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Study of Fuzzy Semi Open Sets in Fuzzy Topological Spaces

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Abstract: The present paper we introduce the concept of fuzzy γ -semi super open sets and fuzzy γ -semi T_i spaces and study some of their properties. Finally we introduce fuzzy (γ, β) –semi super continuous maps and explore the basic properties. Keywords: fuzzy topology, fuzzy continuity, fuzzy open set, fuzzy closed set fuzzy γ -semi open set, fuzzy γ -semi T_i spaces (i= 0, $\frac{1}{2}$, 1, 2), fuzzy (γ, β) –semi continuous maps.

I. INTRODUCTION

Let X be a non-empty set and I= [0,1]. A fuzzy set on X is a mapping from X in to I. The null fuzzy set 0 is the mapping from X in to I which assumes only the value is 0 and whole fuzzy sets 1 is a mapping from X on to I which takes the values 1 only. The union (resp. intersection) of a family $\{A_{\alpha}: \alpha \in \Lambda\}$ of fuzzy sets of X is defined by to be the mapping sup A_{α} (resp. inf A_{α}). A fuzzy set A of X is contained in a fuzzy set B of X if $A(x) \leq B(x)$ for each $x \in X$. A fuzzy point x_{β} in X is a fuzzy set defined by x_{β} (y)= β for y=x and x(y) =0 for $y \neq x$, $\beta \in [0,1]$ and $y \in X$. A fuzzy point x_{β} is said to be quasi-coincident with the fuzzy set A denoted by $x_{\beta q}A$ if and only if $\beta + A(x) > 1$. A fuzzy set A is quasi –coincident with a fuzzy set B denoted by A_qB if and only if there exists a point $x \in X$ such that A(x) + B(x) > 1. A $\leq B$ if and only if $](A_qB^c)$.

A family τ of fuzzy sets of X is called a fuzzy topology [2] on X if 0,1 belongs to τ and τ is super closed with respect to arbitrary union and finite intersection. The members of τ are called fuzzy super open sets and their complement are fuzzy super closed sets. For any fuzzy set A of X the closure of A (denoted by cl(A)) is the intersection of all the fuzzy super closed super sets of A and the interior of A (denoted by int(A)) is the union of all fuzzy super open subsets of A.

II. PRELIMINIARIES

In this section we recall some of the basic definitions and some theorems.

- 1) Definition 2.1: Let (X, τ) be a fuzzy topological space. An operation γ on the fuzzy topology τ is mapping from τ on to power set P(X) of X such that $V \subseteq V^{\gamma}$ for each $V \in \tau$, where V^{γ} denotes the value of τ at V. It is denoted by $\gamma : \tau \to P(X)$.
- 2) Definition 2.2: A subset A of a fuzzy topological space (X,τ) is called fuzzy γ open set if for each $x \in A$ there exists a fuzzy open set U such that $x \in U$ and $U^{\gamma} \subseteq A$. τ_{γ} denotes set of all fuzzy γ open sets in (X, τ) .
- 3) Definition 2.3: The fuzzy point $x \in X$ is in the fuzzy γ closure of a fuzzy set $A \subseteq X$ if $U^{\gamma} \cap A \neq \phi$ for each open set U of x. The fuzzy γ - closure of a set A is denoted by $cl_{\gamma}(A)$.
- 4) Definition 2.4:Let (X,τ) be a fuzzy topological space and A be subset of X then τ_{γ} -cl $(A) = \cap \{ F: A \subseteq F, X F \in \tau_{\gamma} \}$
- 5) *DEFINITION 2.5*: A subset A fuzzy topological space (X, τ) is said to be fuzzy γ generalized closed if $cl_{\gamma}(A) \subseteq U$ whenever $A \subseteq U$ and U is fuzzy γ open in (X, τ) .
- 6) Definition 2.6 : A fuzzy topological space (X, τ) is called
- 1) fuzzy γ T₀ space if for each distinct points $x, y \in X$, there exists an fuzzy open set U such that either $x \in U$ and $y \notin U^{\gamma}$ or $y \in U$ and $x \notin U^{\gamma}$.
- 2) fuzzy γ T₁ space if for each distinct points $x, y \in X$ there exists fuzzy open set U, containing x and y respectively, such that y $\notin U^{\gamma}$ and $x \notin V^{\gamma}$.
- 3) fuzzy γ T₂ space if for each distinct points x,y of X , there exists fuzzy open set $x \in U$, $y \in V$ and $U^{\gamma} \cap V^{\gamma} = \phi$.
- 7) DEFINITION 2.7 : Let (X, τ) be a fuzzy topological space. An operation γ is said to be fuzzy regular if, for every fuzzy open neighborhood U and V of each $x \in X$, there exists an fuzzy open neighborhood W of x such that $W^{\gamma} \subseteq U^{\gamma} \cap V^{\gamma}$



