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Design of Active Frequency Selective Surface Utilizing Laser Machined Electrostatic Actuated Cantilever Switches.

ABSTRACT - Masterthesis

Active frequency selective surfaces (FSS) are capable of shifting their resonant frequency through an array of integrated switching devices. FSS implementing semiconductor switches are limited due to high losses on high power requirements. Laser machined switches overcome these problems. They can be patterned, placed, fixated on the FSS and adjusted in two comparable simple manufacturing steps. Using this technique a simple 10×10 ring array has been developed implementing laser machined aluminium cantilever switches.

The objective of this thesis is the design of a new FSS with stainless steel cantilever switches operating at 10 GHz. The FSS shall be a multilayer structure with a Polyimide layer as insulation layer. The thesis includes the refinement of the fabrication process as well as the optimization of the RF behaviour. The FSS shall be manufactured and tested.