Convergence measure spaces: An approach towards the duality theory of convergence groups

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The theory of integration on topological spaces is well developed but there are a lot of situations in analysis where non-topological convergence originate. Thus, it is natural to extend the theory of abstract integration from topological spaces to convergence spaces as this kind of approach provides the basic framework for analysis on convergence spaces which are not necessarily topological.

We introduce the term convergence measure space whose underlying idea is to define the σ-algebra compatible with the convergence structure using the modification of the convergence space. Further, we present some facts about the measures on general convergence spaces obtained during the investigation of the regular measures in the realm of convergence spaces.

Using this definition we make an attempt to extend the idea of the invariant measures from topological groups to the groups with limit related structures which are not necessarily topological and finally, we point out some general questions that arise with this kind of approach in the extension of the Pontryagin duality theory of topological Abelian groups to the class of convergence groups.

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