



XV Encuentro de Análisis Funcional
Murcia-Valencia

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Abstracts

Alcoi, 14-16 Julio 2017



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Lista de Charlas

Pablo Manuel Berná

Lebesgue-type inequalities for greedy approximation

Juan Bès

Hypercyclic algebras for convolution operators

Nadia Clavero

On L^p theory for outer measures

Sheldon Dantas

On a vector valued Bollobás theorem for compact operators

Pedro Fernández Martínez

Compactness Results for a Class of Limiting Interpolation Methods

Ismael García-Bayona

Generalizing the Schur product

Luis C. García Lirola

Some results on duality of spaces of vector-valued Lipschitz functions

Anna Golińska

Hankel operators on the space of real analytic function

Michał Goliński

Chebyshev multipliers on spaces of analytic functions

Sun Kwang Kim

The Bishop-Phelps-Bollobás point property

Han Ju Lee

On a second numerical index for Banach spaces

Manuel López Pellicer

Metrizability and angelicity in topological groups with bases

Jose Pedro Moreno

On Cantor's intersection theorem in $C(K)$ spaces

Antonio Pérez Hernández

Analysis of Boolean Functions

Eva Primo

Unconditionally convergent multipliers and Bessel sequences

Adam Przystacki

Dynamical properties of weighted composition operators on the space of smooth functions

Ana Trybuła

Boundary behavior of invariant functions on planar domains

Horario

Jueves 14.07.2016

16:00-16:30 Jose Pedro Moreno
16:40-17:10 Luis C. García-Lirola
17:10-17:40 Pausa café
17:40-18:10 Juan Bès
18:20-18:50 Michał Goliński
19:00-19:30 Ana Trybuła

Viernes 15.07.2016

10:00-10:30 Pedro Fernández Martínez
10:40-11:10 Sheldon Dantas
11:10-12:00 Pausa café
12:00-12:30 Sun Kwang Kim
12:40-13:10 Antonio Pérez Hernández
13:30-15:30 Comida
16:00-16:30 Adam Przystacki
16:40-17:10 Ismael García-Bayona
17:10-18:00 Pausa café
18:00-18:30 Pablo Manuel Berná
18:40-19:10 Anna Golińska

Sábado 16/09/2016

10:00-10:30 Han Ju Lee
10:40-11:10 Nadia Clavero
11:10-12:00 Pausa café
12:00-12:30 Eva Primo
12:40-13:10 Manuel López-Pellicer

Tarjeta identificación

XV ENCUENTRO DE ANÁLISIS FUNCIONAL MURCIA-VALENCIA



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LOPEZ PELLICER**

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On a second numerical index for Banach spaces

Han Ju Lee

Dongguk University (República de Corea)

A second numerical index for real Banach spaces with non-trivial Lie algebra is introduced as the best constant of equivalence between the numerical radius and the quotient of the operator norm modulo the Lie algebra. We present a number of examples and results concerning absolute sums, duality, vector-valued function spaces... which show that, in many cases, the behaviour of this second numerical index differs from the one of the classical numerical index. As main results, we prove that Hilbert spaces have second numerical index one and that they are the only spaces with this property among the class of Banach spaces with one-unconditional basis and non-trivial Lie algebra. Besides, an application to the Bishop-Phelps-Bollobás property for numerical radius is given.

This is a joint work with S. K. Kim, M. Martín and J. Merí.

16.07.2016
10:00–16:30

Metrizability and angelicity in topological groups with bases

Manuel López-Pellicer

Universitat Politècnica de València

Motivated by the class \mathfrak{G} of Hausdorff locally convex spaces (introduced by Cascales and Orihuela in [1]) it is said that a topological group G has a \mathfrak{G} -base if there exists a base $\{U_\alpha : \alpha \in \mathbb{N}^{\mathbb{N}}\}$ of neighborhoods of the neutral element in G such that $U_\beta \subseteq U_\alpha$ whenever $\alpha \leq \beta$. Each metrizable topological group has a \mathfrak{G} -base and it has been proved in [6] that each Fréchet-Urysohn topological group with a \mathfrak{G} -base is metrizable.

