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Review text:

The subject of this paper is a systematic description of the qualitative behaviour of solutions of a difference initial-value problem of k -th order. First, various definitions of “stability” (= continuity of dependence on initial conditions in the norm) are recollectd and discussed [only for homogeneous linear equations the stability means that all solutions are bounded (without homogeneity, all solutions are either bounded or unbounded at least, etc)]. Secondly, an insight is gained via numerical experiments. Finally, in the proposed theory, main emphasis is put on the role of the uniform Lipschitz condition (weakened to a local Lipschitz condition, whenever needed). In such a setting, the authors’ discussion is able to cover both the autonomous and non-autonomous systems, and many of their linear as well as non-linear descendants. Four illustrative examples have been selected.