

Abstract Interpolation in Scattering Setting

Alexander Kheifets
University of Massachusetts, Lowell

The Abstract Interpolation Problem (AIP) is a general scheme which encompasses a number of classical problems about interpolation by analytic functions. It is built around a so-called unitary colligation. Analyticity is an essential ingredient because the characteristic function of a unitary colligation is analytic.

Solutions of the classical Nehary problem (i.e., symbols of a Hankel operator) are not typically analytic, neither are symbols of intertwining contractions (solutions of the Commutant Lifting problem). Although these problems can be reduced to the analytic AIP scheme (as it was shown by P. Yuditskii and S. Kupin), solutions of the original problem are not exactly the solutions of the associated AIP under this approach, they are derived from the construction. It is though of interest to develop a modified AIP having a broader scope than the original one. This talk will discuss such a modification. Instead of a unitary colligation, the modified AIP is built around a scattering system without input-state-output structure, a natural thing to get the nonanalytic solutions of the Nehari problem (or symbols of intertwining contractions) directly as scattering functions of those systems. Just as with the original AIP, the modified AIP leads to a parameterization of the set of solutions.