If Σ is a directed unbounded (i.e., $\sup\{\alpha(k) : \alpha \in \Sigma\} = \infty$ for some $k \in \mathbb{N}$) subset of $\mathbb{N}^{\mathbb{N}}$, a base $\{U_\alpha : \alpha \in \Sigma\}$ of neighborhoods of the neutral element of a topological group G is a Σ -base if $U_\beta \subseteq U_\alpha$, whenever $\alpha \leq \beta$ with $\alpha, \beta \in \Sigma$. Christensen theorem implies that if X is a separable and metrizable space that it is not a Polish space, then $C_c(X)$ admits a Σ -base of neighborhoods of the origin but it does not admit any \mathfrak{G} -base (see [4] and also [5] for some strengthening related with Christensen theorem).

A Σ -base $\{U_\alpha : \alpha \in \Sigma\}$ of a Hausdorff topological group G indexed by a boundedly complete subspace Σ of $\mathbb{N}^{\mathbb{N}}$, i.e., each bounded set Δ of Σ has a bound at Σ , will be referred to as a *long Σ -base*. In any ZFC model for which $\aleph_1 = \mathfrak{d} < \mathfrak{c}$ there exists a long Σ -base of absolutely convex neighborhoods of the origin of the space $C_c([0, \omega_1])$ which is not a \mathfrak{G} -base (see [4]).

In [4] we prove among others the following results:

1. Each Fréchet-Urysohn topological group G with a long Σ -base $\{U_\alpha : \alpha \in \Sigma\}$ is metrizable, improving the cited result of [6].

2. If a topological group G has a long Σ -base $\{U_\alpha : \alpha \in \Sigma\}$ then every compact subset K in G is metrizable. Consequently, G is strictly angelic (i.e., each compact subset of G is metrizable). The proof is based on the theorem obtained in [2] that a compact topological space K is metrizable if and only if the space $(K \times K) \setminus \Delta$ is strongly dominated by a second countable space, where $\Delta := \{(x, x) : x \in K\}$.
3. If $C_c(X)$ has a long Σ -base of neighborhoods of the origin, then X is a C -Suslin space. Consequently, by [8], $C_p(X)$ is angelic.
4. If there exists a family $\{A_\alpha : \alpha \in \Sigma\}$ made up of compact sets, indexed by a boundedly complete set Σ such that $A_\alpha \subseteq A_\beta$ whenever $\alpha \leq \beta$ and satisfying that $\overline{\cup\{A_\alpha : \alpha \in \Sigma\}} = X$, then $C_c(X)$ is strictly angelic.

This last result does not say nothing about the compact subsets in $C_p(X)$ that are not compact in $C_c(X)$. Angelicity of $C_p(X)$ is given by the deep Orihuela's angelic theorem (see [8] and also [3] for four equivalences of Orihuela's theorem as well as its application to obtain some Baturov results in C_p theory). Some open questions will be proposed. Joint work with Juan C. Ferrando and Jerzy Kakol.

Referencias

- [1] Cascales, B. and Orihuela, J., *On compactness in locally convex spaces*, Math. Z. **195** (1987) 365-381.
- [2] Cascales, B., Orihuela, J. and Tkachuk, V., *Domination by second countable spaces and Lindelöf Σ -property*, Topology Appl. **158** (2011), 204-214.
- [3] Ferrando, J. C., *On a theorem of D. P. Baturov*. Rev. R. Acad. Cienc. Exactas F s. Nat. Ser. A Math. RACSAM. DOI 10.1007/s13398-016-0312-4.
- [4] Ferrando, J. C., Kąkol, J., López-Pellicer, *Spaces $C(X)$ with ordered bases*, Topology and its Applications **208** (2016) 30–39
- [5] Gabrielyan, S. and Kąkol, J., *Free Locally Convex Spaces with Small Base*, Accepted in Rev. R. Acad. Cienc. Exactas F s. Nat. Ser. A Math. RACSAM.
- [6] Gabrielyan, S., Kąkol, J. and Leiderman, A., *On topological groups with a small base and metrizability*, Fundamenta Math. **229** (2015), 129-158.
- [7] Kąkol, J., Kubiś, W. and López-Pellicer, M., *Descriptive Topology in Selected Topics of Functional Analysis*, Springer, Developments in Math. **24**, New York Dordrecht Heidelberg, 2011.
- [8] Orihuela, J., *Pointwise compactness in spaces of continuous functions*, J. London Math. Soc. **36** (1987), 143-152.