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Steven E Shreve* (shreve@andrew.cmu.edu), Department of Mathematical Sciences, Carnegie Mellon University, 5000 Forbes Avenue, Pittsburgh, PA 15213-3890. *Markov Projection of a Stochastic Process.*

Dupire has shown how to construct a local volatility model that matches given option prices. More generally, if one has an underlying stochastic process on which derivative securities are written, it is desirable to construct a low-dimensional Markov process that generates the same derivative security prices. In this talk, we show how to begin with a general multi-dimensional underlying process whose drift and diffusion are themselves stochastic processes, and then construct a solution of a low-dimensional stochastic differential equation whose distribution at each fixed time agrees with the distribution of the original underlying stochastic process. Indeed, we can do this in such a way that functions of the paths of the two processes, such as running maximum or running average, also have the same distribution at each fixed time. This can be done without assuming non-vanishing volatility or continuity of coefficients, although in this general setting, the low-dimensional stochastic differential equation may have spurious solutions. (Received September 19, 2015)