

Fock Spaces and Tropical Curve Counting

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The goal of this mini-course is to discuss the connection between tropical curve counting techniques, and the theory of operators on Fock Spaces. The first talk will serve as a friendly introduction to the bosonic and fermionic Fock spaces, and explain the bosonic-fermionic correspondence. In the second lecture we will explore theories counting maps from curves to curves: Hurwitz theory and Gromov-Witten theory. We will introduce classical-tropical correspondences, and show how the Okounkov-Pandharipande GW/H correspondence fits into this story. In the last lecture we will study curves in toric surfaces, and use degeneration techniques to show these counts arise as vacuum expectations of certain operators, whose Feynmann diagrams are combinatorial gadgets known as Floor diagrams. Floor diagrams are shown to arise also from the enumeration of tropical curves.

References

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- [5] COOPER,PANDHARIPANDE , *A Fock space approach to Severi degrees.*
- [6] OKOUNKOV, PANDHARIPANDE , *Gromov-Witten theory, Hurwitz theory, and completed cycles.*

[7] RIOS-ZERTUCHE , *An introduction to the half-infinite wedge.*