

UNIVERSITI TEKNOLOGI MARA

**ENHANCEMENT OF TERAHERTZ PHOTONIC
CRYSTAL CAVITIES PATCH ANTENNA
PERFORMANCES USING RESIZED GROUND
PLANE AND SLOTTED TECHNIQUES**

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ABSTRACT

This paper presents a simulation and analysis of a rectangular microstrip patch with photonic crystal cavities (PCC) (PTFE) as a substrate materials at 0.6 Terahertz (THz) using Electromagnetic Computer Simulation Tools (CST Microwave Studio©). The substrate utilizes a 2-D photonic crystal type. Many researches were conducted to improve the performance of antenna efficiency, return loss, power reflected for right hand side (RHS) and left side (LHS) in the near future for the applications of THz spectrum using current microstrip PCC at THz frequency having the limitations in terms of antenna efficiency, return lost, power reflected at LHS and RHS of the S11 are high. Therefore this paper will presents a few technique to modified the geometrical dimensions of the antenna, especially changing the dimensions of the ground plane, slot added at ground and slot on patch to improve the performances of the antenna .The respective results such as S parameters, antenna efficiency, return loss, power reflected at LHS and RHS . This paper prove that the antenna efficiency increase around 30.38%, return loss also around 8.71%, power reflected for LHS and RHS getting better compare with original result. Power reflected at the LHS increase around 57.88% and RHS 55.24%.

Keywords— Terahertz, microstrip antenna, Partial ground plane, Slotted.

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