

Normality and numerical ranges of operators with special pseudospectra

Normal linear bounded operators play a central role in operator theory. In particular, the Spectral Theorem can be applied to answer essentially all questions on normal operators. Therefore, several mathematicians have paid attention to investigate some conditions under which certain operators are normal. In this talk, we will first briefly discuss some properties of spectra, numerical ranges, and pseudospectra of operators. Then we will focus on some characterizations of the normality of a class of operators and matrices in terms of one pseudospectrum and present some applications to numerical ranges. In particular, we will characterize the numerical ranges of triangular Toeplitz operators and discuss the non-stability of quasi-nilpotent operators.