

Abstract Submitted
for the NES17 Meeting of
The American Physical Society

Hyperbolic Metamaterials Used in the SPP DONG JU LEE, Westminster School, RICHARD KYUNG, Choice Research Group — Metamaterials are man-made combinations of two different media. By combining these media, and their properties such as permittivity and index of refraction, and creating a multilayered structure where each layer is thinner than the wavelength of the light propagating through it, new properties are born. The uniqueness about metamaterials is the ability to contain light waves that are greater in size than the entire structure. COMSOL was used for the SPP Problems and virtually constructed metamaterials of specific dimensions and indices of refraction. Then photons passing through the metamaterials were simulated. If the material successfully contains a standing wave within a metamaterial that is much smaller than the wave itself, it shows the size efficiency of using metamaterials in modern appliances. The relations, Reflection Coefficient vs. Angle and the Reflection Coefficient vs. Efficient Index showed the reflectivity of the light that has been propagated through the prism in two period metamaterials were different each other. To find the accurate incident angle and the effective index, we found the point at which the reflectivity (the y-axis) reaches 0. This suggests that the light has not been reflected; instead, it is traveling directly parallel to the media inside.

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Date submitted: 17 Mar 2017

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