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Intersective sets over abelian groups

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Given a finite abelian group G and a subset $J \subset G$ with $0 \in J$, let $D_G(J, N)$ be the maximum size of $A \subset G^N$ such that the difference set $A - A$ and J^N have no non-trivial intersection. Recently, this extremal problem has been studied for different groups G and subsets J. For example, using the linear algebra methods, Alon showed the upper bound $D_G(J, N) \leq (p-1)^N$ when $G = \mathbb{F}_p$ and $J = \{0, 1\}^N$. In this talk, I will introduce some improved upper bounds of $D_G(J, N)$ for several groups G and subsets J.

Primary authors: Mr YIP, Chi Hoi; XU, Zixiang (IBS ECOPRO)

Presenter: XU, Zixiang (IBS ECOPRO)

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