

## Liang-Xue Peng

### *On weakly monotonically monolithic spaces*

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**Abstract:** In this note, we introduce the concept of weakly monotonically monolithic spaces, and show that every weakly monotonically monolithic space is a  $D$ -space. Thus most known conclusions on  $D$ -spaces can be obtained by this conclusion. As a corollary, we have that if a regular space  $X$  is sequential and has a point-countable  $wcs^*$ -network then  $X$  is a  $D$ -space.

**Keywords:**  $D$ -space, sequential space,  $wcs^*$ -network, weakly monotonically monolithic space

**AMS Subject Classification:** Primary 54F99; Secondary 54G99

#### REFERENCES

- [1] Arhangel'skii A.V., *D-spaces and finite unions*, Proc. Amer. Math. Soc. **132.7** (2004), 2163–2170.
- [2] Arhangel'skii A.V., Buzyakova R.Z., *Addition theorems and D-spaces*, Comment. Math. Univ. Carolin. **43.4** (2002), 653–663.
- [3] Borges C.R., Wehrly A.C., *A study of D-spaces*, Topology Proc. **16** (1991), 7–15.
- [4] Burke D.K., *Weak-base and D-space*, Comment. Math. Univ. Carolin. **48.2** (2007), 281–289.
- [5] Buzyakova R.Z., *Hereditary D-property of function spaces over compacta*, Proc. Amer. Math. Soc. **132.11** (2004), 3433–3439.
- [6] van Douwen E.K., Pfeffer W.F., *Some properties of the Sorgenfrey line and related spaces*, Pacific J. Math. **81.2** (1979), 371–377.
- [7] Engelking R., *General Topology*, Sigma Series in Pure Mathematics, 6, Heldermann, Berlin, revised ed., 1989.
- [8] Fleissner W.G., Stanley A.M., *D-spaces*, Topology Appl. **114.3** (2001), 261–271.
- [9] Gruenhage G., *A note on D-spaces*, Topology Appl. **153** (2006), 229–240.
- [10] Gruenhage G., *Generalized metric spaces*, in Handbook of Set-theoretic Topology, K. Kunen and J. Vaughan (Eds), North-Holland, Amsterdam, 1984, pp. 423–501.
- [11] Gruenhage G., Michael E., Tanaka Y., *Spaces determined by point-countable covers*, Pacific J. Math. **113.2** (1984), 303–332.
- [12] Lin S., *Point-countable Covers and Sequence-covering Mappings*, Chinese Science Press, Beijing, 2002.
- [13] Lin S., Liu C., *On spaces with point-countable  $cs^*$ -networks*, Topology Appl. **74** (1996), 51–60.
- [14] Lin S., Tanaka Y., *Point-countable  $k$ -network, closed maps and related results*, Topology Appl. **59** (1994), 79–86.
- [15] Peng L.-X., *The D-property of some Lindelöf spaces and related conclusions*, Topology Appl. **154** (2007), 469–475.
- [16] Peng L.-X., *A special point-countable family that makes a space to be a D-space*, Adv. Math. (China) **37.6** (2008), 724–728.
- [17] Peng L.-X., *A note on D-spaces and infinite unions*, Topology Appl. **154** (2007), 2223–2227.
- [18] Steen L.A., Seebach J.A., Jr., *Counterexamples in Topology*, second edition, Springer, New York-Heidelberg, 1978.
- [19] Tkachuk V.V., *Monolithic spaces and D-spaces revised*, Topology Appl. **156** (2009), 840–846.