GENERALIZING CONTINUTY IN INTUITIVE FUZZY IDEAL TOPOLOGICAL SPACES

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تعميم الاستمرارية في الفضاءات التبولوجية المثالية الحدسية

الخلاصـة: في هذا البحث قدمنا ودرسنا تعميم الاستمرارية في الفضـاءات التبولوجية المثالية الضـبابية الحدسية وتناولنا بعض التعاريف والمبرهنات

Abstract: In this paper we introduce and study the concept of intuitionistic fuzzy idealg-continuous mappings in Intuitionistic fuzzy ideal topological spaces .

Keywordes : Intuitionistic fuzzy topology , Intuitionistic fuzzy points , Intuitionistic fuzzy ideal g-closed sets and Intuitionistic fuzzy ideal g-open sets .

Introdection : After the introduction of fuzzy sets by zadeh in 1965 [20] and fuzzy topology by chang [7] in 1968 .Several researchers Were conducted on the generalizations of the notions of fuzzy sets and fuzzy topology . The concept of intuitionistic fuzzy Sets was introduced by Attanassove [1] as a generalization of fuzzy sets . Coker and Seadati [7] defined the notion of intuitionistic fuzzy topology and studied the basic concept of intuitionistic Fuzzy point [10] in[5] Saber and Abdel-Sattar introduce ideal on fuzzy topological spaces .Recently many fuzzy topoploicals . Concept such as a fuzzy compactness [11] fuzzy separation axioms [8] fuzzy metric spaces [17] fuzzy Continuity [12] fuzzy multifunction have been generalized for intuitionistic fuzzy topological spaces . Salama and ALblowi we introduce the intuitionistic fuzzy ideals topologicals spaces [2] .In the authores of this paper Extend the concepts of fuzzy g-closed sets due to Thakur and Malviya [15] in intuitionistic fuzzy topologicals spaces .

In this paper we introduce and study the concept of intuitionistic fuzzy ideal g-continuous mapping in intuitionistic Fuzzy ideal topological spaces .

Preliminaries

$\boldsymbol{Definition\ 2.1}[2]$: $A\ nonempty\ \ collection\ of\ fuzzy\ sets\ v\ of\ aset\ X\ is\ called\ fazzy\ ideal\ on\ X\ iff$:

1)$A \in v\ and\ B \subseteq A\ \ \to A \in v\ (heredity)$.

2)$A \in v\ and\ B \in v \to A \in v\ (finite\ additivity)$.

Definition 2.2:[1] Let X be a nonempty fixed set . An intuitionistic fuzzy sets A is an having the Form $A = \{ < X, \delta_A(x), \varphi_A(x) >: x\epsilon X \}$ Where the function $\delta_A: X \to I\ and \varphi_A: X \to\ I$ denote the degree of membership (namely $\delta_A(x)$ and the degree of nonmembership (namely $\varphi_A(x)$ of each element $x\epsilon X$ to the set A , respectively , and $0 \le \delta_A(x) + \varphi_A(x) \le 1$ for each $x\epsilon X$.

Definition 2.3: [1] Let X be a nonempty set and the intuitionistic fuzzy sets A and B be in the Form $A = \{ < X, \delta_A(x), \varphi_A(x) >: x\epsilon X \}$,$B = \{ < X, \delta_B(x), \varphi_B(x) >: x\epsilon X \}$ and let $\{A_i: i\epsilon J \}$ be

an arbitrary family of intuitionistic fuzzy sets in X . Then
1)$A \subseteq B\ if\ \forall x\epsilon X\ [\delta_A(x) \leq \delta_B(x)\ and\ \varphi_A(x) \geq \varphi_B(x)]$;
2)$A = B\ if\ A \subseteq B\ and\ B \subseteq A$;
3)$A^c = \{< x, \varphi_A(x), \delta_A(x) >: x\epsilon X \}$;
4)$\cap A_i = \{< x, \wedge \delta_{Ai}(x), \vee \varphi_{Ai}(x) >: x\epsilon X\}$;
5) $\cup A_i = \{< x, \vee\delta_{Ai}(x), \wedge\varphi_{Ai}(x) >: x\epsilon X\}$;
6)$\tilde{0} = \{< x, 0,1 >: x \in X\} and\ \breve{1} = \{< x, 1,0 >: x \in X\}$;

Definition 2.4: [9] Two intuitionistic fuzzy set A and B if X said to be q-coincident (AqB FOR SHORT)if and only if there exits An element $x\epsilon X$ such that $\delta_A(X) > \varphi_B(x) or\ \ \varphi_B(x) < \delta_A(X)$.

