

1054-28-133

Yuichiro Kakihara* (ykakihar@csusb.edu), Department of Mathematics, California State University, 5500 University Parkway, San Bernardino, CA 92407-2397. *Weak Radon-Nikodým derivative for Hilbert space valued measures.*

Let (Θ, \mathfrak{A}) be a measurable space and H be a separable Hilbert space. Let ξ be a H -valued measure on \mathfrak{A} and ν be a finite positive measure on \mathfrak{A} such that $\xi \ll \nu$. Since H has the Radon-Nikodým property, if ξ is of bounded variation, then there exists a unique (in the ν -a.e. sense) Radon-Nikodým derivative $d\xi/d\nu \in L^1(\Theta, \nu : H)$. If ξ is not of bounded variation, a weak Radon-Nikodým derivative of ξ with respect to ν is defined. The existence and uniqueness of weak Radon-Nikodým derivative will be shown under a fairly general condition. Using this weak Radon-Nikodým derivative an integral of a complex valued measurable function with respect to ξ is defined, which reduces to the Dunford-Schwartz integral. (Received September 10, 2009)