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Title:Surface plasmon waves on noble metals at optical wavelengths
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Abstract:In this paper the variation of the propagation constant, the attenuation coefficient, penetration depth inside the metal and the dielectric has been evaluated. The propagation characteristics of Surface Plasmon Waves (SPWs) which exists on noble metals like gold (Au), silver (Ag) and aluminium (Al) due to the formation of Surface Plasmon Polaritons (SPPs), have been evaluated theoretically and simulated. It has been found that highly conducting metals Au and Ag provide a strong confinement to the SPWs than Al at optical frequencies. The comparative study reveals that metal having higher conductivity can support a more confined SPW, having a lower penetration depth than metals of lower conductivity at terahertz frequencies when its dielectric constant assumes a negative value.
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Main heading:Metals
Controlled terms:Electromagnetic wave polarization - Penetration depth (superconductivity) - Plasmons - Silver
Uncontrolled terms:Attenuation coefficient - Comparative studies - Negative values - Optical frequency - Optical wavelength - Propagation characteristics - Propagation constant - Spp - Spw - Strong confinement - Surface plasmon polaritons - Surface plasmon waves - Terahertz frequencies
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