

Quasilinear Fractional Evolution Equations and Continuous Interpolation Spaces

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We consider the parabolic quasilinear fractional evolution equation

$$D_t^\alpha(u_t - z) + A(u)u = f(u) + h(t); \quad u(0) = x, \quad u_t(0) = z,$$

in continuous interpolation spaces allowing a singularity as t_0 . Here D_t^α denotes the time-derivative of order $0 < \alpha < 1$. First, fractional derivatives in the space $L^p((0, T); X)$ are briefly considered; next these derivatives are examined in spaces of continuous functions having at most a prescribed singularity as t_0 . We study the related trace spaces and by using maximal regularity results for the linearized equation we formulate existence and uniqueness results for the quasilinear equation.