Fundamentals of dynamical sampling

Carlos Cabrelli

Dept. of Mathematics, FCEyN, UBA and IMAS-UBA-CONICET, Argentina

cabrelli@dm.uba.ar

Dynamical sampling refers to the process that results from sampling an evolving signal f at various times. The fundamental question of this spatial-temporal sampling is: when do coarse samplings taken at varying times contain the same information as a finer sampling taken at the earliest time? In other words, under what conditions on an evolving system, can time samples be traded for spatial samples?

Because dynamical sampling uses samples from varying time levels for a single reconstruction, it departs from classical sampling theory in which a signal f does not evolve in time and is to be reconstructed from its samples at a single time $t = 0$.

In this talk we study this problem in finite dimensional spaces, and for a large class of self adjoint operators in infinite dimensional spaces.

Joint work with Akram Aldroubi (Vanderbilt University, US), Ursula Molter (University of Buenos Aires, Argentina), Sui Tang (Vanderbilt University, US)..