

## PUBLICATIONS of Giuseppe Buttazzo

- [1] G. BUTTAZZO: *Su una definizione generale dei  $\Gamma$ -limiti*. Boll. Un. Mat. Ital., **14-B** (1977), 722–744.
- [2] G. BUTTAZZO, M. TOSQUES:  *$\Gamma$ -convergenza per alcune classi di funzionali*. Ann. Univ. Ferrara, **23** (1977), 257–267.
- [3] G. BUTTAZZO, G. DAL MASO:  *$\Gamma$ -limit of a sequence of non-convex and non-equi-Lipschitz integral functionals*. Ricerche Mat., **27** (1978), 235–251.
- [4] G. BUTTAZZO:  *$\Gamma$ -limite di una successione di funzionali integrali non convessi e non equi-lipschitziani*. Proceedings of “XI Congresso dell’Unione Matematica Italiana”, Palermo 24–28 September 1979, 26–27.
- [5] G. BUTTAZZO, G. DAL MASO: *Integral representation on  $W^{1,\alpha}(\Omega)$  and  $BV(\Omega)$  of limits of variational integrals*. Atti Accad. Naz. Lincei Rend. Cl. Sci. Fis. Mat. Natur., **66** (1979), 338–343.
- [6] G. BUTTAZZO, G. DAL MASO:  *$\Gamma$ -limits of integral functionals*. J. Analyse Math., **37** (1980), 145–185.
- [7] E. DE GIORGI, G. BUTTAZZO: *Limiti generalizzati e loro applicazione alle equazioni differenziali*. Matematiche, **36** (1981), 53–64.
- [8] G. BUTTAZZO, D. PERCIVALE: *Sull’ approssimazione del problema del rimbalzo unidimensionale*. Ricerche Mat., **30** (1981), 217–231.
- [9] G. BUTTAZZO, D. PERCIVALE: *The bounce problem on  $n$ -dimensional Riemannian manifolds*. Atti Accad. Naz. Lincei Rend. Cl. Sci. Fis. Mat. Natur., **70** (1981), 246–250.
- [10] G. BUTTAZZO: *Il problema del rimbalzo su varietà riemanniane*. Proceedings of “Studio di Problemi-Limite in Analisi Funzionale”, Bressanone 7–9 September 1981, Pitagora Editrice, Bologna (1982), 209–212.
- [11] E. ACERBI, G. BUTTAZZO, N. FUSCO: *Semicontinuity in  $L^\infty$  for polyconvex integrals*. Atti Accad. Naz. Lincei Rend. Cl. Sci. Fis. Mat. Natur., **72** (1982), 25–28.
- [12] G. BUTTAZZO, G. DAL MASO:  *$\Gamma$ -convergence and optimal control problems*. J. Optim. Theory Appl., **38** (1982), 385–407.
- [13] G. BUTTAZZO: *Funzionali locali ed operatori tra  $L^p$  ed  $L^q$* . Proceedings of “XII Congresso dell’Unione Matematica Italiana”, Perugia 2–7 September 1983, 42.
- [14] E. ACERBI, G. BUTTAZZO, N. FUSCO: *Semicontinuity and relaxation for integrals depending on vector-valued functions*. J. Math. Pures Appl., **62** (1983), 371–387.
- [15] G. BUTTAZZO, G. DAL MASO:  *$\Gamma$ -convergence et problèmes de perturbation singulière*. C. R. Acad. Sci. Paris, Ser. I **296** (1983), 649–651.
- [16] G. BUTTAZZO, G. DAL MASO: *On Nemyckii operators and integral representation of local functionals*. Rend. Mat., **3** (1983), 491–509.
- [17] E. DE GIORGI, G. BUTTAZZO, G. DAL MASO: *On the lower semicontinuity of certain integral functionals*. Atti Accad. Naz. Lincei Rend. Cl. Sci. Fis. Mat. Natur., **74** (1983), 274–282.
- [18] G. BUTTAZZO, D. PERCIVALE: *On the approximation of the elastic bounce problem on Riemannian manifolds*. J. Differential Equations, **47** (1983), 227–245.
- [19] E. ACERBI, G. BUTTAZZO: *On the limits of periodic Riemannian metrics*. J. Analyse Math., **43** (1984), 183–201.
- [20] E. ACERBI, G. BUTTAZZO: *Semicontinuous envelopes of polyconvex integrals*. Proc. Roy. Soc. Edinburgh, **96-A** (1984), 51–54.
- [21] G. BUTTAZZO, G. DAL MASO: *Singular perturbation problems in the calculus of variations*. Ann. Scuola Norm. Sup. Pisa Cl. Sci., **11** (1984), 395–430.
- [22] G. BUTTAZZO, A. LEACI: *A continuity theorem for operators from  $W^{1,q}(\Omega)$  into  $L^r(\Omega)$* . J. Funct. Anal., **58** (1984), 216–224.
- [23] G. BUTTAZZO: *Problemi di semicontinuità e rilassamento in calcolo delle variazioni*. Proceedings of “Equazioni Differenziali e Calcolo delle Variazioni”, Pisa 14–16 February 1985, ETS Editrice, Pisa (1985), 23–36.

- [24] G. BUTTAZZO, G. DAL MASO: *A characterization of nonlinear functionals on Sobolev spaces which admit an integral representation with a Carathéodory integrand*. J. Math. Pures Appl., **64** (1985), 337–361.
