

HEAT KERNELS FOR NON-SYMMETRIC NON-LOCAL OPERATORS

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In this talk, we will discuss a family of time-dependent non-local operators which can be expressed as a sum of non-divergence form elliptic differential operator and a non-local operator of fractional order type. I will present recent results on the existence and uniqueness of heat kernels for this class of operators. I will further present sharp two-sided estimates, gradient estimate and fractional derivative estimate for the heat kernels under some mild conditions. Our approach uses a combination of analytic and probabilistic methods. Based on joint work with E. Hu, L. Xie and X. Zhang.