Maude Giasson, Walter Hengartner†, and Gerhard Opfer

Shift Generated Haar Spaces on Unbounded, Closed Domains in the Complex Plane

CMFT 3 No.1 (2003), 151–164. [ISSN 1617-9447]

Abstract. Some of the known Haar spaces are linear hulls of shifts of a single function G on $\mathbb{C}\backslash\{0\}$. We study N-dimensional and universal analytic Haar space generators for some closed sets F of $\mathbb{C}$ (in the sense that an arbitrary finite number of shifts generates Haar spaces by forming linear hulls). The suitable function space for our investigation is $\mathrm{C}^\circ(F)$, the space of all complex valued, continuous functions f on F with the defining property $\lim_{z\in F, z\to\infty} f(z) = 0$. In many cases we are able to characterize universal Haar space generators. We show, in addition, that in $\mathrm{C}^\circ(F)$ a best approximation by elements of finite dimensional spaces V is unique if and only if V is a Haar space.

Keywords. Complex Haar spaces, shift generated spaces, approximation on unbounded domains, Haar space generators.

2000 MSC. 30C15, 30E10, 41A45, 41A50, 41A52.

Received. July 31, 2003.