Optical and Quantum Electronics **30** *(1998) 285–286*

SPECIAL ISSUE

The 1997 International Workshop on Optical Waveguide Theory and Numerical Modelling

It is a good tradition that the Proceedings of the International Workshop on Optical Waveguide Theory and Numerical Modelling are published in this Journal. The Workshop was held on 19 and 20 September 1997 at the University of Twente in Enschede, the Netherlands. It is traditionally loosely connected with the European Conference on Optical Communication (ECOC), and was attended by 30 participants, of whom however only 10% also attended the ECOC. Besides a perceived shift of focus at the ECOC towards systems, other factors explaining the small overlap may be the distance (with the North Sea in between) from Edinburgh, the ECOC venue, and the concurrently held workshop on lasers in Scotland. This special issue was open for other relevant contributions besides the articles that found their origin in presentations given at the workshop.

A variety of modelling techniques is treated in this issue. Besides exciting novel evolutionary design approaches, still a lot of important and interesting work is done on improving and extending more classical methods. We tried to order the contributions to this issue by classifying them according to one of the following subjects: (1) device-oriented modelling, (2) beam propagation methods, (3) mode solvers, (4) boundary conditions and (5) non-linear phenomena. Since these classes are by no means mutually exclusive, there is some degree of arbitrariness in the ordering.

Although the field of optical waveguide modelling is gradually reaching a mature age, we still perceive a lack of convergence towards a limited number preferred methods for certain classes of problems. Instead, new methods pop up all over the place, a sure sign that there are still lots of problems to be solved. The co-existence of several methods for solving roughly the same problem may among others originate from the fact that researchers in integrated optics often have to make a trade-off between computational speed and accuracy. In exploring new device ideas and in the early phases of device design, there is a need for fast, preferably analytical, models, which mostly carry with them a number of simplifying assumptions. As the design progresses, the parameter space is reduced and it becomes possible and necessary to eliminate the most annoying assumptions.

If we compare the situation in the fields of integrated optics (IO) and integrated electronic circuits (IC), we see two major differences; firstly, the basic IO elements are a lot more difficult to model than the IC ones, and secondly, the community of IC designers is orders of magnitude larger than that in IO, reflecting the current state of commercial interest. Both factors contribute to the lack of availability of widely accepted standard IO modelling tools, as opposed to the IC-case (e.g. SPICE). Furthermore, in IO-devices there is a large spread in functionality, and also different devices are used for the same functionality.

The state of 'anarchism' in the IO modelling field certainly provides many rewarding opportunities to its practitioners, but we feel that the IO-field as a whole would benefit

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from the availability of standard tools. This is the most important challenge for the IO modelling community.

We like to thank the authors and the referees for providing and safe-guarding the high-quality technical content of this OQE issue and for complying with the tight time schedule. Furthermore, we gratefully acknowledge the support of our secretarial staff, Carolien Walda, Simone Moekotte and Judith Beld.

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