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ORDER-BOUNDED CONVERGENCE STRUCTURES ON SPACES OF CONTINUOUS FUNCTIONS: CORRIGENDUM

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I am greatly in debt to K. Kutzler of Berlin and H.-P. Butzmann of Mannheim for pointing out some errors in the paper named above, Schroder (1979), and to the latter for providing the relevant examples.

First error. This was a wholly unnecessary remark that the topologies t_a used to define mod-fine convergence were normed. Since trivially, the kernel of the modulus lies inside each ball B_a, and less trivially, the modulus need not be Archimedean, neither t_a nor q_m need be Hausdorff. This has no effect on the rest of the paper.

Second error. Under the given definition, mod-convexity does not imply convexity, for a union of balls is mod-convex but need not be convex. This can only affect results 1.1 and 1.2: the latter is true as stated, but the former is not. A correct version of 1.1 follows, in which (E, m) can be any mod-space whatsoever.

1.1 *Let q be a homogeneous structure on E. Then mq is the finest mod-convex homogeneous structure on E coarser than q, and the modulus m is mq-continuous.*

The original 1.1 claimed as well that if q was a vector structure, then so was mq. This is 'almost always' false, though something can be saved if (E, m) has the decomposition property: in this case, the locally convex modification of mq is a locally convex and mod-convex vector structure.

Third error. In 5.1 as stated, condition (iii) is independent of the other three, which are indeed equivalent. In addition, a slight linguistic alteration is desirable: given a sub-space A of a topological space B, one should say that Count$(A : B)$ holds if the neighbourhood filter of A in B is closed under countable intersections. A correct version of 5.1 now reads as follows.

5.1 Theorem. *Let X be a completely regular Hausdorff topological space. Then the statements below are equivalent:*

(i) *the set of all w-covers of X is weakly countably directed,*

(ii) Count($X : X^*$) *holds,*

(iii) *the set of all covers of X is weakly countably directed, and*

(iv) *in the Stone outgrowth $X^* \setminus X$, the union of any sequence of compact sets has compact closure.*

Fourth error. In the paragraph preceding 5.2, I defined compact filters to be those to which some compact set belongs. Implicitly, this defines non-compact filters. But in the sketch proof of 5.2, I clearly used another property, equivalent for ultrafilters but stronger in general: call a filter *anti-compact* if the complement of each compact set belongs to it. Now let Ξ be the set of all non-compact convergent ultrafilters, as before, but make Λ the set of all anti-compact convergent filters. Even with this redefinition, 5.2 is false.

These errors in 5.1 and 5.2 affect only 5.3, in which the 'Count($X_{n1} : X$)' should be replaced by 'Count($X : X^*$)'.

References

M. Schroder (1979), 'Order-bounded convergence structures on spaces of continuous functions', *J. Austral. Math. Soc. Ser. A* **28**, 39–61.

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