



Contribution ID: 272

Type: **not specified**

Feigin-Semikhatov duality and its applications

Thursday 26 August 2021 15:00 (30 minutes)

In this talk, we investigate relationships between two families of $\mathcal{W}$ -algebras, that is, the subregular $\mathcal{W}$ -algebra for $\mathfrak{sl}_n$ and the principal $\mathcal{W}$ -superalgebra for $\mathfrak{sl}_{1|n}$ in terms of their algebraic structure and representation theory.

The very beginning case is the Kazama-Suzuki coset construction of $\mathcal{N} = 2$ superconformal algebra in terms of WZNW model of $\mathfrak{sl}_2$ whose inverse construction was invented by Feigin-Semikhatov-Tipunin by using a lattice theory.

The relationship of these two algebras are generalized to the above mentioned two families of $\mathcal{W}$ -superalgebras. It was originally conjectured by Feigin and Semikhatov and recently by Gaiotto and Rapcak in a much wider context of chiral algebras appearing at two dimensional boundary of four dimensional super Yang-Mills theory with various boundary conditions.

Firstly, I explain that the Heisenberg cosets of these two (super)algebras are isomorphic, which is conjectured by Gaiotto and Rapcak.

Secondly, I enhance this duality to the reconstruction of these two algebras from the other, which is the honest generalization of Kazama-Suzuki coset construction.

Then I explain the correspondence between the representation theory of these two algebras together with the isomorphisms between the superspaces of logarithmic intertwining operators.

Finally, I explain the levels when these two algebras give rational (super)conformal field theories and the classification of simple modules and the fusion rules. In this case, the duality of the fusion rules is explicitly written down in terms of duality of two lattices appearing as simple currents of respective representation theory.

Author: NAKATSUKA, Shigenori (The University of Tokyo)

Co-authors: Prof. CREUTZIG, Thomas (University of Alberta); Dr GENRA, Naoki (The University of Tokyo); Dr SATO, Ryo (Academia Sinica)

Presenter: NAKATSUKA, Shigenori (The University of Tokyo)

Session Classification: Formal SUSY Theories

Track Classification: Formal SUSY Theories