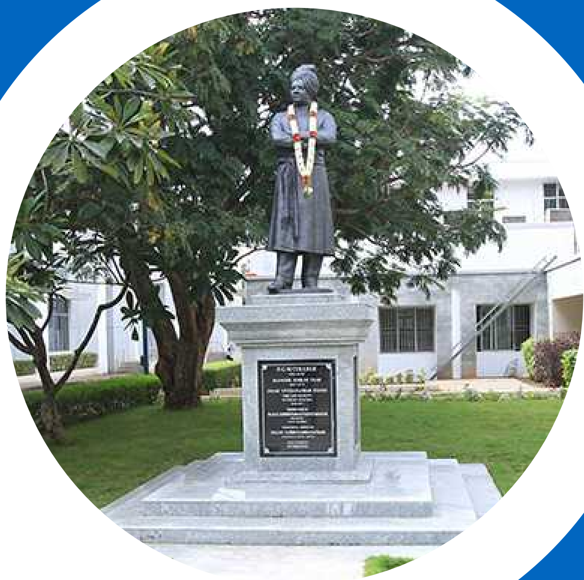
VOLUME XI
ISBN No.: 978-93-94004-00-9
Physical Science

Estd. 1957

NALLAMUTHU GOUNDER MAHALINGAM COLLEGE

An Autonomous Institution, Affiliated to Bharathiar University, An ISO 9001:2015 Certified Institution,

Pollachi-642001



SUPPORTED BY

ABT Industries Ltd.,
Dairy Division

PROCEEDING

One day International Conference
EMERGING TRENDS IN SCIENCE AND TECHNOLOGY (ETIST-2021)
27th October 2021
Jointly Organized by
Department of Biological Science, Physical Science and Computational Science

NALLAMUTHU GOUNDER MAHALINGAM COLLEGE

An Autonomous Institution, Affiliated to Bharathiar University

An ISO 9001:2015 Certified Institution, Pollachi-642001.

Estd. 1957

Proceeding of the

One day International Conference on

EMERGING TRENDS IN SCIENCE AND TECHNOLOGY (ETIST-2021)

27th October 2021

Jointly Organized by

Department of Biological Science, Physical Science and Computational Science

ISBN No: 978-93-94004-00-9

978- 93- 94004- 00- 9

Nallamuthu Gounder Mahalingam College

An Autonomous Institution, Affiliated to Bharathiar University

An ISO 9001:2015 Certified Institution, 90 Palghat Road, Pollachi-642001.

www.ngmc.org

ABOUT THE INSTITUTION

A nations's growth is in proportion to education and intelligence spread among the masses. Having this idealistic vision, two great philanthropists late. S.P. Nallamuthu Gounder and Late. Arutchelver Padmabhushan Dr.N.Mahalingam formed an organization called Pollachi Kalvi Kazhagam, which started NGM College in 1957, to impart holistic education with an objective to cater to the higher educational needs of those who wish to aspire for excellence in knowledge and values. The College has achieved greater academic distinctions with the introduction of autonomous system from the academic year 1987-88. The college has been Re-Accredited by NAAC and it is ISO 9001 : 2015 Certified Institution. The total student strength is around 6000. Having celebrated its Diamond Jubilee in 2017, the college has blossomed into a premier Post-Graduate and Research Institution, offering 26 UG, 12 PG, 13 M.Phil and 10 Ph.D Programmes, apart from Diploma and Certificate Courses. The college has been ranked within Top 100 (72nd Rank) in India by NIRF 2021.

ABOUT CONFERENCE

The International conference on “Emerging Trends in Science and Technology (ETIST-2021)” is being jointly organized by Departments of Biological Science, Physical Science and Computational Science - Nallamuthu Gounder Mahalingam College, Pollachi along with ISTE, CSI, IETE, IEE & RIYASA LABS on 27th OCT 2021. The Conference will provide common platform for faculties, research scholars, industrialists to exchange and discus the innovative ideas and will promote to work in interdisciplinary mode.

