# THE REDUCED SMARANDACHE SQUARE-DIGITAL SUBSEQUENCE IS INFINITE

Maohua Le

**Abstract** . In this paper we prove that the reduced Smarandache square-digital subsequence is infinite.

**Key words**. reduced Smarandache square-digital subsequence, infinite.

Form all square integers 0,1,4,9,16,25,36,..., we choose only the terms whose digits are all perfect squares and disregarding the square numbers of the form $N \cdot 10^{2t}$, where $N$ is also a square number and $t$ is a positive integer. Such sequence is called the reduced Smarandache square-digital subsequence . Bencze [1] and Smith [2] independently proposed the following question.

**Question** . How many terms in the reduced Smarandache square-digital subsequence?

In this paper we completely solve the mentioned question . We prove the following result.

**Theorem** . The reduced Smarandache square-digital subsequence has infinitely many terms.

By our theorem , we can give the following corollary immediately .

**Corollary** . The reduced Smarandache square-partial-digital subsequence has infinitely many terms.

**Proof of Theorem** . For any positive integer $n$ , let

(1) $$A(n)=2.10^n+1.$$

Then we have

(2) $(A(n))2 = 4.102^n + 4.10^n + 1 = 4\,0\underbrace{\cdots}_{(n\text{-}1)\text{zeros}}0\ 4\ 0\underbrace{\cdots}_{(n\text{-}1)\text{zeros}}0\ 1$.

By (1) and (2), we see that $(A(n))^2$ belongs to the reduced Smarandache square—digital sudsequence for any $n$ hus, the sequence has infinitely many terms The theorem is proved.

## References


[1] M. Bencze, Smarandache relationships and subsequences, Smarandache Notions J. 11(2000), 79 — 85.

[2] S. Smith, A set of conjecture on Smarandache sequences, Bull. pure Appl. Sci. 16 E(1997), 2:237-240



Department of Mathematics
Zhanjiang Normal College
Zhanjiang, Guangdong
P R CHINA