

# Toposym 4-B

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Wallman's method

In: Josef Novák (ed.): General topology and its relations to modern analysis and algebra IV, Proceedings of the fourth Prague topological symposium, 1976, Part B: Contributed Papers. Society of Czechoslovak Mathematicians and Physicist, Praha, 1977. pp. [412].

Persistent URL: <http://dml.cz/dmlcz/700649>

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# WALLMAN'S METHOD

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Let  $\underline{R}$  be a base-ring of closed sets of a  $T_0$ -space  $(X, \underline{X})$ .

Theorem Let  $\overline{X} = \underline{P}(X, \underline{R})$  be the primefilter space consisting of all  $\underline{R}$ -primefilters with the hull-kernel topology. Then  $\underline{P}(X, \underline{R})$  is determined uniquely (up to a  $X$ -isomorphism) by the following three properties:

I)  $\overline{X}$  is  $T_0$  and  $\{ \overline{R} \mid R \in \underline{R} \}$  is base of closed sets.

II) If  $R_1, R_2 \in \underline{R}$ , then  $\overline{R_1 \cap R_2} = \overline{R_1} \cap \overline{R_2}$ .

III)a) If  $\hat{X}$  is a  $T_0$ -extension fulfilling I) and II), then there is a  $X$ -embedding of  $\hat{X}$  in  $\overline{X}$ .

b) If  $\hat{X}$  is a  $T_0$ -extension fulfilling I) and II) and if there is a  $X$ -embedding of  $\overline{X}$  in  $\hat{X}$ , then this embedding is an isomorphism.

Theorem Let  $\langle X_\alpha, \prod_\beta^\alpha, A_{\underline{R}} \rangle$ ,  $\alpha, \beta \in A_{\underline{R}}$  be the inverse system of finite  $T_0$ -spaces constructed by  $\underline{R}$ . Then the inverse limit  $\lim \langle X_\alpha, \prod_\beta^\alpha, A_{\underline{R}} \rangle$  is  $X$ -isomorphic to the primefilterspace  $\underline{P}(X, \underline{R})$ .

Further details (concerning Wallman's construction) and some applications will appear in 'Quaestiones Mathematicae'.

- [1] J. Flachsmeier: Zur Spektralentwicklung topologischer Räume, Math. Ann. 144, 253 - 274 (1961).
- [2] J. Nagata: Modern General Topology, Amsterdam-London 1974 .