

Shapiro, Jonathan E.**Relative angular derivatives.** (English) Zbl 1002.46021

J. Oper. Theory 46, No. 2, 265-280 (2001).

Summary: We generalize the notion of the angular derivative of a holomorphic self-map b , of the unit disk, by replacing the usual difference quotient $\frac{b(z)-b(z_0)}{z-z_0}$ with a difference quotient relative to an inner function u , $\frac{1-b(z)}{1-u(z)}$. We relate properties of this generalized difference quotient to the properties of the Aleksandrov measures associated with the functions b and u . Six conditions are shown to be equivalent to each other, and these are used to define the notion of a relative angular derivative. We see that this generalized derivative can be used to reproduce some known results about ordinary angular derivatives, and the generalization is shown to obey a form of the product rule.

MSC:

[46E22](#) Hilbert spaces with reproducing kernels (= (proper) functional Hilbert spaces, including de Branges-Rovnyak and other structured spaces)

Cited in **3** Documents

[46E30](#) Spaces of measurable functions (L^p -spaces, Orlicz spaces, Köthe function spaces, Lorentz spaces, rearrangement invariant spaces, ideal spaces, etc.)

Keywords:

angular derivative; Hardy space; Aleksandrov measure; de Branges-Rovniak space; holomorphic self-map; inner function; generalized difference quotient; product rule