

# Layer potential approaches to interface problems

Hyeonbae Kang

Inha University (hbkang@inha.ac.kr)

We review recent progress on imaging by generalized polarization tensors (GPTs), enhancement of near-cloaking by GPT-vanishing structures, cloaking by anomalous localized resonance, and analysis of stress concentration. These seemingly unrelated problems are all interface problems, and an integral operator called the Neumann-Poincaré operator arises naturally from them. We discuss about boundedness and invertibility properties, and spectral property of this operator, and then relate these properties with above mentioned problems. The schedule of the lecture is as follows:

- Lecture 1. Spectral theory of the Neumann-Poincaré operator
- Lecture 2. Generalized polarization tensors and applications to imaging
- Lecture 3. Enhancement of cloaking using GPT-vanishing structure
- Lecture 4. Analysis of cloaking by anomalous localized resonance
- Lecture 5. Analysis of stress concentration