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TANGENTIAL LIMITS AND EXCEPTIONAL SETS FOR HOLOMORPHIC BESOV FUNCTIONS IN THE UNIT BALL OF $\mathbf{C}^n$

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1. Introduction

Let B^n denote the unit ball in $\mathbf{C}^n$ with boundary S, the unit sphere. If f is holomorphic in B^n with homogeneous expansion

$$f(z) = \sum_{k=0}^{\infty} f_k(z),$$

define a radial fractional derivative of order $\beta > 0$ by

$$R^{\beta} f(z) = \sum_{k=0}^{\infty} (k+1)^{\beta} f_k(z).$$

Note that for $\beta = 1$, $R^1 f = \mathscr{R} f + f$ where $\mathscr{R}$ is the usual radial derivative as defined in [R]. Define the Besov space $B_{\beta}^{p}(B^n)$, $p > 1$, $\beta > 0$, as

$$B_{\beta}^{p}(B^n) = \left\{ f \in H(B^n) : \int_{B^n} |R^{1+\beta} f(z)|^p (1-|z|)^{p-1}\, dV(z) < \infty \right\},$$

so that

$$\|f\|_{p,\beta}^{p} = \int_{B^n} |R^{1+\beta} f(z)|^p (1-|z|)^{p-1}\, dV(z).$$

When β is a positive integer, this definition is equivalent to the analogous space using $\mathscr{R}$ instead (see [BB]), and we will occasionally use $\mathscr{R}$ when it is convenient.

For functions in this space we show the existence of limits in certain non-isotropic tangential approach regions. The exceptional sets are shown to

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