COMPUTATION OF RELATIVE CLASS NUMBERS OF IMAGINARY ABELIAN NUMBER FIELDS

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Abstract. We develop an efficient technique for computing relative class numbers of imaginary abelian fields, efficient enough to enable us to easily compute relative class numbers of imaginary cyclic fields of degrees 32 and conductors greater than 10^{13}, or of degrees 4 and conductors greater than 10^{15}. Acccording to our extensive computation, all the 166204 imaginary cyclic quartic fields of prime conductors p less than 10^7 have relative class numbers less than $p/2$. Our major innovation is a technique for computing numerically root numbers appearing in some functional equations.