On Pythagorean topological algebras

Marina Haralampidou

University of Athens, Greece

Abstract

We introduce the notion of a *Pythagorean topological algebra*. This is a locally convex algebra $(E, (p_\alpha)_{\alpha\in A})$ that satisfies the *Pythagorean property*. Namely,

If $x, y \in E$ *and* $xy = yx = 0$, *then* $p_\alpha(x+y)^2 = p_\alpha(x)^2 + p_\alpha(y)^2$, *for all* $\alpha \in A$.

We see how pseudo-H-structures lead to Pythagorean algebras and formulate conditions, under which, such algebras have a pseudo-H-structure. Moreover, commutative locally m-convex H^*-algebras are characterized, among others, through the Pythagorean property.