

Title: **Annihilators of the ideal class group of imaginary cyclic fields**

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The main objective of this thesis is to find for certain infinite family of imaginary cyclic fields annihilators of the ideal class group living outside the Sinnott's Stickelberger ideal. In this thesis we study a field L which is the compositum of a real cyclic field K whose degree over rationals is a power of an odd prime l and an imaginary cyclic field F whose degree over rationals is not divisible by l . In addition, we assume that the conductors of the fields K and F are relatively prime. The main idea of this thesis is to find in the field L a nontrivial root of a certain modified Gauss sum. The factorization of the principal ideal generated by this root gives rise to annihilators of the ideal class group of L . Then we show that these annihilators live outside the Sinnott's Stickelberger ideal if the number of primes ramified in K that split completely in the smallest imaginary subfield of F is sufficiently large. Assuming that l does not ramify in L , it is sufficient that the number of these primes is greater than or equal to two. In the case of F being a quadratic imaginary field our approach generally leads to a stronger annihilation result compared to a result of Greither and Kučera. At the end, we also obtain a result on the divisibility of the relative class number of L .