Obstinate prefilters in EQ-algebras

Mohadeseh Behzadi[*]

Department of Mathematics, Kerman Branch, Islamic Azad University, Kerman, Iran

Lida Torkzadeh

Department of Mathematics, Kerman Branch, Islamic Azad University, Kerman, Iran

In this paper, we introduce the notions of obstinate prefilters (filters) in an EQ-algebra. We establish properties of obstinate prefilters in an EQ-algebra. We prove some relationships between obstinate prefilters and the other types of prefilters an EQ-algebra .

1 Introduction and Preliminaries

A special algebra called EQ-algebra has been recently introduced by Vilém Novák and B. De Baets [2]. Its original motivation comes from fuzzy type theory, in which the main connective is fuzzy equality. An EQ-algebras have three binary (meet, multiplication and a fuzzy equality) and a top element and also a binary operation implicatin is drived from fuzzy equality. Its implication and multiplication are no more closely tied by the adjunction and so, this algebra generalizes commutative residuated lattice. These algebras intended to develop an algebric structure of truth values for fuzzy type theory. EQ-algebras are interesting and important algebra for studing and researching and also residuated lattices and BL-algebras are particular cases of EQ-algebras.

In this section, we present some definitions and results about EQ-algebras that will be used in the sequel.

Definition 1.1. [1] An EQ-algebra is an algebra $(E, \wedge, \otimes, \sim, 1)$ of type $(2, 2, 2, 0)$ satisfies the following :

(E_1) $(E, \wedge, 1)$ is a $\wedge$-semilattice with top element 1. We set $a \leq b$ if and only if $a \wedge b = a$,

(E_2) $(E, \otimes, 1)$ is a monoid and $\otimes$ is isotone in arguments w.r.t $a \leq b$,

(E_3) $a \sim a = 1$,

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[*]Speaker