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Uncertainty, Fourier optimization, and the zeta function

Uncertainty principles, in their many qualitative and quantitative variants, state a limit on to what extent we can simultaneously control a function and its Fourier transform. Meanwhile, Fourier optimization problems impose restrictions on both, while aiming to optimize a quantity of interest. Based on recent and ongoing work, we discuss some connections between these and several problems involving counting prime numbers, via the Riemann zeta function.