Acharya, Keshav Raj; McBride, Matt
Action of complex symplectic matrices on the Siegel upper half space. (English)

Summary: The Siegel upper half space, $S_n$, the space of complex symmetric matrices, $Z$ with positive definite imaginary part, is the generalization of the complex upper half plane in higher dimensions. In this paper, we study a generalization of linear fractional transformations, $\Phi_S$, where $S$ is a complex symplectic matrix, on the Siegel upper half space. We partially classify the complex symplectic matrices for which $\Phi_S(Z)$ is well defined. We also consider $S_n$ and $\overline{S}_n$ as metric spaces and discuss distance properties of the map $\Phi_S$ from $S_n$ to $S_n$ and $\overline{S}_n$ respectively.

MSC:
15B99 Special matrices
15A60 Norms of matrices, numerical range, applications of functional analysis to matrix theory
15A04 Linear transformations, semilinear transformations

Keywords:
Siegel upper half space; symplectic matrix; Finsler metric

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References:

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