The $B$-completion for families of quasi-pseudometrics

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In [1] we introduced a conjugate invariant method for completing an arbitrary $T_0$-quasi-metric space. Our so-called $B$-completion was built as an extension of the bicompletion of the original space and for balanced $T_0$-quasi-metric spaces our $B$-completion yielded up to isometry the completion due to Doitchinov. The question of which uniformly continuous maps between $T_0$-quasi-metric spaces can be extended to the constructed $B$-completions led us to introduce and investigate a new class of maps that we called balanced maps. In [2] we proved that the $B$-completion of a totally bounded $T_0$-quasi-metric space is totally bounded. Furthermore we noted that even for totally bounded $T_0$-quasi-metric spaces the $B$-completion can be strictly larger than the bicompletion.

In this talk we shall extend the theory of the $B$-completion to arbitrary non-empty $T_0$-families $\mathcal{D}$ of quasi-pseudometrics [3] on a given set $X$. In this way we obtain a completion theory that can be applied to the study of $T_0$-quasi-uniform spaces. We point out however that even for singleton families $\mathcal{D}$ the $B$-completion depends on the quasi-pseudometric that was chosen to generate the underlying quasi-uniformity. Different quasi-pseudometrics may lead to different $B$-completions.

REFERENCES


*Joint work with Charly Makitu Kivuvu.