

Jaroslav Fuka, Petr Holický
On a weak form of uniform convergence

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Abstract: The notion of Δ -convergence of a sequence of functions is stronger than pointwise convergence and weaker than uniform convergence. It is inspired by the investigation of ill-posed problems done by A.N. Tichonov. We answer a question posed by M. Katětov around 1970 by showing that the only analytic metric spaces X for which pointwise convergence of a sequence of continuous real valued functions to a (continuous) limit function on X implies Δ -convergence are σ -compact spaces. We show that the assumption of analyticity cannot be omitted.

Keywords: continuous functions on metric spaces, pointwise convergence, Δ -convergence, analytic spaces, Hurewicz theorem, K_σ -spaces

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