NTU Applied Mathematics Analysis seminar

演講者：Daisuke Kawagoe (Kyoto University)

講　題：Spectral analysis on the elastic　Neumann--Poincar\'e operator

時　間：2019年6月5日 (星期三) 第一場 10:10-11:40；第二場 14:10-15:10

地　點：臺灣大學天數館 440 室

摘　要：The elastic Neumann--Poincar\'e (abbreviated by eNP) operator is a surface integral operator whose kernel is the double layer potential for the Lam\'e system, a system of partial differential equations in linear elasticity. In this seminar, we show two results on its spectral analysis;
(1) Polynomial compactness on $C^{1, \alpha}$ boundaries and (2) Essential spectrum on boundaries with a corner.

(1) Polynomial compactness on $C^{1, \alpha}$ boundaries.
It is known that, unlike the Neumann--Poincar\'e operator for the Laplace equation, the eNP operator is not compact on $C^{1, \alpha}$ boundaries for any $\alpha > 0$, and even on C^∞ boundaries. However, it was proved that it is polynomially compact on $C^{1, \alpha}$ boundaries in the two dimensional case. On the other hand, in the three dimensional case, its polynomial compactness was known only on C^∞ boundaries. In this talk, we extend this result in three dimensions to the case of $C^{1, \alpha}$ domains. This topic is based on a joint work with Hyeonbae Kang (Inha University, Korea).
(2) Essential spectrum on boundaries with a corner.
We move to the case where the two dimensional domain is smooth except at a corner of angle α, $0< \alpha < 2\pi$, $\alpha \neq \pi$, and hence the boundary is no longer $C^{1, \beta}$. In this case, it is known that the Neumann--Poincar\'e operator for the Laplace equation has the essential spectrum appearing around 0, the accumulation point of its eigenvalues. By analogy, we show that, in this case, the essential spectrum of the eNP operator appears around accumulation points of its eigenvalues. This topic is based on a joint work with Eric Bonnetier (Universit\'e Grenoble-Alpes, France), Charles Dapogny (Universit\'e Grenoble-Alpes, France) and Hyeonbae Kang (Inha University, Korea).

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