Defintion 2.5:[9] An intuitionistic fuzzy topology on a nonempty set X is a family τ of intuitionistic fuzzy sets in X satisfy the following axioms :
1)$\tilde{0}, \tilde{1}\ \epsilon\ \tau$.
2)$G_1 \cap G_2\ \epsilon\ \tau\ \ for\ any\ G_1, G_2 \epsilon\ \tau$.
3)$\cup G_i\ \epsilon\ \tau\ for\ any\ arbitrary\ family\ \{ G_i : i\epsilon j\} \subseteq \tau$.
The pair $(X, \tau) is\ called\ intuitionistic\ fuzzy\ topoplgical\ space\ and\ each\ intuitionistic\ fuzzy\ set\ in\ \tau\ is$ Intuitionistic fuzzy open set in X .

Definition 2.6:[9] let (X, τ) be an intuitionistic fuzzy topological spaces and $A =< x, \delta_A(X), \varphi_B(x) >$ be an intuitionistic fuzzy set in X .Then the fuzzy interior and fuzzy closure of A are defined by

$$CL(A) = \wedge\{V: V\ is\ an\ intuitionistic\ fuzzy\ closed\ set\ in\ X\ and\ A \subseteq V \}.$$
$$Int(A) = \vee \{G: G\ is\ an\ intuitionistic\ fuzzy\ open\ set\ in\ X\ and\ G \subseteq V \}.$$

Definition 2.7 : [9]The complement A^c of an intuitionistic fuzzy set A is an intuitionistic fuzzy topological spaces (X, τ) is called An intuitionistic fuzzy closed set in X .

Definition 2.8 :[9] Let X and Y be two nonempty sets and $f: X \to Y$ be a function . Then
(a)$if\ B = \{< y, \delta_B(y), \varphi_B(y) >: y\epsilon Y\}$ is an intuitionistic fuzzy set in Y , then the preimage of B under f denoted by $f^{-1}(B)$, is the IFS in X defined by
$f^{-1}(B) =< x, f^{-1}(\delta_{B)})(x), f^{-1}(\varphi_{B)})(x) : x\epsilon X \}$.
(b)$if\ A = \{< x, \gamma_A(x), V_A(x) >: x\epsilon X \}\ \ is\ an\ intuitionistic\ fuzzy\ set\ in\ X\ , then\ the\ imge\ of\ A\ under\ f\ denoted$ By $f(A)$ is an intuitionistic fuzzy set in Y denoted by
$f(A) = \{y, f(\gamma_A(y), f(V_y)(y) >: y\epsilon Y \}$. where $f(V_y) = 1 - f(1 - V_A)$.

Definition 2.9 : [12]Let $(X, \tau\ ) and\ (Y, \vartheta)$ be two intuitionistic fuzzy topological spaces and let $f: X \to Y$ be a function .Then f is said to be intuitionistic fuzzy continuous if and only if the preimage of each intuitionistic fuzzy open set in Y is an $intuitionistic\ fuzzy\ open\ set\ in\ X$.

Definition 2.10 :[11] A family $\{G_i : i\ \epsilon\ \wedge\}\ \ of\ intuitionistic\ fuzzy\ set\ in\ X\ is\ said\ to\ be\ an\ intuitionistic\ fuzzy\ \ open\ cover\ of\ X\ if\ \ \cup \{G_i : i\epsilon \wedge \} = 1\ and\ a\ finite\ subfamily\ of\ an\ intuitionistic\ fyzzy\ open\ cover\ of\ X\ which\ also\ an\ intuitionistic\ fuzzy\ open\ cover\ of\ X\ is\ called\ a\ finite\ subcover\ \ \{G_i : i\ \epsilon\ \wedge \}$.

