Minimizing anisotropic total variation functionals depending on measures

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(joint work with Thomas Schmidt, Universität Hamburg)

Aim of the talk is to present an existence result to the anisotropic 1-Laplace problem

$$\mathrm{div}\big[\nabla_\xi \varphi(\,\cdot\,, \nabla u)\big] = \mu \quad \text{on } \Omega$$

with Dirichlet boundary datum $u_0 \in \mathrm{L}^1(\partial\Omega)$ and μ a signed, Radon measure on Ω. Our approach consists in proving the existence of BV-minimizers for the corresponding integral functional Φ_{u_0}. In doing so, we characterize the appropriate assumptions for the measure μ in order to obtain lower-semicontinuity of Φ_{u_0}, and discuss a refined LSC for the related parametric functional. Additionally, we prove the definition of Φ_{u_0} to be consistent with the original anisotropic problem in the Sobolev space $\mathrm{W}^{1,1}_{u_0}(\Omega)$ and provide some examples. Finally, further research directions will be sketched to include a broader class of functionals with linear growth.