Infinite-Exponent Partition Relations on Linear Orders

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Partition relations were introduced by Erdős and Rado in [ER52] as a means of generalising Ramsey's theorem. In the same paper, they showed that relations whose exponent[1] is an infinite cardinal always fail in ZFC. In ZF without Choice, however, such *infinite-exponent partition relations* can hold. In this talk we extend the notion of infinite-exponent partition relations to arbitrary linear orders, in part building on ideas from [LSW17]. We will focus in particular on relations which demonstrate curious failures of monotonicity in the exponent.

References

[ER52]   P. Erdős, R. Rado, *Combinatorial theorems on classifications of subsets of a given set*, Proceedings of the London Mathematical Society, Volume s3–2 (1952), pp. 417–439

[LSW17]   P. Lücke, P. Schlicht, T. Weinert, *Choiceless Ramsey theory of linear orders*, Order, Volume 34 (2017), pp. 369–418

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[1]The *exponent* of a partition relation is the "size" or "shape" of the subsets being coloured.