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- 8) Definition 2.8:: A fuzzy topological space (X, τ) is said to be fuzzy γ -regular ,where γ is an operation on τ , if for each $x \in X$ and for each fuzzy open neighborhood V of x, there exists an fuzzy open neighborhood U of x such that U^{γ} contained in V.
- 9) Remark 2.1: Let (X, τ) be a fuzzy topological space, then for any subset A of X, $A \subseteq cl(A) \subseteq cl_{\gamma}(A) \subset \tau_{\gamma} cl(A)$

III. FUZZY γ - SEMIOPEN SETS

- A. Definition 3.1: A subset A of fuzzy topological space (X, τ) is said to be a fuzzy γ semi open set if and only if there exists a fuzzy γ open set U such that $U \subseteq A \subseteq cl_{\gamma}$ (U).
- 1) Remark 3.1: The set of all fuzzy γ -semi open set in (X, τ)fuzzy topological space is denoted as fuzzy τ_{γ} SO(X).
- 2) Definition 3.2: Let A be any subset of X. The fuzzy τ_{γ^-} int(A) is defined as fuzzy τ_{γ^-} int(A)= $\cup \{ U : U \text{ is a fuzzy } \gamma \text{ open set and } U \subseteq A \}$.
- 3) Remark 3.2: A subset A of fuzzy topological space (X,τ) is fuzzy γ open then fuzzy τ_{γ} int(A)= A.
- 4) Proof: Proof is straight forward from the definition.
- 5) Theorem 3.1: If A and B are any two subsets of (X, τ) fuzzy topological space , the
- 6) *PROOF:* Proof of (i) and (ii) is follows from the definition.
- *B. Theorem 3.2:* A subset A of (X, τ) fuzzy topological space is fuzzy γ semi open if and only if $A \subseteq cl_{\gamma}(\tau_{\gamma}-int(A))$.
- 1) Proof: Let $A \subseteq cl_{\gamma}(\tau_{\gamma}\text{-int}(A))$. Take $U = \tau_{\gamma}\text{-int}(A)$ then U is a fuzzy γ open set. We have $U \subseteq A \subseteq cl_{\gamma}(U)$. Hence A is a fuzzy γ semi open set.

Conversely, Given A is a fuzzy γ - semi open set in X, Then $U \subseteq A \subseteq cl_{\gamma}(U)$ for some fuzzy γ -open set in (X,τ) . Since $U \subseteq \tau_{\gamma}$ -int(A), thus we have $cl_{\gamma}(U) \subseteq cl_{\gamma}(\tau_{\gamma}$ -int(A)). Hence $A \subseteq cl_{\gamma}(\tau_{\gamma}$ -int(A)).

