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## The sum of digits of prime numbers

The goal of this talk is to present an application to the theory of prime numbers of ideas coming from transfer operators. In a previous joint work with Etienne Fouvry concerning the study of the sum of digit function  $s$  in base  $q$ , we showed some links between the exponent of repartition in the sieve method and the spectral properties of a class of quasi compact operators. We will show how these ideas can be carried on to answer a question by Alexandre Gelfond (1967) in a very recent joint work with Joel Rivat. In this paper, we prove that the expected proportion of prime numbers  $p$  is such that  $s(p)$  belongs to a given arithmetic progression and that the sequences  $(s(p)x)$  is uniformly distributed modulo 1 for any irrational number  $x$ .