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Correlations of multiplicative functions

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It is a central question in multiplicative number theory to understand how shifts of multiplicative functions correlate with each other. A well-known conjecture of Elliott predicts that there should be no correlation between shifted multiplicative functions, except if the functions involved pretend to be twisted Dirichlet characters in a suitable sense. Elliott's conjecture includes as a special case the famous Chowla conjecture on shifted products of the Möbius function.

We present a logarithmically weighted version of Elliott's conjecture under a certain additional non-pretentiousness assumption. This in particular enables us to settle the odd order cases of Chowla's conjecture with logarithmic weights. We also provide partial progress on the important question of whether one can remove logarithmic averaging from these results.

This is a joint work with Terence Tao.

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