

SEMINARIO

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On some q -analog of an initial value problem with infinite order irregular singularity and Mahler transforms

Abstract: A family of q -difference-differential equations in two complex variables is studied, under the action of a so-called Mahler transform on time variable. The appearance of a leading formal q -difference operator of irregular type in the equation guarantees the existence of a formal solution to the main problem in time variable, which turns out to be obtained after a q -analog of Borel-Laplace procedure. Such formal solution to the main problem is G_q -summable along certain directions. The G_q -sums of such formal solutions do not in general satisfy the initial problem but rather turns out to be the analytic solutions to some related pseudo q -difference-differential equation.

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