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Diagrammatic Expansion of Non-perturbative Little String Free Energies

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Diagrammatic Expansion of Non-perturbative Little String Free Energies
Abstract: In this talk I discuss the non-perturbative free energy of a class of Little String Theories of A-type, which are engineered by N parallel M5-branes on a circle. Exploiting non-perturbative symmetries of these theories, I provide evidence to leading instanton order (from the perspective of the low energy U(N) gauge theory) for a decomposition, which resembles a Feynman diagrammatic expansion: external states are given by expansion coefficients of the N = 1 BPS free energy and a quasi-Jacobi form that governs the BPS-counting of an M5-brane coupling to two M2-branes. The effective coupling functions can be written as a simple combination of two-point functions of a single free scalar field on the torus. To further instanton orders, a decomposition of the free energy in terms of higher point functions with the same external states is still possible but a priori not unique. The loop corrections appearing in this picture can be linked to dihedral graph functions with bivalent vertices, which suggests an interpretation in terms of disconnected graphs.

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