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A class of exactness properties characterized via left Kan extensions. (English) Zbl 07389894
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Summary: We consider a general class of exactness properties on a finitely complete category, all of which can be expressed as the condition that a certain morphism in a diagram is a strong epimorphism. For each such exactness property, we characterize finitely bicomplete categories having the property by restricting the condition to those diagrams built from only one object in the category via a left Kan extension. In the regular context, this generalizes the theory of approximate co-operations introduced by D. Bourn and Z. Janelidze. As an application, we deduce from this a characterization of (essentially) algebraic categories satisfying such a given exactness property. The pointed version of these exactness properties is also studied.

MSC:

18E13 Protomodular categories, semi-abelian categories, Mal’tsev categories
18A40 Adjoint functors (universal constructions, reflective subcategories, Kan extensions, etc.)
18A30 Limits and colimits (products, sums, directed limits, pushouts, fiber products, equalizers, kernels, ends and coends, etc.)
08B05 Equational logic, Mal’tsev conditions
18C30 Sketches and generalizations
08A55 Partial algebras

Keywords:
exactness property; Kan extension; strong epimorphism; approximate operation; essentially algebraic category; Mal’tsev condition

Full Text: DOI

References:


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