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Abstract:The authors provided an analysis of the surface plasmon resonance sensor (SPRS) working at terahertz (THz) frequency with angular modulation and made a brief comparison between optical SPRS and THz-SPRS. At optical frequency, there is a dip in the angular reflection spectrum due to the resonant transfer of the energy carried by the incident light wave to surface plasmon, while there is an enhanced reflection peak at the terahertz frequency. The position of the peak is solely determined by the refractive indices of the prism and the sample, and independent of the properties of the metal film. Our results show that the determination of the dielectric constant of a sample in the THz SPRS is much simpler than its optical counterpart. Taking into account of the importance of THz technology applying in biological and medical field, tThe authors' device may provide a valuable method for bio-sensing and analysis.
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