Summary: Band-limited signals of finite energy, i.e., functions in $L^2$, form the setting for much of signal processing. However, many signals of practical interest do not have finite energy. In this work we extend some results involving prolate spheroidal wave functions (PSWFs) to such signals. We consider those functions whose Fourier transforms have compact support in the sense of generalized functions and obtain convergence results for their PSWF expansions.

MSC:

94A12 Signal theory (characterization, reconstruction, filtering, etc.)
42B35 Function spaces arising in harmonic analysis
42C15 General harmonic expansions, frames

Keywords:
prolate spheroidal wave functions; Fourier transform; distributions

Full Text: DOI

References:


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