The Archimedean Property: New Horizons and Perspectives Joint work with Antonio Ledda and Constantine Tsinakis

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Abstract

Although there have been repeated attempts to define the concept of an Archimedean algebra for individual classes of residuated lattices, there is no all-purpose definition that suits the general case. We suggest as a possible candidate the notion of a normal-valued and e-cyclic residuated lattice that has the *zero radical compact property* — namely, a normal-valued and e-cyclic residuated lattice in which every principal convex subuniverse has a trivial radical (understood as the intersection of all its maximal convex subuniverses). We characterize the Archimedean members in the variety of e-cyclic residuated lattices, as well as in various special cases of interest. A theorem to the effect that each Archimedean and prelinear GBL-algebra is commutative, subsuming as corollaries several analogous results from the recent literature, is grist to the mill of our proposal's adequacy.