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NasirUddin Ahmed* (ahmed@site.uottawa.ca), SITE, 800 King Edward Street, University of Ottawa, Ottawa, Ontario K1N6N5, Canada. *Weak compactness in the space of Operator Valued Measures $M_{ba}(\Sigma, \mathcal{L}(X, Y))$ with an Application.* Preliminary report.

In this paper we present necessary and sufficient conditions for conditional weak compactness in the space of operator valued measures $M_{ba}(\Sigma, \mathcal{L}(X, Y))$ with an application to partially observed stochastic differential equations on infinite dimensional Hilbert spaces.

Theorem 1 Let S be a compact Hausdorff space and Σ the sigma algebra of subsets of the set S . Let $\{X, Y\}$ be a pair of Banach spaces with Y being reflexive and consider the space of operator valued measures $M_{ba}(\Sigma, \mathcal{L}(X, Y))$. A set $\Gamma \subset M_{ba}(\Sigma, \mathcal{L}(X, Y))$ is conditionally weakly compact if, and only if, the following conditions hold:

- (i): Γ is bounded, that is, $\sup\{\hat{T}(S), T \in \Gamma\} < \infty$, with \hat{T} denoting the semivariation of T ,
- (ii): for each $f \in B_\infty(S, X)$, the set of measures $\{v(\mu)(\cdot) \equiv |\mu|(\cdot) : \mu \in \Gamma(f)\}$ where $\Gamma(f) \equiv \{\mu : \mu(\sigma) \equiv (Tf)(\sigma), \sigma \in \Sigma\}$, is uniformly additive.

Application: This result is applied to structural control of partially observed stochastic systems on Hilbert spaces with nonstandard cost functional. (Received May 10, 2009)