Generalized Hilbert operators acting on weighted Bergman spaces

José Ángel Peláez

José Ángel Peláez (japelaez@uma.es)
Universidad de Málaga

Abstract.

The Hilbert matrix $\mathcal{H} = \{\frac{1}{n+k+1}\}_{n,k\geq 0}$ can be viewed as an operator on spaces of analytic functions on the unit disc, called the *Hilbert operator*, which can be written in the form $\mathcal{H}(f)(z) = \int_0^1 f(t)g'(tz)\,d\zeta$ where $g(z) = \log\frac{1}{1-z}$.

This fact motivates the study of generalized Hilbert operators

$$\mathcal{H}_g(f)(z) = \int_0^1 f(t)g'(tz)\,dt$$

acting on a Bergman space A^p_ω induced by a radial weight ω. We shall see how the Muckenhoupt type condition

$$\sup_{0\leq r<1}\left(\int_r^1\left(\int_t^1 \omega(s)ds\right)^{-\frac{p'}{p}} dt\right)^{\frac{p}{p'}}\int_0^r (1-t)^{-p}\left(\int_t^1 \omega(s)ds\right)dt < \infty.$$

arises in the picture.

Joint work with J. Rättyä.

References

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