A VARIANT OF THE HALES-JEWETT THEOREM

MATHIAS BEIGLBÖCK

It was shown by V. Bergelson that any set $B \subseteq \mathbb{N}$ with positive upper multiplicative density contains nicely intertwined arithmetic and geometric progressions: For each $k \in \mathbb{N}$ there exist $a, b, d \in \mathbb{N}$ such that $\{b(a+id)^j : i, j \in \{1, 2, \ldots, k\}\} \subseteq B$. In particular one cell of each finite partition of $\mathbb{N}$ contains such configurations. Using the space of ultrafilters on the set of (located) words over a finite alphabet, it is possible to prove a Hales-Jewett type extension of this partition theorem.

Institute of Discrete Mathematics and Geometry, TU Vienna, Wiedner Hauptstrasse 8-10, 1040 Vienna, Austria.

E-mail address: mathias.beiglboeck@tuwien.ac.at