Iranian Journal of Fuzzy Systems **Vol. 6, No. 4,** (2009) pp. 61-72

SPECTRUM OF PRIME FUZZY HYPERIDEALS

R. AMERI AND R. MAHJOOB

Abstract. Let R be a commutative hyperring with identity. We introduce and study prime fuzzy hyperideals of R. We investigate the Zariski topology on FHspec(R), the spectrum of prime fuzzy hyperideals of R.

1. Introduction

In the last few years a considerable amount of work has been done on fuzzy ideals in general and prime fuzzy ideals in particular, and some interesting topological properties of the spectrum of fuzzy prime ideals of a ring are obtained. As it is well known that Marty in 1934 ([16]) introduced the notion of hypergroup. Zadeh in 1965 ([24]) introduced the notion of a fuzzy subset of a non-empty set X as a function from X to the unit real interval I = [0, 1]. The study of fuzzy hyperstructure is an interesting research topic of fuzzy sets. In this paper we introduce the notion of prime fuzzy hyperideals of a commutative hyperring with identity and will investigate some basic properties of prime fuzzy hyperideals and characterize the prime fuzzy hyperideals. Finally we investigate the topology on FHSpec(R), the set of all prime fuzzy hyperideals of R.

2. Preliminaries

Recall that a fuzzy subset μ of a non-empty set X is a function μ from X to $[0,1]$. F^X denotes the set of all fuzzy subsets of X. Let A be a subset of X and $y \in [0,1]$. Define $y_A \in F^X$ as follows:

$$y_A(x) = \begin{cases} y & x \in A; \\ 0 & otherwise \end{cases}$$

In particular, if $A = \{a\}$ we denote $y_{\{a\}}$ by y_a, and it is called a fuzzy point of X.

For $\mu \in F^X$ and $a \in [0,1]$, define μ_a as follows:

$$\mu_a = \{x \in X | \mu(x) \geq a\},$$

μ_a is called the *a-cut* or *a-level subset* of μ

For $\mu, \nu \in F^X$ we say that μ is contained in ν and we write $\mu \subseteq \nu$ if for all $x \in X$, $\mu(x) \leq \nu(x)$.

Key words and phrases: Commutative hyperring, Prime fuzzy hyperideals, Zariski topology.

The first author has been supported in part by Fuzzy Systems Research Center, University of Sistan and Bluchestan, Zahedan, Iran.