1009-11-23　　　　**David Terhune*** (`terhune@math.psu.edu`), Dept. of Mathematics, 218 McAllister Bldg., State College, PA 16803. *A Weight-Depth Theorem for a Class of Multiple L-values.*

By applying integral operators to generating functions of generalized Bernoulli numbers, and using the monodromies of new polylogarithm-type functions, the following is proven.

For $\chi_1, \ldots, \chi_d$ in a broad class of Dirichlet characters, and $a_1, \ldots, a_d \in \mathbb{Z}_+$ such that

$$\prod_{j=1}^{d} \chi_j(-1) = (-1)^{a_1 + \cdots + a_d + d - 1},$$

the multiple L-value of Euler-Zagier type

$$L \left(\begin{matrix} \chi_1, \ldots, \chi_d \\ a_1, \ldots, a_d \end{matrix} \right) = \sum_{0 < n_1 < \cdots < n_d} \prod_{j=1}^{d} \frac{\chi_j(n_j)}{n_j^{a_j}}$$

is equal to a K-linear finite combination of products of lower-dimensional multiple L-values, for an appropriate finite cyclotomic extension $K/\mathbb{Q}$.

Although the methods here are analytic, these multiple L-values have an extensive algebraic structure, which has been investigated by Racinet, Goncharov, and others. (Received June 20, 2005)