Shou Lin, Mikhail Tkachenko

Connected LCA groups are sequentially connected

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Abstract: We prove that every connected locally compact Abelian topological group is sequentially connected, i.e., it cannot be the union of two proper disjoint sequentially closed subsets. This fact is then applied to the study of extensions of topological groups. We show, in particular, that if H is a connected locally compact Abelian subgroup of a Hausdorff topological group G and the quotient space G/H is sequentially connected, then so is G.

Keywords: locally compact, connected, sequentially connected, Pontryagin duality, torsion-free, divisible, metrizable element, extension of a group
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References

[1] Arhangel'skii A.V., Tkachenko M.G., *Topological Groups and Related Structures*, Atlantis Series in Mathematics, Vol. I, Atlantis Press and World Scientific, Paris–Amsterdam, 2008.
[2] Davis H.F., *A note on Haar measure*, Proc. Amer. Math. Soc. **6** (1955), 318–321.
[3] Engelking R., *General Topology*, Heldermann Verlag, Berlin, 1989.
[4] Fedeli A., Le Donne A., *On good connected preimages*, Topology Appl. **125** (2002), 489–496.
[5] Hewitt E., Ross K.A., *Abstract Harmonic Analysis, Volume I*, Springer, Berlin–Göttingen–Heidelberg, 1979.
[6] Huang Q., Lin S., *Notes on sequentially connected spaces*, Acta Math. Hungar. **110** (2006), 159–164.
[7] Ivanovskiĭ L.N., *On a hypothesis of P.S. Alexandrov*, Dokl. Akad. Nauk SSSR **123** (1958), 785–786 (in Russian).
[8] Kuz'minov V., *On a hypothesis of P.S. Alexandrov in the theory of topological groups*, Dokl. Akad. Nauk SSSR **125** (1959), 727–729 (in Russian).
[9] Lin S., *The images of connected metric spaces*, Chinese Ann. Math. A **26** (2005), 345–350.
[10] Lin S., Lin F.C., Xie L.H., *The extensions of topological groups about convergence phenomena*, preprint.
[11] Pontryagin L.S., *Continuous Groups*, third edition, Nauka, Moscow, 1973.
[12] Robinson D.J.F., *A Course in the Theory of Groups*, Springer, Berlin, 1982.