

**Workshop in Linear Analysis and Probability**  
**Abstracts of Talks - Seminar**  
**Summer 2002**

**Ken Dykema**, *Exotic dense subalgebras of free group factors*

It is interesting to find unusual sets of generators for free group factors  $L(F_n)$ , in part because these may shed lights on the isomorphism problem for free group factors. We find some finite generating sets for free group factors that are unusual in that the  $C^*$ -algebras they generate have interesting (and surprising) approximation properties. Although the results are somewhat technical, the talk will try to give some background and perspective on the results. (This is joint work with Nathaniel Brown).

**Tadeusz Figiel**, *Selecting unconditional sequences, II*

It follows from the Gowers dichotomy theorem that, if a Banach space  $X$  contains no hereditarily indecomposable subspace, then every subspace of  $X$  contains an unconditional basic sequence. (The converse is obviously true.)

In a talk I gave here last year a new proof that result was presented. That approach can be used to obtain other results of a similar nature. In this talk we present applications to the construction of completely bounded unconditional bases in operator spaces and to the existence of some generalized Tsirelson's basic sequences. The results will appear in a joint paper with R. Frankiewicz, R. Komorowski and C. Ryll-Nardzewski.

**Niels Nielsen**, *Extension Properties of Bounded Operators*

A Banach space  $X$  is said to have MEP if every bounded operator from an arbitrary subspace of  $X$  to an arbitrary Banach space of cotype 2 extends to a bounded operator on  $X$ .

In 1974 Maurey proved that if  $X$  is of type 2, then  $X$  has MEP.

In this lecture we shall show that if  $X$  has MEP, then every operator from  $X$  to an  $L_1$ -space factors through a Hilbert space. Hence if in addition  $X$  has "a little bit of structure", e.g. the Gordon-Lewis property, then it is of type 2.

In the lecture we shall also consider other extension properties and discuss certain properties of weak cotype 2 spaces.

**Timur Oikhberg**, *Every separable exact operator space is nuclearly embeddable*

We show that every separable  $C$ -exact operator space embeds completely isometrically into a separable  $C$ -nuclear space (in other words, an operator space which is  $OL_{\infty, C+\epsilon}$  for any  $\epsilon > 0$ ).

**Mikhail Ostrovskii**, *A new class of normed spaces with non-trivial groups of isometries*

The talk is devoted to a new class of finite-dimensional normed spaces with non-trivial groups of isometries. We call this class *the class of spaces with distinguished bases*. The introduction of this new class is motivated by the following:

(a) The class of spaces with distinguished bases contains both the class of spaces with unconditional bases and the class of spaces spanned by characters in translation invariant function spaces on compact abelian groups.

(b) The class of spaces with distinguished bases is stable with respect to taking reasonably normed tensor products.

(c) There is a very simple formula for 2-summing norms of the operators that are diagonal with respect to distinguished bases.

In the talk we shall discuss some natural problems about the class of spaces with distinguished bases:

(1) The relation of this class with the well-known classes.

(2) The possible values of the corresponding analogue of the basic constant.

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The talk is based on a joint paper with B.L. Chalmers

The paper is available at: <http://faculty.cua.edu/ostrovskii/>

**Narutaka Ozawa**,  *$B(H) \otimes B(H)$  fails the WEP*

We prove that  $B(H) \otimes B(H)$  fails the Weak Expectation Property (WEP). The proof uses Kirchberg's and Selberg's theorems and Junge-Pisier argument.

**Maria Grazia Viola**, *Non-outer conjugate actions on a free group factor*

In the '70's, A. Connes gave a complete classification of trace-preserving (periodic) automorphisms on the hyperfinite type II factors, up to outer conjugacy. He showed that the outer period and the obstruction to lifting form a complete set of invariants for such automorphisms. We address the question if a similar classification exists for free group factors. In fact, we show that the situation for free group factors is completely different. We prove the existence of two  $\mathbf{Z}_9$ -actions on an interpolated free group factor which have the same outer period and obstruction to lifting but are not outer conjugate.

**Morry Zippin**,  *$l_1^N$ -bounded orthogonal projections on  $\mathbf{R}^N$*

Let  $P$  be a projection of  $\mathbf{R}^N$  onto a subspace  $E$ . We discuss the connections between the operator  $P + P^t - I$  and the orthogonal projections of  $\mathbf{R}^N$  onto  $E$ .