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Sui Tang* (sui.tang@vanderbilt.edu). *Exact reconstruction of an evolving signal from incomplete information of its future states.*

Let $f \in \ell^2(I)$ be a signal at time $t = 0$ of a dynamical process controlled by a bounded linear operator A that produces the signals Af, A^2f, \dots at times $t = 1, 2, \dots$. Let $Y = \{f(i), Af(i), \dots, A^{l_i}f(i) : i \in \Omega \subset I\}$ be the spatio-temporal samples taken at various time levels. 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 signal f by combining coarse samples of f and its futures states $A^l f$. This problem has connection to many areas of mathematics including frames, Banach algebras, and the recently solved Kadison-Singer/Feichtinger Theorem. We will discuss the problem, its extentions, and show some recent results. (Received September 22, 2015)