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A CHARACTERIZATION OF ABSOLUTE NEIGHBORHOOD RETRACTS IN GENERAL SPACES

Dedicated to Professor Keiô Nagami on his 60th birthday

By

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Some characterizations of absolute neighborhood retracts were established in separable metric spaces by Hanner [4]. Hanner's characterizations were easily extended to the metric case. For this, see Hu [5] Chapter IV. In this paper, we shall extend one of Hanner's characterizations to more general spaces, especially, stratifiable spaces, spaces with a σ-almost locally finite base and paracomplexes. For the ANR theory of these spaces, we refer Cauty [2], Miwa [8] and Hyman [6], respectively.

Throughout this paper, all spaces are assumed to be paracompact normal spaces and all maps to be continuous. I and $\mathcal{S}$ denote the closed unit interval $[0, 1]$ and the class of all stratifiable spaces, respectively. $ANR(Q)$ (resp. $ANE(Q)$) is the abbreviation for absolute neighborhood retract (resp. extensor) for the class Q. For these definitions, see [5].

In this paper, all theorems are proved in the class $\mathcal{S}$. But these theorems can be proved in some other classes. For instance, see Remark 2.3.

1. Preliminaries.

DEFINITION 1.1 ([3]). A space Y is *equiconnected* if there is a map $F: Y\times Y\times I\rightarrow Y$ such that $F(x, y, 0)=x$, $F(x, y, 1)=y$ and $F(x, x, t)=x$ for all $(x, y)\in Y\times Y$ and $t\in I$. The space Y is said to be *locally equiconnected* if F is defined only on $U\times I$, for some neighborhood U of the diagonal of $Y\times Y$.

DEFINITION 1.2 ([4]). Let $f, g: Y\rightarrow X$ be two maps. If X is covered by $\mathcal{U}=\{U_\alpha\}$, f and g are called *$\mathcal{U}$-near* if for each $y\in Y$ there is a $U_\alpha\in\mathcal{U}$ such that $f(y)\in U_\alpha$, $g(y)\in U_\alpha$.

DEFINITION 1.3 ([4]). Let $h_t: Y\rightarrow X$ be a homotopy. If X is covered by $\mathcal{U}=\{U_\alpha\}$, h_t is called a *$\mathcal{U}$-homotopy* if for each $y\in Y$ there is a $U_\alpha\in\mathcal{U}$ such that $h_t(y)\in U_\alpha$ for all $t\in I$.

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