- [25] G. BUTTAZZO, G. DAL MASO: *Integral representation and relaxation of local functionals*. Nonlinear Anal., **9** (1985), 512–532.
- [26] G. BUTTAZZO, A. LEACI: *Relaxation results for a class of variational integrals*. J. Funct. Anal., **61** (1985), 360–377.
- [27] G. BUTTAZZO: *Semicontinuity, relaxation, and integral representation problems in the calculus of variations*. Notes of a series of lectures held at CMAF of Lisbon in November–December 1985, printed by CMAF, Lisbon (1986).
- [28] E. ACERBI, G. BUTTAZZO: *Limit problems for plates surrounded by soft material*. Arch. Rational Mech. Anal., **92** (1986), 355–370.
- [29] E. ACERBI, G. BUTTAZZO: *Reinforcement problems in the calculus of variations*. Ann. Inst. H. Poincaré Anal. Non Linéaire, **3** (1986), 273–284.
- [30] G. ANZELLOTTI, G. BUTTAZZO, G. DAL MASO: *Dirichlet problems for demi-coercive functionals*. Nonlinear Anal., **10** (1986), 603–613.
- [31] G. BUTTAZZO: *Elliptic problems with a thin insulating layer around the boundary*. Proceedings of “Integral Functionals in Calculus of Variations”, Trieste 9–12 September 1985, Rend. Circ. Mat. Palermo, Suppl. **15** (1987), 143–153.
- [32] G. BUTTAZZO: *Homogenization for thin structures*. Proceedings of the XII Summer School “Application of Mathematics in Engineering”, Varna 31 August–7 September 1986, Sofia (1987), 30–33.
- [33] G. BUTTAZZO: *Some relaxation problems in optimal control theory*. J. Math. Anal. Appl., **125** (1987), 272–287.
- [34] G. BUTTAZZO: *Un teorema di esistenza per equazioni ellittiche quasilineari*. Proceedings of “XIII Congresso dell’Unione Matematica Italiana”, Torino 3–9 September 1987.
- [35] E. DE GIORGI, L. AMBROSIO, G. BUTTAZZO: *Integral representation and relaxation for functionals defined on measures*. Atti Accad. Naz. Lincei Rend. Cl. Sci. Fis. Mat. Natur., **81** (1987), 7–13.
- [36] H. ATTOUCH, G. BUTTAZZO: *Homogenization of reinforced periodic one-codimensional structures*. Ann. Scuola Norm. Sup. Pisa Cl. Sci., **14** (1987), 465–484.
- [37] G. BUTTAZZO, G. DAL MASO, U. MOSCO: *A derivation theorem for capacities with respect to a Radon measure*. J. Funct. Anal., **71** (1987), 263–278.
- [38] G. BUTTAZZO, R.V. KOHN: *Reinforcement by a thin layer with oscillating thickness*. Appl. Math. Optim., **16** (1987), 247–261.
- [39] G. BUTTAZZO: *An optimization problem for thin insulating layers around a conducting medium*. Proceedings of the IFIP Conference “Boundary Control and Boundary Variations”, Nice 10–13 June 1986, edited by J. P. Zolésio, Lecture Notes in Control Inform. **100**, Springer-Verlag, Berlin (1988), 91–95.
- [40] G. BUTTAZZO: *Relaxation problems in control theory*. Proceedings of “Calculus of Variations and Partial Differential Equations”, Trento 16–21 June 1986, edited by S. Hildebrandt, D. Kinderlehrer, M. Miranda, Lecture Notes in Math. **1340**, Springer-Verlag, Berlin (1988), 31–39.
- [41] G. BUTTAZZO: *Thin insulating layers: the optimization point of view*. Proceedings of “Material Instabilities in Continuum Mechanics and Related Mathematical Problems”, Edinburgh 1985–1986, edited by J. M. Ball, Oxford University Press, Oxford (1988), 11–19.
- [42] E. ACERBI, G. BUTTAZZO, D. PERCIVALE: *Thin inclusions in linear elasticity: a variational approach*. J. Reine Angew. Math., **386** (1988), 99–115.
- [43] L. AMBROSIO, G. BUTTAZZO: *Weak lower semicontinuous envelope of functionals defined on a space of measures*. Ann. Mat. Pura Appl., **150** (1988), 311–340.
- [44] L. AMBROSIO, G. BUTTAZZO, A. LEACI: *Continuous operators of the form  $Tf(u) = f(x, u, Du)$* . Boll. Un. Mat. Ital., **2-B** (1988), 99–108.
- [45] C. BAIocchi, G. BUTTAZZO, F. GASTALDI, F. TOMARELLI: *General existence results for unilateral problems in continuum mechanics*. Arch. Rational Mech. Anal., **100** (1988), 149–189.

- [46] L. BOCCARDO, G. BUTTAZZO: *Quasilinear elliptic equations with discontinuous coefficients*. Atti Accad. Naz. Lincei Rend. Cl. Sci. Fis. Mat. Natur., **82** (1988), 21–28.
- [47] G. BUTTAZZO: *Thin structures in elasticity: the variational method*. Rend. Sem. Mat. Fis. Milano, **59** (1989), 149–159.
- [48] L. AMBROSIO, O. ASCENZI, G. BUTTAZZO: *Lipschitz regularity for minimizers of integral functionals with highly discontinuous integrands*. J. Math. Anal. Appl., **142** (1989), 301–316.
