

平成 19 年 11 月 12 日

応用物理学会北海道支部
会員各位

応用物理学会北海道支部

講演会のお知らせ

下記講演会を開催いたしますので、多数ご参加下さいますようご案内申し上げます。

演題：Mysteries of Dark Hollow Beam

講師：Ajay Ghosh 氏

（カルカッタ大学教授）

日時：平成 19 年 11 月 30 日（金） 13:30～14:30

場所：北海道大学工学部物理工学系会議室 I（A3-62）

主催：応用物理学会北海道支部

講演の要旨

The proposed presentation deals with the physical explanation of propagation-invariant electro-magnetic waves along with their applications mainly as optical tweezers. These propagation-invariant waves are direct solutions of wave equation. Till now, the wave equation for linear medium can be analytically solved using technique of separation of variables in five different coordinate systems. However, the existence of such beams can also be explained from the concept of spatial frequency. Dark hollow beams belong to the class of propagation-invariant beams with some special characteristics. Most important of them is that they have some phase singularity on the wave front and are able to carry spin and orbital angular momentum. They are also capable to transfer angular momentum to small masses having physical existence.

Use of computer generated holographic technique for generation of propagation-invariant beams is considered. Both in-line configuration and off-axis configuration are considered. The diffractive optical element (DOE) having the computer-generated mask may be fabricated using liquid crystal spatial light modulator or can be fabricated on a photo-resist using suitable technology.

The main application of propagation-invariant beams is the use as optical tweezers. The physics behind optical tweezers is considered and the advantages and disadvantages of using dark hollow beam as optical tweezers are also discussed.

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