Mathematics > Quantum Algebra

Handsaw quiver varieties and finite W-algebras

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Following Braverman-Finkelberg-Feigin-Rybnikov (arXiv:1008.3655), we study the convolution algebra of a handsaw quiver variety, a.k.a. a parabolic Laumon space, and a finite W-algebra of type A. This is a finite analog of the AGT conjecture on 4-dimensional supersymmetric Yang-Mills theory with surface operators. Our new observation is that the C^*-fixed point set of a handsaw quiver variety is isomorphic to a graded quiver variety of type A, which was introduced by the author in connection with the representation theory of a quantum affine algebra. As an application, simple modules of the W-algebra are described in terms of IC sheaves of graded quiver varieties of type A, which were known to be related to Kazhdan-Lusztig polynomials. This gives a new proof of a conjecture by Brundan-Kleshchev on composition multiplicities on Verma modules, which was proved by Losev, in a wider context, by a different method.

Comments:	31 pages; v.2 The main result was proved earlier by Losev in a wider context by a different method; v.3 typos corrected
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