South East Asian J. Math. & Math. Sc.
Vol.6 No.1(2007), pp.85–88

ON THE EXISTENCE OF PARTITIONS OF UNITY FOR PROXIMITY SPACES

Sangita Srivastava

Department of Mathematics
Harish Chandra P.G. College, Varanasi, U.P., India

(*Received: February 02, 2006*)

Abstract: In the present paper it has been shown that if (X, δ) is a separated proximity space with a finite open covering u, then there exists a partition of unity dominated by u.

Keywords and Phrases: Proximity spacs, finite covering, partition of unity, Urysohn lemma, shrinking lemma
2000 AMS Subject Classification: 54A05, 54E05

1. Introduction and Preliminaries

As proximity is a structural layer distinct from and between topological structure and uniform structure, all proximity invariants are topological invariants, but some uniform invariants are not proximity invariants.

Proximity structure on a non-empty set X are defined in two ways. We can either specify when two sets are "close to one other" $(A\delta B)$ or when a set B is a proximal (also called uniform) neighbourhood of A $(B >> A)$. These two concepts are related by $A \not\delta B$ if and only if $A << X - B$.

In this paper preliminaries regarding proximity spaces and topological spaces can be found into [3,4,6]. However, few definitions and results that we need, are presented here for ready references.

Throughout the work, by a proximity space (X, δ) we shall mean a separated proximity space.

Let (X, δ) be a proximity space, For subsets A and B of X, we have

$$A << B \Rightarrow \ A << B^i, \ \ (B^i - \text{interior of } B)$$

and $A << B \Rightarrow \bar{A} << B$, ($\bar{A}-$closure of A).

Lemma 1.1[5] (Proximal Urysohn lemma). Let (X, δ) be a proximity space. Let A, B be subsets of X such that $A \not\delta B$, then there exists a bounded proximally continuous map f such that $f(A) = \{0\}$ and $f(B) = \{1\}$.