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On indices and monogenity of quartic number fields defined by quadrinomials

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Abstract

A number field K is called monogenic if its ring of integers $\mathbb{Z}\_K$ admits a power integral basis of the form $(1, \alpha, \ldots, \alpha^{n-1})$, where n is the degree of K. In this talk, we study the prime common divisors of indices of certain families of quartic number fields defined by quadrinomials of type $x^4 + ax^3 + bx + c$. As an application of our results, we provide explicit conditions on a, b and c for which theses number fields are not monogenic. Also, we identify infinite families of monogenic quartic number fields defined by non-monogenic quadrinomials. Our method based on a classical theorem of Ore on the decomposition of primes in number fields.

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