

Terahertz Plasmonic Microcavity with High Quality Factor and Ultrasmall Mode Volume

Zhen Gao, Linfang Shen, Xiaodong Zheng, 吳家和, 楊宗哲, Dongxiao Yang

Electrical Engineering

Engineering

jjwu@chu.edu.tw

Abstract

In this paper, the characteristics of a novel terahertz plasmonic microcavity consisting of a circular hole and a coaxial (metallic) cylindrical core machined on a planar metal surface is theoretically investigated. It is shown that such a structure can sustain plasmonic modes, whose resonant wavelengths are much larger than the hole diameter and fields tightly localized within the cavity. For this cavity, both high quality factor and ultrasmall mode volume can be achieved in the terahertz range. As this type of microcavity is particularly compatible with planar technology, it has promising applications in the miniaturization and integration of terahertz optical components.

Keyword : surface plasmon