- [49] D. AZÉ, G. BUTTAZZO: *Some remarks on the optimal design of periodically reinforced structures*. RAIRO Modél. Math. Anal. Numér., **23** (1989), 53–61.
- [50] G. BUTTAZZO, E. CAVAZZUTI: *Limit problems in optimal control theory*. Proceedings of “Colloque Franco-Québécois”, Perpignan 22–26 Juin 1987, in “Analyse Non Linéaire - Contribution en l’Honneur de J. J. Moreau”, Ann. Inst. H. Poincaré Anal. Non Linéaire, **6** Suppl. (1989), 151–160.
- [51] G. BUTTAZZO, G. DAL MASO, U. MOSCO: *Asymptotic behaviour for Dirichlet problems in domains bounded by thin layers*. In “Essays in Honor of Ennio De Giorgi”, Birkhäuser, Boston (1989), 193–249.
- [52] G. BOUCHITTÉ, G. BUTTAZZO: *New lower semicontinuity results for nonconvex functionals defined on measures*. Nonlinear Anal., **15** (1990), 679–692.
- [53] G. BUTTAZZO, G. DAL MASO: *Shape optimization for Dirichlet problems: relaxed solutions and optimality conditions*. Bull. Amer. Math. Soc., **23** (1990), 531–535.
- [54] E. ACERBI, G. BUTTAZZO, D. PERCIVALE: *A variational definition of the strain energy for an elastic string*. J. Elasticity, **25** (1991), 137–148.
- [55] G. ALBERTI, G. BUTTAZZO: *Integral representation of functionals defined on Sobolev spaces*. Proceedings of “Composite Media and Homogenization Theory”, Trieste 15–26 January 1990, Birkhäuser, Boston (1991), 1–12.
- [56] G. BUTTAZZO, G. DAL MASO: *Shape optimization for Dirichlet problems: relaxed formulation and optimality conditions*. Appl. Math. Optim., **23** (1991), 17–49.
- [57] G. BUTTAZZO, L. FREDDI: *Functionals defined on measures and applications to non equi-uniformly elliptic problems*. Ann. Mat. Pura Appl., **159** (1991), 133–149.
- [58] G. BUTTAZZO, F. TOMARELLI: *Compatibility conditions for nonlinear Neumann problems*. Adv. in Math., **89** (1991), 127–143.
- [59] G. BUTTAZZO: *Integral representation theory for some classes of local functions*. Proceedings of “Optimization and Nonlinear Analysis”, Haifa March 21–27 1990, Pitman Res. Notes Math. Ser. **244**, Longman, Harlow (1992), 64–75.
- [60] G. BUTTAZZO: *Relaxed formulation for a class of shape optimization problems*. Proceedings of “Boundary Control and Boundary Variations”, Sophia-Antipolis, October 15–17, 1990, Lecture Notes in Control and Inf. Sci. **178**, Springer-Verlag, Berlin (1992), 50–59.
- [61] G. BOUCHITTÉ, G. BUTTAZZO: *Integral representation of nonconvex functionals defined on measures*. Ann. Inst. H. Poincaré Anal. Non Linéaire, **9** (1992), 101–117.
- [62] G. BUTTAZZO, V.J. MIZEL: *Interpretation of the Lavrentiev phenomenon by relaxation*. J. Funct. Anal., **110** (1992), 434–460.
- [63] G. BUTTAZZO: *Existence via relaxation for some domain optimization problems*. Proceedings of “Topology Design of Structures”, Sesimbra 20–26 June 1992, NATO ASI Series E: Applied Sciences **227**, Kluwer Academic Publishers, Dordrecht (1993), 337–343.
- [64] G. BUTTAZZO:  *$\Gamma$ -convergence and its applications to some problems in the calculus of variations*. Lecture notes of a series of lectures held in “School of Homogenization”, ICTP, Trieste 6–17 September 1993. Printed by SISSA, Trieste (1993), 81–106.
- [65] G. ALBERTI, G. BUTTAZZO: *Local mappings on spaces of differentiable functions*. Manuscripta Math., **79** (1993), 81–97.
- [66] L. AMBROSIO, G. BUTTAZZO: *An optimal design problem with perimeter penalization*. Calc. Var., **1** (1993), 55–69.
- [67] M. BELLONI, G. BUTTAZZO, L. FREDDI: *Completion by Gamma-convergence for optimal control problems*. Ann. Fac. Sci. Toulouse Math., **2** (1993), 149–162.

- [68] G. BOUCHITTÉ, G. BUTTAZZO: *Relaxation for a class of nonconvex functionals defined on measures*. Ann. Inst. H. Poincaré Anal. Non Linéaire, **10** (1993), 345–361.
- [69] G. BUTTAZZO, G. DAL MASO: *An existence result for a class of shape optimization problems*. Arch. Rational Mech. Anal., **122** (1993), 183–195.
- [70] G. BUTTAZZO, L. FAINA: *Limit analysis for a class of nonconvex problems*. Proc. Roy. Soc. Edinburgh, **123-A** (1993), 693–706.
- [71] G. BUTTAZZO, L. FREDDI: *Sequences of optimal control problems with measures as controls*. Adv. Math. Sci. Appl., **2** (1993), 215–230.
