Stability of difference equations with an infinite delay

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The relation between the exponential stability of linear difference equations with infinite delay and the ℓ^p-input ℓ^q-state stability (Perron's property) is investigated. The Perron's property means that solutions of the non-homogeneous equation with zero initial data belong to ℓ^q when non-homogeneous terms are in ℓ^p. The two properties are equivalent in a wide range of spaces, under some conditions, which include uniform boundedness of operators and exponential memory fading. We demonstrate [1] that these conditions are to some extent necessary.

References

[1] E. Braverman and I. Karabash, *Bohl-Perron-type stability theorems for linear difference equations with infinite delay*, to appear in Journal of Difference Equations and Applications, DOI: 10.1080/10236198.2010.531276