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Title:Superconducting terahertz metamaterials mimicking electromagnetically induced transparency

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Abstract:We designed and fabricated planar terahertz (THz) metamaterials made from superconducting NbN films to mimic electromagnetically induced transparency (EIT) system. They are characterized using THz time domain spectroscopy over a temperature range from 8 to 300 K. High transmittance and large delay-bandwidth product at transparency window are demonstrated, which mainly arise from the enhanced coupling and decreased damping in superconducting state. The EIT-like spectral response could be tuned in a wide frequency range. By applying two dark resonators with different resonance frequencies coupled with a radiative resonator, we experimentally demonstrated the planar metamaterials mimicking four-level EIT system.

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