- [72] G. BUTTAZZO, B.KAWOHL: *On Newton’s problem of minimal resistance*. Math. Intelligencer, **15** (1993), 7–12.
- [73] G. BUTTAZZO: *The gap phenomenon for integral functionals: results and open questions*. Proceedings of “Variational Methods, Nonlinear Analysis and Differential Equations”, Genova 27–30 September, 1993, ECIG, Genova (1994), 50–59.
- [74] G. ALBERTI, L. AMBROSIO, G. BUTTAZZO: *Singular perturbation problems with a compact support semilinear term*. Asymptotic Anal., **8** (1994), 247–258.
- [75] G. BUTTAZZO, B. DACOROGNA, W.GANGBO: *On the envelopes of functions depending on singular values of matrices*. Boll. Un. Mat. Ital., **8-B** (1994), 17–35.
- [76] G. BUTTAZZO, L. FAINA: *The Euler equation for a class of nonconvex problems*. Portugal. Math., **51** (1994), 405–419.
- [77] G. BUTTAZZO: *Energies on BV and variational models in fracture mechanics*. Proceedings of “Curvature Flows and Related Topics”, Levico 27 June–2 July 1994, Gakkotosho, Tokyo (1995), 25–36.
- [78] G. BUTTAZZO: *Relaxed shape optimization problems with Dirichlet boundary conditions*. Proceedings of “Composite Media and Homogenization Theory II”, Trieste 20 September – 1 October 1993, World Scientific, Singapore (1995), 125–137.
- [79] G. BUTTAZZO: *Semicontinuit  inferiore di funzionali definiti su BV*. Lecture notes of a series of lectures held in “Scuola Internazionale di Equazioni Differenziali e Calcolo delle Variazioni”, Pisa 14–26 September 1992, Pitagora Editrice, Bologna (1995), 197–235.
- [80] G. BUTTAZZO: *The Lavrentiev phenomenon for variational problems*. Proceedings of “Nonlinear Analysis - Calculus of Variations”, Perugia 9–12 May 1993, Atti Sem. Mat. Fis. Univ. Modena, **43** (1995), 193–202.
- [81] G. BUTTAZZO, M. BELLONI: *A survey on old and recent results about the gap phenomenon*. In “Recent Developments in Well-Posed Variational Problems”, edited by R. Lucchetti and J. Revalski, Kluwer Academic Publishers, Dordrecht (1995), 1–27.
- [82] G. BOUCHITTÉ, A. BRAIDES, G. BUTTAZZO: *Relaxation results for some free discontinuity problems*. J. Reine Angew. Math., **458** (1995), 1–18.
- [83] G. BUTTAZZO, V. FERONE, B. KAWOHL: *Minimum problems over sets of concave functions and related questions*. Math. Nachr., **173** (1995), 71–89.
- [84] G. BUTTAZZO, L. FREDDI: *Optimal control problems with weakly converging input operators*. Discrete Contin. Dyn. Syst., **1**, (1995), 401–420.
- [85] G. BUTTAZZO, V.J. MIZEL: *On a gap phenomenon for isoperimetrically constrained variational problems*. J. Convex Anal., **2** (1995), 87–101.
- [86] G. BUTTAZZO: *A general theory of relaxed controls and application to shape optimization problems*. Proceedings of “Progress in Elliptic and Parabolic Partial Differential Equations”, Capri September 19–23 1994, Pitman Res. Notes Math. Ser. **350**, Longman, Harlow (1996), 58–70.
- [87] L. AMBROSIO, G. BUTTAZZO, I. FONSECA: *Lower semicontinuity problems in Sobolev spaces with respect to a measure*. J. Math. Pures Appl., **75** (1996), 211–224.
- [88] A.C. BARROSO, G. BOUCHITTÉ, G. BUTTAZZO, I. FONSECA: *Relaxation of bulk and interfacial energies*. Arch. Rational Mech. Anal., **135** (1996), 107–173.
- [89] G. BOUCHITTÉ, G. BUTTAZZO, I. FRAGALÀ: *Mean curvature of a measure and related variational problems*. Ann. Scuola Norm. Sup. Pisa Cl. Sci., **25** (1997), 179–196.

- [90] G. BOUCHITTÉ, G. BUTTAZZO, P. SEPPECHER: *Energies with respect to a measure and applications to low dimensional structures*. Calc. Var., **5** (1997), 37–54.
- [91] G. BOUCHITTÉ, G. BUTTAZZO, P. SEPPECHER: *Shape optimization solutions via Monge-Kantorovich equation*. C. R. Acad. Sci. Paris, **324-I** (1997), 1185–1191.
- [92] G. BUTTAZZO, G. DAL MASO, A. GARRONI, A. MALUSA: *On the relaxed formulation of Some Shape Optimization Problems*. Adv. Math. Sci. Appl., **7** (1997), 1–24.
- [93] G. BUTTAZZO, M.E. DRAKHLIN, L. FREDDI, E. STEPANOV: *Homogenization of optimal control problems for functional differential equations*. J. Optim. Theory Appl., **93** (1997), 103–119.
- [94] G. BUTTAZZO, L. FAINA: *Existence for optimal control problems governed by noncoercive state equations*. Comm. Appl. Anal., **1** (1997), 417–431.
- [95] G. BUTTAZZO, P. GUASONI: *Shape optimization problems over classes of convex domains*. J. Convex Anal., **4** (1997), 343–351.
