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Existence and uniqueness for non-autonomous parabolic Cauchy problems with rough coefficients

Abstract: I discuss the initial value problem for parabolic equations or systems in the form $\partial_t u = \operatorname{div} A \nabla u$ on the upper half space, with initial data in L^p spaces. After giving a construction of propagators through an optimal energy space, I present a criterion that allows one to obtain interior représentation of solutions and is the key to trace and uniqueness results under weak interior control. In particular, no control when $t \to \infty$ is required to obtain uniqueness for real equations with L^p data, which seems not to have been observed. This is based on a joint work with S. Monniaux et P. Portal.