

Dalibor Pražák, Kumbakonam R. Rajagopal

**Mechanical oscillators
described by a system
of differential-algebraic equations**

Preprint No. MATH-KMA-2009/316

December 2009

Submitted

Department of Mathematical Analysis, Faculty of Mathematics and Physics,
Charles University, Sokolovská 83, 186 75 Praha 8, Czech Republic

<http://www.karlin.mff.cuni.cz/kma-preprints/>

Cover print by Reprořředisko, Malostranské nám. 25, Praha 1 - Malá Strana
Design by Mirko Rokyta, picture of snowflake by Ondřej Kalenda
Current series administrator: Mirko Rokyta

List of preprints released in this series

All preprints available on <http://www.karlin.mff.cuni.cz/kma-preprints/>
E-mail contact to series administrator: kma-prep@karlin.mff.cuni.cz

1999 – 2007

For the details on the 255 papers submitted in years 1999-2007 see the web page of the preprint series.

2008

- [MATH-KMA 2008/256] Miroslav Bulíček, Dalibor Pražák: *A note on the dimension of the global attractor for abstract semilinear hyperbolic problem.*
- [MATH-KMA 2008/257] Eva Fašangová, Pedro J. Miana: *Hilbert, Dirichlet and Fejér families of operators arising from C_0 -groups and cosine functions.*
- [MATH-KMA 2008/258] Josef Daněček, Oldřich John, Jana Stará: *On the Hölder continuity of gradient of solutions to a class of elliptic systems.*
- [MATH-KMA 2008/259] Jakub Duda, Luděk Zajíček: *Semiconvex functions: representations as suprema of smooth functions and extensions.*
- [MATH-KMA 2008/260] Jakub Duda, Luděk Zajíček: *Curves in Banach spaces which allow a C^2 parametrization.*
- [MATH-KMA 2008/261] Václav Vlasák, Miroslav Zelený: *Compact sets of continuity for Borel functions.*
- [MATH-KMA 2008/262] Ondřej Kalenda, Jiří Spurný: *Boundaries of compact convex sets and fragmentability.*
- [MATH-KMA 2008/263] Ondřej Kurka, Dušan Pokorný: *Porosity and the Darboux property of Fréchet derivatives.*
- [MATH-KMA 2008/264] Miroslav Kačena, Jiří Spurný: *Affine images of compact convex sets and maximal measures.*
- [MATH-KMA 2008/265] Miroslav Kačena: *Products and projective limits of function spaces.*
- [MATH-KMA 2008/266] Miroslav Bačák: *Minimal measures and nonsimplicial function cones.*
- [MATH-KMA 2008/267] Miroslav Bačák, Petr Hájek: *Mazur intersection property for Asplund spaces.*
- [MATH-KMA 2008/268] Stanislav Hencl: *On the weak differentiability of $u \circ f^{-1}$.*
- [MATH-KMA 2008/269] Amiran Gogatishvili, Luboš Pick, Jan Schneider: *The rearrangement-invariant hull of a Besov space.*
- [MATH-KMA 2008/270] Ron Kerman, Luboš Pick: *Explicit formulas for optimal rearrangement-invariant norms in Sobolev imbedding inequalities.*
- [MATH-KMA 2008/271] Petr Holický: *Decompositions of Borel bimeasurable mappings between complete metric spaces.*
- [MATH-KMA 2008/272] Luboš Pick: *Optimality of function spaces in Sobolev embeddings.*
- [MATH-KMA 2008/273] Jiří Spurný: *Borel sets and functions in topological spaces.*
- [MATH-KMA 2008/274] Miroslav Kačena, Jiří Spurný: *Affine Baire functions on Choquet simplices.*
- [MATH-KMA 2008/275] Jiří Jelínek, Dalibor Pražák: *On the sign of Colombeau functions and applications to conservation laws.*
- [MATH-KMA 2008/276] Warren B. Moors, Jiří Spurný: *On the topology of pointwise convergence on the boundaries of L_1 -predual.*
- [MATH-KMA 2008/277] Hugo Beirão da Veiga, Petr Kaplický, Michael Růžička: *Boundary regularity of shear thickening flows.*
- [MATH-KMA 2008/278] Petr Hájek, Gilles Lancien, Antonín Procházka: *Weak* dentability index of spaces $C([0, \alpha])$.*
- [MATH-KMA 2008/279] Robert Deville, Antonín Procházka: *Parametric variational principle and residuality.*
- [MATH-KMA 2008/280] Michal Kraus: *A note on the uniform approximation of continuous affine functions.*
- [MATH-KMA 2008/281] Tomáš Bárta: *Smooth solutions of Volterra equations via semigroups.*
- [MATH-KMA 2008/282] Tomáš Bárta: *Delayed quasilinear evolution equations with BV – coefficients.*
- [MATH-KMA 2008/283] Libor Veselý, Luděk Zajíček: *On extensions of d.c. functions and convex functions.*
- [MATH-KMA 2008/284] Ondřej Kalenda, Wiesław Kubiś: *The structure of Valdivia compact lines.*
- [MATH-KMA 2008/285] Petr Holický: *Borel classes of uniformizations of sets with large sections.*
- [MATH-KMA 2008/286] Salvatore Leonardi, Jana Stará: *Regularity results for the gradient of solutions of linear elliptic systems with VMO-coefficients and $L^{1, \lambda}$ data.*
- [MATH-KMA 2008/287] Andrea Cianchi, Luboš Pick: *Optimal Gaussian Sobolev embeddings.*

