A cointegrated VAR model in continuous time

In this talk we will discuss questions concerning existence, uniqueness and representations of integrated solutions to multivariate stochastic delay differential equations (MSDDEs). Motivated by the relation between stationary VAR processes in discrete time and stationary solutions to MSDDEs in continuous time, we show that (i) MSDDEs always admit an error correction form, (ii) solutions to MSDDEs have a Granger type of representation and (iii) the cointegration space is completely characterized by the total mass of the delay measure. By rewriting invertible MCARMA equations as MSDDEs, these results are used to characterize cointegrated invertible MCARMA processes.