

ON THE CORRELATION OF COMPLETELY MULTIPLICATIVE FUNCTIONS

ABSTRACT. Let $f(n)$ be an arithmetic function and $x > 0$, then we define the correlation function $C(f, x) = \sum_{n \leq x} f(n)f(n+1)f(n+2)$. In this talk we present an asymptotic formula for $C(f, x)$ in the case when $f(n)$ is a completely multiplicative function and $|f(n)| \leq 1$ for all $n \in \mathbb{N}$. Let $\lambda_y(n)$ denote the truncated Liouville function which equals $+1$ or -1 according n has odd or even number of prime divisors $p \leq y$ counted with multiplicity. It follows from the main theorem that $C(\lambda_y, x) = o(x)$ whenever $y = x^{o(1)}$ and speaks in favour of the Chowla conjecture that $C(\lambda, x) = o(x)$ where λ is the classical liouville function.