J. of Ramanujan Society of Mathematics and Mathematical Sciences
Vol. 13, No. 1 (2025), pp. 113-122

DOI: 10.56827/JRSMMS.2025.1301.7 **ISSN (Online): 2582-5461**

ISSN (Print): 2319-1023

FUZZY β-CONNECTEDNESS IN THE FUZZY TOPOLOGICAL SPACES

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(**Received:** *Sep. 07, 2025* **Accepted:** *Dec. 13, 2025* **Published:** *Dec. 30, 2025)*

Abstract: This paper investigates the concept of fuzzy β-connectedness in fuzzy topological spaces by introducing fuzzy β-separated sets and related constructs. We define fuzzy β-disconnected spaces and fuzzy β-connected spaces using fuzzy β-open sets. Several theorems are established to characterize the behavior and properties of these notions. We also examine the preservation of fuzzy β-connectedness under M-fuzzy β-continuous and fuzzy β-open mappings. Illustrative examples are provided to demonstrate the theoretical developments and their implications in the broader context of fuzzy topological spaces.

Keywords and Phrases: Fuzzy topological spaces, fuzzy β-open sets, fuzzy β-separated sets, fuzzy β-disconnected sets, fuzzy β-disconnected spaces.

2020 Mathematics Subject Classification: 54A40, 54D05, 03E72, 06D72.

1. Introduction

There are approaches such as fuzzy sets [13], intuitionistic fuzzy sets [3], vague sets [8], and rough sets [12] which can be treated as mathematical tools to avert obstacles dealing with ambiguous data. The theory of fuzzy topological spaces was introduced and developed by Chang [6] and since then various notions in classical topology have been extended to fuzzy topological spaces. The concept of fuzzy β-open sets was introduced by Monseb [1] and studied also by Allam and Hakkim [2]. Among these developments, the concept of fuzzy connectedness has