

Approximation of spectra and pseudospectra of bounded linear operators on Banach spaces

M. Seidel

It is well known that spectra of operators do not behave continuously with respect to small perturbations. When trying to approximate an operator A or its spectrum by finite matrices (e.g. finite sections of A) the situation becomes even worse.

One possible way to avoid this problem is to slightly change the notions and to consider ϵ -pseudospectra instead. These substitutes are known to provide a significantly better continuity but of course at the price of being different from the spectrum. In 2008, Hansen introduced the so called (N, ϵ) -pseudospectra, which share the continuity with the ϵ -pseudospectra, but also mimic the spectrum in a sense. Moreover, he showed that this concept leads to suitable approximations for the spectrum of Hilbert space operators which only require the consideration of finite matrices.

The aim of this talk is to demonstrate what obstacles occur in the Banach space case, and how Hansens concept and its crucial results can be successfully generalized beyond the comfortable world of Hilbert spaces.