

Preface

Andrea Galtarossa and Curtis R. Menyuk

This volume had its origin in conversations we had with Professor Carlo Someda of the Università di Padova in summer 2001. All three of us have had a long-standing interest in polarization mode dispersion and, more generally, polarization effects in optical fibers. We were all impressed by the great increase in interest in this subject that had occurred in the past two years. This subject has many theoretical and experimental subtleties, and we were concerned by the propagation of misconceptions in the scientific literature. The idea of a summer school arose, focused on polarization mode dispersion—or PMD—as it is usually known. Perhaps, it would be an appropriate topic for Lake Como, where summer schools are held every year. Carlo heartily endorsed the idea of a summer school, but suggested that we hold it in Venice. Thus, the idea of holding a summer school on PMD in Venice was born.

The next year was a flurry of activity in which we decided what topics should be taught and who should be asked to teach them. We asked many of the most distinguished researchers in the field to be instructors, and, to our great delight, everyone that we asked was able to accept. At the same time, Carlo was arranging for the Istituto Veneto di Scienze, Lettere, ed Arti to host the summer school and was finding support from commercial sponsors. This financial support, for which we are very grateful, along with the hard work of the local organizing committee and in particular by Marco Santagiustina, allowed us to invite the instructors gratis and to greatly reduce the cost to the participants from what we had originally anticipated.

During this year, the telecommunications bubble burst, and we were worried that not enough paying participants would come to the school. In the end, we need not have worried. Almost every possible seat was filled. Indeed, the school made a small profit, which was expended as prizes for graduate students and non-tenure-track research faculty at universities.

The linchpin of the school was two-hour lectures. The first, which was delivered by Bob Jopson and Lynn Nelson, gave an introduction to the subject of PMD. The second, which was delivered by Henning Bülow and Stéphanie Lanne, discussed the important topic of PMD mitigation; Andrea Galtarossa and Anna Pizzinat presented

the model for low-PMD fibers; Nicolas Gisin covered the increasingly important topic of the interaction of PMD with polarization dependent loss. Other topics that were included in the school were: “PMD models,” which was covered by Antonio Mecozzi and Mark Shtaif; “Interaction of PMD with nonlinearity and chromatic dispersion,” which was covered by Curtis Menyuk; “PMD measurement techniques,” which was covered by Paul Williams and by Marco Schiano in two separate lectures; “Spatially resolved measurement of fiber polarization properties,” which was covered by Luca Palmieri and Andrea Galtarossa; “PMD impact on optical systems,” which was covered by Magnus Karlsson and by Francesco Matera in two separate lectures; “Polarization effects in recirculating loops,” which was covered by Brian Marks, Gary Carter, and Yu Sun; “PMD Emulation,” which was covered by Alan Willner and Michelle Hauer; and, finally, “Applications of importance sampling to PMD,” which was covered by Gino Biondini, Bill Kath, and Sarah Fogal. Dipak Chowdhury worked with Artis and VPI—two producers at that time of commercial software for modeling optical fiber communications systems—to present a lecture that covered numerical modeling of PMD. Additionally, we had lectures on special topics by Hermann Haus, Jim Gordon, Herwig Kogelnik, and Carlo Someda. Finally, we had a poster session, which gave the lecturers the opportunity to learn something from our participants.

The feedback that we received from the participants and the lecturers was overwhelmingly positive. This success was due to the great time and energy that all the instructors put into their lectures. At the summer school and thereafter, we continued to receive the suggestion from many of the lecturers and participants that the summer school lectures would be of interest to a broad audience in the optical fiber communications community.

After asking our lecturers to put so much time and energy into their lectures, we were a little reluctant to request an additional effort. There was also a concern that the material would have to be updated. However, since the material is largely tutorial in nature, little updating was in fact needed. In the end, all the lecturers provided us with contributions, and the result is the volume that you have before you. We hope that it will be of use to researchers and the students in the field of optical fiber communications who want to have an introduction to PMD. If this volume is as successful as the school, it will be due to the hard work of the contributors.

As a final note, we owe a significant debt to Professor Hermann Haus of MIT. He enthusiastically participated in the summer school, sitting in the front row and posing illuminating questions to the lecturers. It was his suggestion to include poster sessions in the school. He passed away suddenly in May 2003. The loss to our community of one of its most distinguished members is still deeply felt.

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