- [MATH-KMA 2008/288] Andrea Cianchi, Luboš Pick: *An optimal endpoint trace embedding.*
- [MATH-KMA 2008/289] Robert Černý, Stanislav Hencl, Jan Kolář: *Integral functionals that are continuous with respect to the weak topology on $W_0^{1,p}(\Omega)$.*
- [MATH-KMA 2008/290] Jaroslav Lukeš, Luboš Pick, Dušan Pokorný: *On geometric properties of the spaces $L^{p(x)}$.*
- [MATH-KMA 2008/291] Miroslav Hušek, Antonio Pulgarín: *Lattice-ordered groups of real continuous functions.*

2009

- [MATH-KMA 2009/292] Petr Hájek, Antonín Procházka: *C^k -smooth approximations of LUR norms.*
- [MATH-KMA 2009/293] Martin Koc: *Upper porous sets in metric spaces which are not σ -lower porous.*
- [MATH-KMA 2009/294] Robert Černý, Silvie Mašková: *On generalization of Mosers'theorem in the critical case.*
- [MATH-KMA 2009/295] Piotr Hajlasz, Jan Malý: *On approximate differentiability of the maximal function.*
- [MATH-KMA 2009/296] Robert Černý, Silvie Mašková: *A sharp form of an embedding into multiple exponential spaces.*
- [MATH-KMA 2009/297] W. Desch, E. Fašangová, J. Milota, G. Propst: *Spectrum of a viscoelastic boundary damping problem.*
- [MATH-KMA 2009/298] W. Desch, E. Fašangová, J. Milota, G. Propst: *Stabilization through viscoelastic boundary damping.*
- [MATH-KMA 2009/299] Jan Rataj, Luděk Zajíček: *Properties of distance functions on convex surfaces.*
- [MATH-KMA 2009/300] Stanislav Hencl: *Sharpness of the assumptions for the regularity of a homeomorphism.*
- [MATH-KMA 2009/301] Robert Černý: *Integral functionals that are lower semicontinuous with respect to the weak topology on $W^{1,p}(\Omega)$.*
- [MATH-KMA 2009/302] Jakub Duda, Luděk Zajíček: *On vector-valued curves that allow a $C^{1,\alpha}$ parametrization.*
- [MATH-KMA 2009/303] Jiří Spurný: *Weights of boundaries of compact convex sets.*
- [MATH-KMA 2009/304] David A. Edwards, Ondřej Kalenda, Jiří Spurný: *A note on intersections of simplices.*
- [MATH-KMA 2009/305] Martin Koc: *On relations among metric derived numbers.*
- [MATH-KMA 2009/306] Domingo García, Ondřej Kalenda, Manuel Maestre: *Envelopes of open sets and extending holomorphic functions on dual Banach spaces.*
- [MATH-KMA 2009/307] Stanislav Hencl, Jan Malý: *Jacobians of Sobolev homeomorphisms.*
- [MATH-KMA 2009/308] Petr Holický, Roman Pol: *On a question by Alexey Ostrovsky concerning preservation of completeness.*
- [MATH-KMA 2009/309] Lukáš Malý: *Calderón-type theorems for operators of non-standard endpoint behavior on Lorentz spaces.*
- [MATH-KMA 2009/310] Petr Holický: *Preservation of completeness by some continuous maps.*
- [MATH-KMA 2009/311] Luboš Pick: *Weighted inequalities for integral and supremum operators.*
- [MATH-KMA 2009/312] Petr Holický: *Descriptive classes of sets in nonseparable spaces.*
- [MATH-KMA 2009/313] Maurizio Grasselli, Dalibor Pražák, Giulio Schimperna: *Attractors for nonlinear reaction-diffusion systems in unbounded domains via the method of short trajectories.*
- [MATH-KMA 2009/314] Antonio Avilés, Ondřej Kalenda: *Compactness in Banach space theory - selected problems.*
- [MATH-KMA 2009/315] Josef Daněček, Oldřich John, Jana Stará: *Morrey space regularity for weak solutions of Stokes systems with VMO coefficients.*
- [MATH-KMA 2009/316] Dalibor Pražák, Kumbakonam R. Rajagopal: *Mechanical oscillators described by a system of differential-algebraic equations.*