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On complete spaces and regular topological spaces. (English summary)

The paper introduces the concept of $I$-thick sequence (net and filter), which allows the author to study completeness properties in regular topological spaces. He proves, for example, a generalization of Baire’s category theorem and the existence and uniqueness of the $I$-completion.

Unfortunately, the definition of $I$-thick sequence (which is the key concept of the paper) is not completely clear, since it seems that it only depends on an index set $I$, but it actually depends on a family of neighborhood bases of each point, and this family is not stated precisely in the results of the paper.

On the other hand, the author proves the equivalence between completeness and Cauchy nets in uniform spaces and $I$-completeness and $I$-thick nets. The same result is true for quasi-uniform spaces and convergence completeness. But Theorem 2, which states the existence and uniqueness of an $(I-J)$-uniformly continuous extension of $(I-J)$-uniformly continuous mappings into $J$-complete regular topological spaces, and the remark in Definition 6 which states the uniqueness of the $I$-completion, are not correct, since it would imply the uniqueness of convergence completion in quasi-uniform spaces, which is known to be false.

Furthermore, Theorem 3 states the existence of the $I$-completion for regular topological spaces, which would imply the existence of convergence completion for those spaces, which is known to be false.

Reviewed by M. A. Sanchez-Granero

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