m-isometric and m-symmetric operators satisfying a similarity condition

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Given a Hilbert space operator S such that $0 \notin \overline{W(S)}$, if $\delta_{A,A^*}(S) = AS - SA^* = 0$ (resp., $\triangle_{A,A^*}(S) = ASA^* - S = 0$) and the operator A is hyponormal (resp., A is invertible and A, A^{-1} are normaloid), then A is self adjoint [1] (resp., A is unitary [2,3]).The hypotheses imply the existence of an invertible positive operator P such that $\delta_{A,A^*}(P) = 0$ (i.e., A^* is $(1,P)$-symmetric), respectively $\triangle_{A,A^*}(P) = 0$ (i.e., A^* is $(1,P)$-isometric). In this talk, we look at the structure of operator pairs (A,B) which are either (m,P)-isometric or (m,P)-symmetric and which satisfy a natural power boundedness condition.

[1] I.H. Sheth, on hyponormal operators, PAMS 20(1969), 121-123.

[2] U.N. Singh and K. Mangla, Operators with inverses similar to their adjoints, PAMS 38(1973), 258-260.

[3] C.R. DePrima, Remarks on "Operators with inverses similar to their adjoints", PAMS 43(1974), 478-480.

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