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A DUALITY-BASED APPROACH TO GRADIENT FLOWS OF LINEAR GROWTH FUNCTIONALS

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Abstract: We study gradient flows of general functionals with linear growth with very weak assumptions. Classical results concerning characterisation of solutions require differentiability of the Lagrangian, as for the time-dependent minimal surface equation, or a special form of the Lagrangian as in the total variation flow. We propose to study this problem using duality techniques, give a general definition of solutions, and prove their existence and uniqueness. This approach also allows us to reduce the regularity and structure assumptions on the Lagrangian.

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Key words: linear growth functionals, total variation flow, bounded variation functions, nonparametric area functional, duality methods.