Abstract

In this paper, the increasing of quality factor in the stimulated amplification of surface plasmon polaritons at visible frequencies was reported. Laser science has been successful in producing high powered, faster, and smaller coherent light sources. Such lasers are restricted, both in optical mode size and physical device dimension, to being larger than half the wavelength of the optical field, and it remains a key fundamental challenge to realize ultra-compact lasers that can directly generate coherent optical fields at the nanometer scale, far beyond the diffraction limit. A way of addressing this issue is to make use of surface plasmons, which are capable of tightly localizing light, but so far ohmic losses at optical frequencies have inhibited the realization of truly nanometer-scale lasers based on such approaches. We design a plasmonic laser with quality factor equal 900 at wavelength 500 nm.

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Index Terms

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