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2-Dimensional non-pointed exactness structures and radicals in categories

This work is devoted to non-pointed versions of constructions and results of [3], which at the same time is a 2-dimensional continuation of the radical theory proposed in [2] and reported on the First Workshop on Categorical Methods in Non-Abelian Algebra in Coimbra last year. It is also related to the approach to radical theory developed in [4]. "2-Dimensional" refers to the simplicial structure involved, and 2-dimensional simplexes represent non-pointed short exact sequences in the sense of M. Grandis (see [1] and references there). In particular, using this 2-dimensional structure allows to improve the connection between radicals and closure operators established in [2].

References:

[1] M. Grandis, *Homological Algebra in Strongly Non-Abelian Settings*, World Scientific, Hackensack NJ, 2013.

[2] M. Grandis, G. Janelidze, and L. Márki, Non-pointed exactness, radicals, closure operators, *Journal of the Australian Mathematical Society* 94, 2013, 348-361.

[3] G. Janelidze and L. Márki, Kurosh-Amitsur radicals via a weakened Galois connection, *Communications in Algebra* 31, 1, 2003, 241-258.

[4] G. Janelidze and L. Márki, A simplicial approach to factorization systems and Kurosh-Amitsur radicals, *Journal of Pure and Applied Algebra* 213, 2009, 2229-2237.

*Joint work with M. Grandis and L. Márki.