

Inverse problem for generalized de Branges matrices

Volodymyr Derkach, UMASS Lowell

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Abstract: de Branges-Pontryagin spaces $B(E)$ with negative index k of entire vector valued functions based on an entire matrix valued function $E(z)$ (called the de Branges matrix) are studied. A characterization of those spaces $B(E)$ that are invariant under the generalized backward shift operator that extends known results when $k = 0$ is given. The theory of rigged de Branges-Pontryagin spaces is developed and then applied to obtain an embedding of de Branges matrices with negative squares in generalized J -inner matrices. A formula for factoring an arbitrary generalized J -inner entire matrix valued function into the product of a singular factor and a perfect one is found analogous to the known factorization formulas for J -inner matrix valued functions.