

**Conjecture on the primes  $S(n)+S(n+1)-1$  where  $S(n)$  is a term in Smarandache-Wellin sequence**

**Abstract.** In this paper I make the following conjecture: There exist an infinity of primes  $S(n) + S(n + 1) - 1$ , where  $S(n)$  is a term in Smarandache-Wellin sequence (which is defined as the sequence obtained through the concatenation of the first  $n$  primes).

**Conjecture :**

There exist an infinity of primes  $S(n) + S(n + 1) - 1$ , where  $S(n)$  is a term in Smarandache-Wellin sequence (which is defined as the sequence obtained through the concatenation of the first  $n$  primes). I will name this primes "Smarandache-Wellin-Marius primes" or SWM.

**The Smarandache-Wellin numbers:**

(A019518 in OEIS)

: 2, 23, 235, 2357, 235711, 23571113, 2357111317, 235711131719, 23571113171923, 2357111317192329, 235711131719232931, 23571113171923293137, 2357111317192329313741, 235711131719232931374143, 23571113171923293137414347 (...)

Note: the Smarandache-Wellin numbers which are primes are named Smarandache-Wellin primes. The first three such numbers are 2, 23 și 2357; the fourth is a number with 355 digits and there are known only 8 such primes. The 8 known values of  $n$  for which through the concatenation of the first  $n$  primes we obtain a prime number are 1, 2, 4, 128, 174, 342, 435, 1429. The computer programs not yet found, until  $n = 10^4$ , another such a prime. Florentin Smarandache conjectured that there exist an infinity of prime terms of this sequence.

**The Smarandache-Wellin-Marius primes:**

(A019518 in OEIS)

: SWM1 =  $S(2) + S(3) - 1 = 23 + 235 - 1 = 257$ ;  
 : SWM2 =  $S(3) + S(4) - 1 = 235 + 2357 - 1 = 2591$ ;  
 : SWM3 =  $S(5) + S(6) - 1 = 235711 + 23571113 - 1 = 23806823$ ;  
 : SWM4 =  $S(11) + S(12) - 1 = 235711131719232931 + 23571113171923293137 - 1 = 23806824303642526067$ ;  
 : SWM5 =  $S(12) + S(13) - 1 = 23571113171923293137 + 2357111317192329313741 - 1 = 23806824303642526068877$ ;  
 (...)