CONDITIONAL ANALYTIC FEYNMAN INTEGRAL OVER PRODUCT SPACE OF WIENER PATHS IN ABSTRACT WIENER SPACE

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ABSTRACT. In this paper, we derive a simple formula for the conditional Wiener integrals over the product space of Wiener paths and evaluate analytic Feynman integrals and conditional analytic Feynman integrals of functionals in Banach algebras which are equivalent to the space of complex Borel measures on a real separable Hilbert space.

1. Introduction and preliminaries. Let $C_0[0,T]$ denote the classical Wiener space, that is, the space of real-valued continuous functions $x(t)$ defined on $[0,T]$ with $x(0) = 0$. The concept of conditional Wiener integral in this space was introduced by Yeh in [**14, 15**], and he used an inversion formula for evaluating some conditional Wiener integrals. On the other hand, Park and Skoug [**11**] derived a simple formula for evaluating conditional Wiener integrals, and Chung and Skoug introduced the concept of a conditional analytic Feynman integral on the classical Wiener space [**6**]. And then, using the simple formula, they evaluated the conditional analytic Feynman integrals of functions in the Banach algebra $\mathcal{S}$ which was introduced by Cameron and Storvick in [**2**]. Also, they proved that the conditional analytic Feynman integral of functions in $\mathcal{S}$ is a solution of the Schrödinger equation.

The space $C_0(\mathbf{B})$, which is the space of abstract Wiener space-valued continuous functions defined on $[0,T]$, was introduced by Kuelb and LePage in [**9**], and Ryu [**13**] introduced various properties on the space, which appear in the classical and abstract Wiener spaces. In [**3**], Chang, Cho and Yoo derived a simple formula for evaluating some conditional