

小沢 登高 (OZAWA Narutaka)

A. 研究概要

2008 年度は, 昨年度に続いて, UCLA の S. Popa 教授と共同で部分 von Neumann 環の正規化群の研究を行った. 研究目標を大雑把に言えば, 与えられた vN 環に対して, 部分環で正規化群が大きいものをすべて特定するというものである. 本年度は, 前年度に自由群に対して示した結果を一般的な形に拡張し, 実階数 1 の連結単純 Lie 群の格子を含む広いクラスに適用できるようにした. さらにコサイクル剛性定理を示すことによって, 群測度 vN 環に対する新たな剛性定理を得た.

In the academic year 2008, N. Ozawa continued the study with S. Popa on normalizer groups of von Neumann subalgebras. Roughly speaking, the goal is to locate, inside a given von Neumann algebra, all subalgebras having large normalizer groups. They extended their previous result for free groups to a more general form which is applicable to a wide class of groups, containing a lattices of connected semisimple Lie groups with the Haagerup property. Combining it with a new cocycle rigidity theorem, they obtained a new rigidity theorem for group-measure-space von Neumann algebras.

B. 発表論文

1. N. Ozawa; “A Kurosh-type theorem for type II_1 factors,” Int. Math. Res. Not. **2006**, Art. ID 97560, 21 pp.
2. N. Ozawa; “Boundary amenability of relatively hyperbolic groups,” Topology Appl., **153** (2006), 2624–2630.
3. N. Ozawa; “Amenable Actions And Applications,” International Congress of Mathematicians. Vol. II, 1563–1580, Eur. Math. Soc., Zürich, 2006.
4. N. Ozawa; “Weakly exact von Neumann algebras,” J. Math. Soc. Japan, **59** (2007), 985–991.
5. N. Ozawa; “Boundaries of reduced free group C^* -algebras,” Bull. London Math. Soc., **39** (2007), 35–38.

6. N. P. Brown and N. Ozawa; “ C^* -algebras and finite-dimensional approximations,” Graduate Studies in Mathematics, 88. American Mathematical Society, Providence, RI, 2008. xvi+509 pp.
7. N. Ozawa; “Weak amenability of hyperbolic groups,” Groups Geom. Dyn., **2** (2008), 271–280.
8. N. Ozawa and S. Popa; “On a class of II_1 factors with at most one Cartan subalgebra,” Ann. of Math. (2), accepted.
9. N. Ozawa; “An example of a solid von Neumann algebra,” Hokkaido Math. J., accepted.
10. N. Ozawa and S. Popa; “On a class of II_1 factors with at most one Cartan subalgebra II ,” Preprint.

C. 口頭発表

1. *On a class of II_1 factors with at most one Cartan subalgebra*; (1) University of Tokyo, July 2007. (2) Workshop in Analysis and Probability, Texas A&M University, August 2007. (3) Operator Spaces and Group Algebras, BIRS, August 2007. (4) New Development of Operator Algebras, RIMS, September 2007. (5) Workshop on von Neumann Algebras, Fields Institute, October 2007. (6) Workshop on Operator Spaces and Quantum Groups, Fields Institute, December 2007 (7) Topics in von Neumann Algebras, BIRS, March 2008. (8) University of Tokyo, April 2008. (9) Operator Algebras, Dynamics, and Classification, Texas A&M University, August 2008. (10) Non-commutative Harmonic Analysis with Applications to Probability, Będlewo, August 2008. (11) Analytic Properties of Infinite Groups, Genève, August 2008. (12) von Neumann Algebras and Ergodic Theory of Group Actions, Oberwolfach, October 2008. (13) Harmonic analysis, operator algebras and representations, CIRM, November 2008.

2. *Rigidity in finite von Neumann algebras* (5-hour minicourse); Summer School in Operator Algebras University of Ottawa, August 2007.
3. *von Neumann algebras and ergodic theory* (90min x 10 lectures); von Neumann algebras, Ergodic theory and Geometric Group theory, IMSc (Chennai), February 2009.

D. 講義

1. 解析学 XD/スペクトル理論 (数理大学院・4年生共通講義): (非有界) 作用素のスペクトル理論を扱った. 主に Gelfand 理論, Hilbert 空間上の自己共役作用素のスペクトル分解, 対称作用素が自己共役であるための必要・十分条件について講義した.

E. 修士・博士論文

F. 対外研究サービス

G. 受賞

1. ICM 招待講演 (Operator Algebras and Functional Analysis), 2006 年 8 月.
2. 解析学賞 (日本数学会), 2006 年 9 月.
3. 文部科学大臣表彰 若手科学者賞, 2008 年 4 月.

H. 海外からのビジター

1. Yves de Cornulier (CNRS 研究員 Rennes) 専門: Lie 群論と離散群論. 講演: “The space of subgroups of an abelian group,” 東大, 9 月 9 日. “Proper action of wreath products,” RIMS, 9 月 11 日.
2. Cyril Houdayer (UCLA 講師) 専門: von Neumann 環とエルゴード理論. 講演: “Free Araki-Woods factors and Connes’ bicentralizer problem,” 東大, 9 月 17 日. “Prime factors and amalgamated free products,” RIMS, 9 月 11 日.