REPRESENTATIONS AND FRACTIONAL INTEGRATION OF CONTINUOUS-TIME ARMA PROCESSES

PETER J. BROCKWELL

Statistics Department, Colorado State University

Abstract

Starting from the kernel representation of a continuous-time Lévy-driven continuous-time ARMA (CARMA) process, we define a class of fractionally integrated Lévy-driven CARMA processes and examine the asymptotic behaviour of the kernel and autocovariance functions. Since the operation of fractional integration preserves kernel non-negativity, this construction includes that of Lévy-driven CARMA processes with non-negative kernel and long memory. This allows the modeling of non-negative Lévy-driven CARMA processes with long memory, extending the class of stochastic volatility models considered by Barndorff-Nielsen and Shephard (J.R.S.S. (B) **63**, 1-42, 2001). A class of non-linear CAR processes driven by Gaussian noise and its application to the modelling of returns on asset prices is also discussed.