- C. Theorem 3.3: If A is a fuzzy γ open set in (X, τ), then A is a fuzzy γ semi open set.
- 1) Proof: Given A is a fuzzy γ -open set in (X, τ), therefore by remark 3.5 τ_{γ} -int(A)= A. Since A \subseteq cl_{γ}(A), implies A \subseteq cl_{γ}(τ_{γ} -int(A)). Hence A is a fuzzy γ -semi open set.
- D. Theorem 3.4: If (X,τ) is γ -regular space, then every γ -semi open set is a semi open set.
- 1) Proof: Easy
- *E.* Definition 3.3: A fuzzy subset A of X is said to be fuzzy γ -semi closed if and only if X A is fuzzy γ -semi open.
- *F.* Definition 3.4: Let A be a subset of X. Then τ_{γ} -scl(A) = \cap {F : F is γ semi closed and A \subseteq F}
- *G. THEOREM 3.6:* For fuzzy point $x \in X$, $x \in \tau_{\gamma}$ -scl(A) if and only if $V \cap A \neq \phi$ for any $V \in \tau_{\gamma}$ SO(X) such that $x \in V$.
- 1) Proof: Let F_0 be the set of all $y \in X$ such that $V \cap A \neq \phi$ for every $V \in \tau_{\gamma^-}$ SO(X) and $y \in V$. Now to prove the theorem it is enough to prove that $F_0 = \tau_{\gamma^-}$ scl(A). Let $x \in \tau_{\gamma^-}$ scl(A). Let us assume $x \notin F_0$ then there exists a fuzzy γ -semi open set U of x such that $U \cap A = \phi$. This implies $A \subseteq U^c$. Hence τ_{γ^-} scl(A) $\subseteq U^c$. Therefore $x \notin \tau_{\gamma^-}$ scl(A) . This is a contradiction. Hence τ_{γ^-} scl(A) $\subseteq F_0$. Conversely, Let F be a fuzzy set such that $A \subseteq F$ and $X F \in \tau_{\gamma^-}$ -SO(X). Let $x \notin F$ then we have $x \in X F$ and $(X F) \cap A = \phi$. This implies $x \notin F_0$. Therefore $F_0 \subseteq F$. Hence $F_0 \subseteq \tau_{\gamma^-}$ scl(A).

IV. FUZZY γ - SEMI τ_i -SPACES

In this section we investigate a general operation approaches on fuzzy $\ T_i \ spaces$.

- 1) Definition 4.1: A fuzzy topological space (X,τ) is called fuzzy γ semi T_0 space if for each distinct points $x,y \in X$ there exists a fuzzy γ semi open set U such that $x \in U$ and $y \notin U$ or $y \in U$ and $x \notin U$.
- 2) Definition 4.2: A fuzzy topological space (X,τ) is called a fuzzy γ semi T_1 space if for each distinct points $x, y \in X$, there exists a fuzzy γ -semi open set U, V containing x and y respectively such that $y \notin U$ and $x \notin V$.
- 3) Definition 4.3: A fuzzy topological space (X,τ) is called a fuzzy γ -semi T_2 space if for each x, $y \in X$ there exists a fuzzy γ -semi open sets U, V such that $x \in U$ and $y \in V$ and $U \cap V = \phi$.
- 4) Definition 4.4: A subset A of fuzzy topological space (X, τ) is said to be fuzzy γ -semi g closed if τ_{γ} -scl(A) \subseteq U whenever A \subseteq U and U is a fuzzy γ -semi open set in (X, τ) .



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- 5) Definition 4.5: A fuzzy topological space (X,τ) is said to be fuzzy γ -semi $T_{\frac{1}{2}}$ space if every fuzzy γ -semi g closed set in fuzzy topological space (X,τ) is fuzzy γ -semi closed.
- 6) theorem 4.1: A subset A of fuzzy topological space (X,τ) is fuzzy γ-semi g closed if and only if τ_γ-scl({x}) ∩A ≠ φ holds for every x ∈τ_γ-scl(A). Let U be fuzzy γ-semi open set such that A⊆U. Let x∈τ_γ-scl(A). By assumption there exists a z∈τ_γ-scl({x}) and z∈A⊆U. then U∩{x}≠φ.Hence x∈U. This implies τ_γ-scl(A)⊆U. Therefore A is fuzzy γ-semi g closed set in (X,τ).

Conversely, suppose $x \in \tau_{\gamma}$ -scl(A) such that τ_{γ} -scl({x}) $\cap A=\phi$.Since, τ_{γ} -scl({x}) is fuzzy γ -semi closed set in fuzzy topological space (X,τ) . Therefore $(\tau_{\gamma}$ -scl({x}))^c is a fuzzy γ -semi open set. Since $A \subseteq (\tau_{\gamma}$ -scl({x}))^c and A is fuzzy γ -semi g closed implies that τ_{γ} -scl(A) $\subseteq (\tau_{\gamma}$ -scl({x}))^c holds, and hence $x \notin \tau_{\gamma}$ -scl(A). which is a contradiction. Hence τ_{γ} -scl({x}) $\cap A \neq \phi$.

