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*Compact Representations of Certain Algebraic Integers*

Suppose we have a real quadratic number field of discriminant  $d$ . If we have a principal ideal  $I$ , it usually requires an exponential (in  $\log d$ ) amount of time to write out a generator of  $I$  in the conventional way. However, there exists a representation of this generator, called a compact representation, which can be written out in polynomial time. In this talk I discuss algorithms for finding compact representations of such a generator, when we are given an approximate value of the logarithm of the absolute value of it and an integral basis of  $I$ . I go on to point out several improvements that have been to algorithms used in the past.