International Conference on Emerging Trends in Science and Technology (ETIST 2021) Jointly Organized by Department of Biological Science, Physical Science and Computational Science Nallamuthu Gounder Mahalingam College, Affiliated to Bharathiar University, Tamilnadu, India. Published by NGMC - November 2021

A note on soft αgrw-closed sets

N. Selvanayaki[1], **Gnanambal Ilango**[2] and **M.Maheswari**[3],

Abstract - Aim of this paper is to study some properties of αgrw-closed sets in soft topological spaces and related characterizations are studied.

Keywords *Soft sets, soft topological spaces, soft αgrw-closed sets and soft regular semi kernal.*
2010 Subject classification: *54A05, 54A10.*

1 Introduction and Preliminaries

Molodtsov [9] (1999) introduced the concept of a soft set as a new approach for modeling uncertainties. After that Maji et al. [7] established some fundamental operations between two soft sets and then tackled one of their applications in decision making problems. Shabir and Naz(2011)[11] studied the topological structures of soft sets.

Selvanayaki et. al. [10] introduced αgrw-closed sets in soft topological spaces. In this paper we study some more properties of soft αgrw-closed sets.

Definition 1.1. *[9] Let U be an initial universe set and E be a set of parameters. Let $P(U)$ denotes the power set of U and $A \subseteq E$. A pair (F, A) is called a soft set over U, where F is a mapping given by $F : A \to P(U)$.*

Definition 1.2. *[8] Let U be an universal set and E be an universe set of parameters. Let (F, A) and (G, B) be soft sets over a common universe set U and $A, B \subseteq E$. Then (F, A) is a subset of (G, B), denoted by $(F, A) \subseteq (G, B)$, if*
(i) $A \subseteq B$,
(ii) for all $e \in E, F(e) \subseteq G(e)$.
(F, A) equals (G, B), denoted by $(F, A) = (G, B)$, if $(F, A) \tilde{\subseteq} (G, B)$ and $(G, B) \tilde{\subseteq} (F, A)$.
We denote the family of these soft sets by $SS(X)_E$.

Definition 1.3. *[8] Two soft set (F, A) and (G, B) over a common universe U are said to be equal if (F, A) is a soft subset of (G, B) and (G, B) is a soft subset of (F, A).*

Definition 1.4. *[8] A soft set (F, A) over U is said to be a null soft set, denoted by $\tilde{\phi}$, if $\forall \epsilon \in A, F(\epsilon) = \phi$.*

[1]Assistant Professor, Department of Mathematics, Nallamuthu Gounder Mahalingam College, Pollachi-642001, Coimbatore, Tamilnadu, India.
E.mail: selvanayaki.nataraj@gmail.com
[2]Assistant Professor, Department of Mathematics, Government Arts College, Coimbatore, Tamilnadu, India.
E.mail: gnanamilango@yahoo.co.in
[3]Assistant Professor, Department of Mathematics, Nallamuthu Gounder Mahalingam College, Pollachi-642001, Coimbatore, Tamilnadu, India.
E.mail: mahimrk@gmail.com

Definition 1.5. *[8] A soft set (F, A) over U is said to be a absolute soft set, denoted by $\widetilde{U}$, if $\forall\epsilon \in A, F(\epsilon) = U$,*

Definition 1.6. *[8] Union of two soft sets of $F, A)$ and (G, B) over the common universe U is the soft set (H, C), where $C = A \cup B$, and $\forall e \in C$,*

$$H(e) = \begin{cases} F(e), \text{if } e \in A - B \\ G(e), \text{if } e \in B - A \\ F(e) \cup G(e), \text{if } e \in A \cap B \end{cases}$$

Definition 1.7. *[8] Intersection of two soft sets (F, A) and (G, B) over the common universe U is the soft set (H, C), where $C = A \cap B$, and $\forall e \in C$, $H(e) = F(e)$ or $G(e)$. We write $(F, A) \widetilde{\cap} (G, B) = (H, C)$.*

