An abelian topological group $G$ is said to be $w$-divisible if the equality between topological weights $w(G) = w(mG) \geq \omega$ holds for every $m \in \mathbb{N}_+$. This notion, introduced by the authors of the present paper in [Topology Appl. 155, No. 4, 252–272 (2008; Zbl 1149.22004)], provides useful insight into the fine structure of compact abelian groups, when studied through Pontryagin duality.

S. Macario and the reviewer [J. Pure Appl. Algebra 215, No. 4, 655–663 (2011; Zbl 1215.54015)] proved that every abelian group $G$ decomposes as $G = G_{\text{tor}} \oplus G_d$ where $G_{\text{tor}}$ is bounded torsion and $G_d$ is $w$-divisible. In the present paper, the authors provide an alternative proof of this fact and draw some consequences from it. Among the latter, the authors prove that for every abelian group $G$, $G^\#$, the same group equipped with its maximal precompact topology, can be decomposed as $G^\# = G^\#_{\text{tor}} \times G^\#_d$ where $G_{\text{tor}}$ is bounded torsion and $G^\#_d$ is $w$-divisible.

Reviewer: Jorge Galindo (Castellón)

MSC:
- 22A05 Structure of general topological groups
- 22C05 Compact groups
- 54H11 Topological groups (topological aspects)
- 20K45 Topological methods for abelian groups
- 54D30 Compactness

Keywords:
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