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Application des fonctions symétriques à la résolution d’équations différentielles autonomes combinaïtoires. (Application of symmetric functions to the solution of autonomous combinatorial differential equations).  (French) [Zbl 1008.05149]


Summary: We present a method of solving combinatorial differential equations based on the utilization of symmetric functions in the context of combinatorial species introduced by A. Joyal [Adv. Math. 42, 1-82 (1981; Zbl 0491.05007)]. Our approach relies on an isomorphism between the ring of symmetric functions and the ring of rational set species, whose elements are formal sums involving variables $E_i$, the species of sets of cardinality $i$. This isomorphism is used to calculate the kernel of the derivative $D$ operator restricted to the above ring. We also study the equation $Y'' = (1 + Y)^2$, $Y(0) = 0$ for which we give, apart from the solution $L^*$ (nonempty linear orders), another solution in the half-ring of species of sets. The question of the existence of another solution to this equation has been raised; see G. Labelle [J. Math. Anal. Appl. 113, 344-381 (1986; Zbl 0622.34013)].

MSC:

05E05 Symmetric functions and generalizations
34A99 General theory for ordinary differential equations

Keywords:
combinatorics; symmetric functions; species theory; combinatorial differential equation

Full Text: DOI