

<<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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 5. Linear Noisy Multiports
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章节摘录

版权页：插图：It is a fact that shot noise can be reduced by utilizing the mutual repulsion among the negatively charged electrons. An electron emitted from the cathode can inhibit the emission of electrons following it. This process is utilized 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 wave are to be detected in a heterodyne experiment (Chap. 8), one cannot rely on the repulsion effect if the amplitude changes of the wave are to be faithfully reproduced at frequencies as high as optical frequencies. In this case the full shot noise level has to be accepted. It turns out that shot noise is the fundamental noise process required to satisfy the uncertainty principle applied to a simultaneous measurement of the amplitude and phase of an optical field in heterodyne detection, as discussed in Chap. 8.

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