

Weyl modules, Demazure flags and hypergeometric series

Weyl modules for the affine and current Lie algebras were introduced as a tool to study finite-dimensional modules for the quantum affine algebra associated to a simple Lie algebra. It turned out that in the simply laced case the Weyl modules are isomorphic to a Demazure module in a level one representation of the affine Lie algebra. This identification had interesting consequences for the character of the local Weyl module. In the non-simply laced case, it is known that the Demazure module is a proper quotient of the Weyl module. In fact, it was shown by K. Naoi that a Weyl module had a filtration where the sections were level one Demazure modules, i.e., had a Demazure flag. This led to a more general development of the theory of Demazure flags and to interesting new connections with the theory of hypergeometric series.

In this talk we shall review these ideas in the simplest possible case of the Lie algebra \mathfrak{sl}_2 and explain how to compute the multiplicities occurring in a Demazure flag. The talk is based on joint work with R. Biswal, L. Schneider, P. Shereen and J. Wand