- [96] G. BUTTAZZO, O.M. ZEINE: *Un problème d’optimisation de plaques*. Modél. Math. Anal. Numér., **31** (1997), 167–184.
- [97] G. BUTTAZZO: *L’opera di Ennio De Giorgi nello sviluppo dei metodi diretti del calcolo delle variazioni*. Lettera PRISTEM, **27-28** (1998), XXVII–XXIX.
- [98] G. BUTTAZZO: *On the existence of minimizing domains for some shape optimization problems*. Proceedings of “29ème Congrès d’Analyse Numérique - CANum’97”, Domaine d’Imbours May 26–30 1997, ESAIM Proceedings, **3** (1998), 53–65.
- [99] S. ADLY, G. BUTTAZZO, M. THÉRA: *Critical points for nonsmooth energy functions and applications*. Nonlinear Anal., **32** (1998), 711–718.
- [100] D. BUCUR, G. BUTTAZZO, A. HENROT: *Existence results for some optimal partition problems*. Adv. Math. Sci. Appl., **8** (1998), 571–579.
- [101] G. BUTTAZZO, G. DAL MASO, E. DE GIORGI: *Calcolo delle variazioni*. Enciclopedia del Novecento, Vol. XI Suppl. II, Istituto della Enciclopedia Italiana, Roma (1998), 831–848.
- [102] D. BUCUR, G. BUTTAZZO: *Results and questions on minimum problems for eigenvalues*. Rapporto Interno, Dipartimento di Matematica Università di Pisa, Pisa (1999).
- [103] D. BUCUR, G. BUTTAZZO, I. FIGUEIREDO: *On the attainable eigenvalues of the Laplace operator*. SIAM J. Math. Anal., **30** (1999), 527–536.
- [104] D. BUCUR, G. BUTTAZZO, P. TREBESCHI: *An existence result for optimal obstacles*. J. Funct. Anal., **162** (1999), 96–119.
- [105] G. BUTTAZZO, L. FREDDI: *Relaxed optimal control problems and applications to shape optimization*. Lecture notes of a course held at the NATO-ASI Summer School “Nonlinear Analysis, Differential Equations and Control”, Montreal, July 27 – August 7, 1998, Kluwer, Dordrecht (1999), 159–206.
- [106] G. BUTTAZZO, P. TREBESCHI: *The role of monotonicity in some shape optimization problems*. In “Calculus of Variations, Differential Equations and Optimal Control”, Haifa 1998, Research Notes in Mathematics Series, Vol. 410, Chapman & Hall/CRC Press, Boca Raton (1999), 41–55.
- [107] G. BUTTAZZO, A. WAGNER: *On the optimal shape of a rigid body supported by an elastic membrane*. Nonlinear Anal., **39** (2000), 47–63.
- [108] E. BINI, G. BUTTAZZO, G. BUTTAZZO: *A hyperbolic bound for the rate monotonic algorithm*. IEEE Proceedings of the 13th Euromicro Conference on Real-Time Systems, Delft, The Netherlands, June 2001, 59–66.
- [109] G. BOUCHITTÉ, G. BUTTAZZO: *Characterization of optimal shapes and masses through Monge-Kantorovich equation*. J. Eur. Math. Soc., **3** (2001), 139–168.
- [110] G. BOUCHITTÉ, G. BUTTAZZO, I. FRAGALÀ: *Convergence of Sobolev spaces on varying manifolds*. J. Geom. Anal., **11** (2001), 399–422.
- [111] G. BUTTAZZO, L. DE PASCALE, I. FRAGALÀ: *Topological equivalence of some variational problems involving distances*. Discrete Contin. Dyn. Syst., **7** (2001), 247–258.
- [112] E. ACERBI, G. BUTTAZZO, F. PRINARI: *The class of functionals which can be represented by a supremum*. J. Convex Anal., **9** (2002), 225–236.
- [113] G. BOUCHITTÉ, G. BUTTAZZO, I. FRAGALÀ: *Bounds for the effective coefficients of homogenized low dimensional structures*. J. Math. Pures Appl., **81** (5) (2002), 453–469.

- [114] A. BRAIDES, G. BUTTAZZO, I. FRAGALÀ: *Riemannian approximation of Finsler metrics*. Asymptotic Anal., **31** (2) (2002), 177–187.
- [115] D. BUCUR, G. BUTTAZZO, N. VARCHON: *On the problem of optimal cutting*. SIAM J. Optim., **13** (2002), 157–167.
- [116] G. BUTTAZZO, E. OUDET, E. STEPANOV: *Optimal transportation problems with free Dirichlet regions*. In “Variational Methods for Discontinuous Structures”, Cernobbio 2001, Progress in Nonlinear Differential Equations **51**, Birkhäuser Verlag, Basel (2002), 41–65.
- [117] G. BUTTAZZO, C. TIMOFTE: *On the relaxation of some optimal partition problems*. Adv. Math. Sci. Appl., **12** (2) (2002), 509–520.
- [118] E. BINI, G. BUTTAZZO, G. BUTTAZZO: *Rate monotonic analysis: the hyperbolic bound*. IEEE Transactions on Computers, **52** (7) (2003), 933–942.
- [119] G. BOUCHITTÉ, G. BUTTAZZO, L. DE PASCALE: *A  $p$ -Laplacian approximation for some mass optimization problems*. J. Optim. Theory Appl., **118** (1) (2003), 1–25.