Definition 1.8. *[2] The complement of a soft set (F, A), denoted by $(F, A)^c$, is defined by $(F, A)^c = (F^c, A), F^c : A \to P(X)$ is mapping given by $F^c(e) = X - F(e), \forall e \in A$ and F^c is called the soft complement function of F.*

Definition 1.9. *[8] A soft set (E, A) over X is said to be soft element if there exists $\alpha \in A$ such that $E(\alpha)$ is a singleton, say $\{x\}$, and $E(\beta) = \phi$, $\forall\ \beta(\neq \alpha) \in A$, such a soft element is denoted by E^x_α.*

Definition 1.10. *[11] Let $\widetilde{\tau}$ be the collection of soft sets over X. Then $\widetilde{\tau}$ is said to be a soft topology on X if*

(i) $(\widetilde{\phi}, A), (\widetilde{X}, A) \widetilde{\in} \widetilde{\tau}$, where $\widetilde{\phi}(\alpha) = \phi$ and $\widetilde{X}(\alpha) = X, \forall A$,

(ii) the intersection of any two soft sets in $\widetilde{\tau}$ belongs to $\widetilde{\tau}$,

(iii) the union of any number of soft sets in $\widetilde{\tau}$ belongs to $\widetilde{\tau}$.
The triple $(X, \widetilde{\tau}, A)$ is called a soft topological space over X. The members of $\widetilde{\tau}$ are said to be soft open sets in X.

Definition 1.11. *Let $(X, \widetilde{\tau}, E)$ be a soft topological space over X and (A, E) be a soft set in $(X, \widetilde{\tau}, E)$ is called*

(a) soft regular open [13] $(A, E) = int_s(cl_s(A, E))$ and soft regular closed $(A, E) \widetilde{=} cl_s(int_s(A, E))$.

(b) soft α-open [1] $(A, E) \widetilde{\subseteq} int_s(cl_s(int_s(A, E)))$ and soft α-closed if $cl_s(int_s(cl_s(A, E))) \widetilde{\subseteq} (A, E)$.

Definition 1.12. *[14] In a soft topological space $(X, \widetilde{\tau}, E)$, a soft set (G, C) is said to be regular semi-open soft set if there is a regular open soft set (H, B) such that $(H, B) \widetilde{\subseteq} (G, C) \widetilde{\subseteq} cl_s(H, B)$*

Definition 1.13. *A soft set (A, E) of a soft topological space $(X, \widetilde{\tau}, E)$ is called*

(a) a soft generalized closed (briefly soft g-closed) [6] if $cl_s(A, E) \widetilde{\subseteq} (U, E)$ whenever $(A, E) \widetilde{\subseteq} (U, E)$ and (U, E) is soft open in $(X, \widetilde{\tau}, E)$,

(b) a soft α-generalized closed (briefly soft αg-closed)[3] if $\alpha cl_s(A, E) \widetilde{\subseteq} (U, E)$ whenever $(A, E) \widetilde{\subseteq} (U, E)$ and (U, E) is soft open in $(X, \widetilde{\tau}, E)$.

Definition 1.14. *[10] A soft set (A, E) in a soft topological space $(X, \widetilde{\tau}, E)$ is called a soft α- generalized regular weakly closed (briefly soft αgrw-closed) set in $(X, \widetilde{\tau}, E)$ if $\alpha cl_s(A, E) \widetilde{\subseteq} (U, E)$ whenever $(A, E) \widetilde{\subseteq} (U, E)$ and (U, E) is soft regular semi open in $(X, \widetilde{\tau}, E)$.*

Definition 1.15. *[5] Let $(X, \widetilde{\tau}, E)$ be a soft topological space, $(F, E), (G, E)$ be semi closed sets in X such that $(F, E) \widetilde{\cap} (G, E) = \widetilde{\phi}$. If there exist semi open soft sets (F_1, E) and (F_2, E) such that $(F, E) \widetilde{\subseteq} (F_1, E), (G, E)$ and $(F_1, E) \widetilde{\cap} (F_2, E) = \widetilde{\phi}$, then $(X, \widetilde{\tau}, E)$ is called a soft semi normal space.*

