

Some applications of operator linear fractional mappings

V. A. Khatskevich
Braude College, Israel
Moscow, Russia

victor_kh@hotmail.com

Coauthors: V. A. Senderov (*Moscow*)

Abstract

The operator analog of the linear-fractional function

$$F(z) = \frac{az + b}{cz + d}$$

is investigated. Namely, we consider the linear fractional transformation of the unit ball operator ball $\mathfrak{K} = \{K\}$ of the form

$$F_A(K) = (A_{21} + A_{22}K)(A_{11} + A_{12}K)^{-1}$$

with operator block matrix $A = (A_{ij})_{i,j=1}^2$.

In Sec. I, we study the conditions under which F_A is an automorphism of the (closed or open) ball; in particular, the conditions under which the automorphism F_A is linear.

In Sec. II, we consider the well-known Königs embedding problem for a discrete semigroup embedded in a one-parameter continuous semigroup. Several results about the possibility of embedding are obtained for a triangle (upper or lower) matrix A .

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