

# 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  $\mathbb{E}_{\text{top}}$  of topologically exact sequences, the maximal exact structure  $\mathbb{E}_{\text{max}}$  consisting of those algebraically exact sequences in which  $f(X) \subseteq Y$  is well-located, and the class  $\mathbb{C}_{\text{all}}$  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  $\mathbf{LB}_{\text{reg}}$  and  $\mathbf{LB}_{\text{com}}$  of regular, respectively, complete LB-spaces.

## References

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- [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.