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**Jacqueline Davis\*** ([jacqueline.t.davis@vanderbilt.edu](mailto:jacqueline.t.davis@vanderbilt.edu)). *Spatio-temporal sampling schemes in evolutionary systems.*

When an evolving signal is to be reconstructed from samples of it, can fine time sampling compensate for coarse spatial sampling? This poster explores this question, which is called the dynamical sampling problem. Under some conditions, the answer is "yes" - it is possible to exactly reconstruct a signal from coarse spatial samples taken at many times. Knowledge of the evolutionary nature of the system is exploited to allow full recovery of spatially undersampled signals.

Mathematically, the problem is stated as follows. Let  $x_0$  be a signal and  $A_t$  be an evolution rule so that the signal at time  $t > 0$  is given by  $x_t = A_t x_{t-1}$ , and let  $S_t$  be a subsampling operator so that the measured signal at time  $t$  is given by  $S_t x_t$ . Under what conditions on  $x_0$ ,  $A_t$ , and  $S_t$ , can  $x_0$  be recovered from the set of samples  $\{S_{t_i} x_{t_i}\}_I$ , where  $I$  is a finite set? (Received September 05, 2013)