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Title:Terahertz Wave Applications of Single-Walled Carbon Nanotube Films with High Shielding Effectiveness
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Abstract:We demonstrate that a filtration method is efficient for the fabrication of thick single-walled nanotube films and is capable of shielding terahertz waves. Shielding effectiveness can be engineered by controlling the film thickness and we achieved 38 dB for a 950-nm-thick film. In addition, we found that the films exhibit a dispersion of dielectric constant obeying the Drude free-electron model, whereas the plasma frequency decreases with increasing film thickness. Based on the nanotube films with a thickness greater than the skin depth, we fabricated grid polarizers by laser- machining process, which enable us to achieve a large polarization extinction ratio.
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Inspec controlled terms:carbon nanotubes - disperse systems - filtration - laser beam machining - nanofabrication - nanofiltration - permittivity - terahertz waves - thin films
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