

Abstract Submitted  
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**Plasmon-polariton band structures of asymmetric T-shaped plasmonic gratings**<sup>1</sup> MOHAMMED ABBAS, YIA-CHUNG CHANG, MIN-HSIUNG SHIH, Research Centre for Applied Sciences, Academia Sinica, Taiwan — It is shown that asymmetric T-shaped plasmonic gratings can display plasmon-polariton band structures with wide range of band gaps and tunable group velocities. A structure gap is introduced in the post of T-shaped plasmonic gratings and it is found that the size of this gap plays an important role in controlling the plasmon-polariton band gap and group velocities. We obtained variation of energy band gap ranging from 0.4eV to 0.0323eV by changing the size of the gap inside the structure from 0 to 250nm. The plasmon-polariton band structures were obtained by using Rigorous Coupled Wave Analysis (RCWA). We have studied the momentum gap in the photonic band structure. In this device, we obtain tunable group velocities ranging from one to several orders of magnitude smaller than the speed of light in the vacuum. This asymmetric T-shaped plasmonic grating is expected to have applications in surface plasmon polariton (SPP) based optical devices, such as filters, waveguides, splitters and lasers, especially for applications requiring large photonic band gap.

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