Research plan

Symplectic volumes of multiplicity varieties and multiple weight varieties are regarded as generating functions of intersection pairings. Thus we can describe the structure of the cohomology ring for them from the obtained volume formulas.

On the other hand, Goldin gave an explicit formula for the rational cohomology ring for weight varieties of type A, which are symplectic torus quotients of a coadjoint orbit associated with special unitary groups, by a different method. Here, Schubert calculus plays the key role. Using this method, I would like to express an explicit formula for the cohomology ring for multiple weight varieties and multiplicity varieties.

I have investigated only the multiple weight varieties associated with special unitary groups. For compact simple Lie groups except of type A, (multiple) weight varieties are orbifolds in general. In this case, I would like to describe the orbifold cohomology for them.