

平成 16 年 10 月 22 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：Inverse problems in photothermal and photoacoustic science

講師：Dr. Roberto Li Voti 氏

(Dipartimento di Energetica, Universita degli Studi di Roma "La Sapienza")

日時：平成 16 年 11 月 8 日 (月) 15:00 ~ 16:00

場所：北海道大学大学院工学研究科量子物理工学専攻会議室 (A3-62)

主催：応用物理学会北海道支部

講演の要旨

Nondestructive evaluation of materials by photothermal and photoacoustic techniques has been the subject of many papers in the last few years. In this seminar different kinds of inverse problems related to both photothermal and photoacoustic phenomena will be discussed.

The first example relates to the so called photothermal depth profiling. This technique uses a pump laser beam to heat a inhomogeneous medium, and uses an infrared detector or camera to reveal the surface temperature time evolution. In such a way, by the help of a suitable inverse procedure, one may retrieve some information about the internal inhomogeneity of the sample. In particular one may determine the optical absorption depth profile of materials that are thermally homogeneous and optically inhomogeneous, or the thermal effusivity depth profile of materials

that are thermally inhomogeneous and optically homogeneous. In this seminar the equivalence of the two problems will be demonstrated.

The second example is related to a new inverse problem in photoacoustic science: the so called strain pulse depth profiling. This profilometry uses a ultrashort laser pulse to generate a picosecond strain pulse in a transparent medium. The strain pulse travelling in the medium is detected by the reflectivity changes of a beam of ultrashort probe laser pulses. In such a way, by the help of a suitable inverse procedure, one may visualize the strain pulse and its shape in the ultrashort time domain while it is travelling inside the transparent medium.

Many numerical and experimental examples, including animations, will be given and discussed.

世話人 松田 理

北海道大学大学院工学研究科量子物理工学専攻

電話 : 011-706-7190 omatsuda@eng.hokudai.ac.jp