

Non-Confidential Description - PSU No. 2855
"Remote Sensing of Chemical and Biological Agents"

Keywords:

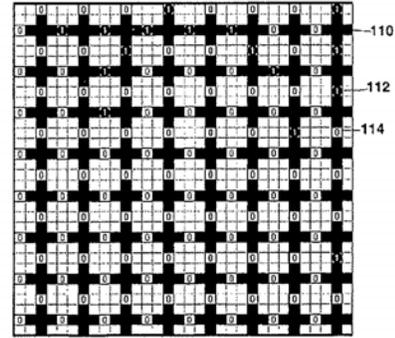
Chemical, biological detection, frequency selective surface, electromagnetic band gap structure, remote sensing

Links:

[Inventor Website](#)

Inventors:

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Background

Frequency selective surfaces (FSS) are periodically replicating patterned metal films that can be printed on the surface of a dielectric substrate. The geometry of the metal patterning allows the tailoring of the electromagnetic properties of the FSS surface. FSS surfaces are used as electromagnetic filtering devices for antenna systems, radomes, and absorbers. In particular, an FSS surface can be used to create thin electromagnetic band-gap (EBG) structures that can be used as Artificial Magnetic Conductors (AMC) at desired frequencies.

Invention Description

This invention describes a Reconfigurable FSS (RFSS) that has "cells" embedded in the pattern that are made up of chemoresistive materials that cause the electrical conductivity of the "cell" to change in the presence of a chemical or biological analyte. The change in electrical conductivity is correlated with a change in an external condition of the cell, such as the binding of a chemical agent to the cell. The FSS electromagnetic properties change in the presence of the analyte, and the analyte can be detected by remote interrogation of the RFSS.

Advantages/Applications

- Electrical detection of the presence of chemical or biological agents
- The RFSS device can be remotely monitored for detection
- Multiple analyte detection cells can be included on a single substrate
- Electromagnetic response of the RFSS can be tailored to needs
- Provides safe "stand-off" detection of dangerous analytes
- May be used covertly to detect analytes, or as "taggants"