

Emil Straube: Compactness of the complex Green operator

Abstract: Let $\Omega \subset \mathbb{C}^n$ be a bounded smooth pseudoconvex domain. We show that compactness of the complex Green operator G_q on $(0, q)$ -forms on $b\Omega$ implies compactness of the $\bar{\partial}$ -Neumann operator N_q on Ω . We prove that if $1 \leq q \leq n - 2$ and $b\Omega$ satisfies (P_q) and (P_{n-q-1}) , then G_q is a compact operator (and so is G_{n-1-q}). Our method relies on a jump type formula to represent forms on the boundary, and we prove an auxiliary compactness result for an ‘annulus’ between two pseudoconvex domains. Our results, combined with the known characterization of compactness in the $\bar{\partial}$ -Neumann problem on locally convexifiable domains, yield the corresponding characterization of compactness of the complex Green operator(s) on these domains. This is joint work with Andrew Raich.