Quasinormality for powers of commuting pairs of subnormal operators

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Abstract

We consider jointly quasinormal and spherically quasinormal pairs of commuting operators on Hilbert space, as well as their powers. We first prove that, up to a constant multiple, the only jointly quasinormal 2-variable weighted shift is the Helton-Howe shift.

Second, we show that a left-invertible subnormal operator T whose square T^2 is quasinormal must be quasinormal.

Third, we generalize a characterization of quasinormality for subnormal operators in terms of their normal extensions to the case of commuting subnormal n–tuples.

Fourth, we show that if a 2–variable weighted shift $W_{(\alpha,\beta)}$ and its powers $W_{(\alpha,\beta)}^{(2,1)}$ and $W_{(\alpha,\beta)}^{(1,2)}$ are all *spherically* quasinormal, then $W_{(\alpha,\beta)}$ may not necessarily be *jointly* quasinormal. Moreover, it is possible for both $W_{(\alpha,\beta)}^{(2,1)}$ and $W_{(\alpha,\beta)}^{(1,2)}$ to be spherically quasinormal without $W_{(\alpha,\beta)}$ being spherically quasinormal.

The talk is based on joint work with Sang Hoon Lee (Chungnam National University, Republic of Korea) and Jasang Yoon (The University of Texas Rio Grande Valley, USA).