$\boldsymbol{Definition\ 2.11} : [\mathbf{11}]$ An intuitionistic fuzzy topological space $(X\ , \tau\ )\ is\ called\ fuzzy\ compact\ if\ each\ \ intuitionistic\ fuzzy\ \ open\ cover\ has\ a\ finite\ subcover$.

$\boldsymbol{Definition\ 2.12}$: [16] $An\ intuitionistic\ fuzzy\ set\ A\ of\ a\ intuitionistic\ fuzzy\ topological\ space\ (X,\tau)\ is\ called$ an intuitionistic fuzzy generalized closed (intuitionistic g-closed) if $cl(A) \subseteq 0\ wherever\ A \subseteq 0\ and\ 0\ is\ intuitionistic\ fuzzy\ open$.

Definition2.13 :[16] Complement of an intuitionistic fuzzy g- closed set is called intuitionistic fuzzy g-open set .

Remark 2.1 : [16]Every intuitionistic fuzzy closed set (intuitionistic fuzzy open set) is intuitionistic fuzzy g- closed set (intuitionistic fuzzy g-open set) but its converse may not be true .

Throughout this paper $f:(X,\tau) \to (Y,\vartheta)$ $denote\ the\ mapping\ from\ an\ intuitionistic\ fuzzy\ topological\ space\ (X,\tau) to\ another\ intuitionistic\ toplogical\ space\ (Y,\vartheta)$.

Definition 2.14: A mapping $I_1, I_2 : I^X \to I$, is called intuitionistic fuzzy ideals on X if it is satisfies the conditions :

1)$I_1(A) + I_2(A) \leq 1, \forall A \epsilon I^X$.

2)$I_1(0) = I_2(0) = 1\ and\ I_1(1) = I_2(1) = 0$.

3)$if\ A \leq B\ , then\ I_1(B) \leq I_1(A)\ and I_2(A) \leq I_2(B)\ for\ each\ A, B \epsilon I^X$.

4)$I_1(A \cup B) \geq I_1(A) \cap I_1(B)\ and\ \ I_2(A \cap B) \leq I_2(A) \cap I_2(B), for\ each\ A, B\ \epsilon I^X$.

Then (X,I_1, I_2) is called intuitionistic fuzzy ideals sets .

Definition 2.15: let (X,τ,I) be an intuitionistic fuzzy ideal topological spaces and $A =< x, \delta_A(X), \varphi_B(x) >$ be an intuitionistic fuzzy ideal set in X .Then the fuzzy interior and fuzzy closure of A are defined by

$$CL(A) = \wedge\{V : V\ is\ an\ intuitionistic\ fuzzy\ ideal\ closed\ set\ in\ X\ and\ A \subseteq V\}.$$

$$Int(A) = \vee\{G : G\ is\ an\ intuitionistic\ fuzzy\ \ ideal\ open\ set\ in\ X\ and\ G \subseteq V\}.$$

$\boldsymbol{Defintion\ 2.16}$: An intuitionistic fuzzy ideal topology on a nonempty set X is a family τ of intuitionistic fuzzy ideal sets in X satisfy the following axioms :

1)$\tilde{0}\ , \tilde{1}\ \epsilon\ \tau$.

2)$G_1 \cap G_2\ \epsilon\ \tau\ \ for\ any\ G_1, G_2 \epsilon\ \tau$.

3)$\cup\ G_i\ \epsilon\ \tau\ for\ any\ arbitrary\ family\ \{\ G_i\ : i \epsilon j\} \subseteq \tau$.

The pair $(X,\tau,I) is\ called\ intuitionistic\ fuzzy\ topoplgical\ space\ and\ each\ intuitionistic\ fuzzy\ ideal\ set\ in\ \tau\ is$ Intuitionistic fuzzy ideal open set in X .

Definition2.17 : The complement A^c of an intuitionistic fuzzy ideal set A is an intuitionistic fuzzy ideal topological space (X,τ,I) is called An intuitionistic fuzzy ideal closed set in X .

