연세대학교 수학계산학부

YONSEI
Math-CSE Colloquium

Geometric Series Expansions of Layer Potential Operators and Their Applications to Composite Materials

임 미 경

KAIST

For a simply connected planar domain, there exists a function that conformally maps a region outside a circular disk to the region outside the domain. This conformal mapping then defines the so-called Faber polynomials, which form a basis for analytic functions. The Neumann–Poincaré (NP) operator, a singular integral operator on the boundary of a domain, naturally appears when one solves a conductivity transmission problem via the boundary integral formulation. In this talk, I present the geometric series expressions for the NP operator and the single-layer potential in two dimensions using the Faber polynomials. I will then provide some geometric properties of composite materials obtained with the series expansions, including the effective conductivity of a periodic array of inclusions with extremal conductivity and extension of the Eshelby conjecture to domains of general shape for anti-plane elasticity.

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**[온라인 강연] 접속 방법은 학과 홈페이지 참조.