Reduction by stages on W-algebras

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1. Abstract

Let X be a Poisson variety with a Hamiltonian G-action and H be a normal subgroup of G. Then X//G is obtained by a (Hamiltonian) reduction of X//H by the induced G/H-action under suitable assumptions, called reduction by stages. We apply for the Slodowy slices and show that the Slodowy slice associated to (g, O) is obtained by a reduction of the Slodowy slice associated to (g, O') for a simple Lie algebra g and nilpotent orbits O, O' such that O > O' with some conditions. The quantum cases imply that the finite/affine W-algebras associated to (g, O) are obtained by W-algebras associated to (g, O'), which proves a conjecture of Morgan in finite cases and gives a conjectural generalization of results of Madsen and Ragoucy in affine cases. This is a joint work with Thibault Juillard.