dr Małgorzata Zbąszyniak
dr inż. Zenon Zbąszyniak
Institute of Mathematics, Poznań University of Technology

On some types of stability for systems of difference equations

We consider a perturbed nonlinear system of difference equations of the form

$$Y(n+1) = A(n)Y(n) + F(n, Y(n), TY(n)) \tag{1}$$

and the linear system

$$Y(n+1) = A(n)Y(n), \tag{2}$$

where A denote the matrix $k \times k$, T is the continuous operator and $F : \mathbb{N}(n_0) \times \mathbb{R}^k \times \mathbb{R}^k \to \mathbb{R}^k$.

In the paper notions of ψ-stability, ψ-asymptotic stability and (ψ, l^p)-stability of trivial solution of (2) are introduced and several new sufficient conditions, for mentioned types of stability, are proved. Furthermore, sufficient conditions are given for the l^p-stability of perturbed system (1).