- [120] G. BUTTAZZO, L. DE PASCALE: *Optimal shapes and masses, and optimal transportation problems*. In “Optimal Transportation and Applications”, Martina Franca 2–8 September 2001, Lecture Notes in Mathematics **1813**, Springer-Verlag, Berlin (2003), 11–52.
- [121] G. BUTTAZZO, E. STEPANOV: *On regularity of transport density in the Monge-Kantorovich problem*. SIAM J. Control Optim., **42** (3) (2003), 1044–1055.
- [122] G. BUTTAZZO, E. STEPANOV: *Optimal transportation networks as free Dirichlet regions for the Monge-Kantorovich problem*. Ann. Scuola Norm. Sup. Pisa Cl. Sci., (5) **2** (2003), 631–678.
- [123] G. BUTTAZZO, A. DAVINI, I. FRAGALÀ, F. MACIÀ: *Optimal Riemannian distances preventing mass transfer*. J. Reine Angew. Math., **575** (2004), 157–171.
- [124] G. BUTTAZZO, M. MINTCHEV: *Curve brachistocrone in campi di gravità*. In “Ricordando Franco Conti”, Scuola Normale Superiore, Pisa (2004), 49–58.
- [125] G. BUTTAZZO, E. STEPANOV: *Minimization problems for average distance functionals*. In “Calculus of Variations: topics from the mathematical heritage of E. De Giorgi”, Quaderni di Matematica II Università di Napoli, vol. **14**, Aracne Editrice, Roma (2004), 47–84.
- [126] A. BRANCOLINI, G. BUTTAZZO: *Optimal networks for mass transportation problems*. ESAIM Control Optim. Calc. Var., **11** (2005), 88–101.
- [127] G. BUTTAZZO, F. SANTAMBROGIO: *A model for the optimal planning of an urban area*. SIAM J. Math. Anal., **37** (2) (2005), 514–530.
- [128] G. BUTTAZZO, B. SCHWEIZER:  *$\Gamma$  convergence of Hausdorff measures*. J. Convex Anal., **12** (1) (2005), 239–253.
- [129] G. BUTTAZZO, E. STEPANOV: *Transport density in Monge-Kantorovich problems with Dirichlet conditions*. Discrete Contin. Dyn. Syst., **12** (4) (2005), 607–628.
- [130] G. BUTTAZZO, N. VARCHON: *On the optimal reinforcement of an elastic membrane*. Riv. Mat. Univ. Parma, **4** (7) (2005), 115–125.
- [131] Z. BELHACHMI, D. BUCUR, G. BUTTAZZO, J.M. SAC EPÉE: *Shape optimization problems for eigenvalues of elliptic operators*. Z. Angew. Math. Mech., **86** (3) (2006), 171–184.
- [132] A. BRANCOLINI, G. BUTTAZZO, F. SANTAMBROGIO: *Path functionals over Wasserstein spaces*. J. Eur. Math. Soc., **8** (2006), 415–434.
- [133] G. BUTTAZZO: *Free Interfaces and Free Discontinuities: Variational Problems*. Encyclopedia of Mathematical Physics (ISBN 978-0-1251-2666-3), Elsevier, Amsterdam (2006), volume 2, 411–416.
- [134] G. BUTTAZZO: *Three optimization problems in mass transportation theory*. In “Nonsmooth Mechanics and Analysis: Theoretical and Numerical Advances”, Advances in Mechanics and Mathematics **12**, Springer, Berlin (2006), 13–23.
- [135] G. BUTTAZZO, A. PRATELLI, E. STEPANOV: *Optimal pricing policies for public transportation networks*. SIAM J. Optim., **16** (3) (2006), 826–853.
- [136] G. BUTTAZZO, M.O. RIEGER: *Variational problems for functionals involving the value distribution*. In “Variational Problems in Materials Science”, Trieste 2004, Progress in Nonlinear Differential Equations and Their Applications **68**, Birkhäuser Verlag, Basel (2006), 25–41.

- [137] G. BUTTAZZO, F. SANTAMBROGIO, N. VARCHON: *Asymptotics of an optimal compliance-location problem*. ESAIM Control Optim. Calc. Var., **12** (2006), 752–769.
- [138] G. BUTTAZZO, N. VARCHON, H. ZOUBAIRI: *Optimal measures for elliptic problems*. Ann. Mat. Pura Appl., **185** (2) (2006), 207–221.
- [139] G. BUTTAZZO, G. CARLIER, M. COMTE: *On the selection of maximal Cheeger sets*. Differential Integral Equations, **20** (9) (2007), 991–1004.
- [140] G. BUTTAZZO, L. DE PASCALE, I. FRAGALÀ: *Erratum to: Topological equivalence of some variational problems involving distances*. Discrete Contin. Dyn. Syst., **18** (1) (2007), 219–220.
- [141] G. BUTTAZZO, F. SANTAMBROGIO: *Asymptotical compliance optimization for connected networks*. Netw. Heterog. Media, **2** (4) (2007), 761–777.
- [142] D. BUCUR, G. BUTTAZZO: *Irreversible quasistatic evolutions by minimizing movements*. J. Convex Anal., **15** (3) (2008), 523–534.
- [143] D. BUCUR, G. BUTTAZZO, A. LUX: *Quasistatic evolution in debonding problems via capacity methods*. Arch. Rational Mech. Anal., **190** (2008), 281–306.
