TOPOLOGICAL CLASSIFICATION OF INFINITE DIMENSIONAL MANIFOLDS BY HOMOTOPY TYPE[1]

BY DAVID W. HENDERSON[2] AND R. SCHORI

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1. **Introduction.** In this paper we prove that if M and N are connected paracompact manifolds modeled on a normed TVS, F, such that F is homeomorphic ($\cong$) to F^ω (countably infinite product of F),[3] then M and N are homeomorphic if and only if they have the same homotopy type. We also prove that if M and N are connected paracompact manifolds modeled on a metrizable locally-convex (MLC) TVS, $F \cong F^\omega$, then each map $f: M \to N$ can be approximated by a closed embedding $g: M \to N$ and an open embedding $h: M \to N$ such that $f \sim g \sim h$ (homotopic). These and other results will be proved on the basis of results in recent, not yet published, papers written separately by the authors. See [5], [6], and [7]. These results already have been proved for separable Fréchet spaces by several authors, see [4] for references.

2. **Theorems to quote.** By manifold we will always mean a paracompact manifold. By TVS we mean a Hausdorff topological vector space.

S1. THEOREM [7]. *If M is a manifold modeled on a metrizable* TVS, $F \cong F^\omega$, *then* $M \times F \cong M$.

Let X and Y be spaces, $\mathcal{U}$ be an open cover of Y, and $f, g: X \to Y$. Then f and g are said to be $\mathcal{U}$-approximate if for each $x \in X$ there is a

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[2] Alfred P. Sloan Fellow.

[3] *Added in proof.* This condition is satisfied by all infinite-dimensional Hilbert spaces, reflexive Banach spaces, and separable Fréchet spaces and is not known to be false for any Fréchet space. (See Bessaga and Kadec, *On topological classification of* (to appear).)