

BOUNDEDNESS, CONTINUITY AND BOUNDED HOMOMORPHISMS IN TOPOLOGICAL GROUPS

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Abstract. In this study, we define a new boundedness concept for topological groups which is compatible with bounded set definition in topological vector spaces. Therefore we extend some definitions and theorems concerned with boundedness in topological vector spaces to topological groups by using this new (boundedness) concept. Further, we prove some new theorems and propositions in topological groups.

1. Introduction

There exists considerable literature of boundedness concept in the topological groups, topological vector spaces and uniform spaces. This concept has been investigated intensively for three decades and has been used on the uniform topological spaces by C. J. Atkin in [1]. Since topological groups are private and convenient class of uniform topological spaces, we can use this definition for topological groups. The other boundedness definitions in topological groups have been presented by Bruguera and Tkachenko, Hejzman [3], [4]. Furthermore Bonales, Hernandez, Kaplan, Smith and Trigos-Arrieta have studied as connected with Pontryagin duality in topological groups [2], [5], [6], [7], [8], [9], [11], [12].

The question is that inspire to us "Can the boundedness concept in topological vector spaces be used to the topological groups as more general?". Thus, our principal goal is to define a new boundedness concept and then to mention some new results on topological groups. Furthermore we give the definition of absorbing set with introducing the set inflation in groups in this paper. The definition is also the generalization of current available boundedness definition in topological vector spaces to topological groups because every topological vector spaces have an additive topological group structure. Therefore we present a kind of boundedness definition in topological groups. The new boundedness definition is not a generalization of existing ones for topological groups. We also examined the order relation between

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