

Andrea Cianchi, Luboš Pick and Lenka Slavíková

**Banach algebras of weakly  
differentiable functions**

MATH-KMA-2015/508

December 2015

Submitted



## 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](mailto:kma-prep@karlin.mff.cuni.cz)

## 1999 – 2013

For the details on papers submitted in specified years see the web page of the preprint series.

## 2014

- MATH-KMA-2014/453 M. Cúth: *Characterization of compact monotonically ( $\omega$ )-monolithic spaces using system of retractions*
- MATH-KMA-2014/454 D. Campbell, S. Hencl, F. Konopecký: *The weak inverse mapping theorem*
- MATH-KMA-2014/455 Marek Cúth a Ondřej Kalenda: *Monotone retractability and retractional skeletons*
- MATH-KMA-2014/456 Dalibor Pražák and Jakub Slavík: *Nonstandard analysis of global attractors*
- MATH-KMA-2014/457 R. Černý: *Concentration-Compactness Principle for embedding into multiple exponential spaces on unbounded domains*
- MATH-KMA-2014/458 Filip Soudský: *Normability of Gamma spaces, case  $p < 1$*
- MATH-KMA-2014/459 S. Hencl, P. Honzík: *Dimension distortion of images of sets under Sobolev mappings*
- MATH-KMA-2014/460 Petr Petráček and Jiří Spurný: *On maximal Lindenstrauss spaces*
- MATH-KMA-2014/461 Jiří Spurný and Miroslav Zelený: *Baire classes of strongly affine functions on simplices and on  $C^*$ -algebras*
- MATH-KMA-2014/462 Petr Petráček and Jiří Spurný: *A characterization of complex  $L_1$ -preduals via a complex barycentric mapping*
- MATH-KMA-2014/463 A. Gogatishvili, F. Soudský: *Normability of Lorentz spaces - an alternative approach*
- MATH-KMA-2014/464 Michal Johanis: *A quantitative version of the Converse Taylor theorem:  $C^{k,\omega}$ -smoothness*
- MATH-KMA-2014/465 Robert Černý: *Concentration-Compactness Principle for Moser-type inequalities in Lorentz-Sobolev spaces*
- MATH-KMA-2014/466 Petr Petráček: *Lineability of nowhere monotone measures*
- MATH-KMA-2014/467 Hana Bendová, Ondřej Kalenda and Jiří Spurný: *Quantification of the Banach-Saks property*
- MATH-KMA-2014/468 Michal Johanis and Luděk Zajíček: *Smoothness via directional smoothness and Marchaud's theorem in Banach spaces*
- MATH-KMA-2014/469 P. Honzík: *Examples of singular integral operators with rough kernels*
- MATH-KMA-2014/470 S. Hencl, C. Mora-Corral: *Diffeomorphic Approximation of continuous almost everywhere injective Sobolev deformations in the plane*
- MATH-KMA-2014/471 Ondřej Kurka and Duan Pokorný: *Notes on the trace problem for separately convex functions*
- MATH-KMA-2014/472 T. Bárta, V. Janeček, D. Pražák: *Heat conduction problem of an evaporating liquid wedge*
- MATH-KMA-2014/473 S. Hencl, B. Vejnar: *Sobolev homeomorphism that cannot be approximated by diffeomorphisms in  $W^{1,1}$*
- MATH-KMA-2014/474 Andrea Cianchi and Lubo Pick: *Optimal Sobolev trace embeddings*
- MATH-KMA-2014/475 O. Kalenda and J. Spurný: *Baire classes of affine vector-valued functions*
- MATH-KMA-2014/476 Dalibor Pražák and Kumbakonam R. Rajagopal: *Mechanical oscillators with dampers defined by implicit constitutive relations*
- MATH-KMA-2014/477 J. Tier, L. Zajíček: *A Criterion of Gamma-nullness and differentiability of convex and quasi-convex functions*
- MATH-KMA-2014/478 Robert Černý: *Moser-Trudinger inequality in grand Lebesgue space*
- MATH-KMA-2014/479 T. Bárta, E. Faangová: *Convergence to equilibrium for solutions of an abstract wave equation with general damping function*
- MATH-KMA-2014/480 Jiří V. Outrata, Michal Červinka, Michal Outrata: *On Walras-Cournot-Nash equilibria and their computation*
- MATH-KMA-2014/481 L. Veselý, L. Zajíček: *Spaces of d.c. mappings on arbitrary intervals*

