

The present work describes the relation between solutions of a special kind of nonlinear stochastic partial differential equation with multiplicative noise, driven by fractional Brownian motion (fBm), and the solutions of deterministic version of this equation. Solution of the stochastic equation is given explicitly by means of solution to the deterministic equation and trajectories of fBm. The geometric fractional Brownian motion plays an important role here. The solutions are considered both in strong and weak sense. Stochastic integral wrt. fBm with Hurst index H can be defined in various ways. Here we consider a Stratonovich type integral for $H > 1/2$. The results obtained are used for the study of properties of solution of stochastic porous media equation – the expected value of total mass of the solution and the long-time behaviour of the solution.