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KREIN SPACES NUMERICAL RANGES AND THEIR COMPUTER GENERATION*

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Abstract. Let J be an involutive Hermitian matrix with signature $(t, n-t)$, $0 \leq t \leq n$, that is, with t positive and $n-t$ negative eigenvalues. The Krein space numerical range of a complex matrix A of size n is the collection of complex numbers of the form $\frac{\xi^* JA\xi}{\xi^* J\xi}$, with $\xi \in \mathbb{C}^n$ and $\xi^* J\xi \neq 0$. In this note, a class of tridiagonal matrices with hyperbolical numerical range is investigated. A *Matlab* program is developed to generate Krein spaces numerical ranges in the finite dimensional case.

Key words. Krein spaces, Numerical range, Tridiagonal matrices.

AMS subject classifications. 15A60, 15A63.

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