

A. 研究概要

Longo とともに, 論文 [8] において, 作用素環の 2 次元共形ネットの分類を行った. Central charge が基本的な不変量であるが, この値が 1 未満のケースについて, parity symmetry を持ち, 包含関係について極大であるものを完全に分類し, $A-D-E$ Dynkin 図形のペアによるラベル付けを行った. Parity symmetry と極大性についての条件は, μ -index が 1 という条件にも言い換えられる. また, central charge が 1 未満である限り, この条件を落とした分類も可能であるが, 単に組み合わせが複雑になるだけである. これは, 前に Longo と論文 [5] でやっていた 1 次元のネットの分類を押し進めたものであり, tensor category についての 2-cohomology 消滅が key になる. この cohomology 消滅によって, [5] では vertex operator algebra を引用して済ませていたある種の代数系の一意性も, 作用素環論的に証明できることになった.

We gave a classification of 2-dimensional local conformal nets of operator algebras with Longo in [8]. The basic invariant is the central charge, and we have given a complete classification for the case where this value is less than 1 and the net has parity symmetry and maximality with respect to inclusions. The conditions on parity symmetry and maximality can be dropped, but we then simply have more combinatorial complexity. This is based on our previous classification of 1-dimensional nets in [5], also with Longo. The new key tool is 2-cohomology vanishing for certain tensor categories, which also gives a new and operator algebraic proof of uniqueness of a certain algebraic system for which we had simply cited an argument on vertex operator algebras in [5].

B. 発表論文

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10. Classification of operator algebraic conformal field theories, XIV International Congress on Mathematical Physics, Lisbon (Portugal), July 2003.

D. 講義

1. 全学自由研究ゼミナール: “Euler: The Master Of Us All” (William Dunham) について英語で輪講を行った。(教養学部前期課程講義)
2. 数理科学 II: 常微分方程式の講義. 常微分方程式の解の存在と一意性, 基本的な解法について解説した。(教養学部前期課程講義)
3. 解析学 XF・無限次元構造論: 作用素環論の講義. 代数的場の量子論における, A. Wassermann による円周上の $SU(N)_k$ -net の構成

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E. 修士・博士論文

1. (修士) ウーイェー・オトゴンバイヤル (Uuye Otgonbayar): The Baum-Connes conjecture for KK -theory.
2. (修士) 奥村義和 (OKUMURA Yoshikazu): On half-sided inclusions of von Neumann algebras.

F. 対外研究サービス

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2. *International Journal of Mathematics* の editor.
3. *Reviews in Mathematical Physics* の associate editor.
4. Conference “Recent Advances in von Neumann Algebras” を UCLA (U.S.A.) で主催。(Sorin Popa, Dimitri Shlyakhtenko 両氏と共同, 2003年5月14日~17日).
5. “Summer School 数理物理 2003: 流体力学・乱流の数理” を東京大学大学院数理科学研究科において主催,(小嶋泉氏と共同, 2003年9月6日~9日).

G. 受賞

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