Definition2.18 : Let X and Y be two nonempty sets and $f : X \to Y$ be a function . Then

(a)$if\ B = \{< y, \delta_B(y), \varphi_B(y) > : y \epsilon Y\}$ is an intuitionistic fuzzy ideal set in Y , then the preimage of B under f denoted by

$f^{-1}(B)$, is the IFS in X defined by $f^{-1}(B) =< x, f^{-1}(\delta_{B)})(x), f^{-1}(\varphi_{B)})(x) : x \epsilon X\}$.

(b)$if\ A = \{< x, \gamma_A(x), V_A(x) > : x \epsilon X\}\ \ is\ an\ intuitionistic\ fuzzy\ ideal\ set\ in\ X\ , then\ the\ imge\ of\ A\ under\ f\ \ denoted$ By $f(A)$ is an intuitionistic fuzzy ideal set in Y denoted by

$f(A) = \{y, f(\gamma_A(y), f(V_y)(y) > : y \epsilon Y\}$. where $f(V_y) = 1 - f(1 - V_A)$.

Definition 2.19: Let $(X,\tau,I)\ and\ (Y,\vartheta,I)$ be two intuitionistic fuzzy ideal topological spaces and let $f: X \to Y$ be a function .Then f is said to be intuitionistic ideal fuzzy continuous if and only if the preimage of each intuitionistic fuzzy ideal open set in Y is an $intuitionistic\ fuzzy\ ideal\ open\ set\ in\ X$.

Definition 2.20: A family$\{G_i : i \epsilon \wedge\}$ $of\ intuitionistic\ fuzzy\ ideal\ set\ in\ X\ is\ said\ to\ be\ an\ intuitionistic\ fuzzy\ ideal\ open\ cover\ of\ X\ if\ \cup\{G_i : i\epsilon \wedge\} = 1\ and\ a\ finite\ subfamily\ of\ an\ intuitionistic\ fyzzy\ ideal\ open\ cover\ of\ X\ which\ also\ an\ ntuitionistic\ fuzzy\ ideal\ open\ cover\ of\ X\ is\ called\ a\ finite\ subcover\ \{G_i : i\ \epsilon\ \wedge\}$.

***Definition* 2.21** : An intuitionistic fuzzy ideal topological space $(X, \tau, I)\ is\ called\ fuzzy\ compact\ if\ each\ intuitionistic\ fuzzy\ ideal\ open\ cover\ has\ a\ finite\ subcover$.

***Definition* 2.22**: $An\ intuitionistic\ fuzzy\ ideal\ set\ A\ of\ a\ intuitionistic\ fuzzy\ ideal\ topological\ space\ (X, \tau, I)\ is\ called\ an$ Intuitionistic fuzzy ideal generalized closed (intuitionistic ideal g-closed) if $cl(A) \subseteq 0\ wherever\ A \subseteq 0\ and\ 0\ is\ intuitionistic\ fuzzy\ ideal\ open$.

Definition2.23 : Complement of an intuitionistic fuzzy ideal g- closed set is called intuitionistic fuzzy ideal g-open set .

Remark2.2 : Every intuitionistic fuzzy ideal closed set (intuitionistic fuzzy ideal open set) is intuitionistic fuzzy ideal g- closed set (intuitionistic fuzzy ideal g-open set) but its converse may not be true . Throughout this paper $f: (X, \tau, I) \to (Y, \vartheta, I)\ denote\ the\ mapping\ from\ an\ intuitionistic\ fuzzy\ ideal\ topological\ space (X, \tau, I) to\ another\ intuitionistic\ ideal\ toplogical\ space\ (Y, \vartheta, I)$.

$3 - Intuitionistic\ Fuzzy\ Ideal\ g - Continuous\ Mapping$

Definition3.1 : $A\ mapping\ f: (X, \tau, I) \to (Y, \vartheta, I) is\ said\ to\ be\ intuitionistic\ fuzzy\ ideal\ g - continuous\ if\ the\ invers\ imge\ of\ every\ intuitionistic\ fuzzy\ ideal\ closed\ set\ of\ Y\ is\ intuitionistic\ fuzzy\ ideal\ g - closed\ in\ X$.

