Convergence of the iterated Aluthge Transform sequence for matrices

Jorge Antezana

Let T be a square matrix, and let $T = U|T|$ be a polar decomposition of T. The Aluthge transform of the matrix T is defined by

$$\Delta(T) = |T|^{1/2}U|T|^{1/2}.$$

Inductively, the n-times iterated Aluthge transform of T is defined by: $\Delta^0(T) = T$ and $\Delta^n(T) = \Delta(\Delta^{n-1}(T))$, $n \in \mathbb{N}$.

Roughly speaking, the idea behind the Aluthge transform is to map an operator into another operator which shares some spectral properties with the first one, in particular the spectrum, and it is closer to be normal. So, a natural question is whether or not the sequence $\{\Delta^n(T)\}_{n\in\mathbb{N}}$ converges to a normal operator. In this talk we discuss a proof of this fact, based in dynamical systems ideas. This is a joint work with E. Pujals and D. Stojanoff.