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On Erdos-Pomerance conjecture

Let k be a global function field whose field of constants is the finite field $\mathbb{F}_q$. Let ∞ be a fixed place of degree one, and A is the ring of elements of k which have only ∞ as a pole.

Let ϕ be a sgn-normalized rank one Drinfeld A-module defined over $\mathcal{O}$, the integral closure of A in the Hilbert class field of A. We prove an analogue of a conjecture of Erdos and Pomerance for φ. Given any $0 \neq \alpha \in \mathcal{O}$ and an ideal $\mathfrak{M}$ in $\mathcal{O}$, let $f_\alpha(\mathfrak{M}) = \{f \in A \mid \phi_f(\alpha) \equiv 0 \pmod{\mathfrak{M}}\}$ be the ideal in A. We denote by $\omega\big(f_\alpha(\mathfrak{M})\big)$ the number of distinct prime ideal divisors of $f_\alpha(\mathfrak{M})$. If $q \neq 2$, we prove that there exists a normal distribution for the quantity

$$\frac{\omega\big(f_\alpha(\mathfrak{M})\big) - \frac{1}{2}(\log \deg \mathfrak{M})^2}{\frac{1}{\sqrt{3}}(\log \deg \mathfrak{M})^{3/2}}.$$

This is the jointed work with Yen-Liang Kuan and Wei-Chen Yao