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Group topologies making every continuous homomorphic image to a compact group connected. (English) Zbl 07506883

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Summary: A topological group is minimally almost periodic (MinAP) if the only continuous homomorphism to any compact group is trivial. Dikranjan and Shakhmatov proved that if an abelian group can be equipped with a MinAP group topology, then for every $m \in \mathbb{N}$ the subgroup $mG$ of $G$ is either the trivial group or has infinite cardinality. In this paper we prove the following: if an abelian group $G$ can be equipped with a group topology making all of its continuous homomorphic images to a compact group connected, then it admits a MinAP group topology. This condition becomes sufficient as well, as every MinAP topological group only has trivial continuous homomorphic images in compact groups.

MSC:

54H11 Topological groups (topological aspects)
22Axx Topological and differentiable algebraic systems
18B30 Categories of topological spaces and continuous mappings (MSC2010)
54D05 Connected and locally connected spaces (general aspects)

Keywords:
minimally almost periodic group; maximally almost periodic group; von Neumann kernel; Bohr topology; Bohr compactification; connected group; pathwise connected group; continuous homomorphic image

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References:

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