- 7) Theorem 4.2: If τ_{γ} -scl({x}) $\cap A \neq \phi$ holds for every $x \in \tau_{\gamma}$ -scl(A), then τ_{γ} -scl(A) A does not contain a non-empty fuzzy γ -semi closed set.
- a) PROOF: Suppose there exists a non-empty fuzzy γ -semi closed set F such that $F \subseteq \tau_{\gamma}$ -scl(A) A. ($\subseteq \tau_{\gamma}$ -scl(A)).Let $x \in F$, $x \in \tau_{\gamma}$ -scl(A) holds. It follows from remark 3.23 such that $F \cap A = \tau_{\gamma}$ -scl(F) $\cap A \supseteq \tau_{\gamma}$ -scl($\{x\}$) $\cap A \neq \phi$. Hence $F \cap A \neq \phi$. This is a contradiction.
- 8) Theorem 4.3: Let $\gamma : \tau \to P(X)$ be an mapping .Then for each $x \in X$, $\{x\}$ is fuzzy γ semi closed or $\{x\}^c$ is fuzzy γ -semi g. closed set in (X, τ) .
- *a) Proof:* Suppose that $\{x\}$ is not fuzzy γ -semi closed then X- $\{x\}$ is not fuzzy γ -semi open. Let U be any fuzzy γ -semi open set such that $\{x\}^c \subseteq U$. Since U=X, implies τ_{γ} -scl($\{x\}^c$) $\subseteq U$. Therefore $\{x\}^c$ is fuzzy γ -semi g closed.

V. FUZZY (γ , β)- SEMI CONTINUOUS MAPPINGS

Through out this chapter let (X,τ) and (Y,σ) be two fuzzy topological spaces and let $\gamma: \tau \rightarrow P(X)$ and $\beta: \sigma \rightarrow p(Y)$ be mapping on τ and σ respectively.

- A. Definition 5.1: A fuzzy mapping f: $(X,\tau) \rightarrow (Y,\sigma)$ is said to be fuzzy (γ, β) semi continuous if for each x of X and each fuzzy β -semi open set V containing f(x) there exists a fuzzy γ -semi open set U such that $x \in U$ and f(U) $\subseteq V$.
- *B. Remark* 5.1: If (X,τ) and (Y,σ) are both fuzzy γ regular spaces then the concept of fuzzy (γ,β) semi continuity and fuzzy semi continuity are coincide.
- *C.* Theorem 5.1 : Let f: $(X,\tau) \rightarrow (Y,\sigma)$ be fuzzy (γ,β) semi continuous mapping. Then,

 $f\left(\tau_{\gamma}\text{-scl}(A)\right) \subseteq \tau_{\beta}\text{-scl}(f(A)) \text{ holds for every subset } A \text{ of } (X,\tau)$

Let γ be mapping , then for every fuzzy β -semi closed set B of (y,σ) f⁻¹ (B) is fuzzy γ - semi closed in (X, τ) .

1) Proof: (i) Let $y \in f(\tau_{\gamma}\operatorname{-scl}(A))$ and V be any fuzzy γ - semi open set containing y. Then there exists a point $x \in X$ and fuzzy γ semi open set U such that f(x) = y and $x \in U$ and $f(U) \subseteq V$. Since $x \in \tau_{\gamma}\operatorname{-scl}(A)$, we have $U \cap A \neq \phi$ and hence $\phi \neq f(U \cap A)$ $\subseteq f(U) \cap f(A) \subseteq V \cap A$. This implies $x \in \tau_{\beta}\operatorname{-scl}(f(A))$. Therefore we have $f(\tau_{\gamma}\operatorname{-scl}(A)) \subseteq \tau_{\beta}\operatorname{-scl}(f(A))$.

Let B be a fuzzy β -semi closed set in (Y,σ) . Therefore τ_{β} -scl(B)=B. By using (i) we have $f(\tau_{\gamma}$ -scl $(f^{-1}(B)) \subseteq \tau_{\beta}$ -scl(B)=B Therefore we have τ_{γ} -scl $(f^{-1}(B)) \subseteq f^{-1}(B)$. Hence $f^{-1}(B)$ is fuzzy γ -semi closed by remark 3.24.

