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Universal meager F_σ -sets in locally compact manifolds

Comment.Math.Univ.Carolin. 54,2 (2013) 179–188.

Abstract: In each manifold M modeled on a finite or infinite dimensional cube $[0, 1]^n$, $n \leq \omega$, we construct a meager F_σ -subset $X \subset M$ which is universal meager in the sense that for each meager subset $A \subset M$ there is a homeomorphism $h : M \rightarrow M$ such that $h(A) \subset X$. We also prove that any two universal meager F_σ -sets in M are ambiently homeomorphic.

Keywords: universal nowhere dense subset, Sierpiński carpet, Menger cube, Hilbert cube manifold, n -manifold, tame ball, tame decomposition

AMS Subject Classification: 57N20, 57N45, 54F65

REFERENCES

- [1] Anderson R.D., *On sigma-compact subsets of infinite-dimensional manifolds*, unpublished manuscript.
- [2] Banakh T., Morayne M., Rałowski R., Żeberski S., *Topologically invariant σ -ideals on the Hilbert cube*, preprint (<http://arxiv.org/abs/1302.5658>).
- [3] Banakh T., Repovš D., *Universal nowhere dense subsets of locally compact manifolds*, preprint (<http://arxiv.org/abs/1302.5651>).
- [4] Bessaga C., Pelczyński A., *Selected topics in infinite-dimensional topology*, PWN, Warsaw, 1975.
- [5] Cannon J.W., *A positional characterization of the $(n - 1)$ -dimensional Sierpinski curve in S^n ($n \neq 4$)*, Fund. Math. **79** (1973), no. 2, 107–112.
- [6] Chapman T.A., *Dense sigma-compact subsets of infinite-dimensional manifolds*, Trans. Amer. Math. Soc. **154** (1971), 399–426.
- [7] Chapman T.A., *Lectures on Hilbert Cube Manifolds*, American Mathematical Society, Providence, R.I., 1976.
- [8] Chigogidze A., *Inverse Spectra*, North-Holland Publishing Co., Amsterdam, 1996.
- [9] Engelking R., *General Topology*, Heldermann Verlag, Berlin, 1989.
- [10] Engelking R., *Theory of dimensions finite and infinite*, Heldermann Verlag, Lemgo, 1995.
- [11] Geoghegan R., Summerhill R., *Infinite-dimensional methods in finite-dimensional geometric topology*, Bull. Amer. Math. Soc. **78** (1972), 1009–1014.
- [12] Geoghegan R., Summerhill R., *Pseudo-boundaries and pseudo-interiors in Euclidean spaces and topological manifolds*, Trans. Amer. Math. Soc. **194** (1974), 141–165.
- [13] Menger K., *Allgemeine Raume und Cartesische Raume Zweite Mitteilung: "Über umfassendste n -dimensional Mengen"*, Proc. Akad. Amsterdam **29** (1926), 1125–1128.
- [14] Sierpiński W., *Sur une courbe cantorienne qui contient une image biunivoque et continue de toute courbe donnée*, C.R. Acad. Sci., Paris, **162** (1916), 629–632.
- [15] Štanko M.A., *The embedding of compact into Euclidean space*, Math USSR Sbornik **12** (1970), 234–254.
- [16] West J., *The ambient homeomorphy of an incomplete subspace of infinite-dimensional Hilbert spaces*, Pacific J. Math. **34** (1970), 257–267.
- [17] Whyburn G., *Topological characterization of the Sierpinski curve*, Fund. Math. **45** (1958), 320–324.