MERGELYAN TYPE THEOREMS FOR SOME FUNCTION SPACES

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Abstract

Let F be a relatively closed subset of the unit disc D. If A is any of the Hardy spaces $H^p(D)$, $0 < p < \infty$, $\overline{A|_F}$ denotes the functions on F being uniform limits of elements from $H^p(D)$. Let $\tilde{F}$ consist of all $z \in D$ such that $|f(z)| \leq \sup\{|f(z)|z \in F\}$ for any bounded analytic function in D. It is proved that $\overline{A|_F}$ consist of all functions f that can be decomposed as $f = u + v$, where u belongs to $H^p(D)$ and v is a uniformly continuous function on the set $\tilde{F}$, analytic at interior points of $\tilde{F}$.