

Additive Iterations in Different Structures

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This survey belongs to the general theme of dynamical systems.

In the middle of the sixties of the last century Erdős and Sárközy observed that for a given sequence of integers with positive upper density (defined by $\bar{d}(A) := \limsup_{n \rightarrow \infty} \frac{|A \cap [1, n]|}{n}$) the difference set $D(A) := \{a - a' : a \geq a', a, a' \in A\}$ has bounded gaps.

Later Stewart, Tijdeman and Ruzsa proved that the *iterated difference set* $D_{k+1}(A) := D(D_k(A))$; $k \geq 1$; $D_1(A) = D(A)$ from a given k_0 is stable, i.e. for $k, n \geq k_0$ $D_k(A) = D_n(A)$. The min k_0 is said to be the time of the stability. The main question is to determine the threshold.

This phenomena pops up in different structures; the author investigated it in sigma finite abelian groups and in other structures too. With F. Hennecart we could give the best possible result in non-commutative groups as well.

We will discuss iterations of other linear operations too.

Some parts of the results are joint work with Francois Hennecart and Alain Plagne.