ON THE CORRELATION OF COMPLETELY MULTIPLICATIVE FUNCTIONS

ABSTRACT. Let f(n) be an arithmetic function and x > 0, then we define the correlation function $C(f, x) = \sum_{n \le x} f(n)f(n+1)f(n+2)$. In this talk we present an asymptotic formula for C(f, x) in the case when f(n) is a completely multiplicative function and $|f(n)| \le 1$ 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 $p \le y$ 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.