Lie Groups and Representation Theory Seminar at the University of Tokyo

DATE   December 21 (Tue), 2010, 16:30–18:00

PLACE   Room 126, Graduate School of Mathematical Sciences

SPEAKER   **Katsuyuki Naoi (   )** (The University of Tokyo)

TITLE   Some relation between the Weyl module and the crystal basis of the tensor product of fudamental representations

ABSTRACT   The Lie algebra defined by the tensor product of a simple Lie algebra and a polynomial ring is called the current algebra, and the Weyl module is defined by a finite dimensional module of the current algebra having some universal property. The fundamental representation is a irreducible, finite dimensional, level zero integrable representation of the quantized affine algebra, and it is known that this module has a crystal basis. If the simple Lie algebra is of ADE type, Fourier and Littelamnn has shown that the Weyl module is isomorphic to a module called the Demazure module. Using this fact, we can easily see that the ($\mathbb{Z}$-graded) characters of the Weyl module and the crystal basis of the tensor product of fundamental representations coincides. In my talk, I will introduce the generalization of this result in the non-simply laced case. In this case, the result of Fourier and Littelmann does not necessarily true, but we can show the characters of two objects also coincide in this case. This fact is shown using the Demazure modules and its "crystal basis" called the Demazure crystals.