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Erdös conjecture. I. (English)

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(KX):http://www.gallup.unm.edu/smarandache/

Summary: An old conjecture of *P. Erdös* [Summa Brasil. Math. 2, 113-123 (1950; Zbl 0041.36808)] states that there exist only 7 integers $A = 4, 7, 15, 21, 45, 75$ and 105 such that the difference $A - 2^B$ is a prime for all B for which it is at least two. It is known that the conjecture is true for all $A < 2^{77}$, as *S. Uchiyama* and *M. Yorinaga* have verified in 1977 [Math. J. Okayama Univ. 19, 129-140 (1977; Zbl 0369.10004) and 20, 41-49 (1978; Zbl 0383.10006)], and in this short paper the author shows how it is related to other famous unsolved problems in prime number theory. In order to do this, he formulates the main hypothetical result of this paper – a useful upper bound conjecture, describing one aspect of the distribution of primes in various special forms, paying brief attention to Fermat, Mersenne, Fibonacci, Lucas and Smarandache sequences, and he debates some side effects of the most surprising results it implies. At the end he also gives connections of the questions discussed to other important areas of prime number theory, such as topics from the theory of distribution of primes in denser sequences, and along the way mentions some further conjectures of Erdős that have relevant applications there.

Keywords : upper bound conjecture; distribution of primes; Smarandache sequences; Mersenne primes; Fermat primes; Fibonacci primes; Lucas primes; conjectures of Erdős
Classification :

∗11A41 Elememtary prime number theory
11N25 Distribution of integers with specified multiplicative constraints
11B39 Special numbers, etc.