For $0 < c < 2$ define the $2n \times 2n$ matrices

$$A := \begin{pmatrix} c & 1 \\ 1 & c & 1 \\ & \ddots & \ddots \end{pmatrix} \quad B := \begin{pmatrix} 1 \\ & \ddots \\ & & 1 \\ & & -1 \\ 1 & c & \end{pmatrix}$$

where the numbers of 1 and $-1$ in $B$ coincide (equal to $n$). The eigenvalues of the pencil $\lambda \mapsto A - \lambda B$ are the eigenvalues of $B^{-1}A = BA$. The spectrum is symmetric with respect to both $\mathbb{R}$ and $i\mathbb{R}$. The non-real eigenvalues are contained in the union of the two closed disks $\{ \lambda \in \mathbb{C} : |\lambda \pm c| \leq 2 \}$ whereas numerical examples suggest that they lie in their intersection.

**Open problem:** Prove that $|\lambda - c| \leq 2$ and $|\lambda + c| \leq 2$ holds for all $\lambda \in \sigma(BA) \setminus \mathbb{R}$. 

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