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# MATRIX CONTINUED FRACTIONS RELATED TO FIRST-ORDER LINEAR RECURRENCE SYSTEMS*

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**Abstract.** We introduce a matrix continued fraction associated with the first-order linear recurrence system $Y_k = \theta_k Y_{k-1}$. A Pincherle type convergence theorem is proved. We show that the $n$-th order linear recurrence relation and previous generalizations of ordinary continued fractions form a special case. We give an application for the numerical computation of a non-dominant solution and discuss special cases where $\theta_k$ is constant for all $k$ and the limiting case where $\lim_{k\to+\infty} \theta_k$ is constant. Finally the notion of adjoint fraction is introduced which generalizes the notion of the adjoint of a recurrence relation of order $n$.

**Key words.** recurrence systems, recurrence relations, matrix continued fractions, non-dominant solutions.

**AMS subject classifications.** 40A15, 65Q05.

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