

# KLOOSTERMAN SUMS IN ARITHMETIC PROGRESSIONS

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ABSTRACT. Distribution of values of complete exponential sums, and prominently of Kloosterman sums, is of central importance in number theory and arithmetic geometry. While Weil's bound gives the best possible estimate for the size of an individual Kloosterman sum, the distribution of values of Kloosterman sums to varying moduli is intimately related to the spectral theory of automorphic forms. In this talk, we will present upper bounds for sums of Kloosterman sums against general "arithmetic" weight functions which, in particular, prove power cancellation in sums of Kloosterman sums over arithmetic progressions. This is the first such equidistribution result over non-zero congruence classes, with cancellation of square-root strength in any fixed primitive class up to bounds towards the Ramanujan conjecture. This is joint work with Valentin Blomer.