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Hyponormal operators and weak forms of supercyclicity

An operator T on a Hilbert space H is said to be N-supercyclic (resp. weakly supercyclic) if it admits a subspace E of dimension N (resp. of dimension 1) such that the orbit of E under T is norm-dense (resp. weakly dense) in H. We study whether or not a hyponormal operator may be N-supercyclic or weakly-supercyclic. This leads us to connections with thin sets of Harmonic Analysis.