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**Genrich Belitskii** and **Victoria Rayskin\*** ([victoria.rayskin@tufts.edu](mailto:victoria.rayskin@tufts.edu)). *Smooth localization of maps on non-smooth spaces. Applications and examples.*

The question of extension of locally defined maps to the entire space arises in many problems of analysis (e.g., local linearization of functional equations). A known classical method of extension of smooth local maps on Banach spaces uses smooth bump functions. However, such functions are absent in the majority of infinite-dimensional spaces. We suggest a new approach to localization of Banach spaces with the help of locally identical maps, which we call blid maps. In addition to smooth spaces, blid maps also allow to extend local maps on non-smooth spaces (e.g.,  $C^q[0, 1]$ ,  $q = 0, 1, 2, \dots$ ).

For the spaces possessing blid maps, we show how to reconstruct a map from its derivatives at a point (see the Borel Lemma). We also demonstrate how blid maps assist in finding global solutions of cohomological equations having linear transformation of the argument. We present application of blid maps to local differentiable linearization of maps on Banach spaces.

We discuss differentiable localization for metric spaces (e.g.,  $C^\infty(\mathbb{R})$ ), prove an extension result for locally defined maps and present examples of such extensions for the specific metric spaces.

In conclusion, we formulate open problems. (Received September 16, 2019)