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Erdős, Paul; Pomerance, Carl

An analogue of Grimm's problem of finding distinct prime factors of consecutive integers. (In English)

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For n natural number, let $f(n)$ denote the largest integer such that for each $m \in \{n + 1, \dots, n + f(n)\}$ there is a divisor d_m of m with $1 < d_m < m$ and such that the d_m 's are all different. The authors prove that for every $\varepsilon > 0$,

$$n^{1/2} \ll f(n) \ll n^{1/12+\varepsilon}.$$

The lower bound is then strengthened to (1) $\liminf f(n)^{1/2} \geq 4$. Moreover, equality holds in (1) if and only if there are infinitely many twin primes. Several other related results are also given.

S. W. Graham

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11N05 Distribution of primes

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distinct prime factors of consecutive integers; Grimm conjecture