Powers of operators and the numerical range

Jaroslav Zemánek, Polish Academy of Sciences, Poland

(Joint work with Iwona Wróbel)

It is shown that a Hilbert space operator A is power-bounded if and only if the sums $A^k + A^{*k}$ are bounded for $k = 1, 2, \ldots$. The method is based on the concept of numerical range, the Schur triangularization of matrices, and a recent inequality of Kittaneh. Its analytic development yields analogous results for arbitrary families of operators, in particular, for the Cesàro means of powers. Related open problems arise throughout.