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Title:Controlling terahertz radiation with nanoscale metal barriers embedded in nano slot antennas
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Abstract:Nanoscale metallic barriers embedded in terahertz (THz) slot antennas are shown to provide unprecedented control of the transition state arising at the crossover between the full- and half-wavelength resonant modes of such antennas. We demonstrate strong near-field coupling between two paired THz slot antennas separated by a 5 nm wide nanobarrier, almost fully inducing the shift to the resonance of the double-length slot antenna. This increases by a factor of 50 the length-scale needed to observe similar coupling strengths in conventional air-gap antennas (around 0.1 nm), making the transition state readily accessible to experiment. Our measurements are in good agreement with a quantitative theoretical modeling, which also provides a simple physical picture of our observations.
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