Definition 1.16. *[4] A soft topological space $(X, \widetilde{\tau}, E)$ is said to be soft compact if every soft open cover of (X, E) has a finite subcover.*

Definition 1.17. *[12] Let $(X, \widetilde{\tau}, E)$ be a soft topological space over $X, (G, A)$ a soft closed set in $(X, \widetilde{\tau}, E)$ and $e_F \widetilde{\in} X_A$ such that $e_F \widetilde{\notin} (G, A)$. If there exist soft open sets (F_1, A) and (F_2, A) such that $e_F \widetilde{\in} (F_1, A), (G, A)$ and $(F_1, A) \widetilde{\subseteq} (F_2, A) = \phi_A$, then $(X, \widetilde{\tau}, E)$ is called a soft regular space.*

2 Soft αgrw-closed sets in soft topological spaces

Proposition 2.1. *In a soft topological space $(X, \widetilde{\tau}, E)$, $RSOSS(X, \widetilde{\tau}, E) = \{\widetilde{\phi}, \widetilde{X}\}$, where $RSOSS(X, \widetilde{\tau}, E)$ is the set of all soft regular semi-open sets, then every subset of $SS(X)_E$ is soft αgrw-closed.*

Proof. Assume that $RSOSS(X, \widetilde{\tau}, E) = \{\widetilde{\phi}, \widetilde{X}\}$ and (A, E) be any subset of $SS(X)_E$. Suppose $(A, E) = \widetilde{\phi}$, then (A, E) is a soft αgrw-closed set. Suppose $(A, E) \neq \widetilde{\phi}$, then $\widetilde{X}$ is the only soft regular semi-open set containing (A, E) and so $\alpha cl_s((A, E)) \widetilde{\subseteq} \widetilde{X}$. Hence (A, E) is soft αgrw-closed.

Remark 2.2. *The converse of the above proposition need not be true as seen from the following example.*

Example 2.3. *Let $X = \{x_1, x_2, x_3\}$, $E = \{e_1, e_2\}$ and $\widetilde{\tau} = \{\ \widetilde{\phi}\ ,\ \widetilde{X}\ , (F_1, E),$
$(F_2, E), (F_3, E), (F_4, E), (F_5, E), (F_6, E)\}$ where $(F_1, E), (F_2, E), (F_3, E), (F_4, E),$
$(F_5, E), (F_6, E)$ are soft sets over X defined as follows*
$F_1(e_1) = \{x_1\}$, $F_1(e_2) = \{x_1\}$,
$F_2(e_1) = \{x_2\}$, $F_2(e_2) = \{x_2\}$,
$F_3(e_1) = \{x_3, x_2\}$, $F_3(e_2) = \{x_3, x_2\}$,
$F_4(e_1) = \{x_1, x_2\}$, $F_4(e_2) = \{x_1, x_2\}$
$F_5(e_1) = \{x_2, x_3\}$, $F_5(e_2) = \{x_2, x_3\}$
$F_6(e_1) = \{x_1, x_3\}$, $F_6(e_2) = \{x_1, x_3\}$.
In $(X, \widetilde{\tau}, E)$, every subset of (X, E) is soft αgrw-closed but $RSOSS(X, E) \neq \{\widetilde{\phi}, \widetilde{X}\}$.

