(KAWAHIGASHI Yasuyuki)

A.

Jones

1980

4 $4\cos^2 \pi/n$,

$n = 3, 4, 5, \dots$ 4

Jones Carpi,

Longo

$4\cos^(\pi/10)$,

$3 + \sqrt{3}$

A-D-E Dynkin

braiding

The possible values of the Jones indices of subfactors have been studied since 1980's and they are now completely determined. That is, the possible values are of the form $4\cos^2 \pi/n$, $n = 3, 4, 5, \dots$, when they are below 4, and all the values larger than or equal to 4 are also realized. In the operator algebraic approach to conformal field theory, we study local conformal nets, which are certain families of von Neumann algebras, and we have studied the problem to determine the possible values of the Jones indices of local conformal nets of subfactors with Carpi and Longo. It is easy to see tha all positive integer values are realized. Besides these values, we have shown that the two smallest values are $4\cos^(\pi/10)$ and $3 + \sqrt{3}$. In connection to this result, we have also classified possible braiding structures on the objects corresponding to the even vertices of the Dynkin diagrams for the A-D-E subfactors.

We have also continued our operator algebraic studies on boundary conformal field theory and superconformal field theory.

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2. The super Virasoro algebra and noncommutative geometry, Functional Analysis Colloquium, UCLA (U.S.A.), May 2009.

3. Quantum field theory and operator algebra, 5th Asian Mathematical Conference, Kuala Lumpur (Malaysia), June 2009.

4. Subfactors and representation theory for von Neumann algebras, 12th Workshop: Non-commutative harmonic analysis, Bedlewo (Poland), August 2009.

5. Superconformal field theory, Moonshine and operator algebras 12th Workshop: Non-commutative harmonic analysis, Bedlewo (Poland), August 2009.

6. Superconformal field theory and noncommutative geometry, Subfactor Seminar, UC Berkeley (U.S.A.), September 2009.

7. Superconformal field theory and noncommutative geometry, RIMS

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8. Superconformal field theory, operator algebras and noncommutative geometry, Conference "Mathematical Quantum Field Theory and Renormalization Theory",
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D.

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E.

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F.

1. *Communications in Mathematical Physics* editor.

2. *International Journal of Mathematics* chief editor.

3. *Japanese Journal of Mathematics* managing editor.

4. *Journal of Mathematical Physics* editor.

5. *Journal of Mathematical Sciences, the University of Tokyo* editor-in-chief.

6. *Reviews in Mathematical Physics* associate editor.

7. 6 (
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8. Special Session on Operator Algebras, 5th Asian Mathematical Conference, (Kuala Lumpur, Malaysia, June 22–26, 2009)

9. 12th Workshop: Non-commutative Harmonic Analysis with Applications to Probability (Bedlewo, Poland, August 16–22, 2009)

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