

# Dynamics of a first order expansive type difference equation

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## Abstract

We consider the following difference equation

$$\frac{u_{n+1} - u_n}{\lambda_n} \in Au_n, \quad (\text{FDE})$$

where  $A$  is a maximal monotone operator. We study the asymptotic behavior of the solutions to (FDE). We also prove that periodic solutions to (FDE) exist when  $A$  is a single-valued and maximal strongly monotone operator. Moreover if periodic solutions to (FDE) exist, then all bounded solutions to (FDE) are periodic. Our work is motivated by Djafari Rouhani [5,6].