Proposition 2.4. *Every subset of $SS(X)_E$ is soft αgrw-closed if and only if $RSOSS(X, \widetilde{\tau}, E) \widetilde{\subseteq} \{(F, E) \widetilde{\subseteq} SS(X$
$(F^c, E) \widetilde{\in} S\alpha OS(X, \widetilde{\tau}, E)\}$, where $S\alpha OS(X, \widetilde{\tau}, E)$ is the set of all soft α-open sets in $(X, \widetilde{\tau}, E)$.*

Proof. Suppose that every soft subset of $SS(X)_E$ is soft αgrw-closed. Let $(U, E) \widetilde{\in} RSOSS(X, \widetilde{\tau}, E)$. Since $(U, E) \widetilde{\subseteq} (U, E)$ and (U, E) is soft regular semi-open, $\alpha cl_s((U, E)) \widetilde{\subseteq} (U, E)$. Thus $(U, E) \widetilde{\in} \{(F, E) \widetilde{\subseteq} (X, E)$
$(F^c, E) \widetilde{\in} S\alpha OS(X, \widetilde{\tau}, E)\}$.

Conversely, assume $RSOSS(X, \widetilde{\tau} E) \widetilde{\subseteq} \{(F, E) \widetilde{\subseteq} (X, E) : (F^c, E) \widetilde{\in} S\alpha OS(X, \widetilde{\tau}, E)\}$.
Let (A, E) be any subset of $SS(X)_E$ such that $(A, E) \widetilde{\subseteq} (U, E)$, where (U, E) is soft regular semi-open. Thus (U, E) is soft α-closed and so $\alpha cl_s((A, E)) \widetilde{\subseteq} (U, E)$. Hence (A, E) is soft αgrw-closed.

Proposition 2.5. *If (A, E) is both soft open and soft g-closed in $(X, \widetilde{\tau}, E)$, then (A, E) is soft αgrw-closed $(X, \widetilde{\tau}, E)$.*

Proof. Let $(A, E) \widetilde{\subseteq} (U, E)$ and (U, E) be soft regular semi-open. Now $(A, E) \widetilde{\subseteq} (A, E)$ and so $cl_s((A, E)) \widetilde{\subseteq} (A, E)$, because (A, E) is soft open and soft g-closed. This implies $\alpha cl_s((A, E)) \widetilde{\subseteq} cl_s(A, E) \widetilde{\subseteq} (U, E)$ since every soft closed is soft α-closed. Hence (A, E) is soft αgrw-closed.

Remark 2.6. *If (A, E) is soft αgrw-closed in $(X, \widetilde{\tau}, E)$, then (A, E) need not be soft open and soft g-closed $(X, \widetilde{\tau}, E)$.*

Example 2.7. *Let $X = \{x_1, x_2\}$, $E = \{e_1, e_2\}$ and $\widetilde{\tau} = \{ \widetilde{\phi}\ ,\ \widetilde{X}\ (F_1, E), (F_2, E),$
$(F_3, E), (F_4, E)\}$ where $(F_1, E), (F_2, E), (F_3, E), (F_4, E)$ are soft sets over X, defined as follows $F_1(e_1) = \{x_2\}$, $F_1(e_2) = \{x_1\}$,*
$F_2(e_1) = \{x_1\}$, $F_2(e_2) = \{x_2\}$,
$F_3(e_1) = \{\phi\}$, $F_1(e_2) = \{x_1\}$,
$F_4(e_1) = \{x_1\}$, $F_3(e_2) = \{X\}$.
Then a soft set (A, E) such that $A(e_1) = \{x_1\}$, $A(e_2) = \{x_1\}$ is both soft open and soft αgrw-closed but not soft g-closed.

Proposition 2.8. *If (A, E) is soft regular semi-open and soft αgrw-closed, then (A, E) is soft α-closed.*

Proof. Suppose (A, E) is soft regular semi-open and soft αgrw-closed, $\alpha cl_s((A, E)) \widetilde{\subseteq} (A, E)$. Also $(A, E) \widetilde{\subseteq} \alpha cl_s((A, E)))$, so $\alpha cl_s((A, E)) = (A, E)$. Hence (A, E) is soft α-closed.

