

Seminar 2022

Math

Spectral theory of the Neumann-Poincaré
operator and its applications

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Abstract: The Neumann-Poincaré (abbreviated by NP) operator is an integral operator defined on the boundary of a domain. It arises naturally when solving boundary value problems for the Laplace equation using layer potentials. The study on the NP operator traces back to the era of Neumann and Poincaré as the name of the operator suggests. Lately, there is a rapid growth of interest in the spectral theory of the Neumann-Poincaré operator. It is mainly due to its relations with plasmon resonance and cloaking by anomalous localized resonance (CALR). Plasmon resonance and CALR are phenomena of resonance and cloaking that occur at eigenvalues of the NP operator and the accumulating point of eigenvalues of the NP operator, respectively. It is also related to the phenomenon of field concentration between two conductors or insulators. In this talk, I will briefly introduce spectral theory of the NP operator and recent results on it.



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