- [144] G. BUTTAZZO: *Problemi di ottimizzazione in teoria del trasporto di massa*. Boll. Un. Mat. Ital., (9) **I** (2008), 401–427.
- [145] A. BRANCOLINI, G. BUTTAZZO, F. SANTAMBROGIO, E. STEPANOV: *Long-term planning versus short-term planning in the asymptotical location problem*. ESAIM Control Optim. Calc. Var., **15** (2009), 509–524.
- [146] D. BUCUR, G. BUTTAZZO, A. HENROT: *Minimization of  $\lambda_2(\Omega)$  with a perimeter constraint*. Indiana Univ. Math. J., **58** (6) (2009), 2709–2728.
- [147] G. BUTTAZZO: *A survey on the Newton problem of optimal profiles*. In “Variational Analysis and Aerospace Engineering”, Springer Optimization and Its Applications **33**, Springer-Verlag, Berlin (2009), 33–48.
- [148] G. BUTTAZZO, C. JIMENEZ, E. OUDET: *An optimization problem for mass transportation with congested dynamics*. SIAM J. Control Optim., **48** (3) (2009), 1961–1976.
- [149] G. BUTTAZZO, E. MAININI, E. STEPANOV: *Stationary configurations for the average distance functional and related problems*. Control Cybernet., **38** (4A) (2009), 1107–1130.
- [150] G. BUTTAZZO, F. SANTAMBROGIO: *A mass transportation model for the optimal planning of an urban region*. SIAM Rev., **51** (3) (2009), 593–610.
- [151] G. BOUCHITTÉ, G. BUTTAZZO, L. DE PASCALE: *The Monge-Kantorovich problem for distributions and applications*. J. Convex Anal., **17** (3-4) (2010), 925–943.
- [152] G. BUTTAZZO, G. CARLIER: *Optimal spatial pricing strategies with transportation costs*. AMS Series Contemporary Mathematics, **514** (2010), 105–121.
- [153] G. BUTTAZZO, G. CARLIER, R. TAHRAOUI: *On some systems controlled by the structure of their memory*. SIAM J. Control Optim., **48** (8) (2010), 5241–5253.
- [154] G. BUTTAZZO, P.I. KOGUT: *Weak optimal controls in coefficients for linear elliptic problems*. Rev. Mat. Complut., **24** (1) (2010), 83–94.
- [155] G. BUTTAZZO, A. WAGNER: *On some rescaled shape optimization problems*. Adv. Calc. Var., **3** (2) (2010), 213–232.
- [156] L. BRASCO, G. BUTTAZZO, F. SANTAMBROGIO: *A Benamou-Brenier approach to branched transport*. SIAM J. Math. Anal., **43** (2) (2011), 1023–1040.
- [157] G. BUTTAZZO: *Spectral optimization problems*. Rev. Mat. Complut., **24** (2) (2011), 277–322.
- [158] G. BUTTAZZO, B. KAWOHL: *Overdetermined boundary value problems for the  $\infty$ -Laplacian*. Int. Math. Res. Not. IMRN, **2011** (2011), 237–247.
- [159] D. BUCUR, G. BUTTAZZO: *On the characterization of the compact embedding of Sobolev spaces*. Calc. Var., (to appear), DOI 10.1007/s00526-011-0441-8.
- [160] G. BUTTAZZO, S.A. NAZAROV: *An optimization problem for the biharmonic equation with Sobolev conditions*. Journal of Mathematical Sciences, **176** (6) (2011), 786–796. Russian translation in: “Problems in Mathematical Analysis”, **58** (2011), 69–78.

- [161] G. BUTTAZZO, F. MAESTRE: *Optimal shape for elliptic problems with random perturbations*. Discrete Contin. Dyn. Syst., **31** (4) (2011), 1115–1128.
- [162] G. BUTTAZZO, F. SANTAMBROGIO, E. STEPANOV: *Asymptotic optimal location of facilities in a competition between population and industries*. Ann. Sc. Norm. Super. Pisa Cl. Sci., (to appear).
- [163] G. BUTTAZZO, S.A. NAZAROV: *Optimal location of support points in the Kirchhoff plate*. Preprint Dipartimento di Matematica, Università di Pisa, (2011).
- [164] D. BUCUR, G. BUTTAZZO, U. STEFANELLI: *Shape flows for spectral optimization problems*. Preprint Dipartimento di Matematica, Università di Pisa, (2011).
- [165] J.C.L. ALFONSO, G. BUTTAZZO, B. GARCÍA-ARCHILLA, M.A. HERRERO, L. NÚÑEZ: *A class of optimization problems in radiotherapy*. Preprint Universidad Complutense Madrid, (2011).
- [166] D. BUCUR, G. BUTTAZZO, B. VELICHKOV: *Shape optimization problems with internal constraint*. Preprint Dipartimento di Matematica, Università di Pisa, (2011).
- [167] E. BINI, G. BUTTAZZO: *The optimal sampling pattern for linear control systems*. Preprint Dipartimento di Matematica, Università di Pisa, (2011).
- [168] G. BUTTAZZO, L. DE PASCALE, P. GORI-GIORGI: *Optimal transport meets electronic density functional theory*. Preprint Dipartimento di Matematica, Università di Pisa, (2011).
