SOME REMARKS ON THE GRAM-SCHMIDT WALK ALGORITHM WITH APPLICATIONS TO KOMLOS CONJECTURE

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Last year, a new result appeared towards the solution of the well-known Komlos conjecture. The conjecture says that given n vectors in $\mathbb{R}^d$ with the Euclidean norm at most one, there is always a coloring ± 1 such that the norm ℓ_1 of a signed-sum vector is constant independent of n and d. The team consisting of Nikhil Bansal, Haotian Jiang, Raghu Meki, Sahil Singli, Makrand Sinh proved this conjecture in a smoothed analysis setting in which the vectors are disturbed by the addition of a small Gaussian noise and when the number of vectors $n = \omega(d \log d)$. The dependence of n on d is the best possible even in a completely random case setting. The result is based on the analysis of Gram-Schmidt walk algorithm, which we could extend in a way that it improves the main Banaszczyk bound $\sqrt{\log d}$ for the constant in the Komlos problem. We also analyzed some extensions of the smoothed analysis outside the Gaussian noise.