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Metrizable and weakly metrizable coset spaces. (English) Zbl 07318671
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Summary: In this paper, we study metrizable and weakly metrizable coset spaces. It is mainly shown that (1) If \( H \) is a closed neutral subgroup of a topological group \( G \), then \( G/H \) is metrizable ⇔ \( G/H \) is bisequential ⇔ \( G/H \) is weakly first-countable ⇔ \( G/H \) is a Fréchet-Urysohn space with countable \( \omega \)-base; (2) If \( H \) is a closed neutral subgroup of a semitopological group \( G \), then \( G/H \) is metrizable if and only if \( G/H \) is a paracompact feathered space with countable \( \pi \)-character; (3) If \( H \) is a closed neutral subgroup of a paratopological group \( G \) such that \( G/H \) is a Hausdorff space, then \( G/H \) is quasi-metrizable if and only if \( G/H \) is first-countable; (4) If \( H \) is a closed neutral subgroup of a quasitopological group \( G \), then \( G/H \) is semi-metrizable if and only if \( G/H \) is first-countable.

MSC:

22A05 Structure of general topological groups
54A25 Cardinality properties (cardinal functions and inequalities, discrete subsets)
54E25 Semimetric spaces
54G20 Counterexamples in general topology
54H11 Topological groups (topological aspects)

Keywords:
topological group; semitopological group; paratopological group; quasitopological group; coset space; neutral subgroup; metrizable space; quasi-metrizable space; semi-metrizable space

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References:


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