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A construction of a Fréchet-Urysohn space, and some convergence concepts

Abstract: Some strong versions of the Fréchet-Urysohn property are introduced and studied. We also strengthen the concept of countable tightness and generalize the notions of first-countability and countable base. A construction of a topological space is described which results, in particular, in a Tychonoff countable Fréchet-Urysohn space which is not first-countable at any point. It is shown that this space can be represented as the image of a countable metrizable space under a continuous pseudoopen mapping. On the other hand, if a topological group G is an image of a separable metrizable space under a pseudoopen continuous mapping, then G is metrizable (Theorem **??**). Several other applications of the techniques developed below to the study of pseudoopen mappings and intersections of topologies are given (see Theorem **??**).

References

[1] Arhangel'skii A.V., *Structure and classification of topological spaces and cardinal invariants*, Russian Math. Surveys **33** (1978), 33–96.

[2] Arhangel'skii A.V., *Hurewicz spaces, analytic sets, and fan-tightness of function spaces*, Dokl. Akad. Nauk SSSR **287**:3 (1986), 525–528; English translation: Soviet Math. Dokl. **33**:2 (1986), 396–399.

[3] Arhangel'skii A.V., Bella A., *Countable fan-tightness versus countable tightness*, Comment. Math. Univ. Carolin. **37**:3 (1996), 565–576.

[4] Arhangel'skii A.V. Ponomarev V.I., *Fundamentals of General Topology in Problems and Exercises*, Izdat. "Nauka", Moscow, 1974, 423 pp. (in Russian); English translation: ser. Mathematics and its Applications, D. Reidel Publishing Co., Dordrecht-Boston, Mass., 1984. xvi+415 pp.; Polish translation: Panstwowe Wydawnictwo Naukowe (PWN), Warsaw, 1986. 456 pp.

[5] Arhangel'skii A.V. Tkachenko M.G., *Topological Groups and Related Structures*, Atlantis Press, Amsterdam-Paris, 2008.

[6] Engelking R., *General Topology*, Sigma Series in Pure Mathematics, 6, Heldermann, Berlin, revised ed., 1989.

[7] Michael E.A., *A quintuple quotient quest*, General Topology Appl. **2** (1972), 91–138.

[8] Nyikos P.J., *Subsets of ω^ω and the Fréchet-Urysohn and α_i-properties*, Topology Appl. **48** (1992), 91–116.