

## SOME ANALOGUES OF TOPOLOGICAL GROUPS

MADHU RAM

*Department of Mathematics  
University of Jammu  
Jammu and Kashmir, India*

**e-mail:** madhuram0502@gmail.com

### Abstract

Let  $(G, *)$  be a group and  $\tau$  be a topology on  $G$ . Let  $\tau^\alpha = \{A \subseteq G : A \subseteq \text{Int}(\text{Cl}(\text{Int}(A)))\}$ ,  $g * \tau = \{g * A : A \in \tau\}$  for  $g \in G$ . In this paper, we establish two relations between  $G$  and  $\tau$  under which it follows that  $g * \tau \subseteq \tau^\alpha$  and  $g * \tau^\alpha \subseteq \tau^\alpha$ , designate them by  $\alpha$ -topological groups and  $\alpha$ -irresolute topological groups, respectively. We indicate that under what conditions an  $\alpha$ -topological group is topological group. This paper also covers some general properties and characterizations of  $\alpha$ -topological groups and  $\alpha$ -irresolute topological groups. In particular, we prove that (1) the product of two  $\alpha$ -topological groups is  $\alpha$ -topological group, (2) if  $H$  is a subgroup of an  $\alpha$ -irresolute topological group, then  $\alpha\text{Int}(H)$  is also subgroup, and (3) if  $A$  is an  $\alpha$ -open subset of an  $\alpha$ -irresolute topological group, then  $\langle A \rangle$  is also  $\alpha$ -open. In the mid of discourse, we also mention about their relationships with some existing spaces.

**Keywords:**  $\alpha$ -open sets,  $\alpha$ -closed sets,  $\alpha$ -topological groups,  $\alpha$ -irresolute topological group.

**2010 Mathematics Subject Classification:** 22A05, 54C08, 54H99.

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doi:10.2991/978-94-6239-024-9\_20

Received 25 March 2020

Revised 12 May 2020

Accepted 21 December 2020