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**Determinant preserving transformations on symmetric matrix spaces.** (English)

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Let  $S_n(F)$  be the vector space of  $n \times n$  symmetric matrices over a field  $F$  (with certain restrictions on cardinality and characteristic). The transformations  $\phi$  on the space which satisfy one of the following conditions:

1.  $\det(A + \lambda B) = \det(\phi(A) + \lambda\phi(B))$  for all  $A, B \in S_n(F)$  and  $\lambda \in F$ ;
2.  $\phi$  is surjective and  $\det(A + \lambda B) = \det(\phi(A) + \lambda\phi(B))$  for all  $A, B$  and two specific  $\lambda$ ;
3.  $\phi$  is additive and preserves determinant;

are characterized. The authors study determinant preservers on the vector space of symmetric matrices.

Reviewer: [Yueh-er Kuo \(Knoxville\)](#)

**MSC:**

[15A04](#) Linear transformations, semilinear transformations

[15A03](#) Vector spaces, linear dependence, rank, lineability

[15A15](#) Determinants, permanents, traces, other special matrix functions

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**Keywords:**

[linear preserving problem](#); [rank](#); [symmetric matrix](#); [determinant preserving transformations](#)

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