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Mês de: Dezembro 2006

SEMINÁRIOS DE ANÁLISE

Dia 07 de Dezembro (quinta-feira), às 14h15, na Sala B3-01

Fredholm symbol calculus in algebras with a finite number of orthogonal projections onto spaces of analytical functions of integer order and multiplication operators by piecewise continuous functions

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Abstract:

The C*-algebra $\mathfrak{A}_{n,m}$ generated by a finite number of orthogonal projections on L^2 of half spaces and of bounded (connected) multi connected domains with smooth boundary onto its closed subspaces of square integrable j-analytic ($j = 1, \cdots, n$) and l-anti-analytical ($l = 1, \cdots, m$) functions is studied. The talk depends on equalities between Poly Bergman projections and elements in the algebra of Calderon-Zygmund operators, and we will also try to say something about dependence of such formulas on the regularity of boundary. In the nice case of half spaces, some special singular integral operators are unitary between different spaces of j-analytical functions.

In view of Fredholm symbol calculus, localization and limit operators techniques and the Plamenevsky results on multidimensional singular integral operators are used to reduce the study to simpler C*-algebras associated with points $z \in \Pi \cup \partial\Pi$ and pairs $(z, \lambda) \in \partial\Pi \times \mathbb{R}$. Imposing a Lyapunov condition on the arcs of discontinuities of coefficients, the use of a special quasiconformal diffeomorphism and some commutator relations of the two-dimensional singular integral operators with shift operators, allow us to substitute the system of curves in a neighborhood of each discontinuity point in $\mathbb{R} \cup \{\infty\}$ by another one that consists of half straight lines.

We characterize some C*-algebras generated by orthogonal projections with relations and by means of hypergeometric function, we construct a symbol calculus. We also establish that the C*-algebras associated with the points $(z, \lambda) \in \partial\Pi \times \mathbb{R}$ are *-isomorphic to $\mathbb{C}^{[(k+1)(n+m)]^2}$, where k is the number of curves with the endpoint z, and we analyze the behavior at infinity points of such algebras. The talk is partially based on joint work with Yu. Karlovich.

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