

## "Discrete Mathematics in Teams" and Combinatorics

Friday 18th October 11:15-12:15

BE01, Steyrergasse 30

## Lipschitz functions on expanders

## JINYOUNG PARK

(Courant Institute of Mathematical Sciences, New York University)

We will discuss the typical behavior of M-Lipschitz functions on d-regular expander graphs, where an M-Lipschitz function means any two adjacent vertices admit integer values differ by at most M. While it is easy to see that the maximum possible height of an M-Lipschitz function on an n-vertex expander graph is about  $C \cdot M \cdot \log n$ , where C depends (only) on d and the expansion of the given graph, it was shown by Peled, Samotij, and Yehudayoff (2012) that a uniformly chosen random M-Lipschitz function has height at most  $C' \cdot M \cdot \log \log n$  with high probability, showing that the typical height of an M-Lipschitz function is much smaller than the extreme case. Peled-Samotij-Yehudayoff's result holds under the condition that, roughly, subsets of the expander graph expand by the rate of about  $M \cdot \log(dM)$ . We will show that the same result holds under a much weaker condition assuming that d is large enough. This is joint work with Robert Krueger and Lina Li.

Josh Erde, Mihyun Kang, Michael Kerber