

1. Record Nr.	UNINA9910790471003321
Titolo	Optical coatings and thermal noise in precision measurement // edited by Gregory Harry, Timothy P. Bodiya and Riccardo DeSalvo [[electronic resource]]
Pubbl/distr/stampa	Cambridge : , : Cambridge University Press, , 2012
ISBN	1-107-22691-0 1-280-48450-0 9786613579485 1-139-20555-2 1-139-20336-3 1-139-20634-6 1-139-20194-8 1-139-20476-9 0-511-76231-3
Descrizione fisica	1 online resource (xiv, 328 pages) : digital, PDF file(s)
Classificazione	SCI053000
Disciplina	621.36
Soggetti	Optical coatings Quantum optics Light - Scattering Electromagnetic waves - Scattering
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Title from publisher's bibliographic system (viewed on 05 Oct 2015).
Nota di bibliografia	Includes bibliographical references.
Nota di contenuto	Machine generated contents note: 1. Theory of thermal noise in optical mirrors Y. Levin; 2. Coating technology S. Chao; 3. Compendium of thermal noises in optical mirrors V.B. Braginsky, M.L. Gorodetsky and S. P. Vyatchanin; 4. Coating thermal noise I. Martin and S. Reid; 5. Direct measurements of coating thermal noise K. Numata; 6. Methods of improving thermal noise S. Ballmer and K. Somiya; 7. Substrate thermal noise S. Rowan and I. Martin; 8. Cryogenics K. Numata and K. Yamamoto; 9. Thermo-optic noise M. Evans and G. Ogin; 10. Absorption and thermal issues P. Willems, D. Ottaway and P. Beyersdorf; 11. Optical scatter J.R. Smith and M.E. Zucker; 12.

Reflectivity and thickness optimisation I.M. Pinto, M. Principe and R. DeSalvo; 13. Beam shaping A. Freise; 14. Gravitational wave detection D. Ottaway and S.D. Penn; 15. High-precision laser stabilisation via optical cavities M.J. Martin and J. Ye; 16. Quantum optomechanics G.D. Cole and M. Aspelmeyer; 17. Cavity quantum electrodynamics T.E. Northup.

Sommario/riassunto

Thermal noise from optical coatings is a growing area of concern and overcoming limits to the sensitivity of high precision measurements by thermal noise is one of the greatest challenges faced by experimental physicists. In this timely book, internationally renowned scientists and engineers examine our current theoretical and experimental understanding. Beginning with the theory of thermal noise in mirrors and substrates, subsequent chapters discuss the technology of depositing coatings and state-of-the-art dielectric coating techniques used in precision measurement. Applications and remedies for noise reduction are also covered. Individual chapters are dedicated to specific fields where coating thermal noise is a particular concern, including the areas of quantum optics/optomechanics, gravitational wave detection, precision timing, high-precision laser stabilisation via optical cavities and cavity quantum electrodynamics. While providing full mathematical detail, the text avoids field-specific jargon, making it a valuable resource for readers with varied backgrounds in modern optics.