## 2015

- MATH-KMA-2015/482 Filip Soudský: *Note on linearity of rearrangement-invariant function spaces*
- MATH-KMA-2015/483 R. Černý: *New results concerning Moser-type inequalities in Lorentz-Sobolev spaces*
- MATH-KMA-2015/484 R. Černý: *On the weak continuity of the Moser functional in Lorentz-Sobolev spaces*
- MATH-KMA-2015/485 Tomáš Roskovec: *Construction of  $W^{2,n}(\Omega)$  function with gradient violating Lusin ( $N$ ) condition*
- MATH-KMA-2015/486 Ondřej Kalenda and Jiří Spurný: *Preserving affine Baire classes by perfect affine maps*
- MATH-KMA-2015/487 Martin Křepela: *Bilinear weighted Hardy inequality for nonincreasing functions*
- MATH-KMA-2015/488 Martin Křepela: *Iterating bilinear Hardy inequalities*
- MATH-KMA-2015/489 S. Hencl, A. Pratelli: *Diffeomorphic approximation of  $W^{1,1}$  planar Sobolev homeomorphisms*
- MATH-KMA-2015/490 V. Kryštof, L. Zajíček: *Differences of two semiconvex functions on the real line*
- MATH-KMA-2015/491 Dalibor Pražák, Jakub Slavík: *Attractors and entropy bounds for a nonlinear RDEs with distributed delay in unbounded domains*
- MATH-KMA-2015/492 Ondřej Kurka: *Amalgamations of classes of Banach spaces with a monotone basis*
- MATH-KMA-2015/493 M. Bohata, J. Hamhalter and O. Kalenda: *On Markushevich bases in preduals of von Neumann algebras*
- MATH-KMA-2015/494 Vít Musil: *Optimal Orlicz domains in Sobolev embeddings*
- MATH-KMA-2015/495 S. Hencl and V. Tengvall: *Sharpness of the differentiability almost everywhere and capacity estimates for Sobolev mappings*
- MATH-KMA-2015/496 Luigi D'onofrio, Stanislav Hencl and Roberta Schiattarella: *Note on Lusin ( $N$ ) condition and the distributional determinant*
- MATH-KMA-2015/497 Ondřej Kurka: *Zippin's embedding theorem and amalgamations of classes of Banach spaces*
- MATH-KMA-2015/498 Ondřej Kurka: *Non-universal families of separable Banach spaces*
- MATH-KMA-2015/499 Zhuomin Liu and Jan Malý: *A strictly convex Sobolev function with null Hessian minors*
- MATH-KMA-2015/500 Marek Cúth, Michal Doucha, Przemyslaw Wojtaszczyk: *On the structure of Lipschitz-free spaces*
- MATH-KMA-2015/501 Marek Cúth: *Separable determination of (generalized-)lushness*
- MATH-KMA-2015/502 Loukas Grafakos, Danqing He, Petr Honzík: *Rough Bilinear Singular Integrals*
- MATH-KMA-2015/503 Martin Křepela: *Integral conditions for Hardy-type operators involving suprema*
- MATH-KMA-2015/504 M. Bohata, J. Hamhalter and O. Kalenda: *Decompositions of preduals of JBW and JBW\* algebras*
- MATH-KMA-2015/505 Jindřich Lechner: *1-Grothendieck  $C(K)$  spaces*
- MATH-KMA-2015/506 Daniel Campbell: *Diffeomorphic approximation of Planar Sobolev Homeomorphisms in Orlicz-Sobolev spaces*
- MATH-KMA-2015/507 T. Bárta: *Rate of convergence to equilibrium and Lojasiewicz-type estimates*
- MATH-KMA-2015/508 Andrea Cianchi, Luboš Pick and Lenka Slavíková: *Banach algebras of weakly differentiable functions*
- MATH-KMA-2015/509 Paola Cavaliere, Andrea Cianchi, Luboš Pick and Lenka Slavíková: *Norms supporting the Lebesgue differentiation theorem*