A. Olevskii, Department of Algebra and Analysis, Moscow Institute of Electronic Engineering, Moscow, USSR

SOME INTERPOLATION PROBLEMS IN REAL AND HARMONIC ANALYSIS [1]

Suppose that $\mathcal{F}$ is any function space and that $\mathcal{G}$ is a subspace of 'good' functions. For an arbitrary $f \epsilon \mathcal{F}$, we wish to find a $g \epsilon \mathcal{G}$ which coincides with f on some set E. This is an interpolation problem. There are fundamentally two distinct types of interpolation problems. The first type, called *interpolation with fixed knots*, is where a fixed set E (not necessarily finite) is given *a priori*. If the problem is resolvable for every $f \epsilon \mathcal{F}$, we say that E is an *interpolating set* for the pair $(\mathcal{F}, \mathcal{G})$. The second type of interpolation problem, called *free interpolation*, is where E is not specified in advance and it can be chosen, depending on f, in such a way that it may be 'thick' in a metric sense or in cardinality. In this talk we shall examine both types of problems and specifically look at *interpolation by smooth functions* by considering the problem of to what degree we can improve the smoothness of a real valued function defined on the unit interval by free interpolation on perfect sets, and *interpolation in Fourier analysis* by interpolating a continuous function on the circle by functions having 'well behaved' Fourier expansions.

[1] A more detailed summary of this talk may be found in the Inroads Section of this issue.