

abstract

Computer Science/Discrete Mathematics Seminar II
Topic:

Speaker:

Affiliation:

Date:

Time/Room:

We give an arithmetic version of the recent proof of the improved triangle removal lemma by Fox [Fox11], for the group F_2^n .

A triangle in F_2^n is a tuple (x,y,z) such that $x+y+z = 0$. The triangle removal lemma for F_2^n states that for every $\epsilon > 0$, there is a $\delta > 0$, such that if a subset A of F_2^n requires the removal of at least $\epsilon 2^n$ elements to make it triangle-free, then it must contain at least $\delta 2^{2n}$ triangles. We give a direct proof which gives an improved lower bound for δ (as a function of ϵ), analogous to the one obtained by Fox for triangle removal in graphs.

This result was previously known via a reduction from the improved removal lemma for directed cycles [Fox11,Král-Serra-Vena 09]. However, we believe our proof in this simplified setting is more transparent, and defines fourier-analytic notions that may be of independent interest.