D. Definition 5.2: A fuzzy mapping f: $(X,\tau) \rightarrow (Y,\sigma)$ is said to be fuzzy (γ, β) - semi closed if for any fuzzy γ -semi closed set A of (X, τ) , f(A) is a fuzzy β -semi closed.

Let id: $\tau \rightarrow P(X)$ be the identity fuzzy mapping. Then, if f is fuzzy (id, β)- semi closed, then f(F) is fuzzy β -semi closed set for any fuzzy semi closed set F of (X, τ).

E. Theorem 5.3: Suppose that f is fuzzy (γ, β) - semi continuous mapping and f is fuzzy (γ, β) -semi closed. Then, for every fuzzy γ -semi g closed set A of (X, τ) the image f(A) is β -semi g. closed.

for every fuzzy β -semi g closed set B of fuzzy space (Y,σ) the inverse set $f^{-1}(B)$ is fuzzy γ -semi g closed.

1) Proof:(i) Let V be any fuzzy β -semi open set in (Y, σ) such that $f(A) \subseteq V$. By using theorem5.3(ii) $f^{-1}(V)$ is fuzzy γ -semi open. Since, A is fuzzy γ -semi g closed and $A \subseteq f^{-1}(V)$, we have τ_{γ} -scl(A) $\subseteq f^{-1}(V)$, and hence $f(\tau_{\gamma}$ -scl(A)) $\subseteq V$, then $f(\tau_{\gamma}$ -scl(A)) $\subseteq V$.



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scl(A)) is a fuzzy β -semi closed set. Therefore τ_{β} -scl(f(A)) $\subseteq \tau_{\beta}$ -scl(f(τ_{γ} -scl(A))=f(τ_{γ} -scl(A)) $\subseteq V$. This implies f(A) is fuzzy β -semi g closed.

Let U be fuzzy γ -semi open set of (X, τ) such that $f^{-1}(B) \subseteq U$. Put $F = \gamma$ -scl $(f^{-1}(B)) \cap U^c$. It follows from remark 3.24 and theorem 3.17, that F is fuzzy γ -semi closed set in (X, τ) . Since f is fuzzy (γ,β) -semi closed, f(F) is fuzzy β -semi closed in $(Y,\sigma).f(F) \subseteq f(\tau_{\gamma} - scl(f^{-1}(B) \cap U^c)) \subseteq \tau_{\beta}-scl(f(f^{-1}(B)) \cap f(U^c)) \subseteq \tau_{\beta}-scl(B)$. This implies $f(F) = \phi$, and hence $F = \phi$. Therefore $\tau_{\gamma}-scl(f^{-1}(B)) \subseteq U$. Hence $f^{-1}(B)$ is fuzzy γ -semi g closed in (X,τ) .

F. THEOREM5.4: Let $f: (X, \tau) \rightarrow (Y, \sigma)$ is fuzzy (γ, β) - semi continuous and fuzzy (γ, β) – semi closed. Then,

If f is injective and (y, β) is fuzzy β -semi $T_{\frac{1}{2}}$, then (x, τ) is fuzzy γ -semi $T_{\frac{1}{2}}$ space.

If f is surjective and (X, τ) is fuzzy γ -semi $T_{\frac{1}{2}}$, then (Y, σ) is fuzzy β -semi $T_{\frac{1}{2}}$.

1) *Proof:* (i) Let A is fuzzy γ -semi g. closed set in (X, τ). Now to show that A is fuzzy γ -semi closed. By theorem 5.5 (ii) and assumption it is obtained that f(A) is fuzzy β -semi g closed and hence f(A) is fuzzy β -semi closed.

Let B be fuzzy β -semi g closed set in (Y, σ) then f¹ (B) is fuzzy γ -semi closed. Since,(X, τ) is fuzzy γ -semi T_{1/2}. It follows from the assumption that B is fuzzy β -semi closed in (Y, σ). Therefore (y, σ) is fuzzy β -semi T_{1/2}.

