International Journal of Applied Research 2018; 4(2): 01-02

ISSN Print: 2394-7500
ISSN Online: 2394-5869
Impact Factor: 5.2
IJAR 2018; 4(2): 01-02
www.allresearchjournal.com
Received: 01-12-2017
Accepted: 02-01-2018

Vivekananda Dembre
Assistant Professor,
Department of Mathematics,
Sanjay Ghodawat University,
Kolhapur, Maharashtra, India

Patil Sandeep N
Assistant Professor,
Department of Civil
Engineering, Sanjay Ghodawat
Polytechnic, Kolhapur,
Maharashtra, India

Correspondence
Vivekananda Dembre
Assistant Professor,
Department of Mathematics,
Sanjay Ghodawat University,
Kolhapur, Maharashtra, India

Pgprw- Submaximal spaces in topological spaces

Vivekananda Dembre and Patil Sandeep N

Abstract
In this paper, we define pgprw-submaximal spaces and obtain some of their properties.

Keywords: Pgprw-submaximal spaces, Pgprw closed set and Pgprw-open set

1. Introduction
In the year 1995, J.Dontchev [3, 4], defined on door spces and submaximal spaces.
and in this paper we define pgprw-submaximal spaces and obtain some of their properties.

2. Preliminaries: A subset A of t.s (X,T) is called a
(i) pre generalized pre regular ωeakly closed set(briefly pgprω-closed set) if pCl(A)⊆U whenever A⊆U and [1] U is rgα open in (X, τ).
(ii) pre generalized pre regular ωeakly open set [2] in X if A^c is pgprω-closed in X.
(iii) Submaximal spaces [3] if every dense subset of X is open in X.
(iv) door space [4] if every subset of X is either open or closed in X.
(v) g-Submaximal space [5] if every dense subset of X is open in X.
(vi) w-Submaximal space [6] if every dense subset of X is g-open in X
(vii) rg-submaximal space [7] if every dense subset of X is rg-open in X.

2.1 Theorem [8]: For a subset A of (X,T) if A∊PGPRW-LC**(X,T),then there exists an open set U s.t A= U ∩ pgprw-cl(A).

2.2 Theorem: [8] For a subset A of (X,T), the following are equivalent.
(i) A∊ PGPRW-LC*(X,T).
(ii) A= U ∩ (p-cl(A) for some pgprw-open set U.
(iii) pcl(A)-A is pgprw-closed.
(iv) A ∪(p-cl(A)^c is pgprw-open.

3. Pgprw- submaximal spaces in topological spaces.
Definition 3.1: A topological space (X,T) is called pgprw-submaximal if every dense subset is pgprw-open.

Theorem 3.2: A t.s (X,T) is pgprw-submaximal iff p(X)= PGPRW-LC*(X,T)

Proof: Let (X,T) be pgprw-submaximal. A∊P(X) and V = A ∪ (X- p-cl(A))^c then
Cl(V) = cl (A ∪ (X-p-cl(A)^c)
= cl (A) ∪ (X-p-cl(A)
= X.
That is cl(V)= X. It follows that V is dense in (X,T) by assumption, V is pgprw-open by thm 2.1 [8], A∊ PGPRW-LC *(X,T) Therefore p(X)= PGPRW-LC*(X,T).
Conversely, Let A be dense in (X,T) and p(X)= PGPRW-LC*(X,T) then A= A∪ (X-p-cl(A) Since A∊PGPRW-LC *(X,T). A = A ∪ (X-p-cl(A) is pgprw-open by theorem 2.2; hence (X,T) is pgprw-submaximal.

Theorem 3.3: Every submaximal space is pgprw-submaximal but not conversely.

Proof: Let (X, T) be a submaximal space and A be a dense subset of (X, T) then A is open but every open set is pgprw-open and so A is pgprw-open. Therefore (X, T) is a pgprw-submaximal space.
The Converse of the above theorem need not be true in geneal as seen from the followin example.

Example: Let X= {a, b, c} with the topology T = {X, ∅, {a}, {b, c}} however the set A= {a, b} is dense in (X,T). But it is not open in (X, T) therefore (X, T) is not submaximal.

