

On the inverse problem associated to $KA^sK = A^{s+1}$

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Abstract

In previous papers, the authors introduced and characterized a kind of matrices called $\{K, s + 1\}$ -potent [1, 2]. Also, they established a method to calculate these matrices. Some related class of matrices were studied in [3, 4]. The purpose of the present paper is to solve the associated inverse problem. Several algorithms are developed in order to find all involutory matrices K satisfying $KA^{s+1}K = A$ for a given matrix $A \in \mathbb{C}^{n \times n}$ and a given natural number s . The cases $s = 0$ and $s \geq 1$ are separately studied since they produce different situations. In addition, some examples are presented showing the numerical performance of the methods.

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References

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