Unbounded p-convergence in Lattice-Normed Vector Lattices

Abstract

A net x_α in a lattice-normed vector lattice (X, p, E) is unbounded p-convergent to $x \in X$ if $p(|x_\alpha - x| \wedge u) \xrightarrow{o} 0$ for every $u \in X_+$. This convergence has been investigated recently for $(X, p, E) = (X, |\cdot|, X)$ under the name of uo-convergence, for $(X, p, E) = (X, \|\cdot\|, \mathbb{R})$ under the name of un-convergence, and also for $(X, p, \mathbb{R}^{X^*})$, where $p(x)[f] := |f|(|x|)$, under the name uaw-convergence. We study general properties of the unbounded p-convergence.