- [169] G. BUTTAZZO: *Evolution models for mass transportation problems*. Preprint Dipartimento di Matematica, Università di Pisa, (2011).
- [170] G. BUTTAZZO, AL-HASSEM NAYAM: *Stationary configuration of some optimal shaping*. Preprint Dipartimento di Matematica, Università di Pisa, (2011).

## Books

- [1] G. BUTTAZZO: *Semicontinuity, Relaxation and Integral Representation in the Calculus of Variations*. Pitman Res. Notes Math. Ser. **207**, Longman, Harlow (1989), iv+222 pp.
- [2] G. BUTTAZZO, G. GAMBINI, E. SANTI: *Esercizi di Analisi Matematica 1*. Pitagora Editrice, Bologna (1991), 508 pp.
- [3] G. BUTTAZZO, G.P. GALDI, L. ZANGHIRATI (EDITORS): *Developments in Partial Differential Equations and Applications to Mathematical Physics*. Proceedings of “Developments in Partial Differential Equations and Applications to Mathematical Physics”, Ferrara 14–18 October 1991, Plenum Press, New York (1992), viii+246 pp.
- [4] G. BOUCHITTÉ, G. BUTTAZZO, P. SUQUET (EDITORS): *Calculus of Variations, Homogenization, and Continuum Mechanics*. Proceedings of “Calculus of Variations, Homogenization, and Continuum Mechanics”, CIRM, Marseille-Luminy, 21–25 June 1993, World Scientific, Singapore (1994), xii+296 pp.
- [5] G. BUTTAZZO, A. VISINTIN (EDITORS): *Motion by Mean Curvature*. Proceedings of “Motion by Mean Curvature”, Trento 20–24 October 1992, Walter de Gruyter, Berlin, (1994), viii+219 pp.
- [6] G. BUTTAZZO, A. MARINO, M.K.V. MURTHY (EDITORS): *Equazioni Differenziali e Calcolo delle Variazioni*. Lecture notes of a series of lectures held in “Scuola Internazionale di Equazioni Differenziali e Calcolo delle Variazioni”, Pisa 14–26 September 1992, Pitagora Editrice, Bologna (1995), 252 pp.
- [7] E. ACERBI, G. BUTTAZZO: *Primo Corso di Analisi Matematica*. Pitagora Editrice, Bologna (1997), 616 pp.
- [8] G. BUTTAZZO, G.P. GALDI, E. LANCONELLI, P. PUCCI (EDITORS): *Nonlinear Analysis and Continuum Mechanics*. Proceedings of a meeting in honor of James Serrin, Ferrara 26–30 October 1992, Springer-Verlag, Berlin (1998), x+148 pp.
- [9] G. BUTTAZZO, M. GIAQUINTA, S. HILDEBRANDT: *One-dimensional Calculus of Variations: an Introduction*. Oxford University Press, Oxford (1998), viii+262 pp. Russian translation: Tamara Rozhkovskaya, Novosibirsk (2002).
- [10] G. BUTTAZZO, V. COLLA: *Temî d’Esame di Analisi Matematica I*. Pitagora Editrice, Bologna (2000), 248 pp.

- [11] G. BUTTAZZO, A. MARINO, M.K.V. MURTHY (EDITORS): *Calculus of Variations and Partial Differential Equations*. Lecture notes of a series of lectures held in “Scuola Internazionale di Equazioni Differenziali e Calcolo delle Variazioni”, Pisa September 1996, Springer-Verlag, Berlin (2000), x+347 pp.
- [12] G. BUTTAZZO, V. COLLA: *Temi d’Esame di Analisi Matematica II*. Pitagora Editrice, Bologna (2001), 200 pp.
- [13] D. BUCUR, G. BUTTAZZO: *Variational Methods in some Shape Optimization Problems*. Lecture Notes of courses at Dipartimento di Matematica Università di Pisa and Scuola Normale Superiore di Pisa, Series “Appunti di Corsi della Scuola Normale Superiore”, Pisa (2002), 213 pp.
- [14] E. ACERBI, G. BUTTAZZO: *Analisi Matematica ABC. 1. Funzioni di una Variabile*. Pitagora Editrice, Bologna (2003), 316 pp.
- [15] E. ACERBI, G. BUTTAZZO: *Matematica Preuniversitaria di Base*. Pitagora Editrice, Bologna (2003), 132 pp.
- [16] D. BUCUR, G. BUTTAZZO: *Variational Methods in Shape Optimization Problems*. Progress in Nonlinear Differential Equations **65**, Birkhäuser Verlag, Basel (2005), viii+216 pp.
- [17] H. ATTOUCH, G. BUTTAZZO, G. MICHAILLE: *Variational Analysis in Sobolev and BV Spaces: Applications to PDEs and Optimization*. MPS-SIAM Book Series on Optimization **6**, SIAM, Philadelphia (2006), xii + 634 pp.
- [18] G. BUTTAZZO, A. PRATELLI, S. SOLIMINI, E. STEPANOV: *Optimal urban networks via mass transportation*. Lecture Notes in Mathematics **1961**, Springer-Verlag, Berlin (2009), x+150 pp.
- [19] G. BUTTAZZO, A. FREDIANI (EDITORS): *Variational Analysis and Aerospace Engineering*. Springer Optimization and Its Applications **33**, Springer-Verlag, Berlin (2009), xxvi+518 pp.