

## Existence of Negative Refraction Index in Periodic Semiconductor-ferrite Composite in Microwave Frequencies

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Taking the advantage of negative permeability of certain ferrites, a new type of negative index materials (NIMs) with only-mu-negative (MNG) materials based on semiconductor-ferrite multi-layers has been proposed. We have studied the effective refraction of index of the film composite in microwave frequencies using transfer matrix method. We have found negative index of refraction could be realized in this kind of composite. For the given ferrite with negative permeability, the effects of material parameters of n-type silicon on negative index have been studied. We have found that the effective negative index and power loss depend on the layer thickness ratio between semiconductor and ferrite, and the impurity concentration in semiconductor. In comparison with other existing NIMs in microwave frequencies, the composite has advantages of low power loss and small in size.