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The solvability of optimal control problem for degenerate parabolic variational inequality

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The main object of investigation is the optimization problem for the next degenerate parabolic variational inequality

$$\begin{aligned} \int_0^T \int_{\Omega} \dot{v} \cdot (v - y) \rho dx dt + \int_0^T \int_{\Omega} (\nabla y, \nabla(v - y))_{\mathbb{R}^N} \rho dx dt &\geq \\ &\geq \int_0^T \int_{\Omega} f \cdot (v - y) dx dt + \int_0^T \int_{\Omega} u \cdot (v - y) dx dt. \end{aligned}$$

Using the so called Hardy-Poincare inequality, we proved, that the considered optimal control problem for degenerate parabolic variational inequality with homogeneous bound conditions has a unique optimal solution in weighted Sobolev space.