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THE EXISTENCE OF CYCLIC DIFFERENCE SETS

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Abstract of Report Talk: A difference set, given by parameters (v, k, λ) , is a set of k elements from a group G of order v . Difference sets have the special property that if we take every possible difference of the k elements under the group operation of G , we are given each nonidentity element exactly λ times. This presentation will focus on difference sets in cyclic groups.

Many such difference sets have been found and the existence of others disproved under certain parameter sets. The Center for Communications Research at La Jolla gives a list of many open cases in which the existence of a cyclic difference set is unknown. Using multiplier theorems and techniques from algebraic number theory, we will tackle this list of open parameter sets, resolving some cases.

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[Joint work with Steven Sam - Undergraduate, University of California Berkeley]

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