Bolzano-Weierstraß Properties in Ordered Fields of Uncountable Base Number

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The $\kappa$-reals, introduced by Galeotti [2] are the natural generalisation of the reals to an uncountable cardinal $\kappa$. Carl, Galeotti, and Löwe [1] studied the Bolzano-Weierstraß theorem for the $\kappa$-reals and proved that they do not satisfy the (regular) $\kappa$-Bolzano-Weierstraß theorem and they characterise the validity of the weak $\kappa$-Bolzano-Weierstraß theorem for strongly inaccessible $\kappa$.

We improve on the results by Carl, Galeotti, and Löwe by giving a sharpened analysis on when the (regular) $\kappa$-Bolzano-Weierstraß theorem fails for non-Archimedean fields and improving their analysis of the weak $\kappa$-Bolzano-Weierstraß theorem to arbitrary uncountable cardinals $\kappa$.

References