Remark 2.9. *In Example 2.7, the soft set $(e_1, \{x_2\}), (e_2, \{\phi\})$ is soft α-closed and soft αgrw-closed but not soft regular semi-open.*

Corollary 2.10. *Let (A, E) be soft regular semi-open and soft αgrw-closed. Then $(A, E) \widetilde{\cap} (F, E)$ is soft αgrw-closed for every soft α-closed set (F, E).*

Proof. Since (A, E) is soft regular semi-open and soft αgrw-closed, then by
Proposition 2.8, (A, E) is soft α-closed. Therefore $(A, E) \widetilde{\cap} (F, E)$ is soft α-closed, since (F, E) is soft α-closed. Hence $(A, E) \widetilde{\cap} (F, E)$ is soft αgrw-closed.

Proposition 2.11. *If (A, E) is both soft open and soft αg-closed, then (A, E) is soft αgrw-closed.*

Proof. Suppose (A, E) is both soft open and soft αg-closed. Let $(A, E) \widetilde{\subseteq} (U, E)$ and (U, E) is soft regular semi-open. Now $(A, E) \widetilde{\subseteq} (A, E)$ and by hypothesis $\alpha cl_s((A, E)) \widetilde{\subseteq} (A, E)$.Therefore $\alpha cl_s((A, E)) \widetilde{\subseteq} (U, E)$. Hence (A, E) is soft αgrw-closed.

Remark 2.12. *If (A, E) is both soft open and soft αgrw-closed, then (A, E) need not be αg-closed. In Example 2.7, the soft subset $A(e_1) = \{\phi\}$, $A(e_2) = \{X\}$ is soft αgrw-closed but not soft open and not soft αg-closed.*

Remark 2.13. *Difference of two soft αgrw-closed sets is not generally soft αgrw-closed.*

Example 2.14. *Let $X = \{x_1, x_2\}$, $E = \{e_1, e_2\}$ and $\widetilde{\tau} = \{ \widetilde{\phi}\ ,\ \widetilde{X}\ , (F_1, E), (F_2, E),$
$(F_3, E)\}$ where $(F_1, E), (F_2, E), (F_3, E)$ are soft sets over (X, E), defined as follows*
$F_1(e_1) = \{\phi\}$, $F_1(e_2) = \{x_1\}$,
$F_2(e_1) = \{x_1\}$, $F_2(e_2) = \{x_2\}$,
$F_3(e_1) = \{x_1\}$, $F_3(e_2) = \{X\}$.
Then the soft sets $(A, E) = \{(e_1, \{X\}), (e_2, \{x_2\})\}$ and $(B, E) = \{(e_1, \{x_2\}), (e_2, \{x_1\})\}$ are soft αgrw-closed but $(A, E) - (B, E) = \{(e_1, \{x_1\}), (e_2, \{x_2\})\}$ is not soft αgrw-closed.

Definition 2.15. *The intersection of all soft regular semi-open subsets of* $(X, \widetilde{\tau}, E)$ *containing* (A, E) *is said to be the soft regular semi-kernal of* (A, E) *and is denoted by* $srsker((A, E))$.
i.e., $srsker((A, E)) = \widetilde{\bigcap} \{(F, E) : (A, E) \widetilde{\subseteq} (F, E), \text{where } (F, E) \widetilde{\in} RSOSS(X, \widetilde{\tau}, E)\}$.

Theorem 2.16. *A soft subset* (A, E) *of* $SS(X)_E$ *is soft* αgrw*-closed if and only if* $\alpha cl_s((A, E)) \widetilde{\subseteq} srsker((A, E))$.

Proof. Consider (A, E) is soft αgrw-closed. Let $X_e^x \widetilde{\notin} \alpha cl_s((A, E))$, where X_e^x is a soft element of $SS(X)_E$. Suppose that $X_e^x \widetilde{\notin} srsker((A, E))$, then there is a soft regular semi-open set (U, E) containing (A, E) such that $X_e^x \widetilde{\notin} (U, E)$. Since (U, E) is soft regular semi-open containing (A, E), we have $X_e^x \widetilde{\notin} \alpha cl_s((A, E))$, which is a contradiction. Thus $\alpha cl_s((A, E)) \widetilde{\subseteq} srsker((A, E))$.

