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Study of optical properties of titania nanotube arrays by FDTD Method OOMMAN VARGHESE[1], PAWANJIT KAUR[2], University of Houston — Finite Difference Time Domain (FDTD) method is a powerful tool for understanding the propagation of electromagnetic waves through materials. The idea behind FDTD technique is to discretize both in time and space, the Maxwell equations with central difference approximations. The study of interaction between the nanostructured semiconductor materials and light is of high relevance in recent years primarily due to the applications of these materials in solar energy conversion process such as solar photovoltaics and solar photocatalysis. Titania nanotube arrays fabricated by anodic oxidation have already attracted considerable attention due to their unique properties and applications. This material has already demonstrated high light scattering and antireflection properties. To obtain a better understanding of nanotube-light interaction we used opti-FDTD software to study the influence of nanotube growth conditions on the optical properties. Simulations were carried out by defining the material properties and using the Lorenz drude model in 380-700nm range. In this presentation we will detail our findings on the correlation between the nanotube array fabrication conditions and its optical properties.

[1]Department of Physics
[2]Department of Physics

Oomman Varghese
University of Houston

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