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NOTES ON THE ANALYTIC YEH-FEYNMAN INTEGRABLE FUNCTIONALS

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ABSTRACT. In this paper we extend Johnson and Skoug's results involving the analytic Feynman integrable functionals on Wiener space to the analytic Yeh-Feynman integrable functionals on Yeh-Wiener space. To do this we define the analytic Yeh-Feynman integral and find a Banach algebra of some Yeh-Feynman integrable functionals. Also we find formulae for the analytic Yeh-Feynman integral and extend some measurability results involving the Wiener measure to the Yeh-Wiener measure.

1. Introduction. In [1], Cameron and Storvick treat a Banach algebra $S(L_2[a,b])$ of functionals on Wiener space which are a kind of stochastic Fourier transform of Borel measures on $L_2[a,b]$. Here $L_2[a,b]$ denotes the space of Lebesgue measurable, square integrable functions on $[a,b]$. For such functionals they show that the analytic Feynman integral, defined by analytic continuation of the Wiener integral, exists, and they give formulae for this Feynman integral. In a recent paper [7], Johnson and Skoug extend somewhat and simplify substantially some of Cameron and Storvick's results in [1].

The main purpose of this paper is to extend Theorem 1 in [7] involving the analytic Feynman integrable functionals on Wiener space to the analytic Yeh-Feynman integrable functionals on Yeh-Wiener space. Let $\mathbf{R}$ and $\mathbf{C}$ denote the real and complex numbers respectively. Let $C_2(Q)$ denote the Yeh-Wiener space, that is, the space of $\mathbf{R}$-valued continuous functions x on $Q = [a,b] \times [\alpha,\beta]$ for some fixed real numbers a and b, and α and β such that $x(a,v) = x(u,\alpha) = 0$ for all $a \leq u \leq b$ and $\alpha \leq v \leq \beta$. In this paper we shall always denote the above

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