

CORR 2000-26

**Reduction in Purely Cubic Function Fields of Unit
Rank One**

R. Scheidler

Abstract This paper analyzes reduction of fractional ideals in a purely cubic function field of unit rank one. the algorithm is used for generating all the reduced principal fractional ideals in the field, thereby finding the fundamental unit or the regulator, as well as computing a reduced fractional ideal equivalent to a given nonreduced one. It is known how many reduction steps are required to achieve either of these tasks, but not how much time and storage each reduction step takes. Here, we investigate the complexity of a reduction step, the precision required in the approximation of the infinite power series that occur throughout the algorithm, and the size of the quantities involved.