

RADIAL VARIATION OF FUNCTIONS IN BESOV SPACES

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Abstract

This paper considers the radial variation function $F(r, t)$ of an analytic function $f(z)$ on the disc D . We examine $F(r, t)$ when f belongs to a Besov space A_{pq}^s and look for ways in which F imitates the behaviour of f . Regarded as a function of position (r, t) in D , we show that F obeys a certain integral growth condition which is the real variable analogue of that satisfied by f . We consider also the radial limit $F(t)$ of F as a function on the circle. Again, $F \in B_{pq}^s$ whenever $f \in A_{pq}^s$, where B_{pq}^s is the corresponding real Besov space. Some properties of F are pointed out along the way, in particular that $F(r, t)$ is real analytic in D except on a small set. The exceptional set E on the circle at which $\lim_{r \rightarrow 1} f(re^{it})$ fails to exist, is also considered; it is shown to have capacity zero in the appropriate sense. Equivalent descriptions of E are also given for certain restricted values of p, q, s .

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