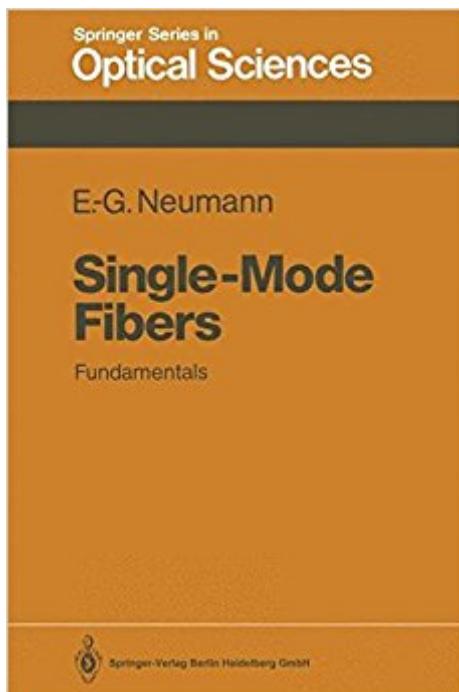


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Single-Mode Fibers: Fundamentals (Springer Series In Optical Sciences) (Volume 57)



Synopsis

Single-mode fibers are the most advanced means of transmitting information, since they provide extremely low attenuation and very high bandwidths. At present, long distance communication by single-mode fibers is cheaper than by conventional copper cables, and in the future single-mode fibers will also be used in the subscriber loop. Since single-mode fibers have many applications, a variety of people need to understand this modern transmission medium. However, waveguiding in single-mode fibers is much more difficult to understand than waveguiding in copper lines. A single-mode fiber is a dielectric waveguide operated at optical wavelengths. Since 1961, I have been involved in experimental and theoretical research on dielectric rod waveguides in the microwave region. From the experiments, I learned much about the properties of a wave guided by a dielectric rod or a glass fiber, especially about its behavior at waveguide discontinuities like bends, gaps, or the waveguide end. Since 1972, my co-workers and I have also been investigating dielectric waveguides at optical frequencies, and since 1973 I have lectured on "Optical Communications". These activities have shown that there is a need for a tutorial introduction to the new technical field of single-mode fibers. In this book the physical fundamentals are emphasized and the mathematics is limited to the absolutely necessary subjects. Besides presenting a physical explanation of waveguiding in single-mode fibers, it is also the aim of this book to give an overview of the knowledge accumulated in this field.

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