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On the Structure of Continuous Uninorms

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Abstract: Uninorms were introduced by Yager and Rybalov [13] as a generalization of triangular norms and conorms. We ask about properties of increasing, associative, continuous binary operation U in the unit interval with the neutral element $e \in [0,1]$. If operation U is continuous, then $e = 0$ or $e = 1$. So, we consider operations which are continuous in the open unit square. As a result every associative, increasing binary operation with the neutral element $e \in (0,1)$, which is continuous in the open unit square may be given in $[0,1)^2$ or $(0,1]^2$ as an ordinal sum of a semigroup and a group. This group is isomorphic to the positive real numbers with multiplication. As a corollary we obtain the results of Hu, Li [7].

Keywords: uninorms; continuity; t-norms; t-conorms; ordinal sum of semigroups;

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