

BACKGROUND READING FOR V5B5, SUMMER TERM 2018

FRANZ GMEINER

The following list gathers some background references that underly my course on V5B5. General introductory expositions about regularity theory are given in [0,6,8,10], with [7] displaying our main reference on measure theory; all other listed references are topic-specific research papers. The list shall be extended as the course evolves.

LITERATURE

- [0] Beck, L.: Elliptic Regularity – A first course. Lecture Notes of the Unione Matematica Italiana, Springer, 2016.
- [1] Beck, L.; Schmidt, T.: On the Dirichlet problem for variational integrals in BV, *J. Reine Angew. Math.* 674 (2013), pp. 113-194.
- [2] De Giorgi, E.: Un esempio di estremali discontinue per un problema variazionale di tipo ellittico. *Boll. Un. Mat. Ital.* (4) 1, 135–137 (1968)
- [3] Diening, L.; Lengeler, D.; Stroffolini, B.; Verde: Partial regularity of minimizers of quasiconvex functionals with general growth. *SIAM J. Math. Anal.*, Vol. 44, No. 5, pp. 3594–3616 (2012).
- [4] Duzaar, F.; Grotowski, J.-F.: Optimal interior partial regularity for nonlinear elliptic systems: the method of A-harmonic approximation, *Manuscr. Math.* 103 (2000), 267–298.
- [5] Evans, L.C.: Quasiconvexity and partial regularity in the calculus of variations. *Arch. Rational Mech. Anal.* 95 (1986), no. 3, 227–252.
- [6] Evans, L.C.: Partial differential equations. Second edition. Graduate Studies in Mathematics, 19. American Mathematical Society, Providence, RI, 2010.
- [7] Evans, L.C., Gariepy, R.F.: Measure Theory and Fine Properties of Functions. CRC, Boca Ration, 1992.
- [8] Giaquinta, M.: Multiple integrals in the calculus of variations and nonlinear elliptic systems. *Annals of Mathematics Studies*, 105. Princeton University Press, Princeton, NJ, 1983.
- [9] Gmeiner, F.; Kristensen, J.: Partial Regularity for BV-minimizers. To appear at *Arch. Ration. Mech. Anal.*
- [10] Giusti, E.: Direct methods in the calculus of variations. World Scientific Publishing Co., Inc., River Edge, NJ, 2003.
- [11] Kristensen, J.; Mingione, G.: The Singular Set of Lipschitzian Minima of Multiple Integrals. *Arch. Rational Mech. Anal.* 184 (2007) 341–369.
- [12] Kuusi, T.; Mingione, G.: Guide to nonlinear potential estimates. *Bull. Math. Sci.* (2014) 4:1–82.
- [13] Mingione, G.: Regularity of minima: an invitation to the dark side of the calculus of variations. *Appl. Math.* 51 (2006), no. 4, 355–426.
- [14] Mingione, G.: The singular set of solutions to non-differentiable elliptic systems. *Arch. Ration. Mech. Anal.* 166, 287–301 (2003)

Moreover, a valuable source for measure theory (and partly geometric measure theory) is given by

- [15] Krantz, S.; Parks, H.: Geometric Integration Theory. Birkhäuser, 2010.

A preprint of the last reference can be accessed here:

<https://www.math.wustl.edu/~sk/books/root.pdf>