

Convolution of periodic multiplicative functions and the divisor problem

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Abstract: I will report on a joint paper with Maiti, Ramaré and Srivastav. The basic question of this talk is the following: Given two arithmetic functions f and g whose Dirichlet series have abscissa of convergence 0 and of absolute convergence 1 , what can we say about the abscissa of convergence of the Dirichlet series of the convolution between f and g ? In this paper, we studied this question for functions f and g belonging to the class of near counterexamples to the Erdős discrepancy problem, that is, periodic multiplicative functions with bounded partial sums. In a previous paper, I exhibited a connection between the partial sums of the convolution between f and g belonging to this class (and 1 -pretentious) with the classical error term in the Dirichlet divisor problem. In this talk I will show almost optimal upper and omega bounds for the partial sums of these convolutions, and a connection with the self-correlation of the classical error term in the divisor problem.