

Séminaire de théorie des nombres

Le 03 juillet 2017 à 14h (Jussieu)

Erratic behaviour of Ramanujan's tau function

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Résumé : Classical results of Rankin show that Ramanujan's tau function can not be ultimately periodic. In a recent joint work with J-M Deshouillers, Y. Bilu and F. Luca, we prove that for any positive integer k , the numbers $\tau(n)$ are $\neq 0$ for $1 \leq n \leq k/2$ if and only if for every permutation σ of the set $\{1, 2, \dots, k\}$, there exists infinitely many positive integers m such that $0 \leq |\tau(m + \sigma(1))| \leq |\tau(m + \sigma(2))| \leq \dots \leq |\tau(m + \sigma(k))|$. In particular, if Lehmer conjecture holds, ie if $\tau(n) \neq 0$ for all n , then our theorem applies to all positive integers k .