RESEARCH ANNOUNCEMENTS

The purpose of this department is to provide early announcement of significant new results, with some indications of proof. Although ordinarily a research announcement should be a brief summary of a paper to be published in full elsewhere, papers giving complete proofs of results of exceptional interest are also solicited. Manuscripts more than eight typewritten double spaced pages long will not be considered as acceptable.

HANKEL TRANSFORMS AND ENTIRE FUNCTIONS

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Paley and Wiener proved that every entire function of exponential type τ which belongs to L^2 in the real axis can be represented as the Fourier transform of a function which belongs to $L^2(-\tau, \tau)$ and conversely (see Boas [1, p. 103]). The L^p-analogue of the Paley-Wiener theorem for $1<p<2$ was proved by Boas [2] and by Plancherel and Pólya [9]. Boas also showed that the theorem does not hold for other values of p unless some restrictions are imposed. The extensions to functions of order $1/m$, where m is an integer $\geqq 1$, and type σ are given by Ibragimov [7]. Since the Hankel transforms are natural generalizations of the Fourier transforms, it is natural to ask whether such a representation for entire functions is possible in this case also. The aim of this note is to obtain an analogue of the Paley-Wiener theorem for Hankel transforms for the case $1<p<2$ and to extend the results of Ibragimov. These results with proofs will appear elsewhere and we shall only summarize them here.

Unless otherwise stated, ν is always assumed to be greater than or equal to $-1/2$. If $p>1$, then q will denote its conjugate index given by $p^{-1}+q^{-1}=1$. Let $z=x+iy$ denote the complex variable. $J_\nu(z)$ denotes the Bessel function of the first kind of order ν.

The Hankel transform of a function $f(x)\in L^p(0, \infty)$, $p>1$, is defined by the formula

$$F(u) = \int_0^\infty (xu)^{1/2}J_\nu(xu)f(x)\,dx,$$

where the integral is taken in the L^q-sense or in the mean, that is,

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