



Christina P. Podara (chpodara@gmail.com) Department of Mathematics, University of Athens, Greece, *Some results related to approximate identities in topological algebras.*

ABSTRACT. Many naturally occurring topological algebras (e.g. all locally C^* -algebras, that is, all inverse limits of C^* -algebras) do not have an identity, but an approximate identity, in fact a bounded one. In this talk, we will present several results on approximate identities in topological algebras. We prove that:

1. If A is a barreled locally convex algebra having a right bounded approximate identity and X is a quasibarreled locally convex A -bimodule such that $A \cdot X := \{a \cdot x : a \in A, x \in X\} = 0$, then every continuous derivation from A into the A -bimodule X'_b (where “ b ” denotes the strong topology) is inner.
2. If A is an Arens regular hypotopological locally convex algebra (where hypotopological means that its multiplication is hypocontinuous), then A has a bounded approximate identity if and only if its strong bidual A'' (with the Arens product) is a unital algebra.
3. The complete projective tensor product $A \hat{\otimes} B$ of two amenable Fréchet m -convex algebras A and B is also amenable (this extends a B. Johnson’s result on Banach algebras).
4. The strong bidual of a Fréchet locally C^* -algebra is again a Fréchet locally C^* -algebra.