Cohomología cuántica y funciones de Schur.

Luc Lapointe

Resumen

Las funciones de k-Schur son generalizaciones de las funciones de Schur asociadas con subespacios del espacio de funciones simétricas. Explicaré como los invariantes de Gromov-Witten en la cohomlogía cuántica del Grassmaniano son casos especiales de coeficientes relacionados con las funciones de k-Schur.

Local systems on nilpotent orbits.

Juan Morales

Abstract

Lusztig uses the generalized Springer correspondence to construct graded Hecke algebras and their simple modules [5]. To do this he has defined cuspidal local system $\mathcal{E}$ on nilpotent orbits. These local systems corresponds to representations of the component group $Z_{^\vee G}(N)/Z_{^\vee G}(N)_o$, where we chose a complex dual group $^\vee G$ to be a connected semisimple simply connected group for simplicity. N is a nilpotent element on the Lie algebra $\mathfrak{g}$ of $^\vee G$. Since there is an equivalence between representations of a topological group and sheaves on a variety. We are interested to understand the relation between representations of the Weil-Deligne group W_F for local fields and local systems on nilpotent orbits. In order to do this we need to construct representations of the group $Z_{^\vee G}(N)/Z_{^\vee G}(N)_o$.

We see, that we can obtain (complex) representations of the component group $Z_{^\vee G}(N)/Z_{^\vee G}(N)_o$ from finite dimensional semisimple representations of the centralizer $Z_{^\vee G}(N)$ of the nilpotent element N.

The group $Z_{^\vee G}(N)$ is not semisimple but we are interested on finite dimensional complex semisimple representations of it. So we use the decomposition of it as an extension of his unipotent radical U^N (connected) and the reductive part R^N [4]. Therefore it is easy to see that the representations of the group $Z_{^\vee G}(N)/Z_{^\vee G}(N)_o$ are the same as of the group R/R_o, since they are isomorphic. The representations of R/R_o comes from the finite dimensional representations of R (since they are

determined by the maximal compact subgroup K and we define invariant of K_o). So in order to construct equivariant local system it is necessary and sufficient to construct representation of R. In this situation we see that the cuspidal local sytem corresponds to representations of an abelian group R. Therefore they are very special and we can associate representations of the Weil-Deligne group to non-cuspidal local systems.

From the Deligne condition we have $Ads.N = q^{\gamma}N$ and $s \in S$ a quotient of the Weil group. So we see that this group S normalizes the centralizer $Z_{^\vee G}(N)$, therefore S acts on the homogeneous space $^\vee G/Z_{^\vee G}(N)$ and this is isomorphic to the orbit $\mathfrak{C}$. So the $^\vee G$-equivariant homogeneous local systems $\mathcal{E}$ on $^\vee G/Z_{^\vee G}(N)$ are transported to the $^\vee G$-equivariant local systems on the orbit $\mathfrak{C}$. So in our situation it is enough to study all in the homogeneaous space.

In this presentaion we will consider the simple groups, where the group R is not connected and construct some representation, with the help of the repesentation theory of the group R. In almost all cases the group R is not simple and the irreducible representations are tensor product of irreducible representations of his factors R_i.

In this presentation we will study , this for the important simply connected cases and construct some important representations of both groups.

References

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