Second International Conference "Mathematics Days in Sofia"
July 10–14, 2017, Sofia, Bulgaria

On an Equation Involving Fractional Powers with Prime Numbers of a Special Type

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Keywords: Diophantine equation, prime numbers, almost prime numbers.

We consider the equation

$$[p_1^c] + [p_2^c] + [p_3^c] = N, \tag{1}$$

where $c \in \mathbb{R}$, $c > 1$, $N \in \mathbb{N}$ and $[t]$ denotes the integer part of t. We prove the following

Theorem. Suppose that $1 < c < \frac{41}{40}$. Then for every sufficiently large N the equation (1) has a solution in prime numbers p_1, p_2, p_3, such that each of the numbers $p_1 + 2$, $p_2 + 2$, $p_3 + 2$ has at most $\left[\frac{59}{41-40c}\right]$ prime factors, counted with the multiplicity.

References

[1] Zh. Petrov, *On an equation involving fractional powers with prime numbers of a special type*, 2017.