

# COMBINATORIAL SOLUTIONS TO INTEGRABLE HIERARCHIES

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In 2000, answering a question by R. Pandharipande, A. Okoun'kov proved that a generating function for connected double Hurwitz numbers satisfies Toda equations. Since then, a number of other solutions to integrable hierarchies, whose coefficients are answers to various enumerative problems, has been constructed in the work of I. Goulden, D. Jackson, J. Harnad, P. Zograf, and others. The talk will present a review of modern approaches to constructing such formal solutions. The relationship between these approaches and combinatorics of symmetric groups and their representations will be explained.

Applications of the results to constructing efficient computations in enumeration of various kinds of maps will be given.