

IS FUNCTIONAL ANALYSIS A SPECIAL CASE OF TILTING THEORY?

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The objects of functional analysis together with the corresponding morphisms don't form abelian categories. Classical examples, e.g., the category of Banach spaces, satisfy almost all axioms of an abelian category but the canonical morphism $\text{cok } f \rightarrow \ker \text{cok } f$ in general fails to be an isomorphism.

In 2003, Bondal and van den Bergh showed that there is a correspondence between (co-)tilting torsion pairs and so-called quasiabelian categories. In 2013, this relation between categorical structures appearing in analysis and tilting theory was extended by Liu to even weaker notions than a quasiabelian category.

In the talk we discuss examples of categories appearing in functional analysis that carry a natural exact structure. The derived category is thus defined. We are interested in understanding the latter as this could be a step towards a successful categorification of certain analytic problems.

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