OSCILLATING INTEGRALS AND INTEGRABLE HIERARCHIES

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Abstract. In this talk I would like to explain part of the proof that the equivariant Gromov–Witten invariants of the orbifold sphere $\mathbb{C}P^1_{k,m}$ are governed by the flows of an integrable hierarchy. The later may be described in terms of vertex operators and Hirota bi-linear equations as well as a reduction of the so called 2-Toda hierarchy. My first goal is to explain the relation between the vertex operators and the equivariant mirror model of $\mathbb{C}P^1_{k,m}$. By a mirror model here I mean a matrix of oscillating integrals that provides a fundamental solution to the system of quantum differential equations of $\mathbb{C}P^1_{k,m}$. My second goal is to explain that the Hirota quadratic equations correspond to a new integrable hierarchy which is a reduction of the 2-Toda hierarchy.

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