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LG-FUZZY PARTITION OF UNITY

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Abstract: In this paper, we define LG^c-fuzzy Euclidean topological space with countable basis, which L denotes a complete distributive lattice and we show that each LG^c-fuzzy open covering of this space can be refined to an LG^c-fuzzy open covering that is locally finite. We introduce C^∞ LG-fuzzy manifold $(X,\ \mathfrak{T}^c)$, with countable basis of LG-fuzzy open sets which X is an L-fuzzy subset of a crisp set M and $\mathfrak{T} : L_X^M \to L$, is an L-gradation of openness on X. We prove that for any LG-fuzzy topological manifold $(X, \mathfrak{T})$, there exists an LG-fuzzy exhaustion. We prove LG-Urysohn lemma and also existence of LG-partitions of unity on every LG-fuzzy topological manifold.

Keywords and Phrases: C^∞ LG^c-fuzzy topological manifold; LG-fuzzy exhaustion; LG-partitions of unity.

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1. Introduction and Definitions

In 1968 Chang [2] has introduced the concept of the fuzzy topological space and later many authors like Katsaras [15], Shostak [31], Chattopadhyay et. al. [3] and Gregori et. al. [10] have presented various kinds of definitions of fuzzy topological spaces. The approach in our manuscript [25] was different from what they have constructed here, since we have answered two questions: What will these structures look like if we assume that the fuzzy topological space X is itself an L-fuzzy subset of a crisp set in Goguen's sense [9], where L denotes a complete distributive lattice