Polylogarithms at non-positive (i.e. negative) multi-indices

Gérard H. E. Duchamp - Hoang Ngoc Minh - Ngo Quoc Hoan

♦ Paris XIII University, 93430 Villetaneuse, France, gheduchamp@gmail.com
♦ Lille II University, 59024 Lille, France, Hoang.Ngocminh@lipn.univ-paris13.fr
♣ Paris XIII University, 93430 Villetaneuse, France, quochoan Ngo@yahoo.com.vn

Abstract

We extend the definition and construct several bases for polylogarithms $Li_T$, where $T$ is recognizable by a finite state (multiplicity) automaton and of alphabet $X = \{x_0, x_1\}^1$. The kernel of the “polylogarithmic map” $Li_*$ is also characterized and provides a rewriting process which terminates to a normal form. We mostly concentrate on the algebraic aspects of this extension.


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1The space of rational series considered here is $(C\langle X \rangle \cup C^{rat} \langle x_0 \rangle \cup C^{rat} \langle x_1 \rangle) \cup \omega, 1_{X^*})$. 