***Remark* 3.1** : $Every\ intuitionistic\ fuzzy\ ideal\ continuous\ mapping\ is\ intuitionistic\ fuzzy\ ideal\ g$–closed Continuous $but\ the\ converse\ may\ not\ be\ true$. For ,

***Theorem* 3.1** : $A\ maping\ f: (X, \tau, I) \to (Y, \vartheta, I)\ is\ intuitionistic\ fuzzy\ ideal\ g - continuous\ if\ andonly\ if\ the\ inverse$ Image of every intuitionistic fuzzy ideal open set of Y is intuitionistic fuzzy ideal g-open in X .

Proof :It is obvious because

$f^{-1}(U^c) = (f^{-1}(U))^c$ $for\ every\ intuitionistic\ fuzzy\ ideal\ set\ U\ of\ Y$.

***Theorem* 3.2** : $If\ f: (X, \tau, I) \to (Y, \vartheta, I)\ is\ an\ intuitionistic\ fuzzy\ ideal\ g - continuous\ then\ for\ each\ intuitionistic\ fuzzy\ ideal\ point\ c(\alpha, \beta) of\ X\ and\ each\ fuzzy\ ideal\ open\ set\ V\ f(c(\alpha, \beta)) \subseteq V\ there\ exist\ a\ intuitionistic\ fuzzy\ ideal\ g - open\ set\ U\ such\ that\ c(\alpha, \beta) \subseteq U\ and\ f(U) \subseteq V$.

$Proof$: $Let\ c(\alpha, \beta) be\ a\ intuitionistic\ fuzzy\ ideal\ point\ of\ X\ an\ V\ be\ a\ intuitionistic\ fuzzy\ ideal\ open\ set\ of\ Y$such that $f(c(\alpha, \beta))_q\ V$ $.put\ U = f^{-1}(V). then\ by\ hypothesies\ U\ is\ an\ intuitionistic\ fuzzy\ ideal\ g - open\ set\ of\ X\ which\ contains\ A$.

***Definition* 3.2** : $Let\ (X, \tau, I) bean\ intuitionistic\ fuzzy\ ideal\ topological\ space$. $The\ generalized\ closure\ of\ a\ intuitionistic\ fuzzy\ ideal\ set\ A\ of\ X\ denoted\ by\ gcl\ (A) is\ the\ intersection\ of\ all\ intuitionistic\ fuzzy\ ideal\ g - closed\ set\ of\ X\ which$

contins A .

***Remark* 3.2** : *It is clear that,* $A \subseteq gcl(A) \subseteq cl(A)$ *for any intuitionistic fuzzy ideal set A of X .*

***Theorm* 3.3** : *if* $f:(X,\tau,I) \to (Y,\vartheta,I)$ *is intuitionistic fuzzy ideal g − continuous then* $f(gcl(A)) \subseteq cl(f(A))$ *for every intuitionistic fuzzy set A of X .*

Proof : *let A be an intuitionistic fuzzy ideal set of X. Then* $cl(f(A))$ *is an intuitionistic fuzzy ideal closed set of Y . Since f is fuzzy ideal g − continuous* $f^{-1}\left(cl(f(A))\right)$ *is an intuitionistic fuzzy ideal g − closed in X . clearly* $A \subseteq f^{-1}(cl(A))$*. Therefore*

$gcl(A) \subseteq gcl\left(f^{-1}\left(cl(f(A))\right)\right) = f^{-1}\left(cl(f(A))\right)$*. Hence* $f(gcl(A)) \subseteq cl(f(A))$.

***Definition* 3.3** : *An intuitionistic fuzzy ideal topological space* (X,τ,I) *is said to be intuitinistic fuzzy ideal* $T_{1\backslash 2}$ *if every intuitionistic fuzzy ideal g − closed set in X is intuitionistic fuzzy ideal closed in X .*

***Theorem* 3.5** : *A mapping f from an intuitionistic fuzzy ideal* $T_{1\backslash 2}$ *space* (X,τ,I) *to an intuitionistic fuzzy ideal toplolgical space* (Y,ϑ,I) *is intuiotionistic fuzzy ideal continuous if and only if it is intuitionistic ideal g − continuous .*

