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On the 2-Class Group of $\mathbb{Q}(\sqrt{5pF_p})$ Where F_p is a Prime Fibonacci Number,

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Abstract

Let F_p be a prime Fibonacci number where $p > 5$. Put $\mathbf{k} = \mathbb{Q}(\sqrt{5pF_p})$ and let $\mathbf{k}_1^{(2)}$ be its Hilbert 2-class field. Denote by $\mathbf{k}_2^{(2)}$ the Hilbert 2-class field of $\mathbf{k}_1^{(2)}$ and by $G = \text{Gal}(\mathbf{k}_2^{(2)}/\mathbf{k})$ the Galois group of $\mathbf{k}_2^{(2)}/\mathbf{k}$. In this paper, we characterize the structure of the 2-class group of \mathbf{k} and we study the metacyclicity of G .