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Solvability of a multivalued filtering problem in a heterogeneous environment with a distributed source

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Abstract

In this paper we formulate a generalized filtering problem in a heterogeneous environment in the presence of a source distributed along a line. Incompressible fluids obey a multivalued law with a linear growth at infinity. In this study we use the additive singularity extraction in the right-hand side of the problem constraint. We represent the pressure field as the sum of a known solution to a certain linear problem and an unknown "additive term". We reduce the problemunder consideration to a variational inequality of the second kind in a Hilbert space (with respect to the mentioned "additive term") and prove its solvability. © 2011 Allerton Press, Inc.

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Keywords

Heterogeneous environment, Multivalued law, Nonlinear filtering of an incompressible fluid, Source distributed along a line, Variational inequality