Proof : *obvious .*

***Thorem* 3.6** : *If* : $(X,\tau,I) \to (Y,\vartheta,I)$ *is intuitionistic fuzzy ideal g − continuous and* $g:(Y,\vartheta,I) \to (Z,\rho,I)$ *is continuous fuzzy ideal continuous .*
. Then gof : $(X,\tau,I) \to (Z,\rho,I)$ *is intuitionistic fuzzy ideal g − continuous .*

Proof : *If an intuitionistic fuzzy ideal closed in Z , then* $f^{-1}(A)$ *is intuitionistic fuzzy ideal closed in Y because g is intuitionistic fuzzy ideal continuous . Therefore* $(gof)^{-1}(A) = f^{-1}(g^{-1}(A))$ *is intuitionistic fuzzy ideal g − closed set in X . Hence gof is intuitionistic fuzzy ideal g − continuous .*

***Theorem* 3.7**: *if* $f:(X,\tau,I) \to (Y,\vartheta,I)$ *and* $g:(Y,\vartheta,I) \to (Z,\rho,I)$ *are two intuitionistic fuzzy ideal g − continuous mapping and* (Y,ϑ,I) *is intuitionistic fuzzy ideal* $T_{1\backslash 2}$ *space then gof*: $(X,\tau,I) \to (Z,\rho,I)$ *is intuitionistic fuzzy ideal g − continuous .*

Proof : *Obvious .*

***Definition* 3.5**: *An intuitionistic fuzzy ideal topological space* (X,τ,I) *is said to be intutionistic fuzzy ideal GO − compact if every intuitionistic fuzzy ideal g −open cover of X has finite subcover .*

***Theorem* 3.8** : *Intuitionistic fuzzy ideal g − continuous image of an intuitionistic intuitionistic fuzzy GO − compact space is intuitionistic fuzzy ideal compact .*

Proof : *Let* $f:(X,\tau,I) \to (Y,\vartheta,I)$ *be an intuitionistic fuzzy ideal g − continuous map from an intuitionistic fuzzy ideal GO − compact space* (X,τ,I) *onto an intuitionistic fuzzy ideal topological space* (Y,ϑ,I) .
Let $\{A_i : i\epsilon \wedge\}$ *be an intuitionistic fuzzy idael g − open cover of Y then* $\{f^{-1}(A_i) : i\epsilon \wedge\}$ *is an intuitionistic fuzzy ideal g − open cover of X .*
Since X is intuitionistic fuzzy ideal GO − compact it has finite intuitionistic fuzzy subcover say $\{f^{-1}(A_1), \ldots\ldots\ldots.. f^{-1}(A_n)\}$*. Since f is onto* $\{A_1, \ldots\ldots\ldots.. A_n\}$ *is an intuitionistic fuzzy ideal open cover Y and so* (Y,ϑ,I) *is*

intuitionistic fuzzy ideal compact .

Definition3.6 : *An intuitionistic fuzzy ideal toplogical space X is called intuitionistic fuzzy ideal GO − connected if there is no proper intuitionustic fuzzy ideal of X which is both intuitionistic fuzzy ideal g − open and intuitionistic fuzzy ideal g*−closed .

Remark 3.4 : *Every intuitionistic fuzzy ideal GO − connected space is intutionistic fuzzy ideal* C_5 *− connected* [15] , *but the converse may not to be true . for ,*

Example3.1 : *Let* $X = \{a, b\}$, $U =< x, (.5/a\ ,.7/b), (.5/a\ ,.3/b) >$, *and* $\tau = \{0, U, 1\}$ *be an intuitionistic fuzzy ideal topology on X , then* (X, τ, I) *is intuitionistic fuzzy ideal connected but not fuzzy ideal GO − connected .*

Theorem3.9 : *An intuitionistic fuzzy ideal* $T_{1\backslash 2}$ *− space is intuitionistic fuzzy ideal* C_5 *− connected if and only if it is intuitionistic fuzzy ideal GO − connected .*

proof : *Obvious* :

Theorem3.10 : *If* $f: (X, \tau, I) \to (Y, \vartheta, I)$ *is an intuitionistic fuzzy ideal g − continuous surjection and X is intuitionistic fuzzy ideal GO − connected then Y is intuitionistic fuzzy ideal* C_5 *− connected .*

proof : *Suppose Y is not intuitionistic fuzzy ideal connected . Then there exists a proper intutionistic fuzzy ideal set G of Y which is both intuitionistic fuzzy ideal open and intuitionistic fuzzy ideal closed . Therefore* $f^{-1}(G)$ *is proper intuitionistic fuzzy ideal closed and intuitionistic fuzzy ideal open set of X , because f intuitionistic fuzzy ideal g − continuous surjection . Hence X is not intuitionistic fuzzy ideal GO − connected .*

Referances

1)*K. Atanassov, Intuitionistic fuzzy sets , In VII ITKR' s Session , (V. Sgurev , Ed .) Sofia , Bulgaria*, (1983) .

