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Complex Symmetry of Composition Operators

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Resumo

A bounded operator T on a complex separable Hilbert space $\mathcal{H}$ is said to be *complex symmetric* if there exists an orthonormal basis for $\mathcal{H}$ with respect to which T has a self-transpose matrix representation. An equivalent way to define complex symmetry is the following: if a *conjugation* is a conjugate-linear operator $C : \mathcal{H} \to \mathcal{H}$ that satisfies the conditions

(a) C is isometric: $\langle Cf, Cg\rangle = \langle g, f\rangle \, \forall f, g \in \mathcal{H}$,

(b) C is involutive: $C^2 = I$,

then we say that T is complex symmetric if there exists a conjugation C such that $T = CT^*C$. Suppose $H^2(\mathbb{B}_n)$ is the classical Hardy space of analytic functions on the unit ball $\mathbb{B}_n \subset \mathbb{C}^n$ and define the composition operator C_ψ on $H^2(\mathbb{B}_n)$ by $C_\psi f = f \circ \psi$, where ψ is an analytic self-map of $\mathbb{B}_n$. In this presentation, a solution is given to problem posed by Stephan Ramon Garcia and Christopher Hammond [1]: *If φ is an involutive Moebius automorphism of $\mathbb{B}_n$, find a conjugation operator $\mathcal{J}$ on $H^2(\mathbb{B}_n)$ such that $C_\varphi = \mathcal{J} C_\varphi^* \mathcal{J}$.*

Referências

[1] S. R. Garcia and C. Hammond, *Which weighted composition operators are complex symmetric?* Operator Theory: Advances and Applications 236 (2014), 171-179.

[2] S. Waleed Noor, *Complex symmetry of composition operators induced by involutive ball automorphisms*, Proc. Amer. Math. Soc. 142 (2014), no. 9, 3103-3107.