Conversely, let $\alpha cl_s((A, E)) \widetilde{\subseteq} srsker(A, E)$ and (U, E) be soft regular semi-open such that $(A, E) \widetilde{\subseteq} (U, E)$, then $\alpha cl_s((A, E))) \widetilde{\subseteq} srsker(A, E) \widetilde{\subseteq} (U, E)$. Therefore (A, E) is soft αgrw-closed.

Proposition 2.17. *Let* $(X, \widetilde{\tau}, E)$ *be a soft regular space in which every soft regular semi-open subset is soft open. If* (A, E) *is soft compact subset of* $(X, \widetilde{\tau}, E)$, *then* (A, E) *is soft* αgrw*-closed.*

Proof. Let $(A, E) \widetilde{\subseteq} (U, E)$ and (U, E) be soft regular semi-open. By assumption (U, E) is soft open in $(X, \widetilde{\tau}, E)$. Since (A, E) is a soft compact subset of a soft regular space $(X, \widetilde{\tau}, E)$, then there exists a soft closed set (V, E) such that $(A, E) \widetilde{\subseteq} (V, E) = cl_s((V, E)) \widetilde{\subseteq} (U, E)$. Thus $\alpha cl_s((A, E)) \widetilde{\subseteq} (U, E)$. Hence (A, E) is soft αgrw-closed.

Proposition 2.18. *If* $(X, \widetilde{\tau}, E)$ *is soft semi-normal and* $(F, E) \widetilde{\cap} (A, E) = \phi$, *where* (F, E) *is soft regular semi-open and* (A, E) *is soft* αgrw*-closed, then there exist disjoint soft semi open sets* (S_1, E) *and* (S_2, E) *such that* $(A, E) \widetilde{\subseteq} (S_1, E)$ *and* $(F, E) \widetilde{\subseteq} (S_2, E)$.

Proof. Since (F, E) is soft regular semi open and $(F, E) \widetilde{\cap} (A, E) = \phi$. Then $(A, E) \widetilde{\subseteq} (F^c, E)$ and so $\alpha cl_s((A, E)) \widetilde{\subseteq} (F^c, E)$. Thus $\alpha cl_s((A, E)) \widetilde{\cap} (F, E) = \phi$. Since $\alpha cl_s((A, E))$ and (F, E) are soft semi closed and $(X, \widetilde{\tau}, E)$ is soft semi normal, there exist disjoint soft semi open sets (S_1, E) and (S_2, E) such that $\alpha cl_s((A, E)) \widetilde{\subseteq} (S_1, E)$ and $(F, E) \widetilde{\subseteq} (S_2, E)$. This implies $(A, E) \widetilde{\subseteq} (S_1, E)$ and $(F, E) \widetilde{\subseteq} (S_2, E)$.

Proposition 2.19. *If* $(X, \widetilde{\tau}, E)$ *is soft semi-normal in which every* α*-closed set is closed and* $(F, E) \widetilde{\cap} (A, E) = \phi$, *where* (F, E) *is soft regular closed and* (A, E) *is soft* αgrw*-closed then there exist disjoint soft open sets* (O_1, E) *and* (O_2, E) *such that* $(A, E) \widetilde{\subseteq} (O_1, E)$ *and* $(F, E) \widetilde{\subseteq} (O_2, E)$.

Proof. Similar to Proposition 2.18.

References

[1] M. Akdag and Al. Ozkan, *Soft α-open sets and soft α-continuous functions*, Abstr. Anal. Appl. Art ID 891341 (2014), 1-7.

[2] M.I. Ali, F. Feng, X. Liu, W.K. Min,M. Shabir, *On some new operations in soft set theory*, Computers and Mathematics with Applications **57** (2009), 1547-1553.

[3] I. Arockiarani and A. Arockia Lancy, *Generalized soft $g\beta$-closed sets and soft $gs\beta$-closed sets in soft topological spaces*, International Journal of Mathematical Archive **4(2)**,(2013),17-23.

