Karlstad Applied Analysis Seminar (2025)

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Many faces of Lebesgue spaces

Abstract

The Lebesgue space is arguably the simplest and most typical example of a function space. In spite of this, there still are new facts about these spaces to be investigated, as this talk is intended to illustrate. Namely, we will discuss a characterization of embeddings of sums and intersections of Lebesgue spaces with different measures, a new result recently obtained in the Master thesis of Pavel Berkman (Charles University in Prague). The solution to this particular problem makes use of various parts of the general theory of Banach function spaces, rearrangement-invariant spaces or Wiener–Luxemburg amalgams. We will also revisit these concepts, all of which may be viewed as generalizations capturing fundamental properties of Lebesgue spaces.