2)*M. E. Abd El − Monsef ; A. A. Nasef and A. A. Salama , Extensions of Fuzzy Ideals, Bull. Cal. Math . Soc.*, 92(3)(2000)181 − 188. (2000).

3) *M. E. Abd El − Monsef ; A. A. Nasef and A. A. Salama , Some Fuzzy Topological operators via Fuzzy Chaos , Solitons and Fractals Vol.* (12). *No.* (13)(2001), *pp.* 2509 − 2515. (2001).

4)*K. Atanassov and S. Stoeva. , Intuitionistic Fuzzy Sets, In Polish Symposium on Interval and Fuzzy Mathematics , Poznan* , (1983), 23 − 26 .

5) *Y. M. Saber and M. A. Abdel − Sattar Ideal ON Fuzzy Topological Spaces applied Mathematical Sciences , Vol.* 8, (2014), *no* .34 , 1667 − 1691 .

6)*K. Atanassov, Intuitionistic Fuzzy Sets . Fuzzy Sets and Systems*, 20(1986), 87 − 96 .

7)*C. L. Chang, Fuzzy Toplogical Spaces, J. Math. Appl* .24(1968)182 − 190.

8)*Bayhan Sadik, On Seperation Axioms in Intuitionistic Topological Spaces . Intern. Jour . Math . Sci.* 27(2001), *no.* 10, 621 − 630 .

9)*D. Coker, An Introduction to Intuitionistic Fuzzy Toplogical Spaces , Fuzzy Sets and Systems* .88(1997) 81 − 89.

10)*D. Coker and M. Demirci , On Intuitionistic Fuzzy Points. Notes On IFS*: 2 − 1(1995), 78 − 83.

11) *D. Coker and A. Es. Hyder., On Fuzzy Compactness in Intuitionistic Fuzzy Topological Spaces, The Journal of Fuzzy Mathmatics*, 3 − 4 (1995), 899 − 909.

12) *H. Gurcay, D. Coker and Es., A. Hayder, On Fuzzy continuity in Intuitionistic Fuzzy Toplogical Spces. The Journal of Fuzzy Mathematics Vol.* 5, *no.* 2, 1997, 365 − 378.

13) *N. Levine., Generalized Closed Sets In Toplogy, Rend. Cerc. Mat. Palermo.* 19(2), 1970 571 − 599.

14) *O. Ozbakir and D. Coker, Fuzzy Multifunctions in IntutionisticvFuzzy Toplogical Spaces Notes On IFS* 5(1999) *No.* 3.

15) *S*.S. Thakur and Malviya R., Generalized Closed *Sets In Fuzzy Topology, Math. Notes* 38 (1995), 137 − 140.

16) *S. S Thakur and Rekha Chaturvedi, Generlized, Generlized Closed Sets in Intuitionistic Fuzzy Topology*(*Submitted*).

17) *B. Tripathy, Intuitionistic Fuzzy Metric Spaces. Notes on IFS Vol.* 5, (1999), *NO.* 2.

18) *N. Turnali and D. Coker, Fuzzy Connectedness in Intuitionistic Fuzzy Topological Spaces. Fuzzy Sets And Systems* 116(2000)(3), 369 − 375.

19) *A. A. Salama and Al. Blowi, Intuitionistic Fuzzy Ideal Topological Spaces Journal advances in Fuzzy Mathematics* (*AFM*). *Volume* 7*no.* 1(2012), *pp.* 51 − 60.

20) *L. A. Zadeh, Fuzzy Sets, Information and Control*, 18(1965), 338 − 353.