國立交通大學應用數學系
學術演講公告

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講　題：Recent progress of mathematical analysis for active thermography

時　間：105 年 6 月 14 日(星期二) 下午 1:20 –2:20

地　點：(光復校區) 科學一館 223 室

茶　會：當天下午 12:50 (科學一館 205 室)

Abstract

Many reconstruction schemes for inverse boundary value problems for heat equation to identify some anomalies in a heat conductor such as unknown cavities and inclusions from the measured data called Neumann to Dirichlet map have been developed. They are for examples, dynamical probe method, linear sampling type method, enclosure method etc..

One of the most attractive and important application of these reconstruction methods is to the active thermography. This is a non-contact and very quick measurement which can be repeated many times for non-destructing testing to identify anomalies inside any heat conductor. More precisely it injects a heat flux by flash lamp and measured the corresponding temperature distribution on the surface of the conductor by an infrared light camera without having any contact to the conductor. The resolution of infrared light camera is very high now a days. Hence the mathematical model of thermography fits very well to the formulation of our inverse problem.

Compared with the other reconstruction schemes, the dynamical probe method and the linear sampling type method are using the most physical and effective input sources to identify the anomalies in details. It can give some possibility to provide a good basis for the active tomography.

In this talk we will introduce some recent development on the dynamical probe method and linear sampling type method for active thermography. The first one and second methods are good when we probe the anomalies from their outside and inside, respectively. Based on this we will propose a true sampling method to identify an anomaly by just one measurement over a relatively short time interval.

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