VIRTUAL EAST-WEST SCV SEMINAR

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Function theory on annuli

We consider the problem of establishing L^2-estimates for the $\overline{\partial}$-operator on a domain Ω in $\mathbb{C}^n$ of the form $\Omega_1 \setminus \overline{\Omega_2}$, where Ω_2 is a relatively compact subset of Ω_1. We use a modified version of the Bochner-Kohn-Morrey-Hormander identity, adapted to pseudoconcave boundaries, to establish L^2-estimates on such domains when both Ω_1 and Ω_2 are bounded pseudoconvex and Ω_2 has $\mathcal{C}^{1,1}$-boundary, and also obtain estimates for weakly q-convex boundaries. We describe a Mayer-Vietoris type exact sequence relating the L^2 and Sobolev cohomologies of the envelope Ω_1, the hole Ω_2 and the annulus $\Omega = \Omega_1 \setminus \overline{\Omega_2}$. This requires the introduction of special realizations of the $\overline{\partial}$-operator in Hilbert spaces, and gives rise to interesting relations between the L^2- and W^1-cohomologies. This is joint work with Phil Harrington.