THE CROUZEIX CONJECTURE

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Summary. Crouzeix observed in 2007 that for any operator A in a Hilbert space and any polynomial p $\|p(A)\| \leq C \sup_W |p|$, where W is the numerical range of A and the constant C is universal, i.e. does not depend neither on the operator nor on the space. He also proved in the same paper that $2 \leq C \leq 11.08$ and conjectured that $C = 2$. We will review recent developments on proving the conjecture ($C \leq 1 + \sqrt{2}$) and show some deformations of the numerical range that may lead to new constants.

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