

Multi-parameter singular Radon transforms

Brian Street

We discuss singular (and maximal) Radon transforms where the singular kernel has a multi-parameter structure. We discuss operators of the form

$$f \mapsto \psi(x) \int f(\gamma(t, x))K(t)dt,$$

where ψ is a C^∞ cutoff function, γ is a smooth function satisfying $\gamma(0, x) = x$, and K is a “singular kernel” supported near $t = 0$. The goal is to give “finite-type” conditions on γ under which the above operator is bounded on L^p ($1 < p < \infty$) for an appropriate class of kernels K . The case when K is a Calderón-Zygmund kernel was studied by Christ, Nagel, Stein, and Wainger. We are interested in, for instance, the case when K is a “product kernel.” For example, $K(t_1, t_2) = \eta(t_1, t_2)1/t_1t_2$ is of this form, where η is a cut-off function supported near $(t_1, t_2) = 0$. This is a joint work with E. M. Stein.