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<<电磁噪声和量子光学测量>>

图书基本信息

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内容概要

Electromagnetic Noise and Quantum
Optical Measurements is the result of more than 40 years of research and teaching. The first three chapters provide the background necessary to understand the basic concepts. Then shot noise and thermal noise are discussed, followed by linear noisy multiparts, the quantum theory of waveguides and resonators, an analysis of phase-insensitive systems, detection, photon probability distributions, solitons, phase-sensitive amplification, squeezing, the quantum theory of solitons and squeezing, and quantum non-demolition measurements. Rich appendices give additional information. The book is intended for graduate students and scientists in physics and engineering. Numerous problems and selected solutions will help readers to deepen their knowledge.

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2. Waveguides and Resonators
3. Diffraction, Dielectric Waveguides, Optical Fibers,and the Kerr Effect
4. Shot Noise and Thermal Noise
5. Linear Noisy Multiports
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7. Classical and Quantum Analysis of Phase-Insensitive Systems
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章节摘录

版权页：插图：It is a fact that shot noise can be reduced bF utilizing the mutual repul-sion among the negatively charged electrons. An electron emitted from thecathode can inhibit the emission of electrons following it. This process is uti-lized to reduce the noise emission from cathodes in traveling-wave tubes.On the other hand, if both the amplitude and the phase of an optical waveare to be detected in a heterodyne experiment （Chap. 8）, one cannot rely onthe repulsion effect if the amplitude changes of the wave are to be faithfullyreproduced at frequencies as high as optical frequencies. In this case the fullshot noise level has to be accepted. It turns out that shot noise is the funda-mental noise process required to satisfy the uncertainty principle applied toa simultaneous measurement of the amplitude and phase of an optical fieldin heterodyne detection, as discussed in Chap. 8.

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