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Reconstructing an Analytic Function Using Truncated Lagrange Polynomials

Let U be the unit disc of the complex plane. We consider the problem of reconstructing a function f in the Hardy space $H^2(U)$ from values $f(z_n^{(m)})$, where $\{z_n^{(m)}\}$, ($m \in \mathbb{N}$; $1 \leq n \leq m$), is a given point system in U . This is an ill-posed problem. The function f is approximated by so-called truncated Lagrange polynomials. Necessary and sufficient conditions for the convergence are established and a regularization result is given.