國立中山大學應用數學系
學術演講

講　　者：張德健教授
　　　　　美國喬治城大學
講　　題：Hardy Spaces, Elliptic BVPs and Div-Curl
　　　　　Lemmas
時　　間：2015/07/08（星期三）15：30～16：30
地　　點：理學院四樓理 SC 4009-1 室
茶　　會：15:00 於理 SC 4010 室（系辦公室）

摘要

In this talk, I want to discuss a long term joint project with E.M. Stein and G. Dafni.

The first part of this talk with discuss estimates of elliptic boundary value problems in Hardy spaces. More precisely, let Ω be a bound domain in $\mathbf{R}^n$ with smooth boundary. Consider the following elliptic boundary valued problem:

$$\begin{cases} \Delta u = f & \text{in} \quad \Omega \\ Xu = g & \text{on} \quad \partial\Omega \end{cases}$$

Here X is a transversal vector field to the boundary. This includes the regular Dirichlet and Neumann problem. The first part of this talk, we first introduce suitable Hardy spaces $H^p(\Omega)$ on Ω. Then we shall show that

$$\left\| \frac{\partial^2 u}{\partial x_j \partial x_k} \right\|_{H^p(\Omega)} \leq C_p \|f\|_{H^p(\Omega)}$$

for $0 < p < \infty$.

The second part of this talk will generalize a div-curl lemma of Coifman, Lions, Meyer and Semmes (1993) to Hardy spaces we introduced in the first part of this talk. Then we will discuss applications of generalized div-curl lemmas to partial differential equations.

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