Renormalized solutions for a stochastic $p$-Laplace equation with $L^1$-initial data

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We consider a $p$-Laplace evolution problem with stochastic forcing on a bounded domain $D \subset \mathbb{R}^d$ with homogeneous Dirichlet boundary conditions for $1 < p < \infty$. The additive noise term is given by a stochastic integral in the sense of Itô. The technical difficulties arise from the merely integrable random initial data $u_0$ under consideration. Due to the poor regularity of the initial data, estimates in $W^{1,p}_0(D)$ are available with respect to truncations of the solution only and therefore well-posedness results have to be formulated in the sense of generalized solutions. We extend the notion of renormalized solution for this type of SPDEs, show well-posedness in this setting and study the Markov properties of solutions.