Benjamin Peter Russo* (russo5@uf1.edu). Sub-Jordan Operator Tuples.

An operator $T$ is called a 3-isometry if there exists a $B_1(T^*, T)$ and $B_2(T^*, T)$ such that

$$Q_T(n) = T^n T^* = I + n B_1(T^*, T) + n^2 B_2(T^*, T)$$

for all natural numbers $n$. A related class of operators, called 3-symmetric operators, have a similar definition. These operators have a connections with Sturm-Liouville theory and are natural generalizations of isometries and self-adjoint operators. We call an operator $J$ a Jordan operator of order 2 if $J = A + N$, where $A$ is either unitary or self-adjoint, $N$ is nilpotent order 2, and $A$ and $N$ commute. As shown in the work of Agler, Ball and Helton, and joint work with McCullough, 3-symmetric and 3-isometric operators can be modeled as Sub-Jordan operators. In this talk we discuss the extension of these theorems to the multi-variable case in relation to a conjecture of Ball and Helton. More specifically, we cover connections between the lifting theorems via spectral theory and the necessity of an extra condition unique to the multi-variable case. (Received September 13, 2015)