Remark 3.4: Pgprw-submaximal and g-submaximal spaces are independent of each other.

Example: Let X= {a, b, c} T= { X, ∅, {a}, {a, b}}, in this space (X, T) every dense subset is pgprw-open and hence (X, T) is pgprw-submaximal. However the set A = {a, c} is dense in (X, T) but it is not g open in (X, T) therefore (x, T) is not g -submaximal.

Example: Let X= {a, b, c} T= { X, ∅, {a}, {b, c}}, in this space (X, T) every dense subset is g-open and hence (X,T) is g -submaximal. However the set A = {a, b} is dense in (X, T) but it is not pgprw-open in (X, T) therefore (X, T) is not pgprw-submaximal.

Remark 3.5: Pgprw-submaximal and w-submaximal spaces are independent of each other.

Example: Let X= {a, b, c}, T= { X, ∅, {a}}, in this space (X, T) every dense subset is pgprw-open and hence (X,T) is pgprw-submaximal. However the set A = {a, c} is dense in (X, T) but it is not w-open in (X, T) therefore (X, T) is not w -submaximal.

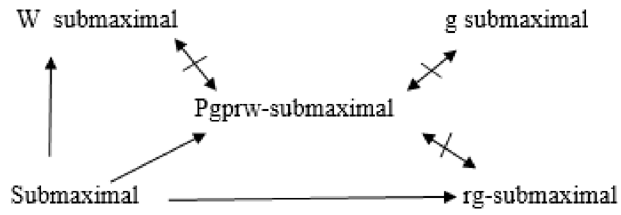
Example: Let X= {a, b, c}, T= {X, ∅, {a}, {b, c}}, in this space (X, T) every dense subset is w-open and hence (X,T) is w -submaximal. However the set A = {a, b} is dense in (X, T) but it is not pgprw-open in (X, T) therefore (X, T) is not pgprw-submaximal.

Remark 3.6: Pgprw-submaximal and rg-submaximal spaces are independent of each other

Example: Let X= {a, b, c, d} T= {X, ∅, {a}, {c, d}, {a, c, d}}, in this space (X, T) every dense subset is pgprw-open and hence (X, T) is pgprw-submaximal. However the set A = {a, b, d} is dense in (X, T) but it is not rg-open in (X, T). Therefore (X, T) is not rg-submaximal.

Example: Let X= {a, b, c} T= {X, ∅, {a}, {b, c}}, in this space (X, T) every dense subset is rg-open and hence (X, T) is rg-submaximal. However the set A = {a, b} is dense in (X, T) but it is not pgprw-open in (X, T). Therefore (X, T) is not pgprw-submaximal.

Remark 3.7: From the above discussions and known results we have the following results.



4. References

1. Wali RS, Vivekananda Dembre. On Pre Generalızed Pre Regular Weakly Closed Sets in Topologıcal Spaces. Journal of Computer and Mathematical Sciences. 2015; 6(2):113-125.
2. Wali RS, Vivekananda Dembre. On Pre Generalized Pre Regular Weakly Open Sets and Pre Generalized Pre Regular Weakly Neighbourhoods in Topological Spaces Annals of Pure and Applied Mathematics, 2015; 10:1. Published on 12 April 2015.
3. Dontchev J. on submaximal spaces, Tamkang j math. 1995; 26:253-260.
4. dontchev J. on door spaces, indian j pure appl math. 1995; 26:873-881.
5. Balachandran K, Sundaram P, Maki H. g-lc and glc-continuous function, Indian j pure appp Math. 1966; 27:235-244.
6. Sheik john M. a study on generalization of closed sets on continuous maps in topological & Bitopological spaces, ph.d thesis, bharathiar university, Coimbatore, 2002.
7. Arockiaarani I, balachandran k, ganster M. rg-locally closed sets & rgl- continuous function, Indian j pure appl math. 1997; 28:661-647.
8. Wali RS, Vivekananda Dembre. On pgprw-locally closed sets in topological spaces. Pgprw-locally closed sets in topological spaces. International Journal of Mathematical Archive. 2016; 7(3):119-123.