1067-65-1797 **Ben Niu*** (nben@iit.edu), 575 W. Madison Street, Apt 3004, Chicago, IL 60661, and **Fred J Hickernell**, **Klaus Ritter** and **Thomas Müller-Gronbach**. *Multi-level Algorithms for Infinite-dimensional Integration on* $\mathbb{R}^{\mathbb{N}}$.

Pricing a path-dependent financial derivative, such as an Asian option, requires the computation of $E(g(B))$, the expectation of a payoff function g, that depends on a Brownian motion B. Employing a standard series expansion of B the latter problem is equivalent to the computation of the expectation of a function of the corresponding i.i.d. sequence of random coefficients. This motivates the construction and the analysis of algorithms for numerical integration with respect to a product probability measure on the sequence space $\mathbb{R}^{\mathbb{N}}$. The class of integrands studied in this paper is the unit ball in a reproducing kernel Hilbert space obtained by superposition of weighted tensor product spaces of functions of finitely many variables. Combining tractability results for high-dimensional integration with the multi-level technique we obtain new algorithms for infinite-dimensional integration. These deterministic multi-level algorithms use variable subspace sampling and they are superior to any deterministic algorithm based on fixed subspace sampling with respect to the respective worst case error. Numerical experiments will be implemented. (Received September 21, 2010)