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# On metrization of hyperspaces

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# ON METRIZATION OF HYPERSPACES

By

Jürgen FLACHSMEYER

Let X be a Hausdorff topological space, H(X) the system of all non-void closed subsets of X and $H_*(X)$ the system of all closed subs of X.

In the paper: "Verschiedene Topologisierungen im Raum der abgeschlossenen Mengen". Math. Nachr. 26, (1964) the author gave some investigations on hyperspace topologies.Recently it has been remarke that there are connections to some early results of H. Busemann (Local metric geometry. TAMS 56, (1944)). The lecture explains these connections and is arranged as follows.

1 . Hausdorff's set convergence in $H_*(X)$ and some hyperspace topologies (a review to the topologies $\tau_T$ ; $\tau_1$; $\tau_c$; $\tau_v$ Vietori topology (= $\tau_T \vee \tau_1$), $\tau_c \vee \tau_1$ (topologizing Hausdorff's set convergence), based on the above mentioned author's paper).
   For locally compact spaces X holds: $H_*(X)$ is compact metrizabl with respect to $\tau_c \vee \tau_1$ iff X has a countable base.
   The treated question is about a "nice" hyperspace metric star with a suitable metric in X.
2. Hausdorff-metric and Busemann-metric in H(X).
3. Connections between Busemann-metric and the topology $\tau_c \vee \tau_1$
4. As an application of the preceding results with some result o the topological embedding of the hyperspace ($H_*(X)$, $\tau_c \vee \tau_1$) into ($H(\alpha X)$, $\tau_v$) ($\alpha X$ denotes the Alexandrov one-point compactification of a locally compact space X) we identify the space of all straight lines of the plane with the pointed projective plane (= Moebius strip without boundary).