

Meeting: 1000, Albuquerque, New Mexico, SS 2A, Special Session on Several Complex Variables and CR Geometry

1000-32-188 **Robert K Hladky*** (robert.k.hladky@dartmouth.edu), Department of Mathematics, 6188
Bradley Hall, Dartmouth College, Hanover, NH 03755. *Examples for the $\bar{\partial}_b$ -Neumann problem.*

The Kohn Laplacian $\square_b = \bar{\partial}_b \bar{\partial}_b^* + \bar{\partial}_b^* \bar{\partial}_b$ provides a useful tool for studying the tangential Cauchy-Riemann equations on CR manifolds. On a compact CR manifold M this operator is known to be Fredholm, at least on forms of bidegree (p, q) with $0 < q < n - 1$. The operator \square_b has sharp regularity in the Folland-Stein spaces. The related $\bar{\partial}_b$ -Neumann problem for a domain in a CR manifold is less well understood. In this talk, I shall present a class of examples of domains for which L^2 existence and sharp global regularity theorems can be established. These examples are generated as products of compact, normal CR manifolds with domains in the hyperbolic plane. The Kohn Laplacian for such a domain has several notable features: \square_b has closed range, $(1 + \square_b)^{-1}$ fails to be compact, \square_b is hypoelliptic/Fredholm if and only if it is injective, although $1 + \square_b$ is always hypoelliptic and Fredholm. These domains do not admit characteristic points. However as a special case the techniques can be adapted to establish existence and sharp weighted regularity theorems for characteristic domains in the Heisenberg group. (Received August 24, 2004)