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Akram Aldroubi* (akram.aldroubi@vanderbilt.edu), **Carlos Cabrelli**, **Ursula Molter** and **Sui Tang**. *Dynamical sampling in Hilbert spaces.*

Let $Y = \{f(i), Af(i), \dots, A^l f(i) : i \in \Omega\}$, where A is a bounded operator on $\ell^2(I)$. The problem under consideration is to find necessary and sufficient conditions on A, Ω, l_i in order to recover any $f \in \ell^2(I)$ from the measurements Y . This is the so called dynamical sampling problem in which we seek to recover a function f by combining coarse samples of f and its futures states $A^l f$, $l = 1, \dots, l_i$. We solve this problem in finite dimensional spaces, and for a large class of self adjoint operators in infinite dimensional spaces. (Received September 12, 2014)