PRINCIPAL IDEALS IN ALGEBRAS OF LORCH ANALYTIC MAPPINGS

GUILHERME V. S. MAURO
LUIZA A. MORAES
UNIVERSIDADE FEDERAL DA INTEGRAÇÃO LATINO-AMERICANA (UNILA), BRAZIL
UNIVERSIDADE FEDERAL DO RIO DE JANEIRO (UFRJ), BRAZIL

Abstract. If E is a commutative complex Banach algebra with unit and U is an open (non empty) connected subset of E, a mapping $f : U \to E$ is analytic in U in the sense of Lorch if given any $a \in U$ there exists $\rho > 0$ and there exist unique elements $a_n \in E$, such that $B_\rho(a) \subset U$ and $f(z) = \sum_{n=0}^{\infty} a_n(z-a)^n$, for all $z \in E$ satisfying $\|z - a\| < \rho$.

The definition of Lorch analytic mapping extends to unitary commutative complex Banach algebras the classical definition of analytic function on $\mathbb{C}$ in a very natural way and a considerable portion of the classical theory of analytic functions carries over to the Lorch analytic mappings.

Let $\mathcal{H}_L(U, E)$ denote the set of all $f : E \to E$ that are Lorch analytic in U, considered as a subalgebra of the algebra $C(U, E)$ of continuous mappings from U into E.

We endow the algebra $\mathcal{H}_L(U, E)$ with a convenient topology τ_d which coincides with the topology τ_b when $U = E$ or $U = B_r(z_0) = \{z \in E; \|z - z_0\| < r\}$ ($z_0 \in E, r > 0$).

An interesting result of the classical theory of analytic functions states that the closed ideals in $(\mathcal{H}(G), \tau_0)$ (where G is an open connected subset of $\mathbb{C}$) are precisely the principal ideals.

As $(\mathcal{H}_L(U, E), \tau_d) = (\mathcal{H}(U), \tau_0)$ when $E = \mathbb{C}$ and U is an open connected subset of E, it is natural to ask how the closed ideals and the principal ideals of $(\mathcal{H}_L(U, E), \tau_d)$ are related.

In this talk we will be concerned with this question.