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*Averages of cubic Gauss sums over functions fields*

We present in this talk some explicit results for averages of cubic Gauss sums over functions fields. Contrary to the quadratic Gauss sums, the behavior of the cubic Gauss sums is chaotic, and in order to address the distribution of cubic Gauss sums, one must use the deep work of Kubota, Heath-Brown and Patterson on automorphic forms for the metaplectic group. This was generalized to the context of function fields by Hoffstein and Patterson. By evaluating precisely the average of those cubic Gauss sums, one gets some unexpected cancellation between the dual and the main error term of the moments of cubic Dirichlet L-functions over number fields.

This is joint work with M. Lalin and Alexandra Florea.