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摘要: We report a type of infrared switchable plasmonic quantum cascade laser, in which far field light in the midwave infrared (MWIR, 6.1 pm) is modulated by a near field interaction of light in the telecommunications wavelength (1.55 mu m). To achieve this all-optical switch, we used cross-polarized bowtie antennas and a centrally located germanium nanoslab. The bowtie antenna squeezes the short wavelength light into the gap region, where the germanium is placed. The perturbation of refractive index of the germanium due to the free carrier absorption produced by short wavelength light changes the optical response of the antenna and the entire laser intensity at 6.1 mu m significantly. This device shows a viable method to modulate the far field of a laser through a near field interaction.
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