[4] A. Aygunoglu and A. Aygun *Some notes on soft topological spaces*, Neural computing and Applications, **21(1)** (2012) 113-119.

[5] Ali Kandil, Ala Mohamed Abd El-latif and Osama El-Tantawy, *Soft semi separation axioms and some types of soft functions*, Ann. Fuzzy Math. Inform., **8(2)** (2014), 305-318.

[6] K. Kannan, *Soft generalized closed sets in soft topological spaces,*, J. of Theoretical and Appl. Inf. Tech. **37(1)**(2012), 17-21.

[7] P. K.. Maji, R. Biswas and A. R. Roy, *An application of soft sets in a decision making problem*, Computers and Mathematics with Applications, **44(8-9)**, (2002) 1077-1083.

[8] P. K.. Maji, R. Biswas and A. R. Roy, *Soft set theory*, Computers and Mathematics with Applications, **45(4-5)**, (2003) 555-562.

[9] D. Molodtsov, *Soft set theory -first results*, Computers and Mathematics with Applications, **37(4-5)**, (1999) 19-31.

[10] N. Selvanayaki, Gnanambal Ilango and M.Maheswari, *New class of generalized closed sets in soft topological spaces*,Communicated.

[11] M. Shabir and M. Naz, *On soft topological spaces*, Computers and Mathematics with Applications, **617)**, (2011) 1786-1799.

[12] Sabir Hussian and Bashir Ahmad, *Soft separation axioms in soft topological spaces*, Hacettepe Journal of Mathematics and Statistics **44(3)** (2015), 559-568.

[13] Sabir Hussian, *On soft regular-open (closed) sets in soft topological spaces*, J. Appl. Math. and Informatics **36** (2018) No.1-2, 59-68.

[14] A. Vadivel and E. Elavarasan, *Regular semiopen soft sets and maps in soft topological spaces*, Annals of Fuzzy Mathematics and Informatics (2016), 1-15.

BIOGRAPHY

Dr. N. Selvanayaki is working as an Assistant Professor in the Department of Mathematics, Nallamuthu Gounder Mahalingam College, Pollachi. She has got her Doctoral degree in the field of Topology from Bharathiar University, Coimbatore. She has 13 years experience in teaching. She published 8 research papers in reputed journals.

Dr.Gnanambal Ilango, born on 8 th December 1968 took her doctoral degree in Mathematics during the year 1999 from Bharathiar University, Coimbatore. She completed M.Sc Mathematics at Alagappa University Karaikudi India during 1989-1991 and obtained first rank in Alagappa University. She also completed M.Phil during 1992-1993 at Alagappa University securing first rank.

She was a UGC-JRF from 1994-1996 and UGC-SRF from 1996 to 1999 at Bharathiar University. Presently she is working as Assistant Professor of Mathematics at Government Arts College, Coimbatore. Previously she served as Assistant Professor at Kumaraguru College of Technology, Coimbatore for nearly 10 years . Some of the publications include 1.N. Selvanayaki and Gnanambal Ilango, αgrw-separation axioms, Far East Journal of Mathematical Sciences, 99(7)(2016) 1037-1045. (SCOPUS) 2.Vidhya Menon and Gnanambal Ilango, On gpr^{μ}- closed mappings and gpr^{μ}-open mappings, East Asian Mathematical Journal, 33(5) (2017), 483-494.(SCI) 3.M. Thiruchelvi and Gnanambal ilango, Application of fuzzy topological relation in cyclone prediction, Malaya Journal of Matematik, S(1)(2020),81-85. She has done research in general topology and Intuitionistic topology. Now she is interested in working in Topological Data Analysis.

Dr. M. Maheswari is working as an Assistant Professor in the Department of Mathematics, Nallamuthu Gounder Mahalingam College, Pollachi. She has got her Doctoral degree in the field of Ideal bitopological spaces from Bharathiar University, Coimbatore. She has 6 years experience in teaching. She published 8 research papers in reputed journals.