Consider non-linear time-fractional stochastic reaction-diffusion equations of the following type,

\[ \partial_t^\beta u_t(x) = -\nu(-\Delta)^{\alpha/2}u_t(x) + I^{1-\beta}[b(u) + \sigma(u) \cdot F(t, x)] \]

in \((d + 1)\) dimensions, where \(\nu > 0, \beta \in (0, 1), \alpha \in (0, 2]\). The operator \(\partial_t^\beta\) is the Caputo fractional derivative while \(-(-\Delta)^{\alpha/2}\) is the generator of an isotropic \(\alpha\)-stable Lévy process and \(I^{1-\beta}\) is the Riesz fractional integral operator. The forcing noise denoted by \(F(t, x)\) is a Gaussian noise. These equations might be used as a model for materials with random thermal memory. We derive non-existence (blow-up) of global random field solutions under some additional conditions, most notably on \(b, \sigma\) and the initial condition. (Received September 17, 2019)