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Capitulation of 2-ideal classes of certain cyclic biquadratic fields. (Capitulation des 2-classes d'idéaux de certains corps biquadratiques cycliques.) (French. English summary)

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Summary: Let $K=k(\sqrt{-pq\varepsilon\sqrt{2}})$ with $k=\mathbb{Q}(\sqrt{2})$, $\varepsilon=1+\sqrt{2}$ the fundamental unit of k, p and q two different prime numbers such that $p\equiv q\equiv\pm 1 \bmod 4$ and $\left(\frac{2}{p}\right)=\left(\frac{2}{q}\right)=-1$, $K_2^{(1)}$ be the Hilbert 2-class field of K, $K_2^{(2)}$ be the Hilbert 2-class field of $K_2^{(1)}$ and $G=\mathrm{Gal}(K_2^{(2)}/K)$ be the Galois group of $K_2^{(2)}/K$. According to *E. Brown* and *C. J. Parry* [Pac. J. Math. 78, 11–26 (1978; Zbl 0405.12009)], $C_{2,K}$, the 2-part of the ideal class group of K, is isomorphic to $\mathbb{Z}/2\mathbb{Z}\times\mathbb{Z}/2\mathbb{Z}$, consequently $K_2^{(1)}/K$ contains three extensions F_i/K $(i=1,2,3)$ and the tower of the Hilbert 2-class field of K terminates at either $K_2^{(1)}$ or $K_2^{(2)}$. In this paper, we study the problem of capitulation of the classes of $C_{2,K}$ in F_i $(i=1,2,3)$ and we determine the structure of G.

MSC:

11R37 Class field theory
11R29 Class numbers, class groups, discriminants
11R16 Cubic and quartic extensions

Full Text: DOI