

ABSTRACT

Fabrication of Polystyrene Sphere Monolayers and Their Transmission Properties

Two dimensional colloidal crystals have many applications such as Biosensors and Optical Switching Devices. Discovering and mastering a cost effective and efficient method to create colloidal crystals is of high interest. This talk will discuss how colloidal crystals are created using capillary action to assist the self-assembly of Polystyrene Sphere Monolayers. The transmission properties of the monolayers are also studied experimentally and theoretically using the Finite difference time-domain (FDTD) method. It is found that after light is transmitted through the crystal, constructive interference occurs and can be interpreted as an incomplete photonic band gap. This interference is found to be correlated with the diameter of spheres used. It is also found that the simulations follow the general trend of the transmission measured in the experiments.