<<非线性纤维光学>>

图书基本信息

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前言

Since the publication of the first edition of this book in 1989, the field of nonlinear fiber optics has remained an active area of research and has thus continued to grow at a rapid pace. During the 1990s, a major factor behind such a sustained growth was the advent of fiber amplifiers and lasers, made by doping silica fibers with rare-earth materials such as erbium and ytterbium. Erbium-doped fiber amplifiers revolutionized the design of fiber-optic communication systems, including those making use of optical solitons, whose very existence stems from the presence of nonlinear effects in optical fibers. Optical amplifiers permit propagation of lightwave signals over thousands of kilometers as they can compensate for all losses encountered by the signal in the optical domain. At the same time, fiber amplifiers enable the use of massive wavelength-division multiplexing, a technique that led by 1999 to the development of lightwave systems with capacities exceeding 1 Tb/s. Nonlinear fiber optics plays an important role in the design of such high-capacity lightwave systems. In fact, an understanding of various nonlinear effects occurring inside optical fibers is almost a prerequisite for a lightwave-system designer. Starting around 2000, a new development occurred in the field of nonlinear fiber optics that changed the focus of research and has led to a number of advances and novel applications in recent years. Several kinds of new fibers, classified as highly nonlinear fibers, have been developed. They are referred to with names such as microstructured fibers, holey fibers, or photonic crystal fibers, and share the common property that a relatively narrow core is surrounded by a cladding containing a large number of air holes. The nonlinear effects are enhanced dramatically in such fibers to the extent that they can be observed even when the fiber is only a few centimeters long. Their dispersive properties are also quite different compared with those of conventional fibers devel-oped for telecommunication applications. Because of these changes, microstructured fibers exhibit a variety of novel nonlinear effects that are finding applications in fields as diverse as optical coherence tomography and high-precision frequency metrology.

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内容概要

这是一本内容非常新颖的非线性纤维光学的研究生教材。
自1989年初版以来,随着非线性纤维光学的迅速发展,作者对其内容不断地更新和扩充。
这最新版虽保留了第1版的大部分内容，但更重要的是它全面介绍了非线性纤维光学领域的最新研究成果，这一特点使得该书不仅是一本优秀的教材，也是相关领域的科学家和工程师的一本重要的参考书。

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书籍目录

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