Abstract

Integer sequences of the form $\lfloor n^c \rfloor$, where $1 < c < 2$, can be locally approximated by sequences of the form $\lfloor n\alpha + \beta \rfloor$ in a very good way. Following this approach, we are led to an estimate of the difference

$$\sum_{n \leq x} \varphi(\lfloor n^c \rfloor) - \frac{1}{c} \sum_{n \leq x^c} \varphi(n)n^{\frac{1}{c}-1},$$

which measures the deviation of the mean value of $\varphi$ on the subsequence $\lfloor n^c \rfloor$ from the expected value, by an expression involving exponential sums. As an application we prove that for $1 < c \leq 1.42$ the subsequence of the Thue-Morse sequence indexed by $\lfloor n^c \rfloor$ attains both of its values with asymptotic density $1/2$. 