G. Definition 5.7: A fuzzy mapping $f:(X,\tau) \rightarrow (Y, \sigma)$ is said to be fuzzy (γ,β) - semi homeomorphism, if f is bijective, fuzzy (γ,β) - semi continuous and f^{-1} is fuzzy (β, γ) – semi continuous.

REFERENCES

- [1]. B. Ghosh, Semi-continuous and semi-closed mappings and semi-connectedness in fuzzy setting, Fuzzy Sets and Systems 35(3) (1990), 345–355.
- [2]. C. L. Chang, Fuzzy topological spaces, J. Math. Anal. Appl. 24 (1968), 182–190.
- [3]. C.W. Baker on Preserving g-super closed sets Kyungpook Math. J. 36(1996), 195-199.
- [4]. G. Balasubramanian and P. Sundaram, On some generalizations of fuzzy continuous functions, Fuzzy Sets and Systems 86(1) (1997), 93–100.
- [5]. G. Balasubramanian and V. Chandrasekar, Totally fuzzy semi continuous functions, Bull. CalcuttaMath. Soc. 92(4) (2000), 305–312.
- [6]. K. K. Azad, On fuzzy semi continuity, fuzzy almost continuity and fuzzy weakly continuity, J. Math. Anal. Appl. 82(1) (1981), 14–32.
- [7]. K. M. Abd El-Hakeim, Generalized semi-continuous mappings in fuzzy topological spaces, J. Fuzzy Math. 7(3) (1999), 577–589.
- [8]. L. A. Zadeh, Fuzzy sets, Information and Control 8 (1965), 338–353.
- [9]. Levine. N., Generalized super closed sets in topology, Rend. Circ. Mat. Palermo 19(1970), 89-96.
- [10]. Levine. N., Semi- super open sets and semi-continuity in topological fuzzy space s, Amer. Math. Monthly, 70(1963), 36-41 .
- [11]. M.K. Mishra et all on "Fuzzy super continuity" International Review in Fuzzy Mathematics July –December2012.
- [12]. M.K. Mishra M. Shukla M. Fuzzy Regular Generalized Super Closed Set" International Journal of Scientific and Research December issue July December 2012.
- [13]. M.K. Mishra, et all on "Fuzzy super closed set" International Journal International Journal of Mathematics and applied Statistics.
- [14]. Maki. H, Devi. R and Balachandran. K., Associated topologies of generalized \Box -super closed sets and \Box -generalized super closed sets, Mem. Sci. Kochi Univ. Ser. A. Math. 15(1994), 51–63.
- [15]. Mashhour. A.S., Abd. El-Monsef. M. E. and El-Deeb S.N., On pre continuous mappings and weak pre-continuous mappings, Proc Math, Phys. Soc. Egypt 53(1982), 47–53.
- [16]. Nagaveni. N., Studies on Generalizations of Homeomorphisms in Topological Fuzzy space s, Ph.D. Thesis, Bharathiar University, Coimbatore, 1999 .
- [17]. P. M. Pu and Y. M. Liu Fuzzy topology I Neighborhood structure of a fuzzy point and More-Smith Convergence. J. Math. Anal. Appl. 76(1980), 571-594.
- [18]. P. M. Pu and Y. M. Liu Fuzzy topology II Product and quotient spaces J.Math. Anal. Appl. 77(1980) 20-37.
- [19]. P. M. Pu, and Y. M. Liu, Fuzzy topology. I. Neighborhood structure of a fuzzy point and Moore-Smith convergence, J. Math. Anal. Appl. 76(2) (1980), 571– 599.
- [20]. Palaniappan. N., and Rao. K. C., Regular generalized super closed sets, Kyungpook Math. J. 33(1993), 211-219.
- [21]. Park. J. K. and Park. J.H., mildly generalized super closed sets, almost normal and mildly normal fuzzy space s, Chaos, Solutions and Fractals 20(2004), 1103–1111.
- [22]. Pushpalatha. A., Studies on Generalizations of Mappings in Topological Fuzzy space s, Ph.D. Thesis, Bharathiar University, Coimbatore, 2000.
- [23]. R. K. Saraf and M. Khanna, On gs-closed sets in fuzzy topology, J. Indian Acad. Math. 25(1),(2003), 133-143.











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