



2009 Seminar Series



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Time: 3:15 - 4:15 PM

Room: MS 2.02.52

Spectral synthesis in the context of reproducing kernel Hilbert spaces

Abstract: Let T be a bounded linear transformation on a Hilbert space H such that the finite linear combinations of its eigenvectors are dense in H . If H is finite dimensional, then any invariant subspace of T must be spanned by eigenvectors. The original question of spectral synthesis asked whether the same is true for infinite dimensional Hilbert spaces. This was answered in the negative by Beurling in 1949, an example being $T=S^*$ the backward shift on l^2 . However, if one takes any subspace M of l^2 that contains and is spanned by a countable number of eigenvalues of S^* , then the restriction of S^* to M does admit spectral synthesis.

In this expository talk I will discuss more recent results and techniques from operator theory and function theory that are used to identify operators which have this latter property. Topics that will come up include the Scott Brown technique, Thomson's Theorem on the structure of the closure of the polynomials in L^2 , and the existence of nontangential limits.

A reception will follow the talk and will be held in MS 2.02.52