Irene Sabadini

Politecnico di Milano

Superoscillations and infinite order differential operators

Abstract

Superoscillating functions were introduced in quantum mechanics in the context of weak values. They are known as band-limited functions that can oscillate faster than their fastest Fourier component. They eventually have become an interesting and independent field of research in mathematics since they have connections with complex analysis and with the theory of infinite order differential operators. We shall discuss classes of infinite order differential operators acting on entire functions with growth conditions which naturally arise in the study of evolution of superoscillating functions. In particular, we consider a new binary operation on the frequencies, that we call relativistic sum, allowing to construct new sequences of functions having a supershift property (a generalization of the notion of superoscillation).