Meeting: 998, Houston, Texas, SS 10A, Special Session on Complex Analysis and Operator Theory

998-47-221 **Ronald G Douglas*** (rgd@tamu.edu), Department of Mathematics, Texas A & M University, TAMU-3368, College Station, TX 77843-3368. *Essentially Reductive Hilbert Modules.* Preliminary report.

An m-tuple $(T_1, ..., T_m)$ of contractive, commuting weighted shifts makes the Hilbert space on which it acts into a module over $C[z]$ and the algebra of functions holomorphic on some fixed ball of radius greater than one. The module is said to be essentially reductive if all the T_i are essentially normal, that is, the self-commutator $T_i * T_i - T_i T_i *$ is compact for each i. Arveson showed in [J. Reine Angew. Math. 522 (2000) 173-236] that the non-comuutative Hardy space, H^2_d, has these properties and conjectured that the same is true for all submodules generated by homogeneous polynomials, even in the case of the tensor product of H^2_d with a finite dimensional Hilbert space. Moreover, he established the conjecture in case the submodule is generated by monomials.

Using very different techniques, we extend his result to the case of modules described above tensored with a finite dimensional Hilbert space under the assumption of an additional necessary technical hypothesis. Moreover, we are able to extend the result to a different class of submodules generated by homogeneous polynomials. The latter results overlap a recent result of Guo who settles Arveson's conjecture for all submodules in case $m = 2$. (Received February 27, 2004)