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Thomas C. Wunderli* (twunderli@aus.edu), American University of Sharjah, P.O. Box 26666, Sharjah, United Arab Emirates. *Some Partial Regularity Results for Selective Smoothing Functionals in the Space of Bounded Variation.*

Here we examine two partial regularity results for minimizers of functionals used for image restoration in BV space. The first, originally introduced by Chambolle and Lions, is a combination of a Laplacian for the part of the image with small gradient and a total variation functional for the part with large gradient. We show that where the gradient is small, this functional smoothes the image u , in the sense that $u \in C^{1,\alpha}$ for some $0 < \alpha < 1$. This functional thus smoothes the image where the gradient is small and preserves edges via total variation where the gradient is large. For the second, partial regularity is proved for a functional where the Laplacian is replaced by a regularized p -Laplacian for $1 < p < 2$. (Received January 08, 2008)