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Title:Energy transportation in a subwavelength waveguide composed of a pair of comb-shape nanorod chains
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Abstract:A subwavelength plasmonic waveguide composed of a pair of comb-shape nanorod chains is proposed. The electromagnetic energy can be transported in the waveguide via the interaction strength of magneto-inductive coupling as well as conduction current exchange. Finite Element Method simulation results reveal that for such a waveguide composed of 50 pairs of 400 nm-long-nanorods, a passband ranging from zero to cutoff frequency 156.2 THz, and an effective propagation length of 20.87 μm can be achieved simultaneously. The proposed mechanism of energy transport in the nanoscale has potential applications in subwavelength transmission lines for a wide range of integrated optical devices.
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Inspec controlled terms:electromagnetic induction - electromagnetic wave propagation - finite element analysis - nanophotonics - nanorods - optical waveguides - plasmonics
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Numerical data indexing:size 4.0E-07 m;frequency 1.562E+14 Hz
Treatment:Practical (PRA); Theoretical or Mathematical (THR)
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