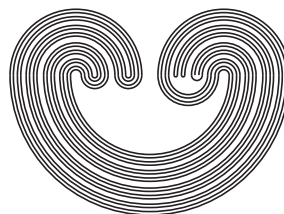


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## ON PARACOMPACT REMAINDERS

by

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## ON PARACOMPACT REMAINDERS

HEIKKI JUNNILA

**ABSTRACT.** We study Tihonov spaces  $X$  which are *paracompact at infinity* (i.e.,  $\beta X \setminus X$  is paracompact). We characterize paracompactness at infinity of a nowhere locally compact Tihonov space, and we give several examples relating to paracompactness at infinity. We also consider strong paracompactness at infinity. We construct a space which is strongly paracompact at infinity but which also has a non-strongly paracompact remainder. We use this space to solve a problem on “paracompactly placed” sets posed by V.I. Ponomarev in 1962.

### 1. INTRODUCTION AND NOTATION

A *space* in this paper means a Tihonov space.

The *remainder* of a space  $X$  in a compactification  $K$  of  $X$  is the subspace  $K \setminus X$  of  $K$ . We say that a space  $Z$  is a *remainder* of  $X$  provided that  $Z$  is the remainder of  $X$  in some compactification of  $X$ . The *Čech-Stone remainder* of  $X$  is the remainder of  $X$  in the Čech-Stone compactification  $\beta X$  of  $X$ ; this remainder of  $X$  is denoted by  $X^*$ .

According to terminology introduced by Henriksen and Isbell in [16], a space  $X$  has *property  $P$  at infinity* if  $X^*$  has property  $P$ . The paper [16] contains the following characterization of Lindelöfness at infinity:  $X$  is Lindelöf at infinity if, and only if, every compact set  $K \subset X$  is contained in a compact set  $C \subset X$  such that  $C$  has a countable outer neighborhood base in  $X$ . As a consequence, every metrizable space is Lindelöf at infinity.

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*Key words and phrases.* Remainder, paracompactness at infinity, strongly paracompact.

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