



# Density Approximations for Multivariate Affine Jump-Diffusion Processes

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We introduce closed-form transition density expansions for multivariate affine jump-diffusion processes. The expansions rely on a general approximation theory which we develop in weighted Hilbert spaces for random variables which possess all polynomial moments. We establish parametric conditions which guarantee existence and differentiability of transition densities of affine models and show how they naturally fit into the approximation framework. Empirical applications in credit risk, likelihood inference, and option pricing highlight the usefulness of our expansions. The approximations are extremely fast to evaluate, and they perform very accurately and numerically stable.

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