

SOME PROPERTIES OF T -FUZZY GENERALIZED SUBGROUPS

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ABSTRACT. In this paper, we deal with Molaei's generalized groups. We define the notion of a fuzzy generalized subgroup with respect to a t -norm (or T -fuzzy generalized subgroup) and give some related properties. Especially, we state and prove the Representation Theorem for these fuzzy generalized subgroups. Next, using the concept of continuity of t -norms we obtain a correspondence between $TF(G)$, the set of all T -fuzzy generalized subgroups of a generalized group G , and the set of all T -fuzzy generalized subgroups of the corresponding quotient generalized group. Subsequently, we study the quotient structure of T -fuzzy generalized subgroups: we define the notion of a T -fuzzy normal generalized subgroup, give some related properties, construct the quotient generalized group, state and prove the homomorphism theorem. Finally, we study the lattice of T -fuzzy generalized subgroups and prove that $TF(G)$ is a Heyting algebra.

1. Introduction

There has been an old problem in mathematical physics: How can one change a Lorentzian Metric to a Rimanian one? In the process of solving this problem many unified theories such as Isotheory have been presented. The theory is based on a method that creates new fields which are called isofields. The notion of a generalized groups introduced by M. R. Molaei, when extending this theory to any manifold, i.e, isomanifold in [10]. This structure was studied more closely by Molaei and others. He studied quotient structure and homomorphism theorems on a generalized group, and also considered them from topological view point. In [6], R. A. Borzooei et al. characterized generalized groups with the order less than 4 and gave some interesting results.

On the other hand, the notion of fuzzy sets has been an interesting subject for mathematicians who have worked on group theory [16] and [17]. In [16], Rosenfeld defined the notion of a fuzzy subgroup. Many authors have worked on fuzzy group theory [11], [12] and [17]. Especially, some authors considered the fuzzy subgroups with respect to a t -norm and gave some results [2], [17] and [13]. In this paper we are interested in studying generalized groups from fuzzy theory point of view with a t -norm.

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