Department of Mathematics Seminar

Real Analytic Singular Radon Transforms With Product Kernels: Necessity of the Stein-Street condition

By

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Abstract: We discuss operators of the form

$$Tf(x) = \psi(x) \int f(\gamma_t(x)) K(t) dt,$$

where $\psi(x) \in C_c^\infty(\mathbb{R}^n)$, $\gamma_t(x)$ is a real analytic function of (t, x) mapping from a neighborhood of $(0,0) \in \mathbb{R}^N \times \mathbb{R}^n$ into $\mathbb{R}^n$ satisfying $\gamma_0(x) \equiv x$, and $K(t)$ is a product kernel with small support in $\mathbb{R}^N$. The celebrated work of Christ, Nagel, Stein, and Wainger studied such operators with smooth $\gamma_t(x)$, in the special case when $K(t)$ is a Calderón-Zygmund kernel. Street and Stein generalized their work to (for instance) the product kernel case, and gave sufficient conditions for the L^p boundedness of such operators for all such kernels K. In this talk, we will state that when $\gamma_t(x)$ is real analytic, the Stein-Street condition is also necessary, and will also use several simple examples and graphs to illustrate this necessary and sufficient condition and explain the main ideas of the proof methods.

Date: 7 December 2022, Wednesday
Time: 16:00
Place: Zoom
To request the event link, please send a message to f.atay@bilkent.edu.tr