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*Fixed Point Methods for Parabolic Quasi-Variational Inequalities with Gradient-type Constraints*

The paper addresses existence, uniqueness and approximation methods for a certain class of nonlinear parabolic quasi-variational inequality (QVI) problems with special gradient-type constraints. Problems of this nature are common in the mathematical modeling of superconductors and ionization in electrostatics. The results are developed based on monotone operator theory, $C_0$ semigroup methods and recent advances on QVIs of the elliptic type. Numerical tests involving the p-Laplacian operator are provided.

Comments: The paper was developed together with Prof. Michael Hintermüller from Institut für Mathematik, Humboldt-Universität zu Berlin