that any new breakthrough in photonics will certainly use and critically rely on high-performance fiber-optics passive components to function properly. For example, erbium-doped fiber amplifiers require wavelength-division-multiplexed couplers, optical isolators and, most recently, gain flattening filters; add–drop wavelength multiplexers would not be possible without fiber Bragg gratings and circulators, etc.

These quite elementary examples illustrate the strategic importance of passive components and their technologies in the development of new ideas and approaches: we should always be ready to choose from emerging developments rather than waiting for them to mature for new applications.

Also noteworthy, fiber-optic passive components are a very creative area to work in, as they call for merging of physical ideas and understanding, technological and engineering efforts, and a multidisciplinary attitude toward system requirements.

This issue is a collection of 21 contributed paper and 5 invited papers from leading experts in the U.S., Japan, and Europe, several of which were presented in preliminary form at WFOPC—the Workshop on Fiber-Optics Passive Components held at the University of Pavia, Italy, 18 and 19 September 1998. It was the enthusiastic response to that workshop that encouraged us to call for this selected topics issue.

Publisher Item Identifier S 1077-260X(99)10384-8.

The papers collected in this issue represent what we believe is a vehicle for disseminating new ideas and stimulating further advances in the field. In particular, the issue offers a good coverage of short- and long-period fiber Bragg gratings, arrayed waveguide gratings, filters, coupling and mode conversion, fiber technologies, and measurement and reliability issues. For readers' reference, we mention two other recent special issues of this JOURNAL dealing with topics close to ours, namely: Alignment-Tolerant Structures for Optoelectronic Packaging (vol. 3, December 1997) and Integrated Optics (vol. 2, June 1996).

We would like to thank all the authors who contributed to this issue as well as the reviewers for their invaluable contributions and patience in trying to perfect manuscripts and shape this issue to provide the most useful content.

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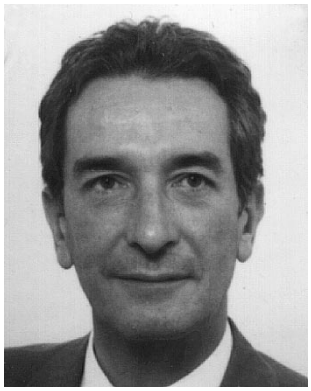
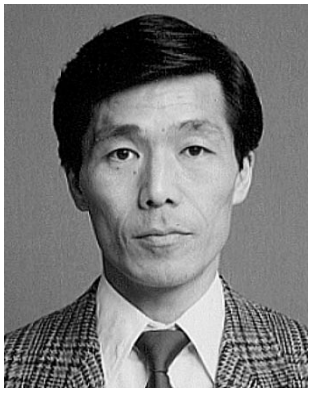


Silvano Donati (M'75–SM'98) was born in Milan, Italy.

From 1966 to 1975, he was with CISE, Milan, and as Lecturer of courses in Electronics since 1971. He has been a Full Professor in Optoelectronics at University of Pavia since 1980. He has been engaged in researches on photodetectors, laser interferometry, and optical fiber sensors and, since 1985, has worked on passive fiber-optic components (coupler, isolator, polarizers, attenuators), optical amplifier noise, and chaotic cryptography. He has authored one book in English, *Photodetectors* (Englewood Cliffs, NJ:Prentice Hall, 1999) and several books in Italian, and has authored or co-authored about 160 papers and holds 10 patents. He has been the Chairman of Optoelectronics Society of AEI (Italian Electronics Engineers Association) from 1993 to 1996, and the Editor of the Journal, *Alta Frequenza*, from 1986 to 1992. He has organized several national (Elettroottica'94 and Fotonica'97) and international conferences and workshops as a chairman (WFOPC, ODIMAP) or as a member of steering or TP committees.

Dr. Donati is a member of the American Physical Society, Optical Society of America, AEI, and IMAPS. He has received six prizes from AEI, of which he is a Senior and Meritorious Member. In 1997, he started and is presently the Chairman of the LEOS Italian Chapter.



Katsunari Okamoto (M'85–SM'98) was born in Hiroshima, Japan, on October 19, 1949. He received the B.S., M.S., and Ph.D. degrees in electronics engineering from Tokyo University, Tokyo, Japan, in 1972, 1974, and 1977, respectively.

He joined Ibaraki Electrical Communication Laboratory, Nippon Telegraph and Telephone Corporation, Ibaraki, Japan, in 1977, and was engaged in the research on transmission characteristics of multimode, dispersion-flattened single-mode, single-polarization (PANDA) fibers, and fiber-optic components. As for the dispersion-flattened fibers (DSF), he first proposed the idea and confirmed experimentally. From September 1982 to September 1983, he joined Optical Fiber Group, Southampton University, Southampton, U.K., where he was engaged in the research on birefringent (bow-tie) optical fibers. Since October 1988, he has been working on the analysis and synthesis of the guided-wave devices, the computer-aided-design (CAD) and fabrication of the silica-based planar lightwave circuits at Ibaraki R&D Center, NTT Opto-electronics Laboratories. He has developed 128ch 25-GHz spacing AWG's, flat spectral response AWG's and integrated-optic add–drop multiplexers. He is presently a Research Fellow in Okamoto Laboratory. He published more than 100 papers and authored or co-authored eight books.

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Tiziana Tambosso (M'94) received the M.S. and Ph.D. degrees in optoelectronic engineering from University of Pavia, Pavia, Italy, in 1983 and 1988, respectively.

After a period spent with SGS-Thomson, working on design and development of bipolar electronic circuits for telecommunication applications, she has been a researcher at University of Pavia and worked on fiber-optic passive components and fiber-optic sensors. From 1989 to 1993, she has been responsible for the fiber-optic devices group at SIRTI, R&D Division, developing optical fiber couplers, attenuators, and EDFA amplifiers. In 1993, she joined CSELT, the Telecom Italian Group R&D Laboratories, where she has developed second window fiber-optic amplifiers. Since 1996, she has been the head of a Group on passive optical components measurement, reliability and standardization. From 1993 to 1997, she was the Secretary of IEC Subcommittee SC86B on fiber optic interconnecting devices and passive components. She holds eight patents and has authored more than forty papers.

Dr. Tambosso is a member of AEI (Italian Electronics Engineers Association). Presently, she is the Secretary of the IEEE LEOS Italian Chapter.