QUANTUM KOSTKA AND THE RANK ONE PROBLEM FOR $\mathfrak{sl}_{2m}$

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JMM Abstract

Vector bundles of conformal blocks on $\overline{M}_{g,n}$, the moduli space of stable $n$-pointed curves of genus $g$, are determined by a simple Lie algebra $\mathfrak{g}$, a positive integer $\ell$, and an $n$-tuple $\vec{\lambda}$ of dominant integral weights for $\mathfrak{g}$ at level $\ell$. On $\overline{M}_{0,n}$ the bundles are globally generated, and their first Chern classes are base point free. The ranks of the bundles, when $\mathfrak{g} = \mathfrak{sl}_{r+1}$, can be computed using Schubert calculus. In this talk, using quantum Kostka and other tools, I classify ranks of $\mathfrak{sl}_{2m}$ bundles with so-called rectangular weights. Using similar techniques I show that the subcone of the nef cone spanned by the infinite family of first Chern classes of bundles of rank one is actually polyhedral, the convex hull of a finite number of extremal rays.

References

[1] V. Alexeev, A. Gibney, and D. Swinarski, Conformal Blocks Divisors on $\overline{M}_{0,n}$ from $\mathfrak{sl}_2$.

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