Continuous BV mappings and their inverses

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This talk is devoted to the question of BV (or Sobolev) regularity of the inverse of a BV (or Sobolev) mapping. After a short review of the history we concentrate on most recent results. In [2], Stanislav Hencl, Rami Luisto and Aapo Kauranen have found sharp conditions for BV regularity of the inverse of a three-dimensional BV mapping. In the joint work [1] with Stanislav Hencl and Aapo Kauranen we establish the formula for the derivative of the inverse involving distributional adjugate of the gradient. The proofs are based on the degree formula for continuous planar BV mappings. This formula relates degree with the distributional Jacobian. The formula for the derivative of the inverse of a planar continuous BV mapping has been derived by Katarína Quittnerová in her unpublished master thesis (2007). In a joint work in progress with Luigi D'Onofrio, Carlo Sbordone and Roberta Schiattarella we prepare a stronger result on rectifiability of graph of such a mapping.

References

[1] S. Hencl, A. Kauranen and J. Malý: On distributional adjugate and derivative of the inverse, Preprint arXiv:1904.04574, 2019.

[2] S. Hencl, A. Kauranen and R. Luisto: Weak regularity of the inverse under minimal assumptions, Preprint arXiv:1804.03449, 2019.