Glöckner, Helge

Completeness of locally $k_\omega$-groups and related infinite-dimensional Lie groups. (English) Zbl 1375.22012


The main result of this paper asserts that a topological group is complete whenever the underlying topological space is locally $k_\omega$. The latter means that each point of the space has an open neighbourhood which is the direct limit of an ascending sequence of compact Hausdorff topological spaces. As a consequence of this result, it is shown that every infinite-dimensional Lie group modelled on a Silva space is complete.

Reviewer: Volodymyr Mazorchuk (Uppsala)

MSC:

22E65 Infinite-dimensional Lie groups and their Lie algebras: general properties
22A05 Structure of general topological groups
46A13 Spaces defined by inductive or projective limits (LB, LF, etc.)
46M40 Inductive and projective limits in functional analysis
58D05 Groups of diffeomorphisms and homeomorphisms as manifolds

Keywords:

infinite-dimensional Lie group; Silva space; (DFS)-space; hemicompact space; compactly generated space; direct limit; completeness

Full Text: DOI arXiv

References:

[12] Glöckner, H., Completeness of infinite-dimensional Lie groups in their left uniformity, preprint · Zbl 1409.22016