A pseudo polynomial is a function $f : \mathbb{R} \to \mathbb{R}$ such that there exist positive real numbers $\alpha_1, \alpha_2, \ldots, \alpha_d, \theta_1, \theta_2, \ldots, \theta_d$ with $1 \leq \theta_1 < \theta_2 < \cdots < \theta_d$ and some $\theta_j \notin \mathbb{Z}$ for $1 \leq j \leq d$ with $f(x) = \alpha_1 x^{\theta_1} + \alpha_2 x^{\theta_2} + \cdots + \alpha_d x^{\theta_d}$. Given such a function $f$, the authors prove that there exist two positive real numbers $\eta_1$ and $\eta_2$ with the following property. Let $\xi$ be a real number and $N$ a sufficiently large integer. Then

$$\min_{1 \leq n \leq N} \| \xi \lfloor f(n) \rfloor \| \ll f^{-\eta_1}$$

and

$$\min_{p \text{ prime}} \| \xi \lfloor f(p) \rfloor \| \ll f^{-\eta_2}.$$
Cook, R. J., Diophantine inequalities with mixed powers (mod 1), Proc. Amer. Math. Soc., 57, 1, 29-34, (1976) and the doi:10.1007/BF01168456
doi:10.4007/annals.2016.184.2.7
Cook, R. J., Diophantine inequalities with mixed powers (mod 1), Proc. Amer. Math. Soc., 57, 1, 29-34, (1976)


Hardy, G. H.; Littlewood, J. E., Some problems of diophantine approximation Part I. The fractional part of $\lfloor n k \theta \rfloor$, Acta Math., 37, 1, 155-191, (1914) - doi:10.1007/BF02401833


Mauduit, C.; Rivat, J., Propriétés $\lfloor \theta \lfloor n \theta \rfloor \rfloor$-multiplicatives de la suite $\left( \sum_{n=1}^{N} \lfloor n \theta \rfloor \right)_n$ modérées, Comptes Rendus Acad. Sci. Paris Sér. I Math., 324, 4, 365-369, (1997) - doi:10.1016/S0764-4442(97)81488-8


Mauduit, C.; Rivat, J., Répartition des fonctions $\lfloor \theta \lfloor n \theta \rfloor \rfloor$-multiplicatives dans la suite $\left( \sum_{n=1}^{N} \lfloor n \theta \rfloor \right)_n$ modérées, Comptes Rendus Acad. Sci. Paris Sér. I Math., 324, 4, 365-369, (1997) - doi:10.1016/S0764-4442(97)81488-8


Nair, R., On certain solutions of the Diophantine equation $\lfloor \theta \lfloor n \theta \rfloor \rfloor - \lfloor \theta \lfloor p \lfloor n \theta \rfloor \rfloor = 0$, Acta Arith., 62, 1, 481-486, (1993) - Zbl 0776.11006 - doi:10.4064/aa-62-1-481-486

Zbl 0574.10050

Zbl 0643.10045

Zbl 1082.11058

Zbl 1196.11091

Zbl 1270.11009

Morgenbesser, J. F., The sum of digits of $\lfloor \theta \lfloor n \theta \rfloor \rfloor$-multiplicatives in the suite $\left( \sum_{n=1}^{N} \lfloor n \theta \rfloor \right)_n$ modérées, Comptes Rendus Acad. Sci. Paris Sér. I Math., 324, 4, 365-369, (1997) - doi:10.1016/S0764-4442(97)81488-8


Zbl 0478.10036

Zbl 0574.10050

Zbl 0643.10045

Zbl 1082.11058

Zbl 1196.11091

Zbl 1270.11009

Morgenbesser, J. F., The sum of digits of $\lfloor \theta \lfloor n \theta \rfloor \rfloor$-multiplicatives in the suite $\left( \sum_{n=1}^{N} \lfloor n \theta \rfloor \right)_n$ modérées, Comptes Rendus Acad. Sci. Paris Sér. I Math., 324, 4, 365-369, (1997) - doi:10.1016/S0764-4442(97)81488-8


Nair, R., On certain solutions of the Diophantine equation $\lfloor \theta \lfloor x \rfloor \rfloor - \lfloor \theta \lfloor y \rfloor \rfloor = 0$, Acta Arith., 62, 1, 481-486, (1993) - Zbl 0776.11006 - doi:10.4064/aa-62-1-481-486


Edited by FIZ Karlsruhe, the European Mathematical Society and the Heidelberg Academy of Sciences and Humanities © 2021 FIZ Karlsruhe GmbH

Page 2