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A Corrigendum to the paper ‘Connecting direct limit topologies with metrics on infinite-dimensional manifolds’

(Compositio Math. 81 (1992), 237–245)

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The Main Theorem is not correct because Lemma 2 is false. However, adding the following assumption to the Main Theorem and the condition (*) in Section 1, Main Theorem and Corollaries 2–5 and 7 are valid:

$\text{id}: (M_i, \tau_2^i) \rightarrow (M_i, \tau_1^i)$ is a fine homotopy equivalence.

The proof of Main Theorem (with Lemma 3) is valid without any changes. Corollary 1 is true since it can be proved that every $(\mathbb{R}^\infty, \sigma)$ -manifold (or every (Q^∞, Σ) -manifold) satisfies the condition above. Corollary 6 is now nonsense. The Proposition should be changed as follows:

PROPOSITION. *Let $M = (M, \tau)$ be an \mathbb{R}^∞ -manifold (or a Q^∞ -manifold), d a continuous metric on M and τ_d the topology generated by d . Then (M, τ, τ_d) is an $(\mathbb{R}^\infty, \sigma)$ -manifold (or a (Q^∞, Σ) -manifold) if and only if $\text{id}: (M, \tau) \rightarrow (M, \tau_d)$ is a fine homotopy equivalence and each compact set in (M, τ_d) is a strong Z -set.*

For details, refer to [BS].

The author would like to express his sincere thanks to Banach for showing a counterexample to him.

Reference

[BS] Banach, T. and Sakai, K.: Characterizations of $(\mathbb{R}^\infty, \sigma)$ - or (Q^∞, Σ) -manifolds and their applications. Preprint.