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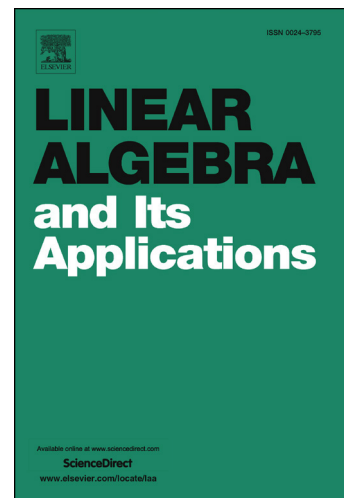
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# Preservers of radial unitary similarity functions on products of operators<sup>☆</sup>

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## Abstract

Let  $\mathfrak{S}$  be a subset of the algebra  $\mathcal{L}(\mathcal{H})$  of all bounded linear operators on an infinite-dimensional complex Hilbert space  $\mathcal{H}$ , and let  $f : \mathfrak{S} \rightarrow [0, \infty)$  be a radial unitary similarity invariant function. Under some assumption on  $\mathfrak{S}$  and  $f$ , characterizations are obtained for surjective maps  $\phi$  on  $\mathfrak{S}$  satisfying

$$f(\phi(T) \circ \phi(S)) = f(T \circ S) \quad (T, S \in \mathfrak{S}),$$

where the binary operation  $\circ$  stands for the product or the Jordan semi-triple product on operators. Analogous descriptions are obtained for the finite-dimensional case, without the surjectivity assumption on  $\phi$ .

*Keywords:* Operator, Jordan products, unitary similarity invariant function, nonlinear preservers

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## 1. Introduction

Motivated by the theory and applications, general preserver problems with respect to various algebraic operations on matrix spaces or on operator algebras, including the usual product and the Jordan semi-triple product,

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