

18 Jun
16:10

Homological properties of the categories of complete and regular LB-spaces

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Let \mathbf{LB} denote the category of LB-spaces with linear and continuous maps as morphisms. The latter can be furnished with three natural classes of *short exact sequences*

$$X \xrightarrow{f} Y \xrightarrow{g} Z,$$

namely: The class \mathbb{E}_{top} of topologically exact sequences, the maximal exact structure \mathbb{E}_{max} consisting of those algebraically exact sequences in which $f(X) \subseteq Y$ is well-located, and the class \mathbb{C}_{all} of all algebraically exact sequences. It then holds $\mathbb{E}_{\text{top}} \subset \mathbb{E}_{\text{max}} \subset \mathbb{C}_{\text{all}}$ and all three notions of exactness yield different homological theories, see [1, Theorem 9.3].

In this talk, we will review the above and extend the investigation to the subcategories \mathbf{LB}_{reg} and \mathbf{LB}_{com} of regular, respectively, complete LB-spaces.

References

- [1] R. Henrard, S. Kvamme, A. C. Roosmalen, S. A. Wegner, The left heart and exact hull of an additive regular category, *Rev. Mat. Iberoam.* **39** (2023), 439–494.
