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Some Remarks Concerning Voronoi's Continued Fraction Algorithm

Abstract. In 1896 G. Voronoi presented an algorithm for determining the fundamental unit(s) of the maximal order of a cubic number field. His procedure is an extension of the well-known simple continued fraction algorithm used to find the fundamental unit of a real quadratic field. This latter process requires that we only perform rational arithmetic and also provides simple bounds on the numbers it produces while executing. Unfortunately, Voronoi's process possesses neither of these computationally desirable features. In this talk we will discuss how Voronoi's algorithm can be modified to provide both of these properties in the case of a cubic field with negative discriminant. This is joint work with Sam Hambleton (Queensland) and Renate Scheidler (Calgary).