

ON A CONJECTURE OF A. L. SHIELDS ABOUT KREISS BOUNDED OPERATORS

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ABSTRACT. Let X be a Banach space and $T : X \rightarrow X$ a continuous operator with $\sigma(T)$ contained in the closed unit disc. T is said Kreiss bounded iff

$$\|(\lambda I - T)^{-1}\| \leq \frac{C}{|\lambda| - 1} \quad \text{for all } |\lambda| > 1.$$

If T is Kreiss bounded operator in a Banach space, then $\|T^n\| = O(n)$ for all $n \in \mathbb{N}$. However, forty years ago Shields conjecture that in Hilbert spaces, $\|T^n\| = O(\sqrt{n})$. We will show that this conjecture is no true, although there is a small improvement to the general estimation in Hilbert spaces, $\|T^n\| = o(n)$.

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