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*Ideal Reduction in Unit Rank One Function Fields*

An important problem in number theory is finding methods for computing invariants of number and function fields. These invariants include the system of fundamental units and the regulator of these fields. Finding efficient algorithms for computing these invariants is believed to be a difficult problem.

An effective way for computing the regulator is to perform arithmetic in a structure of ideals called the infrastructure. This infrastructure plays a paramount role in known algorithms for computing the regulator of quadratic, cubic and certain quartic number and function fields. An important ingredient in these algorithms is a process called ideal reduction.

In this talk, we will present an algorithm for reducing ideals in certain unit rank one function fields. This reduction algorithm incorporates ideas from known lattice basis reduction algorithms and the study of Minkowski geometry of numbers in a field of series.

This is joint work with Renate Scheidler at the University of Calgary.