Exposé court

134 ***Equidistribution of exponential sums indexed by roots of polynomials***

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In this talk, we will consider variants of some classical exponential sums, such as the following "restricted sums of additive characters"

$$\sum_{\substack{x \in \mathbf{F}_p \\ g(x)=0}} e\left(\frac{ax}{p}\right)$$

for a fixed monic polynomial $g \in \mathbf{Z}[X]$. We will be interested in the distribution of these sums as p goes to infinity among the primes that split completely in the splitting field of g, and as a varies in $\mathbf{F}_p$. We show that they become equidistributed with respect to a measure that is related to the group of additive relations among the complex roots of g. This generalizes previous results obtained by Duke, Garcia, Hyde et Lutz in the case where $g = X^d - 1$, and of Burkhardt, Chan, Currier, Garcia, Luca and Suh in the case of "restricted Kloosterman sums" of the form

$$K_p(a, b, d) := \sum_{\substack{x \in \mathbf{F}_p \\ x^d=1}} e\left(\frac{ax + bx^{-1}}{p}\right).$$

This is a joint work with Emmanuel Kowalski.