Der Wissenschaftsfonds.

Institut f. Analysis und Zahlentheorie

Zahlentheoretisches Kolloquium

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Smooth numbers with digital restrictions

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Abstract: An integer n is said to be $y-$smooth if its largest prime factor $P(n)$ is less than y. As usual, we denote by $S(x,y)$ the set of $y-$smooth numbers up to x,

$$S(x,y)=\{1\leq n\leq x, P(n)\leq y\}.$$

In this talk, we provide an asymptotic formula for the number of integers n in $S(x,y)$ such that $S_q(n)\equiv l \mod m$ for $l\in\mathbb{Z}$ and $m\geq 2$, where $S_q(n)$ denotes the sum of the digits in base q of the integer n. Also, we show that the sequence $\big(\alpha S_q(n)\big)_{n\in S(x,y)}$ is uniformly distributed modulo 1 if and only if α is irrational.
Furthermore, we study the number of ordered pairs $(a,b)\in A\times B$ such that $P(a+b)\leq y$ and $S_q(a+b)\equiv l \mod m$, ($l\in\mathbb{Z}$ and $m\geq 2$), for a given sets of integers A and B. Finally, we discuss sums of the form

$$\sum_{\substack{n\in S(x,y)\\ S_q(n)\equiv l \mod m}} f(n-1),$$

where f is a multiplicative function, $l\in\mathbb{Z}$ and $m\geq 2$.

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