Journal of Lie Theory 31 (2021) 233–236

K. Ben Rejeb
Higher Institute of Computer Science and Communication Technologies, University of Sousse, Hammam Sousse, Tunisia
khadija.benrejeb@isitc.u-sousse.tn

On Compact Abelian Lie Groups of Homeomorphisms of $\mathbb{R}^m$

Let G be a compact Lie group of homeomorphisms of $\mathbb{R}^m$. The Naive conjecture saying that G is conjugate to a subgroup of the orthogonal group $O(m)$ is known to be false for higher dimension. In this paper we give a partial answer by considering the action of the group $S = S(K_1)\times...\times S(K_q)$ on $\mathbb{R}^m = K_1\oplus...\oplus K_q$, where $K_i = \mathbb{R}$ or $\mathbb{C}$ and $S(K_i) = \{x \in K_i : |x| = 1\}$ for $1 \leq i \leq q$, and we show that G is contained in S if and only if every element of G centralizes S.

Keywords: Compact Lie group, homeomorphism of the Euclidean space $\mathbb{R}^m$, conjugate, orthogonal group.

MSC: 37B05, 57S05, 57S10, 54H20, 37B20.