



# Stability Results for Large-Scale Difference Systems via Matrix-Valued Liapunov Functions

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**Abstract:** New results concerned with the Liapunov stability of composite or interconnected systems, described by linear difference equations are established. These results involve a matrix-valued Liapunov function. Furthermore, using a new approach for constructing Liapunov functions we obtain some results related to uniform asymptotic stability and compare our results with some known results which were obtained via vector Liapunov functions. The examples illustrating the efficiency of the proposed approach are given.

**Keywords:** *Large scale difference system; matrix-valued Liapunov function; uniform asymptotic stability.*

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