1128-15-140 **Anne Greenbaum*** (greenbau@uw.edu), University of Washington, Applied Math Dept., Box 353925, Seattle, WA 98195. *A New Proof that Any Disk Containing the Numerical Range is a 2-Spectral Set.*

Let A be an n by n matrix and let $W(A) = \{\langle Aq, q\rangle \in \mathbb{C} : \|q\|_2 = 1\}$ denote its numerical range. In 1975, Okubo and Ando showed that if $W(A)$ is a subset of the unit disk $\mathbb{D}$, then $\mathbb{D}$ is a 2-spectral set for A; that is, for any polynomial p, $\|p(A)\| \leq 2\|p\|_{\mathbb{D}}$, where the norm on the left is the operator 2-norm, or, the largest singular value of $p(A)$, and $\|\cdot\|_{\mathbb{D}}$ on the right denotes the infinity norm: $\sup_{z\in\mathbb{D}} |p(z)|$. Crouzeix has conjectured that $W(A)$ itself is a 2-spectral set for A, and very recently Palencia and Crouzeix [https://arxiv.org/abs/1702.00668] were able to prove that $W(A)$ is a $(1+\sqrt{2})$-spectral set for A. We use the Palencia-Crouzeix result, along with a new result about the function $\hat{f}$ that maximizes $\|f(A)\|/\|f\|_{W(A)}$ over all f analytic in $W(A)$, to give a new proof that any disk containing $W(A)$ is a 2-spectral set for A. We discuss some classes of matrices for which the $1+\sqrt{2}$ bound in the Palencia-Crouzeix paper can be reduced to 2. (Received February 22, 2017)