ANNIHILATORS OF THE MINUS CLASS GROUP OF AN IMAGINARY CYCLIC FIELD

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Let ℓ be an odd prime and $K/\mathbb{Q}$ be a cyclic extension of ℓ-power degree $[K\colon \mathbb{Q}] = \ell^k$. Let F be an imaginary cyclic field whose degree $[F\colon \mathbb{Q}]$ is not divisible by ℓ, so the compositum $L = FK$ is cyclic, too. We suppose that ℓ does not ramify in $L/\mathbb{Q}$. We further assume that the conductors of F and K are relatively prime. We shall denote the minus part of the ℓ-Sylow subgroup of the ideal class group of L by A_L^-. The n-th cyclotomic field will be denoted by $\mathbb{Q}_n$.

Our goal is to find an annihilator of A_L^- outside of the Stickelberger ideal S defined by Sinnott in a systematic way. For each imaginary subfield $M \subseteq L$ of the form $L \cap \mathbb{Q}_n$ we construct a new annihilator ξ_M. We take respective correstrictions of all the annihilators ξ_M to generate, together with the elements of S, an ideal of $\mathbb{Z}[\mathrm{Gal}\,(L/\mathbb{Q})]$. This ideal annihilates A_L^- and under certain assumptions on L we can prove that it is strictly larger than S.