Georgiev, Galin; **Mathieu, Olivier**

Fusion rings for modular representations of Chevalley groups. (English) Zbl 0830.20064

Sally, Paul J. jun. (ed.) et al., Mathematical aspects of conformal and topological field theories and quantum groups. AMS-IMS-SIAM summer research conference, June 13-19, 1992, Mount Holyoke College, South Hadley, MA, USA. Providence, RI: American Mathematical Society. Contemp. Math. 175, 89-100 (1994).

Let V and W be finite dimensional representations of a semi-simple algebraic group over a field of characteristic $p > 0$. Suppose all dominant weights of V and W are in the bottom alcove so that V and W are (partial) tilting modules [cf. *S. Donkin*'s paper Math. Z. 212, 39-60 (1993; Zbl 0798.20035)]. By the 'reduced' tensor product of V and W we shall understand the summand of $V \otimes W$ obtained by ignoring all tilting summands whose highest weights are outside the first alcove. In this paper the authors deduce an explicit formula (a fusion rule) for the character of this 'reduced' tensor product.

Similar results covering also quantum groups at roots of unity have been obtained by the reviewer and *J. Paradowski* [Commun. Math. Phys. 169, 563-588 (1995; Zbl 0827.17010)]. In his 1993 Harvard thesis *M. Finkelberg* has presented analogous results for affine Kac-Moody algebras.

For the entire collection see [Zbl 0801.00049].

Reviewer: H.H.Andersen (Aarhus)

MSC:

20G05	Representation theory for linear algebraic groups
20G45	Applications of linear algebraic groups to the sciences
20C20	Modular representations and characters
17B10	Representations of Lie algebras and Lie superalgebras, algebraic theory (weights)
20G15	Linear algebraic groups over arbitrary fields

Keywords:

characters of reduced tensor products; finite dimensional representations; semi-simple algebraic groups; dominant weights; bottom alcove; tilting modules; tilting summands; highest weights; explicit formula; fusion rule; quantum groups; affine Kac-Moody algebras