

Unitary equivalence of complex symmetric contractions with finite defect

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A criterion for a contraction T on a Hilbert space to be complex symmetric is given in terms of the operator-valued characteristic function Θ_T of T in 2007 by Chevrot, Fricain, and D. Timotin. To further classify unitary equivalent complex symmetric contractions, we notice a simple condition of when Θ_{T_1} and Θ_{T_2} coincide for two complex symmetric contractions T_1 and T_2 . As an application, surprisingly we solve the problem for any defect index n , when the defect indexes of contractions are 2, this problem was left open in them. Furthermore, a construction of 3×3 symmetric inner matrices is proposed, which extends some results on 2×2 inner matrices by Garcia and 2×2 symmetric inner matrices by Chevrot, Fricain, and D. Timotin.

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