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Disciplina	530.417 530.44
Soggetti	Surfaces (Physics) Interfaces (Physical sciences) Thin films Optical materials Electronics - Materials Lasers Photonics Surfaces (Technology) Surface and Interface Science, Thin Films Optical and Electronic Materials Optics, Lasers, Photonics, Optical Devices Surfaces and Interfaces, Thin Films
Lingua di pubblicazione	Inglese
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Nota di contenuto	Introduction and background information -- Physical features of the surface plasmon polariton -- Design features of surface plasmon resonance sensors -- Modeling and data processing -- SPR-sensor properties of metal films and particles: free electron type metals -- Classical noble metals -- Noble transition metals of the platinum group -- Common transition metals -- Other common metals -- SPR active metal-type compounds -- Heavy metals -- Artificial metal-insulator

multi-layer structures -- Practical Applications -- Conclusions.

Sommario/riassunto

This significantly extended second edition addresses the important physical phenomenon of Surface Plasmon Resonance (SPR) or Surface Plasmon Polaritons (SPP) in thin metal films, a phenomenon which is exploited in the design of a large variety of physico-chemical optical sensors. In this treatment, crucial materials aspects for design and optimization of SPR sensors are investigated and described in detail. The text covers a selection of nanometer thin metal films, ranging from free-electron to the platinum-type conductors, along with their combination with a large variety of dielectric substrate materials, and associated individual layer and opto-geometric arrangements. Whereas the first edition treated solely the metal-liquid interface, the SP-resonance conditions considered here are expanded to cover the metal-gas interface in the angular and wavelength interrogation modes, localized and long-range SP's and the influence of native oxidic ad-layers in the case of non-noble metals. Furthermore, a selection of metal grating structures that allow SP excitation is presented, as are features of radiative SP's. Finally, this treatise includes as-yet hardly explored SPR features of selected metal–metal and metal–dielectric superlattices. An in-depth multilayer Fresnel evaluation provides the mathematical tool for this optical analysis, which otherwise relies solely on experimentally determined electro-optical materials parameters.