On convergence of TV-regularized linear inverse problems

Gwenael Mercier[1]   José A. Iglesias[2]   Otmar Schezer[3]

In a recent paper by A. Chambolle et al. it was proven that if the subgradient of the total variation at the noise free data is not empty, the level-sets of the total variation denoised solutions converge to the level-sets of the noise free data with respect to the Hausdorff distance. The condition on the subgradient corresponds to the source condition introduced by Burger and Osher, who proved convergence rates results with respect to the Bregman distance under this condition. We generalize the result of Chambolle et al. to total variation regularization of general linear inverse problems with different boundary conditions under such a source condition.

References:

[1] http://iopscience.iop.org/article/10.1088/1361-6420/aab92a/pdf

[1]RICAM, Austrian Academy of Sciences, Linz, Austria
    gwenael.mercier@ricam.oeaw.ac.at

[2]RICAM, Austrian Academy of Sciences, Linz, Austria
    jose.iglesias@ricam.oeaw.ac.at

[3]Universität Wien, Vienna, Austria
    otmar.scherzer@univie.ac.at